FINAL

ENVIRONMENTAL CONDITION OF PROPERTY REPORT

HORSHAM MEMORIAL
U.S. ARMY RESERVE CENTER (PA046)
936 EASTON ROAD, HORSHAM TOWNSHIP
MONTGOMERY COUNTY, PA 19044-3302

Prepared For:

U.S. Army Corps of Engineers – Louisville District
Engineering Division – Environmental Engineering Branch
600 Dr. Martin Luther King, Jr. Place
Louisville, Kentucky 40202-2232

APRIL 2007

CERTIFICATION

All information/documentation provided accurately reflects the environmental condition of the property. This ECP Report is in general accordance with the U.S. Department of Defense (DoD) requirements for completion of an Environmental Condition of Property (ECP) Report.

BRUCE L. KISH **DATE**
Environmental Protection Specialist
99th Regional Readiness Command

The undersigned certifies the contents of this report are in general accordance with DoD policies for the completion of an ECP report.

04/11/07

LENARD GUNNELL, P.G. **DATE**
Project Geologist
U.S. Army Corps of Engineers

Executive Summary

CH2M HILL, under contract to the U.S. Army Corps of Engineers, Louisville District, has prepared this Environmental Condition of Property (ECP) report for the Horsham Memorial U.S. Army Reserve (USAR) Center (Facility ID PA046), hereafter referred to as the "Property" or "USAR Center." The Property is located at 936 Easton Road, Horsham Township, Montgomery County, Pennsylvania, 19044-3302, and encompasses 7 acres.

This ECP Report was conducted in conformance with the Department of Defense's Base Redevelopment and Realignment Manual, DoD 4165.66-M, Army Regulation 200-1, and the American Society for Testing and Materials Designation D6008-96 (2005), *Standard Practice for Conducting Environmental Baseline Surveys.*

This ECP Report details the history of the property, including the USAR and any prior tenant uses of the Property and the resulting environmental condition of the Property.

The USAR Center is on 7 acres of land with two permanent structures, a 24,527-square-foot administration building and a 3,710-square-foot Organizational Maintenance Shop (OMS). The site is currently occupied by three units: 23rd SS Area Maintenance and Support Activity (AMSA), 2/228th Aviation Battalion (AV BN), and 367th Military Policy Company (MP CO).

Based on a review of aerial photographs and U.S. Geological Survey topographic maps dating back to 1938, the Property was an undeveloped lot prior to 1959. Construction of the administration building and OMS building was completed in 1959. Prior to ownership by the U.S. Government, the Property was owned by Albert G. Lippincott and family from 1897 to 1921. In 1953, Edith B. Lippincott and Mary L. Buck sold the Property to the U.S. Government.

Areas of potential environmental concern were reviewed and CH2M HILL identified the following issues relating to the environmental condition of the property:

A leaking underground gasoline storage tank located on the adjacent JOT Fuel property is undergoing remediation. The release impacted soil and groundwater, and has impacted groundwater on the Property. Contaminants of concern (COC) include benzene, toluene, ethylbenzene, and xylene; cumene; naphthalene; and methyl tertiary butyl ether (MTBE). Monitoring wells along the property boundary indicated MTBE was present above Pennsylvania Act 2 Medium Specific Concentrations prior to implementing remedial actions. A pump and treat and vapor recovery system operated on the JOT Fuel property from 1998 to 1999. Ongoing monitoring indicates COCs along the property boundary are currently nondetect. However, COCs were still detected in other monitoring wells on and downgradient of the JOT Fuel property; therefore, the release has not yet been closed by PADEP.

- During the USACE Baltimore District 1995 site inspection, about 40 square feet of petroleum-stained soil and staining on the pavement adjacent to this area was observed on the south side of the OMS building. The reported staining was not observed during

the August 2, 2006, site reconnaissance; however, it is unknown if any remedial activities were conducted in this area.

- About 10 gallons of diesel fuel were spilled in front (north) of the OMS building. Contaminated soil was excavated and subsurface soil samples were collected.
- Contaminated soil associated with a former 2,000-gallon No. 2 fuel oil leaking UST was remediated and is now closed by PADEP.

In accordance with Department of Defense policy defining the classifications (See Sherri Goodman Memorandum dated 21 October 1996), the Property has been classified as Type 4. This classification does not include categorizing the property based on *de minimis* conditions that generally do not present material risk of harm to the public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

Contents

Appendixes

Abbreviations and Acronyms

The following is a comprehensive list of abbreviations and acronyms that are used throughout this report.

ACM	asbestos-containing material
AIRS	Aerometric Information Retrieval System
ALSI	Analytical Laboratory Services, Inc.
AMSA	Area Maintenance Support Activity
amsl	above mean sea level
AR	Army Regulation
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
AV BN	Aviation Battalion
BRAC	Base Realignment and Closure
BRRM	Base Redevelopment and Realignment Manual
BTEX	benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
CFR	Code of Federal Regulations
COC	contaminant of concern
CORRACTS	Resource Conservation and Recovery Act corrective action site
DoD	Department of Defense
DRO	diesel range organics
EA	EA Engineering, Science, and Technology, Inc.
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
ERNS	Federal Emergency Response Notification System
FEMA	Federal Emergency Management Agency

GE	General Electric
IRP	Installation Restoration Program
JRB	Joint Reserve Base
kg	kilogram
LBP	lead-based paint
LUST	leaking underground storage tank
MCL	maximum contaminant level
MEC	munitions and explosives of concern
MEP	military equipment parking
MP CO	Military Police Company
MSC	Medium Specific Concentrations (Pennsylvania Act 2)
MTBE	methyl tertiary butyl ether
NAS	Naval Air Station
NBC	nuclear, biological, and/or chemical
NPL	National Priorities List
NRHP	National Register of Historic Places
OMS	Organizational Maintenance Shop
OWS	oil/water separator
PADEP	Pennsylvania Department of Environmental Protection
PAH	polynuclear aromatic hydrocarbon
PAS	preliminary assessment screening
PCB	polychlorinated biphenyl
pCi/L	picoCuries per liter
PECO	Pennsylvania Electric Company
POL	petroleum, oil, and lubricant
POV	privately owned vehicle
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Act Information System
RRC	Regional Readiness Command
RSC	Regional Support Command

STATSGO	State Soil Geographic Database
SVOC	semivolatile organic compound
Tank Act	Storage Tank and Spill Prevention Act
TPH	total petroleum hydrocarbon
TSD	treatment, storage, and/or disposal
USACE	United States Army Corps of Engineers
USAR	United States Army Reserve
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
UTA	Unit Training Assembly
VOC	volatile organic compound

1 Introduction

CH2M HILL, under contract to the U.S. Army Corps of Engineers (USACE) Louisville District Engineering Division was authorized to conduct an Environmental Condition of Property (ECP) report for the Horsham Memorial U.S. Army Reserve (USAR) Center (PA046). The facility is located at 936 Easton Road, Horsham Township, Montgomery County, Pennsylvania (Figure 1, Appendix A), and is hereafter referred to as the Property or USAR Center. CH2M HILL prepared this ECP report under Contract Number W912QR-04-D-0020, Task Order No. 0018, with the Louisville District USACE.

A visual non-intrusive reconnaissance of the Property was conducted on August 2, 2006, in support of the ECP. The reconnaissance purpose was to visually obtain information indicating the likelihood of recognized environmental conditions associated with the Property or adjacent properties.

In preparing this ECP report, CH2M HILL gathered information from available records and previous work from others, interviews with individuals purporting to be familiar with the Property, and observations from a site reconnaissance. The accuracy of the information obtained from these sources was not verified by CH2M HILL. As such, CH2M HILL will make no warranty, expressed or implied, relative to the accuracy, completeness, or reliability of the information used to create the records and reports prepared by others.

1.1 Purpose of Environmental Condition of Property

The Military Department with real property accountability shall assess, determine, and document the environmental condition of all transferable property in an ECP Report. This ECP Report is based on readily available information. Pursuant to the Department of Defense's (DoD) policy, set forth in the Base Redevelopment and Realignment Manual (BRRM) (DoD 4165.66-M, March 1, 2006) Section C8.3, the primary purposes of the ECP Report include the following:

- Provide the Army with information it may use to make disposal decisions.
- Provide the public with information relative to the environmental condition of the property.
- Assist in community planning for the reuse of Base Realignment and Closure (BRAC) property.
- Assist federal agencies during the property screening process.
- Provide information for prospective buyers.
- Assist prospective new owners in meeting the requirements under U.S. Environmental Protection Agency (USEPA) "All Appropriate Inquiry" regulations.
- Provide information about completed remedial and corrective actions at the property.

- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP Report contains the information required to comply with the provisions of 40 Code of Federal Regulations (CFR) Part 373, which require that a notice accompany contracts for the sale of, and deeds entered into, for the transfer of federal property on which any hazardous substance was stored, released or disposed of. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property for 1 year or more—specifically, quantities exceeding 1,000 kilograms or the reportable quantity, whichever is greater, of the substances specified in 40 CFR 302.4 or 1 kilogram of acutely hazardous waste as defined in 40 CFR 261.30. A notice is also required if hazardous substances have been disposed of or released on the property in an amount greater than or equal to the reportable quantity. Army Regulation (AR) 200-1 requires that the ECP Report address asbestos, lead-based paint (LBP), radon, and other substances potentially hazardous to human health.

This ECP Report used the American Society for Testing and materials (ASTM) Designation D6008-96 (2005), Standard Practice for Conducting Environmental Baseline Surveys, the BRRM, CERCLA § 120, and AR 200-1.

1.2 Scope of Services

This ECP report covers the 7-acre USAR Center located at 936 Easton Road, Horsham Township, Pennsylvania (Figure 1, Appendix A). The Property is bounded by West Moreland Avenue and JOT Fuel, Inc. to the north, State Highway Route 611 to the west, a wooded lot to the east, and office buildings to the south. Hallowell Elementary School and a school bus parking lot and service center (Hatboro Horsham OPR) are located southeast of the Property. The Willow Grove Naval Air Station/Joint Reserve Base (NAS/JRB) is located west of the Property, on the west side of Route 611. All site maps, figures, and aerial photographs referenced herein are provided in Appendix A, while Appendix B contains the photographs taken during the August 2, 2006, site reconnaissance. Appendix C contains the Property warranty deeds and chain of title information, and lease or permit agreements if applicable. Relevant historical environmental documents and reports are provided in Appendix D, while Appendix E contains the Environmental Data Resources, Inc. (EDR) radius search reports commissioned for this effort.

This ECP report classifies the property into one of seven DoD Environmental ECP categories as defined by the DoD policy defining the classifications (see Sherri Goodman Memorandum dated 21 October 1996). The property classification categories are as follows:

- ECP Area Type 1—An area or parcel of real property where no release or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
- ECP Area Type 2—An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.

- ECP Area Type 3—An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
- ECP Area Type 4—An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and all remedial actions necessary to protect human health and the environment have been taken.
- ECP Area Type 5—An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are underway, but all required actions have not yet been taken.
- ECP Area Type 6—An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
- ECP Area Type 7—An area or parcel of real property that is unevaluated or requires additional evaluation.

2 Site Location and Physical Description

2.1 Site Location

The USAR Center is located in Montgomery County, on the west side of Horsham Township, Pennsylvania, at 936 Easton Road (Figure 1, Appendix A). The 7-acre parcel is situated on a main thoroughfare (State Highway Route 611) and is surrounded on other Property boundaries by single-family homes, commercial development, an elementary school, and a school bus parking lot and service center. The Willow Grove NAS/JRB is located west of the Property on the west side of Route 611.

2.2 Asset Information

Facility Name and Address:	Horsham Memorial USAR Center 936 Easton Road Horsham Township, Pennsylvania
Property Owner:	U.S. Government
Date of Ownership:	1953 (Appendix C)
Current Occupant:	23rd SS Area Maintenance and Support Activity (AMSA), 2/228th Aviation Battalion (AV BN), and 367th Military Police Company (MP CO)
Zoning:	C3-Commercial
County, State:	Montgomery, Pennsylvania
USGS Quadrangle:	Ambler, Pennsylvania
Section/Township/Range:	Horsham Township
Latitude/longitude:	40°11'40.2"N; 75°08'14.6"W (EDR, 2006)
Legal Description:	Lot 1, Block 16D, situated and lying in the City of Horsham, Montgomery County, Commonwealth of Pennsylvania (Appendix C)

The USAR Center includes one contiguous 7-acre parcel of land.

2.3 Physical Description

The USAR Center contains two permanent structures and two parking lots. Construction of both the 24,527-square-foot administration building and the 3,710-square-foot Organizational Maintenance Shop (OMS) building was completed in 1959 (Army, 1996). Both structures are on concrete foundations and consist of concrete block walls covered with a brick veneer. A military equipment parking (MEP) area and a privately owned vehicle

(POV) parking area also are contained within the Property. Chain-link security fencing topped with barbed wire encloses the MEP area and OMS building (Figure 2, Appendix A).

Approximately two-thirds of the Property is covered by impervious surface features such as asphalt parking areas, driveways, concrete walkways, and building footprints. The remaining land is grassed with trees along the perimeter of the property.

Administration Building

The administration building is an irregular-shaped two-story structure, with a two-story drill hall connected by a one-story enclosed corridor. The building's interior consists of office space, classrooms, kitchen area, storage, former indoor firing range, and a drill hall. An arms vault is located on the first floor and is used to store rifles and pistols. Based on interviews with 99th Regional Readiness Command (RRC) personnel, ammunition is not stored in the arms vault. The southern portion of the administration building consists of administrative offices, storage, and a former firing range. Additional information regarding the former firing range is presented in Section 6.9. The storage rooms on the first floor contain nuclear, biological, and/or chemical (NBC) monitors that contain small amounts of radioactive materials that are not regulated.

A boiler room is located on the western side of the south wing of the administration building. The boiler room is lower in elevation than the first floor and houses the building's water heater, three natural gas heating units, and a bypass feeder. An electrical sub-panel also is located in the boiler room. Non-hazardous items were stored in the boiler room during the time of the survey including one pallet of 50-pound bags of salt for deicing pavement (Photograph 1, Appendix B). A reddish-brown and slightly purple staining was noted on the west wall of the boiler room (Photograph 2, Appendix B). There were cut pipes in the east wall (Photograph 1, Appendix B).

The second floor is above the entire eastern half of the building and consists of open office space, offices, classrooms, a copy/computer room, and a former medical area. Based on interviews with 99th RRC personnel, the medical area was used to administer physical examinations during drill weekends. Medical wastes generated during these examinations were properly disposed of by medical personnel immediately following the drill weekend. During the August 2, 2006, site reconnaissance, items such as first aid kits, needles, sharps containers, tongue depressors, small glass vials, and a centrifuge were identified; however, these items were new in the original containers. Outside the administration building, there is a small covered storage area on the north side of the drill hall adjacent to the building transformers.

Organizational Maintenance Shop and Vehicle Wash Area

Maintenance activities conducted at the OMS include oil, hydraulic fluid, and antifreeze changes; oil filter replacement; parts cleaning; vehicle washing; engine repair; and brake servicing. As such, this facility is considered a Resource Conservation and Recovery Act (RCRA) small quantity generator (EDR, 2006). The OMS and wash rack area are located southeast of the administration building (Photograph 3, Appendix B). The wash rack is located outside, on the west side of the OMS, and consists of a concrete pad surrounded by a concrete curb. A grate is located in the center of the wash rack and leads to an oil/water

separator (OWS) (Photograph 4, Appendix B). Standing water with a slight sheen was noted inside the grate during a November 2000 survey (Horne Engineering Services, 2001).

The interior of the OMS consists of four vehicle maintenance bays with rows of tool chests, an enclosed parts cleaning device, and varying sizes of containers with new and used motor oil, antifreeze, hydraulic oils, grease, brake fluid, fuel filters, and oil filters. Most of these items were stored on a plastic containment pallet (Photograph 5, Appendix B), with the exception of one container of used motor oil and one container of cleaning solvent that were staged directly on the floor of the OMS (Photograph 6, Appendix B). The enclosed parts cleaning device had a placard that listed the following two chemicals: Break Through (NSN-6850-01-378-0666) and Skysol (NSN-6850-01-381-8024) (Photograph 7, Appendix B).

99th RRC personnel noted that the parts cleaning device is serviced by the Willow Grove NAS/JRB AMSA on an as-needed basis. In addition, 99th RRC personnel were not aware of any permitted 90-day storage area; however, outside the OMS is a small "sea-box" type container about 8 feet high, 6 feet wide, and 15 feet long, which stored used chemicals in 55-gallon drums on top of an elevated spill containment area (Photograph 8, Appendix B). The rear, southern portion of the OMS consists of office space. No floor drains or trench drains were identified within the OMS building; however, a maintenance pit previously existed in the eastern-most bay. This maintenance pit was abandoned with concrete prior to the August 2, 2006, site reconnaissance. Additional information on this maintenance pit is presented in Section 3. Personnel familiar with the OMS building have no knowledge of the existence of any other current or past floor drains or trench drains in the OMS building.

2.4 Site Hydrology and Geology

The USAR Center and Horsham Township are located within the Gettysburg-Newark Lowlands Section of the Piedmont Physiographic Province. This area is characterized by broad gently rolling hills and valleys with elevations ranging from 100 to 1,220 feet above mean sea level (amsl) (Sloto, 2002) (Figure 3, Appendix A). The Property and surrounding area are underlain by the Stockton Formation, which consists of sedimentary rocks of Triassic age. The Stockton Formation is subdivided into three units known as the lower arkose, middle arkose, and upper shale members. The middle arkose member crops out at the Willow Grove NAS/JRB, where it consists of fine- to medium-grained arkosic sandstone interbedded with red siltstone and mudstone. The Stockton Formation is about 6,000 feet thick at the Bucks-Montgomery County border. The middle arkose member has a maximum thickness of 4,200 feet. Bedding in the Stockton Formation at the base generally strikes N 76° E and dips about 7° NW, and vertical fractures are common (Sloto, 2002).

Both Horsham Township and the USAR Center are found on the U.S. Geological Survey (USGS) 7.5-minute Ambler quadrangle map (Figure 3, Appendix A).

2.4.1 Surface Water Characteristics

Figure 3 in Appendix A provides a portion of the 1999 Ambler, Pennsylvania USGS topographic map, which includes the Property. As shown, the Property is situated at an elevation of approximately 369 feet amsl and is on a broad hilltop. The topography is generally flat, with a slight decrease in elevation toward the western and northern portions of the parcel.

Stormwater sheet flows to storm drains located in the MEP area and POV parking area. A storm drain also is located in the grassy area south of the administration building and drains west toward State Highway Route 611. The storm drains then flow north, parallel with State Highway Route 611.

No surface water features are located in the immediate vicinity of the Property. Pennypack Creek is located about 0.5 mile to the east (Figure 3, Appendix A), and the Schuylkill and Delaware rivers are located about 10 miles southwest and 12 miles southeast, respectively. The Schuylkill River discharges into the Delaware River, which ultimately discharges into Delaware Bay and the Atlantic Ocean.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, Community Panel 42091C0284E, the Property is not included in the 100-year floodplain elevation (EDR, 2006; Appendix E).

2.4.2 Hydrogeological Characteristics

In general, the USAR Center is underlain by about 5 feet of soil and overburden followed by the Stockton Formation. Soil in the vicinity of the Property is classified as Class B, which has moderate infiltration rates, is moderately and well drained, and has moderately coarse textures (EDR, 2006). The rocks of the Stockton Formation form a complex, heterogeneous aquifer with partially connected zones of high permeability. The aquifer is composed of a series of gently dipping lithologic units with different hydraulic properties, and permeability commonly differs from one lithologic unit to another. Groundwater in the weathered zone moves through intergranular openings that have formed as a result of weathering. In some places, permeability of the weathered zone may be poor because of a high percentage of clay derived from weathering of mudstone and siltstone. Groundwater storage and movement within the unweathered part of the Stockton Formation primarily occurs through a network of interconnecting secondary openings such as fractures, bedding planes, and joints (Sloto, 2002). The groundwater flow direction is generally to the north (EDR, 2006).

The regional aquifer beneath the site, the Stockton Aquifer, has been characterized as consisting of two hydraulic systems, the water table and the artesian aquifers. The water table aquifer extends to a depth of between 75 and 100 feet below the land surface, and it discharges to nearby streams and open bodies of water. Underlying the water table aquifer is the artesian aquifer, the principal potable water source in Horsham Township. The water table aquifer furnishes recharge to the artesian aquifer (Sloto, 2002).

2.5 Site Utilities

Based on interviews with 99th RRC personnel, the following information was obtained regarding site utilities.

Water Service— The Willow Grove Naval NAS/JRB provides potable water service to the Property.

Sanitary Sewer System— The Willow Grove NAS/JRB provides sanitary sewer service to the Property. The primary source of wastewater that is directed to the Willow Grove

NAS/JRB sewer system includes non-process wastewater (bathrooms, sinks, etc.) and vehicle washing runoff.

Gas and Electric—Pennsylvania Electric Company (PECO) provides natural gas and electric services to the Property.

2.6 Water Supply Wells and Septic Systems

Based on a review of available historical site and agency records and interviews with site personnel, neither a water supply well nor a septic system is or was located at the Property. Based on interviews with 99th RRC personnel, potable water is supplied by the Willow Grove NAS/JRB.

A search of federal and state water well databases identified one water supply source located approximately 0.125 mile south-southeast and upgradient of the Property. The well supplies water to a restaurant, Lee's Hoagie House (EDR, 2006).

Sanitary sewer lines are connected to the Willow Grove NAS/JRB sewer system. Construction of the Property was completed in 1959, and all buildings on this Property are believed to have been connected to the Willow Grove NAS/JRB sewer system since that time. No information was available on whether a septic system existed or was removed.

3 Site History

3.1 History of Ownership

Land titles for the Property, which are included in the chain of title report in Appendix C, were available dating back to 1897. The report did not identify any leases or environmental liens against the USAR Center property. According to the chain of title report, the United States Government acquired the 7-acre parcel in 1953 from Edith B. Lippincott and Mary L. Buck, who owned the Property since 1897.

3.2 Past Uses and Operations

In 1953, the U.S. Government purchased the 7 acres of land for construction of the USAR Center. Construction of the administration building and OMS building was completed in 1959 (USACE Baltimore, 1995a). Historical information sources suggest that prior to the existence of the USAR Center, the land was used for agricultural purposes or was undeveloped. The Property has served as a reserve and mobilization center for USAR since the U.S. Government acquired the land (Unknown, 2005).

The Property primarily functioned as an administrative, logistical, and educational facility, with limited maintenance of military vehicles occurring in the OMS building. The Property was historically used by reservists for drill activities on various weekends throughout the year. Currently, drill training is conducted throughout the year in periods called Unit Training Assemblies (UTAs). The UTA is a 4-hour training session that is conducted in drill sessions during a one weekend per month format at an offsite location such as Fort Indiantown Gap or Fort Dix. Under this system, four UTAs are conducted monthly and, hence, 48 are conducted annually (Gillan and Hartmann, 1992).

Historically, however, training was conducted in one evening per week sessions in which training was performed at the individual facilities. Proficiency in marksmanship was required as part of the UTA training, and sub-caliber (.22) rifle ranges were an integral instrument for unit training. Comprehensive training including the use of the indoor rifle ranges was performed between the 1950s and post-Vietnam era (Gillan and Hartmann, 1992).

Based on the August 2, 2006, site reconnaissance and historical records, the OMS building was used to perform limited maintenance activities on military equipment. The 2006 EDR report identifies the USAR Center as an RCRA small quantity generator (EDR, 2006). Activities inside the OMS building were limited to preventative maintenance checks, including checking vehicle fluids such as motor oil, water, and antifreeze, and light maintenance activities. Any equipment requiring heavier maintenance was sent to an AMSA shop located at the Willow Grove NAS/JRB (USACE Baltimore, 1995a).

At the time of the August 2, 2006, site reconnaissance, the OMS building contained two wheeled military vehicles. Three 55-gallon (one plastic, two metal) drums containing used

motor oil and antifreeze, and five 5-gallon containers with used motor oil and hydraulic oil were staged on a containment pallet (Photograph 5, Appendix B). One plastic container with used motor oil and one plastic container labeled cleaning solvent were stored directly on the floor of the OMS (Photograph 6, Appendix B). Two metal trash cans for nonhazardous waste also were present in the OMS. An enclosed parts-cleaning device was being used in the OMS at the time of the August 2, 2006, site reconnaissance and had a placard that listed the following two chemicals: Break Through (NSN-6850-01-378-0666) and Skysol (NSN-6850-01-381-8024) (Photograph 7, Appendix B). 99th RRC personnel noted that the parts cleaning device is serviced by the Willow Grove NAS/JRB AMSA on an as-needed basis.

A large section of patched concrete was present at the last bay on the northwest side of the OMS building. 99th RRC personnel identified this as a former maintenance pit. The former OMS maintenance pit often collected fluids during maintenance activities. The fluids were more than likely petroleum, but often antifreeze and cleaning solvents used in the cleaning of vehicle components. The pit was not intended to receive significant volumes of fluids, and cracks in the pit floor or wall over extended periods of time could result in a release. The condition of the pit before closure was not available. Furthermore, there was no evidence of a release in the readily available information, and any releases that might have occurred are likely to have been de minimis quantities. Site inspection activities related to the closure of the OMS maintenance pit were performed, and this maintenance pit was closed; however, closure documentation was not available for this ECP report (99th RSC, 1996).

The rear, southern portion of the OMS consisted of office space. No floor drains or trench drains were identified within the OMS building. Personnel familiar with the OMS building have no knowledge of the existence of current or past floor drains or trench drains in the OMS building.

99th RRC personnel were not aware of any permitted 90-day storage area; however, outside the OMS is a small "sea-box" type container about 8 feet high, 6 feet wide, and 15 feet long, which stored used chemicals in 55-gallon drums and used fuel and oil filters on top of an elevated spill containment area (Photograph 8, Appendix B). In addition to the two military vehicles located in the OMS building, several other military vehicles were observed in the MEP area north and south of the OMS building

Vehicle washing would have historically occurred outside the OMS building on the wash rack. The wash rack is located on the west side of the OMS and consists of a concrete pad surrounded by a concrete curb (Photograph 3, Appendix B). A grate is located in the center of the wash rack and leads to an OWS, which ultimately discharges to the Property's sewer (Photograph 4, Appendix B). Standing water with a slight sheen was noted inside the grate during the August 2, 2006, site reconnaissance. No storage tanks are associated with the OWS.

Historical aerial photographs and topographic maps were the primary source of information on the past use and operations at the Property. In Appendix A, Figures 4 through 9 provide aerial views of the Property and surrounding areas in 1938, 1942, 1958, 1965, 1992, and 2006. Figures 3 and 10 through 12 provide historical USGS topographic maps of the Property and surrounding areas in 1999, 1952, 1966, and 1983.

The location of the USAR Center appears to be undeveloped in the 1938, 1942, and 1958 aerial photographs (Figures 4 through 6, Appendix A), consisting of mostly trees and underbrush. In the 1938 photo, the surrounding area appears to be farm land and small single-family residences. In the 1942 photograph, the runway for the Willow Grove NAS/JRB is present to the west of the Property, with a few additional single-family residences to the east. In the 1958 photograph, the runway for the Willow Grove NAS/JRB appears to have expanded south, and more single-family residences are present to the west.

In the 1965 aerial photograph (Figure 7, Appendix A), the administration building, OMS, and wash rack are visible; however, it appears as though no military vehicles are present in this photograph. The Hallowell Elementary School is visible to the southeast of the Property, and additional single-family homes appear to exist to the west of the Property.

The 1992 and 2006 aerial photographs (Figures 8 and 9, Appendix A) show the Property close to its current condition. In 1992, it appears that some military vehicles are parked in the vicinity of the OMS, and no stained or distressed areas are visible in this photograph. In 2006, however, some staining appears to be present on the asphalt at the southern portion of the Property. There also appears to be soil (light tan color) on the pavement between the administration building and the OMS building. This may be the location of a former No. 2 heating oil underground storage tank (UST) (see Section 3.4).

In addition to historical aerial photographs, historical USGS topographic maps from 1952, 1966, 1973, and 1983 (Figures 3 and 10 through 12, Appendix A) were evaluated. Review of these maps indicates the same progression of development of the Property and surrounding areas as the historical aerial photographs. The Property first appears in the 1966 map (Figure 11, Appendix A) and is referred to as "Armory." The 1983 topographic map (Figure 12, Appendix A) shows additional residential streets north and east of the Property. Also in 1983, there appear to be commercial buildings northeast and south of the Property along Valley Drive Road and Route 611.

3.3 Past Use, Storage, Disposal, and Release of Hazardous Substances

3.3.1 Past Use and Storage of Hazardous Substances

Information related to the past use and storage of hazardous substances at the Property were compiled through review of available site records, search of federal and state environmental databases, and interviews with USAR personnel. Chemicals formerly used and stored at the Property were associated with vehicle and facility maintenance activities and janitorial services. Janitorial chemicals and building maintenance-related products were stored in the designated storage area within the janitorial closet located in the administration building. Vehicle maintenance products, including solvents, paints, acids, and antifreeze, and petroleum, oil, and lubricant (POL) products also were stored within designated areas within the OMS building. Other hazardous substances were stored in the outdoor hazardous material storage shed located north of the OMS building within the MEP area.

3.3.2 Past Disposal and Release of Hazardous Substances

Information related to past disposal and potential release of hazardous substances at the Property was compiled through review of available site records, search of federal and state environmental databases, and interviews with USAR personnel. According to USAR personnel and site records, onsite disposal of hazardous substances has not occurred at the Property. Hazardous waste currently generated by the OMS is transported and disposed of at the Willow Grove NAS/JRB by AMSA. No stained soil was observed during the August 2, 2006, site reconnaissance. One area of stressed vegetation consisting of about 4 square feet of dead grass was observed next to the driveway that accesses Route 611 (Photograph 9, Appendix B); however, this appears to have been caused by vehicle traffic and not the result of a release. Additionally, the MEP area and POV parking area did not show any signs of staining, and no noxious or foul odors were noted during the August 2, 2006, site reconnaissance.

The February 1995 preliminary assessment screening report prepared by the USACE Baltimore District identified a debris storage area, covered with a tarpaulin, on the east side of the OMS building that was used to store hazardous material and contaminated soil. The storage area was within 20 feet of the fence line north of the OMS building. This container was staged in this area to contain paint waste, used paint brushes, and paint thinner. The hazardous material and contaminated soil storage area consisted of a hazardous material storage shed and drums containing diesel-contaminated soil. As a result, four soil borings were advanced at each location (total of eight borings) in 1995. Surface and subsurface soil samples were collected from the soil borings and analyzed for volatile organic compounds (VOCs), total petroleum hydrocarbons-diesel range organics (TPH-DRO), polychlorinated biphenyls (PCBs), and lead. Four of the sample locations had concentrations of TPH-DRO in exceedance of Pennsylvania Department of Environmental Protection (PADEP) Interim Cleanup Standards for Contaminated Soil (EA, 1999).

In 1999, EA Engineering, Science, and Technology, Inc. (EA) was contracted by the USACE Baltimore District to further assess surface and subsurface soils in this area. EA collected surface and subsurface soil samples at 50-foot intervals on both sides of the USAR Center fence and analyzed the soil samples for VOCs, semivolatile organic compounds (SVOCs), pesticides, PCBs, and metals. Results of these soil samples indicate that the following compounds were detected below Pennsylvania Act 2 Medium Specific Concentrations (MSCs):

- VOCs—acetone, methylene chloride, and toluene
- SVOCs—chrysene, di-n-octyl phthalate, fluoranthene, pyrene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzo(a)anthracene, indeno(1,2,3-cd)pyrene, and phenanthrene
- Pesticides—aldehyde, endrin ketone, and heptachlor epoxide
- PCBs—aroclor 1254 and aroclor 1260
- Metals—vanadium

Because these compounds were detected below MSCs, this investigation concluded that no evidence exists to suggest that past site practices at the Property have significantly impacted the quality of soil along the fence line between the Property and Hallowell Elementary

School (EA, 1999). A PADEP letter, dated October 24, 2000, concurred with the conclusions in the *1999 Fence-Line Soils Investigation Report*. PADEP, however, directed the 99th RRC to collect additional surface soil samples and analyze the samples for chlorinated herbicides by USEPA SW846 Method 8151 (PADEP, 2000).

On March 13, 2001, the GeoEnvironmental Engineering Section of the USACE Norfolk District collected 10 additional surface soil samples along the eastern fence line and analyzed the samples for chlorinated herbicides by USEPA SW846 Method 8151. Chlorinated herbicides were not detected above their corresponding detection limit in any of the surface soil samples (USACE, 2001).

In a letter from Bruce Beitler (PADEP) to Colonel John Prizner (USAR), PADEP concurred with the conclusions of the *1999 Fence-Line Soils Investigation Report* and the *2001 Analytical Results: Fence-Line Soils Investigation Report*. PADEP then removed the Property from the "List of Scheduled Sites" to the "List of Resolved Sites" under the July 4, 1998, Multi-Site Agreement among PADEP and the Military Components (PADEP, 2001).

The 99th Regional Support Command (RSC) Customer Support Team Number 1 documented that an investigation was conducted to assess OMS maintenance pit closure activities. The report states that the OMS pit has been assessed and closed under the Installation Restoration Program (IRP) (99th RSC, 1996).

3.4 Past Presence of Bulk Petroleum Storage Tanks

Based on a review of available site records, a search of federal and state environmental databases, and interviews with USAR personnel, two USTs were previously located at the Property. One 2,000-gallon UST that contained No. 2 heating oil was removed on January 21, 1997. The 2,000-gallon tank was located behind the OMS building, on the south side under the grass area between the building and the asphalt parking lot (Engineering Technologies, 1997). A second UST was located behind the administration building, on the east side, just outside the boiler room. The *1999 Fence-Line Soils Investigation Report* identifies the location of both USTs, and identifies the administration building UST as having been removed (EA, 1999). During the August 2, 2006, site reconnaissance, 99th RRC personnel confirmed the location of this former UST, and confirmed that it was removed; however, removal documentation was not available for this ECP report. Details on the removal of the 2,000-gallon UST previously located behind the OMS building are presented below.

In August 1993, the 2,000-gallon UST located behind the OMS building failed a tightness test. Prior to removal of the tank, this tightness test provided the only evidence that a leak may have occurred from the tank or piping adjacent to the tank. Removal of the tank began by extracting about 350 gallons of No. 2 fuel oil. The supply and return piping and the vent were removed, inspected for leaks (as was the soil surrounding the lines), and stockpiled onsite. There did not appear to be any visible contamination of the soil stockpile. The tank was inspected for holes or cracks (none were evident) and was loaded and removed by Sensinig Salvage to its recycling facility in Chambersburg, Pennsylvania (Engineering Technologies, 1997).

Four subsurface soil samples were collected from the following locations:

- Directly below the fill connection
- Below the supply line
- Below the centerline of the tank
- Stockpiled soil

These samples yielded results of polynuclear aromatic hydrocarbons (PAHs) in exceedance of PADEP standards. Additional post-excavation samples were collected and analyzed, and did not exceed PADEP standards. Stockpiled soil that was excavated from the tank removal was used with additional "clean stone" to backfill the excavation. Based on the closure report, the final excavation dimensions were about 15 feet by 10 feet by 7 feet deep. Groundwater was not encountered during UST removal and closure activities; therefore, groundwater is deeper than 7 feet below grade (Engineering Technologies, 1997).

The closure report further states that, because this UST was used to supply fuel oil for space heating, it is unregulated by the federal government and by the Commonwealth of Pennsylvania. The report was submitted to PADEP, and states that it does not serve to fulfill any regulatory requirements (Engineering Technologies, 1997).

Two other reported spills of POL products were identified in the reviewed documentation. Neither POL release was associated with a UST or aboveground storage tank (AST), These releases are discussed below.

A 1994 memorandum documented a spill of about 10 gallons of diesel fuel from a vehicle parked in front of the OMS (north side) on March 11, 1994. The 1994 memorandum noted that after the incident, "pans" and "absorbent booms" were placed around the spill. The Willow Grove NAS/JRB fire department was notified, which dispatched a hazardous spill response team. Contaminated soil was excavated and subsurface soil samples were collected, however the results of the analyses conducted on the samples are unknown (Army, 1994). During the August 2, 2006, site reconnaissance, no staining was present in the parking area that was described in this memorandum.

A preliminary assessment screening report prepared by the USACE Baltimore District in February 1995 identified approximately 40 square feet of petroleum-stained soil on the south side of the OMS building (USACE Baltimore, 1995a). This staining could not be confirmed during the August 2, 2006, site reconnaissance, and no other historical documents available for review discussed this area.

3.5 Review of Previous Environmental Reports

A review of site records produced several reports pertaining to the Property. The following subsections provide a brief summary of these reports. Copies of the reports, unless otherwise specified, are provided in Appendix D.

3.5.1 1996 Installation Restoration Program Horsham Memorial USAR Center

This report was prepared by the 99th RSC Customer Support Team Number 1. It concluded that the OMS pit has been assessed and closed by the IRP.

Information from this report is presented in Sections 3.2, 3.3.2, and 6.4.

3.5.2 1992 Sampling and Analysis Test Plan for USARC-Rifle Ranges Germantown, Philadelphia, Horsham, North Penn, Bristol, Reese, Scranton, Marlin Gares, Wilkes-Barre

This report was prepared by Gillan and Hartmann, Inc., which was contracted to assess the environmental impact of the historical use of indoor rifle ranges at nine USAR centers, including the Horsham Memorial USAR Center. This report also provides historical uses of the USAR centers.

As stated in this report, the Property primarily functioned as an administrative, logistical, and educational facility, with limited maintenance of military vehicles occurring in the OMS building. The Property was historically used by reservists for drill activities on various weekends throughout the year. Currently, drill training is conducted throughout the year during UTA periods. The UTA is a 4-hour training session that is conducted in drill sessions during a one weekend per month format at an offsite location such as Fort Indiantown Gap or Fort Dix. Under this system, four UTAs are conducted monthly and, hence, 48 are conducted annually.

Historically, however, training was conducted in one evening per week sessions in which training was performed at the individual facilities. Proficiency in marksmanship was required as part of the UTA training, and sub-caliber (.22) rifle ranges were an integral instrument for unit training. Comprehensive training including the use of the indoor rifle ranges was performed between the 1950s and post-Vietnam era.

Information from this report is presented in Section 3.2 and 6.9.

3.5.3 1994 Memorandum, Report on Hazardous Substance Spill

This one-page memorandum documents the cleanup activities associated with the 10-gallon diesel fuel spill. No follow-up reports are available that document the results of the soil analyses mentioned in this memorandum.

This report stated that after the incident, “pans” and “absorbent booms” were placed around the spill. The Willow Grove NAS/JRB fire department was notified, which dispatched a hazardous spill response team. Contaminated soil was excavated and subsurface soil samples were collected, however the results of the analyses conducted on the samples are unknown (Army, 1994). During the August 2, 2006, site reconnaissance, no staining was present in the parking area that was described in this memorandum.

Information from this report is presented in the Executive Summary and Sections 3.3.2 and 8.2.

3.5.4 1995 Asbestos Management Compliance, Horsham Memorial USAR Center

An excerpt from this report noted that in 1991 tiles tested positive for asbestos-containing material (ACM). The report further states that prior to 1991, ACM was removed from the boiler room.

Information from this report is presented in Section 6.5.

3.5.5 1995 Preliminary Assessment Screening Horsham Memorial USAR Center, Horsham, Pennsylvania

In January 1995, the USACE Baltimore District performed a preliminary assessment screening (PAS) of the USAR Center. The purpose of this PAS was to determine recognized environmental conditions and to provide sufficient information to adequately identify the potential environmental contamination liabilities associated with real property acquisition, transfer, or disposal. The PAS identified approximately 40 square feet of petroleum-stained soil on the south side of the OMS building. This staining could not be confirmed during the August 2, 2006, site reconnaissance. This report further concluded that the presence of stained soils and pavement, a potentially leaking underground storage tank (LUST), and a potentially PCB-contaminated transformer were identified, and a Type II site categorization was recommended. As explained in the PAS report, a Type II property has some potential for environmental contamination from past, present, or proposed activities (USACE Baltimore, 1995a).

Information from this report is presented in Sections 3.2, 3.3.2, and 7.5.

3.5.6 1995 Hazardous Waste Management Consultation #37-10565-95 79th Army Reserve Command Pennsylvania

The 79th Army Reserve Command conducted a survey of non-federally owned transformers, federally owned non-PCB transformers, and federally owned PCB transformers at all of the USAR centers in Pennsylvania, including the Horsham Memorial USAR Center. This report concluded that the Property is supported by one large General Electric (GE) pad-mounted transformer and is suspected to contain PCBs. The report further recommends that the PCB transformer be removed and replaced.

Information from this report is presented in Sections 7.6 and 8.

3.5.7 1995 79th Army Reserve Command Cultural Resource Management Plan

This report documents a survey that inventoried properties controlled or leased by the 79th RRC. Historical information, setting and landscape, cultural resources, security, architectural information, and structure descriptions are included for each property. Each site also was assessed for its eligibility to the National Register of Historic Places (NRHP). The report concluded that no historic architectural resources were identified at the Property, and neither of the buildings at the Property was found to meet the criteria for inclusion in the NRHP.

Information from this report is presented in Section 7.6.

3.5.8 1995 Programmatic Natural Resource Management Plan

This report was prepared for the 79th RRC to inventory and manage natural resources found at 79th RRC facilities in central and southeastern Pennsylvania. The report concluded that the USAR Center did not contain any key natural resources, including wetlands, surface water, floodplains, rare species, or the potential for rare species.

Information from this report is provided in Section 7.5.

3.5.9 1996 Total Facility Assessment Report

This report documents an assessment of the USAR Center that was conducted by the Fort Indiantown Gap Facilities Engineering Team of Engineer Support Group-East. The report states that the facility is in good repair, and that there have been recent improvements and maintenance performed. Major projects completed include window replacement, a new entryway, and partial carpeting. The report also states that a project has been identified to overlay pavement in the MEP area.

Information from this report is presented in Section 2.3.

3.5.10 1997 UST Closure Report for Horsham Memorial USAR Center

This report documents closure activities related to the removal of one 2,000-gallon UST that was used to store No. 2 fuel oil. The report documents analytical results for subsurface soil samples collected from the UST excavation. The closure report states that because this UST was used to supply fuel oil for space heating, it is unregulated by the federal government and by the Commonwealth of Pennsylvania. The report also states that it does not serve to fulfill any regulatory requirements.

Information from this report is presented in the Executive Summary and Sections 3.4, 6.1, 8.1, and 8.2.

3.5.11 1999 Fence-line Soils Investigation Report, Horsham Memorial USAR Center, Horsham, Pennsylvania

This report documents surface and subsurface soil sampling activities at the USAR Center. This investigation concluded that no evidence exists to suggest that past site practices at the Property have significantly impacted the quality of soils along the fence line between the Property and Hallowell Elementary School.

Information from this report is presented in the Executive Summary and Sections 3.3.2, 3.4, 6.1, and 6.2.

3.5.12 2000 Letter from PADEP to USAR RE: Fence-Line Soils Investigation

This letter was submitted to the 99th RRC based on PADEP's review of the *1999 Fence-Line Soils Investigation Report*. In this letter, PADEP concurs with the conclusions of the 1999 report, however, PADEP recommended collecting additional surface soil samples and analyzing the samples for chlorinated herbicides by USEPA SW846 Method 8151.

Information from this report is presented in the Executive Summary and Sections 3.3.2, 3.4, 6.1, and 6.2.

3.5.13 2001 Oil/Water Separator Survey Report for 99th RSC Customer Support Team

Horne Engineering Services, Inc. prepared an OWS evaluation report for numerous USAR sites for the 99th RRC, including the Horsham Memorial USAR Center. As part of the

reporting process, Horne Engineering Services, Inc. was responsible for documenting and locating each OWS located at USAR facilities throughout the 99th RRC. The report states that an OWS is located on the Property within the MEP area, near the southwest corner of the OMS building.

Information from this report is presented in Sections 2.3 and 6.4.

3.5.14 2001 Analytical Results: Fence-Line Soils Investigation for Herbicide Analysis

This report documents additional fence line sampling activities that were conducted in response to the 2000 PADEP letter. Ten surface soil samples were collected and analyzed for chlorinated herbicides (USEPA SW846 Method 8151). The analytical results indicate that chlorinated herbicides were not detected above their corresponding detection limits in these samples.

Information from this report is presented in the Executive Summary and Sections 3.3.2, 3.4, 6.1, and 6.2.

3.5.15 2001 Letter from Bruce D. Beitler (PADEP) to Colonel John Prizner, Jr. (USAR), Re: Horsham Memorial USARC—Site 12 (Fence-line Soils)

This letter documents PADEP's approval of both the *1999 Fence-Line Soils Investigation Report* and the *2001 Analytical Results: Fence-Line Soils Investigation for Herbicide Analysis*, prepared by EA. PADEP concurred that there is no evidence that a release occurred at the USAR Center. PADEP removed the Property from the "List of Scheduled Sites" to the "List of Resolved Sites" under the July 4, 1998, Multi-Site Agreement among PADEP and the Military Components (PADEP, 2001).

This letter is referenced in Sections 3.3.2 and 6.2.

3.5.16 2002 Hydrogeological Investigation at Site 5, Willow Grove Naval Air Station/Joint Reserve Base

The USGS prepared this report, and it provides geological and hydrogeological data that are representative of the Horsham Township area. The following text was used to assist in preparing Sections 2.4 and 2.4.2.

The USAR Center and Horsham Township are located within the Gettysburg-Newark Lowlands Section of the Piedmont Physiographic Province. This area is characterized by broad gently rolling hills and valleys with elevations ranging from 100 to 1,220 feet amsl.

The Property and surrounding area are underlain by the Stockton Formation, which consists of sedimentary rocks of Triassic age. The Stockton Formation is subdivided into three units known as the lower arkose, middle arkose, and upper shale members. The middle arkose member crops out at the Willow Grove NAS/JRB, where it consists of fine- to medium-grained arkosic sandstone interbedded with red siltstone and mudstone. The Stockton Formation is about 6,000 feet thick at the Bucks-Montgomery County border. The middle arkose member has a maximum thickness of 4,200 feet. Bedding in the Stockton Formation

at the base generally strikes N 76°E and dips about 7° NW, and vertical fractures are common.

The regional aquifer beneath the site, the Stockton Aquifer, has been characterized as consisting of two hydraulic systems, the water table and the artesian aquifers. The water table aquifer extends to a depth of between 75 and 100 feet below the land surface, and it discharges to nearby streams and open bodies of water. Underlying the water table aquifer is the artesian aquifer, the principal potable water source in Horsham Township. The water table aquifer furnishes recharge to the artesian aquifer.

Information from this report is presented in Sections 2.4 and 2.4.2.

3.5.17 2003 PCB Management Plan

This is a 2003 report by Bay Associates Environmental, Inc. that identifies one of the Property's transformers (pad-mounted transformer next to the administrative building) as containing PCBs.

The report states that two pad-mounted GE transformers, manufactured in Pittseld, Massachusetts, serial #D276096, are located on the Property, north of the exterior north wall of the administration building. During the August 2, 2006, site reconnaissance, the units appeared to be in good condition, and no evidence of leakage was observed. A document titled *PCB Management Plan* dated January 2003 identifies one of the USAR Center transformers (pad-mounted transformer next to the administrative building) as containing PCBs.

Information from this report is presented in Sections 6.6 and 8.1.

3.5.18 2003 Range Cleanup—PA046, 99th RRC Horsham Memorial USAR Center, Horsham, Pennsylvania

This report provides documentations on final range closure activities at the USAR Center in 2002. At the time of the 2002 decommissioning, the indoor firing range had not been used in several years, and the firing line, shooter partitions, target retrieval system, bullet trap, and deflector plates had been previously removed. In addition, the acoustical tiles had been removed, and the remaining cinder block walls were repainted. The floor of the firing range was cleaned in October 2002 using a cleaning solution in conjunction with floor scrubbers. Confirmatory wipe samples were collected following decommissioning activities in 2002. Results from these wipe samples indicate that concentrations of lead were below 200 micrograms per square foot, and that the range is safe for reoccupation.

Information from this report is provided in Section 6.9.

3.5.19 2005 BRAC 2005 Implementation Plan, S18 Real Property

The Real Property Action Plan is used to define actions relative to the BRAC recommendation to close the USAR Center. This document provides information on land use, building specifications, tenets, and infrastructure.

Information from this report is provided in Section 2.2 and 3.2.

3.5.20 2005 Asbestos-Containing Material, Lead-Based Paint, and Radon Inspections

This report documents asbestos, LBP, and radon assessments performed at the Property in November 2004. The following text was used from this report in Sections 6.5, 6.7, 6.8, and 8.

A November 15, 2004, asbestos inspection at the Property was conducted by Skelly and Loy, Inc. The inspection included visual and tactile assessments of materials suspected of containing asbestos. During this inspection, 23 samples of materials suspected of containing asbestos were collected from the OMS and administration buildings. Of these 23 samples, four were identified as ACM and one was assessed as friable.

Analytical Laboratory Services, Inc. (ALSI) performed an LBP inspection at the Property on November 15 and 16, 2004. ALSI tested 427 building components throughout each building. Of these 427 components, 326 tested positive for either LBP or lead-containing paint. The majority of the positive samples containing LBP and lead-containing paint were located on the walls, doors, door frames, window sills, window frames, ceilings, and radiators in the administration and OMS buildings. Peeling and chipped paint were noted in most of the rooms in the administrative building and OMS during the August 2, 2006, site reconnaissance. The exterior of the OMS and administration buildings are constructed with a brick veneer, and no chipped or peeling paint was noted on the buildings exteriors.

A site-specific radon survey was conducted between November 15 and 17, 2004, by Skelly and Loy's radon inspector Luke R. Marsh (Examination ID#20401012003). Passive radon test kits were used to identify and quantify the presence of radon gas. The test kits were placed in randomly selected rooms on the first floors of both the OMS and administration buildings, about 2 feet to 6 feet above the ground (within the normal breathing zone). The average radon level in the administration and OMS buildings were 1.32 picoCuries per liter (pCi/L) and 0.55 pCi/L, respectively.

4 Adjacent Properties

Adjacent property land uses are significant to the ECP process, as these current or past uses may have an environmental impact on the USAR Center. Adjacent properties were included in the EDR report review for this reason. Typically, adjacent properties within 0.25 mile of the USAR Center property boundaries are reviewed and visually surveyed. For the purposes of this ECP, the adjacent property reconnaissance was performed from the USAR Center property boundaries and from public access points. Historical aerial photographs and topographic maps also were reviewed for conditions or activities that may have had an environmental impact on the Property.

4.1 Land Uses

Figure 9 in Appendix A depicts the most recent image of land use surrounding the Property. Land use south of the USAR Center consists of commercial properties including real estate offices and a restaurant. Southeast of the Property is Hallowell Elementary School and Hatboro Horsham OPR. The Hatboro Horsham OPR is downgradient of the Property and consists of a large school bus parking lot and service center. Three USTs are present at the Hatboro Horsham OPR property, including one that contains gasoline, one containing diesel fuel, and one LUST that contains an unknown petroleum product. Further information regarding this property is provided in Section 5.

West of the Property is County right-of-way for a major highway (State Highway Route 611). The highway is undivided with four lanes. The Willow Grove NAS/JRB is directly west of the USAR Center on the west side of the highway. The Willow Grove NAS/JRB has a fuel tank farm, which includes USTs and LUSTs, and is discussed further in Section 5. Based on aerial photographs and USGS 7.5-minute topographic maps, the tank farm is presumed to be within 1.5 miles and downgradient of the Property.

A small wooded area and West Moreland Road, a two-lane residential road, bound the eastern side of the Property. Single-family homes are located east and north of West Moreland Road. Aerial photographs from 1938 through the present (Figures 4 through 9, Appendix A) show the land east of the Property as agricultural land, and over time, increasing numbers of single-family residences have been developed on the former fields.

The property directly north of the USAR Center is a gas station, JOT Fuel, Inc. JOT Fuel is at an equal or higher elevation than the Property, and there are two active USTs containing gasoline and one LUST containing a petroleum product (assumed to be gasoline). Additional information on JOT Fuel is provided in Section 5.

Table 1 summarizes the current adjacent properties and their owners.

TABLE 1
List of Properties Adjacent to Horsham Memorial USAR Center, Horsham, Pennsylvania

Name/Type of Property	Address	Distance and Direction from Property	Remarks
Hatboro Horsham OPR	224 Maple Avenue Horsham Township, PA 19044	Approximately 988 feet east-southeast	Lower elevation, LUST
Hallowell Elementary School	200 Maple Avenue Horsham Township, PA 19044	Approximately 900 feet southeast	Lower elevation
Willow Grove NAS/JRB	Route 611 (Easton Road) Willow Grove, PA 19090	Approximately 200 feet east	Equal or higher elevation
JOT Fuel	982 Easton Road Horsham Township, PA 19044	Approximately 344 feet north	Equal or Higher elevation, LUST
Studley, Walt—Studley Real Estate Sales	890 Easton Road Horsham, PA 19044	Approximately 200 feet south	Equal or higher elevation

4.2 Findings

The EDR database search results were reviewed for any evidence that adjacent properties may have past or present environmental issues that would impact the USAR Center.

JOT Fuel adjoins the Property to the north, at an equal or higher elevation. There are two active USTs containing gasoline and one LUST containing a petroleum product (assumed to be gasoline). The Hatboro Horsham OPR is south-southeast of the Property and downgradient. The EDR report indicates that three USTs, including one LUST (listed as inactive), are present on this Property. The Willow Grove NAS/JRB has a fuel tank farm that includes USTs and LUSTs. The exact location of the tank farm is unknown; however, based on aerial photographs and USGS 7.5-minute topographic maps, the tank farm is most likely within 1.5 miles and downgradient of the Property. The status of the LUSTs on the Willow Grove NAS/JRB property is unknown (EDR, 2006). Further information regarding these properties and their associated USTs and LUSTs are presented in Section 5.

A search of federal and state water well databases identified one water supply source located approximately 0.125 mile south-southeast and upgradient of the Property. The well supplies water to a restaurant, Lee's Hoagie House (EDR, 2006).

Based on a review of aerial photographs and USGS topographic maps dating back to 1938, land use at adjacent properties has changed significantly over the years (Figures 4 through 12, Appendix A). The property was open fields used for agricultural purposes in 1938. Development in the area began prior to 1942, based on the 1942 aerial photograph. It appears that development initially started with construction of the Willow Grove NAS/JRB, followed by other residential and commercial development to the north and east. Subsequent aerial photographs, 1955 through 1992, show steadily increasing residential and commercial development of the land surrounding the Property.

5 Review of Regulatory Information

An essential component of an ECP is the review of records and databases containing information on the Property and adjacent properties. The review includes reasonably obtainable federal, state, and local government records, and is intended to identify a release or likely release of any hazardous substance or any petroleum product, which is likely to cause or contribute to a release or threatened release of any hazardous substance or any petroleum product to the Property.

The majority of the regulatory information for this ECP was obtained from EDR on July 13, 2006. EDR provides a regulatory database summary that consolidates standard federal, state, local, and tribal environmental record sources based on ASTM D6008-recommended minimum search distances from the Property.

All findings reported in Sections 5.1, 5.2, and 5.3 are from the EDR report unless otherwise noted. A copy of the complete EDR report is included in Appendix E.

5.1 Federal Environmental Records

5.1.1 Federal National Priorities List Sites within 1 Mile

USEPA maintains a record of the nation's worst uncontrolled or abandoned hazardous waste sites, known as the National Priorities List (NPL). Sites on the NPL undergo long-term remedial action under CERCLA. The USAR Center is not an NPL site, nor were any such sites located within 1 mile of the Property (EDR, 2006).

5.1.2 Federal Comprehensive Environmental Response, Compensation and Liability Act Information Systems Sites within 0.5 Mile

The CERCLA Information System (CERCLIS) contains data on potentially hazardous waste sites that have been reported to USEPA by state, municipalities, private companies, and private persons, pursuant to Section 103 of CERCLA. CERCLIS contains sites that either are proposed to be or are on the NPL and sites that are in the screening and assessment phase for possible inclusion on the NPL.

The USAR Center is not a CERCLIS site, and there are no CERCLIS sites located within 0.5 mile of the Property (EDR, 2006).

5.1.3 Resource Conservation and Recovery Act Corrective Action Sites within 1 Mile

RCRA corrective action sites (CORRACTS) represent facilities that have generated or managed hazardous wastes and require corrective action. The USAR Center is not a CORRACTS, nor were any such sites identified within 1 mile of the Property (EDR, 2006).

5.1.4 RCRA Treatment, Storage, and/or Disposal Sites within 0.5 Mile

RCRA defines and regulates sites that generate or provide treatment, storage, or disposal (TSD) of hazardous wastes. The RCRA Information System (RCRIS) includes selective information on these sites.

The USAR Center is not an RCRA TSD site, and there are no such sites located with 0.5 mile of the USAR Center (EDR, 2006).

5.1.5 Federal RCRA Small and Large Quantity Generators List within 0.25 Mile

Conditionally exempt small quantity generators are defined as facilities generating less than 100 kg of hazardous waste or less than 1 kg of acutely hazardous waste per month. RCRA small quantity generators are defined as facilities generating between 100 and 1,000 kg of hazardous waste per month. A facility generating more than 1,000 kg of hazardous waste or over 1 kg of acutely hazardous waste per month is defined as a large quantity generator.

The USAR Center is listed as an RCRA-registered small quantity generator, RCRA ID Number PAR000502534. No RCRA violations are associated with the USAR Center (EDR, 2006).

One adjacent property owner is an RCRA-registered small quantity generator. Tinius Olsen Testing Machine Co. is located within 0.125 mile of the USAR Center, approximately 118 feet south of the Property. No RCRA violations were noted for this site (EDR, 2006).

No large quantity generators are located within 0.25 mile of the Property (EDR, 2006).

5.1.6 Federal Emergency Response Notification System List

The Federal Emergency Response Notification System (ERNS) List maintains information on reported releases of oil and hazardous substances. The USAR Center is not on this notification list (EDR, 2006).

5.2 State and Local Environmental Records

Most of the information presented in this subsection was obtained from the EDR report. Additional information also was obtained from online database searches of the Commonwealth of Pennsylvania's Web site (http://www.depweb.state.pa.us/landrecwaste/cwp/). Occasionally, state and local agency personnel were interviewed via telephone to answer questions about any database issues.

5.2.1 State Lists of Hazardous Waste Sites within 1 Mile

The USAR Center is not on the state list of hazardous waste sites. No adjacent properties within 1 mile of the USAR Center were listed as having a hazardous waste site (EDR, 2006).

5.2.2 State-Registered Landfills or Solid Waste Disposal Sites within 0.5 Mile

The USAR Center does not have a solid waste landfill, incinerator, or transfer station within the Property boundaries (EDR, 2006). No adjacent properties within 0.5 mile of the USAR Center have a solid waste landfill, incinerator, or transfer station (EDR, 2006).

5.2.3 State-Registered Leaking UST Sites within 0.5 Mile

In addition to information obtained from the EDR report, the PADEP Bureau of Waste Management maintains a comprehensive database of LUST sites. This list represents the confirmed release incidents that have been reported to PADEP since the enactment of the Storage Tank and Spill Prevention Act (Tank Act) in July 1989. Releases from home heating oil tanks, which are not regulated by the Tank Act, are not part of this list. The USAR Center is not listed in the state LUST database (PADEP, Land Recycling Program).

Within 0.5 mile of the USAR Center, however, three LUST sites in various stages of closure were identified. Table 2 summarizes their information relative to the USAR Center and provides the status of their corrective action (EDR, 2006).

A release of both leaded and unleaded gasoline from one LUST was reported in 1995 at the JOT Fuel property. Information from the PADEP Web site (http://www.dep.state.pa.us/efacts/searchresults.asp?varFacilityID=604682&varSearchType=facdet&varSearchSubType=tank) indicates that both soil and groundwater were impacted by the release. A plume consisting of benzene, toluene, ethylbenzene, xylenes (BTEX), cumene, naphthalene, and methyl tertiary butyl ether (MTBE), extends north-northeast along the shared property boundary, and eventually downgradient of the USAR Center (PADEP, 2007). Based on a discussion with PADEP, a treatment system using pump and treat and vapor recovery was in operation from about 1998 to 1999, and 24 monitoring wells were installed on JOT Fuel property and at properties located north, east and west of the JOT property. Of these 24 monitoring wells, three are located close to the shared property boundary between JOT Fuel and the USAR Center. One is located downgradient, north of the release point along the western USAR property boundary, one is directly west from the center of the western USAR property boundary (halfway between Easton Road and W. Moreland Ave.), and the third is located upgradient of the release point, near the southwestern USAR property corner, just north of Easton Road. All three wells had detections of VOCs related to gasoline, including MTBE. The location of the monitoring wells and initial water quality data indicates the USAR Property was impacted by the release. Concentrations of MTBE above Pennsylvania Act 2 MSCs were detected in the downgradient monitoring well right along the USAR property boundary and in the monitoring well approximately 90 feet west of the center of the western USAR Property boundary. The upgradient well had detections of POLs and MTBE below remedial action levels prior to implementation of the pump and treat system.

The most upgradient well installed to investigate the release is located in the JOT parking area approximately 10 feet from the Property boundary, near Easton Road. The downgradient monitoring well is located in a gravel lot along the USAR property boundary. The third well is located approximately 90 feet west of the western USAR property boundary, midway between Easton Road and West Moreland Avenue.

Sampling data collected as part of post pump and treat monitoring indicates the contaminants of concern (COCs) in the upgradient and downgradient monitoring wells along the Property boundary have been non-detect for the last few rounds. Detections of COCs are still present in other monitoring wells, including the well 90 feet directly west of the center of the USAR Property; therefore, PADEP has not yet closed the site.

TABLE 2
Leaking Underground Storage Tank Sites
Near Horsham Memorial USAR Center, Horsham Township, Pennsylvania

Company/Site	Address	Distance and Direction from Property	Regulatory Status	Elevation Relative to Property
JOT Fuel	982 Easton Road Horsham Township, PA 19044	Approximately 344 feet north	1 LUST—Interim remedial actions initiated or completed	Equal or Higher
Hatboro Horsham OPR	224 Maple Avenue Horsham Township, PA 19044	Approximately 988 feet east-southeast	1 LUST—Inactive	Lower
Horsham Gulf	660 Easton Road Horsham, PA 19044	Approximately 2,623 feet south-southeast	3 LUSTs—Cleanup completed at two LUSTs, interim remedial actions initiated or completed on a third LUST	Lower

LUST—leaking underground storage tank

5.2.4 State-Registered UST Sites within 0.5 Mile

Review of the EDR report and the Commonwealth of Pennsylvania's UST database indicate that five UST sites were identified within 0.5 mile of the USAR Center. Table 3 lists the sites along with the tanks' status. The Property itself was not listed in the state UST database (EDR, 2006).

Three USTs are located at the JOT Fuel gas station (one is a LUST; see Section 5.2.3). Two of these tanks are listed as active and contain gasoline. The two active tanks range in size from 8,000 to 12,000 gallons in capacity. One documented release occurred at this site on December 28, 1995. There are no violations listed for the JOT Fuel gas station (EDR, 2006).

One 6,000-gallon capacity UST is located at the C & C Ford Sales property. This UST is active and contains gasoline. A review of the Commonwealth of Pennsylvania database indicates that C & C Ford Sales received six violations on December 30, 1998 (EDR, 2006).

Three USTs are located at the Hatboro Horsham OPR property (one is a LUST; see Section 5.2.3). Two out of three of these tanks are active. The two active tanks range in size from 6,000 to 10,000 gallons in capacity and contain gasoline and diesel fuel, respectively. One documented release occurred at this site on October 23, 1990. There are no violations listed for the Hatboro Horsham OPR property (EDR, 2006).

Based on the condition of the USTs present at the C & C Ford Sales and Hatboro Horsham OPR properties and the nature of the one release associated with the Hatboro Horsham OPR, neither property is considered to present an environmental risk to the USAR Center. Additionally, both properties are located topographically downgradient from the USAR Center. As mentioned in Section 5.2.3, the release associated with the LUST at the JOT Fuel property has impacted the USAR Center.

Two unregulated USTs present at Drexel IND and Gaftomski RES are located 2,223 feet south and 2,530 feet southeast, respectively, of the USAR Center. Both locations are downgradient of the Property. A No. 2 fuel oil leak was reported at the Drexel IND site; however, this tank and associated contamination have been cleaned up and were closed by PADEP on April 20, 1998. The Gaftomski RES site has one UST that is being cleaned up using authorities other than the Tank Act; the contents of this tank are not known. Since both of these sites are downgradient of the Property, releases from these USTs do not have the potential to impact the USAR Center (EDR, 2006).

TABLE 3
Underground Storage Tank Sites
Near Horsham Memorial USAR Center, Horsham Township, Pennsylvania

Company/Site	Address	Distance and Direction from Property	Tank Status	Closure Status	Elevation Relative to Property
JOT Fuel	982 Easton Road Horsham Township, PA 19044	Approximately 344 feet north	2 USTs—currently active	NA	Higher
C & C Ford Sales	1100 Easton Road Horsham, PA 19044	Approximately 833 feet north-northwest	1 UST—currently active	NA	Lower
Hatboro Horsham OPR	224 Maple Avenue Horsham, PA 19044	Approximately 988 feet east-southeast	2 USTs—currently active	NA	Lower
Drexel IND	331 Maple Avenue Horsham Township, PA	2,223 feet south	1 UST—No. 2 fuel oil	Closed	Lower
Gaftomski RES	400 Watson Avenue Horsham Township, PA	2,530 feet southeast	1 UST—Unknown contents	Not reported	Lower

UST—underground storage tank

5.2.5 State Spills Incidents

The USAR Center is not listed on the Pennsylvania state petroleum spill list (PADEP, Land Recycling Program).

5.2.6 Records of Contaminated Public Wells within 0.5 Mile

The EDR report identified one water supply source located approximately 0.125 mile south-southeast and upgradient of the USAR Center. This water supply well is owned by Lee's Hoagie House. Coliform contamination was detected in exceedance of the PADEP maximum contaminant level (MCL) on June 22, 1999, and July 15, 1999 (EDR, 2006).

5.2.7 Voluntary Remediation Program Sites within 0.5 Mile

The USAR Center is not listed in Pennsylvania's Brownfield Program (the successor to the Voluntary Cleanup Program). No sites located within 0.5 mile of the USAR Center are listed as being in the Brownfield Program (PADEP, Pennsylvania Brownfield Inventory).

5.2.8 State Registered Bulk Fertilizer and Pesticide Storage Facilities within 0.25 Mile

The USAR Center is not registered with the state as a bulk fertilizer and pesticide storage facility. Additionally, no adjacent properties within 0.25 mile were registered as one of these facilities (EDR, 2006).

5.3 Unmapped Sites

Some sites within the databases EDR searches have the same zip code as the USAR Center, but no street address. These sites, known as unmapped or orphan sites, cannot be mapped from the EDR results alone. Additional efforts described herein were made to locate these sites and assess their environmental importance to the USAR Center.

Using the mapping utility provided at maps.google.com, the locations of the orphan sites were identified and mapped. Two of the sites, Flexofirst, Inc. and Edon Corporation, are located within 0.5 mile of the Property. The location of a third site, the Willow Grove NAS/JRB tank farm, could not be accurately determined; however, based on aerial photographs and USGS 7.5-minute topographic maps, the Willow Grove NAS/JRB tank farm is presumed to be within 1.5 miles of the Property (EDR, 2006).

Flexofirst, Inc. is located about 0.6 mile from the Property. This site is listed in the USEPA database as having a hazardous waste handler, air release, and is listed under the Aerometric Information Retrieval System (AIRS) database. Edon Corporation is located about 0.5 mile from the Property. The site is listed in the USEPA database as having a toxic release, hazardous waste handler, and air release. The site manufactures architectural fiberglass and is listed under the AIRS database. The Willow Grove NAS/JRB tank farm is listed as having one or more LUSTs. These LUSTs are assumed to contain petroleum products related to the Willow Grove NAS/JRB airport operations (EDR, 2006).

Based on the 1999 USGS 7.5-minute topographic map (Figure 3, Appendix A), each of the orphan sites identified by the EDR report are downgradient from the USAR Center and, therefore, are unlikely to have an environmental impact on the Property.

5.4 Summary of Properties Evaluated to Determine Risk to the Property

To summarize Sections 5.1 through 5.3, one separate property (JOT Fuel), adjacent to the USAR Center, was evaluated as a potential risk property to the Property. This adjacent property evaluation was identified as a result of information obtained during area reconnaissance, interviews, and regulatory database searches, and is summarized in Table 4.

TABLE 4
Properties Evaluated for Potential Environmental Risks
Horsham Memorial USAR Center, Horsham Township, Pennsylvania

Company/Site	Database	Elevation Relative to Property?	Potential Impact on the Property?	Comments
JOT Fuel	LUST, UST	Higher	Yes	LUST interim remedial actions initiated or completed. No violations associated with USTs. BTEX, cumene, naphthalene, and MTBE detected in monitoring wells along the shared property boundary with the USAR Center.

6 Site Investigation and Review of Hazards

Findings documented in the following subsections are based on the August 2, 2006, site reconnaissance, a review of available site records, and information obtained from USAR personnel.

6.1 USTs/ASTs

There are currently no USTs or ASTs on the Property. Two No. 2 fuel oil USTs were previously located on the Property as discussed in Section 3.4.

6.2 Inventory of Chemicals/Hazardous Substances

Records pertaining to chemicals, including hazardous materials, chemical bulk storage, petroleum products, hazardous waste, and petroleum waste were reviewed in addition to interviews and the site reconnaissance to develop the inventory for this Property. During the August 2, 2006, site reconnaissance, and the following chemicals were observed on the Property:

- Motor oil
- Diesel oil
- Brake fluid
- Transmission fluid
- Antifreeze
- Battery water
- Edge-Tek filters
- Hydraulic oil
- Grease
- Fuel filters
- Oil filters
- Spray paint
- Insect repellent
- Oxygen and acetylene tanks
- Parts cleaners: Break Through
- (NSN-6850-01-378-0666) and Skysol (NSN-6850-01-381-8024)

Inside the OMS building, three 55-gallon (one plastic, two metal) drums containing used motor oil and antifreeze and five 5-gallon containers with used motor oil and hydraulic oil were staged on a containment pallet. One plastic container with used motor oil and one plastic container labeled cleaning solvent were stored directly on the floor of the OMS.

Other chemicals, consisting of used oils, transmission fluid, antifreeze, and brake fluid were stored in 55-gallon drums along with used oil and fuel filters on top of an elevated spill containment area in a "sea-box" type container located in the MEP area, north of the OMS building. The "sea-box" container is about 8 feet high, 6 feet wide, and 15 feet long, and was unlocked by 99th RRC personnel during the August 2, 2006, site reconnaissance.

Pesticides spray cans were observed inside the administration and OMS buildings during the August 2, 2006. These spray cans are assumed to be for routine yard use. A private commercial company performs landscaping services, and may potentially apply herbicides to the fence line for weed control, although this could not be confirmed through interviews with 99th RRC personnel

6.3 Waste Disposal Sites

Available records and interviews did not indicate the practice of disposing of wastes on the Property has occurred. One area of stressed vegetation consisting of about 4 square feet of dead grass was observed next to the driveway that accesses Route 611 (Photograph 9, Appendix B); however, this has most likely been caused by vehicle traffic. No other waste disposal sites were observed during the August 2, 2006, site reconnaissance, nor were any signs of past onsite waste disposal (such as stressed vegetation or suspicious depressions in the landscape) observed.

6.4 Pits, Sumps, Drywells, and Catch Basins

A wash rack and OWS are located outside, west of the OMS building. The wash rack and deep sink inside the OMS building are connected to the OWS, which is connected to the sanitary sewer system (Horne, 2001). Based on interviews with 99th RRC personnel during the August 2, 2006, site reconnaissance, the sanitary sewer system at the USAR Center is connected to the Willow Grove NAS/JRB sanitary sewer system. The OWS is located underground and is accessible through a metal plate behind the wash rack.

A November 16, 2000, inspection concluded that the OWS was actively used; however, it did not have the hydraulic capacity to adequately treat the amount of wastewater that was generated while using the wash rack. The November 2000 survey also noted the presence of a liquid with an oily sheen and about 0.5 inch of oily sediment in the OWS. The inspection report recommended either replacing or decommissioning the OWS (Horne, 2001). During the August 2, 2006, site reconnaissance, 99th RRC personnel noted that the OWS was replaced at an unknown time after the November 16, 2000, inspection. 99th RRC personnel further stated that the wash rack and new OWS are no longer used.

During the August 2, 2006, site reconnaissance, a large section of patched concrete was present at the last bay on the northwest side of the OMS. 99th RRC personnel identified this as a former maintenance pit. The former OMS maintenance pit often collected fluids during maintenance activities. The fluids were more than likely petroleum, but often antifreeze and cleaning solvents used in the cleaning of vehicle components. The pit was not intended to receive significant volumes of fluids, and cracks in the pit floor or wall over extended periods of time could result in a release. The condition of the pit before closure was not available. There was no evidence of a release in the readily available information, and any releases that might have occurred are likely to have been de minimis quantities. Site inspection activities related to the closure of the OMS maintenance pit were performed, and this maintenance pit was closed by the IRP; however, closure documentation was not available for this ECP (99th RSC, 1996).

The MEP lot is graded to drain into a central storm sewer grate located directly west of the OMS, between the OMS and administrative buildings. This storm sewer grate is connected to a pipe that drains west toward State Highway Route 611. The POV parking lot also is graded west toward State Highway Route 611. East of the facility, the land slopes east-southeast toward an athletic field and elementary school. No ditches were observed on the Property during the August 2, 2006, site reconnaissance.

6.5 Asbestos-containing Material

Prior to the early 1980s, asbestos was commonly used as an insulating material for buildings and piping and as filler for vinyl floor tile. A November 15, 2004, asbestos inspection at the Property was conducted by Skelly and Loy, Inc. The inspection included visual and tactile assessments of materials suspected of containing asbestos. During this inspection, 23 samples of materials suspected of containing asbestos were collected from the OMS and administration buildings. Of these 23 samples, four were identified as ACM and one was assessed as friable (Skelly and Loy, 2005).

Previous reports document that samples were collected from the Property and tested positive for ACM (Data Chem Laboratories, 1992). A 1995 document noted that the facility manager stated that ACM was removed from the boiler room (Unknown, 1995). During the August 2, 2006, site reconnaissance, 99th RRC personnel noted that the 9-inch by 9-inch black and white tiles located throughout the first and second floors of the administrative building tested positive for asbestos during the 2004 ACM inspection (Photograph 10, Appendix A).

6.6 PCB-containing Equipment

Two pad-mounted GE transformers, manufactured in Pittseld, Massachusetts, serial #D276096, are located on the Property, north of the exterior north wall of the administration building (Unknown, 1995). During the August 2, 2006, site reconnaissance, the units appeared to be in good condition, and no evidence of leakage was observed. A document titled *PCB Management Plan* dated January 2003 identifies one of the USAR Center transformers (pad-mounted transformer next to the administrative building) as containing PCBs (Bay Associates, 2003).

No other electrical or hydraulic lifts that could potentially contain PCB oils were identified during the site visit or in the available records reviewed. Site personnel interviewed during the August 2, 2006, site reconnaissance did not know of any other potential PCB-containing equipment or current or past us of PCBs on the Property.

6.7 Lead-based Paint

ALSI performed an LBP inspection at the Property on November 15 and 16, 2004. ALSI tested 427 building components throughout each building. Of these 427 components, 326 tested positive for either LBP or lead-containing paint. The majority of the positive samples containing LBP and lead-containing paint were located on the walls, doors, door frames, window sills, window frames, ceilings, and radiators in the administration and OMS buildings (Skelly and Loy, 2005). Peeling and chipped paint were noted in most of the rooms in the administrative building and OMS during the August 2, 2006, site reconnaissance. The exterior of the OMS and administration buildings are constructed with a brick veneer, and no chipped or peeling paint was noted on the buildings exteriors.

6.8 Radon

A site-specific radon survey was conducted between November 15 and 17, 2004, by Skelly and Loy's radon inspector Luke R. Marsh (Examination ID#20401012003). Passive radon test kits were used to identify and quantify the presence of radon gas. The test kits were placed in randomly selected rooms on the first floors of both the OMS and administration buildings, about 2 feet to 6 feet above the ground (within the normal breathing zone). The average radon level in the administration and OMS buildings were 1.32 picoCuries per liter (pCi/L) and 0.55 pCi/L, respectively (Skelly and Loy, 2005). Both these amounts are below the USEPA recommended action level of 4.0 pCi/L and are below the average indoor amount for the 19044 zip code.

The USEPA map of radon zones indicates that the USAR Center is in Zone 1, meaning it has a high potential for radon, greater than 4.0 pCi/L (http://www.epa.gov/radon/zonemap/pennsylvania.htm).

6.9 Munitions and Explosives of Concern

Based on a review of available records, the site reconnaissance, and interviews with USAR Center personnel, there are no indications that munitions and explosives of concern (MEC) are or were present at the Property. There was an indoor firing range on the Property located on the first floor of the administration building in Room 120; however, it was decommissioned and cleaned in 2002 (IT Corporation, 2003), and was being used as storage for general office equipment as observed during the August 2, 2006 site reconnaissance. Previous reports indicate that the former indoor firing range was being used as a storage area (Gillan and Hartmann, 1992).

At the time of the 2002 decommissioning, the indoor firing range had not been used in several years, and the firing line, shooter partitions, target retrieval system, bullet trap, and deflector plates had been previously removed. In addition, the acoustical tiles had been removed, and the remaining cinder block walls were repainted. The floor of the firing range was cleaned in October 2002 using a cleaning solution in conjunction with floor scrubbers. Confirmatory wipe samples were collected following decommissioning activities in 2002. Results from these wipe samples indicate that concentrations of lead were below 200 micrograms per square foot, and that the range is safe for reoccupation (IT Corporation, 2003).

6.10 Radioactive Materials

Based on the August 2, 2006, site reconnaissance and interviews with USAR Center personnel, radioactive materials were present in equipment used on the Property. Meters used to monitor NBC hazards were stored in the administration building. These meters apparently contain small quantities of radioactive material in sealed containers and are not regulated.

7 Review of Special Resources

7.1 Land Use

The Property is currently zoned for commercial use. Based on historical aerial photographs, the USAR Center is located in an area that combines commercial and residential land uses. As mentioned in Section 1, the Property is bounded by residential neighborhoods to the north and east, a school to the southeast, commercial business to the south, and Route 611 and the Willow Grove NAS/JRB to the west.

7.2 Coastal Zone Management

The PADEP, Water Planning Office is the lead agency for the Pennsylvania Coastal Zone Management Program. This Property is not included in the coastal zone management plan, nor is it in a coastal zone (PADEP, Coastal Zone Management Program).

7.3 Wetlands

According to the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory map, no jurisdictional wetlands are identified on the Property or on adjacent properties. The nearest wetland is located about 0.5 mile east of the Property (EDR, 2006; Appendix E).

During the August 2, 2006, site reconnaissance, no conditions were present that suggested the presence of wetlands on the Property (that is, areas with standing water or wetland vegetation). Based on the Soil Conservation Service's State Soil Geographic Database (STATSGO) data, the soil present at the Property is from the Lansdale series, which is classified as a well-drained loam, and does not meet the requirements for a hydric soil (EDR, 2006). The natural resources survey report prepared in July 1995 did not identify any wetlands at the Property (USACE, 1995b).

7.4 100-year Floodplain

A review of the FEMA digital Flood Hazard Area map indicates that the Property lies outside the 100-year floodplain (EDR, 2006; Appendix E). 99th RRC personnel were not aware of the facility ever being flooded.

7.5 Natural Resources

A report entitled *Programmatic Natural Resource Management Plan 79th Army Reserve Command Pennsylvania* was prepared for the USAR in an effort to inventory and manage natural resources found at 79th RRC facilities in central and southeastern Pennsylvania. The report concluded that the USAR Center did not contain any key natural resources, including

wetlands, surface water, floodplains, rare species, or the potential for rare species (USACE, 1995b).

7.6 Cultural Resources

In July 1995, a Cultural Resource Management Plan for the Property was prepared by the KFS Historic Preservation Group, Kise Franks & Straw, Inc., in association with Hunter Research, Inc. The purpose of the survey and subsequent report was to inventory cultural resources at 32 USAR centers in central and southeastern Pennsylvania. To facilitate the cultural resource assessment, background research and site visits were conducted for each facility. Research included an evaluation of historical documents, previous assessments, and a summary description of the facility and its surroundings. In addition, each site also was assessed for its eligibility to the NRHP.

The report concluded that no historic architectural resources were identified at the Property, and neither of the buildings at the Property was found to meet the criteria for inclusion in the NRHP (KFS Historic Preservation Group, 1995).

7.7 Other Special Resources

Based on a review of available current and historical documents, no additional special resources were identified on the Property or the immediate surrounding area.

8 Conclusions

The following information was obtained after conducting an environmental record search including records for adjacent properties, reviewing available historical information, conducting interviews with knowledgeable parties connected with the Property or with state and local agencies, and conducting a reconnaissance of the Property and adjacent properties.

8.1 Review of Findings

Hazardous Substances. Hazardous substances pursuant to CERCLA §101(14) (42 United States Code §9601 (14)) were used and stored at the Property in amounts necessary to support vehicle and building maintenance activities. Based on historical documents, a debris storage area that reportedly stored hazardous materials and diesel-contaminated soil was previously located between the OMS building and east fence. Investigations in 1995, 1997, and 2001 collected samples that were analyzed for chlorinated herbicides, VOCs, SVOCs, pesticides, PCBs, and metals. Sampling results in 1995 found only TPH-DRO detected in exceedance of PADEP clean-up standards. Sample results from the follow-on investigations detected VOCs, SVOCs, pesticides, PCBs, and vanadium below MSC concentrations. The reports concluded that no contaminants were detected above concentrations required to be protective of human health or the environment. In 2001, PADEP concurred with the conclusions of these investigations, and removed the Property from the "List of Scheduled Sites" to the "List of Resolved Sites" under the July 4, 1998, Multi-Site Agreement among PADEP and the Military Components.

USTs/ ASTs. Two No. 2 heating oil USTs were previously located on the Property. One 2,000-gallon heating oil UST located adjacent to the OMS building, which failed a tightness test, was removed on January 21, 1997. Additional soil excavation and sampling was performed during tank removal. A second UST was located adjacent to the east side of the administration building; however, removal documentation for this UST was not available for this ECP report. Neither tank was regulated under the Tank Act, since they were used to supply fuel oil for space heating, which is unregulated by the federal government and by the Commonwealth of Pennsylvania.

Non-UST/AST Petroleum Storage. Used POL substances were stored in two places on the Property: outside the OMS building in a locked "sea-box" type container with secondary containment and inside the OMS building with secondary containment. One open container of used oil and one 5-gallon container of cleaning solvent were stored directly on the floor inside the OMS building. No spills or staining were present around these storage areas and containers during the site reconnaissance. Non-UST/AST petroleum substances releases at the Property include a 40-square-foot area of stained soil identified in 1995 south of the OMS building and a diesel fuel spill in 1994 north of the OMS building.

PCBs. Two pad-mounted transformers are located on the Property north of the exterior north wall of the administration building. During the August 2, 2006, site reconnaissance,

the units appeared to be in good condition, and no evidence of leakage was observed. One of the transformers contains PCBs (Bay Associates, 2003).

No other electrical or hydraulic lifts that could potentially contain PCB oils were identified during the site visit or in the available records reviewed. Site personnel interviewed did not know of any other potential PCB-containing equipment on the Property.

ACM. A 2004 asbestos inspection identified ACM in four out of 23 locations, including one area with friable asbestos. Previous reports document that samples were collected from the Property during a May 1992 inspection and tested positive for ACM. A 1995 document noted that the facility manager stated that ACM was removed from the boiler room. 99th RRC personnel noted during the August 2, 2006, site reconnaissance that the 9-inch-square black and white tiles located throughout the first and second floors of the administration building tested positive for asbestos during the 2004 ACM inspection.

LBP. ALSI performed an LBP inspection at the Property on November 15 and 16, 2004. A majority of the samples collected during this survey tested positive for either LBP or lead-containing paint. Most of the positive samples containing LBP and lead-containing paint were located on the walls, doors, door frames, window sills, window frames, ceilings, and radiators in the administration and OMS buildings.

Radiological Materials. Based on the August 2, 2006, site reconnaissance and interviews with USAR Center personnel, radioactive materials were present in equipment used on the Property. Meters used to monitor NBC hazards were stored in the administration building. These meters apparently contain small quantities of radioactive material in sealed containers and are not regulated.

Radon. A 2004 radon survey performed on the Property reported that the average radon level in the administration and OMS buildings were below the USEPA recommended action level of 4.0 pCi/L and are below the average indoor amount for the 19044 zip code.

MEC. Available records do not indicate any MEC currently or formerly located at this Property. No evidence of MEC was observed during the August 2, 2006, site reconnaissance. A firing range was formerly located on the Property, but it was closed in 2002.

Surrounding Properties. Potential environmental concerns, located on surrounding properties within the standard ASTM D6008 recommended minimum search distances from the Property, were evaluated through database review and site reconnaissance. One adjacent property (JOT Fuel) had a release that has impacted the property with POL products and MTBE. This adjacent property is currently undergoing remediation with PADEP and post-remediation contaminant concentrations are below PADEP cleanup standards, however, the site is not yet closed.

Wetlands and Floodplain. According to the USFWS National Wetlands Inventory maps, the 2006 EDR report, and visual observations, no wetlands were observed or appear to be associated with any of the facilities at this site, or with any adjacent properties. The Property is not located within a 100-year floodplain or within a coastal zone.

Threatened and Endangered Species. The USAR Center did not contain any key natural resources, including wetlands, surface water, floodplains, rare species, or the potential for rare species.

Archaeological and Historical Resources. No historic architectural resources were identified at the Property, and neither of the buildings at the Property was found to meet the criteria for inclusion in the NRHP (KFS Historic Preservation Group, 1995).

8.2 Environmental Condition of Property

Findings of this ECP report were based on readily available environmental information; interviews with site, state, and local personnel; review of previous environmental studies; and federal and state database and file information related to the storage, release, treatment, or disposal of hazardous substances or petroleum products. Results also were based on visual observations of the Property and adjacent properties.

In accordance with DoD policy defining the classifications (see Sherri Goodman Memorandum dated 21 October 1996), the Property has been classified into one of seven property types. Based on the results of this ECP study, the property has been assigned an overall DoD Environmental Condition Type 4. The property type is based on the following major findings:

- A leaking underground gasoline storage tank located on the adjacent JOT Fuel property is undergoing remediation. The release impacted soil and groundwater, and has impacted groundwater on the Property. COCs include benzene, toluene, ethylbenzene, and xylene; cumene; naphthalene; and MTBE. Monitoring wells along the property boundary indicated MTBE was present above Pennsylvania Act 2 MSCs prior to implementing remedial actions. A pump and treat and vapor recovery system operated on the JOT Fuel property from 1998 to 1999. Ongoing monitoring indicates COCs along the Property boundary are currently nondetect. However, COCs were still detected in other monitoring wells on and downgradient of the JOT Fuel property; therefore, the release has not yet been closed by PADEP.
- During the USACE Baltimore District 1995 site inspection, about 40 square feet of petroleum-stained soil and staining on the pavement adjacent to this area was observed on the south side of the OMS building. The reported staining was not observed during the August 2, 2006, site reconnaissance; however, it is unknown if any remedial activities were conducted in this area.
- About 10 gallons of diesel fuel were spilled in front (north) of the OMS building. Contaminated soil was excavated and subsurface soil samples were collected.
- Contaminated soil associated with a former 2,000-gallon No. 2 fuel oil leaking UST was remediated and is now closed by PADEP.

9 References

Persons Contacted

FOS, 215-384-4616 (cell), 215-443-1618 (fax), August 2, 2006.

Environmental Protection Specialist, RSO #2, 570-342-3786 ext. 1220 (office), 570-417-9556 (cell), August 2, 2006.

Environmental Protection Specialist/Automation Program Manager, 570-342-3786 (office), 570-417-7815 (cell), August 2, 2006.

Resources Consulted

Aerial photographs provided by Environmental Data Resources (EDR) dated 1938, 1942, 1958, 1965, and 1992.

U.S. Fish and Wildlife Service Wetland Map, http://wetlandsfws.er.usgs.gov.wtlnds/launch.html.

U.S. Geologic Survey 7.5-minute 1:24,000 topographic maps provided by Environmental Data Resources (EDR). Ambler Quad dates 1952, 1966, 1973, 1983, and 1999.

State and Local Regulatory Databases

Pennsylvania Brownfield Inventory, http://www.pasitefinder.state.pa.us.

Pennsylvania Department of Environmental Protection (PADEP), Land Recycling Program, Bureau of Waste Management, Storage Tank Cleanup Location, http://www.depweb.state.pa.us/landrecwaste/lib/landrecwaste/storagetankcleanups/tankincidents.xls.

Pennsylvania Department of Environmental Protection (PADEP), Water Planning Office, Coastal Zone Management Program. http://www.dep.state.pa.us/river/czmp.htm.

Works Cited

79th Regional Readiness Command (RRC). 1995. Hazardous Waste Management Consultation #37-10565-95, 79th Army Reserve Command, Pennsylvania. April 2-6.

99th Regional Support Command (RSC) Customer Support Team Number 1, Willow Grove NAS/JRB, Willow Grove Pennsylvania. 1996. Installation Restoration Program Installation Action Plan, Horsham Memorial USAR Center. April.

Bay Associates Environmental, Inc. 2003. PCB Management Plan. January.

Data Chem Laboratories. 1992. Analytical Report. May.

Department of the Army, Headquarters 416th Engineer Command Facilities Engineering TDA (Augmentation). 1996. Total Facility Assessment Report. September 19.

Department of the Army, Headquarters and Headquarters Company, 157th Separate Infantry Brigade (Mechanized). 1994. Memorandum, Report on Hazardous Substance Spill. March 11.

EA Engineering Science and Technology (EA). 1999. Fence-line Soils Investigation Report, Horsham Memorial USAR Center, Horsham, Pennsylvania. May.

Engineering Technologies Associates, Inc. 1997. UST Closure Report for Horsham Memorial USAR Center. May.

Gillan and Hartmann, Inc. 1992. Sampling and Analysis Test Plan for USARC-Rifle Ranges Germantown, Philadelphia, Horsham, North Penn, Bristol, Reese, Scranton, Marlin Gares, Wilkes-Barre. January 9.

Horne Engineering Services, Inc. 2001. Oil/Water Separator Survey Report for 99th RSC Customer Support Team. January 24.

IT Corporation. 2003. Range Cleanup—PA046, 99th RSC Horsham Memorial U.S. Army Reserve Center Horsham, Pennsylvania. August.

KFS Historic Preservation Group, Kise Franks & Straw, Inc., Hunter Research, Inc. 1995. 79th Army Reserve Command Cultural Resource Management Plan. July.

Pennsylvania Department of Environmental Protection (PADEP). 2001. Letter from Bruce D. Beitler (PADEP) to Colonel John Prizner, Jr. (U.S. Army Reserve), Re: Horsham Memorial USAR Center—Site 12 (Fence-line Soils). September 20.

Pennsylvania Department of Environmental Protection (PADEP). 2000. Letter from Dustin A. Armstrong (PADEP) to Ms. Darlene Stringos-Walker (U.S. Army Reserve), Re: Fence-Line Soils Investigation Horsham Memorial USARC. October 24.

PADEP. 2007. Faxsimilie Transmission from Lauren Mapleton (PADEP) regarding JOT Fuel Environmental Report. March 23.

Skelly and Loy, Inc. 2005. Asbestos-Containing Material, Lead-Based Paint, and Radon Inspections. April.

Sloto, Ronald A., United States Geological Survey. 2002. Hydrogeological Investigation at Site 5, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

U.S. Army Corps of Engineers, Baltimore District. 1995a. Preliminary Assessment Screening Horsham Memorial U.S. Army Reserve Center Horsham, Pennsylvania. February 7.

U.S. Army Corps of Engineers, Baltimore District. 1995b. Programmatic Natural Resource Management Plan 79th Army Reserve Command Pennsylvania. July.

U.S. Army Corps of Engineers, Norfolk District, The GeoEnvironmental Engineering Section. 2001. Analytical Results: Fence-Line Soils Investigation for Herbicide Analysis. June.

Unknown Author. 1995. Asbestos Management Compliance, Horsham Memorial USAR Center.

Unknown Author. 2005. BRAC 2005 Implementation Plan, S18 Real Property. October 7.

Appendix A
Figures

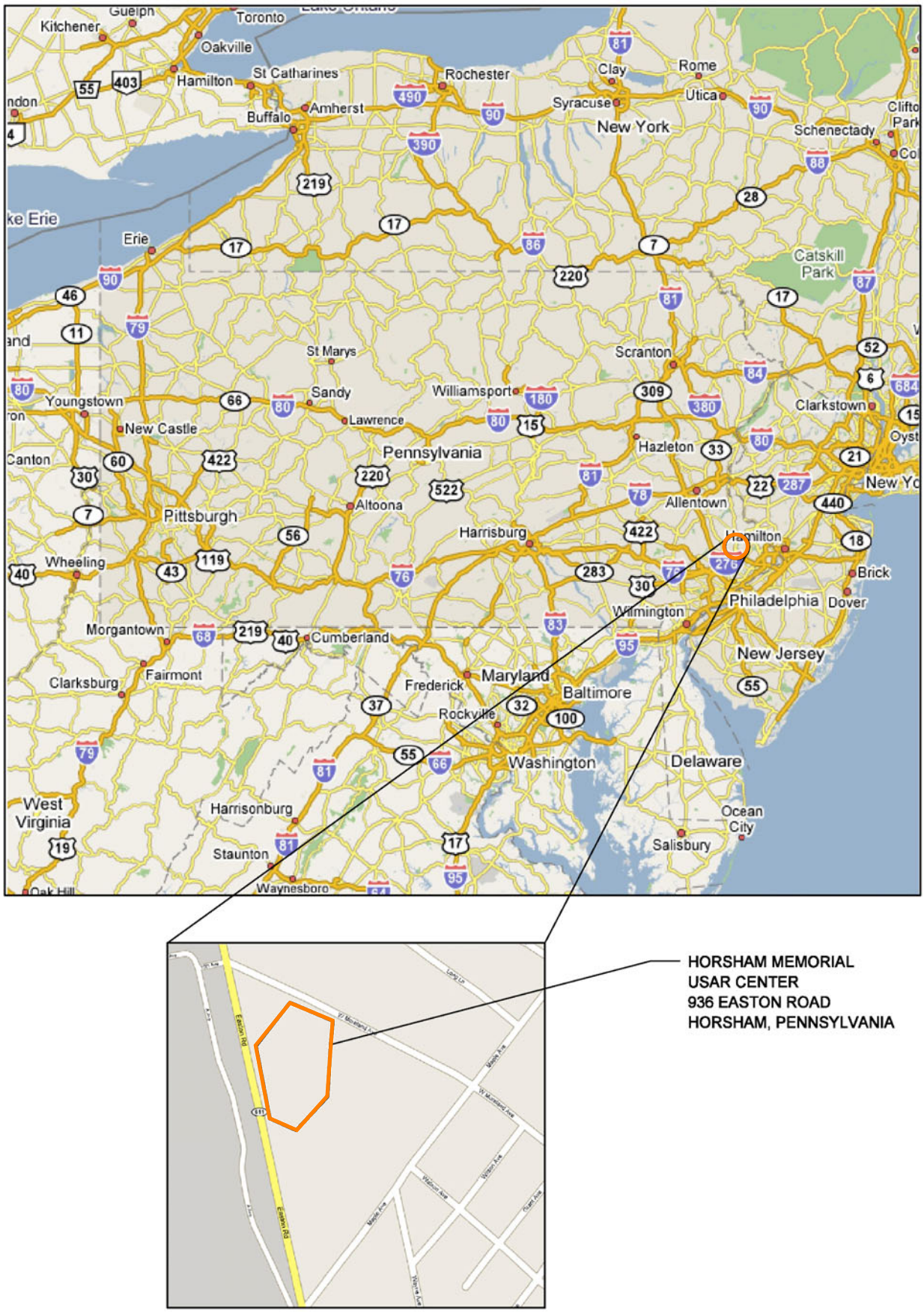

FIGURE 1
Site Location Map
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

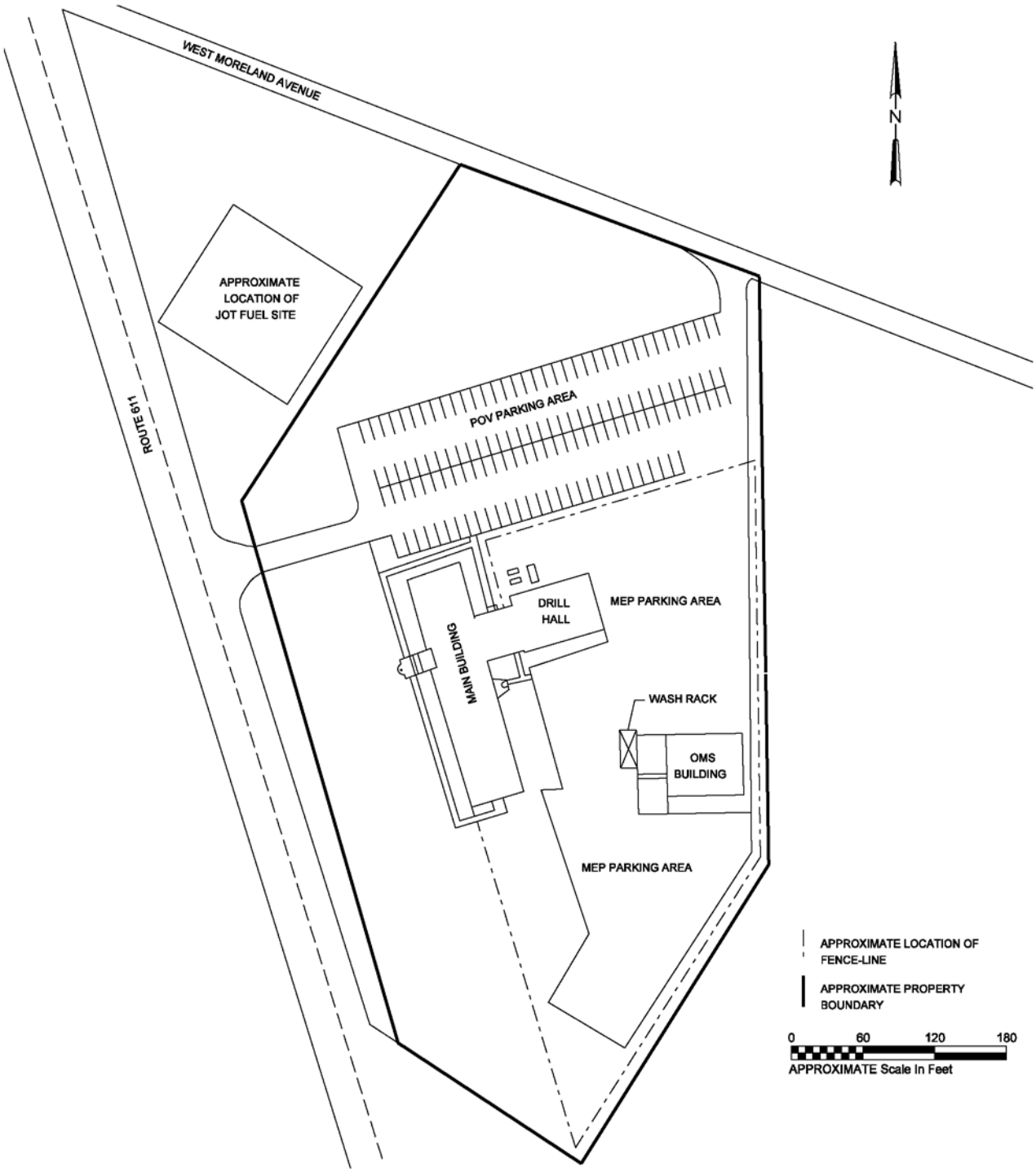

FIGURE 2
Site Layout Plan
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

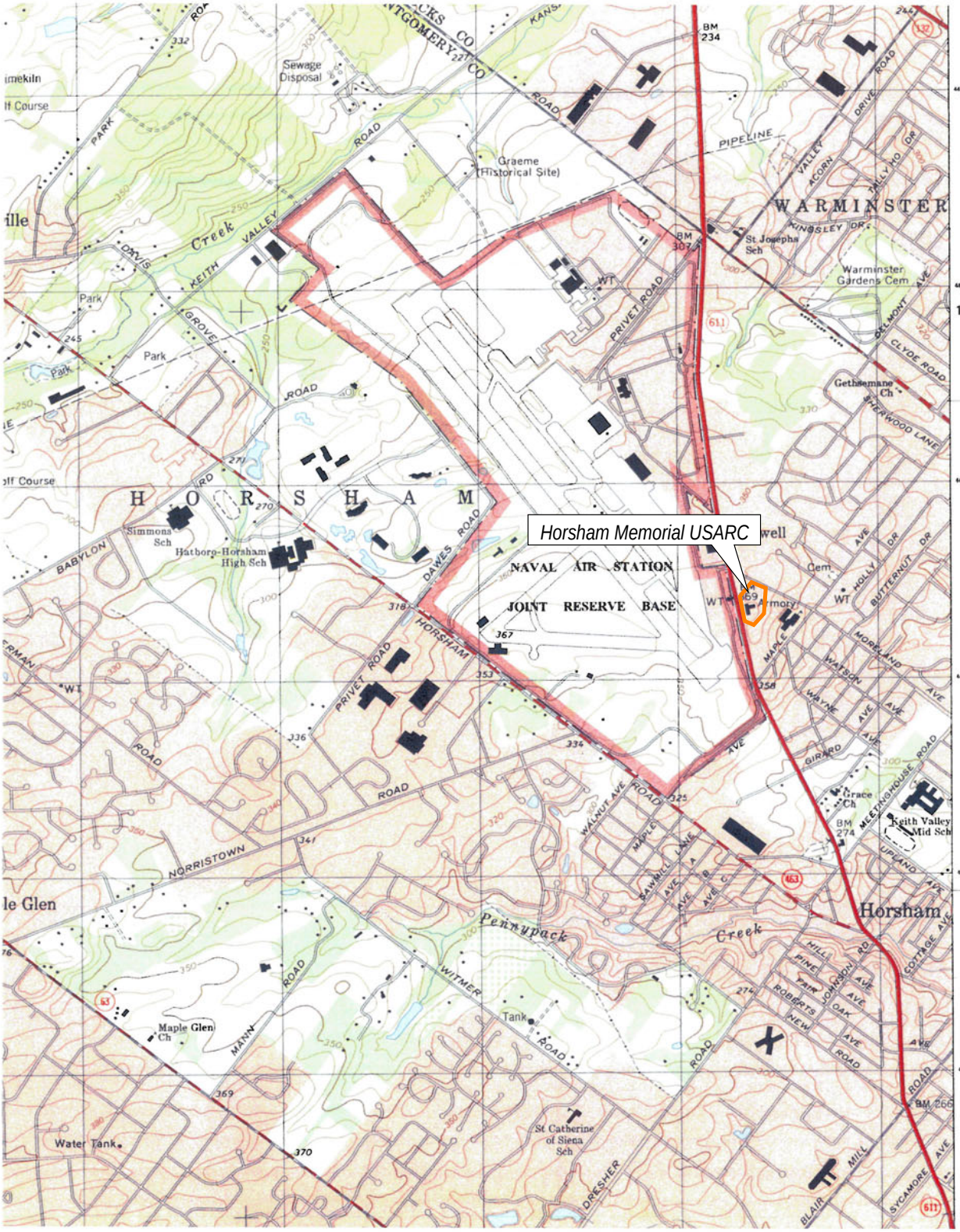

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FIGURE 3
1999 USGS 7.5-Minute Topographic Map
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

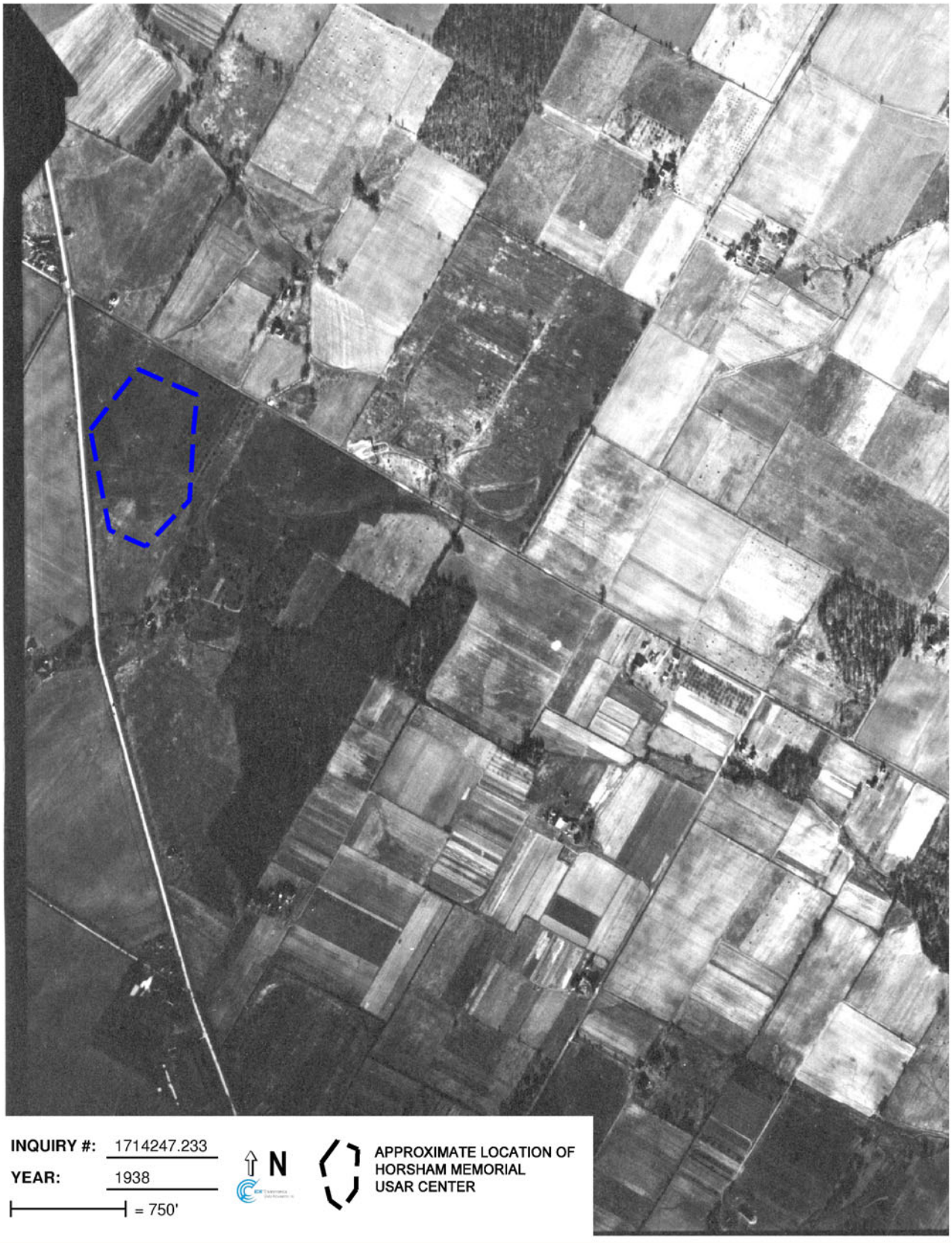


FIGURE 4
1938 Aerial Photograph
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

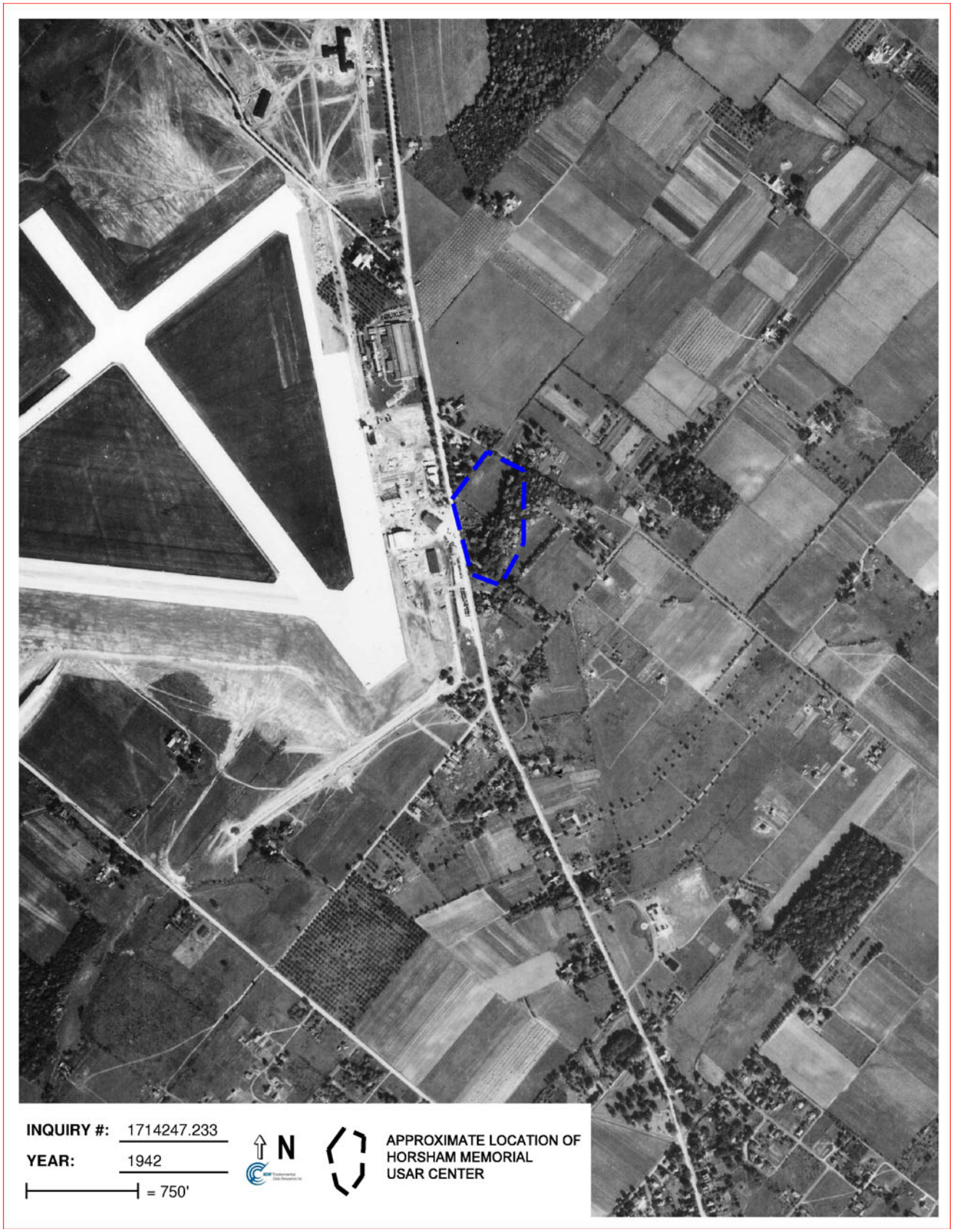


FIGURE 5
1942 Aerial Photograph
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

FIGURE 6
1958 Aerial Photograph
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

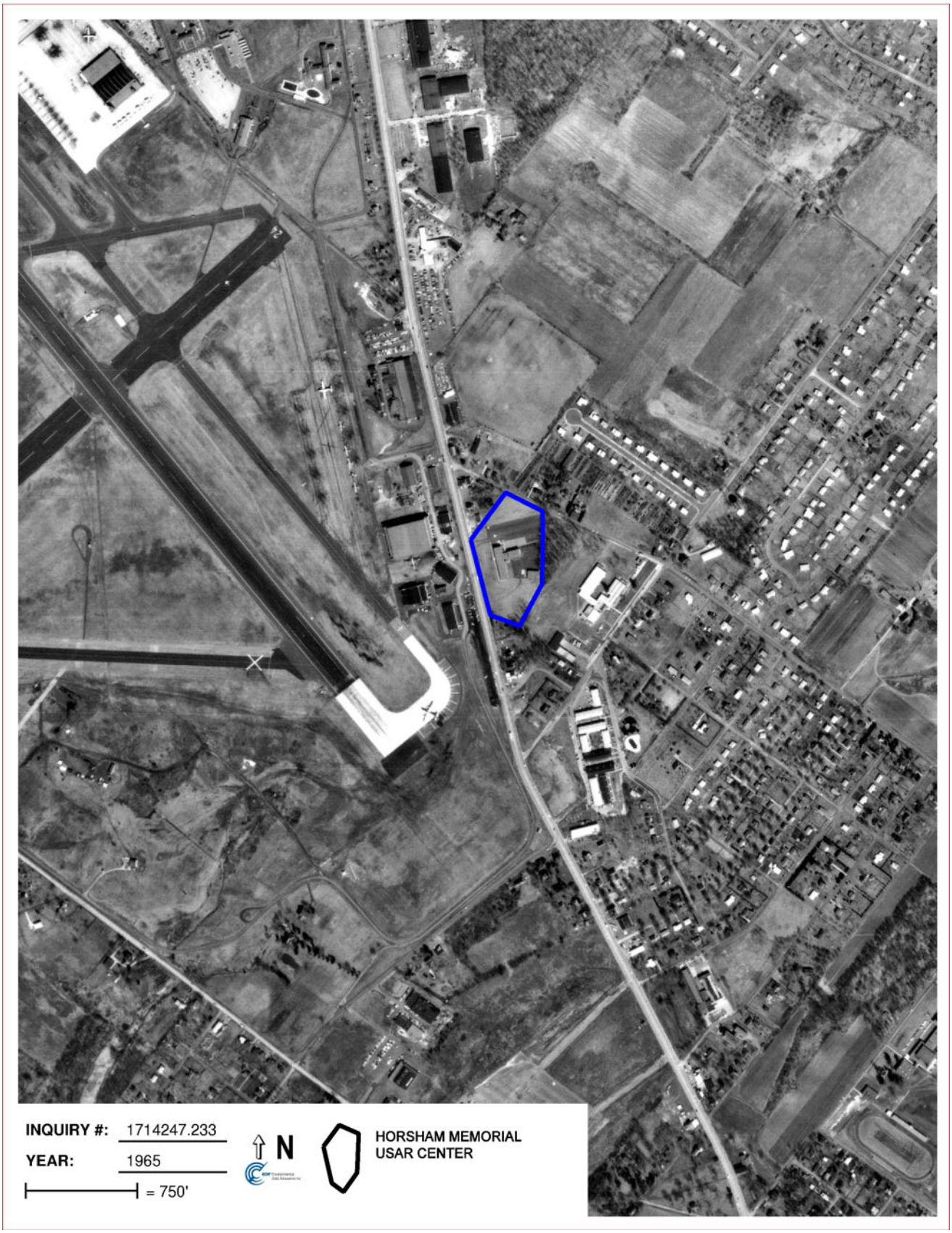


FIGURE 7
1965 Aerial Photograph
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

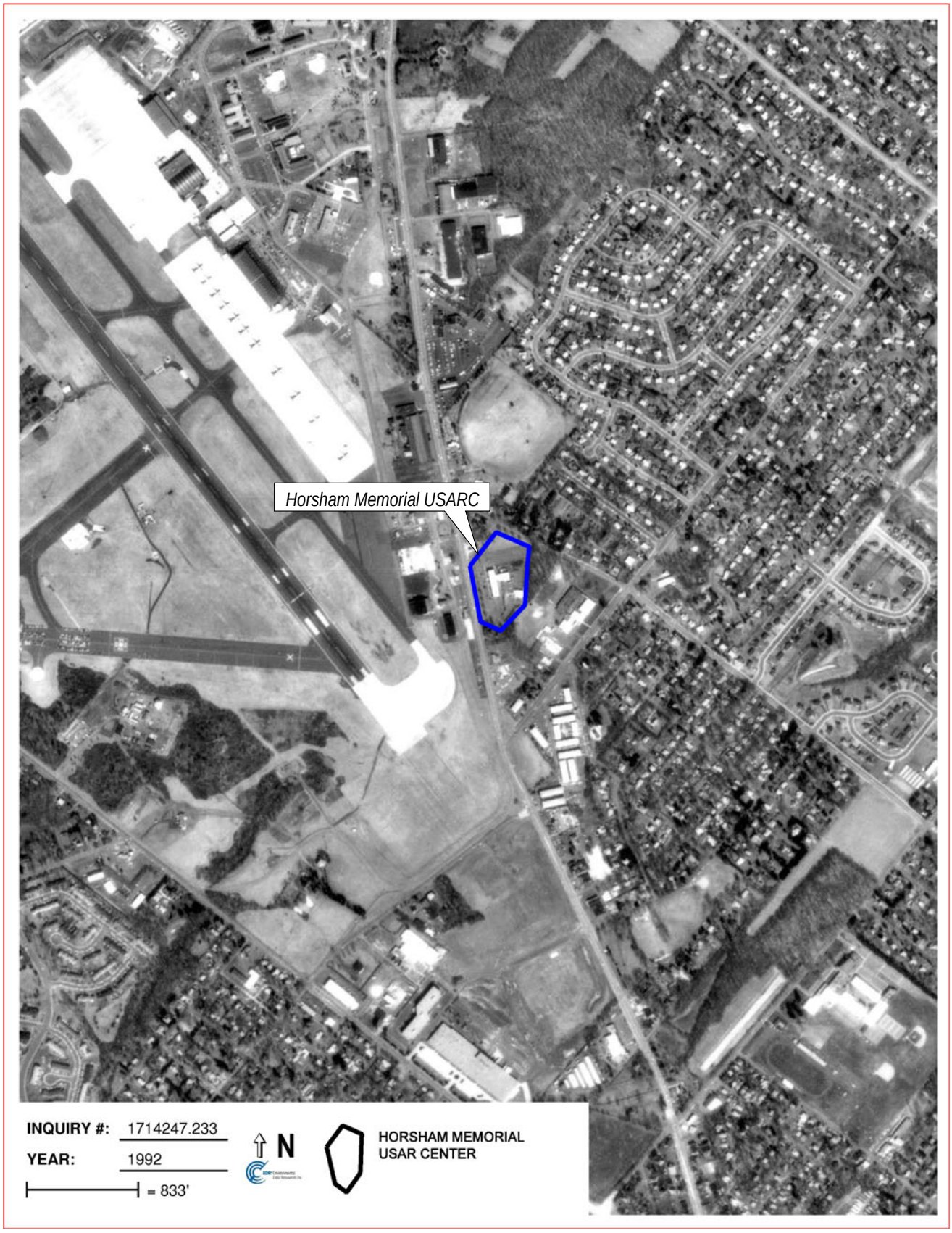


FIGURE 8
1992 Aerial Photograph
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

FIGURE 9
Google Earth Image
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

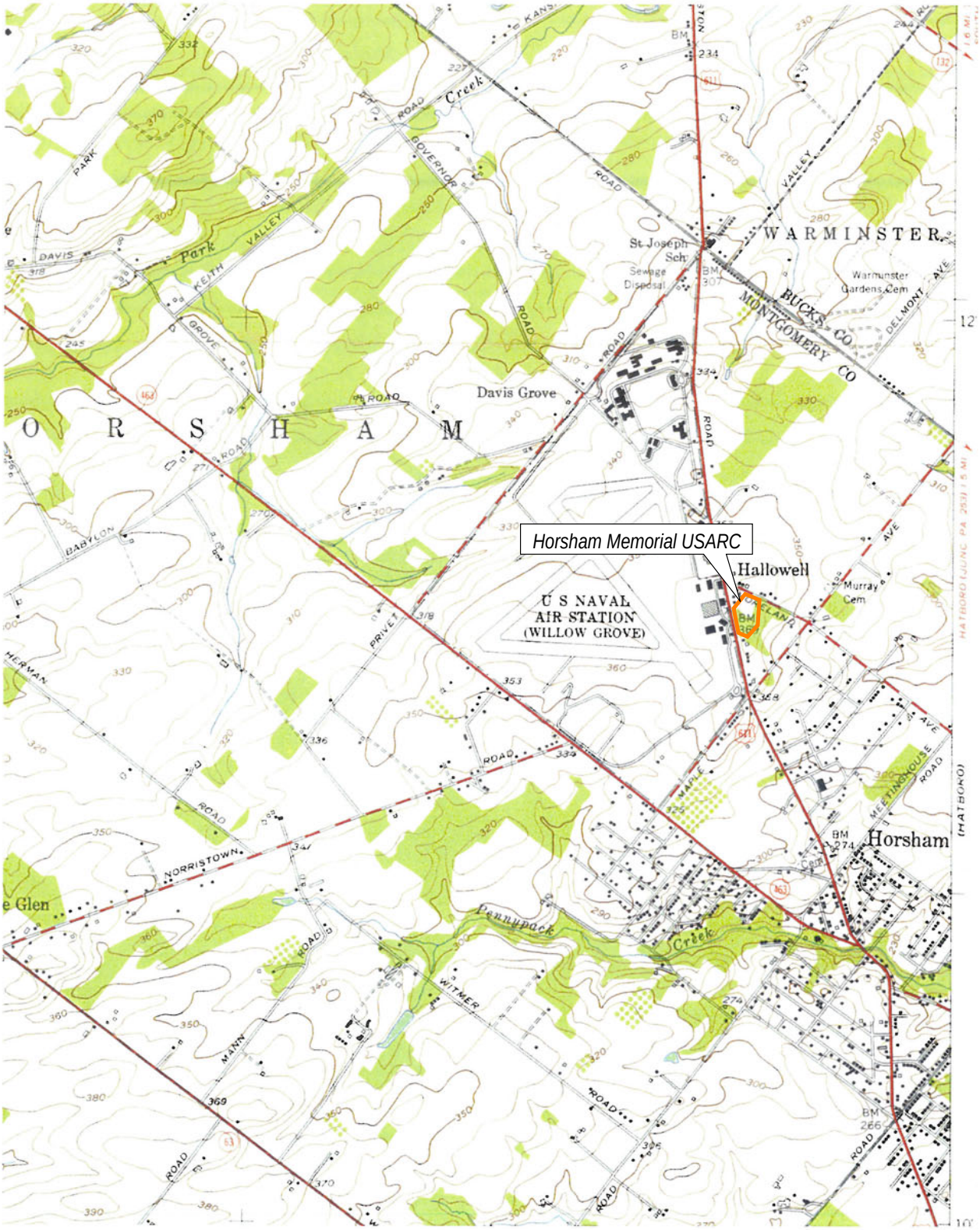


FIGURE 10
1952 USGS 7.5-Minute Topographic Map
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

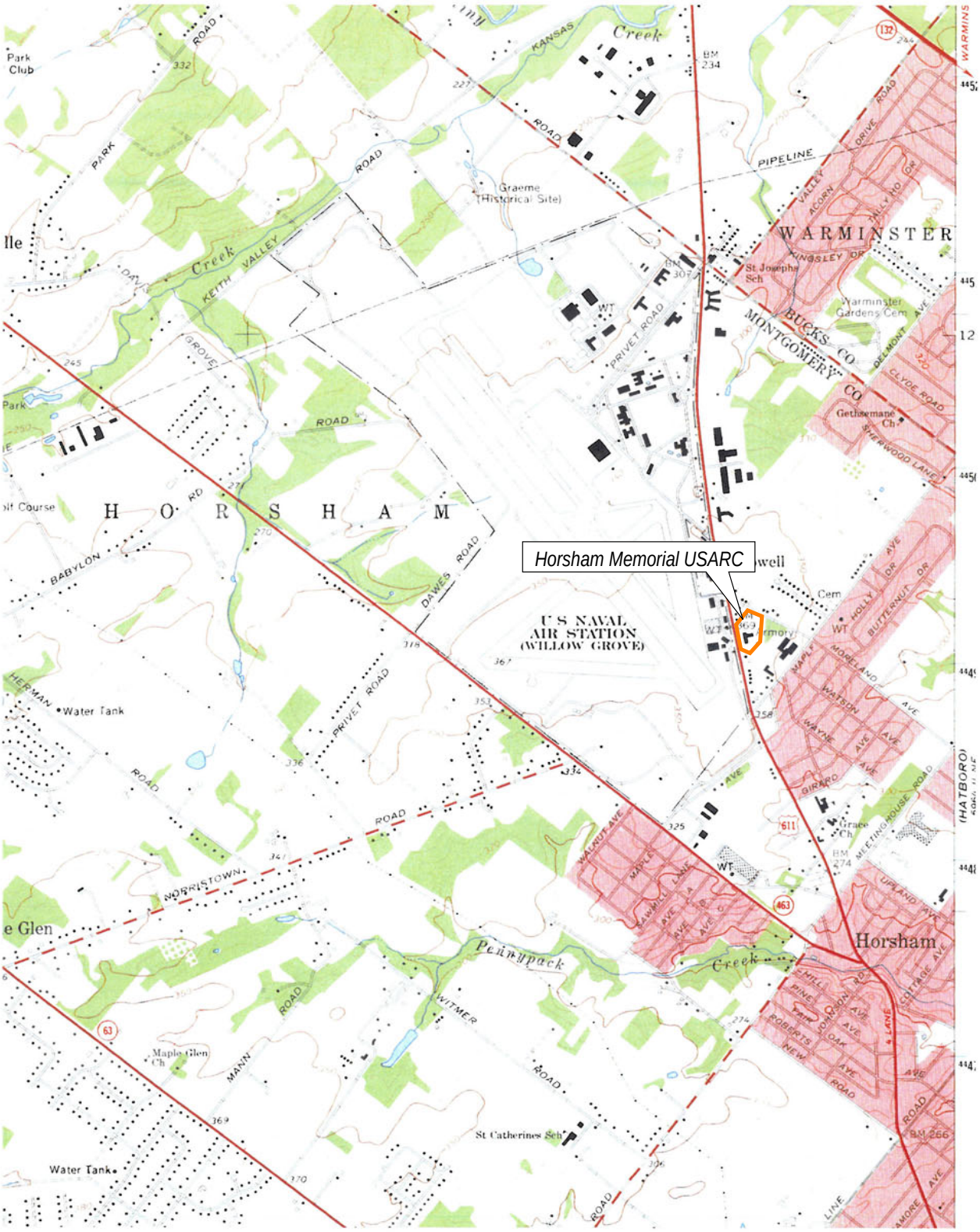


FIGURE 11
1966 USGS 7.5-Minute Topographic Map
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

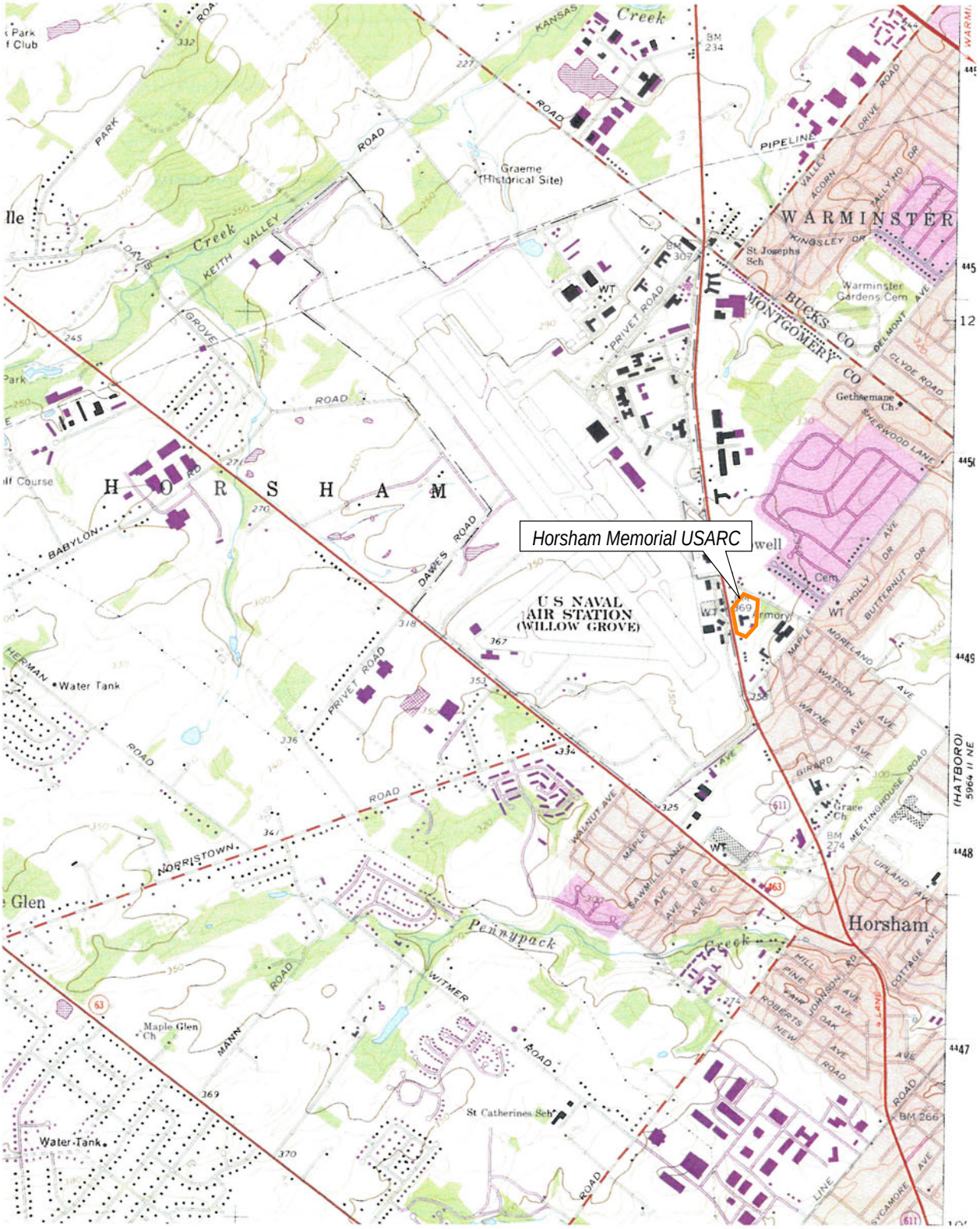


FIGURE 12
1983 USGS 7.5-Minute Topographic Map
Horsham Memorial U.S. Army Reserve Center (PA046)
Phase I ECP Report

Appendix B
Site Reconnaissance Photographs

APPENDIX B

Site Reconnaissance Photographs

1. Boiler room inside the main building, facing east.

2. Boiler room inside the main building, facing west.

3. Wash rack, west side of OMS building.

4. Oil/water separator, between wash rack and OMS building.

5. Containment pallet in OMS building.

6. Used motor oil in OMS building.

7. Parts cleaner, OMS building

8. Hazardous materials storage in "sea-box".

9. Driveway to Route 611, dead grass in *foreground.*

10. Floor tiles with ACM in the main building.

Appendix C

Property Acquisition Documents and Chain of Title Report

2055 East Rio Salado Parkway, Suite 201
Tempe, Arizona 85281
Phone: (480) 967-6752
Fax Number: (480) 966-9422
Web Site: www.netronline.com

HISTORICAL CHAIN OF TITLE REPORT

HORSHAM MEMORIAL USARC, PA
936 EASTON RD
HORSHAM, PENNSYLVANIA

Submitted to:

ENVIRONMENTAL DATA RESOURCES, INC.
C/O
CH2M HILL
1569 Stampmill Way
Lawrenceville, Georgia 30043
(770) 338-1589

Attention: Mary Jacques

Project No. N06-5609

Thursday, September 28, 2006

NETR- Real Estate Research & Information hereby submits the following ASTM historical chain-of-title to the land described below, subject to the leases/miscellaneous shown in Section 2. Title to the estate or interest covered by this report appears to be vested in:

UNITED STATES OF AMERICA

The following is the current property legal description:

Lot 1, Block 16D, situated and lying in the City of Horsham, Montgomery County, State of Pennsylvania

Assessor's Parcel No: 360003874005

1. HISTORICAL CHAIN OF TITLE

1. Albert G. Lippincott acquired title to the property in 1897. Albert G. Lippincott died on 09-15-1902, leaving to survive him as his only heirs at law, a widow Agnes B. Lippincott and two (2) daughters Edith B. Lippincott and Mary L. Buck. Agnes B. Lippincott died on 10-02-1921.

2. DEED:

RECORDED:	07-08-1953
GRANTOR:	Edith B. Lippincott and Mary L. Buck
GRANTEE:	United States of America
INSTRUMENT:	Bk 2385, Pg 500

2. LEASES AND MISCELLANEOUS

1. No environmental liens, institutional controls or engineering controls were found of record.

3. LIMITATION

This report was prepared for the use of Environmental Data Resources, Inc., and CH2M Hill, exclusively. This report is neither a guarantee of title, a commitment to insure, or a policy of title insurance. NETR- Real Estate Research & Information does not guarantee nor include any warranty of any kind whether expressed or implied, about the validity of all information included in this report since this information is retrieved as it is recorded from the various agencies that make it available. The total liability is limited to the fee paid for this report.

Appendix D

Previous Environmental Site Assessment Reports

Table of Contents

List of Tables

List of Figures

18. Real Property Action Plan

18.1 Purpose. The Real Property Action Plan is used to define actions relative to the BRAC recommendation to close the Reese United States Army Reserve Center in Chester, PA, the United States Army Reserve Organizational Maintenance Shop in Chester, PA, the Germantown Veterans Memorial United States Army Reserve Center in Philadelphia, PA, the Horsham Memorial United States Army Reserve Center in Horsham, PA, the 1LT Ray S. Musselman Memorial United States Army Reserve Center in Norristown, PA, and the North Penn Memorial United States Army Reserve Center in Norristown, PA, and relocate units to a new Armed Forces Reserve Center with an organizational maintenance facility at Willow Grove Joint Reserve Base, PA. The Army shall establish an enclave at Willow Grove Joint Reserve Base, PA, to retain essential facilities to support activities of the Reserve Components

18.2 Assumptions.

The below assumptions were used in creating this action plan. Conditions that change the assumptions will directly impact the plan.

- The United States Congress will not disapprove the Commission's recommendation forwarded by the President.
- Full funding will be made available.
- The U.S. Army Corps of Engineers (USACE) will meet required beneficial occupancy dates; otherwise, timelines will change and onetime cost and recurring savings will shift.

- NEPA requirements will be completed in a timely manner to support the proposed action and there will be no legal challenges.
- Command and control relationships may change throughout the process.
- Units will move only once; directly from old facility to new facility.
- Adjustments to milestones may be required based on the ability to meet the execution timeline.

18.3 General.

Land and Land Use:

The Germantown facility is located on 4.94 acres of land located at 5200 Wissahickon Ave., Philadelphia¸ Pa. adjacent to a VA administration facility. Acreage was purchased in 1955. The facility is located in a primarily residential area.

The Reese facility is located on 5 acres of land located at 500 West 24th Street, Chester, Pa 19013-4999. Acreage was purchased in 1957.

The North Penn facility is located on 19 acres of land located at 1625 Berks Road, Norristown, Pa.. The facility is located in a residential/non-industrial area. Land was purchased in 1955.

The Mussleman facility is located on 3.4 acres of land located at 1020 Sandy Street, Norristown, Pa. Acreage was purchased in 1958. The facility is located in a non-industrial, residential area.

The Horsham facility is located on 7 acres of land located at 936 Easton Road, Horsham, Pa. The facility is located in semi-rural suburbs of Philadelphia with light industry and farmland. Acreage was purchased in 1959.

18.3.1 **Land and Anomalies. None.**

18.3.2 **Facilities.**

The Germantown facility consists of a two story brick training building and a separate 5 bay OMS building. The buildings were constructed in 1957 and have had several major facility component improvements in recent years. The POV parking area is completely fenced in as well as a separately fenced MEP area.

IFS data:

1.) Training Building	30,538 GSF
2.) OMS Building	6300 GSF
3.) POV Pavement	4866 SY
4.) MEP Pavement	6382 SY
5.) Access Roads	77 SY
6.) Sidewalk	690 SY
7.) Fence Line	1400 LF

The Reese facility consists of two buildings, a two story training building and an OMS building. The facility, constructed in 1958, is constructed of brick veneer over concrete masonry. The general condition of the buildings is Good.

IFS Data:

1.) Training Bldg	22677 SF
2.) OMS Bldg	5173 SF
3.) Unheated Storage	280 SF
4.) POV Pavement	3491 SY
5.) OMS Parking	6249 SY
6.) Sidewalk	262 SY

The North Penn facility consists of a Training building and OMS building, both constructed in 1974, a non heated storage building

constructed in 1955, and a flammable material storage building constructed in 1958. Overall condition of the facility is Good.

IFS data

1) Training Bldg	45,000 SF
2) OMS Bldg	6,800 SF
3) Unheated Storage	707 SF
4) Flammable Mat Storage	54 SF
5) POV Parking	11,817 SY
6) MEP Parking	4,583 SY
7) Access Roads	11,032 SY
8) Sidewalks	2,405 SY
9) Fence	4,990 LF

The Mussleman facility consists of a two story training building and an OMS Building both originally constructed in 1959.The buildings are of brick construction. The general condition of the buildings is Good

IFS Data:

1.) Training Building	35,496 GSF
2.) OMS Building	3,850 GSF
3.) POV Pavement	4,636 SY
4.) MEP Parking	2,772 SY
5.) Access Roads	316 SY
6.) Sidewalks	585 SY
7.) Fence line	1,561 LF

The Horsham facility consists of a single two story brick faced training building and a separate brick faced OMS building originally constructed in 1959. The general condition of the buildings is good. The facility has a POV and a separate, fenced MEP area.

IFS data

1.) Training building	25041 GSF
2.) OMS	3710 GSF
3.) POV Parking	3368 SY

4.) MEP Parking	8803 SY
5.) Access Roads	841 SY
6.) Sidewalk	275 SY
7.) Fence	1743 LF

18.3.3 **Outgrants and Tenants.**

a. The current tenants of the Germantown facility
223rd QM Co.
3/317 BN (BCT), 80th Div.

b. Current tenants of Reese facility
858 MD CO DENTAL SVC
430 TC Det 1
949TH TC CO Det 2
338 MD BDE HHC
USMCR 6th ESB

Outgrant of Reese to Electric Company for Constriction, Maintenance, and Use Right of Way.

c. Current tenants of the North Penn facility
619 EN DET
633 EN DET
153 JA TM 1
153 JA TM 5
153 JA TM 6
153 JA TM 7
153 JA TM 8
153 JA TM 9
369 EN DET FIREFIGHTING
733 TC CO MED TRK PLS DET 1

319 EN DET
307 AG BAND ARMY
427 TC CO MED TRK PLS

d The current tenant of the Mussleman facility:
358 CA HHC BDE

e. The current tenants or the Horsham facility
23 SS AMSA, 2/228th AV BN
367th MP CO

18.3.4 Off-post Leases. N/A

18.3.5 Infrastructure (Linear Assets).

a. The Germantown facility is serviced by local electric and gas companies. Water distribution, sanitary sewer and storm sewer are also maintained thru local utility companies. (Reportable USAR Assets)

1) Electric Power Distribution	776 LF
2) Gas Pipeline	0
3) Sanitary Sewer	125 LF
4) Water Distribution	571 LF
5) Storm Sewer	0

b. The Reese facility is serviced by local electric and gas companies. Water distribution, sanitary sewer and storm sewer are also maintained thru local utility companies. (Reportable USAR Assets)

1)	Electric Power Distribution	480 LF
2)	Gas Pipeline	475 LF
3)	Sanitary Sewer	0

4)	Combined Sewer	440 LF
5)	Storm Sewer	0

c. The North Penn facility is serviced by local electric and gas companies. Water distribution, sanitary sewer and storm sewer are also maintained thru local utility companies. (Reportable USAR Assets)

1)	Electric Power Distribution	10,575 LF
2)	Gas Pipeline	0
3)	Sanitary Secondary Treat.	12.0 KG
4)	Sanitary Sewer	6,069 LF
5)	Pump Station Potable	4.0 KG
6)	Water Distribution	1,440 LF
7)	Fire Protection Non-Potabl	1,565 LF
8)	Pump station Non-Potable	2.5 KG
9)	Reservoir Non-Potable	600,000 GA
10)	Storm Sewer	920 LF

d. The Mussleman facility is serviced by local electric and gas companies. Water distribution, sanitary sewer and storm sewer are also maintained thru local utility companies. (Reportable USAR Assets)

1)	Electric Power Distribution	616 LF
2)	Gas Pipeline	90 LF
3)	Sanitary Sewer/Ind. Waste	596 LF
4)	Water Well Potable	2.4 KG
5)	Water Distribution	472 LF
6)	Storm Sewer	1,108 LF

e. The Horsham facility is serviced by local electric and gas companies. Water distribution, sanitary sewer and storm sewer are also maintained thru local utility companies. (Reportable USAR Assets)

1)	Electric Power Distribution	2,480 LF

2)	Gas Pipeline	0
3)	Combined Sewer	505 LF
4)	Water Distribution	863 LF
5)	Storm Sewer	0

18.3.6 Privatization Initiatives (Planned, In-progress, Complete).

TBD

18.3.7 Enclaves. None.

18.4 Caretaker Operations.

a) USAR will perform caretaker operations of this facility until final disposal. PA ARNG will follow direction of the Governor of the Commonwealth of Pennsylvania.

18.5 Map and Drawing Inventory. Yes.

18.6 Points of Contact

Table 18-1 is a list of the POCs and collaborators for the preparation of this Action Plan.

	POC Name	POC Phone	POC Email
ACSIM Real Property	Audrey Ormerod	703-601-2520	Audrey.C.Ormerod@us.army.mil
US Army Corps of Engineers HQ (HQUSACE)	Jeanne Herman	202-761-1082	Jeanne.f.herman@hq02.usace.army.mil
Current Real Property Accountability Officer	Ken Dunham	412 604-8163	kenneth.dunham@usar.army.mi
Supporting US Army Corps of Engineers RE District	Robert Webb	(410) 952-3666	bob.webb@nab02.usace.army.mil
99th RRC	Ken Dunham	412 604-8163	kenneth.dunham@usar.army.mil

	POC Name	POC Phone	POC Email

Table 18-1 Real Property Action Plan POC List

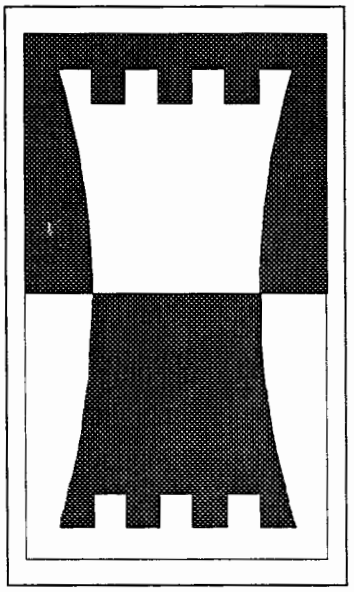
18.7 Completed Forms / Attachments

Table 18-2 is a list of the completed forms and attachments with accompany this Action Plan.

Form / Attachment	File Name
Land Report	TBP
List of Outgrants Report	TBP
Facilities Report	TBP
Infrastructure Report	TBP
Privatization Report	TBP
Maps, Drawings, Photos Inventory Report	TBP
Maps, Drawings, Photos	TBP
Disposal Report	TBP

Table 18-2 Real Property Action Plan Forms / Attachments

DEPARTMENT OF THE ARMY
HEADQUARTERS 416TH ENGINEER COMMAND
FACILITIES ENGINEERING TDA (AUGMENTATION)
4454 WEST CERMAK ROAD
CHICAGO, IL 60623-2991



TOTAL FACILITY ASSESSMENT REPORT

Horsham Memorial USAR Center
Facility EMAAR Number:PA046
99th Regional Support Command

Conducted 19 SEP 1996
by the
Fort Indiantown Gap Facilities Engineering Team
of
Engineer Support Group-East

416th ENGINEER COMMAND
USAR FACILITY
TOTAL FACILITY ASSESSMENT

INSTALLATION NAME: HORSHAM MEMORIAL USAR CENTER
INSTALLATION EMMAR NUMBER: PA046 DATE: 17 NOV 96

TABLE OF CONTENTS

SECTION 1- EXECUTIVE SUMMARY
INSTALLATION NAME: Horsham Memorial USARC
INSTALLATION NUMBER: PA 046

The Horsham Memorial USARC was assessed on 19 September 1996 by the Fort Indiantown Gap FE Team. The USARC consists of a single two story brick faced building with a separate brick faced OMS. The OMS was designed as a "Shed, Motor Vehicle Storage" and has had small offices built in the maintenance area. AMSA 23G operates a full time subshop in a portion of the OMS. Besides the two buildings, there is a privately owned vehicle (POV) parking area and military equipment parking (MEP) area. The center is fenced, except for the front of the main building and the POV parking lot. The facility is adjacent to Willow Grove Naval Air Station on busy Route 611 with the Pennsylvania Turnpike entrance one mile south. The surrounding area is semi-rural suburbs of Philadelphia with light industry and farmland. The facilites are occupied by the 367th Military Police Company and HHC, 2nd Battalion, 228th Aviation Regiment.

The facility was constructed in 1959 and is in good repair. There have been recent improvements and maintenance performed. Major projects completed include window replacement, a new entryway, and partial carpeting. A roof repair contract and door replacement contract are about to commence.

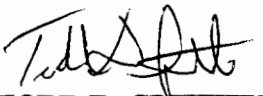
In addition to existing projects, an RPMA project has been identified to overlay pavement in the MEP. Numerous smaller projects have been identified for completion using the local ordering Officer Authority or through self help.

An Energy Audit was conducted and several energy conservation opportunities are possible. Potential savings areas include consolidating offices into comon work areas, installing individual task lighting, and zoning the building for energy usage.

The Safety Assessment documented no RAC 1 findings. The RAC 2 findings included improper wiring of an air conditioner and material stored in front of a power distribution box. The RAC 3 findings related to an uncovered switch box and receptacle,a training room without an accessdoor to the hallway, no approved safety containers in the OMS, and no ventilation in the flammable storage shed. The remainder of the findings were RAC 4 and RAC 5.

The Arms Vault structural certification was reviewed and found to be in compliance.

A table has been made with EMAAR data showing updated room usage and square footage. The environmental Assessment was completed with minimum findings, a marked improvement over the initial assessment.



TODD D. GRIFFITH
MAJ, EN, USAR
Assessment Team Leader

SECTION 2-USAR FACILITY ASSESSMENT IDENTIFICATION

INSTALLATION NAME: Horsham Memorial USAR Center

STREET ADDRESS: 936 Easton Road

CITY: Horsham STATE: PA ZIP CODE: 19044

FACILITY IDENFICATION NUMBER: PA046

RSC/RSG: 99th RSC, Oakdale,PA

TYPE FACILITY:

A.	USARC:	X	B.	AFRC:	____	C.	OMS:	____	D.	AMSA:	____
E.	DS/GS:	____	F.	MED:	____	G.	WET:	____	H.	FLIGHT	____
I.	ECS:	____	J.	CTF:	____	K.	OTHER:	_____			

ASSESSMENT PERFORMED BY: Fort Indiantown Gap Facilities Engineering Team

FACILITY ENGINEERING TEAM INCLUDED:

MAJ Todd D. Griffith
SFC Joseph Baron
SFC James Newcomer

REFER TO FOR INFORMATION:

MAJ Todd D. Griffith
3226 Margate Road
Bethlehem, PA. 18017

PERSONNEL CONTACTED ON SITE:

NAME/GRADE	DUTY POSITION	PHONE NUMBER
Ms. Brenda Kasnic	Facility Manager	215 957-0206

ASSESSMENT CONDUCTED FROM: 19SEP96 0800 TO 19SEP96 1630
(DATE/TIME) (DATE/TIME)

FACILITY DATA - PA046

Facility:	24,157
Administrative Space:	10,663
Assembly Space:	3,588
Total Education:	2,920
Storage:	1,216
Support:	2,430
Gross Center:	20,447
Gross Shop:	3,710
Gross Unheated Storage:	none

TABLE II
FACILITY DATA - PA046

ROOM NO. & NAME	ROOM DIMENSIONS			ROOM AREA	ROOM VOLUME	USE CODE
	LENGTH	WIDTH	HEIGHT			
Lobby (1st floor)	20	16	11	320	3520	IA6
Corridor (1st floor)	212	7	9	1,484	13356	IA3
Stair #1	8	20		160		IA3
101 Office	19	20	9	380	3420	IA1
102 Office	13	20	9	260	2340	IA1
103 Classroom	20	20	9	400	3600	IE1
104 Office	10	20	9	200	1800	IA2
105 Supply Office	21	20	9	420	3780	IF3
Arms Vault	39	20	9	780	7020	ID1
108 Utility Room	6	15	9	90	810	IH8
109 Office	9	15	9	135	1215	IA2
110 Office	12	15	9	180	1620	IA2
112 Men's Latrine	16	15	9	240	2160	IH1
111 Kitchen	16	15	9	240	2160	IC
Boiler Room	40	20	14	800	11200	IH7
Assembly Hall	69	52	21	3,588	75348	IB1
116 Office	19	20	9	380	3420	IA2
117 Womens Latrine	14	20	9	280	2520	IH2
118 Supply Office	31	20	9	620	5580	IF3
119 Office	13	20	9	260	2340	IA2
Stairs #2	8	20		260		IA3
Hall (2nd floor)	212	7	9	1,484	13356	IA3
Lobby (2nd floor)	18	20	9	360	3240	IA3
201 Office	31	20	8	620	4960	IA2
202 Office	31	20	8	620	4960	IA2
203 Office	21	20	8	420	3360	IA2
204 Office	19	20	8	380	3040	IA2
205 Office	21	20	8	420	3360	IA2
206 Janitorial Closet	11	16	9	176	1584	IF4
207 Office	60	20	9	1,200	10800	IA2
208 Office	23	20	9	460	4140	IA2
209 Office	34	20	9	680	6120	IA2

210 Classroom	30	20	9	600	5400	IE1
211 Classroom	33	20	9	660	5940	IE1
213 Classroom	31	20	9	620	5580	IE1
212 Classroom	32	20	9	640	5760	IE1
Maint.Garage	70	53	15	3,710	55650	IIA
CUM. TOTAL				24,527	137250	

TABLE IIA - Administrative Space
FACILITY DATA - PA046

ROOM NO. & NAME	**ROOM DIMENSIONS**			**ROOM AREA**	ROOM VOLUME
	LENGTH	WIDTH	HEIGHT		
Lobby (1st floor)	20	16	11	320	3520
Corridor (1st floor)	212	7	9	1,484	13356
Stair #1	8	20		160	
101 Office	19	20	9	380	3420
102 Office	13	20	9	260	2340
104 Office	10	20	9	200	1800
109 Office	9	15	9	135	1215
110 Office	12	15	9	180	1620
116 Office	19	20	9	380	3420
119 Office	13	20	9	260	2340
Stairs #2	8	20		260	
Hall (2nd floor)	212	7	9	1,484	13356
Lobby (2nd floor)	18	20	9	360	3240
201 Office	31	20	8	620	4960
202 Office	31	20	8	620	4960
203 Office	21	20	8	420	3360
204 Office	19	20	8	380	3040
205 Office	21	20	8	420	3360
207 Office	60	20	9	1,200	10800
208 Office	23	20	9	460	4140
209 Office	34	20	9	680	6120
CUM. TOTAL				10,663	

TABLE IIB - Assembly Space
FACILITY DATA - PA046

ROOM NO. & NAME	ROOM DIMENSIONS			ROOM AREA	ROOM VOLUME
	LENGTH	WIDTH	HEIGHT		
Assembly Hall	69	52	21	3,588	75348
CUM. TOTAL				3,588	

TABLE IIC - Total Education
FACILITY DATA - PA046

ROOM NO. & NAME	ROOM DIMENSIONS			ROOM AREA	ROOM VOLUME
	LENGTH	WIDTH	HEIGHT		
103 Classroom	20	20	9	400	3600
210 Classroom	30	20	9	600	5400
211 Classroom	33	20	9	660	5940
213 Classroom	31	20	9	620	5580
212 Classroom	32	20	9	640	5760
CUM. TOTAL				2920	

TABLE IID - Storage
FACILITY DATA - PA046

ROOM NO. & NAME	ROOM DIMENSIONS			ROOM AREA	ROOM VOLUME
	LENGTH	WIDTH	HEIGHT		
105 Supply Office	21	20	9	420	3780
118 Supply Office	31	20	9	620	5580
206 Janitorial Closet	11	16	9	176	1584
CUM. TOTAL				1216	

TABLE IIE - Support
FACILITY DATA - PA046

ROOM NO. & NAME	ROOM DIMENSIONS			ROOM AREA	ROOM VOLUME
	LENGTH	WIDTH	HEIGHT		
108 Utility Room	6	15	9	90	810
112 Men's Latrine	16	15	9	240	2160
111 Kitchen	16	15	9	240	2160
Boiler Room	40	20	14	800	11200
117 Womens Latrine	14	20	9	280	2520
Arms Vault	39	20	9	780	7020
CUM. TOTAL				2430	

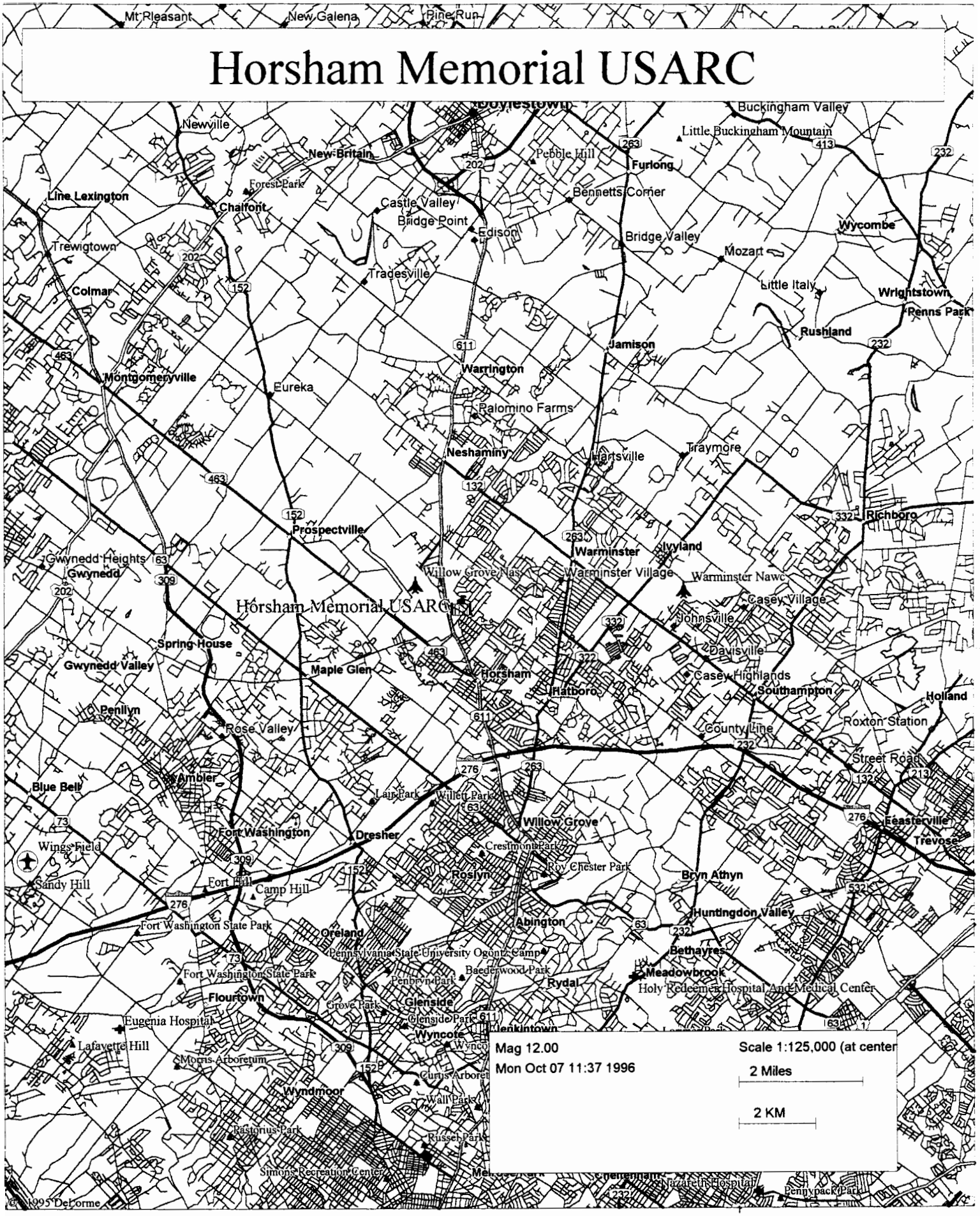
TABLE IIF - Total Shop
FACILITY DATA - PA046

ROOM NO. & NAME	ROOM DIMENSIONS			ROOM AREA	ROOM VOLUME
	LENGTH	WIDTH	HEIGHT		
Maint.Garage	70	53	15	3,710	55650
CUM. TOTAL				3,710	

SECTION 4
GRAPHICAL DATA

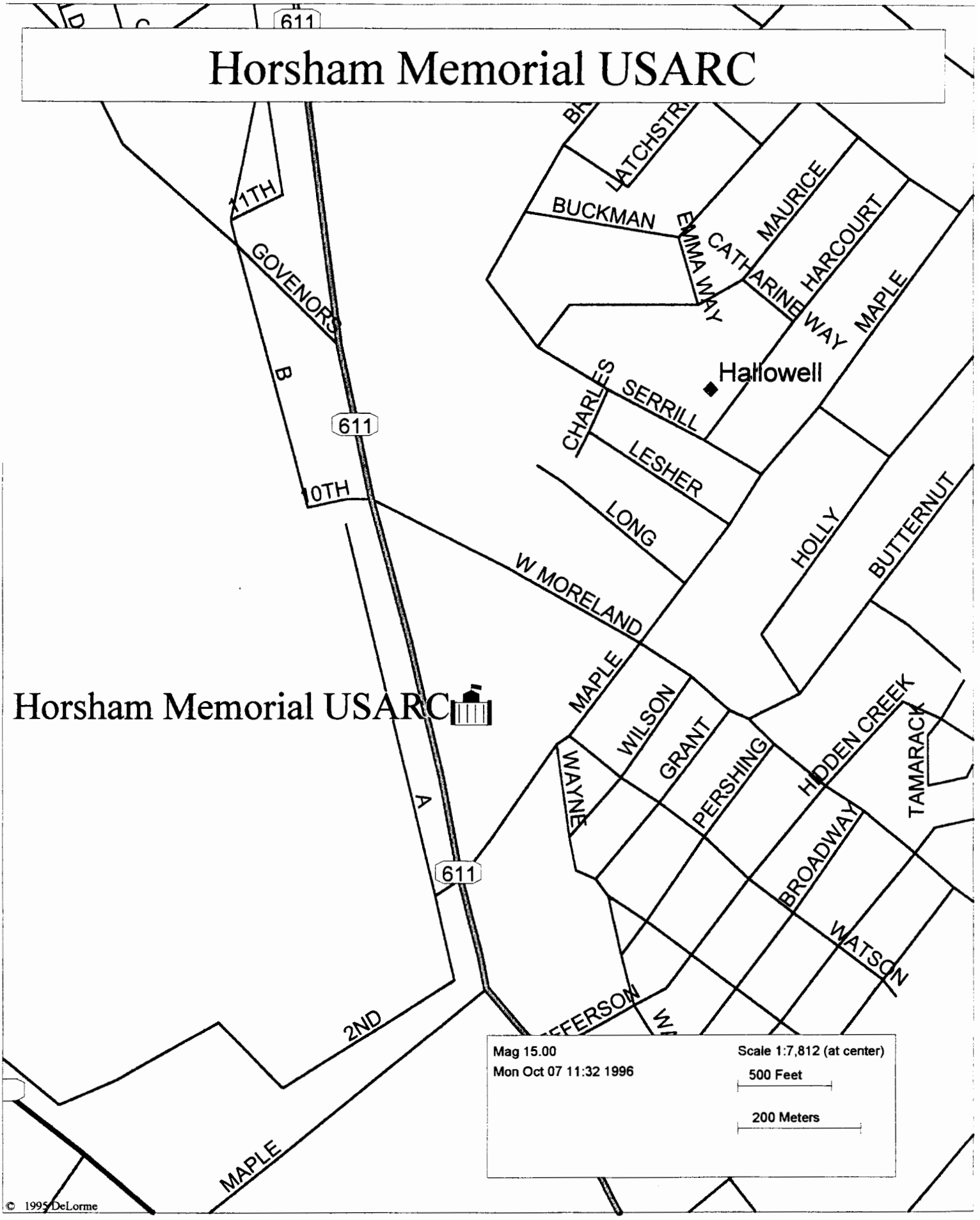
SECTION 4A
VICINITY MAP

Horsham Memorial USARC

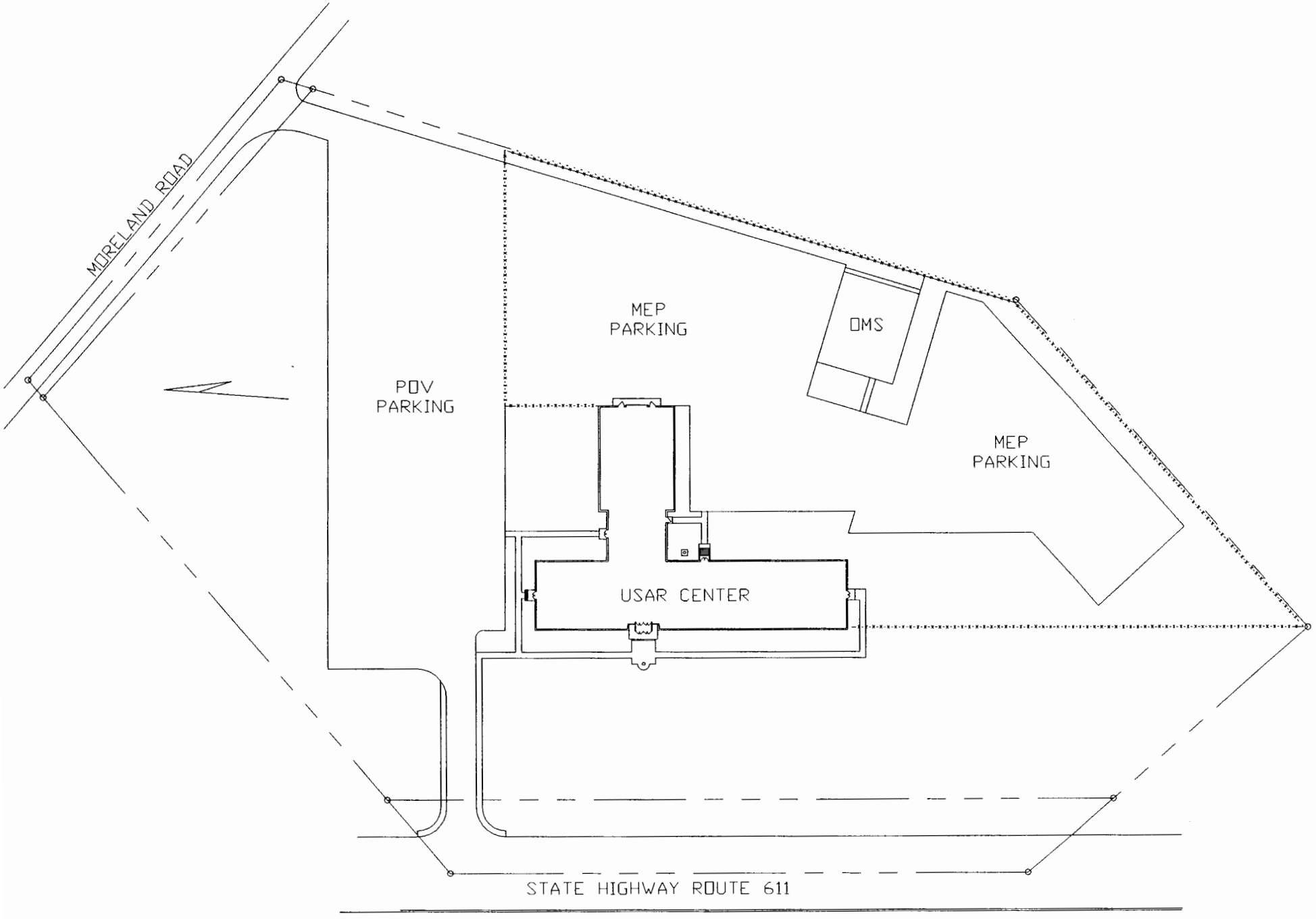


SECTION 4B
LOCATION MAP

Horsham Memorial USARC

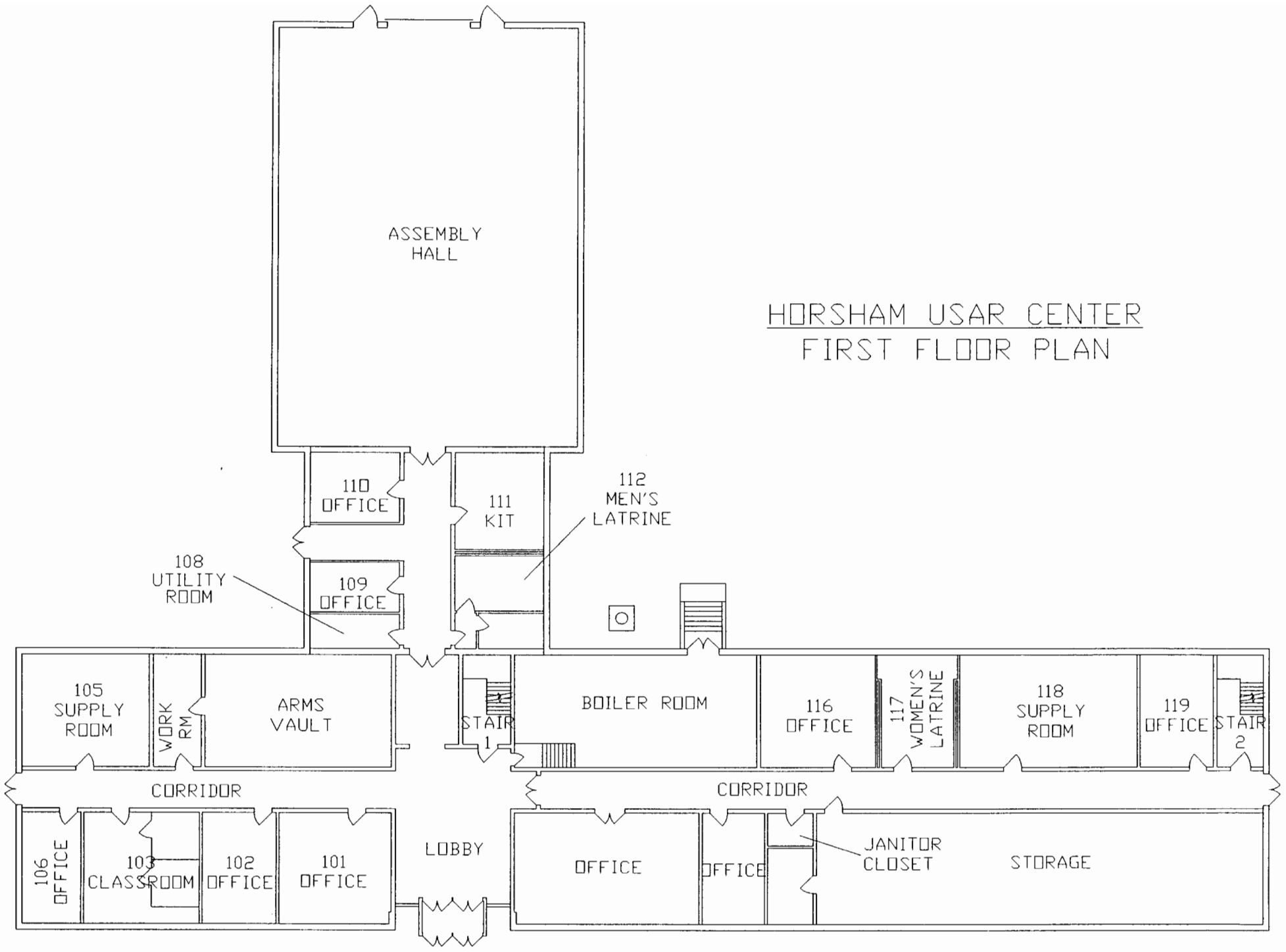


SECTION 4C
SITE MAP

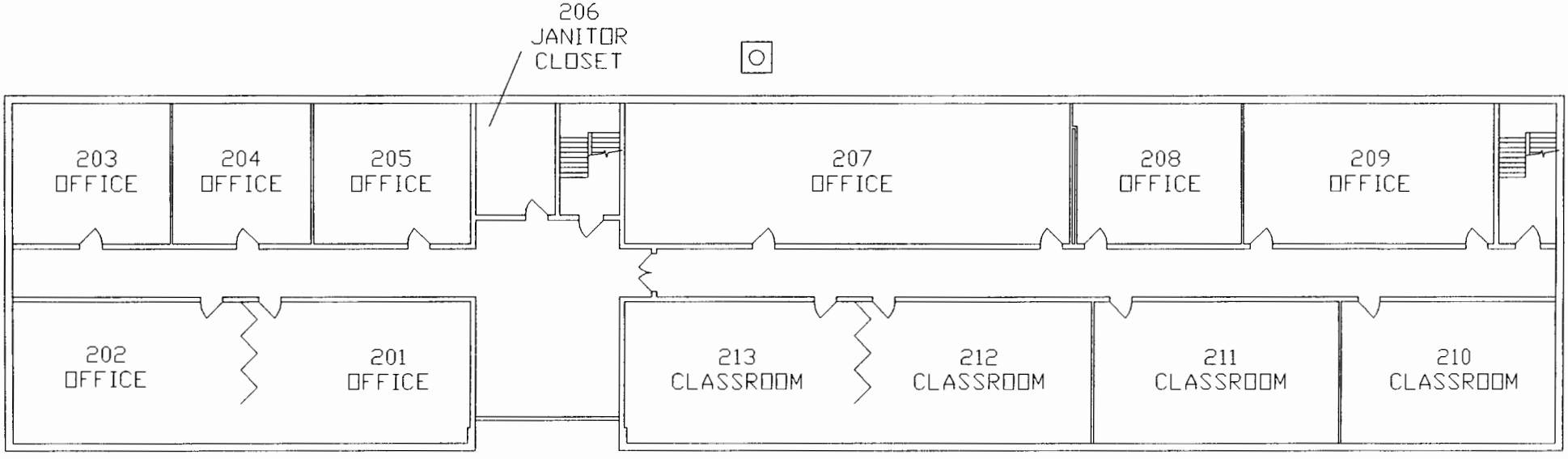


HORSHAM USAR CENTER
SITE PLAN

SECTION 4D
FLOOR PLANS



HORSHAM USAR CENTER
FIRST FLOOR PLAN



HORSHAM USAR CENTER
SECOND FLOOR PLAN

SECTION 5
EXISTING CONDITIONS PHOTOGRAPHS

SECTION 5A
EXTERIOR PHOTOGRAPHS

Horsham USAR Center
PA046

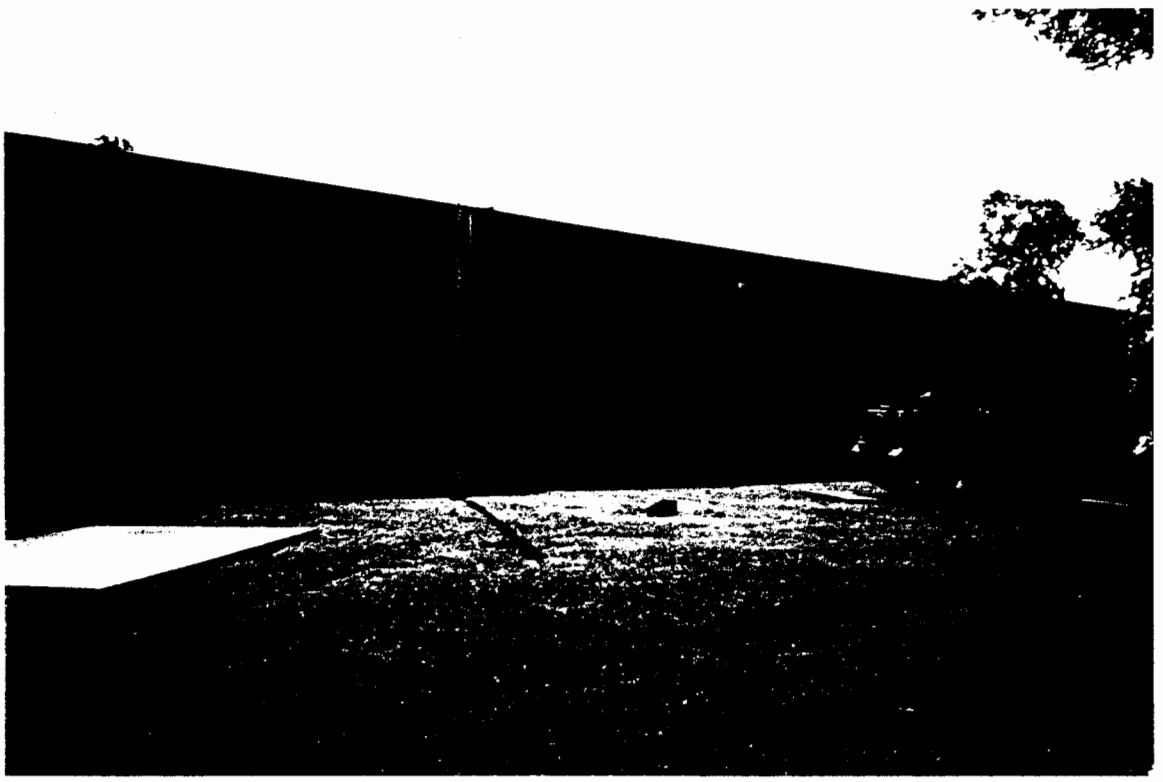


Photo 1:West view of USAR Center

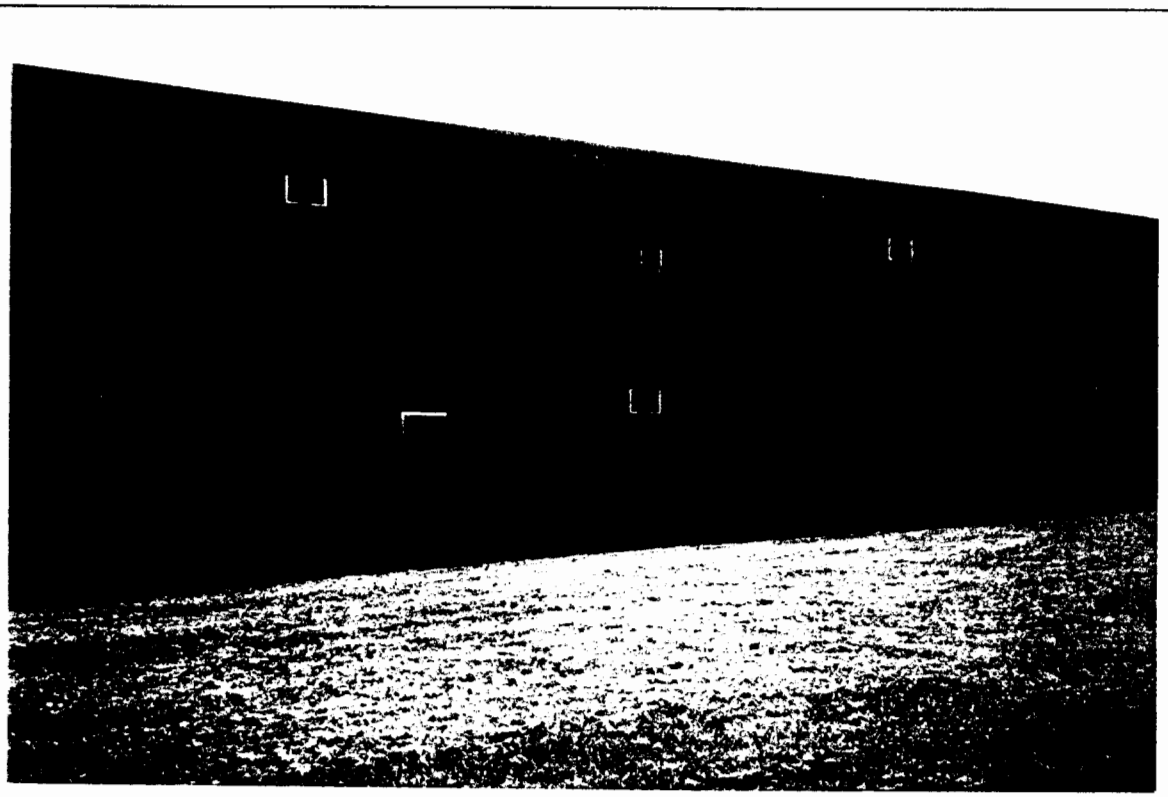


Photo 2: West view of USAR Center

Horsham USAR Center
PA046

Photo 1:East side of USAR Center

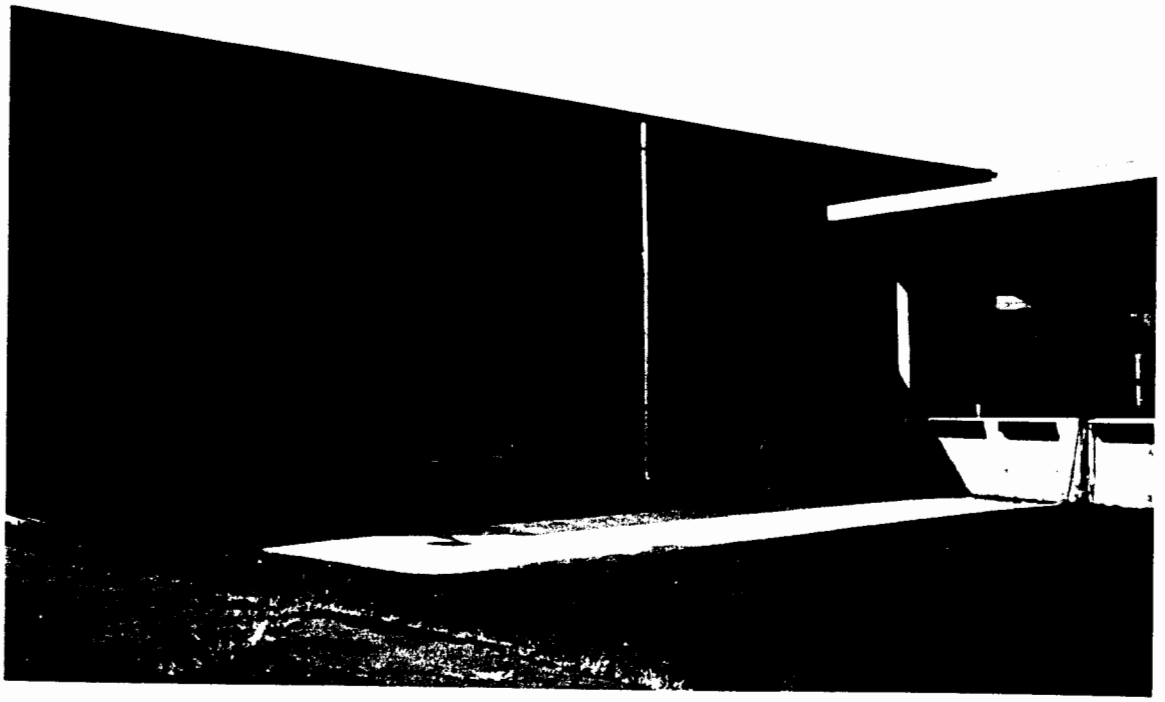


Photo 2: North side of drill hall

Horsham USAR Center
PA046

Photo 1:North side of USAR Center

SECTION 5B
INTERIOR PHOTOGRAPHS

Photo 1:Floor tile, main hallway

Photo 2: Fire doors to drill hall

Photo 3: Lights and drop ceiling in room 207

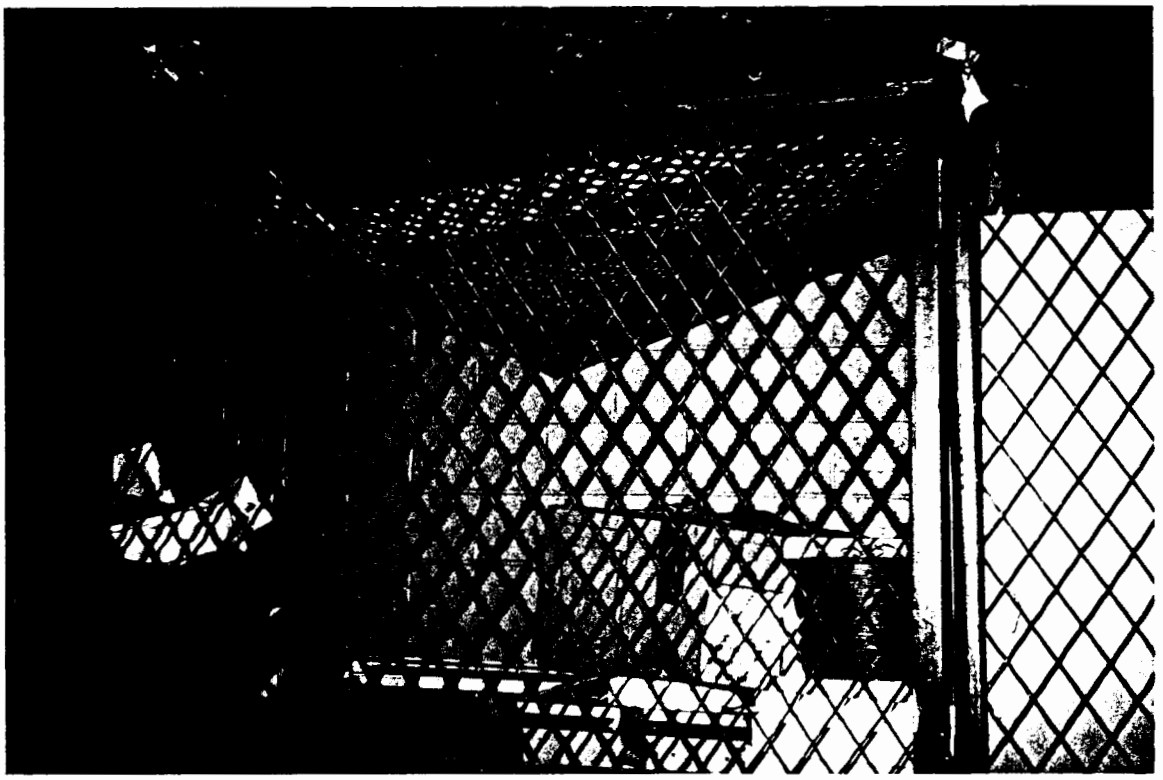


Photo 4: Collapsed cage in drill hall

ENCLOSURE 1
RPMA PROJECT DOCUMENTATION

ENCLOSURE 1 RPMA PROJECT DOCUMENTATION

NEWLY IDENTIFIED RPMA PROJECTS:

Pavement Overlay for MEP (see attached description and estimate)

PROJECTS IDENTIFIED FOR LOCAL PURCHASE (Ordering Officer Authority, Self Help, or existing service contract)

1. Replace panic bar on door of assembly hall
2. Replace exit light cover over door in assembly hall.
3. Install shower head in men's latrine 2nd floor.
4. Lights don't work above sink in 2nd floor men's latrine.
5. No cover on telephone junction box in hallway on 2nd floor.
6. Parking lot flood lights remain on during the day (northeast corner of main building, 4 of 10 lights in south part of lot)
7. Downspout fallen off east side of main building.
8. Leaves and vegetation accumulating around main transformer. (housekeeping item)
9. 4"x4" hole in brick (conduit penetration?) in brick wall on north side of assembly hall.
10. Light switch in room 122 (janitor's closet) inoperable.
11. New windows leaking on second floor. Water marks on bricks indicate that gutters are leaking over some windows. Nevertheless, these new windows should not be leaking.
12. Room 207 has had a drop ceiling installed but the lights remain attached to the original ceiling. Lights need to be properly installed in drop ceiling.
13. Latch on roof access hatch has handle missing.
14. Middle sink doesn't work in men's room on 1st floor.
15. Vinyl cove base strips missing in rooms 124, 207, 208, 209, and 211. Estimate for replacement is $763 for 300 LF.

NEW RPMA PROJECTS

RPMA PROJECT

INSTALLATION: Horsham Memorial USAR Center

PROJECT NUMBER:

PROJECT NAME: Pavement Overlay for MEP

PROJECT DESCRIPTION: Overlay of existing MEP (approximately 8,700 SY), including fill to improve drainage.

DESCRIPTION OF CURRENT CONDITIONS: MEP pavement is severely cracked with vegetation growing through pavement throughout most of the area. The south area of the MEP has standing water, and runoff has further deteriorated the pavement.

JUSTIFICATION: Pavement cracking and pavement failure will continue to accelerate as water enters the pavement during the freeze-thaw cycle. This project should be coordinated with the removal of the loading dock and installation of a latrine in the OMS.

SKETCHES:		None
PHOTOS:		see Enclosure 2
FIELD NOTES:		None
COST ESTIMATE:	$50,820.00	(See Enclosure 1)

COST ESTIMATE

COST ESTIMATE NUMBER: **PA046-1** WORK ORDER NUMBER: **XJ00050-6**

TYPE PROJECT: New Work ___ Repair _X_ Maintenance ___
EIP ___ Other *(specify)*

RECOMMENDED METHOD OF ACCOMPLISHMENT:
DESIGN: A/E Contract ___ 416th ENCOM X
Not Required ___ Other ____
CONSTRUCTION: Contract _X_ Local Purchase ___
Self Help/Troop ___ SDEH In-House ___ Other

SHORT JOB DESCRIPTION: **PAVEMENT OVERLAY FOR MEP**

DESCRIPTION OF WORK:
Overlay of existing MEP (approximately 8,700 SY), including fill to improve drainage.

DETAILED COST ESTIMATE: (SHEET _1_ OF _1_)

ITEM	UM	QTY	UNIT COST	TOTAL COST
Pavement Overlay	**SY**	**8,700**	**3.85**	**33,495**
Drainage Improvement	**SY**	**900**	**3.85**	**3,465**
———				

Estimates are in PROJECT SUBTOTAL: **36,960**
_X_ Current Year Dollars
___FY___ Dollars OVERHEAD & PROFIT (25%) **9,240**
PROJECT TOTAL: **46,200**
CONTINGENCY (10%) **4,620**

TOTAL REQUEST: **50,820**

Prepared By: **MAJ Todd D. Griffith**
Checked By: **MAJ(P) James L. Hugar**
Date Prepared: **19 September 1996**
Enclosure #1 to RPMA Project #

Photo 1:MEP pavement failure

Photo 2: MEP pavement failure

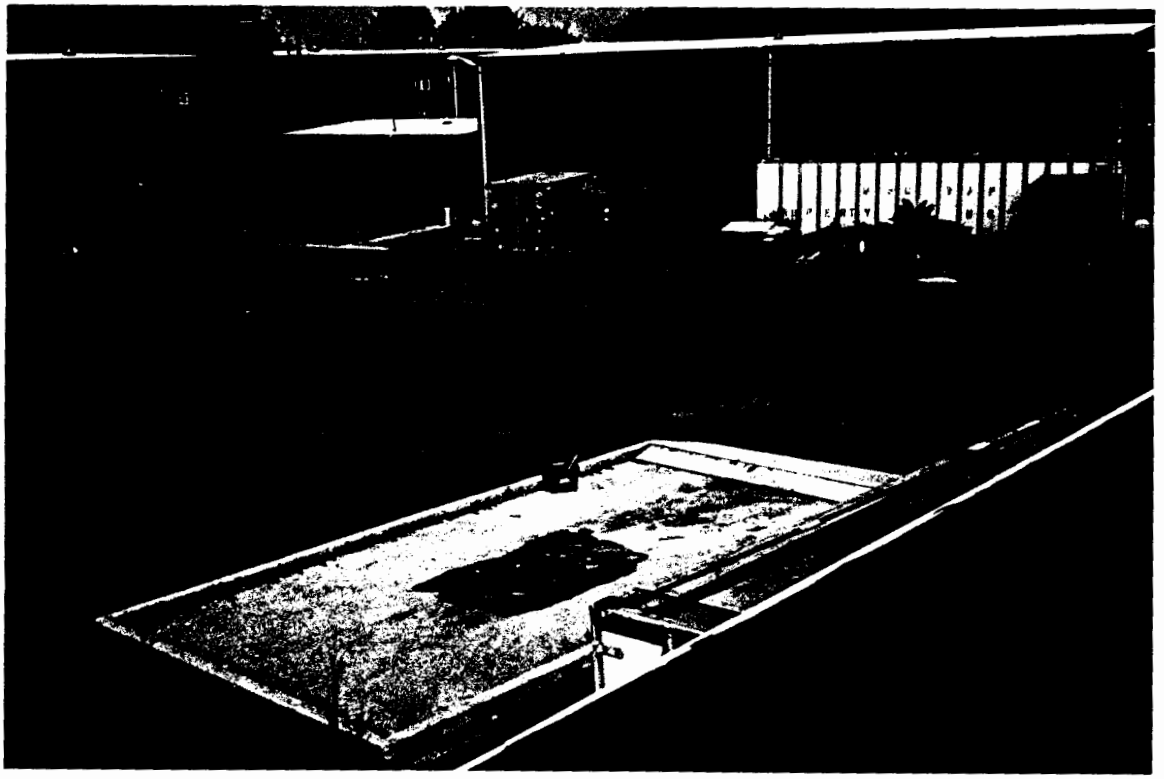


Photo 1:MEP pavement failure

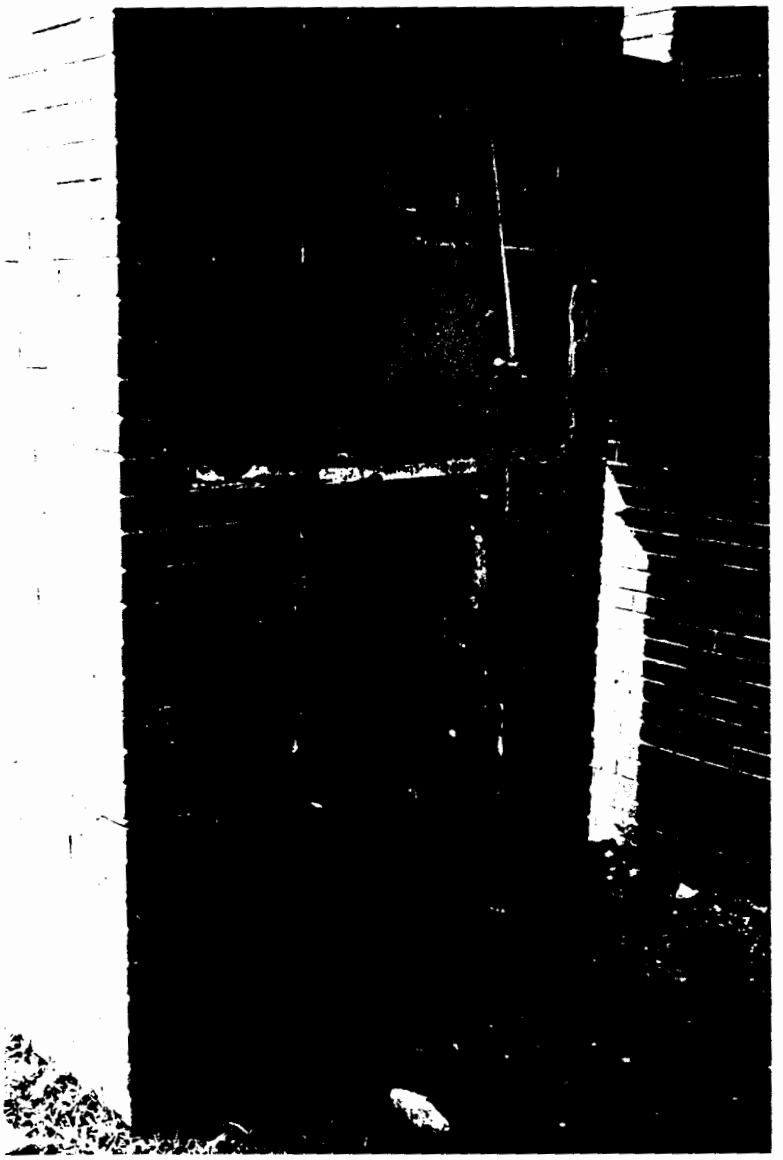


Photo 4:Chimney door missing

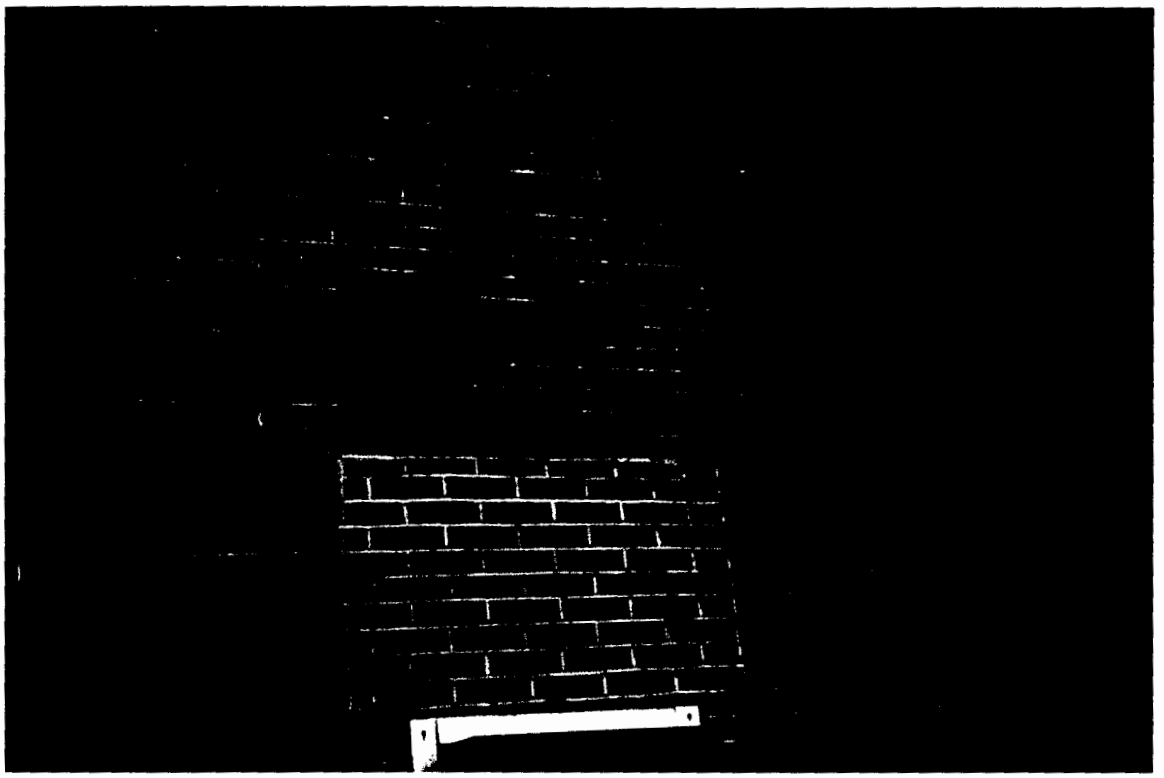


Photo 5: Repointing, west side of USAR Center

Photo 6: Repointing, south side of USAR Center by drill hall

Photo 7: Chimney plenum rusted through

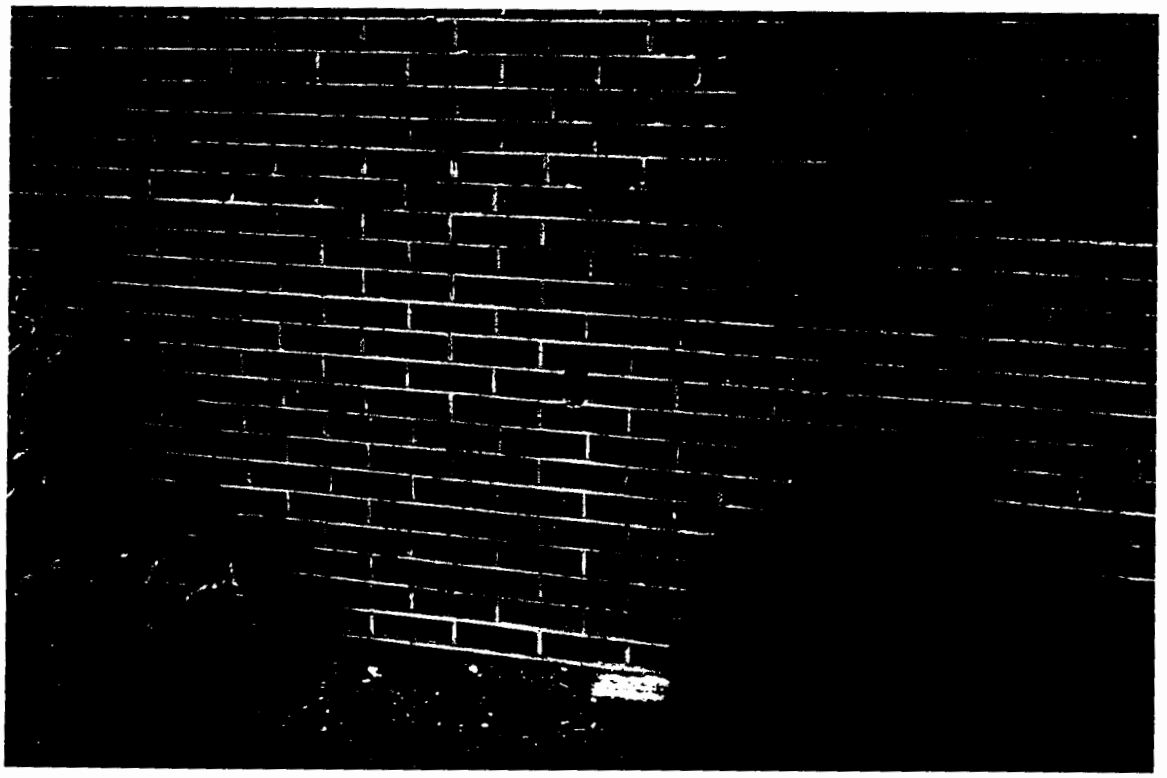


Photo 8: Hole in brick, north side of drill hall

ENCLOSURE 2
ENERGY AUDIT

USAR FACILITY
ENERGY AUDIT REPORT

for the

HORSHAM MEMORIAL USAR CENTER

936 EASTON RD
HORSHAM, PA

Prepared by the

416TH ENCOM FE TDA

FT. MEADE ESG

FORT INDIANTOWN GAP FET

Performed on

JULY 29 & 30, 1996

USAR FACILITY ENERGY AUDIT REPORT

TABLE OF CONTENTS

HORSHAM USAR CENTER
PA046

Section 1 - Facility Data Sheet
USAR Facility Energy Audit Report
Supporting RSC

FACILITY NAME: **HORSHAM MEMORIAL USAR CENTER**

LOCATION: **936 EASTON RD.**
HORSHAM, PA.

FACILITY ID NUMBER: PA046

FACILITY TYPE: USARC **X** OMS **X** AMSA ECS
Specify Other

TELEPHONE NUMBER OF FACILITY MANAGER: WORK (215) 857-0208

AUDIT TEAM DESIGNATION: **FORT INDIANTOWN GAP FACILITY EVALUATION TEAM**

Address: Bldg 11-19, Fort Indiantown Gap
Annville, Pa. 17003

Team Leader: MAJ James L. Hugar
Team Members: MAJ Todd Griffith, SFC Joe Baran

FACILITY PERSONNEL INTERVIEWED: **Mr. Kenneth Scott**

AUDIT DATE: **July 29 & 30, 1996**

DATE OF LAST AUDIT: **None**

BUILDING AREA:

	SQ. FT.
USAR Center	20,447
OMS	3,710

Section 2 - Executive Summary
USAR Facility Energy Audit Report
INSTALLATION NAME: HORSHAM MEMORIAL USAR CENTER
INSTALLATION NO: PA046
INSTALLATION LOCATION: 936 Easton Road, Horsham, PA
DATE ASSESSMENT CONDUCTED: July 29 & 30, 1996

1. An Energy Audit was performed on the Horsham Memorial USAR Center with the results identified in the following pages. The center consists of two buildings: The main USAR Center and the Organization Maintenance Shop (OMS). The buildings are presently fully utilized to include the ADSA3 Van Site Area. The entire complex is fenced with the exception of the front and POV areas. The facility is adjacent to Willow Grove Naval Air Station on busy RT 611 with the turnpike entrance one mile away. The surrounding area is semi-rural suburbs of Philadelphia with light industry and farmland. The facilities are occupied by the 367 MP Co and the HHC 2nd Bn, 228th Aviation Regiment.

2. Several of the critical problems identified at the facility can be corrected relatively inexpensively. Personnel are scattered throughout the building using all of the building lighting. Consolidating offices into a common work area and using individual task lighting can reduce lighting needs. The possibility of zoning the building for energy usage to cut costs exists. The fixture lenses can be replaced to increase lamination. An energy project to include all new lighting fixtures for efficient energy usage should be implemented.

3. Projects recommended from this report can be used to obtain ECIP, FEMP or other available Energy Conservation funding. Section 6 of this report identified several potential Energy Conservation opportunities, as presented in the A&E guide to Energy Conservation in existing buildings.

4. The facility is striving to create an active Energy Conservation awareness program. Mrs. Kasnic and Mrs. Light are dedicated to achieve an efficient building. Also, the vast building areas are a challenge to conserve energy. All areas not in use can be watched for energy conservation opportunities.

HORSHAM USAR CENTER
PA046

Section 3 - Utility Data
USAR Facility Energy Audit Report

ENERGY CONSUMPTION SUMMARY:
Average of FY 94 and 95.

I.	**ENERGY COSTS**	**DOLLARS**
A.	Annual Dollar Cost-Natural Gas	9070
B.	Annual Dollar Cost - Electricity	13253
C.	Annual Dollar Cost - Water	7086
D.	Annual Dollar Cost - Sewer	2915
E.	Annual Dollar Cost - Fuel Oil	2678
F.	Annual Dollar Cost - Propane	
G.	Annual Dollar Cost - Other Fuels	
H.	**TOTAL ENERGY COSTS** (A+B+C+D+E+F+G)	**35,002.00**
II.	**ENERGY CONSUMPTION**	**MBTU**
A.	Natural Gas	
	TOTAL NATURAL GAS ENERGY USE	**1,410,200**
B.	Electricity Use	
	TOTAL ELECTRICITY USE	**382,250**
C.	Other Fuel Use (Type Fuel-NA)	
	TOTAL ENERGY USE (Other fuels)	**0.00**

HORSHAM USAR CENTER
PA046

Section 4 - FACILITY CHECKLIST SUMMARY
USAR Facility Energy Audit Report

I. - BUILDING CONSTRUCTION PRACTICES

Checklist Area	Number of Checklist Items Showing Good Conservation Practices in Effect		
	#YES	#NO	#N/A
A. - Building Envelope	5	3	0
B. - Plumbing	3	3	4
C. - Electrical	5	3	0
D. - HVAC	8	0	0
E. - **Total Responses**	**21**	**12**	**5**

II . - OPERATION AND MAINTENANCE PRACTICES

Checklist Area	Number of Checklist Items Showing Good Conservation Practices in Effect		
	#YES	#NO	#N/A
A. - Building Envelope	7	0	0
B. - Plumbing	4	0	4
C. - Electrical	4	1	1
D. - HVAC	15	2	0
E. - **Total Responses**	**30**	**3**	**5**

HORSHAM USAR CENTER
PA046

Section 5 - POTENTIAL ENERGY CONSERVATION OPPORTUNITIES

See A&E Guide to Energy Conservation in Existing Buildings for Energy Conservation Opportunities. Identify opportunities by ECO number in guide.

ECO #	ECO Description
ECO 3	Reduce operating hours for water heating systems
ECO 4	Reduce operating hours for lighting systems
ECO 72	Reduce hot water consumption
ECO 81	Clean and maintain lighting systems
ECO 83	Reduce time of operational lighting
ECO 84	Use tank lighting
ECO 88	Install high efficiency ballast
ECO 89	Remove or replace lenses
ECO 96	Reduce peak power demand
ECO 101	Install a time-of-day control system

HORSHAM USAR CENTER
PA046

Appendix A FACILITY ENERGY AUDIT CHECKLIST
Appendix A.1 - BUILDING CONSTRUCTION CHECKLIST
Appendix A.1.1 - BUILDING ENVELOPE
USAR Facility Energy Audit Report

INSTALLATION NAME:
INSTALLATION NUMBER:
INSTALLATION LOCATION:
DATE AUDIT CONDUCTED:

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
1. Heavily used entrances have vestibule (airlock) door system.			X		New Vestibule energy glas
2. Wind screens installed to protect doors from prevailing winds.	x				
3. Space around outside wall penetrations well sealed to reduce infiltration.	X				
4. Building has required insulation and it is in good condition.	X				
5. Energy efficient windows (multi-pane or storm) provided.	X				
6. Energy efficient doors (i.e. insulated) provided.	X				Project funder for new doors
7. Infiltration of unconditioned air minimized.	X				
8. Automatic closures and weather-stripping installed on doors between conditioned and unconditioned spaces.	X				
9. Is winter sun used to heat rooms?	X				
TOTALS	8	0	1	0	

HORSHAM USAR CENTER
PA046

Appendix A.1.2 - BUILDING CONSTRUCTION CHECKLIST/PLUMBING
USAR Facility Energy Audit Report

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
1. Domestic hot water heater and storage system separate from boiler?	X				
2. Hot water piping and storage tanks properly insulated?	X				
3. Booster heaters used on kitchen equipment?			X		
4. Self-closing taps used on kitchen equipment & latrine?	X				
5. Electronic pilots used in lieu of standing gas pilots for water heaters?		X			
6. Hot water circulating pumps controlled by time switch?		X			
7. Are flow restrictors used on showers heads?		X			
8. Are steam traps used in heating system?			X		
9. Does steam trap discharge line return to boiler reservoir?			X		
10. Does steam trap overboard valve/float allow return to boiler reservoir?			X		
TOTALS	3	3	4	0	

HORSHAM USAR CENTER
PA046

Appendix A.1.3 - BUILDING CONSTRUCTION CHECKLIST/ELECTRICAL
USAR Facility Energy Audit Report

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
1. Energy efficient security lighting (fluorescent, HID) installed?		X			
2. Exterior lighting controlled by time switch or photocell?	X				Photocell needs time switc
3. Walls and ceilings painted with light colored, reflective paint?	X				
4. Incandescent fixtures used only where appropriate?	X				
5. Are motion sensors used in low occupancy areas?		X			
6. Are electronic ballasts w/T8 fluorescent bulbs used?		X			
7. Are compact fluorescent bulbs used in exit lamps?	X				
8. Are electrical outlets sealed to prevent air leakage?	X				Surface mount masonry wall
TOTALS	5	3	0	0	

Note: Lighting through Center is in poor or failed condition

HORSHAM USAR CENTER
PA046

Appendix A.1.4 - BUILDING CONSTRUCTION CHECKLIST/HVAC
USAR Facility Energy Audit Report

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
1. Automatic setback controls or Energy Monitoring Control Systems provided for heating and cooling systems?		X			Fancoil and manual control
2. Outer surfaces of boilers insulated to reduce heat loss?	X				
3. Boiler combustion air taken from top of boiler room to provide warmer air for increased efficiency?		X			
4. Thermostats are positioned away from outside walls, out of drafts, and in areas of frequent use?	X				
5. Individual controls provided to maintain lower temperatures in unoccupied areas?	X				
6. Automatic louvers/dampers provided on outside air openings?		X			
7. All heating/cooling piping and equipment (pipes, valves,boilers, etc.) insulated and in good condition?	X				
8. Are radiators/heat registers shut off completely in vestibules, corridors, stairways and lobbies?	X				New Gas Boilers (3)
9. Are drapes, shades or blinds drawn on windows where practical during cooling periods?	X				Manual Controls

Appendix A.1.4 - BUILDING CONSTRUCTION CHECKLIST/HVAC (con't)
USAR Facility Energy Audit Report

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
10. All heating equipment (heat exchanger, economizers, condensate tanks) insulated and in good condition?	X				New gas boiler
11. Ducts passing through unconditioned spaces are insulated?			X		
12. High efficiency (EER at least 85) window air conditioners only?	X				
TOTALS	8	3	1	0	

HORSHAM USAR CENTER
PA046

Appendix A.2.1 - OPERATIONS AND MAINTENANCE CHECKLIST/BUILDING ENVELOPE
USAR Facility Energy Audit Report

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
1. Building insulation in good condition? (No wet, crumbly, cracked, broken or missing sections)	X				
2. Windows and doors free from broken or cracked glass?	X				
3. Are storm windows installed?	X				Dbl insulated glass
4. Drapes, shades, and blinds installed and utilized?	X				Blinds only
5. Are windows and other areas sealed properly?	X				
6. Doors fit securely in frames and have weather stripping?	X				
7. Are windows and skylights clean?	X				
TOTALS	7	0	0	0	

HORSHAM USAR CENTER
PA046

Appendix A.2.2 - OPERATIONS AND MAINTENANCE CHECKLIST/PLUMBING
USAR Facility Energy Audit Report

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
1. Are hot water temperatures set for 100° F max at destination?	X				
2. Faucets close properly?	X				
3. Hot water to areas shutdown during periods of non-occupancy?	X				
4. Water heating and distribution systems appear to be free from leaks?	X				New heater
5. Is steam trap output returning to boiler reservoir?			X		
6. During boiler operation, does steam trap overboard system operate minimally?			X		
7. Is the steam trap on a regular maintenance schedule?			X		
8. Has the steam trap been replaced within the previous 3 to 5 years?			X		
TOTALS	4	0	4	0	

HORSHAM USAR CENTER
PA046

Appendix A.2.3 - OPERATIONS AND MAINTENANCE CHECKLIST/ELECTRICAL
USAR Facility Energy Audit Report

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
1. Exterior lights turned off during daylight hours?	X				
2. Is there an energy conservation program?	X				
3. Are interior lights turned off in unoccupied areas?	X				
4. Partitions, lockers, etc. located so as to not unnecessarily block lighting?			X		
5. Are major appliances turned off during non drill periods?	X				
6. Have lights been removed from vending machines?	X	X			Yes (1); No (2)
TOTALS	4	1	1	0	

Appendix A.2.4 - OPERATIONS AND MAINTENANCE CHECKLIST/HVAC
USAR Facility Energy Audit Report

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
1. All coils, boiler tubes and heat transfer surfaces clean to maintain maximum heat transfer?	X				
2. System free from steam or water leaks?	X				
3. Meter and gauges operational?	X				
4. Are steam traps in place and maintained properly? (Bled periodically and repaired)			X		
5. Are radiators in vestibules, corridors, stairwell, and lobbies shut off?	X				
6. Thermostat setting adjusted during periods of non-occupancy? (50-55 DEG F for heating and 80-85 DEG F for cooling)	X				
7. Thermostat settings set at 55 DEG F for areas of physical work? (Maintenance shops)	X				
8. Are heating vents and ducts unobstructed?	X				
9. Are cooling systems shut down during periods of non-occupancy?	X				

Appendix A.2.4 - OPERATIONS AND MAINTENANCE CHECKLIST/HVAC (con't)
USAR Facility Energy Audit Report

AREA OF EVALUATION	YES	NO	N/A	N/OBS	REMARKS
10. Cooling limited to occupied areas only?	X				
11. Doors between conditioned and unconditioned areas are closed?	X				
12. Central units and cooling towers are clean and free from scale?			X		
13. Is evidence of preventative maintenance (PM) schedule in effect?					
14. Is outside air used for cooling?	X	X			
15. Room temperatures maintained properly during cooling season? (76-80 F)	X				
16. Refrigerant and water lines free of leaks?	X				
17. Are internal heat generating units minimized? (copiers, refrigerators, etc)	X				
18. Air conditioning vents or outside air intakes are clear from obstructions?	X				
19. Are window air conditioners covered during heating season?		X			AC also serves as emer heating units
TOTALS	5	2	2	0	

Appendix B.

ECIP LIGHTING SURVEY

AR CENTER/AMSA: Horsham USAR Center
LOCATION: Center - 1st Floor

DATE: 30 Jul 96
PREPARED BY: SFC Baran

ROOM NO	FIXTURE TYPE	BALLAST TYPE	NUMBER FIXTURE	LAMPS/ FIXTURE	WATTS/LAMP	TOTAL # OF LAMPS	LAMP LENGTH	ROOM USE
101	Fluor		9	1	34	9	4	Office
102	Fluor		4	1		4	1	1 SG Office
103	Fluor		4	1		4	4	Tng Office
104	Fluor		3	1		3	4	Office
105	Fluor		4	1		4	4	HHC Office
Arms Vault	Fluor		8	1		8	4	Arms Vault
Corr 1	Fluor		7	1		7	4	Corridor
108	Fluor		4	1		4	4	Elec Clo
109	Fluor		4			4	4	Storage
110	Fluor		4			4	4	Storage
Assy Hall	Fluor	LPS	6	6	250	6	0	Assembly Hall
111	Fluor		4			4	4	Kitchen
.2	Fluor		3			3	4	Men's Toilet
112A	Fluor		1			1	4	Storage
Corr 2	Fluor		5			5	4	Corridor
116	Fluor		4	4/1	34	10	4	Commander's Office
117	Fluor		4	1		1	4	Women's Toilet
118	Fluor		17	2/1		20	4	Supply Room
119	Fluor		4			4	4	Training Room
120	Fluor		14	2	40	28	4	NBC Office
121	Fluor		2	2		2	4	Office
122	Fluor		1	1		1	4	Office
123	Fluor		5	1		5	4	Office
124	Fluor		8	2		16	4	Office
Foyer	Fluor		8	3		3	4	Foyer
Corr 3	Fluor		1	1		11	4	Corridor

ECIP LIGHTING SURVEY

USAR CENTER/AMSA: Horsham USAR Center
LOCATION: Center - 2nd Floor

DATE: 30 Jul 96
PREPARED BY: SFC Baran

ROOM NO	FIXTURE TYPE	BALLAST TYPE	NUMBER FIXTURE	LAMPS/ FIXTURE	WATTS/LAMP	TOTAL # OF LAMPS	LAMP LENGTH	ROOM USE
201	Fluor	Reg	6	2	34	12	4	Administration
201A	Fluor	Typ	2	2	1	4	4	Office
202	Fluor	All	8	2	34	16	4	Administration Office
203	Fluor		4	4		16	4	Office
204A	Fluor		3	2		6	4	Office
204B	Fluor		3	2		6	4	Office
205	Fluor		4	2		8	4	Office
206	Fluor		3	2		3	4	Office
Corr	Fluor		7	1		1	4	Corridor
207A	Fluor		10	2		20	4	207A
207B	Fluor		6	2	1	12	4	207B
208	Fluor		5	5	34	5	4	Men's Toilet
209A	Fluor		12	4	40	48	4	Administration Office
209B	Fluor		4	4	40	16	4	Office
210	Fluor		8	2	34	16	4	Classroom
211	Fluor		8	2	34	16	4	Classroom
212	Fluor		8	2	34	16	4	Classroom
213	Fluor		8	2	34	16	5	Administration Office
Foyer	Fluor		5	1	34	5	4	Foyer
Stair N.	Fluor		3	1	34	3	4	Stairs N.
Stair S.	Fluor		3	1	34	3	4	Stairs S.
Site	Fluor		6	6	150	6	Photo Cell	Site

ECIP LIGHTING SURVEY

HORSHAM.

USAR CENTER/AMSA: Harrisburg USAFR Center
LOCATION: OMS

DATE: 30 Jul 96
PREPARED BY: SFC Baran

ROOM NO	FIXTURE TYPE	BALLAST TYPE	NUMBER FIXTURE	LAMPS/ FIXTURE	WATTS/LAMP	TOTAL # OF LAMPS	LAMP LENGTH	ROOM USE
Bays	Fluor	Unknown	13	3	60	39	4	Maint
Ofc 1	Fluor		4	4	40	16	4	
Cage	Fluor		1	3	60		4	
Ofc 2	Fluor						4	Future Use *

* - Second office under construction by sub-AMSA personnel. Walls/electric done.

HORSHAM USAR CENTER
PA046

Appendix C - Count and Type of Motors
USAR Facility Energy Audit Report

EXHAUST FAN SCHEDULE

Location	Service	SP	CFM	Fan RPM	Wheel Dia	Motor HP	Remarks
Roof Over Repair Shop	Grease Pit Exhaust	⅜"	1150	483	13½	¼	Centrifugal Type provide screen over air discharge
At CLG of Repair Shop	Vewhicle Exhaust Disposal	2½"	1600	991	13½	3	

UNIT VENTILATOR SCHEDULE

QUAN	CFM STD Air DEL (ea)	EXT SP in WG	ENTA ir Temp Deg	LVG Air Temp Deg	Fuel Oil Grade No.	Fuel Oil GPH (ea)	Fan Motor HP	Exh Motor HP	CA MBH (ea)	Remark
2	2500	5/8"	49	135	2	678	1/2	---	150	

PUMP SCHEDULE

Manufacturer	Model #	Service	GPM	Head (ft)	Motor Data HP	RPM	VOLTS	PH	
Bell & Gossett	Series 60 Inline Pump	HHW	77	30	1	1750	208	3	Bronz

ENCLOSURE 3
SAFETY CHECKLIST ASSESSMENT

DEPARTMENT OF THE ARMY
416TH ENGINEER COMMAND
Engineer Support Group - East

USAR FACILITIES SAFETY CHECKLIST
Horsham Memorial USARC 046

GENERAL

SPECIFIC INSPECTION CHECKLISTS

APPLICABLE?	YES	NO
SAFETY PROGRAM ADMINISTRATION	X	
BATTERY SHOP		X
BRAKE AND CLUTCH REPAIR/TIRE SERVICING MULTI-PIECE WHEELS/ASBESTOS		X
CHEMICAL STORAGE		X
COMPRESSED GAS CYLINDERS	X	
CONFINED SPACE		X
ELECTRICAL/MECHANICAL	X	
FIRE SAFETY/EGRESS	X	
FLAMMABLE/COMBUSTIBLE LIQUID STORAGE	X	
HOUSEKEEPING	X	
LADDERS	X	
MOTORPOOL AND MILITARY VEHICLE SAFETY	X	
WELDING OPERATIONS		X

Checklists marked YES are applicable to this facility and are included in the report. Checklists marked NO are not applicable and were not reviewed.

USAR FACILITIES SAFETY CHECKLIST
GENERAL

PURPOSE: This document is a multi-part safety checklist for evaluation of U.S. Army Reserve (USAR) facilities. It is structured as a series of independent checklists which may be used to conduct a screening evaluation of the safety status for USAR facilities. Checklists are structured to allow use and evaluation by qualified 416th Engineer Command, Facility Engineer TDA Team personnel, with minimal additional safety training.

CHECKLIST SUMMARY DESCRIPTION: Checklists are alphabetically listed by major subject area. A brief description of the material covered by each checklist is provided below. The evaluator should initially screen the checklists to eliminate those that obviously do not apply to the specific USAR facility being evaluated. Any "NO" answers on any checklist will require that the evaluator place a comment in the comment section of that particular checklist.

ADMINISTRATIVE: Written programs, documentation, training, etc., necessary for administration of a unit/facility safety program.

BATTERY SHOP: Acid handling, ventilation, protective clothing, and operational precautions applied to battery servicing and repair.

BRAKE AND CLUTCH REPAIR/TIRE SERVICING MULTI-PIECE WHEELS/ ASBESTOS: Protective equipment, waste handling, hazard posting, and operational precautions applied to exposure to asbestos material and multi-piece wheels during brake and clutch repair and tire servicing.

CHEMICAL STORAGE: Labeling, ventilation, fire protection, storage, and training for hazardous chemical storage.

COMPRESSED GAS CYLINDERS: Storage, equipment protection, leak detection, and operational cautions for compressed gas cylinders and tanks.

CONFINED SPACE: Cleaning, testing, ventilation, protective equipment, approvals, tools, training, rescue procedures, and operational precautions for entry into confined spaces.

ELECTRICAL/MECHANICAL: Grounding, high voltage, waste, lightning protection, and safety procedures for use with electrical and mechanical facilities equipment.

FIRE SAFETY/EGRESS: Flammable cabinet usage, signs, appliance usage, vehicle fueling, spill cleanup, fire extinguisher requirements, and egress for fire safety and personnel protection.

HOUSEKEEPING: Storage, housekeeping, aisles, personnel protective equipment, guard rails and stair opening protection.

LADDERS: Standards, maintenance, and operational precautions for use of ladders.

MOTORPOOL AND MILITARY VEHICLE SAFETY: Ventilation, equipment selection, waste handling, housekeeping, protective equipment, signage, training, certification, and operational precautions related to maintenance of vehicles in shops or motorpool areas.

WELDING OPERATIONS: Protective equipment, ventilation, fire protection, maintenance, inspection, and operational precautions related to gas and electric arc welding operations.

HORSHAM MEMORIAL USARC
PA046

SECTION 1 - SAFETY ASSESSMENT EXECUTIVE SUMMARY
FOR THE USAR SAFETY ASSESSMENT OF:
INSTALLATION NAME: **Horsham Memorial United States Army Reserve Center**
INSTALLATION NUMBER: **PA046**
INSTALLATION LOCATION: **936 Easton Road, US Route 611**
Horsham, Pennsylvania 19044-3399

The 416th Fort Indiantown Gap team conducted a total facility assessment at the Horsham Memorial United States Army Reserve Center (USARC), on August 14, 1996. The Horsham facility consists of a two story main building and a single story Organizational Maintenance Shop (OMS). The main building and OMS were constructed in 1959. The facility is owned by the Navy and leased to the Army. The facility is located in a residential/commercial area, with the Wilow Grove Naval Air Station located directly across the street.

SFC Jim Newcomber conducted the safety assessment of the facility, following the USAR Facilities Checklist and the Occupational Safety and Health Administration (OSHA) regulations in the 29 Code of Federal Regulations (CFR) 1910.

Each finding identified in this checklist is not intended to be a regarded as a violation, but a tool in assisting the facility to take corrective actions. The findings were assigned a risk assessment code (RAC), to identify those areas which are of the greatest concern and should be addressed immediately. The RAC is numbered from 1 to 5, 1 being of great concern and an immediate threat to life and health, and 5 being of some concern and typically can be corrected through administrative actions.

The following is a brief description of the findings:

Safety Program Administration
A Safety Program Administrator must be appointed in writing, and a safety SOP developed and published. The DOD Safety and Occupational Health Protection Program poster must be posted (DD Form 2272).

Compressed Gas Cylinders
Store oxygen cylinders separately from fuel gas cylinders (acetelyne). The area must also be posted with No Smoking signs.

Electrical/Mechanical
A Lock out/Tag out program must be developed and instituted immediately. Breaker boxes must be serviced and repaired, and proper labeling must be accomplished. Ground fault interrupters must be installed at all electrical outlets that are within 6 feet of a wet area. Extention cords are not to be used for splicing. If a high voltage item can not reach the electrical socket directly, the equipment should be moved. Storage of any kind is not permitted in boiler rooms or electrical closets.

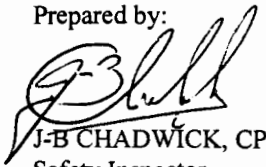
Fire Safety/Egress
A testing program for the emergency lights must be instituted. Materials that are stored in the boiler room and electrical closet must be removed. Fire extinguisher training must be conducted annually.

Flammable/Combustible Liquid Storage
No smoking signs need to be posted. Proper storage of liquid materials must be accomplished. Material compatibility and storage requirements must be adhered to.

Housekeeping
Materials must be stored in storage areas and not in the assembly hall or electrical closet. Any roof leaks that are found should be sealed as soon as possible.

Motor Pool and Military Vehicle Safety
Commanders and shop supervisors should conduct peridoc safety inspections and training for moter pool personnel.

Prepared by:



J-B CHADWICK, CPT
Safety Inspector
EN, USAR

HORSHAM MEMORIAL USARC
PA046

Safety Assessment Overview Sheet

Date of Inspection:	August 14, 1996
Facility Name:	HORSHAM MEMORIAL ARMY RESERVE CENTER
Location:	936 Easton Road, Route 611 Horsham, Pennsylvania 19044-3399
Installation Number:	PA046
Type of Facility, Specify (USARC, OMS, AMSA, ECS, Flight, OTHER):	USARC
Support Installation:	99th Regional Support Command
FE Team:	Fort Indiantown Gap Team 1
Evaluation Team Members:	James Hugar, LTC Jim Newcomer, SFC Michael Crain, MSG Todd Griffith, MAJ
Team Leader:	James Hugar, LTC
Address:	Fort Indiantown Gap, Pennsylvania
Phone:	(717) 861-2345
Persons Interviewed:	Mr. Joseph Slight, AUA
Date of Evaluation:	August 14, 1996
Comments:	

HORSHAM MEMORIAL USARC
PA046

REFERENCES

1. Code of Federal Regulation (CFR) 1910 Labor
   Note: All references to 29 CFR 1910 will be in the form 1910.xxx
2. ANSI C2 National Electrical Safety
3. ANSI Z358.1 Emergency Eyewash and Shower Equipment
4. ANSI Z41 Safety-Toe Footwear
5. ANSI Z89.1 Industrial Workers, Protective Headwear
6. ANSI Z87.1 Occupational and Educational Eye and Face Protection
7. AR 11-34 The Army Respiratory Protection Program
8. AR 385-10 The Army Safety Program
9. AR 385-55 Safety, Prevention of Motor Vehicle Accidents
10. AR 40-5 Preventive Medicine
11. AR 420-90 Fire Prevention and Protection
12. AR 700-68 Storage and Handling of Compressed Gases and Gas Cylinders ASME Boiler and Pressure Vessel Code
13. DA Pam 40-501 Hearing Conservation
14. DOD 4145.19-R-1 Storage and Material Handling
15. FM 10-68 Aircraft Refueling
16. FM 10-69 Petroleum Supply Pint Equipment Operation
17. FM 10-69 Petroleum supply Point Equipment and Operations
18. FM 43-5 Unit Maintenance Operations
19. National Electrical Code (NEC), ANSI/NFPA 70
20. National Fire Protection Agency (NFPA) 410
21. TB 43-0212 Army Oil Analysis Program Guide for Leaders and Users
22. TB 43-0151 Inspection and Test of Air and Gas Compressors
23. TB 385-4 Requirements for Maintenance of Electrical and Electronic Equipment
24. TB Med 503 the Army Industrial Hygiene Program
25. TC 11-6 Grounding Techniques
26. TM 9-2320-209-20-3-2 Organizational Level for 2 1/2 ton, 6X6, M44A1, and M44A2 Series
27. TM 9-6140-200-14 Operator's, Unit, Direct Support and General Support Maintenance Manual for Lead-Acid Storage Batteries
28. TM 38-410 Storage and Handling of Hazardous Material

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: SAFETY PROGRAM ADMINISTRATION
INSPECTOR: SFC Jim Newcomer

NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Has the military or civilian leader appointed, in writing, a unit/facility safety representative/director/ officer? (AR 385-10)	X		
2. Do performance standards for military and civilian managers and supervisors include accident prevention and Occupational Health responsibilities as a rating element? (AR 385-10)		X	
3. Has each unit/activity published a standing operating procedure (SOP) that covers all safety responsibilities, and specifically includes areas, such as motor pools, field training, shop safety, and weapons safety. (AR 385-10)		X	
4. Are DA Form 285s (Accident Reporting Form) or DA 285-AB-R (Abbreviated Ground Accident Report Form) completed, as required, for each accident (Class D and above) and is it submitted through appropriate channels (Class C and above)? Are blank DA Form 285's available? (AR 385-40)	X		
5. Is there a DD Form 2272 (DOD Safety and Occupational Health Protection Program) poster on the unit activity board? (AR 385-10)		X	
6. Are the following Army regulations maintained on file in the official publications library? (AR 385-10)			
a. AR 385-10, Army Safety Program	X		
b. AR 385-40, Accident Reporting and Records	X		
c. AR 385-55, Prevention of Motor Vehicle Accidents	X		
d. AR 672-74, Army Accident Prevention Awards	X		
7. Are military/civilian leaders ensuring that safety related posters and other safety related materials are given the widest possible dissemination? (AR 385-10)	X		
8. Are employees in occupations that could be hazardous to their health (i.e. asbestos, noise) enrolled in the Medical Surveillance Program? (AR 40-5)	X		
9. Are all military/civilian employees provided with appropriate personal protective equipment (i.e. respirators, ear plugs, safety glasses, gloves) and trained in its use? (AR 40-5, AR 385-10) Is the training documented? (1910.132)	X		
10. Is there a "Hazard Communication Program"? (1910.1200)	X		
a. Is there a written internal policy available?	X		
b. Has documented initial training and subsequent hazard specific training (i.e. new processes involving chemicals, etc.) been conducted?	X		
c. Are all containers that contain chemicals marked/labeled as to their contents?	X		
d. Are Material Safety Data Sheets (MSDS) for each chemical present, available for employee review within the work place?	X		
e. Has an inventory listing been prepared of all chemicals stored/used in the workplace and is it readily available?	X		

ITEM	YES	NO	NA
11. Is there an installation/unit hazard abatement plan for all identified RAC 1 and RAC 2 hazards? (AR 385-10, TB MED 503)	X		
12. Are eye and noise hazardous areas/equipment properly identified and labeled? (1910.133, 1910.145, AR 40-5, TB MED 501)	X		
13. Are hearing protective devices and safety eyeware provided for visitors to hazardous areas? (1910.132, AR 385-10)	X		

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)

1. A Safety Program Administrator must be appointed, as required by the Unit SOP. (RAC 5)

2. Safety peformance standards should be included as a rating element for military and civilian managers and supervisors. (RAC 5)

4. A Safety SOP must be published and made available to all Reserve Center personel. (RAC 4)

5. The Poster DD Form 2272, must be conspicuously posted. (RAC 5)

ACTIVITY/AREA: BATTERY SHOP
INSPECTOR: SFC Jim Newcomer

NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Is a deluge shower and eyewash provided in the Battery Shop? Is the area under the shower free of clutter? Is the eyewash tested weekly and is the test recorded? (1910.153)			X
2. Is functional ventilation provided? Is the ventilation interlocked with the battery charger to ensure that the system is operating when batteries are charging? (1910.178, NFPA 410)			X
3. Is electrical equipment effectively grounded? If there are over five battery charging stations, is the electrical equipment, including the exhaust system, rated for a Class I area? (1910.304, NEC)			X
4. Is smoking prohibited in the charging area? (1910.178)			X
5. Have employees received training on the hazards, procedures, and precautions as they relate to safe handling and maintenance of batteries? (1910.1200) Is this training documented? (1910.1200)			X
6. Are protective gloves, apron, and chemical splash goggles (or full-face shields) available for use by battery shop personnel? (1910.132) Are they stamped with ANSI Z 87.1 approval, and are they in good condition? (1910.132) Have employees been trained in the use of this equipment and is it documented?? (1910.132)			X
7. Is there an approved SOP for the Battery Shop? (TM 9-6140-200-14)			X
8. If nickel-cadmium batteries are serviced, is the servicing done in separate facilities from lead-acid batteries? (TM 9-6140-200-14)			X
9. Is there equipment/provisions available for neutralizing and flushing spilled acid? (1910.178)			X
10. Is distilled water available to fill batteries? (TM 9-6140-200-14)			X
11. Is a Class C fire extinguisher available in the shop area? (1910.155)			X
12. Personnel that work in the battery shop require medical monitoring. Are these personnel included in the unit's medical monitoring program? (AR 40-5)			X

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)
At the time of this safety assistance visit the Army does not conduct battery maintenance activities.

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: BRAKE AND CLUTCH REPAIR/TIRE SERVICING MULTI-PIECE WHEELS/ASBESTOS
INSPECTOR: J-B Chadwick
NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Are brake and clutch repair services performed in designated areas and are they properly posted with asbestos exposure warning signs (e.g. "Asbestos, Dust Hazard, Avoid Breathing Dust, Wear Assigned Personal Protective Clothing and Equipment, Do Not Remain In Area Unless Your Work Requires It, Breathing Asbestos Dust May Be Hazardous To Your Health")? (1910.1001)			X
2. During brake/clutch servicing, do workers use an air purifying respirator, either single use or with replaceable cartridges, equipped with high efficiency particulate (HEPA) filters approved by the Mine Safety and Health Administration (MSHA) or the National Institute for Occupational Safety and Health (NIOSH)? (1910.1001)			X
3. During all procedures following the removal of the wheels and/or clutch housing assemblies, to include servicing and cleaning of components, do workers wear approved respirators that provide protection from asbestos exposure? (1910.1001)			X
4. Is asbestos-containing dust first cleaned from brake drums, brake backing plates, brake assemblies, and clutch assemblies, using a wet spray method or an industrial-type vacuum cleaner equipped with a HEPA filter system prior to servicing? (1910.1001)			X
5. After vacuum cleaning or wet spray, are any remaining dust particles removed by use of a damp rag? (1910.1001)			X
6. Is compressed air or dry brushing prohibited for cleaning dust from brake and clutch assemblies containing asbestos? (1910.1001, TM 9-2320-209-20-3-2)			X
7. If washed in water/solvent, is a container placed under the assemblies to catch the runoff, and to trap the dust and debris in the solution? (1910.1001)			X
8. When used, are rags rinsed/wrung over a drip pan? Are rags appropriately disposed of following use? (1910.1001)			X
9. During arcing and riveting operations, are respirators worn? (1910.1001)			X
10. Is local exhaust provided in work areas were grinding/drilling machines are used for maintenance of asbestos parts/assemblies? (1910.1001)			X
11. Is all asbestos waste disposed of properly in accordance with 29 CFR 1910.1001?			X
12. Have personnel been trained to safely service tires (for the rim type being serviced)? (1910.177)			X
13. Does the facility have a serviceable tire cage? Is a portable tire cage available for field exercises? (1910.177)			X X
14. When inflating tires, do employees remain clear of the lock ring trajectory area? (TM 9-2610-200-20)			X
15. Does the facility utilize an air hose with a clip-on-chuck and air line valve with a pressure gauge or a preset regulator of sufficient length to allow employee(s) to stand outside the trajectory? (1910.177, TM 9-2610-200-20)			X
16. Does the facility have current charts or rim manuals containing instructions for the type of wheel being serviced? (1910.177)			X

COMMENTS: (Include item number and location for each comment. Add extra pages if necessary.)
At the time of this safety assistance visit no brake and/or clutch repair, or tire maintenance is conducted at this facility.

ACTIVITY/AREA: CHEMICAL STORAGE
INSPECTOR: SFC Jim Newcomer

NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Is proper separation and compatibility adhered to in the storing and handling of chemicals? (TM 38-410)			X
2. Have all personnel been trained regarding the properties of the hazardous materials that they handle? Is this training documented? (1910.1200, TM 38-410)			X
3. Are all containers conspicuously labeled to indicate the identity and nature of the substance contained? (TM 38-410)			X
4. Are periodic inspections made to ensure that chemical storage containers are serviceable/undamaged? (TM 38-410)			X
5. Is a deluge shower and emergency eyewash provided where the spillage of corrosive chemicals or other hazardous materials is possible? Is this equipment within a straight line distance of less than 100 feet of the hazard with no obstacles, curves, etc. in the path of travel? (TM 38-410)			X
6. Is adequate ventilation of chemical storage areas provided? (TM 38-410)			X
7. Are open flames, smoking, and other sources of ignition prohibited? (TM 38-410)			X
8. Does the installation/facility have an approved Spill Prevention Control and Countermeasure Plan? (TM 38-410)			X
9. Are eyewash and emergency showers flushed weekly? (ANSI Z358.1-1990)			X

COMMENTS: (Include item number and location for each comment. Add extra pages if necessary.)

At the time of the Safety Assistance visit, no chemical storage was being done at the facility.

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: COMPRESSED GAS CYLINDERS
INSPECTOR: SFC Jim Newcomer

NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Is smoking prohibited within 50 feet of compressed gas storage areas and are "NO SMOKING" signs posted? (AR 700-68)		X	
2. When cylinders are stored inside of buildings, are they stored in a well protected, well ventilated, dry location, at least 20 feet from highly combustible materials such as oil or excelsior? (1910.253)	X		
3. Are oxygen cylinders in storage separated from fuel gases or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a non-combustible barrier at least five feet high having a fire-resistant rating of at least 1/2 hour? (1910.253)		X	
4. When cylinders are not in use, are valves closed tightly and valve protector caps installed? (1910.253)	X		
5. When cylinders are standing upright during use or storage, have precautions been taken to prevent accidental upsetting or falling (e.g. chained or strapped to structure)? (1910.253)	X		
6. Are pressure relief devices and gauges in good operating condition? (1910.252)	X		

COMMENTS: (Include item number and location for each comment. Add extra pages if necessary.)
1. The OMS must have a "no smoking within 50 feet" sign posted on both the inside door and the outside door, because of the storage of the compressed gas cylinders. (RAC 4)

3. The oxygen cylinders are stored next to the acetylene cylinders. These items must be stored separately. (RAC 4)

ACTIVITY/AREA: CONFINED SPACE
INSPECTOR: SFC Jim Newcomer

NOTE: All "NO" answers require a comment at the end of the checklist for the area.

All questions were taken from 29 CFR 1910.146.

ITEM	YES	NO	NA
1. Does the unit/facility have any areas that meet the definition of a permit required confined space IAW 1910.146?		X	

If the answer to question 1 is yes, continue with this checklist.

2. Are signs posted that are similar to "DANGER - PERMIT REQUIRED CONFINED SPACE, DO NOT ENTER"?			
3. Is there a written confined space entry program?			
4. Have personnel been trained in the confined space entry program?			

If a confined space entry is in process during the inspection, observe the entry and answer the following questions:

5. Is entry necessary?			
6. Are the instruments used in atmospheric testing properly calibrated?			
7. Was the atmosphere in the confined space tested for the following (in the order listed)? a. An oxygen content at least 19.5% and not more than 21%? b. Flammable gases? c. Potential toxic air contaminants?			
8. If necessary, was the space ventilated before entry? If it was ventilated, was it retested before entry was allowed?			
9. Is the atmosphere in the space monitored while work is on-going?			
10. Is the air intake for the ventilation system located in an area that is free of combustible dusts, vapors, and toxic substances?			
11. Are MSHA/NIOSH approved respirators, of the type required, available at the work site?			
12. Can personnel get through the opening into the confined space with a respirator on?			
13. Have personnel been trained in proper use of a respirator?			
14. Is there a standby person on the outside in constant visual and/or auditory communication with the person on the inside?			
15. Will the standby person be able to see and/or hear the person inside at all times?			
16. Have procedures been developed and implemented for summoning rescue and emergency services? Has the standby person been trained in these rescue procedures?			
17. Are safety lines and harnesses available if they will be required to remove the person in an emergency?			
18. Has a confined space entry permit been issued?			

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)

1. No Confined Spaces were observed at the facility at the time of the Safety Assistance visit.

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: ELECTRICAL/MECHANICAL
INSPECTOR: SFC Jim Newcomer
NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Are live parts of electrical equipment operating at 50 volts or more guarded against accidental contact by being enclosed in approved cabinets or other approved enclosures? (1910.303)	X		
2. Is installed electrical equipment free from recognized hazards likely to cause death, serious physical injury, or fire? (1910.303)	X		
3. Are outside power lines located: a minimum of 10 feet above sidewalks or platforms;	X		
4. Are receptacles grounded by being installed in a complete metallic raceway or by a separate grounding conductor (3 wire) and all receptacles electrically connected to the grounding conductor (wire)? (1910.305)	X		
5. Does each electrical outlet box, pull box, junction box, and cabinet have an installed face plate, cover or canopy cover and are unused openings in cabinets and boxes effectively closed? (1910.305)		X	
6. Is water or moisture prevented from entering/accumulating within electrical cabinets, panel boards and junction boxes? (1910.305) Are weatherproof enclosures used in outside or wet locations? (1910.305)	X		
7. Is motor operated equipment (i.e. hand held motor operated tools, portable hand lamps, refrigerators, air conditioners, etc.) properly grounded with a three prong plug? (Note: Appliances protected by an approved system of double insulation need not be grounded.)? (1910.304)	X		
8. Are flexible cords and cables prohibited from use as substitute for permanent wiring of a structure, and prohibited from being run through holes in walls, ceilings, floors, doorways, windows or similar openings? (1910.305)		X	
9. Are personnel prohibited from wearing bracelets, watches, rings, or other metal objects when troubleshooting, repairing or calibrating electronic equipment? (1910.301)	X		
10. Are attachment adapter plugs with wire "pigtails" prohibited from being utilized? (NEC 70)		X	
11. Has a written Lockout-Tagout policy been established when work is performed on or near de-energized circuit parts or equipment in any situation where there is a danger of injury due to unexpected energization of the circuit parts or unexpected start up of the equipment (i.e. forging equip, power presses, milling equip, woodworking equip, hoisting equip)? (1910.312, NEC 70E)		X	
12. Are floor fans that have large openings in the metal blade guard, properly covered or have a protective covering (i.e. cloth mesh) that limits the opening to less than 1/2"? (1910.212)	X		
13. Are electrical outlets/cords that expose live electrical parts removed from service? (1910.304)	X		
14. Have electrical outlets (outside/inside) that are within 6 feet of a wet area (i.e. sink) been converted to Ground Fault Circuit Interrupters (GFCI) outlets? (NEC 210-8)		X	
15. Are electrically operated tools properly maintained and replaced when worn, broken or deteriorated? (1910.242)	X		
16. Has electrical equipment (e.g. generators) grounding been accomplished and is there documentation of an initial ohm's testing utilizing a multimeter (0-5 volt reading)? (FM 10-69, FM 10-68)			X

ITEM	YES	NO	NA
17. ELECTRICAL CABINETS: Are cabinets covers properly installed and in serviceable condition?		X	
18. Have personnel who work with electrical equipment, circuits, or transmission lines been trained by qualified personnel in safety procedures and methods of first aid? (TB 385-4) Have electrical workers been taught cardiopulmonary resuscitation (CPR) standard techniques by a certified instructor?			X
19. Are entrances to buildings, rooms, and other guarded locations containing exposed live parts, locked and marked with conspicuous warning signs forbidding unqualified persons to enter? (1910.303)	X		
20. When working in an electrical (70 volts or higher) equipment shop, a Safety Board must be available to handle electrical emergencies. It must include (a) FM 21-11 First Aid for Solders"			X
21. Are markings to include manufacturer's name/trademark and voltage/ current/ wattage ratings present on equipment and of sufficient durability to withstand the environment where present? (1910.303)	X		
22. (DATA PROCESSING SYSTEMS-DISCONNECTING MEANS) - Is a disconnecting means provided and readily accessible to the operator at the principle exit door to disconnect the power to all electronic equipment in data processing or computer rooms? (1910.306)		X	
23. Are all alternating current systems of 50 volts to 1000 bolts effectively grounded? (1910.304)	X		
24. Is the path to ground from circuits, equipment, and enclosures permanent and continuous? (1910.304)	X		
25. Has the facility grounding system been evaluated within the last 12 months to assure serviceability and compliance with the National Electric Code? (TB 385-4)		X	
26. Are boilers/furnaces properly labeled or identified? (TB 43-0151)	X		
27. Are boiler/furnace operating instructions available for use and inspection? (TB 43-0151, ASME)		X	
28. Are gas/fuel lines located in mechanical room labeled or identified? (TB 43-0151, ASME)	X		
29. Are emergency shut off valves for gas/fuel lines identified? (TB 43-0151, ASME)	X		
30. Are guards/shields, to prevent worker entanglement, properly installed on motors, pumps, gears, belts, and fans?	X		
31. Is the mechanical room adequately ventilated to allow for proper boiler or furnace operations?	X		
32. Is the mechanical room clean, free of leaks/spills and other debris, as well as stored items?		X	
33. Are the pressure shut-off valve and/or pressure relief valves on air compressors, boilers, water heaters, and other such equipment functional? (TB 43-0151)	X		

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)

E-5. The switch box and recptacle in the kitchen is uncovered. (RAC 3)
E-8/10. A 220 volt air conditioner has a electrical cord that is run approximately 30 feet through a doorway and "pigtailed" (spliced) with wire nuts into another plug. (RAC 2)
E-11. The USAR Center needs to establish a Lock-Out/Tag-Out Program, and conduct Lock-out/Tag-Out training. (RAC 2)
E-14. All electrical outlets located near water supplies need to be converted to ground fault circuit interrupter. This includes water fountains and rest room sinks (RAC 4)
E-17. The electrical cabinet door in the assembly hall is loose and not closing properly, and some of the breakers are not labeled properly. (RAC 4)
E-22. A power disconnect to all computer equipment must be provided in case of an emergency. (RAC 4)
E-27. The operating instructions for the boiler and hot water heater must be maintained in the boiler room for review. (RAC 4)
E-32. Rock salt and Christmas decorations were stored in the boiler room. The Boiler room must be kept free of stored materials. (RAC 4)

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: FIRE SAFETY/EGRESS
INSPECTOR: SFC Jim Newcomer

NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Are all rags, waste, etc., soiled by combustible or flammable materials kept in tightly closed metal containers for daily disposal? (TB 55-1500-204-25)	X		
2. Are all sleeping areas equipped with operational smoke detectors for early warning of smoke and/or fire? (NFPA Life Safety Code 101)			X
3. Are "No Smoking in Bed" signs posted in the billets? (AR 420-90)			X
4. Is excess dried vegetation around buildings/bleachers/fences kept to minimum? (1910.141)	X		
5. Are emergency lights installed and operating properly? (1910.36)	X		
6. Are all fire extinguishers, except pressurized water extinguishers, being hydrostatic tested every twelve years? Five years for pressurized water extinguishers? (1910.157)	X		
7. Are posted "No Smoking" signs enforced by employees/supervisors? (AR 420-90).	X		
8. Are fire extinguishers hung on brackets or mounted in unlocked cabinets with the top of the extinguishers not more than: - 5 feet above the floor for extinguishers with a gross weight at or below 40 pounds; - 3 above the floor for extinguishers with a gross weight above 40 pounds and - not being used as door stops? (1910.157 and NFPA 101)	X	X	
9. Is storage of any type prohibited in furnace or boiler rooms, transformer rooms or vaults, in water heater closets, or mechanical equipment rooms. (AR 420-90)		X	
10. Is a fire plan available and posted for buildings housing 10 or more persons and/or any hazardous operation? (AR 420-90)	X		
11. Are fire extinguishers inspected monthly? (1910.157)	X		
12. Is flammable storage of items in "office occupancies" prohibited, except for the amount required for maintenance and operation of building and operation of equipment? Is it stored in a closed metal container or safety can or in an inside storage room?	X		
13. Have employers distributed portable fire extinguishers for use by employees so that the travel distance for employees to any extinguisher is never greater than: (a) Class A Fire - 75 feet	X		
14. Are portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents prohibited from use? (1910.157)	X		
15. Where portable fire extinguishers have been provided for employee use in the workplace, has an educational program been provided (both initially and annually) to familiarize employees with the general principles of fire extinguisher use and hazards involved with incipient stage fire fighting? (1910.157)		X	
16. Are extinguishers in the proximity of a hazard located so as to be accessible in the presence of a fire without undue danger to the operator (75 ft for normal hazard occupancy and 50 ft for high hazard occupancy)? (1910.157)	X		
17. Is material stacked such that the minimum vertical clearance between emergency sprinklers (interior) and material(s) below is at least 18 inches? (1910.159)	X		
18. Is there an established procedures for sounding emergency alarms in the workplace? (NOTE: Direct voice communication is acceptable when there are 10 or fewer employees) (1910.165)	X		
19. Are alarm systems maintained in operating condition, except when undergoing repairs or maintenance? (1910.165)	X		
20. Are gas fired devices, which are used to generate heat for comfort such as furnaces and space heaters, vented to an external atmosphere to avoid the accumulation of combustible/noxious products of decomposition? (NFPA 54)	X		

MEANS OF EGRESS

ITEM	YES	NO	NA
1. For multi-story buildings that require more than one exit, are the exits remote from each other and free of clutter? (1910.37)	X		
2. In hazardous areas, or where employees may be endangered by the blocking of any single means of egress due to fire or smoke, is there at least two means of egress remote from each other? (1910.36)	X		
3. Are exits and the way of approach and travel from exits maintained so that they are unobstructed and are accessible at all times? (1910.26, 1910.37)	X		
4. Do all exits discharge directly to the street or other open space that gives safe access to a public way? (1910.37)	X		
5. Are all exits unlocked or unfastened so that free escape is not prevented? (1910.36)	X		
6. Has each emergency light been tested monthly for minimum of 30 seconds and annually for a 1 1/2 hour duration? (NFPA 101)		X	
7. Can all exits be reached without going through a kitchen, storage room, restroom, closet, or similar space subject to being locked? (1910.37, NFPA 101)	X		
8. When exit doors are locked, can the door be unlocked from the inside without the use of a key or special knowledge or effort? (NFPA 101)	X		
9. Are horizontal sliding or vertical doors, used as exits in lieu of side hinged swinging doors, secured in the full open position when the area is occupied? (NFPA 101) Is there a durable sign on or adjacent to the door indicating "This door to remain open when building is occupied"? (NFPA 101)	X		
10. Are doors from a room to an exit, or to a way of exit access, of the side-hinged, swinging type? Does the door swing in the direction of exit travel for rooms with more that 50 occupants? (1910.37)	X		
11. Is the minimum width of any way of exit access no less than 28 inches? (1910.37)	X		
12. Are all exits that are not readily visible marked by a readily visible exit sign? (1910.37)	X		

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)

FS-9. Stored materials must be removed from the boiler room. (RAC 4)

FS-11. All fire extinguishers need to be inspected monthly, and the inspection annotated. (RAC 4)

FS-15. Fire extinguisher training must be accomplished on an annual basis for all building occupants. (RAC 4)

E-6. At the time of the assessment there was no evidence of a monthly and annual check of the emergency lighting system. This could be done in conjunction with the inspection of the fire extinguishers. (RAC 5)

E-10. Both training room doors located on the second floor open into the classroom and not into the exit hallway. (RAC 3)

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: FLAMMABLE/COMBUSTIBLE LIQUID STORAGE
INSPECTOR: SFC Jim Newcomer

NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Are employees wearing safety shoes (no nails in the sole) and neoprene gloves when handling empty fuel drums and packaged products and fuels? (FM 10-69)	X		
2. Are POL personnel wearing clothing that is not wool or other synthetic fibers such as nylon, since wool and synthetic fibers can build electrostatic charges? (FM 10-69, FM 10-68)			X
3. Are all flammable liquids stored only in safety-type, approved containers (i.e. 5 gallon cans) with a self-closing lid on the pour spout? (A safety can is defined as a metal container with automatic closing devices on all openings and flame arresters within openings.) (1910.106)		X	
4. Are flammable and combustible materials, in the building or unit operating area, kept to a minimum (1 day supply)? Are they stored in an approved metal locker/cabinet?	X		
5. Are flammable storage cabinets used for storage of flammable/combustible liquids? (1910.101 and 1910.106)	X		
6. Are smoking and the use of open flame or spark-producing devices (i.e. phones, tools, flashlights) prohibited in flammable/ combustible liquids handling or storage areas? (l9l0.106)		X	
7. Are "NO SMOKING WITHIN 50 FEET" signs posted in or on flammable/ combustible liquid handling and storage areas?		X	
8. Is the day-to-day use of flammable/combustible liquids in buildings limited to a 1-day operation level, and stored in an approved safety can (see question 3)? (1910.106)	X		
9. Are adequate quantities of type B fire extinguishers readily available for personnel to fight fires involving flammable liquids? (1910.157)	X		
10. Are flammable/combustible liquids limited to not more than 60 gallons per storage cabinet? (1910.106)	X		
11. Are acids isolated from flammable materials? (DOD 4l45.l9-R-l)	X		
12. Are all tanks/pods, hoses, containers, and all parts of the flammable/ combustible liquid dispensing system grounded? (1910.106 and AR 385-55)	X		
13. Are buildings and compartments where flammable/combustible liquids are stored, processed, or used, ventilated? (1910.106)		X	
l4 . Are portable CO_2 fire extinguishers placed at refueling/ storage points? (FM 10-690)	X		
15. Are metal flammable storage cabinets constructed with the bottom, top, door, and sides of the cabinets with at least No. 18 gage sheet iron and double walled with a 1/2 inch air space; joints riveted, welded or made tight by some equally effective means; the door provided with a three-point lock, and the door still raised at least 2 inches above the bottom of the cabinet? (1910.106)	X		
16. INSIDE STORAGE ROOMS FOR FLAMMABLES/COMBUSTIBLES			
(a) Are openings to other rooms and buildings provided with non-combustible liquid-tight raised sills or ramps at least 4 inches in height, or the floor in the storage area at least 4 inches below surrounding floor? (1910.106)			X
(b) Are openings to other rooms provided with self-closing fire doors? (1910.106)			X
(c) Is the room liquid tight where the walls joint the floor? (1910.106)			X
(d) Is wood used for shelving, racks, dunnage, floor overplay, etc., at least 1 inch nominal thickness? (1910.106)			X
(e) Is at least one clear aisle, a minimum of 3 feet wide, maintained at all times? (1910.106)			X
(f) Is the storage area graded in a manner to divert possible spills away from the building or other exposures or surrounded by a curb at least 6 inches high? (1910.106)			X

16. INSIDE STORAGE ROOMS FOR FLAMMABLES/COMBUSTIBLES (continued)

ITEM	YES	NO	NA
(g) Are storage areas protected against tampering or trespassers, where necessary, and kept free of weeds, debris and other combustible material not necessary to the storage? (1910.106)			X
(h) Are water reactive materials stored in a different room from the room with flammable and combustible liquids? (1910.106)			X

17. SERVICE STATIONS

(a) Is there a clearly identified and easily accessible switch(es) or circuit breaker(s) provided at a location remote from dispensing devices, including remote pumping systems, to shut off the power to all dispensing devices in the event of an emergency? (1910.106)			X
(b) Is a control provided that will permit the pump to operate only when a dispensing nozzle is removed from its bracket on the dispensing unit and the switch on this dispensing unit is manually actuated? Does this control also stop the pump when all nozzles have been returned to their brackets? (1910.106)			X
(c) Is each service station provided with at least one fire extinguisher having a minimum approved classification of 6 B, C, located so that the extinguisher is with 75 feet of each pump, dispenser, underground fill pipe opening, and lubrication or service room? (1910.106)			X

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)

3. No approved safety containers were observed in the OMS work area. POL products were stored on a secondary containment pallet. (RAC 3)
6. A "No Smoking, sparks or other source of ignition permitted" sign must be posted on the OMS door. (RAC 4)
7. A "No Smoking Within 50 Feet" sign must be posted near the POL storage in the Army OMS. (RAC 4)
8. The gasoline should not be stored inside the supply room. It should be stored in the flammable material cabinet in the OMS. (RAC 4)
13. The Army's storage shed near the OMS has flammable materials stored in it, The shed has not been wired with electrical power. There is no light or fan for ventilastion in the storage shed. (RAC 3)
16. There are no inside storage rooms for POL in the OMS.
17. There is no service station located on this Reserve Center.

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: HOUSEKEEPING
INSPECTOR: SFC Jim Newcomer

NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Are all places of employment, passageways, storerooms, and rooms kept clean and orderly and in a sanitary condition? (1910.11)		X	
2. Are aisles and passageways kept clean and unobstructed with no carpet snags, electrical cords, or telephone cords extending across walkways, creating slip, trip, and fall hazards? (1910.22)		X	
3. Have warning signs on buildings and other locations been kept in good condition and not allowed to deteriorated beyond recognition? (NFPA 30A)	X		
4. Are guards or handrails available for stairways having more than four risers? (1910.23)	X		
5. Do the steps have a slip-resistant material that is functional? (1910.24)	X		
6. Has Preventive Medicine been contacted if any of the items listed below appear to exist? (AR 40-5) a. Inadequate lighting b. High mold content in the air c. Loud noises d. Inadequate ventilation	X		
7. If personnel wear respirators for any jobs, is there a written Respiratory Protection Program and does it contain the following: a. Written standing operating procedures for proper selection, use and care of respirators? b. Are respirators/filters selected on the basis of employee hazards and does the equipment meet ANSI standards? c. Are employees trained in the proper use of respirators, and have they been medically qualified (pulmonary function and fit testing from qualified instructor)? d. Are respirators regularly cleaned and disinfected, and stored in a convienient, clean, and sanitary location? e. Are respirators routinely inspected for worn and deteriorated parts? f. Do employees rrecieve yearly pulmunary function and fit testing from a qualified instructor? (AR385-10, 1910.134, and AR 11-34)			X
8. Does the upstairs storage area have the maximum weight capacity sign posted? (l9l0.22)			X
9. Is warm water available in each lavatory? (l9l0.141)	X		
l0. Are the outlets for nonpotable water (e.g. industrial or fire fighting purposes) posted or otherwise marked in a manner that will clearly indicate the water is unsafe and not to be used for drinking or washing of the person? (1910.141)	X		
11. Is hand soap or similar cleansing agents provided? Are individual hand towels or selections thereof, of cloth or paper, warm air blowers, or clean individual selections of continuous toweling provided? (1910.141)	X		
12. Are employees forbidden from consuming food or beverages in a toilet room or in any area exposed to toxic materials? (1910.141)	X		
13. Have all cracked windows /and or leaking roof(s) (if there were any) been fixed so that no water is allowed into the building to create a slipping hazard? (l960.9)		X	
14. Are upstairs storage areas equipped with railings and toe boards? They must have railings on all sides except those with ladders/stairs, etc. (l9l0.23)			X
15. Is approved head protection provided, where necessary, to personnel for the protection of heads from impact and penetration from falling and flying objects and from limited electric shock and burns? (1910.135)	X		
16. Are covers and/or guardrails provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc.? (1910.22)	X		
17. Is every stairway floor opening guarded by a standard railing on all exposed sides except at entrance to stairway? (STANDARD: A smooth-surfaced top rail throughout the length of the railing at a vertical height of 42 inches nominal from the upper surface of top rail to the floor, platform, runway, or ramp level; an intermediate rail approximately halfway between the top rail and the floor, platform, runway, or ramp, and posts.) (1910.23)	X		

ITEM	YES	NO	NA
18. Is every floor hole into which persons can accidentally walk, guarded with a standard guard railing and with a standard toe board? (1910.23)	X		
19. Do fixed stairways have a minimum width of 22 inches? And, are all treads reasonably slip-resistant and is the rise height and tread width uniform throughout any flight of stairs? (1910.24)	X		

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)

1/2. The assembly hall has a battery charging station that is on but can not be easily accessed because of material being stored in the way. This material must be removed, or the battery charging station moved to the OMS. The first floor electrical room needs to be cleaned out. There is material stored in front of the main electrical panel. (RAC 3)

13. There is the indication of water damage along the west wall on the first floor. This may be caused by a roof leak. (RAC 3)

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: LADDERS
INSPECTOR: SFC Jim Newcomer

NOTE: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. The maximum length for portable wood ladders shall be: step-ladders 20 feet; single straight ladders 30 feet; two section extention ladders 60 feet; sectional ladders 60 feet: trestle ladders 20 feet; platform step ladders 20 feet; painters step ladders 12 feet; and mason's ladders 40 feet. (1910.25) Do the ladders in this facility meet these requirements?	X		
2. The maximum length for portable metal ladders shall be: single straight ladders 30 feet; two section extention ladders 48 feet; over two section extention ladders 60 feet; step ladders 20 feet; trestle ladders 20 feet; and platform step ladders 20 feet. (1910.26) Do the metal ladders in this facility meet these requirements?	X		
3. Step-ladders shall be equipped with a metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in a open position. (1910.25, 1910.26) Do the step-ladders in this facility meet these requirements?	X		
4. Are ladders maintained in good condition, and defective ladders withdrawn from service? Are rungs free of grease and oil? (1910.25)	X		
5. Are only portable ladders that have nonconductive siderails used when working with live electrical circuits? (1910.333)	X		
6. Are all portable ladders placed to prevent slipping, or lashed or held in position? (1910.25)	X		
7. Are all portable ladders equipped with non-slip bases when there is a hazard of slipping? (Note: Non-slip bases are not intended as a substitute for care in safely placing, lashing, or holding a ladder that is being used upon oily, metal, concrete, or slippery surfaces.) (1910.25)	X		
8. Do the portable ladders used to gain access to a roof, extend at least 3 feet above the point of support, at eaves, gutter, or roof line? (1910.25)	X		
9. Are ladder stands and work platforms capable of supporting at least four times the design work load? (1910.29)	X		
10. Is the standard (work platform) (4 inch nominal) toe-board installed for work levels 10 feet or higher above the ground or floor? (1910.29)	X		
11. For work levels (work platforms) 10 feet or higher above the ground or floor, is a guardrail of 2 x 4 inch nominal, or the equivalent, installed no less than 36 inches or more than 42 inches high (with a mid-rail when required)? (1910.29)			X
12. Are wheel/casters (work platforms) provided with a positive wheel and/or swivel lock to prevent movement? (1910.29)			X
13. Are wooden ladders free of sharp edges and splinters? (1910.25)	X		

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: MOTORPOOL AND MILITARY VEHICLE SAFETY
INSPECTOR: SFC Jim Newcomer

Note: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Are periodic shop maintenance inspections conducted by the Commander? (FM 43-5)		X	
2. Do supervisors conduct regular safety meetings in the work area? (FM 43-5)	X		
3. Does the unit have a shop safety SOP and does it contain job specific safety precautions and procedures? (FM 43-5)	X		
4. Are maintenance areas kept clean and orderly? (1910.22, FM 43-5)	X		
5. Are oil spills cleaned up immediately? (1910.106, FM 43-5)	X		
6. Are tools properly maintained and replaced when worn, broken, or deteriorated? (1910.242, FM 43-5, and TM 9-243)	X		
7. In addition to job-by-job cleanup, is a scheduled period of 15-30 minutes each shift being utilized for housekeeping duties? (1910.22, FM 43-5)	X		
8. Are drip pans utilized in motor pool bays under vehicles which have seeps or leaks of petroleum, oil, and lubrication (POL) products? (1910.22)	X		
9. Are vehicles that have fuel leaks taken from service until the leak is repaired? (AR 385-55)	X		
10. Is smoking prohibited within 50 feet of vehicles transporting or dispensing flammable liquids, explosives, or other combustible materials? (AR 385-55)	X		
11. Compressed air shall not be utilized for cleaning purposes, except where reduced to less than 30 psi, and then only with effective chip guarding and personal protective equipment. Is this rule being observed? (1910.242)	X		
12. Are military motor vehicles equipped with highway warning kits, which shall include operating procedures for the warning devices used on these vehicles? (AR 385-55)	X		
13. Do emergency response vehicles, vehicles with valuable equipment/explosives, or AMV personnel carriers with a capacity of five or more persons, carry a fire extinguisher? (DOT Reg 393-95, subpart H; AR 385-55)			X
14. Are chock blocks utilized when military vehicles are parked on inclines or whenever maintenance is performed? (AR 385-55)	X		
15. Are guides utilized when drivers back any type of vehicle, if rear visibility is blocked by cargo, or otherwise limited, or with drivers of buses with a capacity greater than 12, and of 2 1/2 ton or larger trucks? (AR 385-55)	X		
16. Are reel drop light cords replaced when they are cracked or damaged? (1910.304 and NEC 70)	X		
17. Is a positive bonding connection made between gasoline tank trucks and the source vehicle/fuel container; and are POL trucks grounded before refueling? (AR 385-55)			X
18. Are drivers performing documented, before, during, and after operation checks of their vehicles? (AR 385-55)	X		
19. Has electrical equipment (i.e. generators) grounding been accomplished and is there documentation of an initial ohms testing utilizing a multimeter (0-5 volt reading)? (TC 11-6, FM 10-69, and FM 10-68)			X
20. Purging of Vehicle Fuel Tanks (TB 43-0212) a. Personnel engaged in purging operations will not wear wool, nylon, silk, rayon or other similar clothing. They will wear cotton clothing, with no metal buttons, and rubber boots. Is this being adhered to?			X
21. Are all flammable waste materials removed to a collection area outside motor shops and garages at the close of each workday? (AR 385-55)	X		
22. Is the use of gasoline prohibited for any cleaning purposes including cleaning vehicle parts, clothing, floors, etc.? (AR 385-55)	X		
23. Are special activities such as painting, welding, and battery work, confined to separate parts of the garage or maintenance areas and isolated from each other?	X		

ITEM	YES	NO	NA
24. Is adequate ventilation provided in the motorpool to prevent accumulation of flammable or injurious vapors and gases?	X		
25. Are floors kept clean and free of oil, grease, gasoline, water, and other hazardous or slippery substances?	X		
26. Do personnel performing hazardous operations have proper personal protective equipment?	X		
27. Are portable guardrails placed around grease or repair pits when not in use?			X
28. Are lifts provided with stop-checks to prevent movement of the vehicle when the lift is in the raised position?			X
29. Are personnel prohibited from remaining in vehicle when vehicle is on the lift?	X		
30. Are vehicles supported securely in position on safety stands after being raised by jacks?	X		
31. Are jacks labeled with their load limit and inspection due date?	X		
32. Are tools in good working condition?	X		
33. Are gas tanks and other fuel containers removed from vehicles, drained, steamed, and filled with water before welding or other heat-producing operations are performed?	X		
34. Are horn warning or other prescribed signals given by vehicles when entering or leaving the shop?	X		
35. Are the safe load limits for cranes and derricks in both maximum and minimum positions clearly indicated?			X
36. Are cranes and derricks equipped with braking devices, capable of stopping at least one and one-half times the rated load?			X
37. Are cables or wire ropes free from broken strands, corrosion and other defects?			X
38. Are electrical light bulbs attached to extension cords provided with wire guards?	X		
39. Are electrical wiring and fixtures installed in grease and repair pits explosion proof?			X
40. Are low voltage lights used in pits? (less than 24V)			X
41. Are steps in pits painted yellow to indicate caution?			X
42. Are fire extinguishers suitable for class B fires distributed and maintained throughout the vehicle parking areas and shops?	X		
43. Are personnel trained as to their individual responsibilities to follow all safety instructions and to use all safeguards incident to the use the tools, machinery, equipment, and processes?	X		
44. Are current maintenance and equipment publications accessible to equipment operators, mechanics, and leaders?	X		

MATERIAL HANDLING AND STORAGE

1. Are only trained and authorized personnel permitted to operate powered industrial trucks? (1910.178)	X		
2. Are overhead guards installed on all powered industrial trucks? (1910.178)	X		
3. Are load backrest extensions used whenever necessary to minimize the possibility of the load or part of it from falling rearward? (1910.178)	X		
4. Are powered industrial trucks in need of repair, defective, or in any way unsafe taken out of service until they are restored to a safe operating condition? (1910.178)	X		
5. Where mechanical handling equipment is used, are sufficient safe clearances allowed for aisles, through doorways, and wherever turns or passage must be made? (1910.176)	X		
6. Are aisles and passageways kept clear and in good repair, with no obstructions across or in aisles that could create a hazard? (1910.176)	X		
7. Are permanent aisles and passageways appropriately marked? (1910.176)	X		
8. Is material stored so as not to create a hazard? (1910.176)		X	
9. Are clearance signs to warn of clearance limits provided? (1910.176)		X	

OVERHEAD AND GANTRY CRANES

1. Are only designated personnel permitted to operate the crane? (1910.179)			X
2. Are crane hooks removed from service when throat openings exceed more than 15 percent of normal or hook shows more than a 10 degree twist from the plane of the unbent hook or shows signs of cracks? (1910.179)			X
3. Do hooks have safety closure latches properly positioned and functional? (TB 43-0142)			X
4. Are hoists, chains, slings and hooks marked to indicate the item identification number, load rating and next periodic inspection date? (TB 43-0142)			X
5. Has a thorough inspection of all ropes (wire ropes) been made at least once a month and a certification record maintained on file? (1910.179)			X
6. Are lifts/hoist that have an hydraulic fluid leak repaired and or replaced, depending upon the problem? (TB 43-0142)			X
7. Do personnel use standard hand signals to communicate with the crane operator?			X
8. Are employees aware of the weight of the load to be lifted?			X
9. Is the hoist chain or rope free from kinks, twists, and NOT wrapped around the load?			X
10. Is hoisting, lowering, swinging, or traveling forbidden while on the load or hook?			X
11. Are loads prohibited over the heads of people?			X
12. Does the operator test the brakes each time a near-capacity load is handled?			X
13. Does the operator stay in position at the controls while the load is suspended?			X
14. When the hook is in the extreme low position, is there at least two complete wraps of rope remaining on the drum?			X
15. Are rope ends securely attached to the drum by means of a clamp or socket arrangement approved by the crane or rope manufacturer?			X
16. Is the hook centered over the load to prevent swinging?			X
17. Has the crane been load tested?			X

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)
MOTORPOOL

1. Safety meetings and maintenance inspections must be conducted on a routine basis. (RAC 4)

MATERIAL HANDLING AND STORAGE

8. A snow blower awaiting parts and repair, was stored in fron of the power distribution box. (RAC 2)

9. Clearance signs must be posted on the overhead doors located in the OMS. (RAC 5)

OVERHEAD CRANE AND/OR GANTRY

At the time of the safety assistance visit there was no overhead crane or gantry.

HORSHAM MEMORIAL USARC
PA046

ACTIVITY/AREA: WELDING OPERATIONS
INSPECTOR: SFC Jim Newcomer

Note: All "NO" answers require a comment at the end of the checklist for the area.

ITEM	YES	NO	NA
1. Are only qualified and authorized personnel permitted to perform welding operations? (1910.252)			X
2. Are personal protective equipment, such as helmets, eye protection shields, goggles, aprons, respirators and gloves provided? (1910.132)			X
3. Is an exhaust system provided whenever natural ventilation is inadequate to remove injurious fumes and gases? (1910.252)			X
4. Have flammable or explosive materials been removed or confined to eliminate the possibility of fire or explosion during welding work? (1910.252)			X
5. Are written SOPs governing the selection and proper use of respirators available? (1910.134)			X
6. Do welding or cutting goggles, helmets and face shields employ the correct filtered lens (shade number) for the welding operation (i.e. soldering-Shade 2; light cutting-Shade 3/4; heavy cutting-Shade 5/6)? (1910.252)			X
7. Are respirators assigned to individual workers for their exclusive use? (1910.134, TB Med 502)			X
8. Are respirators thoroughly cleaned and disinfected after each use? (1910.134, TB Med 502)			X
9. Are personnel who use respirators given a physical examination to determine if they are physically able to perform the work and use this equipment? (1910.134)			X
10. Are fire curtains provided and set up around welding operations to protect property and operators of nearby equipment? (1910.252)			X
11. Are acetylene gas cylinders stored away from heat source stored in an upright position, and chained or secured to prevent falling? (AR 700-68, l910.252)			X
12. Is acetylene gas used at a pressure not to exceed 15 pounds per square inch (PSI) (higher pressure may cause it to explode)? (AR 700-68, 1910.252)			X
13. When oxy-acetylene welding is done using a welding rig,: Have the gauges been calibrated?			X
14. Are Material Safety Data Sheets (MSDS) provided for welding rods and other types of chemicals (hazardous by-products) utilized during welding? (1910.1200)			X
15. Are suitable fire extinguishing equipment (e.g. pails of water, buckets of sand, hose or portable extinguishers), available? (1910.252)			X
16. Is the frame or case of the welding machine (except engine driven machines) grounded? (1910.252)			X
17. Are welders included in the unit's medical surveillance program? (AR 40-5)			X

COMMENTS: (Include item number and location for each comment. Add extra pages, if necessary.)
At the time of the assessment welding operations were not in evidence. There was no designated area for welding operations, no fume hood, or personal protective equipment. There was no medical surveillance program, respiratory protection program, or material safety data sheets available.

Horsham USAR Center
PA046

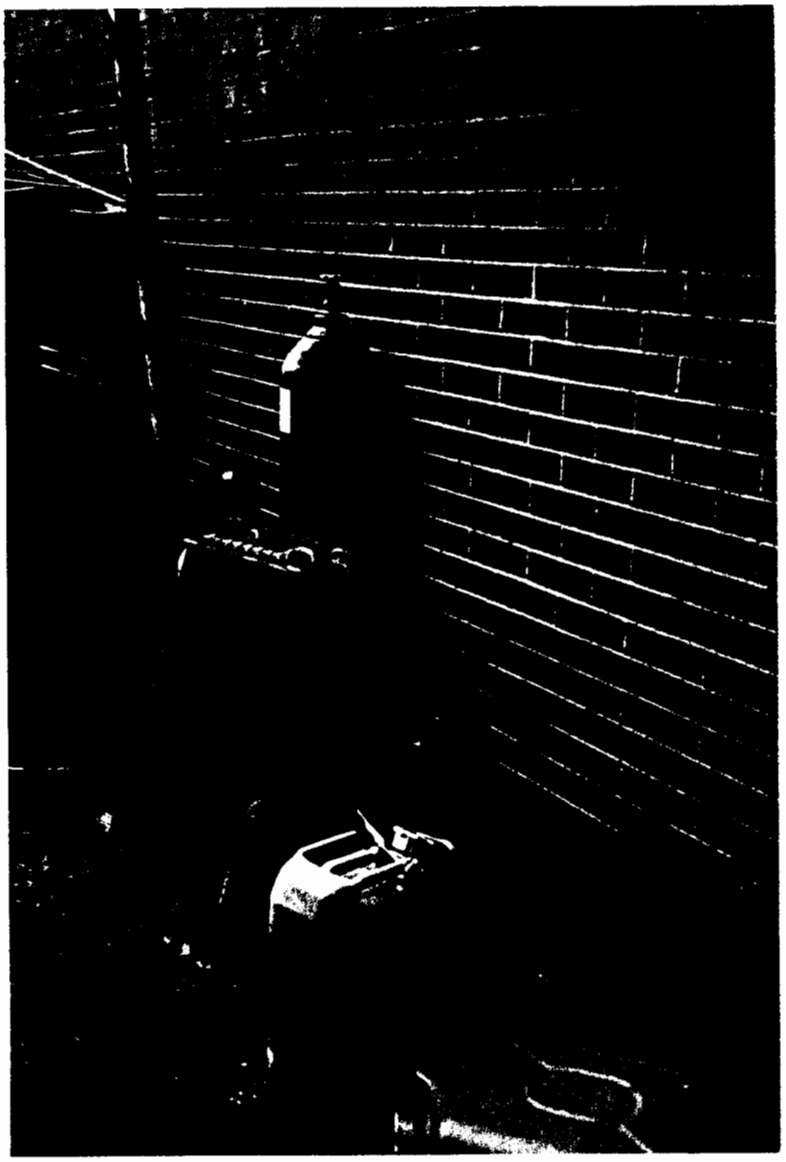


Photo 1: Improperly stored compressed gas cylinder

Photo 2: Improperly stored Mogas containers

ENCLOSURE 4
ENVIRONMENTAL COMPLIANCE ASSESSMENT

INSTALLATION SCREEN

*FFID: PA-2104PA046
*Installation Name: USARC HORSHAM 01
Installation Category: R
MACOM: USARC

MUSARC: 99TH
BASOPS ARCOM: 99TH
Support Installation: FORT INDIANTOWN GAP
Facility / Activity Type: 1) FM 2) OM 3) 4) 5)

EPA Region: 3
Congressional District:
Address: 936 EASTON ROAD

City: HORSHAM
State: PA
Country: USA
Zip Code: 19044-3399

ASSESSMENT SCREEN

*Fiscal Year: 1996 *Assessment Date (MM/DD/YYYY): 09/19/1996
*Assessment Type: E
*Manual Used: T

Manual Supplement Used:

Local Manual (OCONUS: MACOM Specific Manual)
Date (MM/YYYY): /
Author:
Title:

State Manual (OCONUS: Country Specific Manual)
Date (MM/YYYY): /
Author:
State Postal Code or Country Code:

*Assessor Name: MAJ TODD GRIFFITH
Point of Contact: MAJ TODD GRIFFITH

Address: 1129 UTILITY ROAD
FT INDIANTOWN GAP
City: ANNVILLE
State: PA
Zip Code: 17003-5029
Phone: (717)861-2345

For Contract ECAS

Contract Number:
Delivery Order Number:
Contracting Office:

TABLE 1-1
SUMMARY OF FINDINGS

INSTALLATION: USARC HORSHAM 01 Fiscal Year: 1996
FFID: PA-2104PA046

SECTION NO.	TITLE	REGULATORY 1	REGULATORY 2	REGULATORY HS	MANAGEMENT POS	MANAGEMENT 3	MANAGEMENT HS	TOTAL
A	Air Emissions	0	0	0	0	0	0	0
C	Cultural Resources	0	0	0	0	0	0	0
HM	Hazardous Materials	3	0	1	0	1	0	5
HW	Hazardous Waste	0	0	0	0	2	0	2
NR	Natural Resource	0	0	0	0	0	0	0
O1	Environmental Impacts	0	0	0	0	0	0	0
O2	Environmental Noise	0	0	0	0	0	0	0
O3	IRP	0	0	0	0	0	0	0
O4	Pollution Prevention	0	0	0	0	0	0	0
O5	Program Management	0	0	0	0	0	0	0
PM	Pesticide	0	0	0	0	0	0	0
PO	POL	0	0	0	0	0	0	0
SO	Solid Waste	0	0	0	0	0	0	0
ST	Storage Tanks	0	0	0	0	0	0	0
T1	PCB	0	0	0	0	0	0	0
T2	Asbestos	0	0	0	0	0	0	0
T3	Radon	0	0	0	0	0	0	0
T4	Lead Based Paint	0	0	0	0	0	0	0
WA	Wastewater	0	0	0	0	0	0	0
WQ	Water Quality	0	0	0	0	0	0	0
	TOTALS	3	0	1	0	3	0	7

Data File Name Prefix: C:\ECAS\PA076
Date Summary Report Produced: 09/20/96

HM.1.4 #1 I FEDERAL FINDING
MANUAL QUESTION NUMBER: HM-001-004 FINDING ID: PA046HM003
FINDING CATEGORY: CLASS I
FINDING TYPE: Negative EXISTING NOV: NO
LOCATION: MEP
IFS FACILITY NUMBER:
FACILITY TYPE: AFRC(MB) - ARMED FORCES RESERVE CENTER - MAIN BLDG

FINDING DESCRIPTION: Five gallon pail of denatured alcohol is stored outdoors in MEP with no containment.

CRITERIA: Specific housekeeping requirements must be met in areas where hazardous materials are stored (29 CFR 1910.176(c)).

FINDING COMMENTS:

SUGGESTED/ALTERNATIVE CORRECTIVE ACTION(S):

STATUS OF CORRECTION:

INSTALLATION RESPONSE:
CORRECTIVE ACTION DESCRIPTION: _____
_____
_____
_____
_____
_____
_____

DATE CORRECTIVE ACTION COMPLETED: _____

ESTIMATED DATE CORRECTIVE ACTION TO BE COMPLETED: _____
1383 PROJECT # (IF APPLICABLE): _____

POC: _____ PHONE NUMBER: _____

HM.10.1 #1 I FEDERAL FINDING
MANUAL QUESTION NUMBER: HM-010-001 FINDING ID: PA046HM001
FINDING CATEGORY: CLASS I
FINDING TYPE: Negative EXISTING NOV: NO
LOCATION: THROUGHOUT
IFS FACILITY NUMBER:
FACILITY TYPE: AFRC(MB) - ARMED FORCES RESERVE CENTER - MAIN BLDG

FINDING DESCRIPTION: No written hazard communications plan is available for the USARC. (note: there is a plan available for the AMSA 23 subshop colocated in the OMS)

CRITERIA: Installations/CW facilities are required to have a written hazard communication program that is designed to provide all employees with information about the hazardous chemicals to which they are exposed (29 CFR 1910.1200(b)(1) and 1910.1200(e)(1)) [February 1995].

FINDING COMMENTS:

SUGGESTED/ALTERNATIVE CORRECTIVE ACTION(S):

STATUS OF CORRECTION:

INSTALLATION RESPONSE:
CORRECTIVE ACTION DESCRIPTION: _____
_____
_____
_____
_____
_____
_____

DATE CORRECTIVE ACTION COMPLETED: _____

ESTIMATED DATE CORRECTIVE ACTION TO BE COMPLETED: _____
1383 PROJECT # (IF APPLICABLE): _____

POC: _____ PHONE NUMBER: _____

HM.45.1 #1 I FEDERAL FINDING
MANUAL QUESTION NUMBER: HM-045-001 FINDING ID: PA046HM004
FINDING CATEGORY: CLASS I
FINDING TYPE: Negative EXISTING NOV: NO
LOCATION: OMS
IFS FACILITY NUMBER:
FACILITY TYPE: AFRC(MB) - ARMED FORCES RESERVE CENTER - MAIN BLDG

FINDING DESCRIPTION: Compressed gas cylinder is stored outside of MEP without cap and with no "NO SMOKING" sign.

CRITERIA: The in-plant storage, handling, and utilization of all compressed gases in cylinders, portable tanks, rail tankers, or motor vehicles must be done according to the Compressed Gas Association Pamphlet P-1-11965 (29 CFR 1910.101).

FINDING COMMENTS:

SUGGESTED/ALTERNATIVE CORRECTIVE ACTION(S):

STATUS OF CORRECTION:

INSTALLATION RESPONSE:
CORRECTIVE ACTION DESCRIPTION: _____
_____
_____
_____
_____
_____
_____

DATE CORRECTIVE ACTION COMPLETED: _____

ESTIMATED DATE CORRECTIVE ACTION TO BE COMPLETED: _____
1383 PROJECT # (IF APPLICABLE): _____

POC: _____ PHONE NUMBER: _____

HM.1.2.R #1 III ARMY/DOD FINDING
MANUAL QUESTION NUMBER: HM-001-002-R FINDING ID: PAO46HW001
FINDING CATEGORY: CLASS III
FINDING TYPE: Negative EXISTING NOV: NO
LOCATION: THROUGHOUT
IFS FACILITY NUMBER:
FACILITY TYPE: AFRC(MB) - ARMED FORCES RESERVE CENTER - MAIN BLDG

FINDING DESCRIPTION: The written hazardous waste management plan is not being complied with in that the Facility Manager is not maintaining HW manifests or preparing HW reports as required by section 2.3.

CRITERIA: Management and organization of paperwork, materials, and personnel should be done in a manner that prevents noncompliance and recurrence of noncompliance, precludes/minimizes regulatory enforcement actions (including warning letters etc.), promotes good public relations, and addresses systemic weaknesses in the overall operation of the program (MP).

FINDING COMMENTS:

SUGGESTED/ALTERNATIVE CORRECTIVE ACTION(S):

STATUS OF CORRECTION:

INSTALLATION RESPONSE:
CORRECTIVE ACTION DESCRIPTION: _____
_____
_____
_____
_____
_____
_____

DATE CORRECTIVE ACTION COMPLETED: _____

ESTIMATED DATE CORRECTIVE ACTION TO BE COMPLETED: _____
1383 PROJECT # (IF APPLICABLE): _____

POC: _____ PHONE NUMBER: _____

HM.35.1 #1 HS ARMY/DOD FINDING
MANUAL QUESTION NUMBER: HM-035-001 FINDING ID: PA046HM002
FINDING CATEGORY: HEALTH/SAFETY
FINDING TYPE: Negative EXISTING NOV: NO
LOCATION: THROUGHOUT
IFS FACILITY NUMBER:
FACILITY TYPE: AFRC(MB) - ARMED FORCES RESERVE CENTER - MAIN BLDG

FINDING DESCRIPTION: Several examples were found of flammables stored improperly. -lacquer can stored on tool room shelf in OMS -paint can on floor in corner of OMS -lacquer can on shelf in storage room 120

CRITERIA: Specific management practices should be considered when storing and handling flammable/combustible materials (MP) [April 1995].

FINDING COMMENTS:

SUGGESTED/ALTERNATIVE CORRECTIVE ACTION(S):

STATUS OF CORRECTION:

INSTALLATION RESPONSE:
CORRECTIVE ACTION DESCRIPTION: _____
_____
_____
_____
_____
_____
_____

DATE CORRECTIVE ACTION COMPLETED: _____

ESTIMATED DATE CORRECTIVE ACTION TO BE COMPLETED: _____
1383 PROJECT # (IF APPLICABLE): _____

POC: _____ PHONE NUMBER: _____

HW.10.2 #1 III ARMY/DOD FINDING
MANUAL QUESTION NUMBER: HW-010-002 FINDING ID: PA046HW002
FINDING CATEGORY: CLASS III
FINDING TYPE: Negative EXISTING NOV: NO
LOCATION: MEP AND OMS
IFS FACILITY NUMBER:
FACILITY TYPE: AFRC(MB) - ARMED FORCES RESERVE CENTER - MAIN BLDG

FINDING DESCRIPTION: Trash can filled with water/oil/grease stored outside in MEP. Greasy engine block and grease pump stored outside by OMS. Unknown/unmarked five gallon pail (roofers tar?) stored outside by chimney.

CRITERIA: Areas where containers of hazardous waste are stored should have secondary containment (MP).

FINDING COMMENTS:

SUGGESTED/ALTERNATIVE CORRECTIVE ACTION(S):

STATUS OF CORRECTION:

INSTALLATION RESPONSE:
CORRECTIVE ACTION DESCRIPTION: _____
_____
_____
_____
_____
_____
_____

DATE CORRECTIVE ACTION COMPLETED: _____

ESTIMATED DATE CORRECTIVE ACTION TO BE COMPLETED: _____
1383 PROJECT # (IF APPLICABLE): _____

POC: _____ PHONE NUMBER: _____

HW.25.1.A #1 III ARMY/DOD FINDING
MANUAL QUESTION NUMBER: HW-025-001-A FINDING ID: PA046HW003
FINDING CATEGORY: CLASS III
FINDING TYPE: Negative EXISTING NOV: NO
LOCATION: MEP
IFS FACILITY NUMBER:
FACILITY TYPE: AFRC(MB) - ARMED FORCES RESERVE CENTER - MAIN BLDG

FINDING DESCRIPTION: Numerous spots on the pavement by tactical vehicle tires indicate that soldiers are using diesel fuel to "clean" tires and they are spilling significant quantities of this fuel on the pavement. This practice indicates a lack of training and environmental awareness.

CRITERIA: All SQG personnel who handle hazardous waste should meet certain training requirements (MP).

FINDING COMMENTS:

SUGGESTED/ALTERNATIVE CORRECTIVE ACTION(S):

STATUS OF CORRECTION:

INSTALLATION RESPONSE:
CORRECTIVE ACTION DESCRIPTION: _____
_____
_____
_____
_____
_____
_____

DATE CORRECTIVE ACTION COMPLETED: _____

ESTIMATED DATE CORRECTIVE ACTION TO BE COMPLETED: _____
1383 PROJECT # (IF APPLICABLE): _____

POC: _____ PHONE NUMBER: _____

Horsham USAR Center
PA046

Photo 1: Unknown pail stored outdoors with no secondary containment

Photo 2: Oil and grease covered trah can stored outdoors with no secondary containment

Photo 5: Greasy engine block and pump stored outdoors with no secondary containment

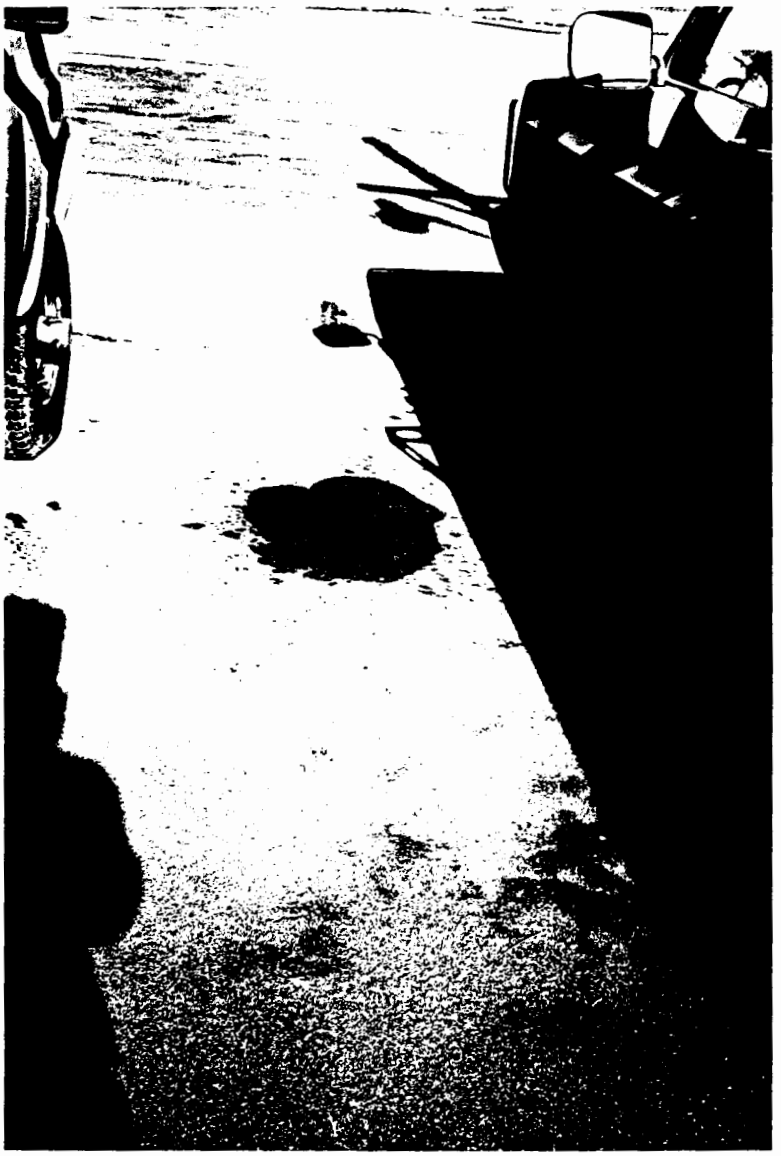


Photo 3: POL spill in MEP

Photo 4: POL spill in MEP, indicates diesel fuel is being used to clean tires

ENCLOSURE 5
ARMS VAULT FACILITY STRUCTURAL CERTIFICATION

INSPECTION
ARMS ROOM CHECK LIST

FACILITY: Horsham Memorial U.S. Army Reserve Center
936 easton Road5200
Horsahm, PA
19044

POINT OF CONTACT: Mr. J. Slight

	Yes	No
A. FLOORS:		
1. 6 inch thick concrete slab on grade reinforced with wire mesh.	X	
2. 6-inch thick concrete slab reinforced with steel bars (Floor forms the ceiling of underlying room or area).	N/A	
3. 2-inch concrete topping over existing floor slab.	N/A	
4. Existing slabs removed and replaced with new 6-inches of reinforced concrete.	N/A	
B. WALLS:		
1. 8-inch concrete reinforced with No. 4 bars at 9 inches on center in each direction.	N/A	
2. 8-inch concrete masonry with No. 4 bars threaded through masonry units cavities at 8 inch centers. Cells of masonry filled with mortar or concrete.	N/A	
3. 8 inches of brick interlocked between inner and outer courses.	N/A	
4. Existing walls: New 8 inch reinforced (inner) (outer) walls constructed against existing walls.	N/A	
5. Other: 8 inch masonary block reinforced with 3/16 expanded metal	X	
C. CEILING:		
1. 8 inch concrete slab reinforced with No. 4 bars minimum, and forming a grid where the area of any opening does not exceed 96 square inches.	X	
2. Concrete Pan Joists: Thinnest portion of the joist not less than 6 inches and the clear space between joist does not exceed 20 inches	N/A	
3. _____ inch concrete topping provided over existing concrete ceiling slab. Reinforcing bars spacing form a grid where the area of any opening does not exceed 96 square inches.	N/A	

D. DOORS: (Barracks and other Full-Time occupied spaces)

1. Two doors provided to arms vault. Each door 1-3/4 inch thick solid core wood with 12 gauge metal plate securely attached to the outside face.	N/A	__
2. Two doors provided to arms vault. Each door 1-3/4 inch thick industrial type internally reinforced vertically with continuous steel stiffeners spaced 6 inches on center. Minimum thickness or skin of doors is not less than 14 gauge.	N/A	__
3. Two doors provided to arms vault. One door as described in D1 or D2 above. The second door, rod and bar grid door as required in AR 190-11.	N/A	__

E. DOORS: (Reserve Centers)

1. One Class 5 steel vault door (Fed. Spec. AA-D-600B) with a built in three position dail-type changeable combination lock used in lieu of door described above.	X	__
2. Day gate provided but not required.	N/A	__

F. ARMS PASS WINDOW DOORS:

Pass window provided with doors as required for entrance to Arms Vault.	N/A	__

G. DOORS AND PASS WINDOW FRAMES:

Frames are compatible with doors and frames and securely anchored.	N/A	__

H. HARDWARE FOR DOORS:

1. Locking device for the outer door to vault is high security hasp conforming to military specification MIL-P-43607.	N/A	__
2. The inner door to the arms vault has mortise cylinder deadbolt lock "ultra 700" with Medelo or Emhart high security cylinder.	N/A	__
3. Door hinges are (fixed-Pin security type) (safety-stud hinges) (with hinge pins welded) to prevent removal.	N/A	__
4. Hinge mounting screws not exposed to the outside of the arms rooms.	N/A	__

I. OPENINGS: (Walls or Ceilings)

1. No opening required in walls or ceilings.	X	__
2. All openings greater than 96 square inches protected by rod-and bar grid as required in paragraph E-5 or AR 190-11.	N/A	__

J. ARMS ROOM ANCHOR RINGS:

Anchor rings provided at arms room walls to secure arms racks.	X	__

K. SECURITY LIGHTING:

Interior entrances of arms rooms illuminated a minimum of .1 foot-candle at any point with in 20 foot radius of the entrance.	X	

L. INTRUSION DETECTION SYSTEM: (IDS)

1. Intrusion alarm detection system provided for vaults as required in AR 190-11.	X	
2. Alarms at local law enforcement (Willow Grove Naval Air Station)	X	
3. Other: IDS has motion sensors	X	

M. MECHANICAL:

1. Electrical dehumidifier provided for vault temperature control.	X	
2. 3-inch floor drain provided for dehumidifier.		X

N. SECURITY PATROLS:

Reserve center is checked by security patrol periodically.	X	

O. BOLTS:

If facility is not located on a military installation bolts of weapons shall be removed and secured separately.	X	

P. WAIVERS, UNUSUAL REQUIREMENTS AND ADDITIONAL FEATURES:		X

Q. SUMMARY:

This facility meets Class II storage requirements for weapons.	X	

CERTIFICATION OF COMPLIANCE WITH CRITERIA SET FORTH AR 190-11

Todd D. Griffith, Major CE PE
Mechanical Engineer
416th ENCOM

23 August 1996

SECURITY CONSTRUCTION STATEMENT

For use of this form, see AR 190-11; the proponent agency is ODCSPER.

INSTRUCTIONS

This form will be prepared in three copies. The original will be maintained permanently in the files of the individual signing the form. The first copy will be maintained permanently in the using unit/organizational files. The second copy will be filed permanently in the Arms/ammunition storage facility. All entries except item 5 will be typewritten.

1. THE CONSTRUCTION OF THIS FACILITY CONFORMS TO THE CRITERIA OF AR 190-11 WHICH IS IN EFFECT ON THIS DATE EXCEPT AS INDICATED HEREON

This facility meets the Standards of Paragraph 4-2, Category II, AR 190-11, dated 31 Mar 86, for the Storage of Arms, Ammunition and Explosives.

2. ROOM AND BUILDING NUMBER, STREET AND INSTALLATION ADDRESS

Horsham Memorial USARC
936 Easton Road
Horsham, PA 19044-3399

3. THIS APPLIES TO

a. [X] AN EXISTING STRUCTURE
b. [ ] CONSTRUCTION OF NEW FACILITY
c. [ ] MODIFICATION OF EXISTING FACILITY *(Explain)*

4. NAME, GRADE, ORGANIZATION AND ADDRESS OF OFFICIAL SIGNING IN ITEM 5 BELOW

Larry R. Kelley
Directorate of Engineering and Housing
Fort Indiantown Gap, Annville, PA 17003-5011

5. SIGNATURE	6. DATE SIGNED
Larry R Kelley	6 June 1994

DA Form 4604-R, 1 Mar 77

PRELIMINARY ASSESSMENT SCREENING

Horsham Memorial U.S. Army Reserve Center
Horsham, Pennsylvania

Prepared For:

79th Army Reserve Command
Willow Grove, Pennsylvania

Prepared By:

Baltimore District
U.S. Army Corps of Engineers

7 February 1995

PRELIMINARY ASSESSMENT SCREENING
HORSHAM MEMORIAL U.S. ARMY RESERVE CENTER
HORSHAM, PENNSYLVANIA

TABLE OF CONTENTS

1.0 SUMMARY OF FINDINGS

A Preliminary Assessment Screening (PAS) of the Horsham Memorial U.S. Army Reserve Center (USARC) was conducted by the Baltimore District, U.S. Army Corps of Engineers. The subject facility is located in Horsham, Pennsylvania, and is owned and controlled by the 79th Army Reserve Command (ARCOM) located at Willow Grove Naval Air Station (NAS), Pennsylvania. Indications of environmental contamination, including the presence of stained soils and pavement, a potentially leaking underground storage tank (UST) and a potentially PCB-contaminated transformer, were identified at the subject facility. Therefore, a Type II site categorization is recommended. (See Section 2.3 for definition of site categories).

2.0 INTRODUCTION

2.1 Purpose

A PAS is conducted to determine recognized environmental conditions. These conditions are defined as the presence or potential presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or the potential for future release into structures or into the ground, groundwater, or surface water of the property. The PAS provides sufficient information to adequately identify the potential environmental contamination liabilities associated with real property acquisition, transfer, or disposal.

2.2 Special Terms and Conditions

This report was prepared in accordance with Army Regulation 200-1, *Environmental Enhancement and Protection*, paragraph 12-5, Real Property Transactions, as revised per memorandum, Department of the Army, Office of the Chief of Engineers, ENVR-EH, 1 November 1990, subject: Real Property Transactions and Environmental Baseline Studies (EBS).

The standards used to define the scope and methodology of the PAS is based on the American Society for Testing and Materials (ASTM) Standard Practice E 1527-94: *Environmental Site Assessments: Phase I Environmental Site Assessment Process*, June 1994. Throughout this report, these standards will be referred to as the ASTM standards.

Items considered to determine the type and quantity of hazardous substances stored, released into the environment or structures, or disposed on the site were based on available information during a comprehensive records search and visual site inspection.

For the purpose of real property transactions in accordance with AR 200-1, hazardous substances include polychlorinated biphenyls (PCBs); petroleum, oil, and lubricants (POL); friable asbestos; and unexploded ordnance (UXO).

For informational purposes, other environmental conditions discovered during preparation of the PAS that may warrant further consideration are discussed in Section 5.7. This PAS does not include any testing or sampling of materials (i.e., soil, water, air, or building materials).

2.3 Methodology Used

The PAS was conducted in four phases: a records review, site reconnaissance, interviews, and report preparation. Items considered include:

- Properties or structures in which it is known that hazardous substances were stored, released, or disposed;

- Environmental Compliance Assessment - U.S. Army Reserve (ECAAR) reports and other environmental documents.

- Information from Federal, state and local regulatory agencies regarding hazardous substances at the site and vicinity, including license/permit actions; violations of hazardous substance regulations; litigations; and illegal dumping of hazardous substances;

- Visual site inspection for unusual odors, stained soils, stressed vegetation, leachate seeps, land features related to human activities, and unnatural surface features;

- Personal interviews and a review of historic records.

Upon completion of the records review and the visual site inspection, the site was categorized as a Type I, II, or III property. Site categorization was based on the following criteria:

A Type I property has little potential for environmental contamination or disruption from past, present or proposed activities. The property is typically located in a non-hazardous location, such as an administrative, recreational, or residential area.

A Type II property has some potential for environmental contamination from past, present, or proposed activities. Current and former industrial sites are typically categorized as Type II properties. This site category consists or a perceived clean location which, due to former industrial or other activities within or near the site, has the potential for environmental contamination.

A Type III property has known environmental contamination or disruption from past or present activities. Sites currently known to be contaminated are included in this category. Examples include known disposal sites for hazardous substances as identified in previous studies; unexploded ordnance at a former range; etc.

These criteria are identified in Department of the Army memorandum, CEEC-P, 7 March 1989, subject: Environmental Survey Guidance for Potential Construction Sites as derived from AR 415-15, Military Construction, Army (MCA) Program Development.

3.0 SITE DESCRIPTION

3.1 Location and Legal Description

The subject facility is located at 936 Easton Road (State Route 611), Horsham, Pennsylvania (see Appendix A). The facility occupies approximately 6.8 acres in Montgomery County. The site is owned and controlled by the 79th ARCOM located at Willow Grove, Pennsylvania. The real property record holder and support installation is Fort Indiantown Gap, Pennsylvania.

3.2 Site and Vicinity Characteristics

The Horsham Memorial USARC is located in Horsham Township directly west of the Willow Grove NAS. The facility includes a main administration building and a vehicle maintenance facility. These two buildings occupy approximately 29,000 square feet (See Appendix B). The area surrounding the facility is primarily commercial in nature. Topography in the area is predominantly level.

3.3 Current Uses of the Property

The USARC is currently used for administrative and training purposes by Headquarters and Headquarters Company of the 157 Separate Infantry Brigade. The vehicle maintenance facility operates as a satellite of the Willow Grove Area Maintenance Support Activity (AMSA) #23G. The maintenance facility has four bays, a petroleum, oil, and lubricant (POL) storage room, and offices. A vehicle wash platform and hazardous materials storage shed are located adjacent to the maintenance facility. Floor drains from the maintenance facility and the wash platform are connected to an oil/water separator. Maintenance activities conducted at the maintenance facility include oil, hydraulic fluid, and antifreeze changes; oil filter replacement; parts cleaning; vehicle washing; engine repair; and brake servicing.

3.4 Past Uses of the Property

The subject facility was constructed in 1960. Based on archival research, prior to military use, the property was undeveloped with some agricultural use.

3.5 Current and Past Uses of Adjoining Properties

Willow Grove NAS is located west of the subject property. Residential areas are located north of the subject facility; a commercial area is located to the south; and Hallowell Elementary School is located to the east. Historically all of the surrounding properties were used for agricultural purposes.

4.0 RECORDS REVIEW

The following sources were used as references to determine environmental conditions and historical use of the property.

4.1 Federal, State and Local Environmental Records Sources

- *Draft Report, U.S. Army Compliance Assessment-Army Reserve (ECAAR),* Horsham Memorial U.S. Army Reserve Center, prepared by 416th Engineer Command, Fort Indiantown Gap, Pennsylvania, November 1991.

- *CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) Report,* Environmental Protection Agency (EPA), Region III, November 1994.

A review of Fort Indiantown Gap files and coordination with the Pennsylvania Department of Environmental Resources concerning the subject facility was also conducted.

4.2 Physical Setting Sources

The physical setting was obtained from a U.S. Geological Survey topographic map and a visual site inspection conducted 10 January 1995.

4.3 Historical Use Information

Historical use information was obtained from archival research at the Montgomery County Courthouse, interviews with the facility manager, Lieutanant Schuler, and the maintenance facility supervisor, Mr. Frank Hoff, and a review of real property records concerning the subject facility (see Appendix C).

5.0 INFORMATION FROM SITE RECONNAISSANCE AND INTERVIEWS

On 10 January 1995, a PAS team from the Baltimore District, U.S. Army Corps of Engineers conducted a visual inspection of the property. Interviews and telephone conversations with personnel familiar with the site were also conducted.

5.1 Hazardous Substances in Connection with Identified Uses

Waste POL products are stored in a hazardous materials storage shed with secondary containment. A POL storage room is located in the vehicle maintenance building. POL products in use are stored on a spill pallet in the maintenance building.

5.2 Hazardous Substance Containers and Unidentified Substance Containers

Five gallon containers of antifreeze, oil and cleaning compounds were located by the hazardous materials shed.

5.3 Storage Tanks

A 2,000 gallon underground storage tank (UST) for fuel oil is located south of the maintenance building. The UST was installed in 1960 and failed leak testing conducted in 1993. Removal of the UST has been recommended. Leaking of the UST could result in soil and ground water contamination.

5.4 Indications of Polychlorinated Biphenyls (PCBs)

A transformer was located north of the administrative building. No records of testing the transformer for PCB contamination were available.

5.5 Indications of Solid Waste Disposal

No indications of solid waste disposal were identified.

5.6 Physical Setting Analysis, if Migrating Hazardous Substances are an Issue

Due to the potential leaking of the UST, migration of fuel through groundwater and soil could occur. Topography in the vicinity of the subject facility is relatively flat.

5.7 Other Conditions of Concern

On the south side of the maintenance building, on a grassy area adjacent to the parking lot, approximately 40 square feet of stained soils were observed. The staining appeared to be from a petroleum spill. Two vehicle engines were observed north of the maintenance facility. The pavement beneath the engines was visibly stained by petroleum hydrocarbons.

A diesel fuel spill occured on the north side of the administrative building in March 1994. All contaminated soil was removed and replaced with clean fill. In addition, asbestos remediation for the two structures and lead abatement of a former indoor rifle range has been completed.

The Willow Grove NAS, located east of the subject facility, is listed in the CERCLIS report for preliminary assessment.

6.0 FINDINGS AND CONCLUSIONS

Based on the review of historical property records and available environmental documents, physical site investigations, and interviews with personnel familiar with the subject property, a Type II site categorization is recommended for the subject facility. Due to the presence of soils and pavement stained with petroleum hydrocarbons, a transformer which could contain PCBs,

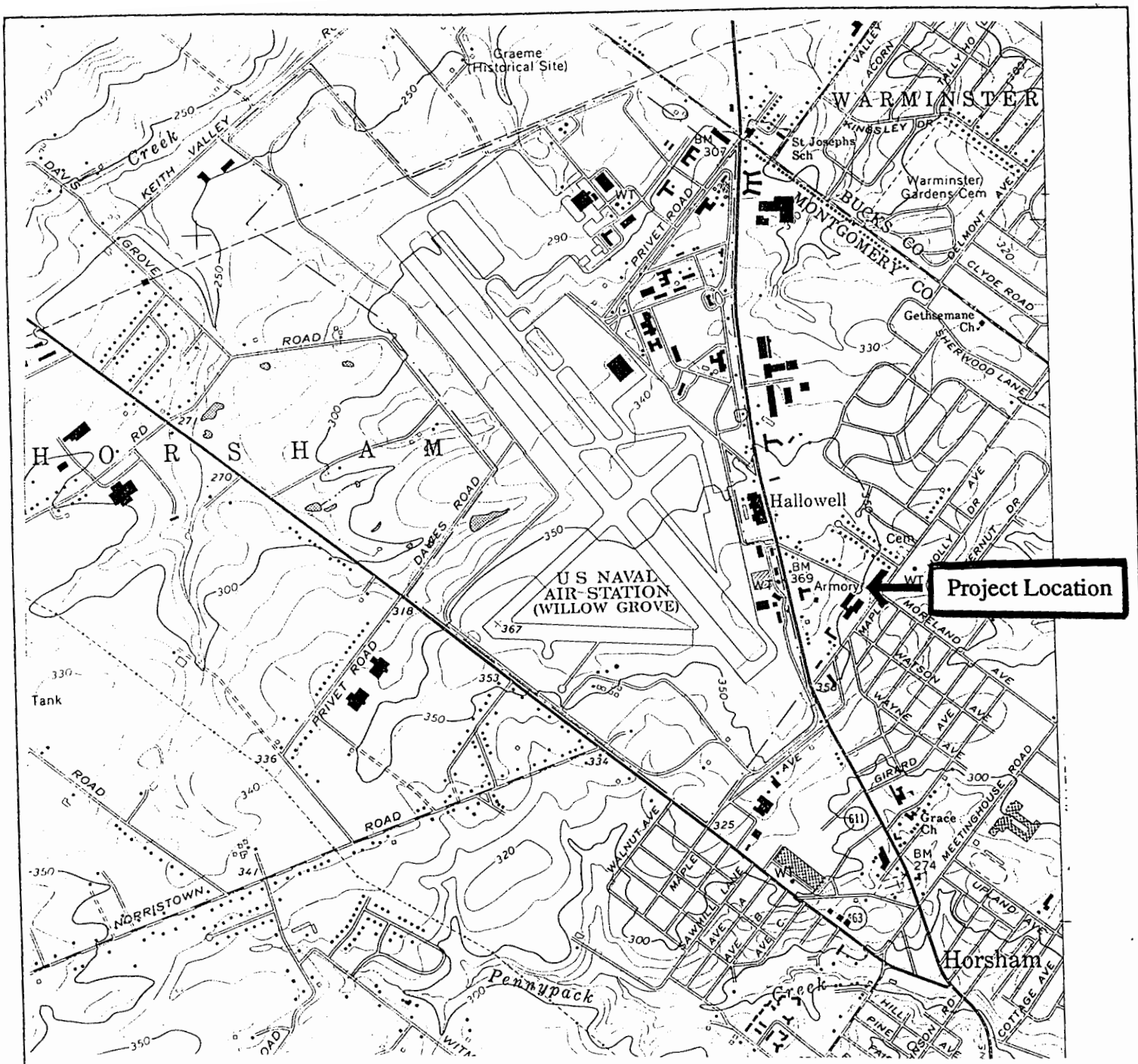
and a potentially leaking UST, the possibility of environmental contamination exists. Sampling should be conducted in the area of petroleum staining to determine if contamination has occured. In addition, the fluid in the transformer should be tested for PCB contamination, and the UST and any associated contamination should be removed.

7.0 PREPARED BY

Alysia Koufos (410)962-4938/3208
Jeffray N. Jones CENAB-PL-EM

APPENDIX A

Topographic Map



SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

MN GN
10° 178 MILS
0°07' 2 MILS

UTM GRID AND 1973 MAGNETIC NORTH

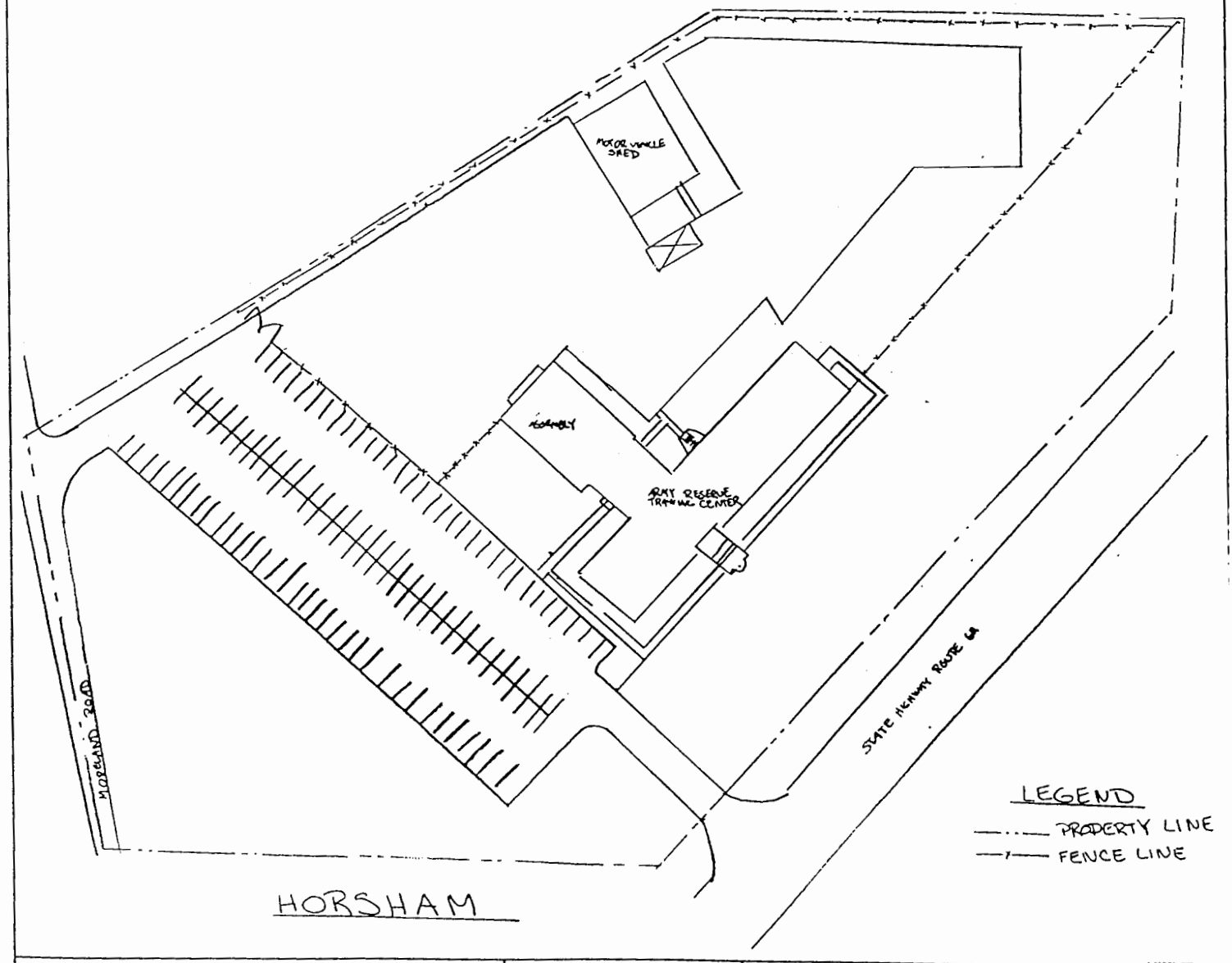
Source: U.S.G.S. Ambler Quadrangle, Pennsylvania, 7.5 Minute Series

US Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715

Horsham Memorial
U.S. Army Reserve Center
Horsham, PA

APPENDIX B

Site Map



US Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715

Site Map

Horsham Memorial
U.S. Army Reserve Center
Horsham, PA

APPENDIX C

Historical Use Information

Historical Use Information

79th ARCOM USARCs

Chain-of-Title for U.S. Army Reserve Center, Germantown, PA.			
Date of Purchase	**Seller**	**Purchaser**	**Deedbook # & Page**
1942	C. Sewall Clark	U.S. Government	#1564 Pg:269
1932	Clarence Clark	C. Sewall	#3845 Pg:496

Chain-of-Title for U.S Army Reserve Center, Horsham, PA.			
Date of Purchase	**Seller**	**Purchaser**	**Deedbook # & Page**
1953	Edith Lippincott	U.S. Government	#2385 Pg:500
1897	Daniel Buck	Albert Lippincott	#427 Pg:89
1893	Esther Lauken	Daniel Buck	#380 Pg:103

Chain-of-Title for U.S. Army Reserve Center, Bristol, PA.			
Date of Purchase	**Seller**	**Purchaser**	**Deedbook # & Page**
1954	Alice Taylor	U.S. Government	#1183 Pg:529
1943	Caleb N. Taylor	Alice Taylor	#731 Pg:147

Chain-of-Title for U.S. Army Reserve Center, Lock Haven, PA.			
Date of Purchase	**Seller**	**Purchaser**	**Deedbook # & Page**
1982	Kinley Bower	U.S. Government	#282 Pg:342
1964	Beulah Apker	Kinley Bower	#209 Pg:426

Chain-of-Title for U.S. Army Reserve Center, Gettysburg, PA.			
Date of Purchase	**Seller**	**Purchaser**	**Deedbook # & Page**
1961	Ralph Deatrick	U.S. Government	
1939	Paul & John Burkholder	Ralph Deatrick	#5854 Pg:319

Chain-of-Title for U.S. Army Reserve Center, Chambersburg, PA.			
Date of Purchase	**Seller**	**Purchaser**	**Deedbook # & Page**
1957	Charles Bender	U.S. Government	#488 Pg:523

UST CLOSURE REPORT
FOR
HORSHAM MEMORIAL USARC
936 EASTON RD.
HORSHAM, PA
CONTRACT NO. DACA31-95-D-0106
DELIVERY ORDER NO. 0002

Prepared by:

Engineering Technologies Associates, Inc.
3458 Ellicott Center Dr.
Ellicott City, MD 21043

MAY 1997

TABLE OF CONTENTS:

1.0 INTRODUCTION

This closure report has been completed in response to the removal of a 2000 gallon heating oil underground storage tank at the Horsham Memorial United States Army Reserve Center . This tank is unregulated by the federal government and the state of Pennsylvania. The removal was done as part of an ongoing contract with the Corps of Engineers (COE), Contract No. DACA31-95-D-0106. The tank was inactive at the time of removal, the facility converted to natural gas for space heating. The underground tank was due to be replaced with an aboveground storage tank while awaiting the conversion to natural gas heating. The concrete pad for the aboveground tank was poured in June of 1996. The aboveground tank was never placed because the gas lines were installed earlier than expected, eliminating the need for an aboveground tank. The design specifications for the concrete pad are included in the appendix in the event that the pad should ever be needed.

2.0 RELEASE INVESTIGATION AND CONFIRMATION STEPS

2.1 EVIDENCE OF RELEASE AND RELEASE DETECTION

The tank failed a tightness test in August of 1993. Prior to removal of the tank, the tightness test provided the only evidence that a leak may have occurred from the tank or piping adjacent to the tank.

2.2 ACTIONS TAKEN TO REMOVE THE TANK

The tank was excavated and removed for permanent closure on January 21, 1997. The steps taken to remove the tank are detailed below:

M & M Oil Supply removed approximately 350 gallons of oil from the tank prior to ETA initiating removal actions. The tank was located in the back of the garage under the grass area between the building and the asphalt parking lot. The equipment operator hit an unmarked, privately run electric line which passed directly over the tank, it was approximately 1 foot below the surface. The line ran from the corner of the building to a light pole, and was used to power a light for the parking lot. The line and conduit were removed from the ground and an electrical contractor ran an overhead line to supply power to the pole.

After removing the conduit from the ground, the rest of the overburden was removed and the tank top was exposed. The supply and return piping and the vent were removed, inspected for leaks (as was the soil surrounding the lines) and stockpiled on site. There did not appear to be any visible contamination of the soil stockpile. The tank was inspected for holes/cracks (none were evident), loaded onto a flatbed and transported by Sensinig Salvage to their recycling facility in Chambersburg, PA. Confirmatory sampling in the excavation and the stockpile was conducted to verify that none of the PADEP action levels for soil were exceeded. After taking the samples the excavation was backfilled with the soil and additional stone.

4.0 SAMPLING

No groundwater was encountered in the excavation, the only required sampling was of soil. The soil samples collected consist of the following:

1 below the end of the tank, directly below the fill connection
1 below the supply line from the tank
1 below the centerline of the tank
1 from the stockpiled soil

The sample results are documented in Appendix C of this report.

4.1 DESCRIPTION AND JUSTIFICATION OF SAMPLING

HNU Photoionization measurements were made on the excavated soils from the tank pit. Readings from the meter were well below the 10 ppm level for stockpiling soil as contaminated. All the soil was stockpiled together as clean, while waiting to backfill.

All of the soil samples were analyzed for Benzo(a)anthracene, Benzo(a)pyrene, Fluorene, Naphthalene and Phenanthrene by method 8270B. Samples were taken on January 21, 1997. These samples were analyzed by Wright Laboratories, all of the samples except the stockpile sample had at least one compound which exceeded the PADEP action levels for soil. Sample 0002 and 0003 exceeded the action levels for Benzo(a)anthracene and Benzo(a)pyrene. Sample 0004 exceeded the levels for Benzo(a)anthracene, Benzo(a)pyrene, Fluorene and Phenanthrene. Please refer to the sample results and the drawing in Appendix C which documents sample locations and sample results.

Because of the lack of suspected contamination in the excavation, confirmatory samples were taken to eliminate the possibility of spikes and/or contamination of the original samples. A core drill and a hand auger were used to gather samples in and around the original tank excavation, this took place on 4-4-97. The samples were analyzed for Benzo(a)anthracene, Benzo(a)pyrene, Fluorene, Naphthalene and Phenanthrene by method 8270B. Please refer to the drawing in Appendix C for the confirmatory sample locations. The second set of samples was analyzed by Core Laboratories, none of these confirmatory samples yielded levels above PADEP regulatory action levels. The results of these samples were sent to Christy Hughes, who is the regional representative for PADEP.

All correspondence regarding the issue of sampling and contamination levels is documented in Appendix F.

5.0 TANK AND PIPING DISPOSAL

The tank and piping were hauled off-site for cleaning and recycling by Sensenig Salvage. A copy of the "Certificate of Storage Tank Disposal" is included in Appendix G.

6.0 CLOSURE REPORT REQUIREMENTS

This tank, having been used to supply fuel oil for space heating, is unregulated by the federal government and by the state of Pennsylvania. This closure report is provided as part of the contractual agreement and does not serve to fulfill any regulatory requirements.

7.0 SITE RESTORATION

The excavation was backfilled with the clean dirt removed with the tank and with additional stone provided by Eureka Quarry. The final excavation dimensions were approximately 15 ft. X 10 ft. X 7 ft. deep. All disturbed areas will be restored with topsoil, seed and straw.

APPENDIX A- PHOTOGRAPHIC SHEETS

JANUARY 21, 1997–UST LOADED AND READY FOR TRANSPORT

JUNE 1996–CONCRETE PAD WITH BOLLARDS

DESIGNED		
DRAWN	R.G.	DATE
CHECKED		DATE
APPROVED		DATE

ENGINEERING TECHNOLOGIES ASSOCIATES, INC.
ENGINEERS • PLANNERS • SURVEYORS
3456 ELLICOTT CENTER DRIVE SUITE 101
ELLICOTT CITY, MARYLAND 21043
BALTO. 461-9938 WASH. 621-0999

CONTRACT NO. DACA31-95-D-0106
HORSHAM MEMORIAL USARC
PHOTOGRAPHIC SHEET

SCALE	CONTRACT NO. ~~DACA31-95~~ D-0106	DATE	SHEET

APPENDIX B- DISPOSAL DOCUMENTATION

M & M Oil Services Inc.

P.O. BOX 53
WARMINSTER, PA 18974
(215) 675-4640
FAX (215) 957-0522

CONTROL # 3432

BILL TO:
Engineering Tech.
3451 Ellicott CTR. DR.
Ellicott City, MD. 21043
CUSTOMER NUMBER
ROB GRIBBEN

SERVICE ADDRESS:
U.S. Army Reserve CTR.
Easton Rd.
Horsham, PA

DATE OF INVOICE	DRIVER	YOUR P.O. #	TAX EXEMPTION #	TRUCK #	DATE SERVICED	TERMS
1/21/97	Jeff B.			104		10 DAYS/NET

DESCRIPTION	QTY	UNIT PRICE	AMOUNT
350 Gallons used oil!			
Thank You!			

CUSTOMER PAYMENT: ☐ CHEQUE # _____ ☐ CASH ☐ INVOICE

WHITE COPY — BRANCH YELLOW COPY — CUSTOMER

N/C
PLEASE PAY THIS AMOUN

CUSTOMER SIGNATURE X _____ CUSTOMER PHONE # _____

I certify I have not mixed hazardous waste with any of my used products.

APR-01-1997 10:52

Recycle Today For Tomorrows Needs.

A SERVICE CHARGE OF 2% PER MONTH, (24% PER ANNUM), WILL BE CHARGED ON ALL OVERDUE ACCOUNTS

"Certificate of Storage Tank Disposal"

Transfer of Responsibility to

Sensenig Salvage

Chambersburg, Pennsylvania

PHONE: (717) 369-4283 DATE 1-21-97

The undersigned Salvage Facility accepts responsibility for the disposal of the tank(s) listed below in accordance with current Federal, State and Local regulations.

Having been permanently removed from service, these tanks ARE NOT . . . . .

1. Vapor free
2. Suitable for storage of Food Liquids intended for Human or Animal consumption.
3. Suitable for Underground storage of FLAMMABLE/COMBUSTIBLE/HAZARDOUS Liquids or materials.

2000	Gallon tank	Former Contents	#2 oil
	Gallon tank	Former Contents	
	Gallon tank	Former Contents	
	Gallon tank	Former Contents	
	Gallon tank	Former Contents	
	Gallon tank	Former Contents	
	Gallon tank	Former Contents	
	Gallon tank	Former Contents	

Owner Location
Name: US Army Reserve Center
Address: 936 Easton Rd.
Horsham, PA.
Signature: Michael C[illegible]
Date: 1-21-97

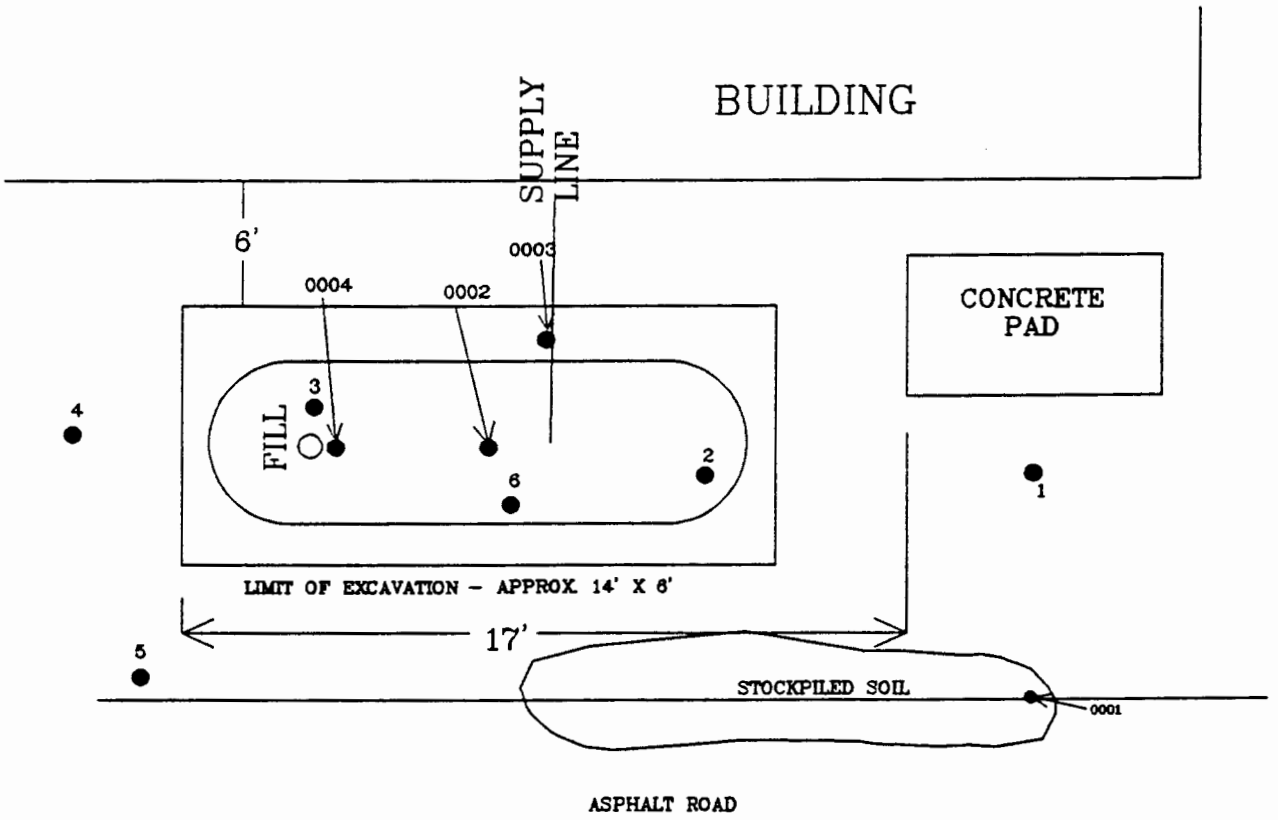
* CONTRACTOR *

E.T.A.

Salvage Facility
Sensenig Salvage
792 Coble Road
Chambersburg, PA 17201
Signature: Keith Sensenig
Date: 1-27-97

E.I ... # P...0055...58

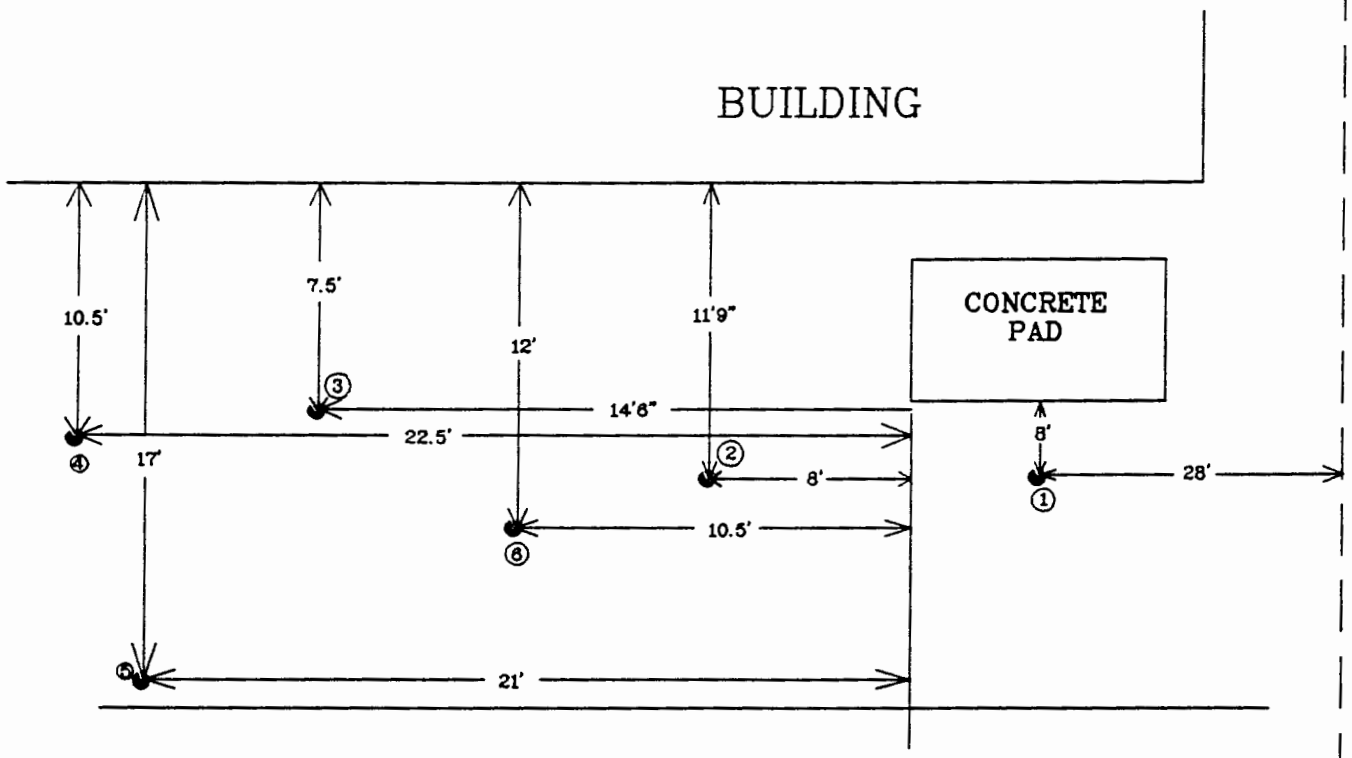
APPENDIX C- SOIL SAMPLE RESULTS



● ORIGINAL SAMPLES GATHERED ON 1/21/97

● CONFIRMATORY SAMPLES TAKEN WITH AUGER ON 4/4/97

DESIGNED ____ DATE DRAWN R.G. 6/24/98 DATE CHECKED ____ DATE APPROVED ____ DATE	ENGINEERING TECHNOLOGIES ASSOCIATES, INC. ENGINEERS • PLANNERS • SURVEYORS 3468 ELLICOTT CENTER DRIVE SUITE 101 ELLICOTT CITY, MARYLAND 21043 BALTO. 410-[illegible] WASH. 621-[illegible]	HORSHAM MEMORIAL USARC SAMPLING LOCATIONS SCALE: NTS | CONTRACT NO.: DACA31-95-D-0108 | DATE: 4-11-97 | SHEET:



● CONFIRMATORY SAMPLES TAKEN WITH AUGER ON 4/4/97
SAMPLES 1,2 AND 3 TAKEN AT 6' DEPTH
SAMPLE 4 TAKEN AT 2' DEPTH
SAMPLES 5 AND 6 TAKEN AT 3' DEPTH

DESIGNED ____ DATE
DRAWN R.G. 6/24/96 DATE
CHECKED ____ DATE
APPROVED ____ DATE

ENGINEERING TECHNOLOGIES ASSOCIATES, INC.
ENGINEERS • PLANNERS • SURVEYORS
3456 ELLICOTT CENTER DRIVE SUITE 101
ELLICOTT CITY, MARYLAND 21043
BALTO. 461-6660 WASH. 621-6660

HORSHAM MEMORIAL USARC
CONFIRMATORY SAMPLING LOCATIONS
TAKEN ON 4-4-97

SCALE: NTS | CONTRACT NO. DACA31-96-D-0106 | DATE 4-11-97 | SHEET

Wright Laboratory Services, Inc.
34 Dogwood Lane
Middletown, PA 17057
717-944-5541

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Please print. See back of COC for directions.

COC #: 5201

Sample Date: 1 / 21 / 97

Client Name: ETA
Address: Ellicott City MD
Contact: Rob Gribben
Phone #: 410 461 9920
Project Name/#: Horsham
Quote/PO #:
TAT: Normal ☒ *Rush ☐ *Rush TAT subject to approval and surcharges
Date Required:
Approved by:
Fax Results ? (Y) or N #: 410 750-8505

ANALYSES REQUESTED

	8270 naphthalene, Fluorine, phenanthrene, Benzo(A) Anthracine, Benzo Pyrene												
Container Type	G												
Preservative	4												

RECEIVING INFO (Lab use only)
COOLER TEMP:
COC SEAL INTACT: Y or N
SHIPPING CARRIER:
SHIPPING NO:

SAMPLE DESCRIPTION//LOCATION	G/C *	TIME 00:00	MATRIX **	NO. OF CONTAINERS PER ANALYSIS REQUESTED												COMMENTS/FIELD DATA
1 Supply Line 0003	G	1330	SD	1	✓	✓										
2 Center of Tank 0002	G	1330	SD	1	✓	✓										
3 Stock Pile 0001	G	1330	SD	1	✓	✓										
4 Far End of TANK 0004	G	1330	SD	1	✓	✓										
5																
6																
7																
8																
9																
10																
11																
12																

1.22.97

	Print Name and Company	Signature	Date/Time
Sampled by:	Robert Gribben	Robert Gribben	1/21/97 1320
Received by:	Eric Carpenter WLSI	Eric Carpenter	1-21-97 1520
Relinquished by:	Eric Carpenter WLSI	Eric Carpenter	1-21-97
Received by:	Ron Ditzel	Ron Ditzel	1-21-97 17:00
Relinquished by:	Ron Ditzel	Ron Ditzel	1-21-97 19:00
Received by:		JHK	1-21-97 1927

Remarks:

METHOD PROTOCOL: SW846 ☐ CFR136 ☐
DRINKING WATER ☐ OTHER:
REPORTING REQUIREMENTS: PADEP ☐
OTHER: PWSID:

* G = Grab; C = Composite ** Matrix - SD = Soil; SD = Solid; DW = Drinking Water; WW = Wastewater; GW = Groundwater; SL = Sludge; OL-Oil

Copies: WHITE - ORIGINAL CANARY - CUSTOMER MAILING PINK - FILE GOLDENROD - CUSTOMER COPY

Wright Laboratory SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

Sample # 92071-1

ATTN: Mr. Rob Gribben
ENGINEERING TECH. ASSOC. INC.
458 ELLICOTT CENTER DRIVE
SUITE 101
ELLICOTT MD 21043

January 28, 1997

LAB ANALYSIS REPORT

Job Name	: Engineering Tech.	Customer PO#	:
Job Number	: ET2135-RG-MC	Date Sampled	: 01/21/97 01:30 PM
Location	: Supply Line 0003	Date Received	: 01/21/97
Sample State	: Soil Grab	Date Approved	: 01/28/97
Collector	: RG	Discard Date	: 02/06/97

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT	METHOD
WATER QUALITY				
Total Solids	80	%	1	3540B
Diesel Fuel, Fuel Oil #2				
GAS CHROMATOGRAPH MASS SPEC.				
BASE NEUTRAL COMPOUNDS				
Benzo(a)anthracene	13000	ug/kg	700	8270B
Benzo(a)pyrene	3000	ug/kg	70	8270B
Fluorene	3200	ug/kg	100	8270B
Naphthalene	260	ug/kg	100	8270B
Phenanthrene	37000	ug/kg	1000	8270B
Benzo(a)anthracene	16000	ug/kg	Dry Weight	
Benzo(a)pyrene	3800	ug/kg	Dry Weight	
Fluorene	4000	ug/kg	Dry Weight	
Naphthalene	330	ug/kg	Dry Weight	
Phenanthrene	46000	ug/kg	Dry Weight	

**** Continued ****

Wright Laboratory SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

January 28, 1997

Due to the level of analytes present in the sample, a dilution was performed on the GC/MS semi-volatile sample. Detection limits were raised accordingly.

The GC/MS semi-volatile surrogate standard, 2-fluorobiphenyl, was not within the acceptable recovery limits of 30-115% for the diluted sample. 01-24-97 jlk

This report relates only to the samples as received by the laboratory, and may only be reproduced in full.

QUALITY ASSURANCE REPORT

Q/A PARAMETER	RESULT		
GAS CHROMATOGRAPH MASS SPEC.			
BASE NEUTRAL COMPOUNDS			
2-Fluorobiphenyl	113	% Recovery	Surrogate
2-Fluorobiphenyl	116	% Recovery	Surrogate
Nitrobenzene-d5	78	% Recovery	Surrogate
Nitrobenzene-d5	90	% Recovery	Surrogate
Terphenyl-d14	66	% Recovery	Surrogate
Terphenyl-d14	114	% Recovery	Surrogate
ATER QUALITY			
Total Solids	81	%	Duplicate

TEST/PARAMETER	PRESERVATIVE	TECH	ANALYSIS DATE	TIME
Total Solids	Cool to 4 Deg. C	NMC	01/24/97	11:30
BASE NEUTRAL COMPOUNDS	Cool to 4 Deg. C	STR	01/22/97	16:56
3550A Ultrasonic Extraction		DCF	01/21/97	

Respectfully Submitted,
WRIGHT LABORATORY SERVICES

James L. Ressler
Laboratory Manager

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

Sample # 92071-2

ATTN: Mr. Rob Gribben
ENGINEERING TECH. ASSOC. INC.
458 ELLICOTT CENTER DRIVE
SUITE 101
ELLICOTT MD 21043

January 28, 1997

LAB ANALYSIS REPORT

Job Name	: Engineering Tech.	Customer PO#	:
Job Number	: ET2135-RG-MC	Date Sampled	: 01/21/97 01:30 PM
Location	: Center of Tank 0002	Date Received	: 01/21/97
Sample State	: Soil Grab	Date Approved	: 01/28/97
Collector	: RG	Discard Date	: 02/06/97

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT	METHOD
WATER QUALITY				
Total Solids	81	%	1	3540B
Diesel Fuel, Fuel Oil #2				
GAS CHROMATOGRAPH MASS SPEC.				
BASE NEUTRAL COMPOUNDS				
Benzo(a)anthracene	12000	ug/kg	700	8270B
Benzo(a)pyrene	3300	ug/kg	70	8270B
Fluorene	3300	ug/kg	100	8270B
Naphthalene	460	ug/kg	100	8270B
Phenanthrene	31000	ug/kg	1000	8270B
Benzo(a)anthracene	15000	ug/kg	Dry Weight	
Benzo(a)pyrene	4100	ug/kg	Dry Weight	
Fluorene	4100	ug/kg	Dry Weight	
Naphthalene	570	ug/kg	Dry Weight	
Phenanthrene	38000	ug/kg	Dry Weight	

**** Continued ****

Wright Laboratory SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

January 28, 1997

Due to the level of analytes present in the sample, a dilution was performed on the GC/MS semi-volatile sample. Detection limits were raised accordingly.

This report relates only to the samples as received by the laboratory, and may only be reproduced in full.

QUALITY ASSURANCE REPORT

Q/A PARAMETER	RESULT	
GAS CHROMATOGRAPH MASS SPEC.		
BASE NEUTRAL COMPOUNDS		
2-Fluorobiphenyl	94	% Recovery Surrogate
2-Fluorobiphenyl	98	% Recovery Surrogate
Nitrobenzene-d5	73	% Recovery Surrogate
Nitrobenzene-d5	82	% Recovery Surrogate
Terphenyl-d14	74	% Recovery Surrogate
Terphenyl-d14	100	% Recovery Surrogate

TEST/PARAMETER	PRESERVATIVE	TECH	ANALYSIS DATE	TIME
Total Solids	Cool to 4 Deg. C	NMC	01/24/97	11:30
BASE NEUTRAL COMPOUNDS	Cool to 4 Deg. C	STR	01/22/97	17:23
3550A Ultrasonic Extraction		DCF	01/21/97	

Respectfully Submitted,
WRIGHT LABORATORY SERVICES

James L. Ressler
Laboratory Manager

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

Sample # 92071-3

ATTN: Mr. Rob Gribben
ENGINEERING TECH. ASSOC. INC.
458 ELLICOTT CENTER DRIVE
SUITE 101
ELLICOTT MD 21043

January 28, 1997

LAB ANALYSIS REPORT

Job Name	: Engineering Tech.	Customer PO#	:
Job Number	: ET2135-RG-MC	Date Sampled	: 01/21/97 01:30 PM
Location	: Stockpile 0001	Date Received	: 01/21/97
Sample State	: Soil Grab	Date Approved	: 01/28/97
Collector	: RG	Discard Date	: 02/06/97

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT	METHOD
ATER QUALITY				
Total Solids	81	%	1	3540B
iesel Fuel, Fuel Oil #2				
GAS CHROMATOGRAPH MASS SPEC.				
BASE NEUTRAL COMPOUNDS				
Benzo(a)anthracene	650	ug/kg	70	8270B
Benzo(a)pyrene	410	ug/kg	70	8270B
Fluorene	330	ug/kg	100	8270B
Naphthalene	N.D.	ug/kg	100	8270B
Phenanthrene	2500	ug/kg	100	8270B
Benzo(a)anthracene	800	ug/kg	Dry Weight	
Benzo(a)pyrene	510	ug/kg	Dry Weight	
Fluorene	410	ug/kg	Dry Weight	
Naphthalene	< 120	ug/kg	Dry Weight	
Phenanthrene	3100	ug/kg	Dry Weight	

N.D. - Not Detected

**** Continued ****

Wright Laboratory SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

January 28, 1997

This report relates only to the samples as received by the laboratory, and may only be reproduced in full.

QUALITY ASSURANCE REPORT

Q/A PARAMETER	RESULT	
AS CHROMATOGRAPH MASS SPEC.		
BASE NEUTRAL COMPOUNDS		
2-Fluorobiphenyl	69	% Recovery Surrogate
Nitrobenzene-d5	49	% Recovery Surrogate
Terphenyl-d14	101	% Recovery Surrogate

TEST/PARAMETER	PRESERVATIVE	TECH	ANALYSIS DATE	TIME
otal Solids	Cool to 4 Deg. C	NMC	01/24/97	11:30
ASE NEUTRAL COMPOUNDS	Cool to 4 Deg. C	STR	01/22/97	19:10
3550A Ultrasonic Extraction		DCF	01/21/97	

Respectfully Submitted,
WRIGHT LABORATORY SERVICES

James L. Ressler
Laboratory Manager

Wright Laboratory SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

Sample # 92071-4

ATTN: Mr. Rob Gribben
ENGINEERING TECH. ASSOC. INC.
3458 ELLICOTT CENTER DRIVE
SUITE 101
ELLICOTT MD 21043

January 28, 1997

LAB ANALYSIS REPORT

Job Name	: Engineering Tech.	Customer PO#	:
Job Number	: ET2135-RG-MC	Date Sampled	: 01/21/97 01:30 PM
Location	: Far End of Tank 0004	Date Received	: 01/21/97
Sample State	: Soil Grab	Date Approved	: 01/28/97
Collector	: RG	Discard Date	: 02/07/97

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT	METHOD
WATER QUALITY				
Total Solids	82	%	1	3540B
Diesel Fuel, Fuel Oil #2				
GAS CHROMATOGRAPH MASS SPEC.				
BASE NEUTRAL COMPOUNDS				
Benzo(a)anthracene	81000	ug/kg	5600	8270B
Benzo(a)pyrene	50000	ug/kg	5600	8270B
Fluorene	45000	ug/kg	8000	8270B
Naphthalene	N.D.	ug/kg	8000	8270B
Phenanthrene	240000	ug/kg	8000	8270B
Benzo(a)anthracene	99000	ug/kg	Dry Weight	
Benzo(a)pyrene	61000	ug/kg	Dry Weight	
Fluorene	55000	ug/kg	Dry Weight	
Naphthalene	< 9800	ug/kg	Dry Weight	
Phenanthrene	290000	ug/kg	Dry Weight	

N.D. - Not Detected

**** Continued ****

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

January 28, 1997

A dilution was performed on the GC/MS semi-volatile sample at the extraction level. Detection limits were raised accordingly.
01-24-97 jlk

Due to the level of analytes present in the sample, a dilution was performed on the GC/MS semi-volatile sample. Detection limits were raised accordingly.

This report relates only to the samples as received by the laboratory, and may only be reproduced in full.

QUALITY ASSURANCE REPORT

Q/A PARAMETER	RESULT	
GAS CHROMATOGRAPH MASS SPEC.		
BASE NEUTRAL COMPOUNDS		
2-Fluorobiphenyl	40	% Recovery Surrogate
Nitrobenzene-d5	48	% Recovery Surrogate
Terphenyl-d14	59	% Recovery Surrogate

TEST/PARAMETER	PRESERVATIVE	TECH	ANALYSIS DATE	TIME
Total Solids	Cool to 4 Deg. C	NMC	01/24/97	11:30
BASE NEUTRAL COMPOUNDS	Cool to 4 Deg. C	STR	01/23/97	17:50
3550A Ultrasonic Extraction		DCF	01/21/97	

Respectfully Submitted,
WRIGHT LABORATORY SERVICES

James L. Ressler
Laboratory Manager

CORELAB

CORE LABORATORIES, INC.

No. 091421

CHAIN OF CUSTODY RECORD

CUSTOMER INFORMATION	PROJECT INFORMATION
COMPANY: Engineering Tech. Assoc. Inc.	PROJECT NAME/NUMBER: Horsham USARC
SEND REPORT TO: Rob Cribben	**BILLING INFORMATION**
ADDRESS: 345B Ellicott Center Dr. Ellicott City, MD 21043	BILL TO: Engineering Tech. Assoc., Inc. ADDRESS: 345B Ellicott Center Dr. Ellicott City, MD
PHONE: (410) 461-7770	PHONE: (410) 461-7770
FAX: (410) 750-8565	FAX: 410 750 8565 PO NO.

NUMBER OF CONTAINERS

ANALYSIS / METHOD REQUEST: Benzo(a)anthracene-8270B; Benzo(a)pyrene-8270B; Fluorene-8270B; Naphthalene 8270B; Phenanthrene-8270B

LAB JOB NO.

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	CONTAINER	PRESERV.	REMARKS / PRECAUTIONS
1		4.4.97	1:20PM	Soil	Glass	Ice	
2							
3							
4							
5							
6							

SAMPLER:

SHIPMENT METHOD:

AIRBILL NO.:

REQUIRED TURNAROUND:* [ ] SAME DAY [ ] 24 HOURS [ ] 48 HOURS [ ] 72 HOURS [ ] 5 DAYS [ ] 10 DAYS [ ] ROUTINE OTHER

1. RELINQUISHED BY:	DATE	2. RELINQUISHED BY:	DATE	3. RELINQUISHED BY:	DATE
SIGNATURE: Robert Cribben	4/4/97	SIGNATURE:		SIGNATURE:	
PRINTED NAME/COMPANY: Rob Cribben / ETA	TIME: 2:40	PRINTED NAME/COMPANY:	TIME	PRINTED NAME/COMPANY:	TIME
1. RECEIVED BY:	DATE	2. RECEIVED BY:	DATE	3. RECEIVED BY:	DATE
SIGNATURE:	4/4/97	SIGNATURE:		SIGNATURE:	
PRINTED NAME/COMPANY: CORE LABS	TIME 2:40	PRINTED NAME/COMPANY:	TIME	PRINTED NAME/COMPANY:	TIME

RUSH TURNAROUND MAY REQUIRE SURCHARGE

☐ Anaheim, CA 1250 E. Gene Autry Way Anaheim, CA 92805 (714) 937-1094 Fax (714) 937-1170

☐ Aurora, CO 10703 E. Bethany Drive Aurora, CO 80014 (303) 751-1780 Fax (303) 751-1784

☐ Casper, WY 420 W. First Street Casper, WY 82601 (307) 235-5741 Fax (307) 266-1676

☐ Corpus Christi, TX 1733 N. Padre Island Drive Corpus Christi, TX 78408 (512) 289-2673 Fax (512) 289-2471

☒ Edison, NJ 284 Raritan Center Parkway Edison, NJ 08837 (908) 225-6700 Fax (908) 225 6777

☐ Houston, TX (Env) 6310 Rothway Drive Houston, TX 77040 (713) 690-4444 Fax (713) 690-5646

☐ Houston, TX (Pet) 8210 Mosley Road Houston, TX 77075 (713) 943-2276 Fax (713) 943-3846

☐ Indianapolis, IN 7726 Moller Road Indianapolis, IN 46268 (317) 875-5894 Fax (317) 872-6189

☐ Lake Charles, LA 3645 Beglis Parkway Sulphur, LA 70663 (318) 583-4 (318) 583

☐ Long Beach, CA 3700 Cherry Avenue Long Beach, CA 90807 (310) 5 ax (310)

☐ Tampa, FL 5460 Beaumont Center Blvd. Tampa, FL 33634 (8 68 Fax 4938

☐ Valparaiso, IN 2400 Cumberland Drive Valparaiso, IN 464-238) 462-2

CLIENT COPY

CORE

DATA MANAGEMENT SUMMARY REPORT
(DM-OCC) - Parameters Tested, Selected Samples, Selected Parameter List

Chain of Custody Data Required for ETC Data Management Summary Report

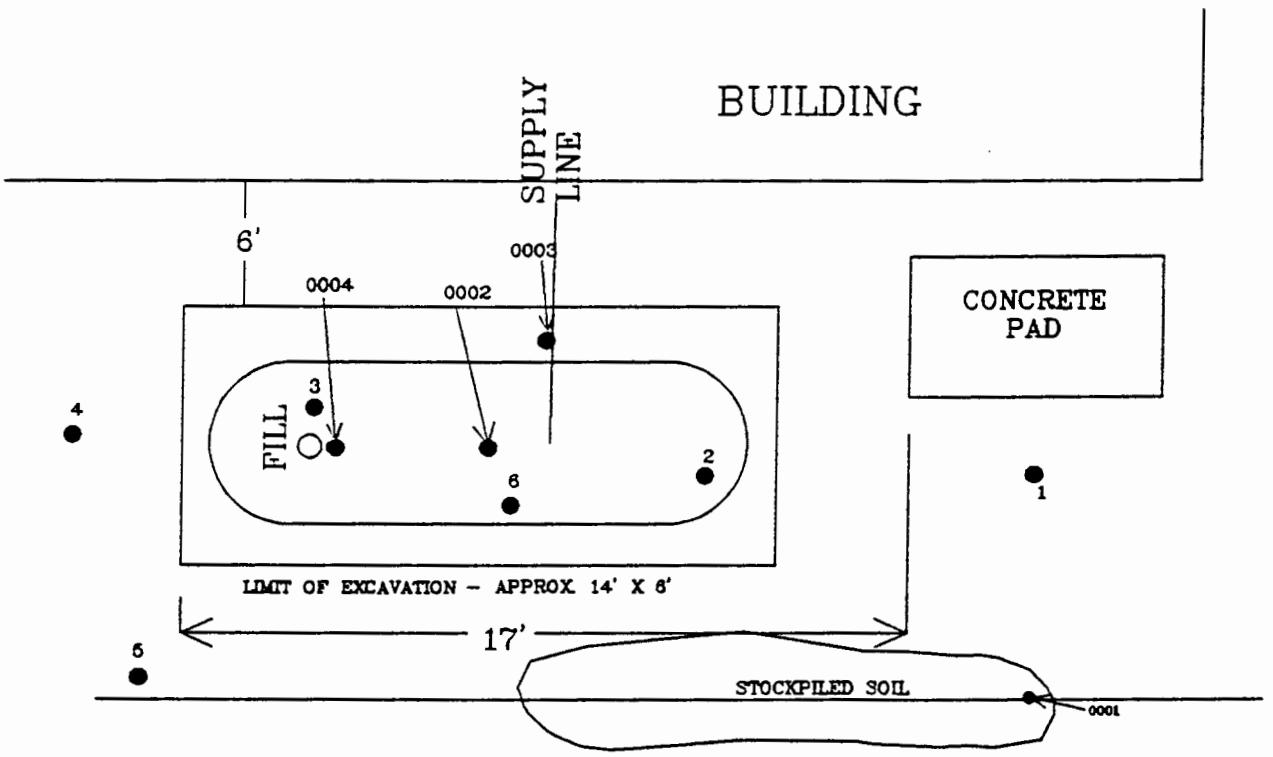
ENGINEERING TECHNOLOGIES & ASSOC., 1 HORSHAM

See Below — *ETC Sample No.* | *Company* | *Facility* | See Below — *Sample Point* | *Date*

Parameters	*Units*	*Sample Points, Sampling Dates, and ETC Sample No.'s*							
		SOIL1 970404 BVA500	SOIL2 970404 BVA501	SOIL3 970404 BVA502	SOIL4 970404 BVA503	SOIL5 970404 BVA504	SOIL6 970404 BVA505		
Custom Parameter List									
Benzo(a)anthracene	ug/kg	< 300	643	< 400	< 300	< 400	< 300		
Benzo(a)pyrene	ug/kg	< 100	313	< 100	< 100	< 100	< 100		
Fluorene	ug/kg	< 80	206	< 90	< 80	< 90	< 80		
Naphthalene	ug/kg	< 70	< 80	< 80	< 70	< 80	< 70		
Phenanthrene	ug/kg	J 43	2120	< 300	J 62	< 300	J 93		

Footnotes: BMDL=Below Method Detection Limit ND=Parameter not detected "-"=Parameter not tested J=BMDL(Value Reported) <=ND(MDL Reported)

APPENDIX D- AS BUILT DRAWING



● ORIGINAL SAMPLES GATHERED ON 1/21/97

● CONFIRMATORY SAMPLES TAKEN WITH AUGER ON 4/4/97

DESIGNED ____ DATE	ENGINEERING TECHNOLOGIES ASSOCIATES, INC.	HORSHAM MEMORIAL USARC SAMPLING LOCATIONS
DRAWN R.G. 6/24/96 DATE	ENGINEERS • PLANNERS • SURVEYORS	
CHECKED ____ DATE	3468 ELLICOTT CENTER DRIVE SUITE 101 ELLICOTT CITY, MARYLAND 21043	
APPROVED ____ DATE	BALTO. 410-[illegible] WASH. 202-[illegible]	SCALE: NTS CONTRACT NO. DACW31-95-D-0106 DATE: 4-11-97 SHEET

APPENDIX E- UST SUMMARY CLOSURE REPORT FORM

Underground Storage Tank Closure Form

Prepared by: Robert Gribben Date: _____ Page 1 of 2

Owner Name Facility Engr. - Fort Indiantown Gap	Facility Name Horsham USARC
Address 1119 Utility Rd. Annville, PA	Address 936 Easton Rd.
Contact Person Mr. Jim Troese	Contact Person
Telephone No. (717) 782-3750	Telephone No.
ID No.	ID No.

Description of UST

Tank No.	1
Contents (Gas, diesel, etc.)	Fuel Oil
Capacity (Gallons)	2,000
Material (Steel, etc.)	Steel
Contents Volume (Gallons)	350
Installation Year	

Closure Method

Removal	✓
Abandon in Place	

Samples

No. of Tank Content Samples	0
No. of Pit Soil Samples	3
No. of Stockpiled Soil Samples	1
No. of Wash Water Samples	0

Contamination Information

Depth to Groundwater (Feet) N/A
Groundwater Contamination (Y/N) N/A
Soil Contamination Quantity (CY) 0
Describe Excavated Soil (Sandy, clay, etc.) Sand + Rocky Material
Other pertinent information: Core Drill Samples taken following initial excavation samples. Initial samples came up not (except stockpile sample), Core drill samples were below PADEP action levels for all compounds analyzed for.

Remediation Actions

Soil Transportation (By Whom) N/A
Soil Disposal (Operator & Location)
Soil Treatment (Where:Method)

Groundwater Treatment Method
Effluent Discharge Location
Monitoring Wells (Q'ty, Depth & Diameter
Wash Water Transportation (By Whom)
Wash Water Disposal (Operator & Location)
Wash Water Treatment Method
Effluent Discharge Location
Tank Content Transportation (By Whom)
Tank Content Disposal (Operator & Location)
Tank Content Recycling (Operator & Location)

APPENDIX F- PADEP CORRESPONDENCE

Engineering Technologies Associates, Inc.
Engineers • Planners • Surveyors

3458 Ellicott Center Drive, Suite 101
Ellicott City, MD 21043

Baltimore Area (410) 461-9920
Washington Area (301) 621-4690
FAX: (410) 750-8565

FAX TRANSMITTAL

Date: 3/1/97

Number of Pages (including cover): 6 Fax No. (610) 832-6143

Company: PADEP RE: UST Closure (1,000 G #2140) at Horsham USARC.

Attn: Kathy Nagle

Message: Kathy,

Please review and advise me ~~of~~ as to any actions which need to take place.

Original Copy will be forwarded by mail: Yes ~~No~~

From: Robert Gribben

If you have any problems receiving this transmission, please contact our office at the number listed above.

I removed a 1,000 gallon #2 Heating Oil Tank at the Horsham United States Army Reserve Center (936 Easton Rd. Horsham, PA) on 1/21/97. This is an unregulated Tank, but we still sample in the excavation and in the stockpile prior to backfilling the excavation, as per our contract with the Corps of Engineers. The hole and the stockpile both appeared to be clean, there was no odor & no stains in the soil. I collected 3 samples in the excavation and one in the stockpile. The 3 samples in the excavation yielded levels above the regulatory Limit (shown with a * on the sample results). The stockpile levels were not above the action levels for any of the parameters analyzed for.

I had to take over a project at Ft. Dix, NJ, and I did not see these sample results as I have been up there for about a month. Please contact me so we can discuss this matter. You can reach me at Ft. Dix on (609) 723-7661, if you can't reach me there leave a message at (410) 461-9920 x 110 & I will check ~~it~~ my messages this week.

Wright Laboratory SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

Sample # 92071-3

ATTN: Mr. Rob Gribben
NGINEERING TECH. ASSOC. INC.
458 ELLICOTT CENTER DRIVE
SUITE 101
ELLICOTT MD 21043

January 28, 1997

LAB ANALYSIS REPORT

Job Name	: Engineering Tech.	Customer PO#	:
Job Number	: ET2135-RG-MC	Date Sampled	: 01/21/97 01:30 PM
Location	: Stockpile 0001	Date Received	: 01/21/97
Sample State	: Soil Grab	Date Approved	: 01/28/97
Collector	: RG	Discard Date	: 02/06/97

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT	METHOD
WATER QUALITY				
Total Solids	81	%	1	3540B
Diesel Fuel, Fuel Oil #2				
GAS CHROMATOGRAPH MASS SPEC.				
BASE NEUTRAL COMPOUNDS				
Benzo(a)anthracene	650	ug/kg	70	8270B
Benzo(a)pyrene	410	ug/kg	70	8270B
Fluorene	330	ug/kg	100	8270B
Naphthalene	N.D.	ug/kg	100	8270B
Phenanthrene	2500	ug/kg	100	8270B
Benzo(a)anthracene	800	ug/kg	Dry Weight	
Benzo(a)pyrene	510	ug/kg	Dry Weight	
Fluorene	410	ug/kg	Dry Weight	
Naphthalene	< 120	ug/kg	Dry Weight	
Phenanthrene	3100	ug/kg	Dry Weight	

N.D. - Not Detected

**** Continued ****

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

Sample # 92071-1

ATTN: Mr. Rob Gribben
ENGINEERING TECH. ASSOC. INC.
158 ELLICOTT CENTER DRIVE
SUITE 101
ELLICOTT MD 21043

January 28, 1997

LAB ANALYSIS REPORT

Job Name	: Engineering Tech.	Customer PO#	:
Job Number	: ET2135-RG-MC	Date Sampled	: 01/21/97 01:30 PM
Location	: Supply Line 0003	Date Received	: 01/21/97
Sample State	: Soil Grab	Date Approved	: 01/28/97
Collector	: RG	Discard Date	: 02/06/97

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT	METHOD
WATER QUALITY				
Total Solids	80	%	1	3540B
Diesel Fuel, Fuel Oil #2				
GAS CHROMATOGRAPH MASS SPEC.				
BASE NEUTRAL COMPOUNDS				
Benzo(a)anthracene	13000	ug/kg	700	8270B
Benzo(a)pyrene	3000	ug/kg	70	8270B
Fluorene	3200	ug/kg	100	8270B
Naphthalene	260	ug/kg	100	8270B
Phenanthrene	37000	ug/kg	1000	8270B
* Benzo(a)anthracene	16000	ug/kg	Dry Weight	
* Benzo(a)pyrene	3800	ug/kg	Dry Weight	
Fluorene	4000	ug/kg	Dry Weight	
Naphthalene	330	ug/kg	Dry Weight	
Phenanthrene	46000	ug/kg	Dry Weight	

**** Continued ****

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

ATTN: Mr. Rob Gribben
NGINEERING TECH. ASSOC. INC.
458 ELLICOTT CENTER DRIVE
SUITE 101
ELLICOTT MD 21043

January 28, 1997

LAB ANALYSIS REPORT

Job Name	: Engineering Tech.	Customer PO#	:
ob Number	: ET2135-RG-MC	Date Sampled	: 01/21/97 01:30 PM
ocation	: Center of Tank 0002	Date Received	: 01/21/97
Sample State	: Soil Grab	Date Approved	: 01/28/97
Collector	: RG	Discard Date	: 02/06/97

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT	METHOD
ATER QUALITY				
Total Solids	81	%	1	3540B
iesel Fuel, Fuel Oil #2				
GAS CHROMATOGRAPH MASS SPEC.				
BASE NEUTRAL COMPOUNDS				
Benzo(a)anthracene	12000	ug/kg	700	8270B
Benzo(a)pyrene	3300	ug/kg	70	8270B
Fluorene	3300	ug/kg	100	8270B
Naphthalene	460	ug/kg	100	8270B
Phenanthrene	31000	ug/kg	1000	8270B
Benzo(a)anthracene	15000	ug/kg	Dry Weight	
Benzo(a)pyrene	4100	ug/kg	Dry Weight	
Fluorene	4100	ug/kg	Dry Weight	
Naphthalene	570	ug/kg	Dry Weight	
Phenanthrene	38000	ug/kg	Dry Weight	

**** Continued ****

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

Sample # 92071-4

ATTN: Mr. Rob Gribben
ENGINEERING TECH. ASSOC. INC.
458 ELLICOTT CENTER DRIVE
SUITE 101
ELLICOTT MD 21043

January 28, 1997

LAB ANALYSIS REPORT

Job Name	: Engineering Tech.	Customer PO#	:
Job Number	: ET2135-RG-MC	Date Sampled	: 01/21/97 01:30 PM
Location	: Far End of Tank 0004	Date Received	: 01/21/97
Sample State	: Soil Grab	Date Approved	: 01/28/97
Collector	: RG	Discard Date	: 02/07/97

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT	METHOD
ATER QUALITY				
Total Solids	82	%	1	3540B
iesel Fuel, Fuel Oil #2				
GAS CHROMATOGRAPH MASS SPEC.				
BASE NEUTRAL COMPOUNDS				
Benzo(a)anthracene	81000	ug/kg	5600	8270B
Benzo(a)pyrene	50000	ug/kg	5600	8270B
Fluorene	45000	ug/kg	8000	8270B
Naphthalene	N.D.	ug/kg	8000	8270B
Phenanthrene	240000	ug/kg	8000	8270B
Benzo(a)anthracene	99000	ug/kg	Dry Weight	
Benzo(a)pyrene	61000	ug/kg	Dry Weight	
Fluorene	55000	ug/kg	Dry Weight	
Naphthalene	< 9800	ug/kg	Dry Weight	
Phenanthrene	290000	ug/kg	Dry Weight	

N.D. - Not Detected

**** Continued ****

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

January 28, 1997

Due to the level of analytes present in the sample, a dilution was performed on the GC/MS semi-volatile sample. Detection limits were raised accordingly.

The GC/MS semi-volatile surrogate standard, 2-fluorobiphenyl, was not within the acceptable recovery limits of 30-115% for the diluted sample. 01-24-97 jlk

QUALITY ASSURANCE REPORT

Q/A PARAMETER	RESULT		
GAS CHROMATOGRAPH MASS SPEC.			
BASE NEUTRAL COMPOUNDS			
2-Fluorobiphenyl	113	% Recovery	Surrogate
2-Fluorobiphenyl	116	% Recovery	Surrogate
Nitrobenzene-d5	78	% Recovery	Surrogate
Nitrobenzene-d5	90	% Recovery	Surrogate
Terphenyl-d14	66	% Recovery	Surrogate
Terphenyl-d14	114	% Recovery	Surrogate
WATER QUALITY			
Total Solids	81	%	Duplicate

TEST/PARAMETER	PRESERVATIVE	TECH	ANALYSIS DATE	TIME
Total Solids	Cool to 4 Deg. C	NMC	01/24/97	11:30
BASE NEUTRAL COMPOUNDS	Cool to 4 Deg. C	STR	01/22/97	16:56
3550A Ultrasonic Extraction		DCF	01/21/97	

Respectfully Submitted,
WRIGHT LABORATORY SERVICES

James L. Ressler
Laboratory Manager

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

January 28, 1997

Due to the level of analytes present in the sample, a dilution was performed on the GC/MS semi-volatile sample. Detection limits were raised accordingly.

This report relates only to the samples as received by the laboratory, and may only be reproduced in full.

QUALITY ASSURANCE REPORT

Q/A PARAMETER	RESULT	
GAS CHROMATOGRAPH MASS SPEC.		
BASE NEUTRAL COMPOUNDS		
2-Fluorobiphenyl	94	% Recovery Surrogate
2-Fluorobiphenyl	98	% Recovery Surrogate
Nitrobenzene-d5	73	% Recovery Surrogate
Nitrobenzene-d5	82	% Recovery Surrogate
Terphenyl-d14	74	% Recovery Surrogate
Terphenyl-d14	100	% Recovery Surrogate

TEST/PARAMETER	PRESERVATIVE	TECH	ANALYSIS DATE	TIME
Total Solids	Cool to 4 Deg. C	NMC	01/24/97	11:30
BASE NEUTRAL COMPOUNDS	Cool to 4 Deg. C	STR	01/22/97	17:23
3550A Ultrasonic Extraction		DCF	01/21/97	

Respectfully Submitted,
WRIGHT LABORATORY SERVICES

James L. Ressler
Laboratory Manager

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

January 28, 1997

QUALITY ASSURANCE REPORT

Q/A PARAMETER	RESULT	
GAS CHROMATOGRAPH MASS SPEC.		
BASE NEUTRAL COMPOUNDS		
2-Fluorobiphenyl	69	% Recovery Surrogate
Nitrobenzene-d5	49	% Recovery Surrogate
Terphenyl-d14	101	% Recovery Surrogate

TEST/PARAMETER	PRESERVATIVE	TECH	ANALYSIS DATE	TIME
Total Solids	Cool to 4 Deg. C	NMC	01/24/97	11:30
BASE NEUTRAL COMPOUNDS	Cool to 4 Deg. C	STR	01/22/97	19:10
3550A Ultrasonic Extraction		DCF	01/21/97	

Respectfully Submitted,
WRIGHT LABORATORY SERVICES

James L. Ressler
Laboratory Manager

34 Dogwood Lane • Middletown, PA 17057
Philadelphia • (610) 640-1323 (717) 944-5541 • FAX (717) 944-1430 Maryland • (410) 244-8889

Wright Laboratory
SERVICES INC.
ENVIRONMENTAL TESTING LABORATORIES

January 28, 1997

A dilution was performed on the GC/MS semi-volatile sample at the extraction level. Detection limits were raised accordingly.
01-24-97 jlk

Due to the level of analytes present in the sample, a dilution was performed on the GC/MS semi-volatile sample. Detection limits were raised accordingly.

This report relates only to the samples as received by the laboratory, and may only be reproduced in full.

QUALITY ASSURANCE REPORT

Q/A PARAMETER	RESULT	
GAS CHROMATOGRAPH MASS SPEC.		
BASE NEUTRAL COMPOUNDS		
2-Fluorobiphenyl	40	% Recovery Surrogate
Nitrobenzene-d5	48	% Recovery Surrogate
Terphenyl-d14	59	% Recovery Surrogate

TEST/PARAMETER	PRESERVATIVE	TECH	ANALYSIS DATE	TIME
Total Solids	Cool to 4 Deg. C	NMC	01/24/97	11:30
BASE NEUTRAL COMPOUNDS	Cool to 4 Deg. C	STR	01/23/97	17:50
3 50A Ultrasonic Extraction		DCF	01/21/97	

Respectfully Submitted,
WRIGHT LABORATORY SERVICES

James L. Ressler
Laboratory Manager

Wright Laboratory Services, Inc.
34 Dogwood Lane
Middletown, PA 17057
717-944-5541

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Please print. See back of COC for directions.

COC #: 32071

Sample Date: 1 / 21 / 97

Client Name: ETA
Address: Ellicott City MD
Contact: Rob Gribben
Phone #: 410 461 9920
Project Name/#: Horsham
Quote/PO #:
TAT: Normal ☒ *Rush ☐ *Rush TAT subject to approval and surcharges
Date Required:
Approved by:
Fax Results? (Y) or N #: 410 750-8505

ANALYSES REQUESTED

8270 naphthalene, Fluorine thenanthrene Benzo(A) Anthracine Benzo Pyrene

RECEIVING INFO (Lab use only)
COOLER TEMP:
COC SEAL INTACT: Y or N
SHIPPING CARRIER:
SHIPPING NO:

	G														Container Type:	
	1	1	1												Preservative:	

SAMPLE DESCRIPTION/LOCATION	G/C *	TIME 00:00	MATRIX **	NO. OF CONTAINERS PER ANALYSIS REQUESTED												COMMENTS/FIELD DATA
1 Supply Line 0003	G	1330	SD	1	✓	✓										
2 Center of tank 0002	G	1330	SD	1	✓	✓										
3 Stock Pile 0001	G	1330	SD	1	✓	✓										
4 Far End of TANK 0004	G	1330	SD	1	✓	✓										
5																
6																
7																
8																
9																
10																
11																
12																

VT 1-22-97

	Print Name and Company	Signature	Date/Time
Sampled by:	Robert Gribben		1/21/97 1420
Received by:	Eric Carpenter WLSI		1-21-97 1520
Relinquished by:	Eric Carpenter WLSI		1-21-97
Received by:	Ron Ditel		1-21-97 17:00
Relinquished by:	Ron Ditel		1-21-97 19:00
Received by:		JHK	1-21-97 1927

Remarks:

METHOD PROTOCOL: SW846 ☐ CFR136 ☐
DRINKING WATER ☐ OTHER:
REPORTING REQUIREMENTS: PADEP ☐
OTHER: PWSID:

* G=Grab; C=Composite ** Matrix - SO=Soil; SD=Solid; DW=Drinking Water; WW=Wastewater; GW=Groundwater; SL=Sludge; OL-Oil

Copies: WHITE - ORIGINAL CANARY - CUSTOMER MAILING PINK - FILE GOLDENROD - CUSTOMER COPY

Engineering Technologies Associates, Inc.
Engineers • Planners • Surveyors

3458 Ellicott Center Drive, Suite 101
Ellicott City, MD 21043

Baltimore Area (410) 461-9920
Washington Area (301) 621-4690
FAX: (410) 750-8565

FAX TRANSMITTAL

Date: 5/7/97

Number of Pages (including cover): 4 Fax No. (610) 832-6143

Company: SE region DADEP RE: Horsham USARC

Attn: Christy Hughes

Message: Christy,

Sample results from borings at Horsham, these indicate no levels above DADEP action levels, I will proceed w/ closure report, Please advise if additional sampling or other activity is necessary.

Original Copy will be forwarded by mail: Yes ~~No~~

From: Rob Grieben (X110)

If you have any problems receiving this transmission, please contact our office at the number listed above.

CORE

DATA MANAGEMENT SUMMARY REPORT
(DM-OCC) - Parameters Tested, Selected Samples, Selected Parameter List

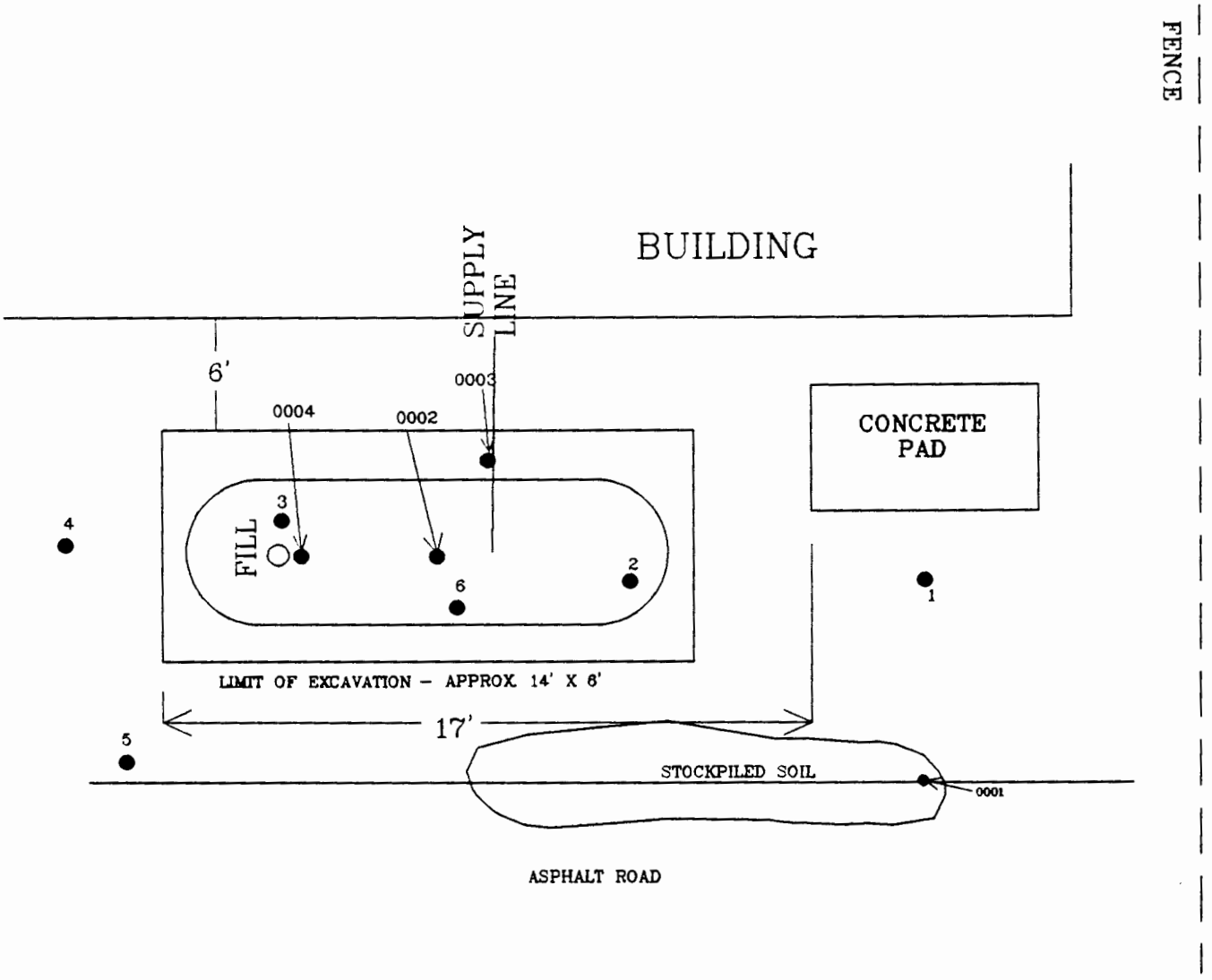
DATE: 04/29/97
PAGE: 1

Chain of Custody Data Required for ETC Data Management Summary Report

See Below | ENGINEERING TECHNOLOGIES & ASSOC., I HORSHAM | See Below
ETC Sample No. | *Company* | *Facility* | *Sample Point* | *Date*

Parameters	*Units*	*Sample Points, Sampling Dates, and ETC Sample No.'s*							
		SOIL1 970404 BVA500	SOIL2 970404 BVA501	SOIL3 970404 BVA502	SOIL4 970404 BVA503	SOIL5 970404 BVA504	SOIL6 970404 BVA505		
Custom Parameter List									
Benzo(a)anthracene	ug/kg	< 300	643	< 400	< 300	< 400	< 300		
Benzo(a)pyrene	ug/kg	< 100	313	< 100	< 100	< 100	< 100		
Fluorene	ug/kg	< 80	206	< 90	< 80	< 90	< 80		
Naphthalene	ug/kg	< 70	< 80	< 80	< 70	< 80	< 70		
Phenanthrene	ug/kg	J 43	2120	< 300	J 62	< 300	J 93		

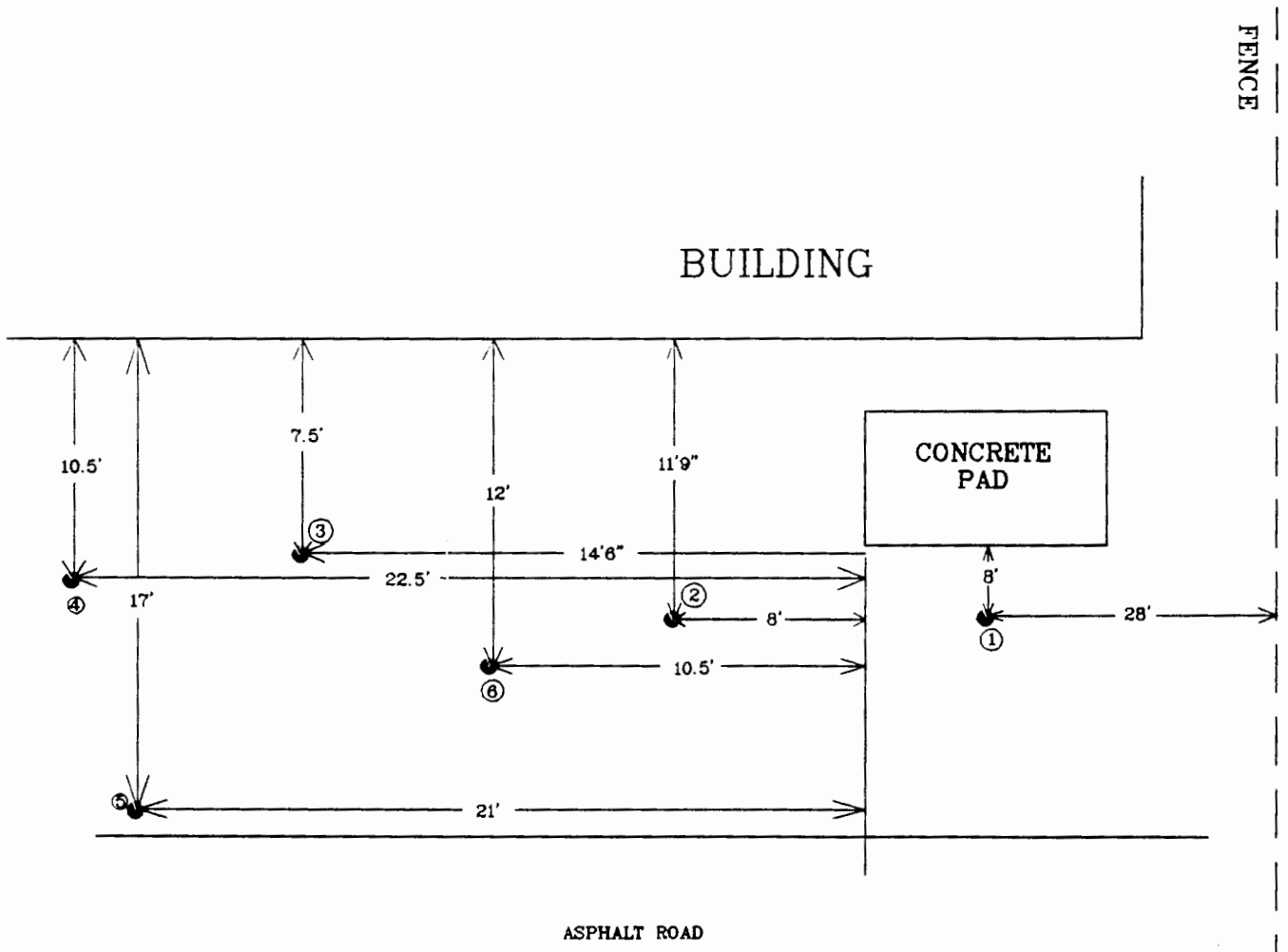
Footnotes: BMQL = Below Method Detection Limit ND = Parameter not detected NT = Parameter not tested J = BMQL (Value Reported) <= ND (MCL Reported)



● ORIGINAL SAMPLES GATHERED ON 1/21/97

● CONFIRMATORY SAMPLES TAKEN WITH AUGER ON 4/4/97

DESIGNED ____ DATE DRAWN R.G. 6/24/96 DATE CHECKED ____ DATE APPROVED ____ DATE	ENGINEERING TECHNOLOGIES ASSOCIATES, INC. ENGINEERS • PLANNERS • SURVEYORS 3468 ELLICOTT CENTER DRIVE SUITE 101 ELLICOTT CITY, MARYLAND 21043 BALTO. 461-6838 WASH. 621-4888	HORSHAM MEMORIAL USARC SAMPLING LOCATIONS SCALE: NTS | CONTRACT NO.: DAAA21-95-D-0108 | DATE: 4-11-97 | SHEET:



● CONFIRMATORY SAMPLES TAKEN WITH AUGER ON 4/4/97
SAMPLES 1,2 AND 3 TAKEN AT 6' DEPTH
SAMPLE 4 TAKEN AT 2' DEPTH
SAMPLES 5 AND 6 TAKEN AT 3' DEPTH

DESIGNED ____ DATE
DRAWN R.G. 6/24/96 DATE
CHECKED ____ DATE
APPROVED ____ DATE

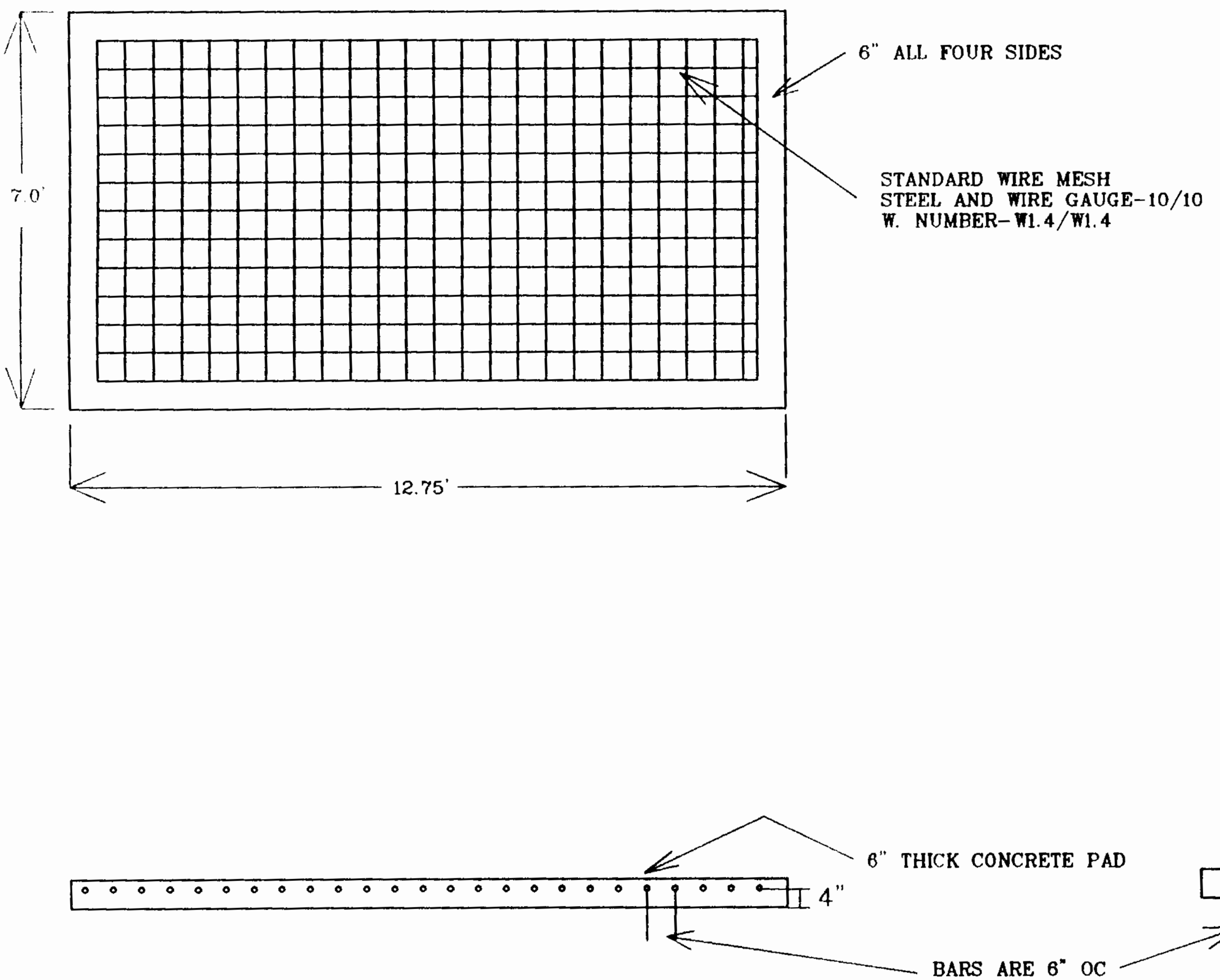
ENGINEERING TECHNOLOGIES ASSOCIATES, INC.
ENGINEERS • PLANNERS • SURVEYORS
3488 ELLICOTT CENTER DRIVE SUITE 101
ELLICOTT CITY, MARYLAND 21043
BALTO. 461-6920 WASH. 621-6920

HORSHAM MEMORIAL USARC
CONFIRMATORY SAMPLING LOCATIONS
TAKEN ON 4-4-97

SCALE: NTS | CONTRACT NO.: DAC31-95-D-0106 | DATE: 4-11-97 | SHEET:

APPENDIX G- CONCRETE PAD DESIGN SPECIFICATIONS

AST CONCRETE PAD



DESIGNED BY: R.G. 4/25/96
DRAWN BY: R.G. 4/25/96
CHECKED BY:
APPROVED BY:

REVISIONS

ENGINEERING TECHNOLOGIES ASSOCIATES, INC.
ENGINEERS • PLANNERS • SURVEYORS
3458 ELLICOTT CENTER DRIVE SUITE 101
ELLICOTT CITY, MARYLAND 21043

AST PAD TO BE INSTALLED 6" BELOW EXISTING GRADE

CONTRACT NO. DACA31-95-D-0106
HORSHAM MEMORIAL USARC-DELIVERY ORDER NO. 0002
AST CONCRETE PAD AND STEP
REINFORCEMENT DETAILS

SCALE: NTS | CONTRACT NO. 95112.01 | DATE: 4-25-96 | SHEET:

J. D. M. MATERIALS CO.

851 COUNTY LINE ROAD

HUNTINGDON VALLEY, PA. 19006-1198

SNYDERSVILLE PLANT
(717) 992-4444

DOYLESTOWN PLANT
(215) 348-8121

DALEVILLE PLANT
(717) 842-4506

PHOENIXVILLE PLANT
(610) 933-3566

SOUTHAMPTON PLANT
(215) 357-5505
(215) 677-3100

LANGHORNE PLANT
(215) 757-7676

NEW HOPE PLANT
(215) 862-2244
(N.J. ONLY) 800-331-9233

GRANT AVE. PLANT
(215) 673-7711

NORRISTOWN PLANT
(610) 272-0825

TELFORD PLANT
(215) 723-9801

ENGINEERING & TESTING LABORATORY
CERTIFIED CONCRETE

READY MIXED CONCRETE

No. A010884 Date 4/29/96

Sold To ENGINEERING TECH

Address 936 BYSTON

Deliver To HORSHAM MEMORIAL

Charge	Cash	Your Order No.	PRICING

CU. YARDS	MIX
2	4000 4"
	45

JOB # | CUSTOMER NUMBER: O.K. CREDIT

CAUTION: CONCRETE CAN CAUSE SEVERE BURNS TO SKIN

GALS. WATER ADDED

TRUCK	TIME OUT	TIME ARRIVED ON JOB
150	11:35	
RECEIVED BY	TIME LEFT JOB	TIME IN

Delivery Subject to General Terms and Conditions Printed on Reverse Side

PRINTED BY THE STANDARD REGISTER COMPANY U.S.A. ZIPSET® 19298I-80

DELIVERY RECEIPT

J. D. M. MATERIALS CO.

Main Office
851 COUNTY LINE ROAD
HUNTINGDON VALLEY, PA. 19006-1198

(215) 677-3100
(215) 357-5505
FAX (215) 357-6979

June 12, 1996

Engineering Technologies
Associates, Inc.
Suite 101
3458 Ellicott Center Drive
Ellicott City, MD 21043

Attn: Mr. Robert Gribben

RE: AST Concrete Pad
Horsham, PA

Gentlemen:

Per your request we are submitting our mix design for class 4000#-1"AE concrete for the above project. Concrete to be supplied from the County Line facility of the J.D.M. Materials Company.

These designs are predicated on the use of the materials listed. These strength relationships have been established through prior use of the materials and proportions.

Respectfully,

James R. McNelis
Quality Control Engineer

AMBRIC TESTING & ENGINEERING ASSOCIATES, INC.

MATERIALS

Cement;	Essroc Portland Cement, ASTM C150-Type I,
Fine Aggregate;	Concrete Sand, Triborough Sand Co., Elkhaboro, NJ, meeting the requiremen of ASTM C33-85 and approved by PennDo Tests on Page 3,
Coarse Aggregate;	Size No. 57 (1" to No. 4) Crushed Sto Eureka Quarry, Rush Valley, PA meetin the requirements of ASTM C33-85 and approved by PennDot. Tests on Page 3,
Admixture;	Sika 15 AE - Air Entraining Agent, Si Corporation, Lyndhurst, NJ, meeting r requirements of ASTM C260-77;
	Plastiment N/S, Water Reducing Agent, Sika Corporation, Lyndhurst, NJ, meet the requirement of ASTM C494-85, Type

AMBRIC TESTING & ENGINEERING ASSOCIATES, INC.

TESTS OF AGGREGATES

SIEVE ANALYSIS (PERCENT PASSING)

SIEVE SIZE	FINE AGGREGATE	#57 COARSE AGGREGATE
1 1/2 In.	-----	100
1 In.	-----	98.4
3/4 In	-----	84.8
1/2 In.	-----	41.3
3/8 In.	100	15
No. 4	97.8	3
No. 8	91.1	1
No. 16	78.2	----
No. 30	52.0	----
No. 50	16.7	----
No. 100	4.1	----
Fineness Modulus	2.60	6.99
Materials Finer Than #200	2.1	0.1
Adsorption (%)	0.10	0.14
Specific Gravity	2.62	2.72
Clay Lumps	None	None
Soft Particles	----	None
Coal & Lignite	None	None
Colorimetric Test for Organic	Satisfactory	----
Los Angeles Abrasion Test % Loss - (500 Revolutions)	----	18.5
Sodium Sulphate Soundness % Loss - (5 Cycles)	3.53	3.8

The aggregates noted above meet the requirements of ASTM C33-86 for Concrete Aggregate.

$\rho \approx 62.4(2.65) = 165.4\ lb/ft^3$

AMBRIC TESTING & ENGINEERING ASSOCIATES, INC.

CONCRETE MIX DESIGN

QUANTITIES OF CONSTITUTE MATERIALS PER CUBIC YARD OF CONCRETE

Mix	
Mix Designation	4000#-1"AE
Method of Placement	Regular
Minimum 28 day p.s.i.	4000
Portland Cement Type I (sacks)	6.5
Portland Cement Type I (lbs.)	611
Fine Aggregate ssd (lbs.)	1280
No. 57 Coarse Aggregate ssd (lbs.)	1770
Sikament 300 (fl.oz. per cu.yd.)	----
Plastiment N/S Water Reducer (fl.oz. per cu.yd.)	14.0
Sika 15 AE (fl.oz. per cu.yd.)	3.0
Entrained AIr (%)	6.0 ± 1
Total Water (gallons)	32.5
Total Water (lbs.)	271
W/C (gallons per sack)	5.0
W/C (lbs. per lbs.)	0.44
Slump (inches) Initial	----
Slump (inches) Final	3

COMPRESSIVE STRENGTH (PSI)

7	Days	3710
		3740
		3790
	Average	3747
28	Days	5280
		5330
		5350
	Average	5320

Respectfully submitted,

AMBRIC TESTING & ENGINEERING ASSOCIATES, INC.

D. H. Hafner, P. E., FACI

ORIGINAL INVOICE

J. D. M. MATERIALS CO.

Main Office

851 COUNTY LINE ROAD, HUNTINGDON VALLEY, PA 19006-1198
(215) 357-5505 — 677-3100 • FAX (215) 357-6979

Ready Mix Concrete

REMIT TO: P.O. BOX 217, SOUTHAMPTON, PA 18966

PLANT LOCATIONS

1 - SOUTHAMPTON — (215) 357-5505
— (215) 677-3100
2 - LANGHORNE — (215) 757-7676
3 - GRANT AVE. — (215) 673-7711
4 - DOYLESTOWN — (215) 348-9121
5 - NEW HOPE — (215) 862-2244
N.J. ONLY — (800) 331-9233
6 - SNYDERSVILLE — (717) 992-4444
7 - NORRISTOWN — (610) 272-0825
8 - PHOENIXVILLE — (610) 933-3566
— (610) 933-6650
10 - DALEVILLE — (717) 842-4505
11 - TELFORD — (215) 723-9801

ENGINEER TECH ASSOC, INC
SUITE 101
3458 ELLICOTT CENTER DR.
ELLICOTT CITY
MD 21043
00024930

6/30/96
INVOICE DATE

550635
INVOICE NUMBER

PURCHASE ORDER NUMBER

TERMS: NET 10 DAYS — A SERVICE CHARGE OF 1.5% PER MONTH WILL BE ADDED TO PAST DUE ACCOUNTS. 18% PER YEAR MAXIMUM.

TICKET NO.	DATE OF DELIVERY	HAULED TO	PLANT	CU. YDS.	MIX	ADD'T'L. CHARGES	UNIT PRICE	TOTAL PRICE
A10884	6/20	PAD, NAVAL AIR STA	1	2.00	4000	A	75.00	150.00

[illegible] TO. Horsham USARC
95112.02
Robert [illegible]

B 5020

RECEIVED
JUL 8 1996
ENGINEERING TECHNOLOGIES

SUB TOTAL 150.00
PA TAX 9.00
TOTAL 159.00

EXPLANATION OF ADDITIONAL CHARGES

A. SMALL LOAD CHARGE
B. PREMIUM DELIVERY CHARGE
C.
D. 2" STONE
E. 1% CALCIUM
F. 2% CALCIUM
G. DEL. IN MIXER
H. HI EARLY
I.
J.
K. 3/4" GRAVEL
L. RETARDER
M. STRAIGHT MIX
N. PUMP MIX
O. TRUCK TIME
P. PEA GRAVEL
Q. SUPER PLASTICIZER
R. 2" FIBERMESH
S.
T. 3/4" FIBERMESH
U. LIGHTWEIGHT
V. 1% PLASTOCRETE
W. WINTER HEAT
X. 2% PLASTOCRETE
Y. ADDITIONAL CEMENT
Z. MISCELLANEOUS

TANKNOLOGY
TECHNOLOGY FOR TANKS AND THEIR ENVIRONMENT

VacuTect™ TEST REPORT

S.O. # 091496

Date 08/20/93

Owner 79TH ARCOM

Site #

Phone (215) 697-6816

Invoice Name/Address DEFENSE LOGISTIC AGENCY DEF.IND.SUP.CNT. DISC EPT 700 ROBBINS AVENUE PHILADELPHIA, PA 19111-5096

Attn: RICK HERPAL

Site Name/Address HORSHAM MEMORIAL USAR 936 EASTON ROAD HORSHAM, PA

TANKS											LINES							Leak Det		
See Diag. For Loc. Tank #	Tank Product	Tank Capacity	Tank Dia. & Material ST/FRP/Lined	Dipped Water Level START END	Dipped Product Level START END	Probe Water Level START END	Water Ingress Detected Yes/No	Bubble Ingress Detected Yes/No	Ullage Air Ingress Detected Yes/No	TANK Tight or Fail	Line #	Line Material ST/FRP	Line Delivery Syst. Type PS/SS/GS	LINE TEST START TIME	LINE TEST END TIME	Final Leak Rate GPH	LINE Tight or Fail	Exist LD(s) Pass/Fail/or NONE	NEW LD(s) Tested & PASS	TANKS and LINES Tested to CFR-40 Parts 280-281 & NFPA 329 Spec's. Other:
1	HTG	2000	Diameter	00.250	036.00	00.160	N	Y	N	F	1A	ST	SS	8:44	10:15	0.000	F	-	N	Exist LD SN/MDL/MFG
	OIL		48	00.250	036.00	00.160					1B	ST	SS	8:44	10:15	0.000	F			New/2nd LD SN/MDL/MFG:
			Material	Start Time: 8:44		Percent of Fill at Time of Test: 75.0		Pump Mfg.: SUCTION SY												LINE TEST PSI: LINE TESTED WITH TANK
			ST	End Time: 10:15		Tank Test PSI: - .20		Probe Entry: FILL	Inclinometer Degrees: N/A											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:		Probe Entry:	Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:		Probe Entry:	Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:		Probe Entry:	Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:		Probe Entry:	Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:		Probe Entry:	Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)

TANKNOLOGY Region: NORTH EAST REGION Unit # 040 State Lic. # State: PA

Tanknology Corporation International
5225 Hollister St., Houston, TX 77040
(800) 888-8563 • FAX (713) 690-2255

NOTE: Original VacuTect Data recordings are reviewed by Tanknology's Audit Control Department and maintained on file.

TAK-01

SO# 496 Owner: DEFENSE IND. SUPPLY CENTER Site# USAR

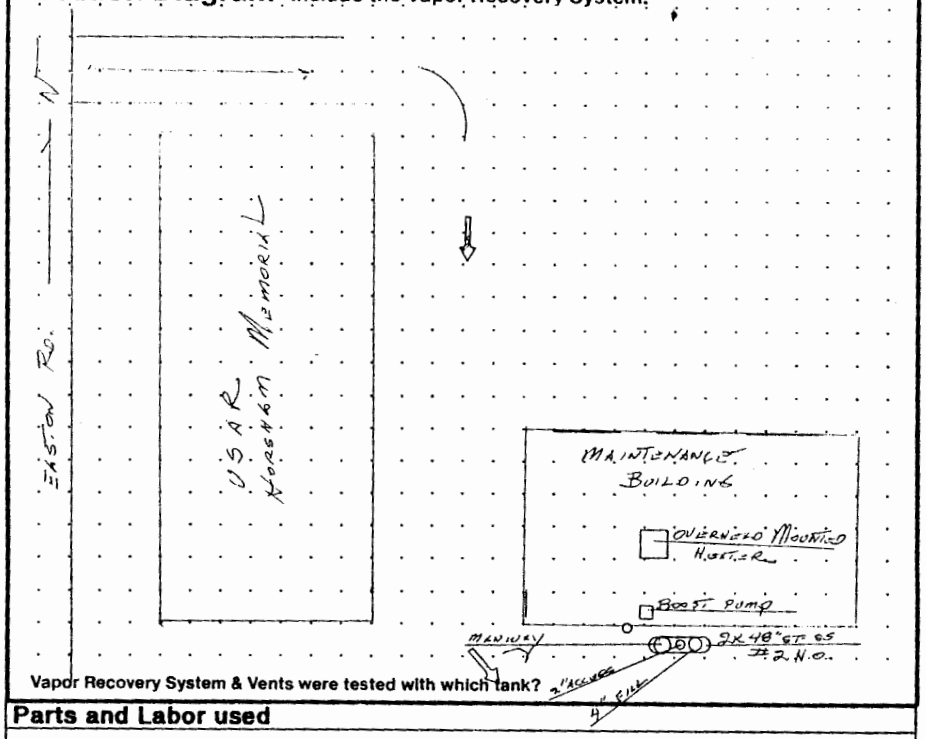
MONITOR WELLS

Well Number	1	2	3	4	5	6	7	8	9	10	11	12
Well Depth												
Depth to Water			None									
Product Detected AMOUNT in inches												

Standard Symbols for diagram below:

(V/B) V.R. w / Ball Float
(B) Ball Float
[M] Manway
(F) Fill
(M) Monitor Well (Outside Tank Bed Area)
(G) Tank Gauge
[I] Iron Cross
(V) Vapor Recovery
(Δ) Observation Well (Inside Tank Bed Area)
( ) Vent
[T] Turbine

Location Diagram–Include the Vapor Recovery System.



Vapor Recovery System & Vents were tested with which tank?

Parts and Labor used

General Comments

TANK INITIALLY HAD 3.75" OF WATER IN IT. I PUMPED THE WATER INTO A DRUM FOR THE TEST. WATER WAS PUT BACK INTO TANK AFTER TEST.

When OWNER or local regulations require immediate reports of system failure–Complete the following:

REPORTED TO: NAME	DATE	TIME
RICK HERPEL	8-20-93	

Phone#	OWNER or Regulatory Agency	FILE NUMBER
215-697-6816	DEFENSE IND SUPPLY CENTER	

Print Certified Testers Name	Vacutect™ Certification Number
LLOYD S. PETERSON	0112

Certified Testers Signature	Date Testing Completed
Lloyd S. Peterson	8-20-93

SO# 91496 Owner: DEFENSE IND. SUPPLY CENTER Site# USAR

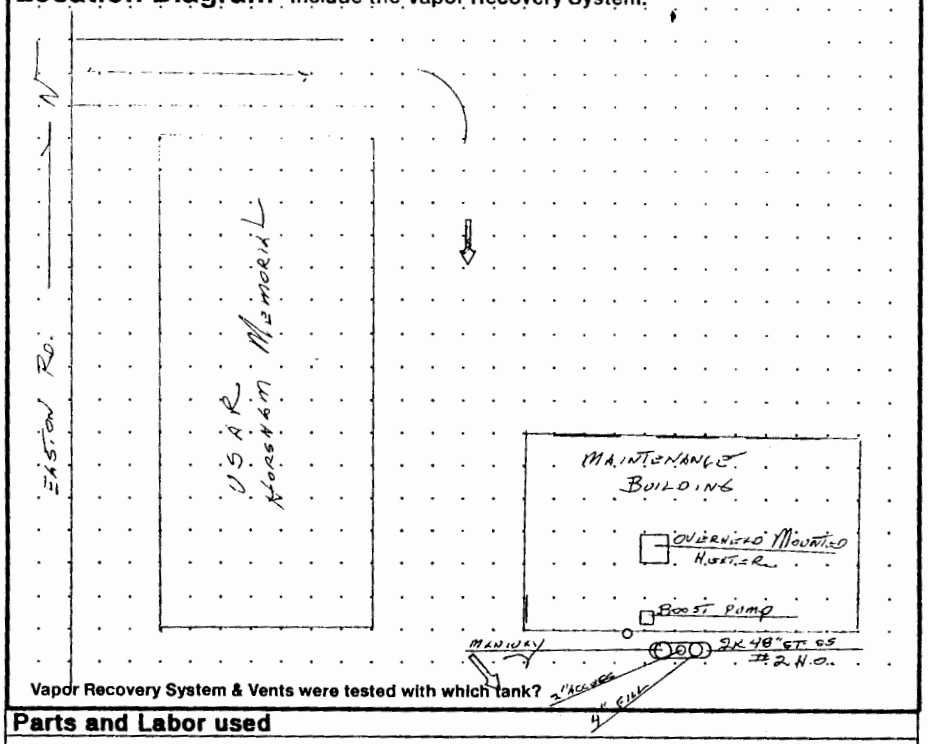
MONITOR WELLS

Well Number	1	2	3	4	5	6	7	8	9	10	11	12
Well Depth												
Depth to Water			NONE									
Product Detected AMOUNT in inches												

Standard Symbols for diagram below:

- (V/B) V.R. w / Ball Float
- (B) Ball Float
- [M] Manway
- (F) Fill
- (M) Monitor Well (Outside Tank Bed Area)
- (G) Tank Gauge
- [I] Iron Cross
- (V) Vapor Recovery
- (Δ) Observation Well (Inside Tank Bed Area)
- ( ) Vent
- [T] Turbine

Location Diagram–Include the Vapor Recovery System.



Vapor Recovery System & Vents were tested with which tank?

Parts and Labor used

General Comments

TANK INITIALLY HAD 3.75" OF WATER IN IT. I PUMPED THE WATER INTO A DRUM FOR THE TEST. WATER WAS PUT BACK INTO TANK AFTER TEST.

When OWNER or local regulations require immediate reports of system failure–Complete the following:

REPORTED TO:	NAME	DATE	TIME
	RICK HERPEL	8-20-93	

Phone#	OWNER or Regulatory Agency	FILE NUMBER
215-697-6816	DEFENSE IND SUPPLY CENTER	

Print Certified Testers Name	Vacutect™ Certification Number
LLOYD S. PETERSON	0113
Certified Testers Signature	**Date Testing Completed**
Lloyd S. Peterson	8-20-93

TANKNOLOGY
TECHNOLOGY FOR TANKS AND THE ENVIRONMENT

VacuTect™ TEST REPORT

S.O. # 091496

Date 08/20/93

Owner 79TH ARCOM

Site #

Phone (215) 697-6816

Invoice Name/Address DEFENSE LOGISTIC AGENCY DEF.IND.SUP.CNT. DISC EPT 700 ROBBINS AVENUE PHILADELPHIA, PA 19111-5096

Attn: RICK HERPAL

Site Name/Address HORSHAM MEMORIAL USAR 936 EASTON ROAD HORSHAM, PA

TANKS											LINES							Leak Det		
See Diag. For Loc. Tank #	Tank Product	Tank Capacity	Tank Dia. & Material ST/FRP/Lined	Dipped Water Level ■ START END	Dipped Product Level ■ START END	Probe Water Level ■ START END	Water Ingress Detected ■ Yes/No	Bubble Ingress Detected ■ Yes/No	Ullage Air Ingress Detected ■ Yes/No	TANK ■ Tight or Fail	Line #	Line Material ■ ST/FRP	Line Delivery Syst. Type ■ PS/SS/GS	LINE TEST ■ START TIME	LINE TEST ■ END TIME	Final Leak Rate ■ GPH	LINE ■ Tight or Fail	Exist LD(s) Pass/Fail/or NONE	NEW LD(s) Tested & PASS	TANKS and LINES Tested to CFR-40 Parts 280-281 & NFPA 329 Spec's. Other:
1	HTG	2000	Diameter	00.250	036.00	00.160	N	Y	N	F	1A	ST	SS	8:44	10:15	0.000	F	–	N	Exist LD SN/MDL/MFG:
	OIL		48	00.250	036.00	00.160					1B	ST	SS	8:44	10:15	0.000	F			New/2nd LD SN/MDL/MFG:
			Material	Start Time: 8:44		Percent of Fill at Time of Test: 75.0		Pump Mfg.: SUCTION SY												LINE TEST PSI: LINE TESTED WITH TANK
			ST	End Time: 10:15		Tank Test PSI: - .20	Probe Entry: FILL		Inclinometer Degrees: N/A											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG:
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:	Probe Entry:		Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG:
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:	Probe Entry:		Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG:
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:	Probe Entry:		Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG:
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:	Probe Entry:		Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)
			Diameter																	Exist LD SN/MDL/MFG:
																				New/2nd LD SN/MDL/MFG:
			Material	Start Time:		Percent of Fill at Time of Test:		Pump Mfg.:												LINE TEST PSI
				End Time:		Tank Test PSI:	Probe Entry:		Inclinometer Degrees:											Dispenser Shear Valves Operate (yes/no)

TANKNOLOGY Region: NORTH EAST REGION Unit # 040 State Lic. # State: PA

Tanknology Corporation International
5225 Hollister St., Houston, TX 77040
(800) 888-8563 • FAX (713) 690-2255

NOTE: Original VacuTect Data recordings are reviewed by Tanknology's Audit Control Department and maintained on file.

TAK-01

[redacted]

OIL/WATER SEPARATOR SURVEY REPORT

FOR

99TH RSC CUSTOMER SUPPORT TEAM #1

HORNE ENGINEERING SERVICES, INC.

Prepared by:

Horne Engineering Services, Inc.
2750 Prosperity Avenue, Suite 450
Fairfax, VA 22031-4312

JANUARY 24, 2001

OIL/WATER SEPARATOR SURVEY REPORT
99TH RSC CUSTOMER SUPPORT TEAM #1

Date of Inspection: November 16, 2000

Facility Information
Facility Name: (FAC ID PA046)
HORSHAM MEMORIAL USARC
936 EASTON ROAD
Horsham, PA 19044-3399

Phone #: (215) 957-0545
Fax #: (215) 957-0553

Tenants:

Section I - Separator Information
Location: Behind wash rack
General Areas Served: Wash rack and sink drain

Manufacturer's Information: Josam Cascade Oil Interceptor, rated capacity: 25 gallons/minute.

Type of Separator:	Josam Cascade Oil Interceptor, with inserts (sediment pan).
Date installed:	Unknown
Status:	Active
Elevation of Separator:	Underground
Configuration:	Rectangular with a triangular shaped side on the downgrade portion of the interceptor
Construction Material:	Unlike the Wade interceptor, this interceptor is constructed of concrete as an integral part of the sewer system. The upper portion of the structure has a metal lining (corroded). There is no outer vault.
Wastewater treatment prior to separator:	Grit removal at wash rack.
Effluent/discharge structure:	Underflow
Oil Skimmer Type:	None
Accessibility:	Under metal plate

SEPARATOR DIMENSIONS (NOTE: All dimensions are interior.)
Length: __ Depth (from top of tank): _ .
Width: __ Freeboard (liquid surface to top of tank): 26 inches
Operational volume: Liquid depth - 12 inches.

Waste-Tron Information - March 1996
Horsham - Horsham Memorial USARC
Composite samples of both wastewater and sludge
Chester/Philadelphia/Horsham wastewater - pH = 11.28
Chester/Philadelphia/Horsham sludge - Sulfide reactivity = 155 mg/kg, DRO = 1,370 mg/kg
OWS Dimensions: 27" x 18" x 18 ½" , Capacity: 25 gallons
Vault: 40" x 26" x 17", Capacity: 75 gallons
Volume of sludge: 5 gallons (3 inches)
Volume of wastewater: 10 gallons (6 inches)
Oil: No sheen

USED OIL STORAGE – Evaluated only if Tank Serves Separator

Used Oil Storage Serving Separator:	None
Configuration comments: The liquid in the interceptor had a sheen. Approximately ½ inch of oily sediment was in the interceptor. Internal structures, sediment pan, etc, were evident. The discharge line was traced to the sanitary sewer system. The interceptor does not have the hydraulic capacity to adequately treat the wastewater generated by a wash rack.	

SECTION II - OPERATION & MAINTENANCE:

Frequency of maintenance and inspections	No maintenance is conducted on this system.

SECTION III - COMPLIANCE:
Effluent Discharge: to sanitary sewer
Bypass/Overflow/Storm Water Diversion discharge location(s): None apparent
Current CWA permits: None
UST/AST/RCRA compliance comments: N/A

SECTION IV - INDUSTRIAL WASTEWATER SOURCES TO THE SEPARATOR
Description of Sources

Activity	Description	Comments
Wash Rack	The (15' x 30') has a 6-inch curbing surrounding the wash pad. The curbing is slightly separated from the pad and had previously been patched with asphalt. The pad has a large grate.	
Maintenance Area Sink	The sink located in the maintenance building has been piped to the wash rack pad. Foam was noted on the pad from the sink discharge (contains soap or detergent).	

SECTION V - RUNOFF SOURCES TO SEPARATOR

Activity	Description	Comments
Wash Rack	Incident rainfall to wash rack.	

SECTION VI - STORM WATER PERMIT

Runoff discharges to: storm sewer, some sheet flow, low area below fire hydrant
Filed NOI: No

Completed preparedness, prevention, and contingency (PPC) plan: No

Storm Water Permit Exclusion Review:

Condition	Description	Comments
Outdoor vehicles/equipment:	Trailers, HMMWVs, Trucks, Forklifts. Minimal staining.	
Outdoor raw material:	AFFF in 5-gallon drums on pallets and tarped.	
Outdoor waste and dumpsters:	Empty drums, spray paint cans (still containing paint), empty fuel cans (one can contained material, 1/3 full). Dumpster with open top, due to the quantity of material in the dumpster. Loose cardboard on ground, beside the dumpster. Generally unkempt storage/disposal areas.	
Outdoor industrial activities:	Wash rack. Fire hydrant had sprung a leak, flooding a low lying area and flowing to the storm sewer system.	
Fueling operations:	None.	
Materials or residuals on ground/storm inlets	Minimal	
Visible deposits from roof stacks	None.	

SECTION VII – SUMMARY

1. The site has one gravity oil/water interceptor (Jasom Cascade Oil Interceptor) and inserts, which discharges to the sanitary sewer. According to the manufacturer, the rated capacity of the system is 25 gallons/minute, which is misrepresentative.
2. The interceptor does not have a separate used oil storage tank.
3. In 1996, the interceptor wastewater and sludge samples from this location were composited with samples from Chester and Philadelphia locations and tested for PCBs, reactivity, ignitability, corrosivity, TPH, and TCLP (volatiles, semi-volatiles, pesticides/herbicides, and metals). The wastewater composite had a pH of 11.28. The sludge composite yielded a sulfide reactivity of 155 mg/kg, and TPH-DRO of 1,370 mg/kg. This information does not adequately describe the wastewater or the sludge.
4. The interceptor receives no maintenance.
5. No permit is required for the discharge to the sanitary sewer.
6. Two sources (wash rack and maintenance building sink) discharge to the interceptor. The wash rack is occasionally used.
7. Other than incident rainfall on the wash rack, rainfall does not affect the performance of the interceptor.
8. The site apparently has not filed an NOI related to storm water permitting.
9. The potential that the site could successfully request an exclusion, or make a determination that the facility is excluded, from storm water permitting is moderate-to-high (based on exterior waste/raw material handling practices).

SECTION VIII - RECOMMENDED ACTIONS

Condition	Recommendation	Estimated Costs:
Wash Rack	If the wash rack is to be used, the gap between the pad and the curbing should be sealed. If the wash rack is not needed, it should be closed.	• Mob/Demob: $3,600 • Seal the gap between the wash pad and the curbing: $800 Or. • Wash rack closure: $13,200
Oil/Water Interceptor	The interceptor is not capable of treating wastewater generated by a wash rack and should be closed. If the wash rack is to be used, an appropriately designed oil/water separator should be installed.	• Close oil/water interceptor: $9,600 • Install new oil/water separator: $26,500
Report Generation	Generate construction/closure/system upgrade reports (assumes no residual contamination)	• System closure reports: $6,600 or • System upgrade reports: $10,120
Storm Water Permit	There are some existing conditions that would not allow an exclusion. A site review should be conducted to determine the modifications the facility can make without impacting its mission. If allowable modifications can eliminate sources, then document reasons for exclusion, if not then: • The site should develop a Preparedness, Prevention, and Contingency plan, and • File a PA storm water NOI.	• Review site and prepare exclusion documentation: $2,750, or • Prepare NOI and PPC plan: $6,000.
Other Issues:		
Maintenance Building Sink	This sink discharges directly to the wash rack pad. The current interceptor provides little to no treatment of the wash rack discharge, therefore the sink has no affect on the interceptor operation. However, if an appropriately designed separator is installed, the sink discharge should be diverted to the sanitary sewer downgrade of the new separator (soaps and detergents will adversely affect the operation of a separator).	
Solid Waste Handling	On the day of the site visit, the dumpster was full to the point that the lid was open and bagged material was higher than the top of the dumpster. Cardboard to be recycled was laying on the ground adjacent to the dumpster. The overall handling of these items must be improved, such that the materials are not exposed to rainfall.	
Materials Stored On-site	Empty drums, spray paint cans (still containing paint), empty fuel cans (one can contained material, 1/3 full) were noted on-site. These unkempt storage/disposal areas should be addressed.	

Condition	Recommendation	Estimated Costs:
Transformer (PECO)	The on-site transformer should display the appropriate PCB labeling.	
Leaking Hydrant	A fire hydrant behind the administration building was leaking, pooling and flowing off-site. This condition may lead to erosion problems and cost the facility unnecessary funds for excessive water usage.	

DATA CHEM LABORATORIES

A SORENSON COMPANY

Edgemont pending + Germantown

AIHA Accredited

NVLAP Accredited

ANALYTICAL REPORT

POLARIZED LIGHT MICROSCOPY

Reference Data:

Analysis:	Bulk building materials for asbestos
Method:	PLM

The following samples were prepared and analyzed by Polarized Light Microscopy for asbestos and other fibrous constituents using the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020. The samples were examined under a stereomicroscope in a laboratory fume hood for general composition and phase separation. If needed, portions of the sample were removed and ground with a mortar and pestle before being mounted on a glass microscope slide*. Mountings of representative portions of the material are prepared in one or more appropriate refractive index liquids (1.550, 1.605, 1.680) and examined by Polarized Light Microscopy. Estimates of concentration are made on an area basis. The results of the analysis apply only to the materials analyzed and are summarized on the attached Bulk Asbestos Analysis data sheets.

Analyst
Katherine Wysong

Group Leader
Christopher Gibson

*Floor tiles, decorative paints, joint compounds, and cement materials require additional treatment in order to evaluate the concentration of small asbestos fibers bound in the material. Some samples may contain fibers which are not visible by PLM and can only be discovered by electron microscopy techniques.

Laboratory accreditation by the National Institute of Standards and Technology (NIST) does not in any way constitute approval or endorsement by NIST.

Samples will be disposed after 60 days unless instructed otherwise. Report applies only to portion of sample analyzed.

NVLAP Accredited

DATACHEM LABORATORIES
FiberFAX SM
Polarized Light Microscopy
Asbestos Analysis Summary

Client: Carlisle Barracks
Sample Set ID Number: 92-A-1599
Date: 5/1/92
Page:

Client Sample #:	1H2792	1H2892	1H2992	1H3092	1H3192
DataChem Laboratories Sample #:	92-11247	92-11248	92-11249	92-11250	92-11251
MACROSCOPIC EXAMINATION:					
Sample Accepted or Rejected:	Accepted	Accepted	Accepted	Accepted	Accepted
Homogeneity:	Layered	Homog.	Layered	Homog.	Layered
Color:	Green/Tan	Grey	Grey/Black	Grey	Grey/Black
Texture:	Cmpt/Fbrs	Compact	Cmpt/Adhs	Compact	Cmpt/Adhs
Sample Description:	Tile/Back	Tile	Tile/Mastic	Tile	Tile/Mastic
Analysis:	PLM	PLM	PLM	PLM	PLM
ASBESTIFORM MINERALS:					
% Chrysotile:	>3≤5	>1≤3	>1≤3		>1≤3
% Amosite:					
% Crocidolite:					
% Tremolite:					
% Actinolite					
% Anthophyllite					
% Total Asbestos	**>3≤5**	**>1≤3**	**>1≤3**	**ND**	**>1≤3**
OTHER MATERIALS:					
% Cellulose:	>10≤20	Trace	Trace		Trace
% Fiberglass:					
% Mineral Wool:					
% Other Fibrous:					
% Resin/Binder:	>5≤10	>10≤20	>10≤20	>10≤20	>10≤20
% Other Non-Fibrous:	>60≤70	>70≤80	>70≤80	>80≤90	>70≤80

Special Prep. Procedures:

*Notes: Sample No.: 92-11249 Asbestos is present in tile only.
Sample No.: 92-11251 Asbestos is present in tile only.

Katherine Wysong
Microscopist

All values are in percent by area by visual estimate. The Federal Register/Vol. 55, No. 224/Tuesday, November 20, 1990/Rules and Regulations states "...If the asbestos content is estimated to be less than 10% by a method other than point counting,...(the analysis) be repeated using the point counting technique with PLM." Any of the above samples can be reanalyzed by point counting at the client's request, if deemed necessary by the client. Separate phases are analyzed individually and are reported as a combined average.

ND=Non-Detected Trace= <1%

NVLAP Accredited

DATACHEM LABORATORIES
FiberFAX℠
Polarized Light Microscopy
Asbestos Analysis Summary

Client: Carlisle Barracks
Sample Set ID Number: 92-A-1599

Horsham Rm 211 Horsham Hall Wing

Date: 5/1/92
Page: 2

Client Sample #:	1H3292	1H3392
DataChem Laboratories Sample #:	92-11252	92-11253
MACROSCOPIC EXAMINATION:		
Sample Accepted or Rejected:	Accepted	Accepted
Homogeneity:	Homog.	Homog.
Color:	Grey/Black	Black
Texture:	Cmpt/Adhs	Compact
Sample Description:	Tile/Mastic	Tile
Analysis:	PLM	PLM
ASBESTIFORM MINERALS:		
% Chrysotile:	>1≤3	>3≤5
% Amosite:		
% Crocidolite:		
% Tremolite:		
% Actinolite		
% Anthophyllite		
% Total Asbestos	**>1≤3**	**>3≤5**
OTHER MATERIALS:		
% Cellulose:	Trace	
% Fiberglass:		
% Mineral Wool:		
% Other Fibrous:		
% Resin/Binder:	>10≤20	>10≤20
% Other Non-Fibrous:	>70≤80	>70≤80

Special Prep. Procedures:

*Notes:

Katherine Wysong
Microscopist

All values are in percent by area by visual estimate. The Federal Register/Vol. 55, No. 224/Tuesday, November 20, 1990/Rules and Regulations states "...If the asbestos content is estimated to be less than 10% by a method other than point counting,...(the analysis) be repeated using the point counting technique with PLM." Any of the above samples can be reanalyzed by point counting at the client's request, if deemed necessary by the client. Separate phases are analyzed individually and are reported as a combined average.

ND=Non-Detected Trace= <1%

1995

ASBESTOS MANAGEMENT COMPLIANCE
HORSHAM MEMORIAL USARC

1. ASBESTOS MANAGEMENT OVERVIEW

Asbestos, a group of natural fiber minerals, has been used primarily for thermal and acoustical purposes. Asbestos becomes a health hazard when it degrades into microscopic fibers causing it to crumble. This crumbled form of asbestos is known as "friable" asbestos. Due to the potential health effects of breathing friable asbestos, the Army has established a program to manage asbestos on Army installations. The program entails identifying asbestos and abating the areas cited as a health risk.

Below is a list of the primary objectives of the Army's Asbestos Management Program.

- Minimize environmental releases and occupational and incidental exposure;
- Exclude asbestos from procurement and uses where asbestos free substitutes exist;
- Handle, store, transport, and dispose of asbestos in compliance with all applicable regulations;
- Develop and maintain an inventory of all asbestos in Army structures and determine the potential for human exposure;
- In areas known to have asbestos, implement a program to minimize exposure until abatement is accomplished;
- Maintain a non-occupational environment safe from exposure; and
- Execute an Asbestos Management Plan (AMP) in support of Army policy.

2. APPLICABILITY OF REGULATORY REQUIREMENTS

There are several federal agencies charged with regulating asbestos products and wastes. EPA regulations pertaining to asbestos are contained in 40 CFR 61. The OSHA standard, which limits occupational exposure to asbestos, is contained in 29 CFR 1910 and 29 CFR 1926. In addition, EPA has published several guidance documents on asbestos management or abatement. Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*, contains a chapter

providing Army regulations for asbestos management. In addition to the Army regulations and the federal regulations, The Commonwealth of Pennsylvania, Department of Labor and Industry, requires notification regarding asbestos abatement projects. Abatement pertains not only to demolition activities, but also to any type of action that is taken to minimize exposure or release. All correspondence should be directed to Pennsylvania Department of Labor and Industry at the following address:

Asbestos Notification
PO Box 8468
400 Market Street
Harrisburg, PA 17105-8468

In addition to the Army regulations and the federal regulations, The Commonwealth of Pennsylvania, Department of Labor and Industry, requires notification regarding asbestos abatement projects. Abatement pertains not only to demolition activities, but also to any type of action that is taken to minimize exposure or release.

3. RESPONSIBILITIES

The Army is responsible for appropriating adequate resources to identify, manage, and control exposure to asbestos, prohibiting the introduction of asbestos into the workplace, providing personal protective equipment, and other requirements associated with the implementation of a nationwide asbestos management program. It is the responsibility of the Installation Commander to:

- Establish an Installation Asbestos Management Team to prepare and execute the Installation AMP;
- Perform and update asbestos surveys to determine the location, extent, and condition of all asbestos;
- Complete an initial asbestos survey, performed by accredited personnel, by 23 May 1991 per Army Regulation 200-1;
- Annotate master planning documents and drawings to indicate real property containing asbestos;
- Notify 79th ARCOM whenever a notice of violation (NOV) is received;

- Prepare and implement an Operation and Maintenance (O&M) Plan that minimizes and monitors asbestos exposure in areas where potential asbestos exposure exists;

- Develop an environmental impact analysis of the installation asbestos management plan as required by Army Regulation 200-2; and

- Provide worker education and training programs for individuals that are identified to work with asbestos.

4. COMPLIANCE STATUS SUMMARY

ECAAR Status:	Data was unavailable.
Surveys:	According to the FM, in 1991 tiles tested positive for asbestos containing material ACM. Prior to 1991, ACM in the boiler room was removed.
Recordkeeping:	Asbestos survey results were not available.
Plan contents:	Data was unavailable.
Documented accredited inspector:	Data was unavailable.

CONTRACT NUMBER: DACA31-89-D-0061
DELIVERY ORDER NUMBERS: 0003, 0004, 0005

SAMPLING AND ANALYSIS TEST PLAN

FOR

USARC-RIFLE RANGES
GERMANTOWN, PHILADELPHIA, HORSHAM, NORTH PENN, BRISTOL, REESE, SCRANTON, MARLIN GARES, WILKES-BARRE

PREPARED BY:

GILLAN & HARTMANN, INC.

JOB NO. 91283

DATE: JANUARY 9, 1992

Gillan & Hartmann, Inc.

215-935-0101 • 302-654-5959 • 609-347-1593 • FAX 215-935-7520

TABLE OF CONTENTS

1.0 INTRODUCTION

The following document is the Field Investigation and Sampling Report for United States Army Reserve Center's (USARC) indoor firing range at the Horsham, USARC, 936 Easton Road, Horsham, Pennsylvania. Filed sampling activities were conducted by RT Environmental Services ("RT") under the terms of contract #DACA-89-D-0061, Delivery Order #0003. The purpose of the field investigation was to collect samples and perform field observations relevant to the investigation of possible residual lead contamination within the rifle ranges and to make subsequent recommendations with respect to site remediation. On site sampling activities were performed on February 20, 1992. Field activities and sampling procedure were conducted in accordance to those outlined in the Sampling and Analysis Test Plan for United States Army Reserve Centers ("USARC") Rifle Ranges. The approved final Sampling and Analysis Plan was dated February 1992.

2.0 SITE HISTORY

The Department of the Army operates a Army Reserve Center at 936 Easton Road, Horsham, Pa. for housing and training Army Reserve Units during their active service period. (See Figure 1.)

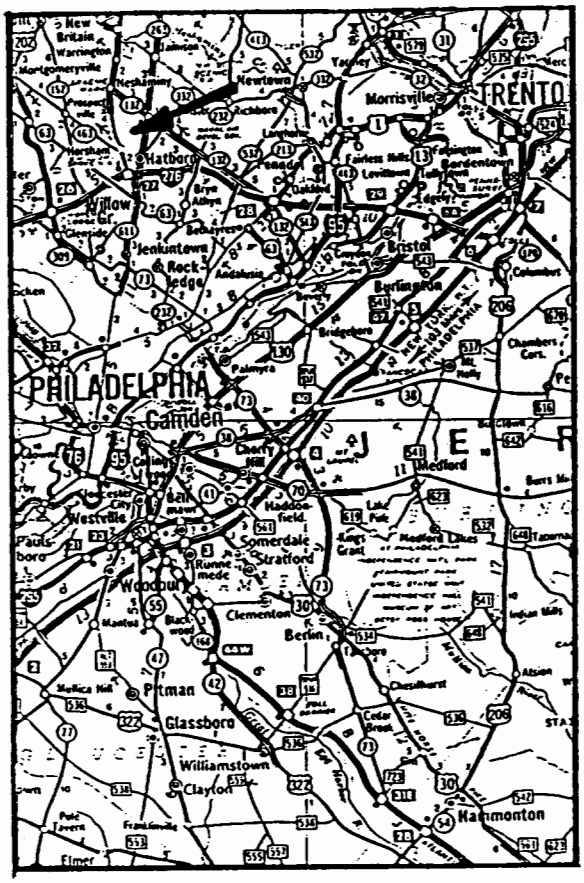
Under the current set-up, drill training is conducted throughout the year in periods called Unit Training Assemblies (UTA's). The UTA is a four hour training session which is conducted in drill sessions during a one weekend per month format at an off-site location such as Fort Indiantown Gap or Fort Dix. Under this system, four UTA's are conducted monthly and, hence, forty-eight are conducted annually.

Historically, however, training was not conducted in the one weekend per month format. Rather, drill sessions were conducted in one evening per week sessions in which training was performed at the individual facilities. Proficiency in marksmanship was required as part of the UTA training and to that end, sub-caliber (.22) rifle ranges were an integral instrument for unit training.

From information given to RT Environmental Services ("RT") during site visits, comprehensive training including the use of the indoor rifle ranges was performed for a period of time between the 1950's and the post-Vietnam era.

Changes in the late 1960's in the training requirements of reserve units meant that the field drills (UTA's) were being conducted at a central location (Fort Indiantown Gap) and, therefore, the use of the rifle ranges at Reserve Centers became obsolete.

Currently, the Army is considering alternative uses for these rifle ranges and is interested in determining the environmental impact of their historic use in creating a comprehensive remedial plan. Under the Delivery Order, the Contractor has been asked to devise,



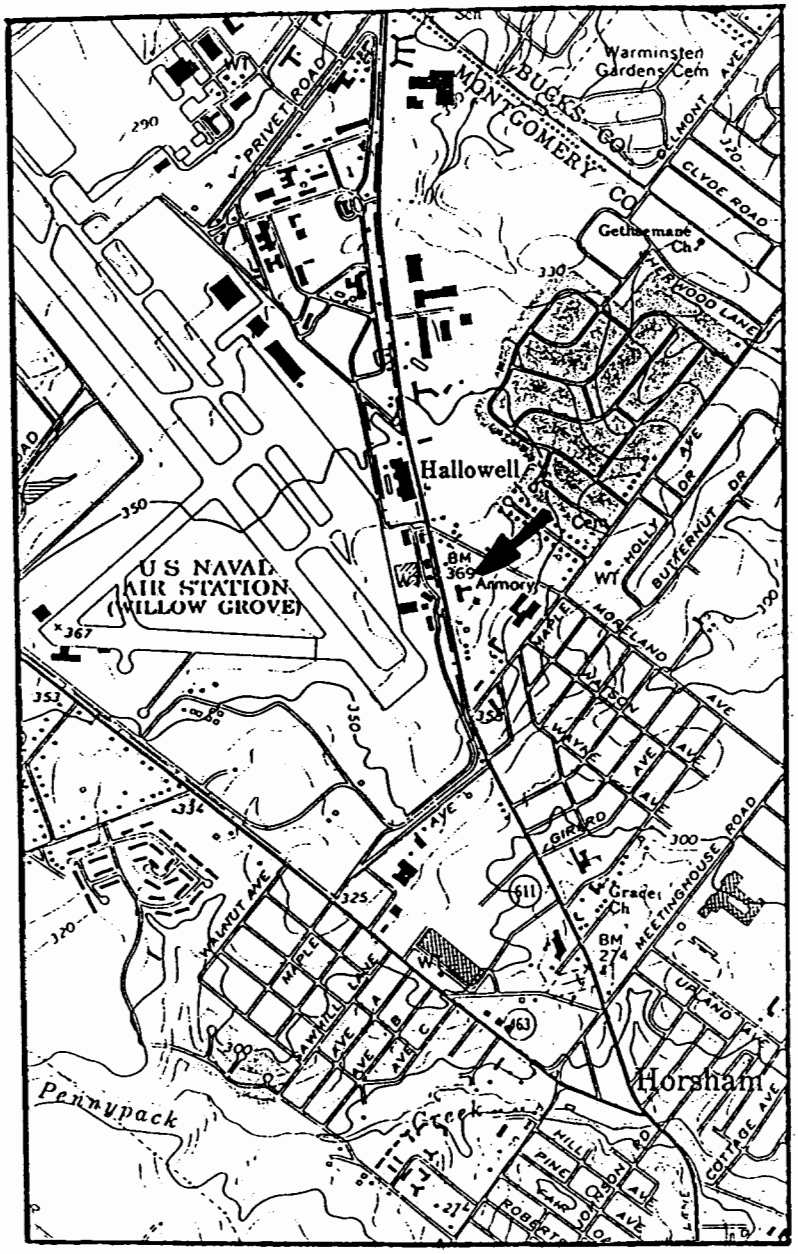


FIGURE 1
LOCATION MAP

HORSHAM USARC

justify, schedule and conduct a sampling of the rifle ranges and related structures by assessing the potential for lead contamination at the site.

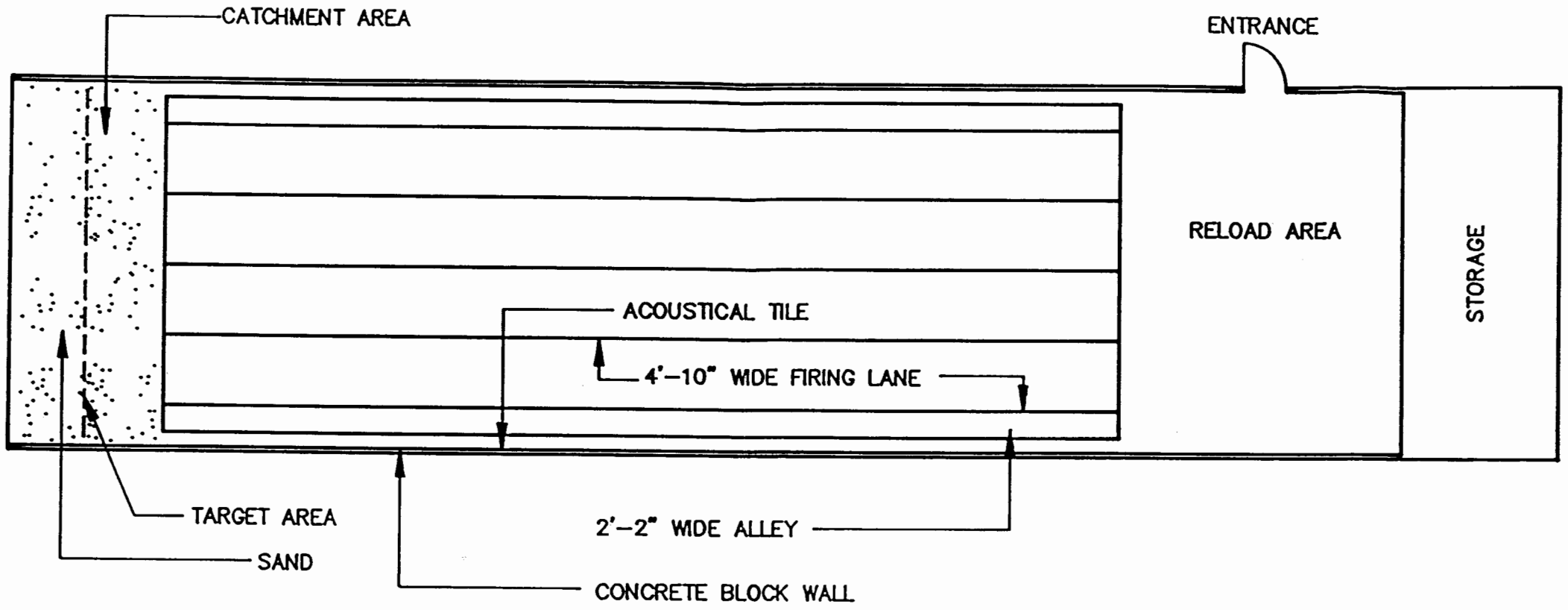
2.1 TYPICAL RIFLE RANGE LAYOUT

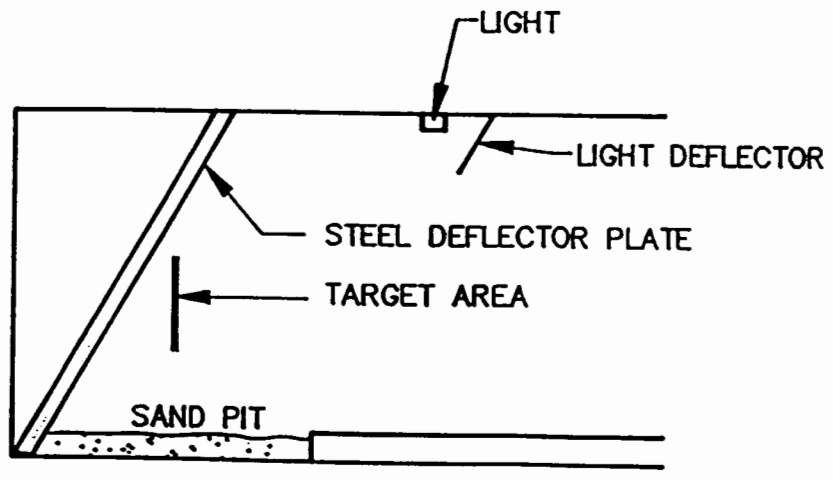
The typical range is 70′ to 110′ from the firing line to the target, and is made up of three or four 4′10" firing lanes with 2′2" outside alleys. Behind the firing line is a 400 square foot area (20′ x 20′) where presumably reloading or instructional activities were conducted. Beyond that is a 300 square foot range storage room. Entrance and egress to the rifle range is typically from a side door which enters in the area immediately behind the firing line. (See Figure 2.)

The rifle range target area uses a standard layout with a 8′ - 12′ sand pit (the width of the range at the target area). The depth of the pit may vary, but has been determined in the field to be as deep as 10", with seven to eight inches of sand. At the rear of the pit is a large heavy gauge steel deflector plate which originates from the rear of the pit and slants forward at a 45° upward angle.

The targets are positioned immediately in front of this plate, and it functions to deflect the bullets downward. The base of this plate is mounted directly within the pit; however, the top of the plate may or may not extend completely to the ceiling. As a result, an area of 800-1,000 ft^3 may exist behind the deflector shield.

The walls of the USARC rifle ranges, are cinder block with a paint finish. At most ranges the area from the rear of the pit to a point approximately 20′ in front of the target, the block walls are exposed. From this a 1" thick coarse fiber acoustical tile,





CROSS SECTION OF
DEFLECTOR PLATE
N.T.S.

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

FOR
USARC RIFLE RANGES
DEPARTMENT OF THE ARMY

PLAN VIEW TYPICAL

Gillan and Hartmann, Inc
CONSULTING ENGINEERS
VALLEY FORGE, PENNSYLVANIA 19481-0345

CHARGE | APPROVED FILE | ENGINEER | DESIGNER | DRAFTSPERSON
SCALE 1"=10'
DATE
DRAWING NUMBER
FIGURE 2
REVISION

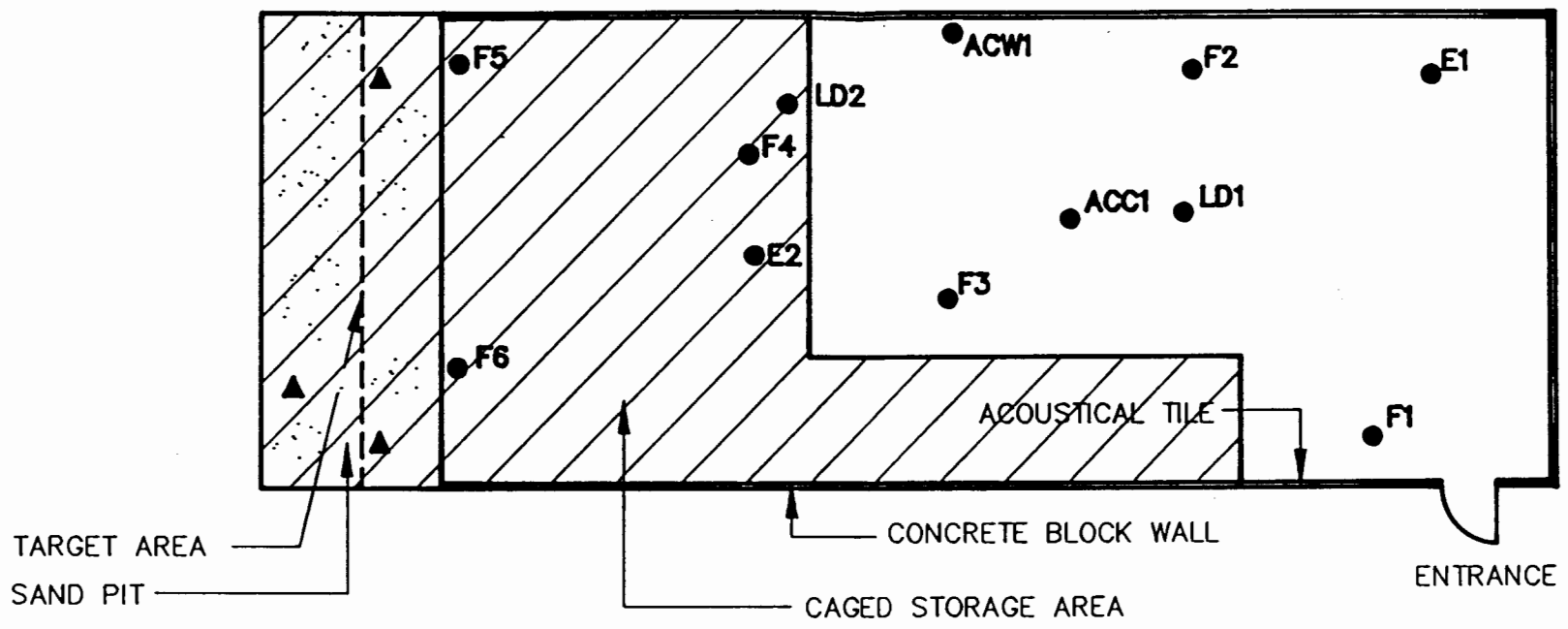
REV.	DATE	DESCRIPTION	REV.	DATE	DESCRIPTION	REFERENCE DRAWING NUMBER	REFERENCE DRAWING TITLE	APPROVED	DATE

mounted on a 1 x 3 furring strip nailed to the wall serves as the interior finish. The start of this is trimmed with a return piece so that a gap does not exist along the section of the wall. These tiles generally are 2' x 4' in size, and for the most part intact. The tiles continue in the same configuration across the ceiling.

The ranges are typically lit using an incandescent spot light at the front of the range to illuminate the targets. Extending to the rear are rows of fluorescent lights 20' apart and three wide. The lights are protected by a series of deflector shields which are anchored to the ceiling at the rear and extend downward at a 45° angle two feet from the ceiling. The floors of the rifle ranges are unpainted, smooth trowel finished concrete.

2.2 HORSHAM USARC RIFLE RANGE

The Horsham USARC range is 70' by 25' and is currently being used as a storeroom. Part of the range is sectioned into individual storage areas with a chain link fence (Figure 3). The catchment area is also sectioned off with pallets placed on the sand. The catchment area was completely full of stored materials which limited access and sampling activities. Materials stored in the range appeared to be mostly camping and field equipment. The range has hot water baseboard heat and the walls and floor were freshly painted. The room appeared to be well kept with very little dust accumulation.



LEGEND

SYMBOL		DESCRIPTION	NUMBERS
▲ CS	–	CATCHMENT SAND SAMPLE	(3)
● LD	–	LIGHT DEFLECTOR WIPE SAMPLE	(2)
● F	–	FLOOR WIPE SAMPLE	(6)
●ACW	–	ACOUSTICAL WALL TILE SAMPLE	(1)
●ACC	–	ACOUSTICAL CEILING TILE SAMPLE	(1)
● E	–	EQUIPMENT WIPE SAMPLE	(2)

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)

1 inch = 10 ft.

REV.	DATE	DESCRIPTION	REV.	DATE	DESCRIPTION	REFERENCE DRAWING NUMBER	REFERENCE DRAWING TITLE	APPROVED	DATE
								REVIEWED	DATE

Gillan and Hartmann, Inc
CONSULTING ENGINEERS
VALLEY FORGE, PENNSYLVANIA 19481-0345

FOR:
U.S. ARMY RESERVE CENTER
HORSHAM, PENNSYLVANIA

SAMPLE LOCATIONS

PREPARED BY:
R T ENVIRONMENTAL SERVICES, INC.
KING OF PRUSSIA, PENNA.

CHARGE	AUTOCAD FILE	ENGINEER	DESIGNER	DRAFTSPERSON
1068–01	1090F9		RFJ	RFJ

SCALE	DRAWING NUMBER	REVISION
1"=10'	FIGURE 3	

DATE 4/2/92

3.0 SAMPLE COLLECTION PROCEDURES

Sample collection procedures used in this field investigation were conducted in accordance with those presented in the Sampling and Analysis Plan submitted by RT Environmental Services in February, 1992.

The Horsham USARC at 936 Easton Road, Horsham, Pa. was sampled on February 20, 1992, by RT personnel, Eric Eaby. During the course of the sampling investigation, three types of samples were collected, including ten individual wipe samples, two acoustical tile samples and three composite catchment sand samples.

Wipe samples were collected from: six discrete locations on the floor of the USARC, two pieces of stored equipment and from two locations on the light deflectors. Samples were collected utilizing laboratory grade filter paper wetted with de-ionized 1% nitrite acid water solution.

Two individual acoustical tile samples were collected: one from the wall and one from the ceiling in bulk utilizing sampling equipment decontaminated between each sample.

Catchment samples were collected at only three individual locations within the sand pit. Due to access limitation in the catchment area and difficulty in collecting sand samples, the sand samples were not composited together by depths but by sampling location.

All samples were tested for total lead in accordance with the methods stated in the SAP. Analytical results presented in this report are reported in a quantities of ug/mg for catchment sand and acoustical tile samples, and ug/ft^2 for wipe samples.

No composite sand sample to be included in the multi-site TCLP lead analysis was collected at this site.

It must be noted that dust accumulation was variable according to the sample location within the range, although sample locations were chosen to be representative of the average dust accumulation variations in dust density and collection were unavoidable. Analytical results are, therefore, representative of both dust accumulation at a particular point and a lead contamination in general for the particular range. Further, the wipe samples were not able to collect 100% of the dust present within a sample area. Accordingly, sampling results as reported are biased low.

4.0 SAMPLE RESULTS

Analytical samples collected from the Horsham USARC revealed elevated levels of lead in several of the matrices collected. (See Table 1.)

Of the six floor wipe samples which were collected from within the rifle range, two revealed lead levels in excess of the recommended remedial threshold of 200 ug/ft^{2}. Individual results ranged from 100 ug/ft^{2} to 1,520 ug/ft^{2}. Lead values were observed to decrease with distance from the sand pit area.

Two equipment wipe samples were collected from two locations within the Horsham USARC. Sample E1 was collected from the heating baseboard in the center of the rifle range and revealed lead concentrations of 180 ug/ft$_{2}$. Sample E2 was collected from a storage shelf near the catchment area and had a value of 140 ug/ft^{2}.

Samples collected from the light reflectors had elevated lead concentrations of 460 ug/ft^{2} and 250 ug/ft^{2}.

Acoustical tile samples collected from the wall and ceiling of the facility revealed lead calculations of 30 ug/Kg.

Sand samples collected from the catchment area revealed lead concentrations ranging from 46,500 ug/Kg at the base to 52,800 ug/Kg at the surface. All these values represent extremely elevated concentrations of lead.

TABLE ONE

ANALYTICAL RESULTS

HORSHAM USARC

SAMPLE #	TOTAL LEAD ug/ft.^{2}
W-F1-HO	130
W-F2-HO	130
W-F3-HO	100
W-F3-DUP-HO	100
W-F4-HO	200
W-F5-HO	840
W-F6-HO	1,520
W-E1-HO	180
W-E2-HO	140
W-LD1-HO	460
W-LD2-HO	250
W-BLANK-HO	<1
W-BLANK-SP-HO	13,800
AC-W1-HO	30 ug/Kg
AC-C2-HO	30 ug/Kg
CS-1-HO	50,500 ug/Kg
CS-2-HO	52,500 ug/Kg
CS-3-HO	46,500 ug/Kg

5.0 SUMMARY INVESTIGATION AND REMEDIATION

Based on the data collected during the course of the sampling investigation, RT recommends the following action be undertaken to investigate and remediate potential lead problems at the USARC.

- The facility should discontinue the storage of any and all materials within the catchment sand area, immediately.

- The facility should restrict all access to the catchment sand area, immediately.

- The Horsham USARC should begin procurement of remedial services associated with the decontamination of the facility. Specific measures for decontamination are given in Section 6.

- The Horsham USARC should evaluate alternative interim storage room facilities.

- All equipment and material stored within the range should be decontaminated before removal.

6.0 RECOMMENDED REMEDIAL RESPONSES

Based on the data collected during our investigation, RT recommends the following remedial response be conducted at the Horsham USARC.

- Catchment sand from within the catchment area should be removed and disposed of as hazardous waste.

- The projectile deflection shield should be vacuumed and then removed and disposed of.

- The light deflector shields should be removed and decontaminated using the same procedure as for the projectile deflection shield.

- All equipment stored in the range should be properly decontaminated. Decontamination procedures, which are dependent on the nature of equipment present, include pressure washing, vacuuming, wiping and industrial washing.

- All concrete surfaces (floor, wall and ceiling) should be initially vacuumed, then pressure washed with trisodium phosphate and rinsed with clean water. All accumulating wash and rinse waters should be collected at the time of generation and disposed.

- Follow-up wipe sampling should be conducted on all surfaces to ensure that concentrations of residual lead dust meet the acceptable levels.

- The catchment sand pit should be decontaminated using the same methods for all concrete and then should be filled with concrete to floor grade.

- All concrete surfaces should be painted as a final step.

ATTACHMENT 1

LABORATORY ANALYTICAL RESULTS

Data Package

Tier II Data Package

Analytical Data Report Package
for
R. T. Environmental Services

USARC - Horsham Grab Wipe Samples
Collected on 2/20/92 by EE
LLI Sample No. 1779298-1779310

Prepared by Guy C. Tasco

Reviewed & Approved by Susan B. Shorter

Date 3/11/92

Delivery Date 3/16/92

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TABLE OF CONTENTS

Analysis Request/Environmental Services

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1779278 - 315

Chain of Custody

1

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: RT Environmental Acct. #: 5271
Project Name/#: USARC - Horsham
Project Manager: Peter Uhlman P.O. #: 1068-01-01
Sampler: EE Quote #: 108513

For LLI use only
FSC:
SCR #:

(5) Analyses Requested: Total Lead

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	(4) Matrix: Soil	Water	Other: Wipe	Total # of Containers	Total Lead								(6) Remarks
W-F1-HO	2/20/92	1630	↓				↓		↓								
W-F2-HO	↓	↓	↓				↓		↓								
W-F3-HO	↓	↓	↓				↓		↓								
W-F3-HO Duplicate	↓	↓	↓				↓		↓								
W-F4-HO	↓	↓	↓				↓		↓								
W-F5-HO	↓	↓	↓				↓		↓								
W-F6-HO	↓	↓	↓				↓		↓								
W-E1-HO	↓	↓	↓				↓		↓								
W-E2-HO	↓	↓	↓				↓		↓								
W-C01-HO	↓	↓	↓				↓		↓								

(7) **Turnaround time requested** (please circle): Normal (circled) Rush
(Rush TAT is subject to LLI approval and surcharge.)

Rush results requested by (please circle):
Fax Fax #:
Phone Phone #:

(8) **Data package options** (please circle if requested):
QC Summary
Tier I (NJ)
Tier II (NJ)
EPA CLP

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)
Data Package Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
E. Thompson	2/10/92	1700	[signature]	2/14/92	1707
[signature]	2/24/92	1200	[signature]	2/24/92	1200
[signature]	2/24/92	1335			
Relinquished by:	Date	Time	Received for LLI by:	Date	Time
			Doug [signature]	2/24/92	1330

Analysis Request/Environmental Services

Chain of Custody

2

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Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: RT Acct. #:
Project Name/#: Page 2 of 2
Project Manager: P.O. #:
Sampler: Quote #:

For LLI use only
FSC:
SCR #:

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	(4) Matrix: Soil	Water	Other Wipe	Total # of Containers	(5) Analyses Requested								(6) Remarks
W-LD2-E2	2/20/92	1630	|				|										
W-Blank1-110	|	|	|				|										
W-Blank2-HO	|	|	|				|										
AC-W1-110	|	|	|		X												
AC-C1-HO	|	|	|		|												
CS-1-HO	|	|	|		|												
CS-2-HO	|	|	|		|												
CS-3-HO	|	|	|		X												

(7)
Turnaround time requested (please circle): (Normal) Rush
(Rush TAT is subject to LLI approval and surcharge.)

Rush results requested by (please circle):
Fax Fax #:
Phone Phone #:

(8)
Data package options (please circle if requested):

QC Summary
Tier I (NJ)
Tier II (NJ)
EPA CLP

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Data Package Chain of Custody required?
Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
E. Thompson	2/10/92	1700	[signature]	2/10/92	1702
[signature]	2/24/92	1200	[signature]	2/24/92	12:00
[signature]	2/24/92	1336			

Relinquished by:	Date	Time	Received for LLI by:	Date	Time
			[signature]	2/24/92	1330

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LLI LAB CHRONICLE

Analysis		Trial	Analysis Date
LLI Sample # 1779298			
R. T. Environmental Services			
W-F1-HO Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92
LLI Sample # 1779299			
R. T. Environmental Services			
W-F2-HO Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92
LLI Sample # 1779300			
R. T. Environmental Services			
W-F3-HO Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92

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LLI LAB CHRONICLE

Analysis		Trial	Analysis Date
LLI Sample # 1779301			
R. T. Environmental Services			
W-F3-HO Duplicate Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92
LLI Sample # 1779302			
R. T. Environmental Services			
W-F4-HO Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92
LLI Sample # 1779303			
R. T. Environmental Services			
W-F5-HO Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92

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LLI LAB CHRONICLE

Analysis		Trial	Analysis Date
LLI Sample # 1779304			
R. T. Environmental Services			
W-F6-H0 Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92
LLI Sample # 1779305			
R. T. Environmental Services			
W-E1-H0 Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92
LLI Sample # 1779306			
R. T. Environmental Services			
W-E2-H0 Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92

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LLI LAB CHRONICLE

Analysis		Trial	Analysis Date
LLI Sample # 1779307			
R. T. Environmental Services			
W-LD1-HO Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92
LLI Sample # 1779308			
R. T. Environmental Services			
W-LD2-HO Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92
LLI Sample # 1779309			
R. T. Environmental Services			
W-Blank 1-HO Wipe Sample			
USARC - Horsham			
Collected 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0493	Metals Digestion	1	02/27/92
1155	Lead (furnace method)	1	03/04/92

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LLI LAB CHRONICLE

Analysis		Trial	Analysis Date

LLI Sample # 1779310
R. T. Environmental Services

W-Blank 2-HO Spike Wipe Sample
USARC - Horsham
Collected 02/20/92 by EE
Receipt/Refrigeration: 02/24/92

0155	Lead	1	02/28/92
0493	Metals Digestion	1	02/27/92

METHODOLOGY SUMMARY/REFERENCE

Lead Flame AA (solids)

The solution resulting from the metals digestion is analyzed by ICP or Flame AA. Samples are analyzed by ICP unless specifically identified as being analyzed by Flame AA.

Reference: ICP: Test Methods for Evaluating Solid Waste, SW-846, Method 6010, September, 1986.
AA: Test Methods for Evaluating Solid Waste, SW-846, Method 7420, September, 1986.

High Volume Air Filters

The lead present in the particulate matter on the air filter is solubilized by extraction with nitric acid and heat. The resulting solution is analyzed by Flame or Graphite Furnace Atomic Absorption.

Reference: Section 7.1, 40 CFR Ch.1 (7-1-90 Edition), Part 50, App. G.

Lead Furnace Method (solids)

The solution resulting from the Metals Digestion is analyzed by graphite furnace atomic absorption (GFAA).

Reference: Test Methods for Evaluating Solid Waste, SW-846, Method 7421, September 1986.

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14:06:05 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779298
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-F1-HO Wipe Sample
USARC - Horsham

F1-HO SDG# USA9-01	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
ANALYSIS				
Lead	130.	ug	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental
Client Services at (717) 656-2301
041 05271 25.00 003900

Respectfully Submitted
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Reviewed and Approved by:

Debora K. Gifford,
Group Leader, Inorganics

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ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779299
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-F2-HO Wipe Sample
USARC - Horsham

F2-HO SDG# USA9-02	RESULT		LIMIT OF	
ANALYSIS	AS RECEIVED		QUANTITATION	LAB CODE
Lead	130.	ug	10.	015501400

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ASR000 D 2 18
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R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779300
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-F3-H0 Wipe Sample
USARC - Horsham

F3-H0 SDG# USA9-03 ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	100.	ug	10.	015501400

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ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779301
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-F3-H0 Duplicate Wipe Sample
USARC - Horsham

F3H0D SDG# USA9-04 ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	100.	ug	10.	015501400

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ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779302
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-F4-HO Wipe Sample
USARC - Horsham

F4-HO SDG# USA9-05 ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	200.	ug	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
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ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779303
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01

W-F5-H0 Wipe Sample
USARC - Horsham

F5-H0 SDG# USA9-06 ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	840.	ug	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
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Questions? Contact Environmental Client Services at (717) 656-2301
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14:06:11 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779304
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-F6-HO Wipe Sample
USARC - Horsham

F6-HO SDG# USA9-07 ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	1,520.	ug	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
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Client Services at (717) 656-2301
041 05271 25.00 003900

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Reviewed and Approved by:

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Group Leader, Inorganics

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14:06:12 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779305
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-El-HO Wipe Sample
USARC - Horsham

El-HO SDG# USA9-08 ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	180.	ug	10.	015501400

1 COPY TO R. T. Environmental
1 COPY TO Data Package Group

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Questions? Contact Environmental
Client Services at (717) 656-2301
041 05271 25.00 003900

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Lancaster Laboratories, Inc.
Reviewed and Approved by: 15

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Group Leader, Inorganics

Analysis Report

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14:06:13 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

W-E2-H0 Wipe Sample
USARC - Horsham

LLI Sample No. G4 1779306
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

E2-H0 SDG# USA9-09 ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	140.	ug	10.	015501400

1 COPY TO R. T. Environmental
1 COPY TO Data Package Group

ATTN: Mr. Peter Uhlman

Questions? Contact Environmental
Client Services at (717) 656-2301
041 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by: 17

Debora K. Gifford,
Group Leader, Inorganics

Lancaster Laboratories
Where quality is a science.

14:06:14 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779307
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-LD1-HO Wipe Sample
USARC - Horsham

LD1HO SDG# USA9-10	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
ANALYSIS				
Lead	460.	ug	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental
Client Services at (717) 656-2301
041 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Debora K. Gifford,
Group Leader, Inorganics

18

Lancaster Laboratories
Where quality is a science.

14:06:15 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779308
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-LD2-HO Wipe Sample
USARC - Horsham

LD2HO SDG# USA9-11	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
ANALYSIS				
Lead	250.	ug	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental
Client Services at (717) 656-2301
041 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Debora K. Gifford,
Group Leader, Inorganics

Lancaster Laboratories
Where quality is a science.

14:06:16 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779309
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

W-Blank 1-HO Wipe Sample
USARC - Horsham

B-1HO SDG# USA9-12 ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead (furnace method)	< 1.	ug	1.	115504000

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental
Client Services at (717) 656-2301
041 05271 25.00 006500

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Debora K. Gifford,
Group Leader, Inorganics

29

Lancaster Laboratories
Where quality is a science.

14:06:17 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

W-Blank 2-HO Spike Wipe Sample
USARC - Horsham

LLI Sample No. G4 1779310
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

B-2HO SDG# USA9-13* ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	13,800.	ug	10.	015501400

1 COPY TO R. T. Environmental
1 COPY TO Data Package Group

ATTN: Mr. Peter Uhlman

Questions? Contact Environmental Client Services at (717) 656-2301
041 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Debora K. Gifford,
Group Leader, Inorganics

METALS DATA

CASE NARRATIVE

CASE NARRATIVE FOR INORGANICS

Laboratory Name: Lancaster Laboratories

SDG Number: USA9

Date Received: 02/24/92

Calibration Standards:
Instrument calibration standards are prepared monthly from stock solutions purchased from Spex or Baker chemical.
Total ICP intergration time is 24 seconds.

Analysis:
Sample F6-HO was analyzed at a 1:10 dilution. The laboratory control sample and B-2HO S were analyzed at 1:40 dilutions.

Case Narrative reviewed and approved by:

Mary C Townsend

Mary C. Townsend, Data Validation Chemist I
Inorganic Data Packages

Lancaster Laboratories, Inc. • 2425 New Holland Pike, Lancaster, PA 17601-5994 • 717-656-2301 • Fax: 717-656-2681

QC SUMMARY

QUALITY ASSURANCE SUMMARY

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA9___

Client Sample ID	Lab Sample ID
B-1HO	1779309
B-2HO_S	1779310
E1-HO	1779305
E2-HO	1779306
F1-HO	1779298
F2-HO	1779299
F3-HO	1779300
F3HOD_D	1779301
F4-HO	1779302
F5-HO	1779303
F6-HO	1779304
LD1HO	1779307
LD2HO	1779308

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO_

LEGEND:

Flags:	U = Below IDL	Methods:	A = Flame Atomic Absorption
	B = Below LOQ		P = Inductively Coupled Plasma
	N = Matrix Spike Out of Spec.		F = Graphite Furnace
	* = Duplicate Out of Spec.		HY = Hydride Generation
			CV = Cold Vapor
Terms:	IDL = Instrument Detection Limit		AV = Automated Cold Vapor
	LOQ = Limit of Quantitation		NR = Not Required

I certify that this data package is in full compliance with the terms and conditions as specified by the NJDEP, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Mary C Townsend Name: MARY C TOWNSEND

Date: March 4, 1992 Title: DATA VALIDATION COORDINATOR

QUALITY ASSURANCE SUMMARY

BLANKS

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA9__

Preparation Blank Matrix (soil/water): WIPE_

Preparation Blank Concentration Units (ug/L or mg/kg): UG___

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Boron											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead									0.200	U	F
Lithium											NR
Magnesium											NR
Manganese											NR
Mercury											NR
Molybdenu											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silicon											NR
Silver											NR
Sodium											NR
Strontium											NR
Thallium											NR
Tin											NR
Titanium											NR
Vanadium											NR
Zinc											NR

QUALITY ASSURANCE SUMMARY

SPIKE SAMPLE RECOVERY

CLIENT SAMPLE NO.

B-2HO S

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA9__
Matrix: WIPE_
% Solids for Sample: 100.0

Level (low/med): LOW

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Boron									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	75-125	13840.0000		0.9200		15015.55	92.2		A
Lithium									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Molybdenu									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silicon									NR
Silver									NR
Sodium									NR
Strontium									NR
Thallium									NR
Tin									NR
Titanium									NR
Vanadium									NR
Zinc									NR

NOTE: An (N) in column "Q" indicates a spike recovery that is not within the control limits. The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample page of the Quality Assurance Summary.

Comments:

QUALITY ASSURANCE SUMMARY

DUPLICATES

CLIENT SAMPLE NO.

F3HOD D

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA9__

Matrix (soil/water): WIPE_ Level (low/med): LOW

% Solids for Sample: 100.0 % Solids for Duplicate: 100.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Boron								NR
Cadmium								NR
Calcium								NR
Chromium								NR
Cobalt								NR
Copper								NR
Iron								NR
Lead		104.0000		98.0000		5.9		A
Lithium								NR
Magnesium								NR
Manganese								NR
Mercury								NR
Molybdenu								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silicon								NR
Silver								NR
Sodium								NR
Strontium								NR
Thallium								NR
Tin								NR
Titanium								NR
Vanadium								NR
Zinc								NR

NOTE: An asterisk(*) in column "Q" indicates poor duplicate precision. The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample page of the Quality Assurance Summary.

QUALITY ASSURANCE SUMMARY

LABORATORY CONTROL SAMPLE

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA9__

Solid LCS Source: LLI_____

Aqueous LCS Source: _____

Analyte	Aqueous (ug/L) True	Found	%R(1)	Solid (mg/kg) True	Found	C	Control Limits		%R
Aluminum_									
Antimony_									
Arsenic__									
Barium___									
Beryllium									
Boron____									
Cadmium__									
Calcium__									
Chromium_									
Cobalt___									
Copper___									
Iron_____									
Lead_____				12154.8	10960.0		9723.8	14585.8	90.2
Lithium__									
Magnesium									
Manganese									
Mercury__									
Molybdenu									
Nickel___									
Potassium									
Selenium_									
Silicon__									
Silver___									
Sodium___									
Strontium									
Thallium_									
Tin______									
Titanium_									
Vanadium_									
Zinc_____									
_____									
_____									
_____									

(1) Control Limits: All Metals 80-120

SAMPLE DATA

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

B-1HO

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA9
Matrix (soil/water): WIPE
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779309
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	0.92			F
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

E1-HO

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA9
Matrix (soil/water): WIPE
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779305
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	182			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

E2-HO

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA9
Matrix (soil/water): WIPE
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779306
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	138			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

F1-HO

Lab Name: LANCASTER_LABORATORIES_____
SDG No.: USA9__
Matrix (soil/water): WIPE_
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779298___
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__				NR
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
	Boron____				NR
7440-43-9	Cadmium__				NR
7440-70-2	Calcium__				NR
7440-47-3	Chromium_				NR
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____				NR
7439-92-1	Lead_____	132			A_
	Lithium__				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury__				NR
	Molybdenu				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
	Silicon__				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___				NR
	Strontium				NR
7440-28-0_	Thallium_				NR
	Tin______				NR
	Titanium_				NR
7440-62-2_	Vanadium_				NR
7440-66-6_	Zinc_____				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

F2-HO

Lab Name: LANCASTER_LABORATORIES_____
SDG No.: USA9__
Matrix (soil/water): WIPE_
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779299___
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__				NR
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
	Boron____				NR
7440-43-9	Cadmium__				NR
7440-70-2	Calcium__				NR
7440-47-3	Chromium_				NR
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____				NR
7439-92-1	Lead_____	134			A_
	Lithium__				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury__				NR
	Molybdenu				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
	Silicon__				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___				NR
	Strontium				NR
7440-28-0_	Thallium_				NR
	Tin______				NR
	Titanium_				NR
7440-62-2_	Vanadium_				NR
7440-66-6_	Zinc_____				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

F3-HO

Lab Name: LANCASTER_LABORATORIES_____
SDG No.: USA9__
Matrix (soil/water): WIPE_
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779300___
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__				NR
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
	Boron____				NR
7440-43-9	Cadmium__				NR
7440-70-2	Calcium__				NR
7440-47-3	Chromium_				NR
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____				NR
7439-92-1	Lead_____	104			A_
	Lithium__				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury__				NR
	Molybdenu				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
	Silicon__				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___				NR
	Strontium				NR
7440-28-0_	Thallium_				NR
	Tin______				NR
	Titanium_				NR
7440-62-2_	Vanadium_				NR
7440-66-6_	Zinc_____				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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_____
_____
_____

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

F4-HO

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA9
Matrix (soil/water): WIPE
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779302
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	198			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

F5-HO

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA9
Matrix (soil/water): WIPE
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779303
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	844			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

F6-HO

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA9
Matrix (soil/water): WIPE
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779304
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	1520			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

LD1HO

Lab Name: LANCASTER_LABORATORIES_____
SDG No.: USA9__
Matrix (soil/water): WIPE_
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779307___
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__		_		NR
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
	Boron____		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron_____		_		NR
7439-92-1	Lead_____	462	_		A_
	Lithium__		_		NR
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
	Molybdenu		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
	Silicon__		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
	Strontium		_		NR
7440-28-0_	Thallium_		_		NR
	Tin______		_		NR
	Titanium_		_		NR
7440-62-2_	Vanadium_		_		NR
7440-66-6_	Zinc_____		_		NR
			_		
			_		
			_		

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

_____
_____
_____
_____

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

LD2HO

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA9
Matrix (soil/water): WIPE
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779308
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	250			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

Method Detection Limits (Annually)

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA9
ICP Method No.:
Other AA Method No.:
Furnace AA Method No.: GF_1,2,3_SOLID_

Date: 01/15/92

Analyte	Wave-length (nm)	Back-ground	LOQ ** (ug/L)	MDL (ug/L)	M
Aluminum			200		NR
Antimony			50		NR
Arsenic			50		NR
Barium			200		NR
Beryllium			10		NR
Boron			50		NR
Cadmium			5		NR
Calcium			500		NR
Chromium			50		NR
Cobalt			50		NR
Copper			20		NR
Iron			100		NR
Lead	283.30	BD	3	1.0	F
Lithium			500		NR
Magnesium			500		NR
Manganese			10		NR
Mercury			0.5		NR
Molybdenu			100		NR
Nickel			40		NR
Potassium			500		NR
Selenium			50		NR
Silicon			500		NR
Silver			10		NR
Sodium			500		NR
Strontium			50		NR
Thallium			10		NR
Tin			500		NR
Titanium			50		NR
Vanadium			50		NR
Zinc			20		NR

** The LOQ must be adjusted for % Solids and Sample Weight for samples reporting in mg/Kg.

Comments:

QUALITY ASSURANCE SUMMARY

Method Detection Limits (Annually)

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA9
ICP Method No.:
Other AA Method No.: AA_1,2_SOLID
Furnace AA Method No.:
Date: 01/15/92

Analyte	Wavelength (nm)	Background	LOQ ** (ug/L)	MDL (ug/L)	M
Aluminum			200		NR
Antimony			50		NR
Arsenic			50		NR
Barium			200		NR
Beryllium			10		NR
Boron			50		NR
Cadmium			5		NR
Calcium			500		NR
Chromium			50		NR
Cobalt			50		NR
Copper			20		NR
Iron			100		NR
Lead	217.00		50	14.0	A
Lithium			500		NR
Magnesium			500		NR
Manganese			10		NR
Mercury			0.5		NR
Molybdenu			100		NR
Nickel			40		NR
Potassium			500		NR
Selenium			50		NR
Silicon			500		NR
Silver			10		NR
Sodium			500		NR
Strontium			50		NR
Thallium			100		NR
Tin			500		NR
Titanium			50		NR
Vanadium			50		NR
Zinc			20		NR

** The LOQ must be adjusted for % Solids and Sample Weight for samples reporting in mg/Kg.

Comments:

0.000 PROGRAM 8 Pb
SAMPLE 1 REPLICATE 1 MANUAL
ABSORBANCE CONCENTRATION BC ON
INTEGRATION 3.0 (sec) AIR-ACETYLENE

PRINTING

	CONC	%RSD	CALIBRATION MEAN ABS		READINGS		Start time
BLANK	0.00		0.000	0.000	0.001	-0.001	0940
STANDARD 1	0.05	11.3	0.006	0.006	0.007	0.006	
STANDARD 2	0.10	5.6	0.010	0.010	0.009	0.011	
STANDARD 3	0.50	1.0	0.040	0.040	0.041	0.041	
STANDARD 4	1.00	1.3	0.081	0.081	0.082	0.080	
STANDARD 5	5.00	0.3	0.355	0.354	0.356	0.356	
RESLOPE	0.50	0.0					

LANCASTER LABORATORIES
FLAME AA ELEMENT: Pb
DATE: FEB 28 1992
ANALYST:
LANCASTER LABORATORIES
INSTRUMENT ID # 3368
BKG CORR: BD

	SOLUTION TYPE	UNITS MG/L		CALIBR'N GRAPH	ANALYTICAL RESULTS		
0.50	ICV	0.49	1.2	0.040	0.040	0.039	0.040
0.00	ICB	-0.00	99.9	-0.001	0.000	-0.001	-0.000
0.05	CRA	0.03	43.1	0.004	0.005	0.005	0.002
0.50	CCV	0.51	3.2	0.041	0.041	0.042	0.040
0.00	CCB	-0.01	99.9	-0.001	0.000	-0.000	-0.002
X 058493004	PBS	0.00	99.9	0.000	-0.001	0.001	0.001
FHO 058493004.1	LCSS	OVER	0.2	1.307	1.309	1.309	1.305
X 1779298		0.66	1.0	0.054	0.053	0.054	0.054
X 1779299		0.67	1.0	0.054	0.054	0.054	0.055
X 1779300	BKG	0.52	2.7	0.042	0.041	0.043	0.041
X 1779301	D	0.49	2.1	0.040	0.040	0.041	0.039
X 1779302		0.99	0.8	0.080	0.080	0.080	0.081
X 1779303		4.22	0.6	0.311	0.314	0.311	0.310
FHO 1779304		OVER	0.4	0.521	0.519	0.520	0.523
X 1779305		0.91	1.1	0.073	0.073	0.074	0.073
0.50	CCV	0.50	3.1	0.040	0.041	0.041	0.039
0.00	CCB	-0.01	99.9	-0.001	-0.002	-0.000	0.000
X 1779306		0.69	0.5	0.056	0.056	0.056	0.055
X							

0.00 CCB		-0.01	99.9	-0.001	-0.002	-0.000	0.000
X 1779306		0.69	0.5	0.056	0.056	0.056	0.055
X 1779307		2.31	1.4	0.183	0.183	0.186	0.180
X 1779308		1.25	0.8	0.101	0.102	0.101	0.100
R 1779309		0.00	81.6	0.001	0.001	0.001	0.000 * Reread by GFAA (8) TJT 3/4/92
240 1779310	R	OVER	0.6	1.346	1.349	1.336	1.351
0.50 CCV		0.50	4.0	0.040	0.039	0.039	0.042
0.00 CCB		-0.01	84.9	-0.002	-0.001	-0.001	-0.003
X 058493004/40 LCSS		1.37	0.5	0.111	0.110	0.111	0.111
X 1779304/10		0.76	1.5	0.061	0.062	0.062	0.060
X 1779310/40	R	1.73	0.6	0.138	0.138	0.139	0.138
0.50 CCV		0.48	0.0	0.039	0.039	0.039	0.039
0.00 CCB		0.00	99.9	0.000	-0.000	-0.001	0.002

LANCASTER LABORATORIES
FLAME AA ELEMENT: Pb
DATE: FEB 28 1992
ANALYST: [signature]

DATA VERIFIED
WITH AN X BY: TJT 383
3/4/92

SAMPLE	CONC ppb	%RSD	MEAN ABS	READINGS	
STANDARD 1	5.00	3.1	0.031	0.030	0.030
QC				04Mar92	17:58
STANDARD 2	10.00	0.4	0.059	0.059	0.060
QC				04Mar92	18:04
STANDARD 3	25.00	0.8	0.143	0.142	0.143
QC				04Mar92	18:09
STANDARD 4	40.00	0.7	0.207	0.208	0.206
QC				04Mar92	18:15
STANDARD 5	50.00	0.7	0.250	0.249	0.251
QC				04Mar92	18:20
ICV					
QCSTANDARD	20.17	1.4	0.117	0.116	0.118
QC				04Mar92	18:25
				%R =	(100.9)
ICB					
QCBLANK	0.11	99.9	0.001	0.002	-0.000
QC				04Mar92	18:30
				ABS =	0.002
CRA	2.97	9.7	0.016	0.017	0.020
QC				04Mar92	18:35
QCSPIKE	22.98	1.0	0.132	0.133	0.131
QC				04Mar92	18:41
				%R =	100.0
CRA 1.0	1.35	11.6	0.008	0.009	0.009
QC				04Mar92	18:46
QCSPIKE	21.63	1.5	0.124	0.123	0.126
QC				04Mar92	18:51
				%R =	101.4
CCV					
QCSTANDARD	19.91	1.4	0.115	0.114	0.116
QC				04Mar92	18:56
				%R =	(99.6)
CCB					
QCBLANK	0.10	99.9	0.001	0.002	-0.001
QC				04Mar92	19:02
				ABS =	0.002
PBS 058 004	0.61	0.0	0.004	0.004	0.004
QC				04Mar92	19:07
QCSPIKE	21.37	1.1	0.123	0.124	0.122
QC				04Mar92	19:12
				%R =	100.0
1779309	4.60	0.6	0.028	0.028	0.027
QC				04Mar92	19:17
QCSPIKE	21.60	2.0	0.124	0.127	0.122
QC				04Mar92	19:23
				%R =	99.0

LANCASTER LABORATORIES
GFAA PB
DATE: MAR 04 1992
REVIEWER Kelly J. Hamlin

RAW QC DATA

0.00 CCB	-0.01	99.9	-0.001	-0.002	0.000	0.000	
X 1779306	0.69	0.5	0.056	0.056	0.056	0.055	
X 1779307	2.31	1.4	0.183	0.183	0.186	0.180	
X 1779308	1.25	0.8	0.101	0.102	0.101	0.100	
R 1779309	0.00	81.6	0.001	0.001	0.001	0.000	* Reread by GFAA (8) MT 3/4/92
1779310 R	OVER	0.6	1.346	1.349	1.336	1.351	
0.50 CCV	0.50	4.0	0.040	0.039	0.039	0.042	
0.00 CCB	-0.01	84.9	-0.002	-0.001	-0.001	-0.003	
X 058493004/40 LCSS	1.37	0.5	0.111	0.110	0.111	0.111	
X 1779304/10	0.76	1.5	0.061	0.062	0.062	0.060	
X 1779310/40 R	1.73	0.6	0.138	0.138	0.139	0.138	
0.50 CCV	0.48	0.0	0.039	0.039	0.039	0.039	
0.00 CCB	0.00	99.9	0.000	-0.000	-0.001	0.002	

LANCASTER LABORATORIES
FLAME AA ELEMENT: Pb
DATE: FEB 28 1992
ANALYST:

DATA VERIFIED
WITH AN X BY: TJT 383
3/4/92

SAMPLE	CONC PPB	%RSD	ABS	READINGS	
STANDARD 1 QC	5.00	3.1	0.071	0.070 04Mar92	0.070 17:58
STANDARD 2 QC	10.00	2.4	0.139	0.138 04Mar92	0.140 18:04
STANDARD 3 QC	25.00	0.8	0.143	0.142 04Mar92	0.143 18:09
STANDARD 4 QC	40.00	0.7	0.207	0.208 04Mar92	0.206 18:15
STANDARD 5 QC	50.00	0.7	0.250	0.249 04Mar92	0.251 18:21
ICV QCSTANDARD QC	20.17	1.4	0.117	0.118 04Mar92 %R =	0.116 18:25 (100.7)
ICB QCBLANK QC	0.11	99.9	0.001	0.002 04Mar92 ABS =	-0.000 18:30 0.002
CRA QC	2.97	9.7	0.018	0.017 04Mar92	0.020 18:35
QCSPIKE QC	22.98	1.0	0.131	0.133 04Mar92 %R =	0.131 18:41 100.7
CRA 1.0 QC	1.35	11.6	0.008	0.009 04Mar92	0.008 18:46
QCSPIKE QC	21.63	1.5	0.124	0.123 04Mar92 %R =	0.126 18:51 101.4
CCV QCSTANDARD QC	19.91	1.4	0.115	0.114 04Mar92 %R =	0.116 18:56 (99.6)
CCB QCBLANK QC	0.10	99.9	0.001	0.002 04Mar92 ABS =	-0.001 19:02 0.002
PBS 058 004 QC	0.61	0.0	0.004	0.004 04Mar92	0.004 19:07
QCSPIKE QC	21.37	1.1	0.123	0.124 04Mar92 %R =	0.122 19:12 103.0
1779309 QC	4.60	0.6	0.026	0.028 04Mar92	0.025 19:17
QCSPIKE QC	21.60	2.0	0.124	0.126 04Mar92 %R =	0.123 19:23 85.0

LANCASTER LABORATORIES
GFAA PB
DATE: MAR 04 1992
REVIEWER Kelly J. Gamble

EXTRACTION/DISTILLATION/DIGESTION LOGS

QUALITY ASSURANCE SUMMARY

PREPARATION LOG

Lab Name: LANCASTER_LABORATORIES_____

SDG No.:_USA9__

Method: A_

Client Sample No.	Preparation Date	Weight (gram)	Volume (mL)
B-1HO	02/27/92	1.00	200
B-2HO_S	02/27/92	1.00	200
E1-HO	02/27/92	1.00	200
E2-HO	02/27/92	1.00	200
F1-HO	02/27/92	1.00	200
F2-HO	02/27/92	1.00	200
F3-HO	02/27/92	1.00	200
F3HOD_D	02/27/92	1.00	200
F4-HO	02/27/92	1.00	200
F5-HO	02/27/92	1.00	200
F6-HO	02/27/92	1.00	200
LCSS	02/27/92	1.00	200
LD1HO	02/27/92	1.00	200
LD2HO	02/27/92	1.00	200
PBS	02/27/92	1.00	200

Lancaster Laboratories

CLP SOLID DIGESTION LOGBOOK

Batch # 9 2 0 5 8 | 4 9 3 | 0 0 4

	Sample No.	T	Sample Wt (gm)	Final Vol (ml)	EPA Number	SDG Number	Date	Init.
1	1779298		1 wipe	200 ml		USA 9	2/27/92	BS580
2	1779299							
3	1779300							
4	1779302							
5	1779303							
6	1779304							
7	1779305							
8	1779306							
9	1779307							
10	1779308							
11	1779309							
12								
13								
14								
15								
16								
17								
18								
19								
20								
Dup.	1779301		1 wipe	200 ml		USA 9	2/27/92	BS580
Spike	1779310							
Blank	BLANK							

	Sample Number	Spike Information	1	2	3	4	5
QC	1779310	Sol. ID					
		Lot. No.	NBS 1579				
		Vol. Added	.1265				
	LCS	Lot. No.	NBS 1579				
		Vol. Added	.1024				

Page 46

1387 Rev. 4/4/91

Lancaster Laboratories

Digest Delivered ______

Digest Type 1156 by AA Tier II DP COC (Y/N) N Digest Received ______

Before: Color	Before: Texture	Before: Artifacts	After: Color	Notes	
				Tier II DP	1
					2
				BKG	3
					4
					5
					6
					7
					8
					9
					10
					11
					12
					13
					14
					15
					16
					17
					18
					19
					20
				M. Dup	Dup.
				M. Spike	Spike
					Blank

6	7	8	Notes	Date	Init
				2/27/92	BS580

1387a Rev. 4/4/91

Page 46

①

57

Data Package

Tier II Data Package

Analytical Data Report Package
for
R. T. Environmental Services

USARC - Scranton/USARC - Horsham/USARC - Wilkes Barre
Grab Solid Tile Samples
Collected on 02/20/92, 02/21/92 by EE
LLI Sample No. 1779212-1779213, 1779283-1779284,
1779311-1779312

Prepared by Joy C. Jones

Reviewed & Approved by Susan B. Shorter

Date 3/20/92

Delivery Date 3-23-92

Lancaster Laboratories
Where quality is a science.

TABLE OF CONTENTS

Analysis Request/Chain of Custody

Lancaster Laboratories
Where quality is a science.

1779298 - 315

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: RT Environmental Acct. #: 5271

Project Name/#: USARC - Horsham

Project Manager: Peter Uhlman P.O. #: 1068-01-01

Sampler: EE Quote #: 108513

(4) Matrix

(5) Analyses Requested: Total Lead

For LLI use only

FSC: ______

SCR #: ______

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	Matrix				Total Lead	(6) Remarks
W-F1-HO	2/20/92	1630	↓				↓		↓	
W-F2-HO	↓	↓	↓				↓		↓	
W-F3-HO	↓	↓	↓				↓		↓	
W-F3-HO Duplicate	↓	↓	↓				↓		↓	
W-F4-HO	↓	↓	↓				↓		↓	
W-F5-HO	↓	↓	↓				↓		↓	
W-F6-HO	↓	↓	↓				↓		↓	
W-E1-HO	↓	↓	↓				↓		↓	
W-E2-HO	↓	↓	↓				↓		↓	
W-C01-HO	↓	↓	↓				↓		↓	

(7) Turnaround time requested (please circle): **Normal** (circled) Rush
(Rush TAT is subject to LLI approval and surcharge.)

Rush results requested by (please circle):

Fax Fax #: ______

Phone Phone #: ______

(8) Data package options (please circle if requested):

QC Summary
Tier I (NJ)
Tier II (NJ) ✓
EPA CLP

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Data Package Chain of Custody required?
Yes No

(9)

Relinquished by	Date	Time	Received by	Date	Time
E. THOMPSON	2/10/92	1700	[signature]	2/11/92	1702
[signature]	2/24/92	1200	[signature]	2/24/92	1200
[signature]	2/24/92	1330			

Relinquished by	Date	Time	Received for LLI by	Date	Time
			[signature]	2/24/92	1330

Analysis Request/Environmental Services

Chain of Custody

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Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: RT Acct. #:

Project Name/#: page 2 of 2

Project Manager: P.O. #:

Sampler: Quote #:

Matrix (4) | (5) Analyses Requested | For LLI use only: FSC: SCR #:

(2) Sample Identification	(3) Date collected	Time collected	Matrix	Analyses Requested	(6) Remarks
W-LD2-E2	2/10/92	1630			
W-Blank1-110					
W-Blank2-110					
AC-W1-110			X		
AC-C1-110					
CS-1-110					
CS-2-110					
CS-3-110			X		

(7) **Turnaround time requested** (please circle): (Normal) Rush
(Rush TAT is subject to LLI approval and surcharge.)

Rush results requested by (please circle):

Fax Fax #:

Phone Phone #:

(8) **Data package options** (please circle if requested):

QC Summary
Tier I (NJ)
Tier II (NJ)
EPA CLP

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Data Package Chain of Custody required?
Yes No

(9)

Relinquished by	Date	Time	Received by	Date	Time
E. Thompson	2/10/92	1700		2/10/92	1700
	2/24/92	1200		2-24-92	12:00
	2-24-92	1336			
			Doug Hostetter	2/24/92	1338

Analysis Request/Environmental Se

Chain of Custo

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1779198 – 215

Please print. **Instructions on reverse side correspond with circled numbers.**

(1) Client: RT Environmental Acct. # : 5271
Project Name/# : USARC – Scranton
Project Manager: Pete Uhlman P.O. # : 10840-01
Sampler: EE Quote # : 108513

(4) Matrix

(5) Analyses Requested — TCLP Lead

For LLI use only
FSC: _____
SCR # : _____

(2) Sample Identification	(3) Date Collected	Time Collected	Grab	Composite	Soil	Water	Sludge	Other	TCLP Lead	(6) Remarks
W-F1-SC	2/21/92	1530					X		X	
W-F2-SC										
W-F3-SC										
W-F3-SC Duplicate										
W-F4-SC										
W-F5-SC										
W-F6-SC										
W-F7-SC										
W-E1-SC										
W-E2-SC										

(7) **Turnaround time requested** (please circle): (Normal) Rush
(Rush TAT is subject to LLI approval and surcharge.)

Rush results requested by (please circle):
Fax Fax # : _____
Phone Phone # : _____

(8) **Data package options** (please circle if requested):
QC Summary
Tier I (NJ)
Tier II (NJ)
EPA CLP
Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)
Data Package Chain of Custody required? Yes No

(9) Relinquished by	Date	Time	Received by	Date	Time
E. THOMPSON	2/20/92	1700		2/14/92	1707
	2/24/92	1155		2/24/92	1155
	2/24/92	1330			
			Dawn Hostetter	2/24/92	1330

Analysis Request/Environmental Services

Chain of Custody

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1779267-85

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: RT Acct. #: 5271
Project Name/#: Page 2 of 2
Project Manager: P.O. #:
Sampler: Quote #:

For LLI use only
FSC:
SCR #:

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total # of Containers	Total lead	TCLP metals						Remarks
W-E2-WB	2/21/92	1215	|				X		|						
W-Blank 1-WB	|	|	|				|		|						
W-Blank 2-WB	|	|	|				X		|						
CS-Surf-WB	|	|	|		X				|						
CS-6"-WB	|	|	|		|				|						
CS-Base-WB	|	|	|		|				|						
AC-W1-WB	|	|	|		|				|						
AC-C1-WB	|	|	|		|				X						
Composite 2	—	—		X	|					X						

(7)
Turnaround time requested (please circle): Normal (circled) Rush
(Rush TAT is subject to LLI approval and surcharge.)

Rush results requested by (please circle):
Fax Fax #:
Phone Phone #:

(8)
Data package options (please circle if requested):
QC Summary
Tier I (NJ)
Tier II (NJ)
EPA CLP

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Data Package Chain of Custody required?
Yes No

4 [initials] 3-26-92

(9)

Relinquished by	Date	Time	Received by	Date	Time
E Thompson	2/10/92	1700	[signature]	2/10/92	1700
[signature]	2-24-92	11:55	[signature]	2-24-92	11:55
[signature]	2-24-92	1700	—		
—			—		
—			Received for LLI by: Donald J Nogami	2-24-92	1330

Chain of Custody

Lancaster Laboratories — *Where quality is a science.*

1779267-85

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: RT Environmental Acct. #: 5271
Project Name/#: USARC Wilkes Barre
Project Manager: Peterchman P.O. #: 1084-A-01
Sampler: EC Quote #: 108513

(4) Matrix

(5) Analyses Requested: Total Lead

For LLI use only
FSC:
SCR #:

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	Soil	Water	One Liter Amber	(6) Remarks
W-F1-WB	2/21/92	1215	X				X	
W-F2-WB								
W-F3-WB								
W-F3-WB-Duplicate								
W-F4-WB								
W-F5-WB								
W-F6-WB								
W-L01-WB								
W-L02-WB								
W-E1-WB								

(7) **Turnaround time requested** (please circle): (Normal) Rush
(Rush TAT is subject to LLI approval and surcharge.)

Rush results requested by (please circle):
Fax Fax #:
Phone Phone #:

(8) **Data package options** (please circle if requested):
QC Summary
Tier I (NJ)
Tier II (NJ)
EPA CLP

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Data Package Chain of Custody required?
Yes No

(9) Relinquished by:	Date	Time	Received by:	Date	Time
F. Thompson	2/10/92	1700		2/19/92	1102
	2/19/92	1155		2/19/92	1155
	2-19-92	1200			
			Received for LLI by:		
			Donald J Nyman	2-24-92	1330

Copies: White and Yellow copies accompany samples to lab. Pink is retained by client

Analysis Requested/Environmental Services

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Chain of Custody

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: RT Acct. # :

Project Name/# : Page 2 of 2

Project Manager: P.O. # :

Sampler: Quote # :

(4) Matrix

(5) Analyses Requested — Total Lead

For LLI use only

FSC:

SCR # :

(2) Sample Identification	Date collected	Time collected	(3) Grab	Composite	Soil	Water	Other (specify)	Total Lead	(6) Remarks
W-L01-SC	2/21/92	1530					X		
W-L02-SC									
W-Blank 1-SC									
W-Blank 2-SC									
AC-W1-SC									
AC-W2-SC									
CS-Surf-SC									
CS-1'-SC									

(7) **Turnaround time requested** (please circle): Normal Rush

(Rush TAT is subject to LLI approval and surcharge.)

Rush results requested by (please circle):

Fax Fax # :

Phone Phone # :

(8) **Data package options** (please circle if requested):

QC Summary
Tier I (NJ)
Tier II (NJ)
EPA CLP

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Data Package Chain of Custody required?
Yes No

(9)

Relinquished by	Date	Time	Received by	Date	Time
E. THOMPSON	2/15/92	1700		2/16/92	700
	2/24/92	1155		2/24/92	1155
	2/24/92	1330			
			Doug Hostetter	2/21/92	1330

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LLI LAB CHRONICLE

Analysis		Trial	Date
LLI Sample # 1779212			
R. T. Environmental Services			
AC-W1-SC Tile Sample			
USARC - Scranton			
Collected on 02/21/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/27/92
0493	Metals Digestion	1	02/26/92
LLI Sample # 1779213			
R. T. Environmental Services			
AC-W2-SC Tile Sample			
USARC - Scranton			
Collected on 02/21/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/27/92
0493	Metals Digestion	1	02/26/92

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Lancaster, PA 17601-5994
717-656-2301

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LLI LAB CHRONICLE

Analysis		Trial	Date
LLI Sample # 1779283			
R. T. Environmental Services			
AC-W1-WB Tile Solid Sample			
USARC - Wilkes Barre			
Collected on 02/21/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/27/92
0493	Metals Digestion	1	02/26/92
LLI Sample # 1779284			
R. T. Environmental Services			
AC-C1-WB Tile Solid Sample			
USARC - Wilkes Barre			
Collected on 02/21/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/27/92
0493	Metals Digestion	1	02/26/92

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717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI LAB CHRONICLE

Analysis		Trial	Date
LLI Sample # 1779311			
R. T. Environmental Services			
AC-W1-H0 Tile Sample			
USARC - Horsham			
Collected on 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/27/92
0493	Metals Digestion	1	02/26/92
LLI Sample # 1779312			
R. T. Environmental Services			
AC-C1-H0 Tile Sample			
USARC - Horsham			
Collected on 02/20/92 by EE			
Receipt/Refrigeration: 02/24/92			
0155	Lead	1	02/27/92
0493	Metals Digestion	1	02/26/92

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METHODOLOGY SUMMARY/REFERENCE

Lead - (solids)

The solution resulting from the metals digestion is analyzed by ICP or Flame AA. Samples are analyzed by ICP unless specifically identified as being analyzed by Flame AA.

Reference: ICP: Test Methods for Evaluating Solid Waste, SW-846, Method 6010, September, 1986.
AA: Test Methods for Evaluating Solid Waste, SW-846, Method 7420, September, 1986.

Metals Digestion (solids)

The organic material is oxidized and the metals dissolved with nitric acid, hydrogen peroxide, and hydrochloric acid.

Reference: Test Methods for Evaluating Solid Waste, SW-846, Method 3050, September 1986.

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Analysis Report

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13:34:58 329967
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779212
Date Reported 2/28/92
Date Submitted 2/24/92
Discard Date 3/14/92
Collected 2/21/92 by EE
Time Collected 1530
P.O. 1084-01-01
Rel.

AC-W1-SC Tile Sample
USARC - Scranton

W1-SC SDG# USA10-01	RESULT		LIMIT OF	
ANALYSIS	AS RECEIVED		QUANTITATION	LAB CODE
Lead	150.	mg/kg	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental Client Services at (717) 656-2301
383 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by: 11

Debora K. Gifford,
Group Leader, Inorganics

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
Where quality is a science.

13:34:59 329967
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779213
Date Reported 2/28/92
Date Submitted 2/24/92
Discard Date 3/14/92
Collected 2/21/92 by EE
Time Collected 1530
P.O. 1084-01-01
Rel.

AC-W2-SC Tile Sample
USARC - Scranton

W2-SC SDG# USA10-02

ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	130.	mg/kg	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental Client Services at (717) 656-2301
383 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Debora K. Gifford,
Group Leader, Inorganics

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Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
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14:05:58 329981
ASR000 D 2 19
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779283
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/21/92 by EE
Time Collected 1215
P.O. 1084-01-01
Rel.

AC-W1-WB Tile Solid Sample
USARC - Wilkes Barre

W1-WB SDG# USA10-03	RESULT		LIMIT OF	
ANALYSIS	AS RECEIVED		QUANTITATION	LAB CODE
Lead	40.	mg/kg	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental
Client Services at (717) 656-2301
041 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Debora K. Gifford,
Group Leader, Inorganics

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Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

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14:05:59 329981
ASR000 D 2 19
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779284
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/21/92 by EE
Time Collected 1215
P.O. 1084-01-01
Rel.

AC-C1-WB Tile Solid Sample
USARC - Wilkes Barre

C1-WB SDG# USA10-04	RESULT		LIMIT OF	
ANALYSIS	AS RECEIVED		QUANTITATION	LAB CODE
Lead	230.	mg/kg	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental
Client Services at (717) 656-2301
041 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Debora K. Gifford, 14
Group Leader, Inorganics

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2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of comments and abbreviations

Analysis Report

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14:06:18 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779311
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

AC-W1-HO Tile Sample
USARC - Horsham

W1-HO SDG# USA10-05 ANALYSIS	RESULT AS RECEIVED		LIMIT OF QUANTITATION	LAB CODE
Lead	30.	mg/kg	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental Client Services at (717) 656-2301
041 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Debora K. Gifford,
Group Leader, Inorganics

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Analysis Report

Lancaster Laboratories
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14:06:19 329984
ASR000 D 2 18
05271 0

R. T. Environmental Services
215 West Church Road
King of Prussia, PA 19406

LLI Sample No. G4 1779312
Date Reported 3/ 5/92
Date Submitted 2/24/92
Discard Date 3/20/92
Collected 2/20/92 by EE
Time Collected 1630
P.O. 1068-01-01
Rel.

AC-Cl-HO Tile Sample
USARC - Horsham

Cl-HO SDG# USA10-06	RESULT		LIMIT OF	
ANALYSIS	AS RECEIVED		QUANTITATION	LAB CODE
Lead	30.	mg/kg	10.	015501400

1 COPY TO R. T. Environmental ATTN: Mr. Peter Uhlman
1 COPY TO Data Package Group

Questions? Contact Environmental
Client Services at (717) 656-2301
041 05271 25.00 003900

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Debora K. Gifford,
Group Leader, Inorganics

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

METALS DATA

CASE NARRATIVE

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CASE NARRATIVE FOR INORGANICS

Laboratory Name: Lancaster Laboratories

SDG Number: USA10

Date Received: 02/24/92

Calibration Standards:
Instrument calibration standards are prepared monthly from stock solutions purchased from Spex or Baker chemical.
Total ICP intergration time is 24 seconds.

Sample Preparation:
An aqueous laboratory control sample was prepared and analyzed with the solid samples.

Analysis:
The digested spike recovery was out of the control limits for lead. The sample was not redigested due to the laboratory control sample being within the control limits.

Case Narrative reviewed and approved by:

Mary C. Townsend

Mary C. Townsend, Data Validation Chemist I
Inorganic Data Packages

QC SUMMARY

QUALITY ASSURANCE SUMMARY

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA10__

Client Sample ID	Lab Sample ID
C1-HO	1779312
C1-WB	1779284
W1-HO	1779311
W1-SC	1779212
W1-WB	1779283
W2-SC	1779213

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO

LEGEND:

Flags:	U = Below IDL	Methods:	A = Flame Atomic Absorption
	B = Below LOQ		P = Inductively Coupled Plasma
	N = Matrix Spike Out of Spec.		F = Graphite Furnace
	* = Duplicate Out of Spec.		HY = Hydride Generation
			CV = Cold Vapor
Terms:	IDL = Instrument Detection Limit		AV = Automated Cold Vapor
	LOQ = Limit of Quantitation		NR = Not Required

I certify that this data package is in full compliance with the terms and conditions as specified by the NJDEP, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Mary C Townsend Name: MARY C. TOWNSEND

Date: March 4, 1992 Title: DATA VALIDATION CHEMIST I

QUALITY ASSURANCE SUMMARY

BLANKS

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA10_

Preparation Blank Matrix (soil/water): SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Boron											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead									2.800	U	A
Lithium											NR
Magnesium											NR
Manganese											NR
Mercury											NR
Molybdenu											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silicon											NR
Silver											NR
Sodium											NR
Strontium											NR
Thallium											NR
Tin											NR
Titanium											NR
Vanadium											NR
Zinc											NR

QUALITY ASSURANCE SUMMARY

SPIKE SAMPLE RECOVERY

CLIENT SAMPLE NO.

W1-SC S

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA10_
Matrix: SOIL_
% Solids for Sample: 100.0

Level (low/med): LOW

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Boron									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	75-125	295.1456		154.0000		97.09	145.4	N	A
Lithium									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Molybdenu									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silicon									NR
Silver									NR
Sodium									NR
Strontium									NR
Thallium									NR
Tin									NR
Titanium									NR
Vanadium									NR
Zinc									NR

NOTE: An (N) in column "Q" indicates a spike recovery that is not within the control limits. The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample page of the Quality Assurance Summary.

Comments:

QUALITY ASSURANCE SUMMARY

DUPLICATES

CLIENT SAMPLE NO.

W1-SC D

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA10_

Matrix (soil/water): SOIL_ Level (low/med): LOW

% Solids for Sample: 100.0 % Solids for Duplicate: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Boron								NR
Cadmium								NR
Calcium								NR
Chromium								NR
Cobalt								NR
Copper								NR
Iron								NR
Lead		154.0000		137.8641		11.1		A
Lithium								NR
Magnesium								NR
Manganese								NR
Mercury								NR
Molybdenu								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silicon								NR
Silver								NR
Sodium								NR
Strontium								NR
Thallium								NR
Tin								NR
Titanium								NR
Vanadium								NR
Zinc								NR

NOTE: An asterisk(*) in column "Q" indicates poor duplicate precision. The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample page of the Quality Assurance Summary.

QUALITY ASSURANCE SUMMARY

LABORATORY CONTROL SAMPLE

Lab Name: LANCASTER_LABORATORIES_____

SDG No.: USA10_

Solid LCS Source: _____

Aqueous LCS Source: LLI_____

Analyte	Aqueous (ug/L) True	Found	%R(1)	Solid (mg/kg) True	Found	C	Control Limits		%R
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Boron									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	500.0	480.00	96.0						
Lithium									
Magnesium									
Manganese									
Mercury									
Molybdenu									
Nickel									
Potassium									
Selenium									
Silicon									
Silver									
Sodium									
Strontium									
Thallium									
Tin									
Titanium									
Vanadium									
Zinc									

(1) Control Limits: All Metals 80-120

SAMPLE DATA

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

C1-HO

Lab Name: LANCASTER_LABORATORIES_____
SDG No.: USA10_
Matrix (soil/water): SOIL_
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779312___
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	29.4			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

C1-WB

Lab Name: LANCASTER_LABORATORIES_____
DG No.: USA10_
Matrix (soil/water): SOIL_
Level (low/med): LOW
Solids: 100.0

Lab Sample ID: 1779284___
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__		_		NR
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
	Boron____		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron_____		_		NR
7439-92-1	Lead_____	226	_		A_
	Lithium__		_		NR
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
	Molybdenu		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
	Silicon__		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
	Strontium		_		NR
7440-28-0_	Thallium_		_		NR
	Tin_____		_		NR
	Titanium_		_		NR
7440-62-2_	Vanadium_		_		NR
7440-66-6_	Zinc_____		_		NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

W1-HO

Lab Name: LANCASTER_LABORATORIES_____
SDG No.: USA10_
Matrix (soil/water): SOIL_
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779311___
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	34.0			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

W1-SC

Lab Name: LANCASTER_LABORATORIES_____
DG No.: USA10_
Matrix (soil/water): SOIL_
Level (low/med): LOW
% Solids: 100.0

Lab Sample ID: 1779212___
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	154			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

W1-WB

Lab Name: LANCASTER_LABORATORIES
SDG No.: USA10
Matrix (soil/water): SOIL
Level (low/med): LOW
Solids: 100.0

Lab Sample ID: 1779283
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
	Boron				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	35.6			A
	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
	Molybdenu				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
	Silicon				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
	Strontium				NR
7440-28-0	Thallium				NR
	Tin				NR
	Titanium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

W2-SC

Lab Name: LANCASTER_LABORATORIES_____
DG No.: USA10_
Matrix (soil/water): SOIL_
Level (low/med): LOW
Solids: 100.0

Lab Sample ID: 1779213___
Date Received: 02/24/92

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__		_		NR
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
	Boron____		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron_____		_		NR
7439-92-1	Lead_____	131	_		A_
	Lithium__		_		NR
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
	Molybdenu		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
	Silicon__		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
	Strontium		_		NR
7440-28-0_	Thallium_		_		NR
	Tin______		_		NR
	Titanium_		_		NR
7440-62-2_	Vanadium_		_		NR
7440-66-6_	Zinc_____		_		NR
			_		
			_		
			_		

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

QUALITY ASSURANCE SUMMARY

Method Detection Limits (Annually)

Lab Name: LANCASTER_LABORATORIES_____
SDG No.: USA10_
ICP Method No.: _____ Date: 01/15/92
Other AA Method No.: AA_1,2_SOLID___
Furnace AA Method No.: _____

Analyte	Wave-length (nm)	Back-ground	LOQ ** (ug/L)	MDL (ug/L)	M
Aluminum			200		NR
Antimony			50		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			10		NR
Boron			50		NR
Cadmium			5		NR
Calcium			500		NR
Chromium			50		NR
Cobalt			50		NR
Copper			20		NR
Iron			100		NR
Lead	217.00		50	14.0	A
Lithium			500		NR
Magnesium			500		NR
Manganese			10		NR
Mercury			0.5		NR
Molybdenu			100		NR
Nickel			40		NR
Potassium			500		NR
Selenium			5		NR
Silicon			500		NR
Silver			10		NR
Sodium			500		NR
Strontium			50		NR
Thallium			100		NR
Tin			500		NR
Titanium			50		NR
Vanadium			50		NR
Zinc			20		NR

** The LOQ must be adjusted for % Solids and Sample Weight for samples reporting in mg/Kg.

Comments:

-0.000 PROGRAM 8 Pb
SAMPLE 1 REPLICATE 1 MANUAL
ABSORBANCE CONCENTRATION BC.ON
INTEGRATION 3.0 (sec) AIR-ACETYLENE

PRINTING

	CONC	%RSD	CALIBRATION MEAN ABS	READINGS			Start time
BLANK	0.00		0.001	0.001	0.001	0.000	0827
STANDARD 1	0.05	5.0	0.004	0.004	0.003	0.004	
STANDARD 2	0.10	10.7	0.008	0.009	0.007	0.009	
STANDARD 3	0.50	1.6	0.039	0.039	0.039	0.040	
STANDARD 4	1.00	1.1	0.076	0.075	0.077	0.077	
STANDARD 5	5.00	0.8	0.357	0.360	0.357	0.354	
RESLOPE	0.50	0.0					

LANCASTER LABORATORI
FLAME AA ELEMENT: P
DATE: FEB 27 1992
ANALYST: Cindy Orl

LANCASTER LABORATORI
INSTRUMENT ID # 3368
BKG CORR: BD

SOLUTION TYPE		UNITS MG/L	CALIBR'N GRAPH	ANALYTICAL RESULTS			
0.50	ICV	0.51	7.1	0.040	0.039	0.038	0.044
0.00	ICB	-0.01	99.9	-0.001	-0.001	-0.000	0.000
0.05	CRA	0.04	13.4	0.003	0.003	0.004	0.003
0.50	CCV	0.50	3.7	0.039	0.041	0.039	0.038
0.00	CCB	0.01	99.9	0.001	-0.001	0.001	0.001
X057493001	PBS	-0.01	49.6	-0.001	-0.001	-0.000	-0.001
X057493001.1	LCSS	0.48	1.6	0.038	0.039	0.038	0.037
Reread 1779311		0.15 1.00g	11.7	0.013	0.014	0.013	0.011
1779312		0.14 1.02g	14.2	0.011	0.011	0.010	0.013
X1779212		0.77 1.00g	2.5	0.059	0.061	0.059	0.058
X1779212.1	D	0.71 1.03g	0.8	0.055	0.055	0.055	0.055
X1779212.2	R	1.52 1.03g	1.9	0.115	0.112	0.116	0.116
X1779213		0.68 1.04g	2.8	0.052	0.053	0.051	0.054
1779315	see batch 057-493-002	OVER	1.4	1.484	1.492	1.461	1.499
X1779283		0.18 1.01g	8.5	0.014	0.014	0.013	0.016
0.50	CCV	0.51	1.6	0.040	0.040	0.040	0.039
0.00	CCB	0.00	99.9	0.000	0.001	0.001	-0.002
X1779284		1.14 1.06g	0.8	0.087	0.086	0.087	0.088
1779212.3	A	1.74 1.00g	2.2	0.131	0.128	0.134	0.131

1779212.3 A	1.74 1.00 g	2.2	0.131	0.128	0.134	0.131
0.50 CCV	0.51	1.3	0.040	0.040	0.040	0.039
0.00 CCB	-0.02	69.1	-0.002	-0.001	-0.003	-0.001
X1779311 TJT 2/27/92 (3)	0.17 1.00 g	5.2	0.014	0.013	0.014	0.013
X1779312	0.15 1.02 g	3.3	0.012	0.012	0.013	0.012
0.50 CCV	0.51	2.0	0.040	0.040	0.040	0.039
0.00 CCB	-0.01	99.9	-0.000	-0.001	0.000	-0.001

LANCASTER LABORATORIES
FLAME AA ELEMENT: Pb
DATE: FEB 27 1992
ANALYST:

DATA VERIFIED
WITH AN X BY: TJT 383
2/27/92

RAW QC DATA

-0.000 PROGRAM 8 Pb
SAMPLE 1 REPLICATE 1 MANUAL
ABSORBANCE CONCENTRATION BC ON
INTEGRATION 3.0 (sec) AIR-ACETYLENE

PRINTING

	CONC	%RSD	CALIBRATION MEAN ABS	READINGS			Start time
BLANK	0.00		0.001	0.001	0.001	0.000	0827
STANDARD 1	0.05	5.0	0.004	0.004	0.003	0.004	
STANDARD 2	0.10	10.7	0.008	0.009	0.007	0.009	
STANDARD 3	0.50	1.6	0.039	0.039	0.039	0.040	
STANDARD 4	1.00	1.1	0.076	0.075	0.077	0.077	
STANDARD 5	5.00	0.8	0.357	0.360	0.357	0.354	
RESLOPE	0.50	0.0					

LANCASTER LABORATOF
FLAME AA ELEMENT:
DATE: FEB 27 1992
ANALYST:

LANCASTER LABORATOR
INSTRUMENT ID # 3368
BKG CORR: BD

	SOLUTION TYPE	UNITS MG/L		CALIBRATION GRAPH	ANALYTICAL RESULTS		
0.50	ICV	0.51	7.1	0.040	0.039	0.038	0.044
0.00	ICB	-0.01	99.9	-0.001	-0.001	-0.000	0.000
0.05	CRA	0.04	13.4	0.003	0.003	0.004	0.003
0.50	CCV	0.50	3.7	0.039	0.041	0.039	0.038
0.00	CCB	0.01	99.9	0.001	-0.001	0.001	0.001
X057493001	PBS	-0.01	49.6	-0.001	-0.001	-0.000	-0.001
X057493001.1	LCSS	0.48	1.6	0.038	0.039	0.038	0.037
Reread 1779311		0.15 1.00g	11.7	0.013	0.014	0.013	0.011
1779312		0.14 1.02g	14.2	0.011	0.011	0.010	0.013
X1779212		0.77 1.00g	2.5	0.059	0.061	0.059	0.058
X1779212.1	D	0.71 1.03g	0.8	0.055	0.055	0.055	0.055
X1779212.2	R	1.52 1.03g	1.9	0.115	0.112	0.116	0.116
X1779213		0.68 1.04g	2.8	0.052	0.053	0.051	0.054
1779315	see batch 057-493-002	OVER	1.4	1.484	1.492	1.461	1.499
X1779283		0.18 1.01g	8.5	0.014	0.014	0.013	0.016
0.50	CCV	0.51	1.6	0.040	0.040	0.040	0.039
0.00	CCB	0.00	99.9	0.000	0.001	0.001	-0.002
X1779284		1.14 1.04g	0.8	0.087	0.086	0.087	0.088
1779212.3	A	1.74 1.00g	2.2	0.131	0.128	0.134	0.131

EXTRACTION/DISTILLATION/DIGESTION LOGS

QUALITY ASSURANCE SUMMARY

PREPARATION LOG

Lab Name: LANCASTER_LABORATORIES_____

SDG No.:_USA10_

Method: A_

Client Sample No.	Preparation Date	Weight (gram)	Volume (mL)
C1-HO	02/26/92	1.02	200
C1-WB	02/26/92	1.01	200
LCSW	02/26/92		200
PBS	02/26/92	1.00	200
W1-HO	02/26/92	1.00	200
W1-SC	02/26/92	1.00	200
W1-SC_D	02/26/92	1.03	200
W1-SC_S	02/26/92	1.03	200
W1-WB	02/26/92	1.01	200
W2-SC	02/26/92	1.04	200

Lancaster Laboratories
3425 New Holland Pike • Lancaster, PA 17601-5994

CLP SOLID DIGESTION LOGBOOK

Batch # 9205 | 493 | 001

	Sample No.	T	Sample Wt (gm)	Final Vol (ml)	EPA Number	SDG Number	Date	Init.
1	1779312		1.02	200		USA 10	2/26/92	SCS23
2	1779311		1.00					
3	1779284		1.01					
4	1779283		1.01					
5	1779213		1.04					
6	1779212		1.00					
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Dup.	1779212		1.03	200		USA 10	2/26/92	SCS23
Spike	1779212		1.03					
Blank	BLANK							

Sample Number	Spike Information						
	Sol. ID	1	2	3	4	5	
QC LCS	Lot. No.				0246		
	Vol. Added				4.0ml		
1779212	Lot. No.						
	Vol. Added						

Page 40

1387 Rev. 4/4/91

40

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3425 New Holland Pike • Lancaster, PA 17601-5994

2 COPIES

COPY 1

Digest Delivered ____

Digest Type 0493 AA METALS COC (Y/N) ____ Digest Received ____

	Before			After		
	Color	Texture	Artifacts	Color	Notes	
1					OP	1
2						2
3						3
4						4
5						5
6						6
7						7
8						8
9						9
10						10
11						11
12						12
13						13
14						14
15						15
16						16
17						17
18						18
19						19
20						20
Dup						Dup
Spi						Spi
Bla						Bla

6	7	8	Notes	Date	Init
				2/26/92	SC SCS23
				↓	↓

1387a Rev. 4/4/91

Page 40

AFRC-IBPA-EN (220-1) 1ST END Maj Hobson/jmh/957-8607

SUBJECT: Hazardous Spill Report

Headquarters, 79th ARCOM, ATTN: AFRC-ARPA-EN, MG Wurts USARC,NAS Willow Grove, PA 19090-5110 13 March 1994

1. Reference, Army Regulation 200-1, Environmental Protection and Enhancement, 23 April 1990.

2. This office has reviewed the attached Hazardous **Spill report** concerning the Horsham facility located on Horsham Road. A site visit of the spill was conducted immediately upon notification. I concurs with the actions taken and request further guidance.

3. Point of contact for this headquarters is the undersigned, comm (215) 957-8607/8608.

Encls
as

J MICHAEL HOBSON
MAJ, EN
Brigade Engineer

DISTRIBUTION:
CDR
XO
PAO

DEPARTMENT OF THE ARMY
HEADQUARTERS AND HEADQUARTERS COMPANY
157TH SEPARATE INFANTRY BRIGADE (MECHANIZED)
936 EASTON ROAD
HORSHAM, PA 19044-3399

AFRC-IBPA-HHC 11 March 1994

MEMORANDUM FOR Commander, 157th Separate Infantry Brigade (Mechanized), Attn: AFRC-IBPA-EN, 400 Horsham Road, Horsham, PA 19044-2189

SUBJECT: Report on Hazardous Substance Spill

1. On 11 March 1994, 0830 hrs it was discovered that a small quantity of diesel fuel, approximately 10 Gallons, had been spilled from an M577A2 Armored Personnel Carrier stationed at this Center. Efforts to contain the spill were started immediately. Drip pans were placed under the vehicle and the source of the leak was determined and the leak was stopped. Absorbent booms were placed to keep the spilled fuel from running off into ground water. Simultaneously, the Brigade Executive Officer, LTC Ryan and the Brigade Engineer, MAJ Hobson were notified. Additionally, the Fire Department of the Willow Grove Naval Air Station were notified and they dispatched a hazardous spill response team to evaluate the situation. The 79th USARCOM Engineer office was notified of the problem and assistance was requested form their environmental personnel.

2. Recommendations from the spill response team were implemented immediately. Absorbent rags were placed at the spill source to stop any further migration of fuel and to clean up the spill location. Concurrently, booms were placed around the entire contaminated area to further lessen the chance that contaminated water would run off. All contaminated snow was placed in a containment field so that it would melt and leave the fuel behind as it melted.

3. Cleanup operations suggested by the Navy spill response team included removing all contaminated snow and ice, determining whether or not any soil was contaminated, removing it if necessary and testing the soil and surrounding areas for any evidence of contamination. Cleanup operations have been started and are continuing. All possible actions have been implemented to cleanup the site.

4. Environmental personnel from the 79th ARCOM Engineer Office (Steve Costello and Steve Fritz), reported to the USARC to render assistance and to observe cleanup operations. They concurred with the recommendations of the Navy spill response team to continue clean up operations and suggested no alternatives or other actions required to correct the situation.

5. POC for further information is the undersigned, comm (215) 957-0206/0207.

FOR THE COMMANDER:

CHRISTOPHER D. SCHULER
1LT, IN
Executive Officer

DEPARTMENT OF THE ARMY
HEADQUARTERS AND HEADQUARTERS COMPANY
157TH SEPARATE INFANTRY BRIGADE (MECHANIZED)
936 EASTON ROAD
HORSHAM, PA 19044-3399

(215) 957-0206 VOICE
(215) 957-8669 FAX

FAX TRANSMITTAL SHEET

TO: STEVE COSTELLO

FROM: 1LT SCHULER

CLASSIFICATION U PRECEDENCE R

DATE/TIME 940311/1615 NO OF PAGES 2 INC HEADER

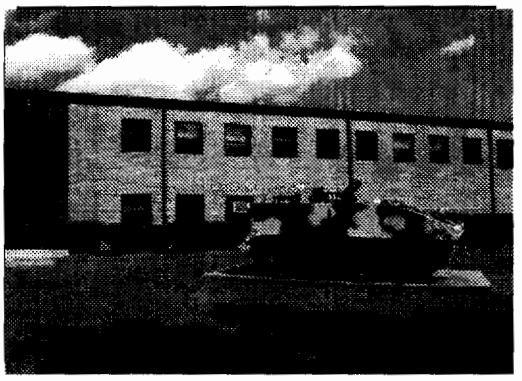
MESSAGE:

If there are problems with this transmission, call above number for retransmission.

CROSS-CONNECTION CONTROL SURVEY
FOR
99th REGIONAL SUPPORT COMMAND

SITE:

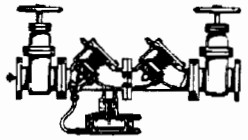
HORSHAM MEMORIAL USARC
936 EASTON RD.
HORSHAM, PA. 19044



BY: NAVY PUBLIC WORKS CENTER WASHINGTON
1311 10 ST SE Suite 102
Washington Navy Yard DC 20374-5095

22 SEPTEMBER 2000

CROSS-CONNECTION CONTROL INVENTORY

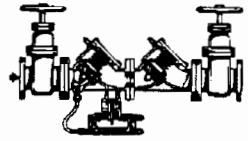


HORSHAM MEMORIAL USARC

936 EASTON ROAD
HORSHAM, PA. 19044-3399

ROOM	PWC ID	TYPE	INSTALLED	SIZE	SYSTEM	DEGREE OF HZ	REMARKS
MECHANICAL EQUIPMENT ROOM	510	REDUCE PRESSURE PRINCIPLE	YES	3"	MAIN	HEALTH	REBUILD RP
MECHANICAL EQUIPMENT ROOM	511	REDUCE PRESSURE PRINCIPLE	YES	3/4"	HEAT MAKE UP	HEALTH	FAILS FOR HEIGHT Y= 10'. NOT AN ASSEMBLY. REPLACE WITH NEW APPROVED RP. LOCATE NO MORE THAN 4' OFF FLOOR.
MECHANICAL EQUIPMENT ROOM	512	HOSE CONNECTION VACUUM BREAKER	NO	3/4"	HOSE BIB	HEALTH	
122 JANITORS CLOSET	513	ATMOSPHERIC VACUUM BREAKER	YES	3/4"	MOP SINK	HEALTH	HBVB ALSO
108 JANITORS CLOSET	514	ATMOSPHERIC VACUUM BREAKER	NO	3/4"	MOP SINK	HEALTH	INSTALL NEW AVB TYPE FAUCET.
MOTOR POOL BAY	515	HOSE CONNECTION VACUUM BREAKER	NO	3/4"	MOP SINK	HEALTH	
MOTOR POOL BAY	516	HOSE CONNECTION VACUUM BREAKER	YES	3/4"	HOSE BIB	HEALTH	
KITCHEN	517	HOSE CONNECTION VACUUM BREAKER	NO	3/4"	HOSE BIB	HEALTH	

CROSS-CONNECTION CONTROL INVENTORY

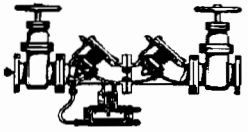


HORSHAM MEMORIAL USARC

936 EASTON ROAD
HORSHAM, PA. 19044-3399

ROOM	PWC ID	TYPE	INSTALLED	SIZE	SYSTEM	DEGREE OF HZ	REMARKS
MOTOR POOL EXTERIOR	518	HOSE CONNECTION VACUUM BREAKER FROST FREE	YES	3/4"	HOSE BIB, FROST FREE	HEALTH	
MOTOR POOL EXTERIOR	519	HOSE CONNECTION VACUUM BREAKER FROST FREE	YES	3/4"	HOSE BIB, FROST FREE	HEALTH	
MOTOR POOL EXTERIOR	520	HOSE CONNECTION VACUUM BREAKER FROST FREE	YES	3/4"	HOSE BIB, FROST FREE	HEALTH	
RESTROOMS	521	FLUSH VALVE VACUUM BREAKER	YES		TOILETS AND URINALS	HEALTH	APROXIMATELY 17 FVVB'S INSTALLED.

TESTABLE BACKFLOW PREVENTER INVENTORY

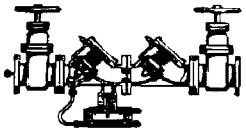


HORSHAM MEMORIAL USARC

936 EASTON ROAD
HORSHAM, PA. 19044-3399

ROOM	TYPE	HAZARD	TEST FREQ	PWC ID	SIZE	INSTALLED	MAKE	MODEL	SERIAL #	DATE
MECHANICAL EQUIPMENT ROOM	REDUCE PRESSURE PRINCIPLE	HEALTH	SEMI-ANNUAL	510	3"	YES	WATTS	909		8/17/00
		REBUILD RP								FAILED
MECHANICAL EQUIPMENT ROOM	REDUCE PRESSURE PRINCIPLE	HEALTH	SEMI-ANNUAL	511	3/4"	YES				8/17/00
		FAILS FOR HEIGHT Y= 10'. NOT AN ASSEMBLY. REPLACE WITH NEW APPROVED RP. LOCATE NO MORE THAN 4' OFF FLOOR.								FAILED

CROSS-CONNECTION CONTROL INVENTORY PHOTOS

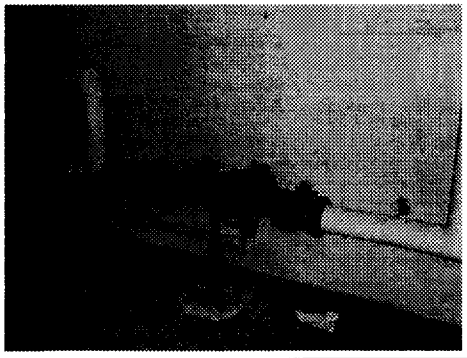


HORSHAM MEMORIAL USARC

936 EASTON ROAD
HORSHAM, PA. 19044-3399

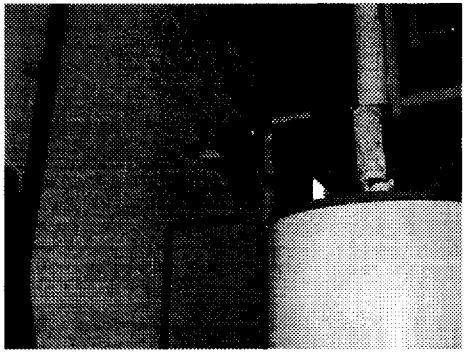
ROOM: MECHANICAL EQUIPMENT ROOM
SYSTEM: MAIN
SIZE: 3"
HAZARD: HEALTH
TEST FREQ: SEMI-ANNUAL
STATUS: FAILED
PWC ID: 510
REMARKS: REBUILD RP

TYPE: REDUCE PRESSURE PRINCIPLE
INSTALLED: YES
MAKE: WATTS
MODEL: 909
SERIAL #:
DATE: 8/17/00



ROOM: MECHANICAL EQUIPMENT ROOM
SYSTEM: HEAT MAKE UP
SIZE: 3/4"
HAZARD: HEALTH
TEST FREQ: SEMI-ANNUAL
STATUS: FAILED
PWC ID: 511
REMARKS: FAILS FOR HEIGHT Y= 10'. NOT AN ASSEMBLY. REPLACE WITH NEW APPROVED RP. LOCATE NO MORE THAN 4' OFF FLOOR.

TYPE: REDUCE PRESSURE PRINCIPLE
INSTALLED: YES
MAKE:
MODEL:
SERIAL #:
DATE: 8/17/00



HORSHAM - BACKFLOW PREVENTOR

Philadelphia Suburban Water Company

BACKFLOW PREVENTION ASSEMBLY TEST & MAINTENANCE FORM

THIS FORM MUST BE COMPLETED BY A CERTIFIED TESTER

I. GENERAL INFORMATION

RETURN TO PSWC NO LATER THAN	SERIAL NO.	INDEX NO.

NAME OF FACILITY	[illegible]
ADDRESS	136 Caster Rd Horsham Pa [illegible]
LOCATION OF ASSEMBLY	[illegible]
SERVICE CLASS	[illegible]
DATE OF INSTALL	?
MANUFACTURER	[illegible]
MODEL	709
SERIAL NO.	
SIZE	3
TYPE	☒ RP ☐ PVB ☐ AG ☐ DC
TYPE OF TEST GAUGE INSTRUMENT	[illegible]
MODEL	[illegible] 2300
SERIAL NUMBER	34976[illegible]
PURCHASE DATE	9/93
CALIBRATED BY	[illegible]
TELEPHONE NO.	[illegible] 1900
RGA NO.	n/a
CALIBRATED ON	4/1/96
NEXT CALIBRATION DUE	4/1/97

II. TESTS & REPAIRS INFORMATION

	CHECK VALVE NO. 1	CHECK VALVE NO. 2	DIFFERENTIAL PRESSURE RELIEF VALVE	PRESSURE VACUUM BREAKER
INITIAL TEST	☑ LEAKED ☐ CLOSED TIGHT PRESURE DROP ACROSS FIRST CHECK VALVE ______ PSID	☐ LEAKED ☐ CLOSED TIGHT	☐ OPEN AT ______ PSID ☐ DID NOT OPEN	☐ AIR INLET OPENED AT ______ PSIG ☐ DID NOT OPEN
* REPAIRS	☑ CLEANED REPLACED: ☑ RUBBER PARTS KIT ☑ CV ASSEMBLY ☑ DISC ☑ O-RINGS ☑ SEAT ☐ SPRING ☐ STEM/GUIDE ☐ RETAINER ☐ LOCKNUTS ☐ OTHER:	☑ CLEANED REPLACED: ☑ RUBBER PARTS KIT ☑ CV ASSEMBLY ☑ DISC ☑ O-RINGS ☑ SEAT ☐ SPRING ☐ STEM/GUIDE ☐ RETAINER ☐ LOCKNUTS ☐ OTHER:	☑ CLEANED REPLACED: ☑ RUBBER PARTS KIT ☑ RV ASSEMBLY ☑ DISC ☑ DIAPHRAGM ☑ SEAT ☐ SPRING ☐ GUIDE ☑ O-RINGS ☐ OTHER:	☐ CHECK VALVE: ______ PSID ☐ CHECK VALVE LEAKED ☐ CLEANED REPLACED: ☐ CV ASSEMBLY ☐ DISC AIR INLET ☐ DISC CV ☐ SPRING ☐ RETAINER ☐ GUIDE ☐ O-RINGS ☐ OTHER:
FINAL TEST	☑ CLOSED TIGHT	☑ CLOSED TIGHT	☑ OPENED AT 4.25 PSID REDUCED PRESSURE	☑ SATISFACTORY

REMARKS			
CONDITION OF NO. 2 CONTROL VALVE	☑ CLOSED TIGHT	☐ LEAKED	DATE 7/25/96 ASSEMBLY PASS
WITNESS TO ASSEMBLY TEST: [illegible]	[illegible] model & serial # not [illegible] in service		DATE ______ ASSEMBLY FAIL

* NOTE: ALL REPAIRS/ REPLACEMENTS MUST BE COMPLETED WITHIN FOURTEEN (14) DAYS

III. APPROVALS

I HEREBY CERTIFY THAT THIS DATE IS ACCURATE AND REFLECTS THE PROPER OPERATION AND MAINTENANCE OF THE ASSEMBLY

NAME OF CERTIFIED BACKFLOW PREVENTION ASSEMBLY TESTER (PRINT): [illegible] M. Taylor	PHONE NUMBER: 3[illegible] 9800	BUSINESS NAME: [illegible] Inc	
INITIAL TEST — SIGNATURE OF INITIAL CERTIFIED BACKFLOW PREVENTION ASSEMBLY TESTER	CERTIFIED TESTER NUMBER	DATE	
REPAIRS — SIGNATURE OF REPAIRER	CERTIFIED TESTER NUMBER (IF APPLICABLE)	DATE	
FINAL TEST — SIGNATURE OF FINAL CERTIFIED BACKFLOW PREVENTION ASSEMBLY TESTER: [signature]	CERTIFIED TESTER NUMBER: 3131	DATE: 7/25/96	

Send Completed Original Form To:

Philadelphia Suburban Water Co.
Cross Connection Control Dept.
762 Lancaster Ave.
Bryn Mawr, PA 19010
(610) 645-1174

SEND COMPLETED ORIGINAL FORM TO THE CROSS CONNECTION CONTROL DEPT., 762 LANCASTER AVE., BRYN MAWR, PA 19010

DUPLICATE-CUSTOMER COPY

MADSEN INCORPORATED

Kitchens & Baths PLUMBING • HEATING • COOLING

CONTRACT PROPOSAL

SUBMITTED TO Army Reserve Center DATE 9/25/96

ADDRESS 136 Easton Rd PHONE 957-0206

JOB LOCATION Horsham Pa 19044

WORK TO BE DONE	PRICE
Cleaned all parts on #1 ck, #2 ck, & relief valve tested device for proper operation	
Work defects were caused by rust and tissue deposits	
Paid by Visa	
~~Name~~	
~~Card #~~ 2 hrs labor @ 54.-	108 —
~~exp date~~ test and certification	75 —
TOTAL	183 —

TERMS: $_____ (%) _____

$_____ (%) _____

$_____ (%) _____

$_____ (%) _____

The above prices include all material and the finest of workmanship. Terms Cash on completion of work, unless otherwise specified in contract.
Any deviation from the above involving extra cost of material and labor will become an extra charge and must be approved by bidder.
All contracts subject to approval of Management. This proposal subject to change after 30 days.

ACCEPTANCE OF CONTRACT Date 9/25/96

Signed [signature]

Signed _____

MADSEN INC.

Signed [signature]

WORKMEN'S COMPENSATION AND PUBLIC LIABILITY INSURANCE CARRIED BY BIDDER

US Army Corps
of Engineers
Baltimore District

79th Army Reserve Command
Cultural Resource Management Plan

Prepared for:	79th Army Reserve Command
Prepared under contract to:	U.S. Army Corps of Engineers, Baltimore District (Contract No. DACW31-89-D-0054) Delivery Order No. 32
Prepared by:	KFS Historic Preservation Group Kise Franks & Straw Inc. Philadelphia, Pennsylvania
In Association with:	Hunter Research, Inc. Trenton, New Jersey
	July 1995

IV. INVENTORY

A. Introduction

This chapter describes the process by which historic architectural resources and archeological site potential were identified and evaluated. Background research and site visits were conducted for each of the thirty-two facilities. The information derived from these tasks is presented on the facility data forms in Appendix C. Data entered on the forms include a research checklist of records examined, information on previous assessments, results of the current survey, and a summary description of the facility and its surroundings. The site visits were divided among three organizations: the Army Corps of Engineers, Baltimore District (ACOE), Hunter Research, Inc. (HRI), and Kise Franks & Straw (KFS).

B. Historic Architectural Resources

No historic architectural resources were identified at any of the thirty-two facilities. Facility construction dates range from 1951 to 1994. A large percentage of the facilities consist of two buildings, the reserve center and maintenance shop. Facility architecture is utilitarian, consisting of, for the most part, one and two-story rectangular brick and/or concrete block buildings with metal windows and built-up roofing. Architectural resources should be evaluated for the National Register when they attain fifty years of age.

Three of the facilities (Bristol, Edgemont, and Worcester) were established on the site of former Nike missile facilities. Most of the buildings and structures associated with the missile program were removed after the Nike program was terminated in the 1960s. In general, the only vestiges of the Nike tenancy at the facilities are underground storage silos, sewage treatment plants, and utility systems, such as sanitary sewer, storm sewer, electrical lines, water lines, and water well. In some instances, the storage silos have been converted to fire protection water storage or have been backfilled with building demolition debris. The large loss of buildings precludes these facilities from being considered significant as representatives of the Nike program. Nevertheless, the Pennsylvania SHPO only considers resources that are fifty years or older, thereby precluding resources related to the Cold War, such as the Nike missile program.[1]

Although there are no eligible or potentially eligible resources on the facilities, there are adjacent or surrounding resources, namely buildings and districts, that may fall within an undertaking's area of potential effects. Adjacent resources at Bellefonte, Edgemont, and Gettysburg were previously listed on the National Register of Historic Places. In the course of field survey for the preparation of this plan, potentially eligible resources were identified neighboring the Chester and Harrisburg facilities. Facility managers should be cognizant of these issues when planning an undertaking. The specific resources are the following:

Bellefonte: Bellefonte Armory, located east of the facility, is listed on the National Register of Historic Places (NRHP).

Chester: Bell Mansion, located northeast of the facility, appears potentially eligible for the NRHP.

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[1]U.S. Department of Defense, Legacy Cold War Project, *Coming in from the Cold; Military Heritage in the Cold War* (Washington, 1994), 59.

Edgemont: Ridley Creek State Park Historic District, located south of the facility, is listed on the NRHP.

Gettysburg: Facility is located in the Gettysburg Historic District, listed on the NRHP.

Harrisburg: Facility is located in a residential district that appears potentially eligible for the NRHP.

C. Archeological Site Potential

Background research at the Bureau for Historic Preservation (BHP) in Harrisburg and pedestrian reconnaissance surveys of the thirty-two facilities revealed that eight of the facilities appear to have archeological site potential. Seven of the facilities are considered to have low archeological potential: Ashley, Edgemont, Gettysburg, Schuylkill Haven, State College, West Hazleton, Williamsport. Greencastle is considered to have high archeological potential. All of the facilities except Schuylkill Haven are considered to have prehistoric archeological potential. Schuylkill Haven, Greencastle and Gettysburg are considered to have historic archeological potential.

Phase 1b testing should be undertaken at facilities considered to have archeological site potential. The Phase 1b survey constitutes the next step in the determination of eligibility process. The Phase 1b results will determine if the specific location appears eligible for inclusion in the National Register of Historic Places. Appendix E contains archeological procedures for reference if archeological resources are discovered at any of the facilities, including those considered to have no potential.

The following summaries provide a fuller description of the nature of archeological potential at the facilities. The facilities are arranged by study units and references to quadrangle maps refer to archeological maps on file at the BHP.

Pennsylvania Study Unit I-- Piedmont and Coastal Plain:

Bristol: No archeological sites have been identified in the vicinity of the facility. A Phase I archeological survey (G on the U.S.G.S. Beverly quadrangle map) has been undertaken, and no archeological sites were found.

Chester: Survey records maintained by the Bureau for Historic Preservation in Harrisburg indicate that an archeological site (36DE30) containing 19th and 20th century artifacts is located near the facility.

Edgemont: Archeological site survey records maintained by the Bureau for Historic Preservation in Harrisburg indicate that three prehistoric sites in Delaware County (36DE15, 16 and 17) and two undefined sites in Chester County (36CH120 and 276) lie in the vicinity of the facility. The Delaware County sites yielded lithics and ceramics, the latter indicative of Woodland occupation. An 18th-century farmstead is located to the north of the facility. The facility is considered to have low archeological potential.

Germantown: Two archeological sites -- the Gardette Site (36PH50) and the Atwater Kent Factory Site (36PH51) -- are located in the vicinity of the facility.

Gettysburg: No archeological sites are known in the immediate vicinity, but an area of medium potential for prehistoric occupation was identified near wetlands in the southwest corner of the facility. Since the facility occupies a portion of the site of the Battle of

Gettysburg, the presence of Civil War artifacts within the property boundaries seems likely. The facility is considered to have low archeological potential.

Horsham: No archeological sites have been identified in the vicinity of the facility. An 18th-century structure stands to the south.

Lancaster: Archeological site survey records indicate that numerous prehistoric sites may be found in the vicinity of the facility. The sites (36LA421-423, 36LA655-680) are open-air loci yielding lithic artifacts.

Marcus Hook: No archeological sites have been identified in the vicinity of the facility. Since the entire site was constructed on fill placed along the Delaware River bank after 1870, no archeological sites are present within this fill. It should be noted, however, that deep excavations may encounter old river bottom with the potential for prehistoric and historic maritime artifacts.

Norristown: No archeological sites have been identified in the vicinity of the facility.

Willow Grove: No archeological sites have been identified in the vicinity of the facility.

Philadelphia (Woodhaven): No archeological sites have been identified in the vicinity of the facility.

Worcester: No archeological sites have been identified in the vicinity of the facility.

York: No archeological sites have been identified in the vicinity of the facility.

Pennsylvania Study Unit II-- Ridge and Valley:

Ashley: No archeological sites have been identified within the immediate vicinity of the facility. The presence of a wetland to the west of the facility suggests that evidence of prehistoric occupation could be found, but grading and filling throughout most of the facility have probably removed most of that potential. The facility is considered to have low archeological potential.

Bellefonte: No archeological sites have been identified in the immediate vicinity of the facility.

Bethlehem: No archeological sites have been identified in the vicinity of the Bethlehem facility.

Bloomsburg: No archeological sites have been identified in the vicinity of the facility. An archeological survey (D on the U.S.G.S. Bloomsburg quadrangle map) has been undertaken, but the report which described that survey was not available for study at the Bureau for Historic Preservation in Harrisburg.

Chambersburg: No archeological sites have been located in the vicinity of the facility.

Greencastle: A review of the Pennsylvania Archeological Site Survey files in Harrisburg indicates that numerous prehistoric sites (36FR205-222) may be found in the general vicinity of the facility. These sites date from the Early Archaic to the Late Woodland periods and have yielded lithic projectile points and other tools, ceramics, pipe fragments, a shell bead, and possibly human bone. The occupants of these sites utilized the local rhyolite outcrops for lithic raw material almost exclusively.

The northern fenced portion of the facility appears to be completely disturbed, but the southern wooded portion contains rhyolite outcrops, and one shovel test excavation yielded a prehistoric rhyolite flake. A surface scatter of historic artifacts is also present in the southern portion. The facility is considered to have high archeological potential.

Harrisburg: No archeological sites have been located in the vicinity of the facility.

Lewisburg: The Pennsylvania SHPO has previously determined the Lewisburg facility contained no archeological potential and did not warrant archeological survey (see Appendix B).

Lewistown: No archeological sites have been located in the immediate vicinity of the facility.

New Cumberland: One prehistoric archeological site is located north of the facility on the Susquehanna River. There are no archeological sites in the general vicinity of the reserve center.

Reading: The Pennsylvania SHPO has previously determined the Reading facility contained no archeological potential and did not warrant archeological survey (see Appendix B).

Schuylkill Haven: The facility is located on or near the site of a late 19th-early 20th century almshouse. The site of a cemetery associated with the almshouse is reportedly immediately beyond the western boundary fence of the facility. No archeological sites are indicated in the vicinity of the facility. The facility is considered to have low archeological potential.

Scranton: A series of prehistoric rock shelters (36LW008) are located in the general vicinity of the facility. No specific temporal affiliations were indicated in the Pennsylvania Archeological Site Survey files.

State College: Three prehistoric sites (36CE281, 336 and 337) are located in the immediate vicinity of the facility. The sites, ranging in date from Early to Late Archaic, contain jasper flakes and chert projectile points. The proximity of these sites suggests evidence of prehistoric occupation may have existed within the boundaries of the facility, although construction associated with the buildings and parking areas have resulted in a certain degree of disturbance. The facility is considered to have low archeological potential.

West Hazleton: Pennsylvania Archeological Site Survey records in Harrisburg record that a prehistoric shell midden with associated pottery indicative of Woodland occupation (36LU175) is located near the facility. A historic site related to a 19th-20th century building (36LU126) is also located in the vicinity. The facility is considered to have low archeological potential.

Wilkes-Barre (Highway 315): No archeological sites have been recorded for the immediate vicinity of the facility.

Wilkes-Barre (AMSA #32, 100 Stephens Road): No archeological sites have been recorded for the immediate vicinity of the facility.

Williamsport: No archeological sites have been reported for the vicinity of the facility. The proximity of Miller's Run Creek, which forms the northern and eastern boundary of the facility, suggests that evidence of prehistoric occupation may be found within the grounds of the facility. The facility is considered to have low archeological potential.

Pennsylvania Study Unit III-- Appalachian Plateau:

Lock Haven: The Pennsylvania SHPO has previously determined the Lock Haven facility contained no archeological potential and did not warrant archeological survey (see Appendix B).

MCHB-DE-HM

HAZARDOUS WASTE MANAGEMENT CONSULTATION #37-10565-95
79TH ARMY RESERVE COMMAND
PENNSYLVANIA ~~AND NEW JERSEY~~
2-6 APRIL 1995

I. FINDINGS.

Three categories result from the survey conducted: A) non federally owned transformers, B) federally owned non PCB transformers, and C) federally owned PCB transformers.

A. Non Federally Owned Transformers. This refers to the condition of the reserve center as 1) not having a transformer on site, 2) having a transformer or more that are owned by the local utility, or 3) being located on leased property.

1. The 79th ARCOM Centers without transformers.

Babylon Campus USARC, Horsham, PA
Northhampton City Memorial USARC, Stockertown, PA
Woodlawn USARC, Willow Grove, PA
Northeast Philadelphia USARC, Wingohocking, PA
Monroe County Memorial USARC, Tobyhanna, PA

2. The 79th ARCOM Centers with local utility owned transformers.

CH(CPT) Sabalis Memorial USARC, Ashley, PA
Wilson-Kramer USARC, Bethlehem, PA
Bloomsberg USARC, Bloomsburg, PA
Adams County Memorial USARC, Gettysburg, PA
Harrisburg AFRC, Harrisburg, PA
Landcaster USARC, Landcaster, PA
Mifflin County USARC, Lewistown, PA
Reading USARC, Reading, PA
Robert E. Roeder USARC, Schuykill Haven, PA
CSM S.P. Serrenti Memorial USARC, Scranton, PA
Lenkalis USARC, West Hazleton, PA
AMSA#32, Wilkes-Barre, PA
Lycoming Memorial USARC, Williamsport, PA
York Memorial USARC, York, PA
SGT Paul Beck AFRC, Bellefonte Boro, PA

James W. Reese USARC, Chester, PA
Huntingdon USARC, Huntingdon, PA
Clinton County USARC, Lock Haven, PA
AMSA#112, Lock Haven, PA
Centre County Memorial USARC, State College, PA
Wilkes-Barre USARC, Wiles-Barre, PA
Aviation Support FAC#28, Willow Grove, PA
AMSA#84, Marcus Hook, PA
Lewisburg USARC, Lewisburg, PA
Ray S. Musselmen USARC, Norristown, PA
North Penn USARC, Worchester, PA

3. The 79th ARCOM Centers on leased facilities.
Downingtown USARC, Downingtown, PA
Folsom USARC, Folsom, PA
Horsham Corporative USARC, Horsham, PA
Quakertown USARC, Quakertown, PA
AMSA#23, Willow Grove, PA
MG John W. Wurts Memorial USARC, Willow Grove, PA
ECS#24, Annville, PA
CO C, 6/68 Armor, Annville, PA
SGT Marlin L. Gahres USARC, Annville, PA
1079th USAR Garrison, Annville, PA
Hot Mission, Annville, PA
Regional Training Site-Maintenance, Annville, PA

B. **Federally Owned Non PCB Transformers.** Dry transformers or those containing only mineral oil.

1. The 79th ARCOM Centers with dry transformers.
CH(CPT) Sabalis Memorial USARC, Ashley, PA
Two dry transformers are located in the furnace room. One of the concrete pads is cracked.

2. The 79th ARCOM Centers with mineral oil transformers.
a. Germantown USARC, Germantown, PA
Three stored mineral oil transformers awaiting collection by DRMO and one operational, pad mounted transformer located in the rear of the building.

b. New Cumberland USARC, New Cumberland, PA
One pad mounted transformer.

C. **Federally Owned PCB Transformers.**
AMSA#118, Greencastle, PA

Edgemont USARC and AMSA#31G, Edgemont, PA
North Penn USARC, Worchester, PA
Horsham Memorial USARC, Horsham, PA
Philadelphia Memorial AFRC, Philadelphia, PA
Bristol Veterans USARC, Bristol, PA
Lewisburg USARC, Lewisburg, PA

VII. DISCUSSION.

A. The Toxic Substances Control Act (TSCA) states that the particular PCB transformer owner is the responsible party in an incident (Appendix C), thus exempting all leased facilities and those utilizing utility owned equipment from liability unless a contractual agreement or negligence is involved. Therefore, only the federally owned polychlorinated biphenyls (PCBs) transformers cause concern. 32 transformers located among seven Reserve Centers fall into this catagory. Each are explained in the following paragraphs.

1. Greencastle, PA

The Center is supported by two large pad mounted transformers. There is some PCB ground contamination. The transformers are to be removed and the site remediated under a separate project during the second quarter of FY96. See Appendix D for a copy of the scope of work.

2. Edgemont, PA

The Center is supported by 19 transformers: 1 pad mounted and 18 pole mounted, three of which are deenergized. The Hevi-Duty Electric pad mounted transformer, serial #GM204699, model #585731T00, manufactured in Goldsboro, NC contains PCBs. The point of contact is John Dockerty at commerical: (919) 590-3211. This transformer should be removed and replaced. The three denergized pole mounted transformers should also be removed. They have not been used of several years. The other 15 pole mounted transformers should be sampled and handled according to Title 40 CFR 761. Cost estimates need to be determined prior to testing.

3. Worchester, PA

The Center is supported by eight transformers: one pad mounted and seven pole mounted. The General Electric pad mounted tranformer contains 780 gallons of Pyranol and should be removed and replaced. The other seven pole mounted transformers should be sampled and handled according to Title 40 CFR 761. Cost estimates need to be determined prior to testing.

4. Horsham, PA

The Center is supported by one large General Electric (GE) pad mounted transformer manufactured in Pittseld, Mass., serial #D276096. It appears to be original to the building and as GE does not operate the Pittseld plant, they suspect it to be PCB; therefore, the transformer should be removed and replaced.

5. Philadelphia, PA

The Center is supported by two large pad mounted transformers. It has not been determined if the content of the dielectrid fluid contains greater then 500 ppm PCB. The manufacturer's information is located inside the unit and without turning off the transformer this information could not be obtained. Research the manufacturer prior to commensing with the sampling.

6. Bristol, PA

The Center is supported by one pad mounted transformer. The manufacturer information is still being tracked down.

7. Lewisburg, PA

The Center is is supported by a transformer that is owned by the utility. There may be another on the property owned by the Center.

- WATER/ WASTEWATER
- SOILS / SOLIDS
- AIR / GASES

Wright Lab Services, Inc.

- ATOMIC ABSORPTION
- GAS CHROMATOGRAPHY
- WET CHEMISTRY

Sample # 10963-1

ATTN: Facility Engineers
Fort Indiantown Gap
Department of the Army DEH
Attn: AFKA-ZQ-DE-E
Annville PA 170035011

July 14, 1989

LAB ANALYSIS REPORT

Job Name	: Fort Indiantown Gap	Customer PO#	: DAKF2789P0930
Job Number	: F5673-AK-MC	Date Sampled	: 06/29/89
Location	: KM 9180-01	Date Received	: 06/29/89
Sample State	: Oil	Date Completed	: 07/12/89
Collector	: Clt	Discard Date	: 07/27/89

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT
GAS CHROMATOGRAPH ANALYSES			
PCBs in Oil			
PCB-1242	N.D.	mg/kg	5
PCB-1254	N.D.	mg/kg	5
PCB-1221	N.D.	mg/kg	5
PCB-1232	N.D.	mg/kg	5
PCB-1248	N.D.	mg/kg	5
PCB-1260	N.D.	mg/kg	5
PCB-1016	N.D.	mg/kg	5

N.D. - Not Detected

Respectfully Submitted,
WRIGHT LAB SERVICES

Ian Milnes
Laboratory Manager

- WATER/ WASTEWATER
- SOILS / SOLIDS
- AIR / GASES
- ATOMIC ABSORPTION
- GAS CHROMATOGRAPHY
- WET CHEMISTRY

Wright Lab Services, Inc.

ATTN: Facility Engineers
Fort Indiantown Gap
Department of the Army DEH
Attn: AFKA-ZQ-DE-E
Annville PA 170035011

July 14, 1989

LAB ANALYSIS REPORT

Job Name	: Fort Indiantown Gap	Customer PO#	: DAKF2789P0930
Job Number	: F5673-AK-MC	Date Sampled	: 06/29/89
Location	: KM 9180-02	Date Received	: 06/29/89
Sample State	: Oil	Date Completed	: 07/13/89
Collector	: Clt	Discard Date	: 07/28/89

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT
GAS CHROMATOGRAPH ANALYSES			
PCBs in Oil			
PCB-1242	N.D.	mg/kg	5
PCB-1254	N.D.	mg/kg	5
PCB-1221	N.D.	mg/kg	5
PCB-1232	N.D.	mg/kg	5
PCB-1248	N.D.	mg/kg	5
PCB-1260	N.D.	mg/kg	5
PCB-1016	N.D.	mg/kg	5

N.D. - Not Detected

Respectfully Submitted,
WRIGHT LAB SERVICES

Ian Milnes
Laboratory Manager

- Water/ Wastewater
- Soils /Solids
- Air /Gases
- Atomic Absorption
- Gas Chromatography
- Wet Chemistry

Wright Lab Services, Inc.

Sample # 10963-3

ATTN: Facility Engineers
Fort Indiantown Gap
Department of the Army DEH
Attn: AFKA-ZQ-DE-E
Annville PA 170035011

July 14, 1989

LAB ANALYSIS REPORT

Job Name	: Fort Indiantown Gap	Customer PO#	: DAKF2799P0930
Job Number	: F5673-AK-MC	Date Sampled	: 06/29/89
Location	: KM 9180-03	Date Received	: 06/29/89
Sample State	: Oil	Date Completed	: 07/13/89
Collector	: Clt	Discard Date	: 07/28/89

TEST/PARAMETER	RESULT	UNITS	DETECTION LIMIT
GAS CHROMATOGRAPH ANALYSES			
PCBs in Oil			
PCB-1242	N.D.	mg/kg	5
PCB-1254	N.D.	mg/kg	5
PCB-1221	N.D.	mg/kg	5
PCB-1232	N.D.	mg/kg	5
PCB-1248	N.D.	mg/kg	5
PCB-1260	N.D.	mg/kg	5
PCB-1016	N.D.	mg/kg	5

N.D. - Not Detected

Respectfully Submitted,
WRIGHT LAB SERVICES

Ian Milnes
Laboratory Manager

34 Dogwood Lane Middletown, Pa. 17057 (717) 944-5541

PCB MANAGEMENT PLAN

U.S. Army Reserve Centers
Edgemont, North Penn, Horsham
Germantown, Philadelphia, Bristol - Pennsylvania

Prepared for:

Army Corps of Engineers
GeoEnvironmental Branch
ATTN: CENAO-EN-G
803 Front Street
Norfolk, Virginia 23510-1096

Prepared by:

Bay Associates Environmental, Inc.
P.O. Box 21009
Baltimore, Maryland 21228
Phone: 1-800-801-0405

January 2003

BAY ASSOCIATES ENVIRONMENTAL, INC.

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

ATTACHMENTS

1.0 PROGRAM OVERVIEW

The policy of the U.S. Army Corps of Engineers - Virginia (USACE-VA) is required to comply with all federal, state, Army, and local regulations pertaining to Polychlorinated Biphenyl (PCB) management. Compliance with environmental regulations will ensure that the USACE-VA conducts operations in a manner that protects human health and the environment. This management plan has been prepared to provide an overview of the regulatory requirements that govern the use and management of PCB-filled equipment, including generation, storage, handling, transportation, and disposal of PCB-wastes. This plan is developed according to guidelines and regulations set forth in the Code of Federal Regulations (CFR) 40 CFR Part 761, Pennsylvania Code 25 Pa Code 288 & 299, and the Army Hazardous Waste Sampling Instructions EM 200-1-3, Appendix D, Section D.2 – Transformer Sampling (February 1, 2001). See **Table 1.0 Federal/Pennsylvania Regulatory Matrix** on the following page.

This plan focuses on six distinct U.S. Army Reserve Centers in southeast Pennsylvania. These centers include 32 army-owned pad and/or pole mounted transformers. The centers, with corresponding type and number of transformers, are as follows:

- Edgemont USARC/AMSA
  2101 S. Delchester Road
  Edgemont, PA 19073
  Transformers: 15 pole/1 pad
- North Penn Memorial USARC
  1625 Berks Road
  Worcester, PA 19490
  Transformers: 7 pole/1 pad
- Horsham Memorial USARC
  936 Easton Road
  Horsham, PA 19044
  Transformers: 1 pad
- Bristol Veterans Memorial USARC
  2501 Ford Road
  Bristol, PA 19007
  Transformers: 4 pole
- Germantown Veterans Memorial USARC
  5200 Wissahickon Avenue
  Philadelphia, PA 19144
  Transformers: 1 pad
- Philadelphia Memorial AFRC
  2828-98 Woodhaven Road
  Philadelphia, PA 19154
  Transformers: 2 pad

T 1.0
Federal/Pennsylv a Regulatory Matrix

Environmental Regulations	Purpose	Approach/Basic Requirements	Implementing Agency	Applicability	Key Deadlines	Permitting/ Inspection Requirements	Data Management Requirements	Critical Coordination Needs	Penalties
FEDERAL Toxic Substances Control Act, U.S.C. 2601 *et seq.* 40 CFR Part 761	To regulate the use, storage, and disposal of PCBs	Establishes labeling, storage, and disposal requirements for PCB-containing material and equipment and establishes "cradle to grave" tracking of PCB waste	USEPA	PCB regulations address the use, storage, and disposal of PCB and PCB-contaminated materials and wastes. Facilities that have equipment and materials containing PCBs at a concentration of 50 ppm or greater must comply with these requirements.	6/4/90: PCB generators are required to have a Generator ID number and must use manifests for disposal of PCB waste. 7/1: Written annual document log must be completed for previous year and maintained at facility.	(1) Generators must notify EPA and have EPA identification number prior to PCB waste handling activities. (2) Quarterly PCB transformer inspections.	(1) Use and storage records (equipment lists). (2) Written annual documents log of disposition of PCBs and PCB items (3) Manifests and certificates of disposal (4) Quarterly inspection logs.	(1) Superfund and RCRA corrective action programs. (2) Land disposal restriction regulations. (3) Clean Water Act regulations.	None
PENNSYLVANIA Residual Waste Management Subchapter A 299.154 *Storage of PCB containing waste material*	To regulate the storage of PCB-containing waste.	PADEP establishes regulations for the storage of PCB-containing waste (4-50ppm PCBs).	PADEP	Applies to a person or municipality storing residual waste.	None.	None.	Maintain sufficient records to ensure compliance.	None.	(1) $500 per acre for applying residual waste to a non-permitted area. (2) $1,000 minimum for obstructing, hindering, threatening, or delaying an employee of the department from performance of duties, including inspections.
PENNSYLVANIA Residual Waste Management 288.191 - *Plan for Disposal of PCBs* & 288.301 - *PCBs*	To regulate solid waste containing PCBs.	PADEP establishes additional requirements for the disposal of PCB-containing waste and equipment.	PADEP	Applies to a person or municipality storing residual waste.	None.	None.	Maintain sufficient records to ensure compliance. For disposal of electrical transformers that previously contained 50-500 ppm PCBs, documentation must contain narrative description and any necessary plans/documents to show compliance with 288.301.	None.	None.

This plan addresses the management of the 32 transformers located at the aforementioned Army Reserve Centers, including:

- Equipment and Waste Characterization
- Equipment Use including Servicing and Retrofilling
- Inspections
- PCB Marking and Labeling
- Waste Storage, Transportation, and Disposal
- Cleanup of Old & New Spills
- Manifest and Land Disposal Restriction Forms
- Reporting and Recordkeeping
- Planning Level Cost Analysis for Upgrade/Replacement of Transformers.

This plan does not address other PCB articles and PCB-contaminated equipment, such as capacitors, circuit breakers, re-closers, voltage regulators, switches, and cables. The 99th RSC Environmental Specialist for the Pennsylvania region will implement this plan for each of the Army Reserve Centers.

To ensure that PCB-filled equipment and PCB wastes are properly managed, the United States Congress passed a law known as the Toxic Substances Control Act (TSCA). In Pennsylvania, TSCA is administered by the United States Environmental Protection Agency (USEPA). In Pennsylvania, the Pennsylvania Department of Environmental Protection (PADEP) has designated PCB waste as a solid waste containing PCBs if the concentration of PCBs is between 4 and 50 ppm. As such, the PCB-containing waste would be handled as a residual waste and may be disposed of at a residual waste disposal facility. In Pennsylvania, PCBs are not designated a hazardous waste. If the waste contains greater than 50 ppm PCBs, it is considered a TSCA regulated waste. As a TSCA regulated waste, PCBs must be managed from the point where the waste is first produced to the point where the waste is disposed of (i.e., "cradle to grave"). Waste generators are responsible for ensuring that the waste is properly handled throughout the cradle to grave process. The waste must be managed while it is on the generator's property. The generator must select a licensed transporter to haul the waste off-site and ensure that the waste is safely disposed of at a licensed commercial disposal facility.

2.0 EQUIPMENT AND WASTE CHARACTERIZATION

Oil-filled electrical equipment, e.g., transformers, switches, voltage regulators, capacitors, circuit breakers, re-closers, and cables, may contain PCBs in varying concentrations. Depending on the equipment type, location, and PCB concentration, certain environmental regulations apply. Equipment containing less than 500 parts per million (ppm) PCBs is generally not subject to PCB regulation while it is in service or while awaiting evaluation to determine whether it will be repaired and returned to service. Transformers and capacitors in service that contain 500 ppm or greater PCBs are subject to regulation. Certain environmental regulations also apply to waste materials containing PCBs, depending on the PCB concentration. Wastes containing less than 50 ppm PCBs, but greater than 4 ppm, are generally not subject to PCB regulation and in Pennsylvania are handled as a residual waste, which requires disposal in a certified residual waste disposal facility. Wastes containing 50 ppm or greater PCBs are subject to regulation and are classified as TSCA regulated wastes. Determining the proper classification of the waste is necessary to determine the proper handling and disposal method for the waste. This section reviews the different equipment and waste classifications; discusses the anti-dilution provision for wastes, and waste sampling/analysis; and provides a brief overview of recordkeeping requirements.

With certain limited exceptions, environmental regulations do not generally require electrical equipment containing PCBs to be removed from service and disposed of prior to the end of the equipment's useful life, except for PCB transformers located ***in or near commercial buildings.*** USAR Centers are not commercial buildings. However, while equipment containing 500 ppm or greater PCBs is in service, several requirements must be followed, including registration and inspection requirements for PCB transformers, emergency response requirements, and servicing requirements.

2.1 Characterization of Electrical Equipment

Oil-filled electrical equipment may be characterized by one of the following categories:

- Non-PCB Electrical Equipment - Contains less than 50 ppm PCBs.
- PCB-Contaminated Electrical Equipment – Contains, or must be assumed to contain, 50 ppm or greater PCBs, but less than 500 ppm PCBs.
- PCB Electrical Equipment – Contains, or must be assumed to contain, 500 ppm or greater PCBs.

These equipment classifications should not be applied to waste materials (see ***Section 2.2, Federal/State Characterization of Waste Materials,*** below).

On April 23-25, 2002, 30 of the 32 transformers were sampled to analyze the oils contained within each unit and to identify those transformers containing PCBs. Two pad-mounted units located at the Philadelphia Reserve Center were discovered to be dry-type transformers (containing no oils) and were therefore not sampled. The sampling program was conducted by Bay Associates Environmental, Inc. (BAE) located in Baltimore, Maryland, in accordance with sampling protocols and procedures outlined in a *Sampling and Analysis Plan (BAE, February 2002).*

Of the 30 transformers sampled by BAE, 26 of those are considered Non-PCB Electrical Equipment (less than 50 ppm PCBs), two are considered PCB-Contaminated (50-500 ppm PCBs), and two are considered PCB Electrical Equipment (greater than 500 ppm PCBs). Of

these last two PCB transformers, both are pad mounted with one located at North Penn and one located at Edgemont. The following table summarizes the analytical results of the identified as containing PCBs above laboratory reporting limits. Copies of laboratory analytical data with chain-of-custody, field trip reports, and photographs of each Army Reserve Center, are provided in Attachments 1 through 6 of this plan. Laboratory QA/QC data is provided in Attachment 7.

Table 2.0 Summary of Sampling Results

Site	Sample ID	Date Analyzed	Parameter	Result (ppb)	Result (ppm)	Reportable Limit (ppb)	Reportable Limit (ppm)
North Penn	NPPAD1	5/17/02	PCB-1254	710,000,000	710,000	7,900,000	7,900
North Penn	NPPOLE1c	5/13/02	PCB-1260	23,000	23	5,700	5.7
Edgemont	EPAD1	5/17/02	PCB-1254	820,000,000	820,000	80,000,000	80,000
Edgemont	EPOLE1a	5/13/02	PCB-1260	27,000	27	9,500	9.5
Edgemont	EPOLE1b	5/13/02	PCB-1260	7,900	7.9	8,500	8.5
Edgemont	EPOLE1c	5/13/02	PCB-1260	7,500	7.5	8,300	8.3
Edgemont	EPOLE4b	5/14/02	PCB-1260	15,000	15	7,600	7.6
Edgemont	EPOLE4c	5/14/02	PCB-1260	56,000	56	8,300	8.3
Edgemont	EPOLE3a	5/14/02	PCB-1260	42,000	42	9,100	9.1
Edgemont	EPOLE3b	5/14/02	PCB-1260	40,000	40	7,000	7.0
Edgemont	EPOLE3c	5/14/02	PCB-1260	43,000	43	9,200	9.2
Edgemont	EPOLE5a	5/14/02	PCB-1260	1,800	1.8	5,200	5.2
Edgemont	EPOLE5b	5/14/02	PCB-1260	9,100	9.1	6,000	6.0
Horsham	HPAD1	5/14/02	PCB-1260	81,000	81	8,400	8.4

Legend:

	50-500ppm
	>500 ppm - subject to regulation

ppb = parts per billion

ppm = parts per million

PCB equipment may be converted to PCB-contaminated or non-PCB equipment, and PCB-contaminated equipment may be converted to non-PCB equipment by draining, refilling, and/or otherwise servicing the equipment. This process is known as *retrofilling*. Refer to ***Section 3.5, Retrofilling and Reclassifying a PCB Transformer,*** for information on retrofilling procedures. Additional information on the management of in-service PCB electrical equipment is discussed in ***Section 4.0, Equipment Marking Requirements***; ***Section 5.0, Transformer Inspections***; and ***Section 13.0, Reporting and Recordkeeping***.

2.2 Federal/State Characterization of Waste Materials

Waste materials may be characterized by one of the following categories:

- PCB-Containing Waste – A solid waste that contains less than 50 ppm PCBs, but more than 4 ppm PCBs. In Pennsylvania, this is considered a "Residual Waste".
- PCB TSCA Regulated Waste – Contains, or must be assumed to contain, 50 ppm or greater PCBs.

Of the 14 transformers sampled by BAE that were identified to contain PCBs above laboratory reporting limits, only four contain greater than 50 ppm PCBs (one at North Penn, two at

Edgemont, and one at Horsham). The oils from these units are considered a PCB TSCA regulated waste and must be disposed of properly (see ***Section 12.0 Disposal***).

Of the remaining 10 transformers, nine contain PCBs between 4 ppm and 50 ppm. The oils from these units by definition must be handled and disposed of as a Pennsylvania residual waste, which requires disposal at a certified residual waste disposal facility.

2.3 Anti-Dilution Provision for PCB Wastes

TSCA regulations state that compliance with a specific PCB waste disposal or storage requirement may not be avoided by intentionally or unintentionally diluting the PCB waste. This provision is known as the ***Anti-Dilution Provision.*** Dilution includes reducing or shifting the PCB concentration from one material or environmental medium to another. The following are several examples.

If a leak occurs from a transformer containing greater than 50 ppm PCBs and the leaked PCB liquid contaminates the surrounding soil, then the soil must be disposed of as a PCB TSCA regulated waste (i.e., 50 ppm or greater PCBs), even though laboratory analysis may have revealed that the soil contains less than 50 ppm PCBs. The PCB concentration in the soil is considered to be equal to the PCB concentration in the leaked material as opposed to the resulting PCB concentration in the soil.

Non-PCB (less than 50 ppm PCBs) liquid or soil cannot be mixed with PCBs that are TSCA regulated waste liquid or soil (50 ppm or greater PCBs). If the two types of wastes are mixed, then the resulting mixture must be disposed of as a PCB TSCA regulated waste, even though the resulting concentration may be below 50 ppm PCBs.

Pads, rags, or absorbent materials that are used to clean up or contain a PCB spill must be disposed of as PCB TSCA regulated waste, even though the PCB contamination on the material is minimal, and sampling and analysis of the material reveals that the PCB concentration is less than 50 ppm PCBs.

2.4 Types of PCB Waste

PADEP regulations have classified waste material that contains 50 ppm or greater PCBs (or that must be managed as if the material contains 50 ppm or greater PCBs because of the Anti-Dilution Provision), as a PCB TSCA regulated waste. Wastes that may be classified as PCB TSCA regulated include, but are not limited to, dielectric fluids, contaminated solvents, used oil, heat transfer fluids, hydraulic fluids, dredge spoils, soil, and materials contaminated as a result of spills (cleanup materials).

Oil in or from electrical equipment whose PCB concentration is unknown (except circuit breakers, re-closers, and cables) must be assumed to contain between 50 and 500 ppm PCBs and is classified as a TSCA regulated waste. Circuit breakers, re-closers, and cables may be assumed to contain less than 50 ppm PCBs, unless the equipment nameplate indicates that the equipment was designed to contain concentrated PCBs, or unless there is a reason to believe that the equipment was filled with dielectric fluid containing 50 ppm or greater PCBs.

Oil-filled electrical equipment, except capacitors, that contain 50 ppm or greater PCBs, but less than 500 ppm PCBs, is no longer classified as PCB TSCA regulated once all free-flowing liquid has been drained from the equipment, the equipment rinsed, and free liquids have been removed utilizing oil absorbent materials. The drained liquid and any solvent used to flush the equipment must be managed as a PCB TSCA regulated waste.

2.5 Determining if Waste is TSCA Regulated

TSCA waste determinations are based on two methods: 1) knowledge of the waste or how the waste was generated (e.g., soil contaminated from a known PCB spill); and 2) sampling and laboratory analysis of the waste. The facility or site manager responsible for compliance is responsible for determining whether a waste is TSCA regulated. Contact the 99th RSC Environmental Specialist for the Pennsylvania region for guidance in performing waste determinations.

All transformers at each of the U.S. Army Reserve Centers, which are the focus of this management plan, have been sampled and tested for PCBs. Sampling was conducted by BAE on April 23-25, 2002. A trip report, Daily Construction Quality Control Report, analytical results with chain-of-custody, and photographs, for each site is included in Attachments 1 through 6. Of the 14 transformers sampled that indicated PCB concentrations in the oils greater than laboratory reportable limits, only two units are considered PCB transformers (greater than 500 ppm PCBs – Waste Code B006). One is located at the North Penn Army Reserve Center and one at Edgemont. Refer to Table 2.0 in Section 2.1 for a summary of the sampling results.

All wastes that have not been determined to be PCB-containing or non-TSCA regulated through the waste determination process discussed above, must be handled as a PCB TSCA regulated waste until analytical results are available to document that the waste is non-TSCA regulated or PCB-containing. For further information on handling known and unknown PCB TSCA regulated wastes, refer to ***Section 6.0, Waste labeling*** and ***Section 7.0, Waste Storage.***

2.6 Recordkeeping

Recordkeeping requirements differ for PCB equipment and PCB TSCA regulated waste. For PCB equipment, a record of the latest test results of all transformers and other electrical equipment must be maintained, either electronically or on hard copy, for at least 3 years after disposing of the equipment. For equipment at the Army Reserve Centers, the records are maintained by the facility. Maintenance records for all transformers must also be maintained.

For PCB TSCA regulated waste, all records of test results, PCB waste analyses, or other determinations must be maintained in a file at the facility or central location for at least 5 years from the date that the PCB waste was last shipped off-site for disposal. These documents should be compiled along with the corresponding manifest(s) that were used to ship the waste off-site (see ***Section 10.0, Manifests***). After 5 years, the facility must archive the files indefinitely.

Additional recordkeeping is required for PCB electrical equipment and spill cleanup events. Refer to ***Section 13.0, Reporting and Recordkeeping*** for additional information.

3.0 PCB EQUIPMENT USE

This section applies to the following transformer units that were determined through sampling to be PCB transformers (containing greater than 500 ppm PCBs):

- North Penn (NPPAD1)
- Edgemont (EPAD1)

With certain limited exceptions, environmental regulations do not require electrical equipment containing PCBs to be removed from service and disposed of prior to the end of the equipment's useful life, except for PCB transformers located in or near commercial buildings. USAR Centers are not commercial buildings. However, while equipment containing 500 ppm or greater PCBs is in service, several requirements must be followed, including registration and inspection requirements for PCB transformers, emergency response requirements, and servicing requirements. This section discusses specific use and servicing requirements for each type of equipment, and provides a brief overview of recordkeeping requirements. This section also discusses phase-out requirements for PCB transformers located in or near commercial buildings, which does not apply to USAR Centers.

3.1 Management of PCB Transformers

The two aforementioned transformers that contain 500 ppm or more PCBs, which are currently in use, must comply with the following requirements:

- They must be registered with the local fire department. The following information must be provided:
  - — The location of each PCB transformer. For indoor PCB transformers, the addresses of the buildings and the physical location of the PCB transformers on the building site must be provided. For outdoor PCB transformers, the location of the outdoor substation must be provided.
  - — The principal constituent of the dielectric fluid in the transformers (e.g., PCBs, mineral oil, or silicone oil).
  - — The name and telephone number of the 99th RSC Environmental Specialist for the Pennsylvania region to contact in the event of a fire involving the equipment.
- If in or near commercial buildings, they must be registered with the building owners within 30 days after discovery. For PCB transformers located inside commercial buildings, the Army must register the transformers with the building owner of record. For PCB transformers located near commercial buildings, the Army must register the transformers with all owners of buildings located within 100 feet (30 meters) of the PCB transformers. The following information must be provided:
  - — The specific locations of the PCB transformers.
  - — The principal constituent of the dielectric fluid in the transformers (e.g., PCBs, mineral oil, or silicone oil).
  - — The types of transformer installations (i.e., voltages).
- Combustible materials, including paints, solvents, plastics, paper, and wood must not be stored within a PCB transformer enclosure (i.e., a transformer vault or a partitioned area housing a transformer), within 15 feet (5 meters) of a transformer enclosure, or if the PCB transformer is not enclosed, within 15 feet (5 meters) of the PCB transformer.
- PCB transformers and transformer locations must be marked to indicate that the

equipment contains 500 ppm or greater PCBs. Marking of PCB-contaminated transformers is not required. Refer to ***Section 4.0, Equipment Marking Requirements*** for additional information on the marking of PCB transformers.

- A visual inspection of each PCB transformer must be performed at least once every 3 months. These inspections may be conducted during the periods of January-March, April-June, July-September, and October-December, as long as there is a minimum of 30 days between inspections. The visual inspection must include an investigation for leaks of dielectric fluid on or around the transformer, for the presence of the PCB mark on the transformer and transformer location, and for the presence of combustible materials stored nearby. The extent of the visual inspection will depend on the physical constraints of each transformer installation and should not require an electrical shutdown of the transformer. An inspection log is required to document PCB transformer inspections. Refer to ***Sector 5.0, PCB Transformer Inspections*** for additional information on inspection requirements. The facility or site manager responsible for compliance must ensure that all required inspections are conducted.
- The frequency of visual PCB transformer inspections can be reduced to at least once every 12 months if the transformer utilizes either of the following risk reduction measures:

  — The PCB transformer is equipped with impervious secondary containment with a capacity of at least 100 percent of the total dielectric fluid volume of all contained transformers.

  — The PCB transformer has been tested and determined to contain less than 60,000 ppm PCBs.

  These inspections may be conducted any time during the calendar year, as long as there is a minimum of 180 days between inspections.
- If a PCB transformer is found to be leaking, which results in any quantity of dielectric fluid running off or about to run off the external surface of the transformer, then the transformer must be repaired or replaced to eliminate the source of the leak. Any leaking material must be cleaned up and properly disposed of as PCB TSCA regulated waste. Cleanup of the released PCBs must be initiated no later than 48 hours after its discovery. Until appropriate action is completed, any active leak of PCBs must be contained to prevent exposure to humans or the environment, and the spill area must be inspected daily to verify containment of the leak. Trenches, dikes, buckets, and pans are examples of proper containment. Refer to ***Section 8.0, Cleanup of New Spills*** for additional spill cleanup information and ***Section 12.0, Disposal*** for additional PCB TSCA regulated waste disposal information.
- If a PCB transformer is involved in a fire-related incident, the facility emergency coordinator or prime contact must immediately report the incident to the 99th RSC Environmental Specialist for the Pennsylvania region. Field personnel who discover such an incident involving the PCB transformer in a street vault or in a customer building or premises should contact their supervisor, who will contact the 99th RSC Environmental Specialist for the Pennsylvania region. The 99th RSC Environmental Specialist for the Pennsylvania region will notify all local and government authorities, the National Response Center (NRC), outside emergency response contractors, and all internal company contacts. Information must be provided regarding the type of PCB transformer installation involved in the incident and the readily ascertainable cause of the incident.

The Army Reserve Center must also take measures as soon as possible to contain and control any potential releases of PCBs and incomplete combustion products into drains or open water. These measures include the following:

— The blocking of all drains in the vicinity of the transformer.
— The containment of water runoff.
— The control and treatment of any water used in cleanup operations.

3.2 Discovery of a New PCB Transformer

United States Environmental Protection Agency (USEPA) regulations required the removal of all known PCB transformers located in or near commercial buildings by no later than October 1, 1990. As noted earlier, USAR Centers are not commercial buildings. In the event that a mineral oil transformer, assumed to contain less than 500 ppm PCBs, is tested and found to contain 500 ppm or greater PCBs, then the transformer will be subject to all regulations applicable to PCB transformers. The following efforts must be initiated:

- Reporting of fire-related incidents involving the transformer is effective immediately after discovery.
- The PCB transformer and its means of access (doorway, fence, hallway) must be marked within 7 days after discovery. Refer to ***Section 4.0, Section Equipment Marking Requirements*** for additional information on the marking of PCB transformers.
- The PCB transformer must be registered in writing with the local fire department within 30 days after discovery.
- If the PCB transformer is located in or near a commercial building, the transformer must be registered with the owners of nearby buildings within 30 days after discovery. In addition, the transformer must be removed and replaced or retrofilled and reclassified to non-PCB or PCB-contaminated transformer status within 18 months after discovery.

The facility or site manager responsible for compliance must ensure that these activities are performed when necessary.

3.3 Servicing of PCB Transformers

Any servicing of PCB transformers that requires the removal of the transformer coil from the transformer casing is prohibited. Dielectric fluid from PCB (500 ppm or greater PCBs) transformers must not be mixed with or added to dielectric fluid from PCB-contaminated electrical equipment. If dielectric fluid containing 500 ppm or greater PCBs is mixed with dielectric fluid containing less than 500 ppm PCBs, the entire mixture must be considered to be greater than 500 ppm PCBs and must be disposed of as PCB TSCA regulated waste by incineration. Refer to ***Section 12.0, Disposal*** for additional information on the disposal of PCB TSCA regulated waste.

3.4 Retrofilling and Reclassifying a PCB Transformer

PCB transformers that are removed from service must either be retrofilled and reclassified as PCB-contaminated or non-PCB, placed in storage for disposal, or disposed of. PCB transformers that have been placed in storage for disposal or that have been removed from service cannot be reinstalled, except if the transformer has been retrofilled and reclassified as a PCB-contaminated or non-PCB transformer.

A PCB transformer may be converted to a PCB-contaminated or non-PCB transformer and a

PCB-contaminated transformer may be converted to a non-PCB transformer by draining and refilling with non-PCB dielectric fluid and/or otherwise servicing the transformer. Once a retrofilled transformer has been installed for reclassification purposes, the transformer must be put in service for a minimum of 3 months and then retested to determine the concentration of PCBs. "In service" means that the transformer is used electrically under loaded conditions that raise the temperature of the dielectric fluid to at least 122° F.

If the PCB concentration is less than 50 ppm, then the transformer can be reclassified as a non-PCB transformer. If the PCB concentration is 50 ppm or greater but less than 500 ppm, then the transformer can be reclassified as a PCB-contaminated transformer. If the PCB concentration remains at 500 ppm or greater, then the entire process must be repeated until the transformer is reclassified as a non-PCB or PCB-contaminated transformer, or the transformer must be removed from service. All PCBs removed from a transformer for reclassification purposes must be properly disposed of as PCB TSCA regulated waste. Refer to ***Section 12.0, Disposal*** for additional information on the disposal of PCB TSCA regulated waste.

If any of the Army Reserve Centers install a transformer for reclassification purposes, then they must maintain a file at the facility with the following information:

- Date of installation of the transformer.
- Type of transformer installed (i.e., radial or lower or higher network).
- PCB concentration at the time of installation (if known).
- Retrofill and reclassification schedule.

3.5 Recordkeeping

The following PCB transformer records must be maintained in a file at the facility where the unit is located:

- Copies of PCB transformer registration letters to the local fire department and nearby commercial building owners. The registered mail receipts for the registration letters must be stapled to the letters.
- Records of inspection and maintenance history for each PCB transformer.
- Records pertaining to the retrofilling and reclassification of PCB transformers (i.e., the date of installation, the type of transformer, the initial PCB concentration, and the retrofill and reclassification schedule).

These files must be made available for inspection upon request of USEPA and must be maintained for at least 3 years after disposing of the PCB equipment. The facility or site manager responsible for compliance must ensure that these records are maintained. Refer to ***Section 13.0, Reporting and Recordkeeping*** for additional information on recordkeeping requirements.

4.0 EQUIPMENT MARKING REQUIREMENTS

While transformers and capacitors containing 500 ppm or greater PCBs are in service, equipment and/or equipment locations must be marked with a specific identification label. This section describes the marking formats that must be used, and identifies the equipment and equipment locations that must be marked.

Marking requirements also exist for PCB containers, article containers, storage areas, and transport vehicles. These requirements are discussed in ***Section 3.0, PCB Equipment Use; Section 6.0, Waste Labeling; Section 7.0, Waste Storage;*** and ***Section 11.0, Transportation***.

4.1 Types of PCB Marks

Two formats may be used as the PCB mark. These marks are known in the environmental regulations as the large PCB mark (M_L) and the small PCB mark (M_S). A description of each mark is as follows:

- Large PCB Mark: The. M_L mark consists of letters and striping on a white or yellow background, and shall be sufficiently durable to equal or exceed the life of the transformer (including storage for disposal). The mark is square and must measure at least 6 inches on each side. If the equipment is too small to accommodate this size, the mark may be reduced in size to a minimum of 2 inches on each side.
- Small PCB Mark: The M_S mark consists of letters and striping on a white or yellow background, and shall be sufficiently durable to equal or exceed the life of the transformer (including storage for disposal). The mark is rectangular and measures 1 inch by 2 inches. If the equipment is too small to accommodate this size, the mark may be reduced in size to a minimum of 0.4 inch by 0.8 inch.

Figure 4.0 on the following page presents illustrations of the large and small PCB marks.

4.2 Marking Requirements for PCB Equipment & Equipment Locations

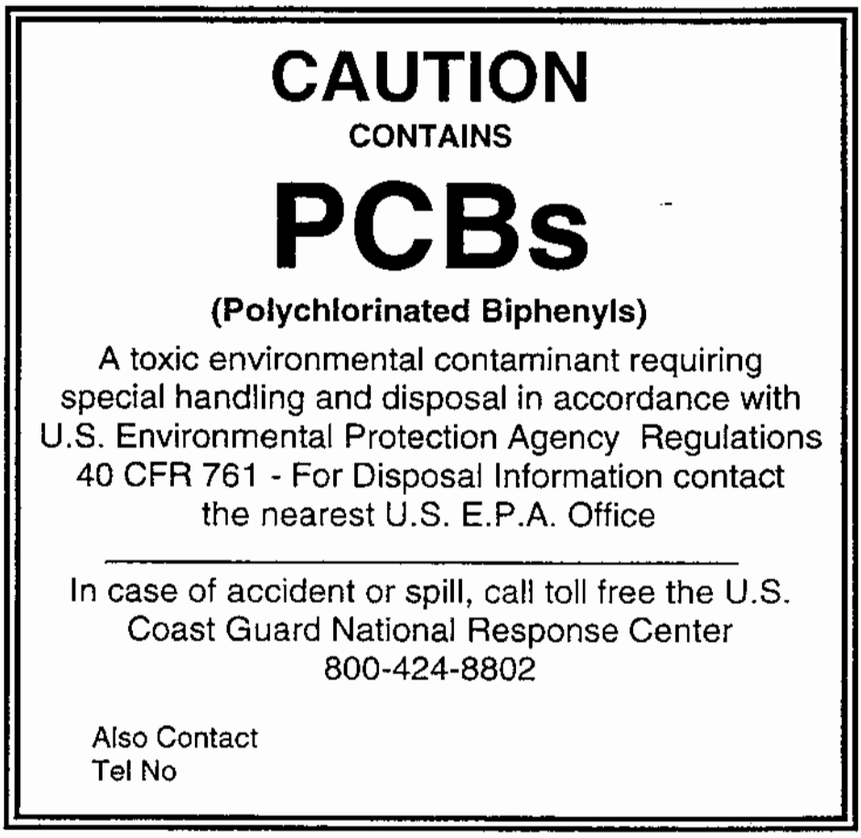
PCB equipment and equipment locations must be marked with the large PCB mark (M_L) in accordance with the following requirements:

- All PCB transformers (transformers containing 500 ppm or greater PCBs) must be marked. Marking of PCB-contaminated transformers (transformers containing between 50 and 500 ppm PCBs) is not required.
- The marks must remain on the PCB transformers while in service and after removed from service.
- All marks must be placed in a position on the exterior of the equipment so that the marks can be easily read by persons inspecting or servicing the equipment.
- If the PCB transformer is too small to accommodate the smallest allowable size of the M_L mark, then the M_S mark may be used.
- The vault door, machinery room door, fence, hallway, or means of access, other than grates and manhole covers, to a PCB transformer must be marked with the M_L mark. The mark must be placed in a location where it can be easily read by emergency response personnel fighting a fire involving the equipment.
- In the event that a mineral oil transformer, assumed to contain less than 500 ppm PCBs, is tested and found to contain 500 ppm or greater PCBs, then the PCB transformer and its means of access (doorway, fence, hallway) must be marked within 7 days after discovery.

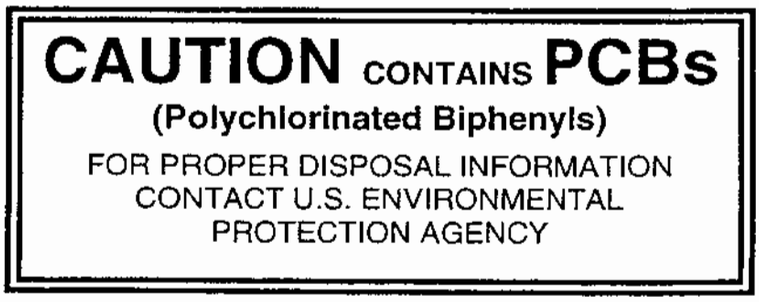
The facility or site manager or area manager responsible for compliance must ensure that all PCB transformers and PCB transformer locations are properly marked.

Figure 4.0 PCB Marks

Large PCB Mark



Small PCB Mark



5.0 PCB TRANSFORMER INSPECTIONS

While transformers containing 500 ppm or greater PCBs are in service or in storage, the transformers must be inspected on a periodic basis to ensure proper management, e.g., proper labeling, no combustible materials stored nearby, and no evidence of leaks. This section describes the PCB transformer inspection schedule, inspection items, and recordkeeping requirements.

5.1 PCB Transformer Inspection Schedule

A visual inspection of each PCB transformer must be performed at least once every 3 months. These inspections may be conducted during the periods of January-March, April-June, July-September, and October-December, as long as there is a minimum of 30 days between inspections. The extent of the visual inspection will depend on the physical constraints of each transformer installation and should not require an electrical shutdown of the transformer. PCB transformer inspections are required to be documented in an inspection log, which must be retained for at least 3 years after the transformer is removed and disposed of.

The frequency of visual PCB transformer inspections can be reduced to at least once every 12 months if the transformer utilizes either of the following risk reduction measures:

- The PCB transformer is equipped with impervious secondary containment with a capacity of at least 100 percent of the total dielectric fluid volume of all contained transformers.
- The PCB transformer has been tested and determined to contain less than 60,000 ppm PCBs.

These inspections may be conducted any time during the calendar year, as long as there is a minimum of 180 days between inspections. The facility or site manager responsible for compliance must ensure that these inspections are conducted.

5.2 PCB Transformer Inspection Items

The visual inspection must include the following observations:

- The presence of the PCB mark on the transformer must be confirmed. In-service transformers containing 500 ppm or greater PCBs must be marked with the large PCB mark (M_L). If the unit is too small to accommodate the M_L mark, then the small PCB mark (M_S) must be used. A description of each mark was provided in ***Section 4.0, Equipment Marking Requirements*** and ***Figure 4.0***.
- The presence of the M_L mark on the transformer location must also be confirmed. The vault door, machinery room door, fence, hallway, or means of access, other than grates and manhole covers, to a PCB transformer must be marked with the M_L mark. The mark must be placed in a location where it can be easily read by emergency response personnel fighting a fire involving the equipment.
- The absence of combustible materials stored near the PCB transformer must be confirmed. Combustible materials, including paints, solvents, plastics, paper, and wood, must not be stored within a PCB transformer enclosure (i.e., a transformer vault or a partitioned area housing a transformer), within 15 feet (5 meters) of a transformer enclosure, or if the PCB transformer is not enclosed, within 15 feet (5 meters) of the PCB transformer.

- An investigation for leaks of dielectric fluid on or around the transformer must be conducted. If a PCB transformer is found to be leaking which results in any quantity of dielectric fluid running off, or about to run off, the external surface of the transformer, then the transformer must be repaired or replaced to eliminate the source of the leak. Leaking material must be cleaned up and properly disposed of as PCB TSCA regulated waste. Cleanup of the released PCBs must be initiated no later than 48 hours after discovery of the leak. Until appropriate action is completed, any active leak of PCBs must be contained to prevent exposure to humans or the environment, and the spill area must be inspected daily to verify containment of the leak. Trenches, dikes, buckets, and pans are examples of proper containment.

Refer to ***Section 8.0, Cleanup of New Spills*** for additional spill cleanup information.

5.3 Recordkeeping

An inspection log and maintenance history for each PCB transformer must be maintained in a file at the facility where the transformer is located. The inspection log must include the following information:

- Name of the facility and the location of the transformer.
- Date of each visual inspection and the date that any leak was discovered, if different from the inspection date.
- Documentation that PCB marks are properly affixed to the transformer and transformer location.
- Documentation that no combustible materials are stored near the transformer.
- Name of the person performing the inspection and his/her signature.
- Location of any leaks.
- Date and description of corrective action, e.g., cleanup, containment, or repair.
- Results of containment and daily inspections required for uncorrected active leaks.

These files must be made available for inspection upon request of the USEPA, and must be maintained for at least 3 years after disposing of the PCB transformer. The facility or site manager responsible for compliance must ensure that these records are maintained.

6.0 WASTE LABELING

Special labeling requirements exist in the regulations for PCB TSCA regulated waste while they are accumulated and stored on-site prior to disposal. All waste PCB articles and PCB containers, which are grouped under the term "PCB item," must be marked with a specific PCB label. The facility or site manager responsible for compliance must ensure that all PCB TSCA regulated wastes are properly labeled. This section describes the labeling requirements for PCB TSCA regulated waste during accumulation and storage, pending laboratory analysis, and for off-site shipment.

6.1 Labeling of PCB TSCA Regulated Waste During Accumulation & Storage

Containers that are used to collect PCB TSCA regulated waste must be **labeled** with the following:

- Words that identify the contents of the drum (e.g., "PCB-Contaminated Soil").
- PCB concentration (if known). If the PCB concentration is unknown, mark the drum **"PCB Content Unknown,"** but assume that the drum contains between 50 and 500 ppm PCBs.
- Accumulation start date. For waste that is collected in a satellite accumulation area, the date that PCB TSCA regulated waste is first placed in the container must be marked on the container. In addition, the date when 55 gallons of PCB TSCA regulated waste has been generated in the satellite accumulation area must also be marked on the container. This date is the accumulation start date. The waste must be removed from the area and shipped to a licensed commercial Treatment, Storage, and Disposal Facility (TSDF) within 3 days after the accumulation start date. For waste that is initially collected in a temporary storage area, the accumulation start date is the date that PCB TSCA regulated waste is first placed in the container. PCB waste must not be stored for more than 30 days from the date that waste is first placed in the container at either a satellite accumulation area or at a temporary storage facility.
- The PCB Mark. Two formats may be used, which are known in the environmental regulations as the large PCB mark (M_L) and the small PCB mark (M_S). A description of each mark is as follows:

Large PCB Mark: The M_L mark consists of letters and striping on a white or yellow background, and shall be sufficiently durable to equal or exceed the life of the transformer (including storage for disposal). The mark is square and must measure at least 6 inches on each side. If the container is too small to accommodate this label, the mark may be reduced in size to a minimum of 2 inches on each side.

Small PCB Mark: The M_S mark consists of letters and striping on a white or yellow background, and shall be sufficiently durable to equal or exceed the life of the container (including storage for disposal). The mark is rectangular and measures 1 inch by 2 inches. If the container is too small to accommodate this size, the mark may be reduced in size to a minimum of 0.4 inch by 0.8 inch.

Refer to ***Figure 4.0*** in ***Section 4.0, Equipment Marking Requirements*** for an illustration of the M_L and M_S marks.

This information must be placed on the drum just before waste is placed in the drum, and the information must remain on the drum while the drum is being filled and when the waste is shipped off-site.

All information on PCB articles and containers must be clearly marked and visible for

inspection. Preprinted labels may be used, or the information may be clearly written directly onto the drum. Labels must be durable, and the information on the label must be in English. Labels must be placed on the container so that they can be easily read by persons inspecting the waste. If drums are placed against a wall, the information must face outward, not toward the wall. If a label or marking begins to fade and becomes illegible, the label or marking must be replaced or rewritten.

6.2 Labeling of Unknown Waste Pending Analysis

If a waste has been generated and it is not known whether the waste is classified as a PCB TSCA regulated waste, sampling and laboratory analysis of the waste must be performed. During the time period that a facility is awaiting the results of the laboratory analysis, the waste must be labeled as if it is a PCB TSCA regulated waste.

All unknown wastes and wastes suspected to contain PCBs (e.g., soil contaminated with dielectric fluid) must be handled as a PCB TSCA regulated waste until analytical results are available to document that the waste is non-hazardous. While awaiting the results of the laboratory analysis, the facility should continue to manage the waste as if the waste was a PCB TSCA regulated waste. If laboratory analysis reveals that the waste is a PCB TSCA regulated waste, then the facility must continue to manage the waste as a PCB TSCA regulated waste, and all labels and markings must remain. If laboratory analysis reveals that the waste is a non-TSCA regulated waste, then markings must be removed and replaced with the words **"Non-hazardous Waste."** In Pennsylvania, a waste containing between 4 ppm and 50 ppm PCBs is considered a PCB-containing waste and is therefore handled as a Pennsylvania residual waste. It is acceptable to keep the markings that describe how the waste was generated and the accumulation start date. These markings are helpful, but not necessary, for non-hazardous waste.

6.3 Labeling of PCB TSCA Regulated Waste for Off-Site Transportation

Before PCB TSCA regulated waste is shipped off-site from a generator facility to a licensed TSDF, the facility shipping the PCB TSCA regulated waste must ensure that the waste is labeled in accordance with USDOT regulations. Even if a disposal vendor usually prepares the facility waste for shipment, the facility or site manager responsible for compliance is ultimately responsible for ensuring that all labeling requirements are met.

For PCB containers of 110 gallons or less (e.g., pails, buckets, drums, boxes, bags, and totes, but not roll-off containers), two labels are required to be placed on each container: a PCB mark (M_L) and a hazard class label. The M_L mark is only required to be placed on PCB transformers, PCB capacitors, and roll-off containers being shipped off-site for disposal.

The PCB mark is the same mark used during accumulation and storage.

The hazard class label is a diamond-shaped label that describes the hazard class of the waste inside the container. The Class 9 label is used for PCB TSCA regulated waste.

For containers larger than 110 gallons (e.g., roll-off containers), the PCB mark and hazard class must still be marked on the container. Marking of the hazard class is usually accomplished with a placard.

7.0 WASTE STORAGE

Whenever PCB TSCA regulated wastes are generated at a field location, the waste must be transferred to a temporary PCB TSCA regulated waste storage area. This section describes two types of storage areas, provides specific requirements for each area, and discusses waste equipment, container, and recordkeeping requirements.

7.1 Storage Area Requirements

The storage area for PCBs and PCB items designated for disposal must meet the following requirements:

- The area must be equipped with adequate roof and walls or a rain shield to prevent rainwater from reaching the stored PCB-containing waste materials.
- The area must be equipped with floors and continuous curbing constructed of continuous smooth and impervious materials, such as Portland cement, concrete, or steel, to prevent or minimize penetration of PCBs. The curbing must be at least 6 inches high and made of the same type of materials as are required for the floor, and the area must not have drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area.
- The floor and curbing must provide containment equal to at least twice the volume of the largest PCB article or PCB container stored in the area, or 25 percent of the total volume of all PCB articles or PCB containers, whichever is greater.
- The area must not be located within the 100-year floodplain.

Additional requirements under ***Pennsylvania Residual Waste Regulations, §299.154, Storage of PCB-Containing Waste Material,*** for the temporary storage of up to six months of non-liquid PCB-containing waste material include:

- The waste shall be stored in a container, which adequately contains the waste to prevent dispersal into the air and prevent rainwater from reaching the waste.
- The container used to store the waste shall be labeled, indicating the date that the waste was first placed in temporary storage.
- The container used to store the waste may not be located in the 100-year floodplain of the waters of Pennsylvania.
- The person operating the temporary storage facility shall establish and maintain sufficient records to demonstrate compliance.

Non-leaking and structurally undamaged ***PCB-contaminated electrical equipment*** that has not been drained of free-flowing dielectric fluid may be stored on pallets next to the storage area. PCB-contaminated electrical equipment that has been drained of free-flowing dielectric fluid is not subject to these storage requirements. This type of storage is allowed only if the storage area has immediately available unfilled storage space equal to 10 percent of the volume of the equipment stored outside of the area. The equipment stored outside of the facility must be inspected weekly for leaks.

7.2 Temporary Storage Area Requirements

Certain waste PCB items and drums containing PCB TSCA regulated waste materials may be stored in a temporary storage area that does not comply with the above storage area requirements prior to being transferred to a commercial disposal facility. Storage in temporary storage areas is allowed for up to 30 days from the date of the waste PCB item's removal from service or the

date that the PCB TSCA regulated waste materials were initially generated.

The following PCB items may be stored in a temporary storage area:

- Non-leaking waste PCB articles and PCB equipment.
- Leaking waste PCB articles and PCB equipment, provided that they are placed in a container with sufficient sorbent material to absorb residual PCB liquids. Large equipment, such as transformers, must be placed in a containment pan with sorbent material and covered with a tarp to prevent rainwater from entering the pan.
- PCB containers holding solid PCB waste, such as contaminated soil, rags, and debris.
- PCB containers holding liquid PCBs at a concentration between 50 and 500 ppm PCBs, provided that a Spill Prevention, Control, and Countermeasure (SPCC) Plan has been prepared for the temporary storage area.

Each container of liquid PCBs containing between 50 and 500 ppm PCBs must be marked with the words, **"PCB Liquid - 50-500 ppm PCBs."** Dielectric fluid whose PCB concentration is unknown (except from circuit breakers, re-closers, and cables) must be assumed to contain between 50 and 500 ppm PCBs.

Containers of PCB liquids containing 500 ppm or greater PCBs cannot be stored in a temporary storage area. This type of PCB TSCA regulated waste must be shipped to a licensed TSDF.

7.3 Requirements for All Storage Areas

The facility or site manager responsible for compliance must ensure that PCB TSCA regulated wastes is properly stored. The following requirements must be met:

- Storage areas must be managed so that the PCB articles and PCB containers can be located by the date they entered storage for disposal.
- Storage areas must have adequate aisle space around the containers to facilitate inspection and emergency response (if required). A minimum of 2.5 feet of aisle space is recommended.
- Each storage area must be marked with the large PCB mark (M_L). A description of the M_L mark is provided in ***Section 4.0, Equipment Marking Requirements***. The storage area must also be marked "TSCA Regulated Waste."
- Equipment and tools that come into direct contact with PCBs while handling PCBs and PCB items in the storage area cannot be removed from the storage area. The equipment and tools must first be decontaminated by washing with solvent or detergent and wiping dry with rags or sorbent pads. All rags, pads, solvent, and detergent used in the decontamination process must be placed in a drum and labeled as PCB TSCA regulated waste.
- Inspection requirement or non-requirement for Conditionally Exempt Small Quantity Generators. All storage areas must be inspected on a weekly basis. Since PCB wastes (>50 ppm PCBs) are classified as TSCA regulated in Pennsylvania, all storage inspections must follow the requirements for TSCA regulated waste storage area inspections as described in ***Section 5.0, PCB Transformer Inspections***. However, if the Army Reserve Center facility where the storage area is located is classified as a small-quantity generator of hazardous waste, then the inspections can be performed every 30 days. Each inspection must be documented on a weekly inspection log to demonstrate compliance.
- Any leaking PCB articles and PCB containers must be transferred immediately to properly marked non-leaking containers, or the article or container must be placed in an

overpack container. Any spill and/or leaked materials must be immediately cleaned up, and all materials used in the cleanup process must be placed in a drum and labeled as PCB TSCA regulated waste.

7.4 Waste Equipment and Container Requirements

All containers used to store PCB TSCA regulated waste must meet USDOT standards. The following containers must be used:

— 18-gauge, 55-gallon steel drum with non-removable head (closed-head or tight-head drum); USDOT Class 17E; used for liquid hazardous waste.
— 85-gallon steel drum with snap ring and removable lid (overpack drum); used for overpacking 55-gallon drums.
— 1 6-gauge, 55-gallon steel drum with 15-mn liner, snap ring, and removable lid (open-head drum); USDOT Class 17C; used for PCB waste (50 ppm or more PCBs).

In addition, all waste containers must adhere to the following:

- A container of PCB TSCA regulated waste must not be opened, handled, or stored in a manner that may rupture the container or cause it to leak.
- PCB containers must be labeled or marked identifying the contents of the container (e.g., "PCB-Contaminated Soil").
- Marking and labeling information must be placed on the container before PCB TSCA regulated waste is placed in the container. If containers are placed against a wall, the information must face outward, not toward the wall. If a label or marking begins to fade and becomes illegible, the label or marking must be replaced or rewritten.
- Each PCB item or PCB container (containing the PCB item) must be marked with the date the item was removed from service. Containers of liquid or solid PCB waste must be marked with the date that the waste was initially generated.
- Containers must always be tightly closed during storage, except when adding or removing waste. Lids and rings must be tightly fastened, and bungs must be replaced. The general rule is that if a drum is accidentally tipped over and no leakage from the drum occurs, then the drum is tightly closed.

7.5 Recordkeeping

The facility or site manager responsible for compliance must ensure that records concerning waste storage areas (e.g., inspection logs, annual document logs) are maintained in a file at the facility or a central location.

8.0 CLEANUP OF NEW SPILLS

The USEPA PCB spill policy addresses the cleanup of new PCB spills. The policy requires the prompt cleanup of PCBs to different levels depending on location (i.e., residential, industrial, or rural), the potential for exposure, the concentration of PCBs initially spilled, and the nature and size of the population potentially at risk. Surface concentrations of PCBs on hard surfaces, such as concrete, wooden poles, and asphalt, are determined by a standard wipe test. Compliance with the spill policy (i.e., timely notification and cleanup) creates a presumption against enforcement action for penalties and the need for further cleanup under TSCA; however, USEPA reserves the right to compel additional cleanup or impose penalties if decontamination levels in the policy have not been achieved. This section provides an overview of the spill cleanup policy, and reviews reporting, PCB spill cleanup, and post-cleanup sampling requirements.

8.1 Exclusions of the Spill Policy

The following spills are subject to notification requirements, but not to cleanup standards of the Spill Policy:

- Spills that result in the direct contamination of surface waters.
- Spills that result in the direct contamination of sewers and sewage treatment plants.
- Spills that result in the direct contamination of private or public sources of drinking water or distribution systems.
- Spills that migrate to and contaminate surface waters, sewers, and drinking water supplies before cleanup has been completed in accordance with the spill policy.
- Spills that contaminate animal grazing areas (e.g., horse/cow pastures, zoos, etc.).

In these situations, the USEPA regional offices are to determine site-specific cleanup requirements.

8.2 Spill Reporting Requirements

The following reporting requirements apply to all spills of PCBs:

- All spills involving 10 pounds or greater PCBs must be reported to the USEPA Region III office of the Office of Pesticides and Toxic Substances Branch in the shortest possible time after discovery of the spill, but no later than 24 hours after discovery. Decontamination of the spill area must be initiated immediately.
- Spills confined within enclosed structures and facilities with no possibility of escape to the environment must be reported if 10 pounds or more PCBs were spilled.
- Spills of one pound or more of PCBs to the environment (i.e., soil, water, or sewers) must be reported to the National Response Center (NRC).
- Where any spill directly contaminates surface water, sewers, drinking water supplies, or animal grazing areas, the USEPA Region III office of the Office of Pesticides and Toxic Substances Branch must be notified in the shortest possible time after discovery of the spill, but no later than 24 hours after discovery, to obtain guidance on appropriate cleanup measures.

Spills of 10 pounds or less that do not directly contaminate surface water, sewers, or drinking water supplies must be cleaned up in accordance with the PCB spill policy, but notification to USEPA is not required.

Whenever a PCB spill is discovered, the emergency coordinator or primary contact at a facility

must immediately notify the 99th RSC Environmental Specialist for the Pennsylvania region, who will perform all required government notifications and internal company contacts. Field personnel should contact their supervisor.

8.3 Sampling Requirements

PCB concentrations on solid surfaces are determined by a standard wipe test. A 10-centimeter by 10-centimeter surface area isolated with a template is wiped with a gauze pad or glass wool of known size that has been saturated with hexane. It is important that the wipe be performed very quickly before the hexane evaporates. USEPA strongly recommends that the wiping medium be prepared with hexane in the laboratory and placed in a sealed vial or jar prior to use. The wiping medium is then submitted to a laboratory for analysis, and results are reported in micrograms per 100 square centimeters.

When performing post-cleanup sampling of a spill area, the following is required:

- The sampling area must consist of the area cleaned plus an additional 1-foot boundary, or an area 20 percent larger than the original area of contamination, whichever is larger.
- Random grab sampling or grid sampling may be performed.
- Samples must be spaced no more than 2 feet apart.
- The minimum of samples to be collected is 3, and the maximum number of samples is 40.
- USEPA may also collect samples from a spill site. Based on USEPA's sampling results, additional cleanup may be required.

Cleanup Requirements for Spills of Less Than 1 Pound of ***Low-Concentration PCBs*** (i.e., less than 500 ppm PCBs) or Less Than 270 Gallons of Untested Mineral Oil

- Solid surfaces must be double washed/rinsed, except that indoor residential surfaces other than vault areas must be cleaned to 10 ug PCBs/100 cm^2. Do not hose down an oil spill.
- All soil within the spill area must be excavated, and the area must be returned to original grade by backfilling with clean soil (less than 1 ppm PCBs).
- Cleanup must be completed within 48 hours after discovery of the spill. Completion of the cleanup may be delayed beyond 48 hours because of civil emergency, adverse weather conditions, lack of site access, or emergency operating conditions. Completion of the cleanup may only be delayed for the duration of the adverse weather conditions.

Cleanup Requirements for Spills of ***High-Concentration PCBs*** (i.e., 500 ppm PCBs or Greater); Spills Greater Than 1 Pound of Low Concentration PCBs; or 270 Gallons or Greater of Untested Mineral Oil

- Cleanup of visible traces of contamination must be initiated within 24 hours (or 48 hours for PCB transformers) after discovery of the spill. Initiation of the cleanup may be delayed beyond 24 hours because of civil emergency, adverse weather conditions, lack of site access, or emergency operating conditions. Completion of the cleanup may be delayed only for the duration of the adverse weather conditions.
- All visible traces of the spill plus at least a 3-foot buffer must be cordoned off.
- Signs advising persons to avoid the area must be clearly posted. PCB signs shall not be used in areas accessible to the public.
- The facility must record and document the center and the extent of the area of visible contamination. If visible traces are not evident, this fact must be documented, and the

USEPA regional office must be contacted for guidance.

- No time limit has been specified in the spill cleanup policy to complete the cleanup. However, USEPA expects cleanup to be achieved promptly and will consider promptness in determining whether a good faith effort has been made to clean up the spill.
- Do not hose down an oil spill.
- Spills in outdoor electrical substations that are located more than 325feet from residential/commercial areas must be cleaned up as follows:
  - Contaminated impervious solid surfaces and non-impervious solid surfaces must be cleaned to100 ug PCBs/100 cm^2.
  - Contaminated soil must be cleaned to either 25 ppm PCBs or to 50 ppm PCBs, provided that a label or notice is visibly placed in the area.
- Spills in restricted access areas other than outdoor electrical substations (i.e., industrial facilities) that are located more than 325 feet from residential/commercial areas must be cleaned up as follows:
  - High-contact industrial surfaces must be cleaned to 10 ug PCBs/100 cm^2.
  - Low-contact indoor impervious solid surfaces must be cleaned to 10 ug PCBs/100 cm^2.
  - Low-contact indoor non-impervious solid surfaces must be cleaned to 10 ug PCBs/100cm^2 or, with USEPA's approval, to 100 ug PCBs/100 cm^2 and encapsulated.
  - Low-contact outdoor solid surfaces (both impervious and non-impervious) must be cleaned to 100 ug PCBs/100 cm^2.
  - Contaminated soil must be cleaned to 25 ppm PCBs.
- Spills in non-restricted access areas (i.e., residential and commercial areas) must be cleaned up as follows:
  - Easily replaceable household items (e.g., toys, furniture) must be disposed of and replaced.
  - Indoor solid surfaces and outdoor ***high-contact residential, commercial surfaces*** must be cleaned to 10 ug PCBs/100 cm^2.
  - Indoor vault areas and low-contact residential/commercial outdoor impervious surfaces must be cleaned to 10 ug PCBs/100 cm^2 or, with USEPA's approval, to 100 ug PCBs/100 cm^2 and encapsulated.
  - Contaminated soil must be cleaned to 10 ppm PCBs, provided that the area is excavated to a minimum depth of 10 inches, the excavated soil is replaced with clean soil (less than 1 ppm PCBs), and the area is returned to its original condition (e.g., turf replacement). USEPA's interpretation of this standard is that for residential and other non-restricted access areas, the recommended soil cleanup level from the ground surface to 10 inches below ground surface is less than 1 ppm PCBs.

8.4 Recordkeeping

The facility or site manager responsible for compliance must ensure that written and signed cleanup and decontamination records are maintained in a file at the facility. The records must consist of the following:

- Identification of the source of the spill, e.g., type of equipment.
- Estimated or actual date and time of the spill.
- The date and time cleanup was completed or terminated. If the cleanup was delayed by

emergency or adverse weather, then the nature and duration of the delay must be recorded.

- A brief description of the spill location and the nature of the materials contaminated. This information should include whether the spill occurred in an outdoor electrical substation, other restricted access location, or non-restricted access location.
- Pre-cleanup sampling data used to establish the spill boundaries if required because of insufficient visible traces, and a brief description of the sampling methodology.
- A brief description of the solid surfaces cleaned and of the double wash/rinse method used (if applicable).
- Approximate depth of soil excavation and the amount of soil removed.
- Post-cleanup verification sampling data, and a brief description of the sampling methodology.
- A signed certification statement from the facility or site manager responsible for compliance that the cleanup requirements have been achieved and that the information is true to the best of his/her knowledge.

These records must be maintained at the facility or central location for a period of 5 years and then archived indefinitely.

9.0 CLEANUP OF OLD SPILLS

Old (or existing) PCB spills are defined as any release of materials containing 50 ppm or greater PCBs that occurred before May 4, 1987. An old spill also includes any PCB release since May 4, 1987 that was not initially thought to be a PCB spill, but new information indicates that 50 ppm or greater PCBs was released, and the 24-hour time period for notification to government authorities has expired. No established guidelines (e.g., USEPA spill cleanup policy for new PCB spills) exist for the cleanup of old spills. Cleanup standards for old spills are established by USEPA and/or the PADEP on a case-by-case basis. Additional cleanup is not necessarily required for old spills that have been cleaned up. Old spills are likely to involve more pervasive PCB contamination than are new spills and are generally more difficult to clean. This section discusses how to assess PCB contamination from an old spill, and how to establish site-specific cleanup guidelines with USEPA authorities.

Old PCB spills are excluded from the USEPA PCB spill cleanup policy by TSCA for the following reasons:

- The policy was not intended to require additional cleanup where a cleanup had already been performed in accordance with requirements imposed by the USEPA regional office, nor was the policy intended to interfere with ongoing litigation of enforcement actions concerning PCB spill cleanup.
- Old spills require a site-by-site evaluation because of the likelihood that an old spill site involves more pervasive PCB contamination and would generally be more difficult to remediate than new spills.

Old spills must be decontaminated in accordance with requirements established at the discretion of the USEPA Region III office.

Facilities are not required to notify USEPA of the discovery of an old spill. However, if no remedial action has been performed to address an old spill, the USEPA Region III office should be contacted for guidance.

9.1 Assessment of PCB Contamination from an Old Spill

If an old spill area is suspected at one of the U.S. Army Reserve Centers, the facility or site manager responsible for compliance must ensure that the possible presence of PCBs is determined through PCB sampling and analysis.

Discrete grab (not composite) soil samples should be collected and submitted to a certified analytical laboratory for analysis. Refer to ***Section 2.0, Equipment and Waste Characterization*** for guidance on sampling unknown PCB wastes.

Solid surfaces must be sampled by a standard wipe test. A 10-centimeter by 10-centimeter surface area is wiped with a gauze pad or glass wool of known size that has been saturated with hexane. It is important that the wipe be performed very quickly before the hexane evaporates. USEPA strongly recommends that the wiping medium be prepared with hexane in the laboratory and placed in a sealed vial or jar prior to use. The wiping medium is then submitted to a laboratory for analysis, and results are reported in micrograms per 100 square centimeters.

If PCBs have soaked into a non-impervious solid surface, such as concrete, the wipe test may reveal a relatively low result. The material may exhibit higher PCB concentrations below the surface. Inadvertently shipping PCB-contaminated concrete to a municipal landfill may result in future environmental liability. Upon initial inspection of the pad-mounted transformer at the

Edgemont facility, a very small old spill was observed on the concrete below the transformer. This spill should be cleaned as stated in this section.

9.2 Development of Cleanup Strategy

Once it is determined that a cleanup may be required, the USEPA Region III and the PADEP should be contacted.

U.S. EPA REGION III

U.S. Environmental Protection Agency, Region III
1650 Arch Street
Mail Code 3 WC00
Philadelphia, PA 19103-2029
215-814-3110 Tel
215-814-3114 Fax

PADEP CENTRAL OFFICE CONTACTS

PA Department of Environmental Protection
14th Floor Rachel Carson State Office Building
P.O. Box 8471
Harrisburg, PA 17105-8471
717-787-6239 Tel

10.0 WASTE MANIFESTS

Before PCB TSCA regulated waste can be shipped from a U.S. Army Reserve Center to a licensed commercial TSDF, a waste manifest form must be completed. The manifest is a document that accompanies the waste from the time it leaves the generator's facility until it reaches its final destination. The manifest requires information about the waste generator, the transporter, the disposal facility, and the waste. The purpose of this document is to track the waste shipment from the point of generation to the final destination (i.e., cradle to grave). This section discusses the regulatory requirements for manifests and how to complete and distribute a manifest, required training, and recordkeeping requirements.

10.1 When to Use a Manifest

A manifest is required whenever a PCB TSCA regulated waste is shipped from a U.S. Army Reserve Center to a commercial TSDF.

10.2 Who is Authorized to Complete, Review, and Sign the Manifest

Typically a regulated waste disposal vendor would provide a nearly complete manifest. However, it is the Reserve Center's responsibility to ensure that the manifest is completed correctly, regardless of who prepares the manifest. Special training is required by the USDOT for employees who review and sign the manifest. Contact the 99th RSC Environmental Specialist for the Pennsylvania region for training course information. In order to sign a manifest, employees must have received training. Only a U.S. Army Reserve Center employee can sign a manifest for the company. USDOT regulations require that refresher training be given every 2 years to remain authorized to review and sign manifests. The facility or site manager responsible for compliance must ensure that the Army Reserve Center personnel who sign manifests have been properly trained.

10.3 How to Select the Proper Manifest

The general rule in selecting a manifest is that the generator must use the manifest that is supplied by the state to which the PCB TSCA regulated waste is being sent. Each state has its own manifest based on the version that was originally developed by the USEPA. The USEPA version is known as Form 8700-22, and all states' versions are similar. If the disposal vendor cannot provide the proper manifest from another state, the manifest may be obtained by contacting the environmental regulatory agency of that state.

If the state to which the PCB TSCA regulated waste will be shipped does not have its own form, then a Pennsylvania manifest must be used. Copies of the manifest can be obtained from the 99th RSC Environmental Specialist for the Pennsylvania region or they can be ordered from the PADEP web site at **www.dep.state.us/dep/deputate/airwaste/wm/drfc/info/manifest.htm**.

A manifest has adequate space to list four different wastestreams on one form. If there is shipment of more than four wastestreams, another manifest or a continuation manifest (Form 8700-22A) can be used. The regular manifest and continuation manifest are similar, but the continuation manifest has space to enter approximately twice as many wastestreams. Continuation manifests are also used if more than two transporters are used to ship waste, or if the required information cannot fit on one manifest form.

Most manifests consist of a top page and seven copies (eight pages total). It is preferable to type

the information onto the manifest to ensure that the information appears on all of the copies. However, if the information cannot be typed onto the manifest, use a ballpoint pen, press hard when writing and signing, and check the last copy to make sure that all copies are legible.

10.4 How to Complete the Manifest

The one-page manifest form consists of numerous sections identified by the numbers 1 to 20 (shaded areas) and the letters A to K (unshaded areas). All unshaded sections of the manifest must be completed. The shaded portions are not required by Federal law to be completed, but most states require that you provide some of the information requested in the shaded areas.

The following instructions are based on completing a typical eight-page manifest. Other states' manifests may differ slightly, so check the instructions on the back of the manifest for assistance. As of May 1, 1999, Pennsylvania adopted a six page manifest, effectively eliminating copies 3 & 4 relating to "Generator: Mail to Destination" and "Generator: Mail to Generator State," respectively. If you have any questions, contact the 99th RSC Environmental Specialist for the Pennsylvania region.

Item 1: Enter the US EPA identification number that is assigned to the generator facility. This ID number usually begins with "PAD" followed by nine numbers. Under Manifest Document Number, enter a five-digit number that is unique to each manifest. The disposal vendor may have already completed this section. If not, you can use this section to track your manifests throughout the calendar year. For example, your first manifest in 2002 can have a Manifest Document Number of "02001", the second manifest is "02002", and so on.

Item 2: Enter the total number of manifests used. In almost every case, enter "1". If more than one manifest is used in the same shipment, enter "1" on each of the manifests. Enter a number other than 1 only if a continuation manifest is used.

Item 3: Enter the generator's name and the mailing address. This may not necessarily be the address of the generating facility. For example, if an unmanned facility generates the PCB TSCA regulated waste, do not enter that address; instead, enter the address for the person responsible for managing the completed manifests. If the mailing address is a large facility, be sure to include the name of the department or person (e.g., the facility or site manager responsible for compliance) that manages the manifests. This will help to avoid manifests getting lost in the mail.

Item 4: Enter the generator's telephone number. It is advised to enter the telephone number for the facility or site manager responsible for compliance.

Items 5 and 6: Enter the transporter's name and USEPA identification (ID) number.

Items 7 and 8: These sections are usually not required to be completed, but will be completed by the transporter if a second transporter is needed to complete the transportation of your waste.

Items 9 and 10: Enter the name, address, and USEPA ID number of the disposal facility.

Item 11: Enter the proper USDOT shipping name for the waste.

For Liquids: Polychlorinated Biphenyls Solution, 9, UN231 5, PG III
For Solids: Polychlorinated Biphenyls Mixture, 9, UN231 5, PG III

If the quantity of PCBs in the waste exceeds the reportable quantity for PCBs (which is 10 pounds), then the initials "RQ" must be entered before the shipping name.

Item 12: Enter the number and code for the type of containers being shipped. When entering the

number of containers, be sure to fill in all three boxes; e.g., one container would be entered as "001". The codes for the most common types of containers are as follows:

CM: Roll-off container or dumpster.
OW: Wooden box.
DF: Plastic or fiber drums.
DM: Metal drums.
DT: Dump truck.
TT: Tank truck.

Other codes are found on the back of the manifest.

Item 13: Enter the total weight in kilograms of PCB TSCA regulated waste being shipped (1 kilogram = 2.2 pounds). If the weight cannot be accurately determined, the abbreviation "Est." may be entered above the quantity to signify that the weight is an estimate.

Item 14: Enter the code for the unit of measurement for the number in Item 13. Use "K" for kilograms. Other codes are found on the back of the manifest.

Item 15: Enter a 24-hour emergency telephone number that may be used to notify the 99th RSC Environmental Specialist for the Pennsylvania region in case of a transportation accident. Other PCB information that must be entered in this section includes the following:

- For bulk loads of PCBs, enter the identity of the PCB waste and the earliest date that any of the waste in the bulk load was generated.
- For containers of PCB waste or PCB articles, enter the unique identification number, the type of PCB waste (e.g., soil, debris, small capacitors), and the earliest date of removal from service for disposal. The continuation manifest form must be used when a large number of drums and/or articles are being disposed and there is not enough space on the first-page manifest form for all of the required information.
- For each PCB article not in a container, enter the serial number if available or other identification number if there is no serial number, and the date of removal from service for disposal.

Other information, such as disposal approval numbers or work order numbers, may also be entered here. If the required information cannot fit on one manifest form, then the information must be entered on a continuation manifest.

Item 16: The authorized U.S. Army Reserve Center representative must print and sign his/her name. The date of receipt by the transporter must also be entered.

Item 17: The transporter must print and sign his/her name before the PCB TSCA regulated waste leaves the Army Reserve Center facility. The date of receipt by the transporter must also be entered.

Item 18: If required, the second transporter must print and sign his/her name. The date of receipt by the second transporter must also be entered.

Item 19: This section will be completed by the disposal facility if discrepancies are discovered, e.g., incorrect weight.

Item 20: This section will be signed by the disposal facility as proof that the PCB TSCA regulated waste reached its final destination.

Item A: No action required. This section contains a preprinted manifest number.

Item B: If the address where the PCB TSCA regulated waste was generated is different from the mailing address entered in Item 3, then enter the address where the waste was actually generated. If the facility and mailing addresses are the same, enter "same".

Item C: Enter the state of registration and the license plate number of the waste-carrying portion of the vehicle. Some states may require entering different information, such as a special transporter ID number.

Item D: Enter the transporter's telephone number.

Items E and F: If required, enter the same information as in Items C and D, but for the second transporter.

Item G: Not required.

Item H: Enter the telephone number for the disposal facility.

Item I: Enter the waste code for the PCB TSCA regulated waste being transported.

Item J: If a general term or N.O.S. (not otherwise specified) is used in Item 11 for the shipping name, then enter a description of the waste, e.g., "PCB-Contaminated Soil." The specific gravity of the waste is assumed to be 1.00 unless indicated otherwise in the lower right corner of the box.

Item K: Each material must be assigned an ultimate disposal method code. Both the generator and the disposal facility should agree on the code. Use "L" for landfill, "B" for incineration, or "T" for treatment.

10.5 Distribution of Manifest

Each standard manifest consists of a top page and seven copies (eight pages total), and the page numbers are printed on the bottom of each page. After the generator and the transporter sign the manifest, the generator retains Copy Nos. 3, 4, and 8, and the transporter keeps the remaining manifest copies.

The generator must manage the manifest copies as follows:

Copy No. 3: Mail within 5 business days to the state environmental regulatory agency of the disposal facility. The address may be found on the front of the manifest. You **do not** need to mail a copy to the PADEP.

Copy No. 4: Mail within 5 business days to the state environmental regulatory agency address on the front of the manifest. You **do not** need to mail a copy to the PADEP.

Copy No. 8: Keep in the facility's environmental files.

Copy No. 5: The disposal facility will mail Copy No. 5, with a handwritten signature, back to the generator as proof that the PCB TSCA regulated waste reached its final destination. Attach this copy to the corresponding Copy No. 8 and keep in the environmental files at the facility.
Some states provide only six copies of each manifest, not eight copies. If you ship your waste to a state whose manifest has only six copies, you must make a photocopy of the manifest copy that you keep when the waste leaves your facility and a photocopy of the manifest copy that is returned by the disposal facility. These photocopies must be mailed promptly to the PADEP.

10.6 Confirmation of Waste Receipt

When a U.S. Army Reserve Center uses an independent transporter to transport the PCB waste to a commercial storage or disposal facility, the Reserve Center must confirm by telephone, or by

other means agreed to by both parties, that the disposal facility actually received the manifested waste. A record of the telephone conversation must be maintained at the facility. The generator must confirm receipt of the waste by close of business the day after the disposal facility mails back Copy No. 5 of the manifest with a handwritten signature.

10.7 Exception Reports

If a generator does not receive a signed Manifest Copy No. 5 from the disposal facility within 35 days of the date of shipment, the generator must immediately contact the transporter and/or disposal facility to determine the status of the shipment. If within 45 days of the date of shipment the generator has not received a signed copy of the manifest, then the generator facility must submit an exception report to USEPA, PADEP, and in the case of an out-of-state shipment, to the state environmental regulatory agency of the disposal facility (but only if that state also classifies PCB waste as a TSCA regulated waste). The exception report must include the following information:

- A legible copy of the manifest in question.
- A cover letter signed by the generator that explains the efforts taken and the results of determining the status of the shipment.

Written telephone conversation logs must be maintained in a file at the facility as part of the annual document log. The 99th RSC Environmental Specialist for the Pennsylvania region must also be notified if a signed manifest copy has not been received within 45 days. These actions must be taken so penalties can be avoided. The facility or site manager responsible for compliance is responsible for exception reporting.

10.8 Certificate of Disposal

For each shipment of manifested PCB TSCA regulated waste that a disposal facility accepts from a U.S. Army Reserve Center facility, the disposal facility is required to prepare a certificate of disposal and send the certificate to the Army Reserve Center facility that shipped the waste. The certificate must be sent within 30 days from the date that disposal of the waste was completed (e.g., the date that the waste was incinerated, treated, or landfilled).

Under USEPA regulations, PCB waste must be destroyed within 1 year after the waste was generated. For that reason, U.S. Army Reserve Center purchase orders with disposal facilities require that Army Reserve Center shipments be destroyed within relatively short time periods. If a disposal facility does not provide a certificate of disposal within the time specified in the purchase order, then contact the 99th RSC Environmental Specialist for the Pennsylvania region.

10.9 Recordkeeping

Completed manifests (Copies 5 and 8 of each manifest), exception reports, and certificates of disposal must be retained by the generator at the facility for a period of 5 years. However, since the manifest is an important document, completed manifests over 5 years old must not be discarded. After 5 years, the records must be archived indefinitely.

11.0 WASTE TRANSPORTATION

TSCA regulated waste that is shipped off-site over public roadways for storage or disposal must be transported by a licensed waste transporter and must be accompanied by a hazardous waste manifest and land disposal restriction form. The vehicle transporting the waste must also be equipped with the proper placards. PCB TSCA regulated waste must be transported directly from the U.S. Army Reserve Center facility to a commercial TSDF by a licensed hazardous waste transporter. This section describes the regulatory requirements for transportation of PCB TSCA regulated waste and provides procedures that generators must follow to ensure safe transportation of waste.

11.1 Preshipment Vehicle Inspection

Prior to shipment of TSCA regulated waste off-site to a commercial TSDF, the facility or site manager responsible for compliance must ensure that the following vehicle inspection is performed:

- If containerized waste (drums, pails, bags, etc.) is being shipped, ensure that all containers are tightly sealed to prevent spills or leaks inside the box trailer during transport. Also, inspect the box trailer to ensure that it is equipped with a liquid-tight seal at the end of the trailer to prevent spilled liquid from leaking out the rear of the vehicle during transport.
- If bulk waste (e.g., roll-off container, tank truck, or dump truck) is being shipped, inspect the interior of the bulk container and the plastic liner to ensure that no foreign waste is present in the container.
- Ensure that roll-off container and dump truck shipments are tightly covered with a tarp and bungee cords and that manways on tank trucks are tightly sealed to prevent the escape of waste during transport.
- Inspect the exterior of the vehicle to ensure that it is clean and free from waste residues that may become loose during transport.

11.2 Preshipment Requirements for Generators

The facility or site manager responsible for compliance must ensure that the following actions are performed:

- Ensure that all PCB containers are properly labeled and marked with the PCB mark (M_L), and the Class 9 hazard class label (white with black stripes).
- Ensure that all applicable sections of the manifest are completed, including the generator's certification in Section 16. If containers are being shipped, the exact number of containers must be entered in Section 12 of the manifest. In Section 13, the total weight of waste being shipped must be estimated in kilograms to within 10% (1 kilogram = 2.2 pounds). In Section 15, the unique identification number and the date of removal from service for each drum must be listed on the manifest and (if necessary) the continuation sheet. For waste PCB equipment, the serial number and date of removal from service must be listed in Section 15 of the manifest and (if necessary) the continuation sheet.
- Ensure that a 24-hour emergency response telephone number and other information is entered in Section 15 of the manifest.
- Ensure that the transporter signs the transporter certification on the manifest before the

Army Reserve Center retains its manifest copies.

- Retain three copies of the manifest (Copy Nos. 3, 4 and 8 on a Pennsylvania manifest) and give all other manifest copies to the transporter.
- Confirm that the transporter has been assigned a USEPA ID Number.
- Confirm that the transporter is carrying in the vehicle a copy of the transporter's current and valid PADEP transporter permit.
- Confirm that the transporter is carrying in the vehicle a copy of the latest "Emergency Response Guide (ERG)," which is a pocket-sized book that describes emergency response procedures for hazardous materials or wastes according to United Nations (UN) number. For example, for UN 2315 (PCB) wastes, ERG Number 31 must be followed during an emergency response. The applicable ERG number may also be entered in Section 15 of the manifest.

11.3 Transport Vehicle Requirements

The vehicle transporting the PCB waste must comply with the following requirements:

- The vehicle must be equipped with Class 9 (miscellaneous hazardous wastes or materials) placards (white with black stripes). Placards, like hazard class labels, are used to graphically communicate a cargo's hazards. Placards are diamond-shaped, and may be made of plastic, metal, or other durable materials. They are placed on the outside and at the ends and sides of trucks, railcars, or roll-off containers. Before transporting TSCA regulated waste or offering TSCA regulated waste for transportation off-site, the generator must placard the transport vehicle or offer the transporter the appropriate placards.
- The vehicle must be marked on each end and side with the M_L mark if it is loaded with PCB containers holding more than 99.4 pounds of liquid PCB waste (i.e., contains 50 ppm or greater PCBs) or if the vehicle is loaded with one or more PCB transformers (i.e., contains 500 ppm or greater PCBs). The PCB marks must be positioned on the exterior of the transport vehicle so that the marks can be easily read by any persons inspecting or servicing the vehicle.
- The vehicle must be marked with its Pennsylvania waste transporter permit number on its sides and rear.

11.4 Preshipment Requirements for Transporters

Prior to shipment of PCB TSCA regulated waste off-site, the transporter is required to perform the following:

- Determine that the generator sections of the manifest are completed and that the generator has signed the manifest in Section 16.
- Sign the transporter's certification in Section 17 of the manifest.
- Accept all five copies of the manifest that are not retained or distributed by the generator.

11.5 Undeliverable Shipments

If the transporter cannot deliver the waste to the intended TSDF, either because of an emergency situation on the road or because the waste is rejected by the TSDF, the transporter must contact the U.S. Army Reserve Center representative designated on the manifest for further instructions. The transporter must obtain authorization from the U.S. Army Reserve Center representative to

deliver the shipment to an alternative TSDF or return the shipment to the Army Reserve Center facility. A new manifest must be sent to the new TSDF, and a letter must be submitted to the PADEP explaining the disposition of the first manifest.

12.0 WASTE DISPOSAL

Facilities that generate PCB TSCA regulated waste must ensure that the waste is ultimately shipped to a licensed commercial disposal facility for disposal. The U.S. Army Reserve Center must ensure that the disposal facility has been assigned a USEPA ID Number, and that the disposal facility possesses the proper permits and equipment to handle the waste. This section discusses the disposal requirements for each type of PCB TSCA regulated waste and commercial disposal facility requirements.

12.1 Disposal Requirements for PCB TSCA Regulated Waste

Disposal of PCB TSCA regulated waste is typically handled through arrangements with a disposal vendor under a term contract. The contract is designed to ensure compliance with the requirements specified in the TSCA regulations. The contract usually specifies the types of PCB TSCA regulated wastes that have been pre-approved for disposal at a commercial disposal facility. TSCA regulations provide the following four disposal options for use, depending on PCB concentration, physical state, and other characteristics:

- A TSCA- approved high-temperature incinerator.
- A TSCA-approved chemical waste landfill.
- A high efficiency boiler.
- A TSCA-approved alternative disposal method.

High-temperature incineration is the primary acceptable means of disposal for PCB TSCA regulated waste; however, in certain cases, chemical waste landfills or an alternative method (e.g., dechlorination) may be used for disposal. Although allowed by the regulations, high-efficiency boilers are not commonly used for PCB disposal.

In general, PCB TSCA regulated waste containing 50 ppm or greater PCBs must be disposed of in a TSCA-approved incinerator, except as provided for the following types of PCB TSCA regulated waste:

- Liquids containing 50 ppm or greater PCBs but less than 500 ppm must be disposed of in a TSCA-approved incinerator or by a TSCA-approved alternative method.
- Solids in the form of contaminated soil, rags, or other debris containing 50 ppm or greater PCBs must be disposed of in a TSCA-approved incinerator or TSCA-approved landfill.
- **PCB transformers** must be disposed of in a TSCA-approved incinerator, but may also be disposed of in a TSCA-approved landfill, provided that the transformer is first drained and rinsed of all free flowing liquids, filled with solvent, allowed to stand for at least 18 hours, and then drained thoroughly. Solvents may include kerosene, xylene, toluene, or other solvent in which PCBs are readily soluble. The fluids and flush solvents drained from the transformers must be disposed of in a TSCA-approved incinerator or by a TSCA-approved alternative method.
- PCB-contaminated electrical equipment, except capacitors, containing 50 ppm or greater PCBs but less than 500 ppm, must be disposed of by draining all free-flowing liquid from the electrical equipment. The liquid must be disposed of as a PCB TSCA regulated waste, but the drained equipment is not regulated. For electrical transformers, an application for the disposal of the units that previously contained between 50 ppm and 500 ppm PCBs must contain a narrative description and necessary plans and drawings to show how the facility will comply.
- Other PCB articles containing 500 ppm or greater PCBs must be disposed in a TSCA-approved incinerator, but may also be disposed of in a TSCA-approved landfill, provided

that all free-flowing liquid PCBs have been thoroughly drained, and the drained liquids are disposed of in a TSCA-approved incinerator.

- Other PCB-contaminated articles containing 50 ppm or greater PCBs, but less than 500 ppm, must be disposed of by draining all free-flowing liquid from the electrical equipment. The liquid must be disposed of as PCB TSCA regulated waste, but the drained equipment is not regulated.
- PCB containers (e.g., drums) that previously held a PCB waste with a concentration of 50 ppm or greater PCBs must be disposed of in a TSCA-approved incinerator or TSCA-approved landfill. If the container is being landfilled, all liquids must be drained and disposed of as PCB TSCA regulated waste.
- Sp ill materials must follow the disposal requirements for PCB liquids and solids.

12.2 Commercial Disposal Facility Requirements

U.S. Army Reserve Center facilities must not ship PCB TSCA regulated waste to a commercial disposal facility that has not been assigned a USEPA identification number and has not received TSCA authorization from USEPA and any additional state permits for the disposal of PCBs. The facility or site manager responsible for compliance must verify that the disposal facility has received a USEPA identification number. Verification must be performed before shipment of PCB TSCA regulated waste before issuing a purchase order to the disposal facility.

Prior to shipment of waste to a disposal facility, the facility or site manager responsible for compliance must confirm by written communication that the disposal facility is authorized to dispose of PCB waste, the facility has the disposal capacity to manage the waste shipment, and the facility will ensure that the ultimate disposal method will be followed. Verification should be performed before issuing a purchase order to the vendor.

The disposal facility must comply with all manifesting requirements. Refer to ***Section 10.0, Manifests*** for further information.

For each shipment of manifested PCB TSCA regulated waste that a disposal facility accepts from a U.S. Army Reserve Center facility, the disposal facility can prepare a certificate of disposal and send the certificate to the Army Reserve Center facility that shipped the waste, if requested. The certificate must be sent within 30 days from the date that disposal of the waste was completed (e.g., the date that the waste was incinerated).

13.0 REPORTING AND RECORDKEEPING

Environmental regulations require specific reports to be submitted to federal and state regulatory agencies. In addition, specific documents and papers must be maintained in a file at the generator's facility or central location to document that PCB TSCA regulated wastes are properly managed. These records must be available upon request to federal or state inspectors, officer, employee, or representative. This section describes all reports that are required to be submitted to regulatory agencies and all records that are required to be maintained at the facility.

13.1 Reporting Requirements

PCB wastes containing greater than 50 ppm PCBs are classified as TSCA regulated wastes in Pennsylvania; therefore, all reporting requirements for TSCA regulated wastes must be followed for PCB wastes. The facility or site manager responsible for compliance must ensure that all required reports are submitted to the PADEP and the USEPA.

The following reports may be required to be submitted to regulatory agencies depending on the facility's regulatory status:

- Notification of Regulated Waste Activity - This form must be completed by large-quantity generators (LQGs) and small-quantity generators (SQGs) of hazardous waste. The form must be submitted to the USEPA in order to obtain a USEPA Identification (ID) Number. This two-page form is designated by the USEPA as Form 8700-12. The form requires information such as the facility name, street address, and mailing address; contact person, job title, and telephone number; the name, address, and telephone number of the facility's legal owner; the generator status of the facility (LQG or SQG); and the types of hazardous wastes generated at the facility. All facilities that have been assigned a USEPA ID number have already completed this form. If information on the form has changed, the USEPA does not require the generator to resubmit an updated form.
- Exception Reports - If a facility, regardless of generator status, does not receive a signed manifest copy from a commercial storage or disposal facility for a PCB waste shipment within 35 days of the date of shipment, the facility must immediately contact the transporter and/or disposal facility to determine the status of the shipment. If within 45 days of the date of shipment, the facility has not received a signed copy of the manifest, the facility must submit an exception report to USEPA Region III, the PADEP, and, in the case of an out-of-state shipment, to the state environmental regulatory agency of the storage or disposal facility (but only if that state also classifies PCB waste as a hazardous waste). The exception report must include a legible copy of the manifest in question, and a cover letter signed by the generator that explains the efforts taken and results of determining the status of the shipment. The 99th RSC Environmental Specialist for the Pennsylvania region must also be notified if a signed manifest copy has not been received within 45 days.
- Incident Reports - Whenever an LQG's contingency plan is implemented in response to an emergency situation involving hazardous waste (including PCB TSCA regulated waste), such as a spill, fire, or explosion, the facility or site manager responsible for compliance must record the time, date, and any details of the incident. Within 15 days after the incident, a written incident report must be submitted to the PADEP, including: name, address, and telephone number of the owner or operator and facility; date, time, and type of incident; nature and quantity of materials involved; any injuries that resulted from the incident; an assessment of the actual or potential hazards to human health and/or

the environment; and an estimated quantity of recovered material from the incident and the current status of the material.

- Hazardous Waste Reduction Plans - LQGs that generate greater than 25 tons of hazardous waste per year are required to prepare and submit to the PADEP a written Hazardous Waste Reduction Plan (HWRP) that describes the facility's waste minimization activities. The initial HWRP must be prepared, implemented, and submitted to the PADEP by July 1, 1996, and the plan must be updated every other year and resubmitted to the PADEP. Annual status reports are also due to the PADEP by March 1 of every year with the facility's annual hazardous waste generator report.
- Annual Hazardous Waste Generator Reports - Any LQG that ships PCB TSCA regulated waste off-site to a commercial storage or disposal facility must submit an annual report every March 1 for the preceding calendar year. The report must include the facility's USEPA ID number; the calendar year covered by the report; the name, address, and USEPA ID number for each off-site storage or disposal facility to which PCB waste was shipped during the year; the name and USEPA ID number for each transporter used during the calendar year; a description, PCB waste code, hazard class, and quantity of each PCB waste shipped to a commercial storage or disposal facility; a description of waste minimization activities during the preceding year; and a certification signed by a generator representative.

13.2 Annual Document Log

Each facility using or storing at any time at least 99.4 pounds of PCBs contained in PCB containers, or one or more PCB transformers, must develop and maintain at the facility a written annual document log concerning PCB waste handling at the facility. The annual document log must be prepared for each facility by July 1 covering the previous calendar year, and must be available for inspection at the facility. The log is not required to be submitted to USEPA or the PADEP. The annual document log includes the following:

- The name, address, USEPA ID number, and the calendar year covered.
- The unique manifest number of every manifest generated by the facility during the calendar year.

From each manifest and for unmanifested waste that may be stored at the facility, the annual document log must also include the following:

- For bulk waste, its weight (in kilograms), the first date it was removed from service for disposal, the date it was transported for off-site disposal or storage, and the date of disposal (if known).
- The serial number or other means of identifying each PCB article, the weight (in kilograms) of the PCB waste in each transformer, the date it was removed from service, the date it was transported for off-site disposal or storage, and the date of disposal (if known).
- A unique number for each PCB container, a description of the contents of each PCB container, the total weight of the material (in kilograms) for each container, the first date that material placed in each PCB container was removed from service for disposal, the date each container was transported for off-site storage or disposal, and the date of disposal (if known).
- A unique number for each PCB article container, a description of the contents of each container, the total weight (in kilograms) of each container, the first date that a PCB

article placed in each container was removed from service for disposal, the date the container was transported for off-site storage or disposal, and the date of disposal (if known).

- The total number of PCB articles and the total weight (in kilograms) of PCBs in PCB articles, the total number and the total weight (in kilograms) of PCB article containers, the total number of PCB containers and the total weight (in kilograms) of the contents of PCB containers, and the total weight of bulk PCB waste that was placed into storage for disposal or disposed of during the calendar year.
- The total number of PCB transformers and the total weight (in kilograms) of PCBs contained in the transformers remaining in service at the end of the calendar year.
- The total weight (in kilograms) of any PCBs and PCB items in PCB containers, including the identification of container contents, remaining in service at the facility at the end of the year.
- A record of each telephone call or other means of verification to confirm receipt of PCB waste by the designated disposer.

13.3 Inspection and Maintenance Records

Records of inspection and maintenance history for each PCB transformer in service must be maintained in the form of a log. The log must contain the following information:

- The location of each PCB transformer.
- The date of each visual inspection and the date that any leak was discovered (if different from the inspection date).
- The person performing the inspection.
- Verification of the PCB mark on the transformer.
- Verification of the lack of combustible materials stored near the transformer.
- The location of any leaks.
- An estimate of the amount of dielectric fluid released from any leak.
- The date and description of any cleanup, containment, repair, or replacement performed.
- The results of any containment and daily inspection required for uncorrected active leaks.

The log must be maintained at the facility for at least 3 years after disposing of the PCB transformers, and must be made available for inspection upon request by the USEPA.

13.4 Recordkeeping Requirements

The facility or site manager responsible for compliance must ensure that all required records are maintained in a file at the facility. After 3 or 5 years, depending on the document, the files may be archived. No environmental files are to be discarded without first contacting the 99th RSC Environmental Specialist for the Pennsylvania region.

The following records may be required to be maintained on file at the facility depending on the facility's regulatory status:

- Proof of SQG Status - **Required of SQGs and conditionally-exempt SQGs**; must be maintained at the facility for at least 3 years.
- Hazardous Waste Determination Records - **Required of all generators**; must be maintained at the facility for at least 5 years.
- Weekly Inspection Logs for PCB Waste - **Required of all LQGs and SQGs**; must be maintained at the facility for at least 3 years.

FIGURE 13.0
SAMPLE Inspection Checklist

Inspector_____ Title_____ Date_____ Time_____

Signature_____ Location_____ Weather Conditions_____

Item	Yes	No	N/A	Comments	Follow-Up Actions Planned	Date Follow-Up Actions Completed
PCB Mark present on transformer?						
Area free of combustible materials?						
Is transformer in good condition?						
Any evidence of staining on the pad or ground around the transformer?						
Is the transformer leaking? (Note in Comments location of leak and estimate amount of dielectric fluid released)						

- Weekly Inspection Logs for PCB Transformers - **Required of all facilities**; must be maintained at the facility for at least 3 years after disposing of the PCB transformers.
- Hazardous Waste Manifests - **Required of all generators**; must be maintained at the facility for at least 5 years, then archived indefinitely.
- Exception Reports - **Required of all generators**; must be maintained at the facility for at least 5 years.
- Contingency Plan - **Required of LQGs**; must be maintained at the facility at all times.
- Personnel Training Documentation - **Required of LQGs**; must be maintained at the facility for at least 3 years.
- Hazardous Waste Reduction Plan - **Required of LQGs that generate greater than 25 tons of hazardous waste per year**; must be maintained at the facility at all times.
- Annual Hazardous Waste Generator Reports - **Required of LQGs**; must be maintained at the facility for at least 3 years, then archived indefinitely.
- Certificates of Disposal - **Required of all generators**; must be maintained at the facility for at least 3 years after the facility ceases using or storing PCBs and PCB items, then archived indefinitely.
- Annual Document Log - **Required of large-volume PCB waste generators**; must be maintained at the facility for at least 3 years after the facility ceases using or storing PCBs and PCB items.

14.0 PLANNING LEVEL COST ANALYSIS

The following are planning level cost estimates for the recycling, disposal, and replacement of transformers located at the aforementioned Army Reserve Centers in southeast Pennsylvania. The recycling and disposal of transformers, including oils, is typically determined on a cost per weight basis with the following approximations being made:

- 10 KVA = 225lbs/each
- 25 KVA = 300lbs/each
- 75 KVA = 500lbs/each
- 112 KVA = 800lbs/each
- 240 KVA = 1,500lbs/each

Typically, the unit cost per pound of disposal increases with higher PCB concentrations. Based on these assumptions and assuming the transformers are in good condition with no leaking oil, the following table presents estimated costs for the disposal and replacement of each of the transformers located at the Army Reserve Centers in southeast Pennsylvania. In addition, the table reflects the corresponding regulations (i.e., Residual Waste or TSCA regulated), if any, that apply to each transformer based on the sampling results. Please refer to the appropriate sections (i.e., labeling, storage, marking, disposal etc.) of this plan for detailed information.

PECO Energy provides electric power to each of the Army Reserve Centers. Their charge to take-over ownership of the service will depend upon their proprietary calculation of the pay-back period for the costs involved. The charge can vary from $0 to the full cost of replacement service, depending upon the anticipated rate at which power will be consumed in the future (the pay-back period). This is a recent change in the way PECO does business, a result of utility privatization. Versar has estimated the cost to purchase and install new transformers based on R.S. Means construction cost data, which will be the "worst case" scenario. Specific historic data and future projections on the consumption of power would be required to estimate more accurately the privatization costs.

Additional information for each transformer including gallonage, condition, and dimensions of each unit, would present a more accurate cost analysis. However, the above planning level cost estimates can be used for providing a ball park estimate for budgeting purposes.

Table 14.0 Estimated Disposal & Replacement Cost

Site	Identifier	Xformer Type	KVA	Sample No.	PCBs (ppm)	Disposal Cost[a]	Replacement Cost	Action Required
Edgemont	Pole #1	Pole	10	EPOLE1a	27	$750	$14,185	Residual Waste[c]
Edgemont	Pole #1	Pole	10	EPOLE1b	7.9	$750	$14,185	Residual Waste[c]
Edgemont	Pole #1	Pole	10	EPOLE1c	7.5	$750	$14,185	Residual Waste[c]
Edgemont	Pole #2	Pole	25	EPOLE2a	ND	$750	$14,185	None
Edgemont	Pole #2	Pole	25	EPOLE2b	ND	$750	$14,185	None
Edgemont	Pole #2	Pole	25	EPOLE2c	ND	$750	$14,185	None
Edgemont	Pole #4	Pole	25[b]	EPOLE4a	ND	$750	$14,185	None
Edgemont	Pole #4	Pole	25[b]	EPOLE4b	15	$750	$14,185	Residual Waste[c]
Edgemont	Pole #4	Pole	25[b]	EPOLE4c	56	$750	$14,185	TSCA Regulated
Edgemont	Pole #3	Pole	10	EPOLE3a	42	$750	$14,185	Residual Waste[c]
Edgemont	Pole #3	Pole	10	EPOLE3b	40	$750	$14,185	Residual Waste[c]
Edgemont	Pole #3	Pole	10	EPOLE3c	43	$750	$14,185	Residual Waste[c]
Edgemont	Pole #5	Pole	10	EPOLE5a	1.8	$750	$14,185	None
Edgemont	Pole #5	Pole	10	EPOLE5b	9.1	$750	$14,185	Residual Waste[c]
Edgemont	Pole #5	Pole	10	EPOLE5c	ND	$750	$14,185	None
Edgemont	Pad	Pad	240[b]	EPAD1	820,000	$1,500	$13,055	TSCA Regulated
North Penn	Pole #1	Pole	10	NPPOLE 1a	ND	$750	$14,185	None
North Penn	Pole #1	Pole	25	NPPOLE 1b	ND	$750	$14,185	None
North Penn	Pole #1	Pole	25	NPPOLE 1c	23	$750	$14,185	Residual Waste[c]
North Penn	Pole #2	Pole	25	NPPOLE 2a	ND	$750	$14,185	None
North Penn	Pole #2	Pole	25	NPPOLE 2b	ND	$750	$14,185	None
North Penn	Pole #2	Pole	25	NPPOLE 2c	ND	$750	$14,185	None
North Penn	Pole #3	Pole	25	NPPOLE 3	ND	$750	$14,185	None
North Penn	Pad	Pad	240[b]	NPPAD1a	710,000	$1,500	$13,055	TSCA Regulated
Germantown	Pad	Pad	240[b]	GVPAD1	ND	$1,500	$13,055	None
Philadelphia	Dry	Pad	240	Not Sampled	Not Sampled	N/A	N/A	N/A
Philadelphia	Dry	Pad	240	Not Sampled	Not Sampled	N/A	N/A	N/A
Bristol	Pole #1	Pole	25	BPOLE1	ND	$750	$14,185	None
Bristol	Pole #2	Pole	75	BPOLE2a	ND	$750	$14,185	None
Bristol	Pole #2	Pole	75	BPOLE2b	ND	$750	$14,185	None
Bristol	Pole #2	Pole	75	BPOLE2c	ND	$750	$14,185	None
Horsham	Pad	Pad	112.5	HPAD1	81	$1,500	$9,990	TSCA Regulated
					TOTALS	$25,500	$417,965	

[a]Disposal costs include transportation and labor costs.
[b]These transformers were estimated to be 25 KVA for pole mounted and 240 KVA for pad mounted.
[c]Waste may be disposed of at a residual waste disposal facility.

15.0 DEFINITIONS

Annual Document Log: Detailed information maintained by the generator concerning PCB waste handling at the facility.

Anti-Dilution Provision: Compliance with a specific PCB waste disposal requirement may not be avoided by intentionally or unintentionally diluting the PCB waste. Dilution includes reducing or shifting the PCB concentration from one material or environmental medium to another. For example, the PCB concentration in soil or bluestone from a spill is determined by the PCB concentration in the spilled material as opposed to the resulting PCB concentration in the soil or bluestone.

Certificate of Disposal: Documentation provided by a commercial disposal facility that PCB TSCA regulated waste was properly disposed of. The certificate must be sent within 30 days from the date that disposal of the waste was completed.

Exception Report: A report that a generator must send to the PADEP and the disposal facility's state regulatory agency if a signed manifest copy has not been received by the generator within 45 days of shipping the waste to an off-site commercial storage or disposal facility.

Fire-Related Incident: Any incident involving a PCB transformer that involves the generation of sufficient heat and/or pressure to result in the rupture of a PCB transformer and the release of PCBs.

High-Concentration PCBs: PCBs that contain 500 ppm or greater PCBs, or those materials that USEPA requires to be assumed to contain 500 ppm or greater PCBs in the absence of testing, such as capacitors or transformers with nameplates indicating the presence of Askarel, Pyranol, Inerteen, or other high concentration PCB dielectric fluids.

High-Contact Industrial Surface: A surface, generally made of impervious solid material, in an industrial setting that is repeatedly touched, often for relatively long periods of time. Examples include manned machinery and control panels. Examples of low-contact industrial surfaces include ceilings, walls, floors, roofs, roadways, and sidewalks in an industrial area; utility poles; unmanned machinery; concrete pads beneath electrical equipment; curbing; exterior structural building components; indoor vaults; and pipes.

High-Contact Residential/Commercial Surface: A surface in a residential/commercial setting that is repeatedly touched, often for relatively long periods of time. Examples include doors, wall areas below 6 feet high, uncovered flooring, windowsills, fencing, banisters, stairs, automobiles, children's play areas, and sidewalks. Examples of low-contact residential/commercial surfaces include interior ceilings, interior wall areas above 6 feet high, roofs, asphalt or concrete roadways, wooden utility poles, unmanned machinery, concrete pads beneath electrical equipment, curbing, exterior structural building components (e.g., aluminum/vinyl siding, cinder block, asphalt tiles), and pipes.

Impervious Solid Surfaces: Solid surfaces that are nonporous and unlikely to absorb spilled PCBs within the short period of time required for spill cleanup under USEPA's spill cleanup policy. Impervious surfaces include, but are not limited to, metals, glass, aluminum siding, and

enameled or laminated surfaces.

In or Near Commercial Buildings: Within the interior of, on the roof of, attached to the exterior wall of, in the parking area serving, or within 100 feet (30 meters) of a non-industrial non-substation building. Commercial buildings are typically accessible to both members of the general public and employees, and include public assembly properties, educational properties, institutional properties, residential properties, stores, office buildings, and transportation centers (e.g., airport terminal buildings, subway stations, bus stations, or train stations).

Leak or Leaking: Any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface.

Low-Concentration PCBs: PCBs that are tested and found to contain less than 500 ppm PCBs, or those PCB-containing materials that USEPA requires to be assumed to be at concentrations PCBs below 500 ppm (i.e., untested mineral oil dielectric fluid).

Manifest: The document that acts as a tracking mechanism and travels with the waste from the time the waste leaves the generator's facility until the waste reaches its final destination. The manifest contains information on the generator, the transporter, the storage or disposal facility, and the waste.

Marked: The marking of PCB items, storage areas, and transport vehicles by means of applying a legible mark by painting, by fixation of an adhesive label, or by any other method that meets the requirements of these regulations. The PCB mark provides the descriptive name, cautions, and emergency instructions.

Non-impervious Solid Surfaces: Solid surfaces that are porous and more likely to absorb spilled PCBs prior to completion of USEPA's spill cleanup requirements. Non-impervious surfaces include, but are not limited to, wood, concrete, asphalt, and plasterboard.

Outdoor Electrical Substations: Outdoor, fenced-off, and restricted access areas used in the transmission and/or distribution of electrical power that are located at least 325 feet (0.1 kilometer) from a residential/commercial area. Outdoor, fenced-off, and restricted access areas used in the transmission and/or distribution of electrical power that are located less than 325 feet from a residential/commercial area are considered to be residential/commercial areas.

PCBs: Polychlorinated biphenyl chemical compounds, which are toxic, persistent (i.e., do not break down in the environment) chemicals used in transformers, capacitors, and other electrical equipment for insulating purposes, and in gas pipeline systems as a lubricant. The sale of PCBs was banned by law in 1979.

PCB Article: Any manufactured article, other than a PCB container (i.e., a drum, bag, tank, etc.), that contains or must be assumed to contain 50 ppm or greater PCBs and whose surfaces have been in direct contact with such PCBs. Examples include, but are, not limited to, capacitors, transformers, electric motors, circuit breakers, re-closers, voltage regulators, switches (including sectionalizers and motor starters), electromagnets, cable, hydraulic machines, pumps, and pipes.

PCB Container: Any package, e.g., can, bottle, bag, barrel, drum, or tank, that contains or must be assumed to contain 50 ppm or greater PCBs, or PCB articles and whose surfaces have been in

direct contact with such PCBs.

PCB- Containing Waste: A solid waste containing PCBs in the following concentrations:

(i) More than 4 parts per million, but less than 50 parts per million.

(ii) 50 parts per million or more, if the following are met:

(A) Regulations promulgated under the Toxic Substances Control Act (15 U.S.C.A. § § 2601—2629) provide that the waste may be disposed of as municipal solid waste.

(B) The waste is not a hazardous waste under the act.

(C) The Resource Conservation and Recovery Act (42 U.S.C.A. §6901—6991) does not impose specific standards or requirements for the disposal of the waste.

PCB-Contaminated Electrical Equipment: Any electrical equipment, including but not limited to transformers, capacitors, circuit breakers, re-closers, voltage regulators, switches, and cable, which contains 50 ppm or greater PCBs, but less than 500 ppm PCBs. Oil-filled electrical other than circuit breakers, re-closers, and cables, whose PCB concentration is unknown must be assumed to be PCB-contaminated electrical equipment. Circuit breakers, re-closers, and cable may be assumed to contain less than 50 ppm PCBs, unless the equipment nameplate indicates that the equipment was designed to contain concentrated PCBs, or unless there is a reason to believe that the equipment is filled with dielectric fluid containing 50 ppm or greater PCBs.

PCB Equipment: Any manufactured item, except for a PCB container or PCB article container, which contains a PCB article. Examples of PCB equipment include microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.

PCB TSCA Regulated Waste: Any waste material that contains 50 ppm or greater PCBs or that must be managed as if the material contains 50 ppm or greater PCBs because of the Anti-Dilution Provision.

PCB Item: Any PCB article, PCB article container, PCB container, or PCB equipment that contains PCBs.

Residential/Commercial Areas: Areas where people live or reside, or areas where people work in other than manufacturing or farming industries. Residential areas include housing and the property, on which housing is located, as well as playgrounds, roadways, sidewalks, parks, and other similar areas within a residential community. Commercial areas are typically accessible to both members of the general public and employees and include public assembly and institutional properties, store, office buildings, and transportation centers.

Residual Waste Code: The numeric code developed by the PADEP that is assigned to each type of residual waste. For example, 502 is the waste code for a waste containing 4 to 50 ppm PCBs.

Retrofill: To remove PCB or PCB-contaminated dielectric fluid and replace it with non-PCB dielectric fluid.

Satellite Accumulation Area: Can accumulate hazardous waste in or at the point of generation and under the control of the operator. Can accumulate a maximum of 55-gallons of hazardous

waste or 1-quart of acutely hazardous waste.

Soil: All vegetation, soils, and other ground media, including but not limited to, sand, grass, gravel, and oyster shells. It does not include concrete and asphalt.

Spill: Both intentional and unintentional spills, leaks, and other uncontrolled discharges, where the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases. USEPA's spill cleanup policy applies to spills of 50 ppm or greater PCBs. The concentration of PCBs spilled is determined by the PCB concentration in the material spilled, as opposed to the PCB concentration in the material onto which the PCBs were spilled. Where a spill of untested mineral oil occurs, the oil is presumed to contain greater than 50 ppm PCBs, but less than 500 ppm PCBs, and is subject to USEPA's spill cleanup policy.

Spill Area: The area of soil on which visible traces of the PCB spill can be observed, plus a buffer zone of 1 foot beyond the visible traces. Any surface or object (e.g., concrete sidewalk or automobile) within the visible traces area or on which visible traces of the spilled material are observed is included in the spill area. The area represents the minimum area assumed to be contaminated by PCBs in the absence of pre-cleanup sample results, and is the minimum area that must be cleaned.

TSCA Regulated Waste Determination: The procedure that is used to determine whether a waste is a TSCA regulated waste. The determination can be made either through knowledge of the waste or the process generating the waste, or through sampling and laboratory analysis of the waste.

USEPA Identification (ID) Number: The facility-specific number assigned by the USEPA to each hazardous waste generator, transporter, and storage or disposal facility.

16.0 REFERENCES

Toxic Substances Control Act, 42 U.S.C. §2601 et seq.

Title 40, Code of Federal Regulations, Part 761 – *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.*

25 Pennsylvania (PA) Code Residual Waste Management 288.191 – *Plan for Disposal of PCBs*

25 PA Code Residual Waste Management 288.301 – *PCBs*

25 PA Code Subchapter A – Residual Waste Management 299.154 – *Storage of PCB-Containing Waste Material.*

ATTACHMENT 1

North Penn Survey & Sampling Documentation

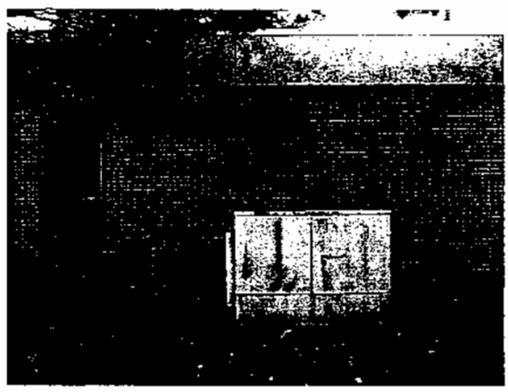
North Penn Memorial USARC

NPPad1
04/24/2002

Pad mount transformer located next to the main USARC building (in the background). Prior to the site visit someone had labeled the transformer as containing PCBs.

BAE labeled the transformer with a paint marker as NPPad1.

IDW was placed in a plastic bag, labeled as NPPad1 and placed in a DOT-shippable 5-gallon pail for North Penn IDW.

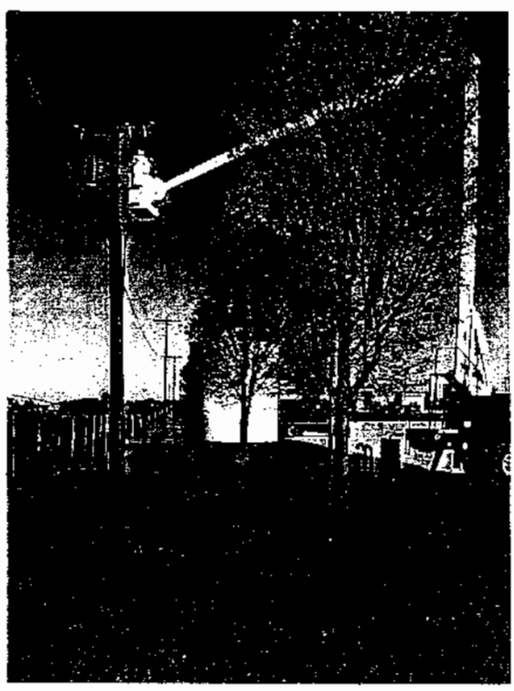


NPPole1
04/24/2002

Three transformers mounted on a pole, left of the second parking area and near a small water treatment plant (in background of picture).

BAE labeled the transformers with a paint marker as a, b, and c. 'a' is the transformer on the right of the photo, 'b' is obscured by the pole, and 'c' is the black transformer on the left of the picture.

IDW was placed in a plastic bag, labeled as NPPole1 and placed in the DOT-shippable 5-gallon pail for North Penn IDW.



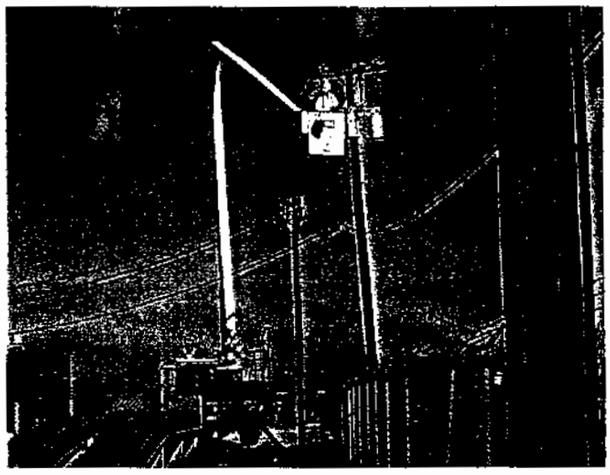
North Penn Memorial USARC

NPPole2
04/24/2002

Three transformers mounted on a pole just outside of the fence enclosing the military equipment parking (MEP) area. This photo was taken facing away from the main USARC building.

BAE labeled the transformers with a paint marker as a, b, and c. 'a' is obscured by the bucket, 'b' is the transformer in line with the pole, and 'c' is the transformer on the right of the picture.

IDW was placed in a plastic bag, labeled as NPPole2 and placed in the DOT-shippable 5-gallon pail for North Penn IDW.



NPPole3
04/24/2002

Single transformer mounted on a pole also outside of the fence enclosing the military equipment parking (MEP) area. The transformer was not connected, and appears to be linked to the waste water treatment plant to the left of the pole (out of range of the photo)

BAE labeled the transformers with a paint marker as NPole3

IDW was placed in a plastic bag, labeled as NPPole3 and placed in the DOT-shippable 5-gallon pail for North Penn IDW.

North Penn Memorial USARC

The 5-gal pail of IDW was placed in the storage building within the MEP area. Kendra Borka's business card was affixed to the top of the pail and included her phone numbers.

GPL LABORATORIES, LLLP

North Penn

Summary of Analytical Results

Client ID NPPAD1
GPL ID: 204159-001-001-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/15/2002
Time Analyzed 02:32
Analysis Batch 53886

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	7900000	ug/kg	U	1000
PCB-1221	BQL	7900000	ug/kg	U	1000
PCB-1232	BQL	7900000	ug/kg	U	1000
PCB-1242	BQL	7900000	ug/kg	U	1000
PCB-1248	BQL	7900000	ug/kg	U	1000
PCB-1254	340000000	7900000	ug/kg	P	1000
PCB-1260	BQL	7900000	ug/kg	U	1000

Summary of Analytical Results

Client ID NPPAD1
GPL ID: 204159-001-001-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/17/2002
Time Analyzed 12:06
Analysis Batch 53886

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	79000000	ug/kg	U	10000
PCB-1221	BQL	79000000	ug/kg	U	10000
PCB-1232	BQL	79000000	ug/kg	U	10000
PCB-1242	BQL	79000000	ug/kg	U	10000
PCB-1248	BQL	79000000	ug/kg	U	10000
PCB-1254	710000000	79000000	ug/kg		10000
PCB-1260	BQL	79000000	ug/kg	U	10000

Summary of Analytical Results

Client ID NPPOLE1a
GPL ID: 204159-002-002-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 17:48
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	6700	ug/kg	U	1
PCB-1221	BQL	6700	ug/kg	U	1
PCB-1232	BQL	6700	ug/kg	U	1
PCB-1242	BQL	6700	ug/kg	U	1
PCB-1248	BQL	6700	ug/kg	U	1
PCB-1254	BQL	6700	ug/kg	U	1
PCB-1260	BQL	6700	ug/kg	U	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID NPPOLE1b
GPL ID: 204159-003-003-I/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 18:16
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	6600	ug/kg	U	1
PCB-1221	BQL	6600	ug/kg	U	1
PCB-1232	BQL	6600	ug/kg	U	1
PCB-1242	BQL	6600	ug/kg	U	1
PCB-1248	BQL	6600	ug/kg	U	1
PCB-1254	BQL	6600	ug/kg	U	1
PCB-1260	BQL	6600	ug/kg	U	1

Summary of Analytical Results

Client ID NPPOLE1c
GPL ID: 204159-004-004-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 18:44
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	5700	ug/kg	U	1
PCB-1221	BQL	5700	ug/kg	U	1
PCB-1232	BQL	5700	ug/kg	U	1
PCB-1242	BQL	5700	ug/kg	U	1
PCB-1248	BQL	5700	ug/kg	U	1
PCB-1254	BQL	5700	ug/kg	U	1
PCB-1260	23000	5700	ug/kg	P	1

Summary of Analytical Results

Client ID NPPOLE3
GPL ID: 204159-005-005-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 19:12
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	8500	ug/kg	U	1
PCB-1221	BQL	8500	ug/kg	U	1
PCB-1232	BQL	8500	ug/kg	U	1
PCB-1242	BQL	8500	ug/kg	U	1
PCB-1248	BQL	8500	ug/kg	U	1
PCB-1254	BQL	8500	ug/kg	U	1
PCB-1260	BQL	8500	ug/kg	U	1

Summary of Analytical Results

Client ID NPPOLE2a
GPL ID: 204159-006-006-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 19:40
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	7700	ug/kg	U	1
PCB-1221	BQL	7700	ug/kg	U	1
PCB-1232	BQL	7700	ug/kg	U	1
PCB-1242	BQL	7700	ug/kg	U	1
PCB-1248	BQL	7700	ug/kg	U	1
PCB-1254	BQL	7700	ug/kg	U	1
PCB-1260	BQL	7700	ug/kg	U	1

Summary of Analytical Results

Client ID NPPOLE2b
GPL ID: 204159-007-007-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 21:32
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	9900	ug/kg	U	1
PCB-1221	BQL	9900	ug/kg	U	1
PCB-1232	BQL	9900	ug/kg	U	1
PCB-1242	BQL	9900	ug/kg	U	1
PCB-1248	BQL	9900	ug/kg	U	1
PCB-1254	BQL	9900	ug/kg	U	1
PCB-1260	BQL	9900	ug/kg	U	1

GPL *LABORATORIES, LLLP*

Summary of Analytical Results

Client ID NPPOLE2c
GPL ID: 204159-008-008-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 22:00
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	9100	ug/kg	U	1
PCB-1221	BQL	9100	ug/kg	U	1
PCB-1232	BQL	9100	ug/kg	U	1
PCB-1242	BQL	9100	ug/kg	U	1
PCB-1248	BQL	9100	ug/kg	U	1
PCB-1254	BQL	9100	ug/kg	U	1
PCB-1260	BQL	9100	ug/kg	U	1

DAILY CONSTRUCTION QUALITY CONTROL REPORT

CONTRACTORS NAME: **BAY ASSOCIATES ENVIRONMENTAL, INC.** DATE: 4/24/02

CONTRACTORS ADDRESS: **P.O. Box 21009**
Baltimore, MD 21228

REPORT NO: 20424-1

CONTRACT NO: **DACA65-01-D-0017**
D.O. #0005

PROJECT NAME: **PCB SURVEY - various locations in Pennsylvania**

LOCATION OF WORK: **North Penn Memorial USARC, Pennsylvania**

WEATHER: Cold/Sunny RAIN: NONE INCHES TEMP: 45 MAX. 38 MIN.

WIND DIRECTION: _____ OTHER WEATHER CONDITIONS: WINDY.

1)

	CONTRACTORS OR SUBCONTRACTOR	C = CONT S = SUB	AREA OF RESPONSIBILITY
1	BAY ASSOCIATES ENVIRONMENTAL, INC.	C	ENVIRONMENTAL CONTRACTOR
2	HARRY B. MILLER CO., INC.	S	ELECTRICAL

2) WORK PERFORMED TODAY (INDICATE IDENTITY OF CONTRACTOR AND SUB-CONTRACTORS, LOCATION AND DESCRIPTION OF WORK):

N. Penn. USARC 7 pole mounts, 1 pad mounts

Angela Peyton
John - from Harry B. Miller
Jessica Lackey
Chris Seymour
Hendra Barker Start 7:46
Finish 10:00

3) SAMPLES COLLECTED:

PCB - 8, 7 pole + 1 pad

See Sample Log / COC

DAILY CONSTRUCTION QUALITY CONTROL REPORT

4) RESULTS OF SURVEILLANCE (INCLUDE SATISFACTORY WORK COMPLETED, OR DEFICIENCIES WITH ACTION TO BE TAKEN):

No problems encountered

5) VERBAL INSTRUCTIONS GIVEN BY GOVERNMENT PERSONNEL (INCLUDE NAME, TIME, PLACE, INSTRUCTIONS AND RESULTANT ACTIONS):

None to report

DAILY CONSTRUCTION QUALITY CONTROL REPORT

6) JOB SAFETY (INCLUDE DEFICIENCIES AND CORRECTIVE ACTIONS):

no deficiencies to report.

Sampling Log Transformer Sampling at North Penn Memorial USARC, Pennsylvania

Sample No.	Sample Location	Date	Sample Location		Sample Collection		Sampler's Initials	Sample Size	Type of Analysis	Pole or Pad Mounted	Photo Taken & Logged	Sample Labeled	COC Complete	Decon. Complete
			Start Time	End Time	Start Time	End Time								
NPPAD1	NP PAD 1	4/24	7:55	8:29	8:15	8:21	CS	40ml	PCB	PAD	✓	✓	✓	✓
NPPOLE 1a	NPPOLE 1	4/24	8:30	9:05	8:40	8:45	CS	40ml	PCB	Pole	✓	✓	✓	✓
NPPOLE 1b	NPPOLE 1	4/24	8:30	9:05	8:48	8:50	CS	40ml	PCB	Pole	✓	✓	✓	✓
NPPOLE 1c	NPPOLE 1	4/24	8:30	9:05	8:51	8:55	CS	40ml	PCB	Pole	✓	✓	✓	✓
NP POLE 3	NPPOLE 3	4/24	9:11	9:20	9:14	9:17	CS	40ml	PCB	Pole	✓	✓	✓	✓
NPPOLE 2a	NPPOLE 2	4/24	9:24	9:50	9:30	9:40	CS	40ml	PCB	Pole	✓	✓	✓	✓
NPPOLE 2b	NPPOLE 2	4/24	9:24	9:50	9:30	932	CS	40ml	PCB	Pole	✓	✓	✓	✓
NPPOLE 2c	NPPOLE 2	4/24	9:24	9:50	9:41	9:45	CS	40ml	PCB	Pole	✓	✓	✓	✓

Samples collected by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

Photographic Log Transformer Sampling at North Penn Memorial, Pennsylvania

Date	Time	Roll Number	Picture Number	Photographer (Initials)	Site Location	Direction facing	Sample No. Documented	Additional Comments
4/24	7:46	DIGIT	#17	jdl	NORTH PENN	ENE	NPPAD 1 Yes	already labelled PCB
4/24	8:40	DIGIT	#18	jdl	NORTH PENN	NW	NPPOLE 1 YES	H2O tower in background parking lot on Right
4/24	9:15	DIGIT	#19	jdl	NORTH PENN	E/ESE	NPPOLE3 YES	Single transformer
4/24	9:29	DIGIT	#20	jdl	NORTH PENN	W	NPPOLE 2 YES	triple - facing rear of property
4/24	9:35	DIGIT	21	jdl	"			Storage area (Dw

Photos taken by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

GPL LABORATORIES, LLLP

202 Parkway
Gaithersburg, MD 20877
(301) 926-6802
Fax (301) 840-1209

Contract #/Billing Reference: North Penn Memorial UND-005

1 of 1 Pgs.

North Penn Memorial USARC

Project: PCB sampling and analysis
Client: US Army Corps of Engineers
Send Results To: Bay Associates Environmental
Address: PO Box 21009
Baltimore MD 21228
Phone: 410-418-4880

Turnaround Time: Norm
# of Containers: 1pc
Container Type: 40ml
Preservative Used: 4°C
Type of Analysis: PCB

NPM Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	PCB	Lab Cooler No.	CLIENT COMMENTS
NPPAD 1	4/24	8:20	oil	CS	✓	1	
NPPOLE1a		8:44	oil	CS	✓		
NPPOLE1b		8:50	oil	CS	✓		
NPPOLE1c		8:55	oil	CS	✓		
NPPOLE3		9:17	oil	CS	✓		
NPPOLE2a		9:40	oil	CS	✓		
NPPOLE2b		9:32	oil	CS	✓		
NPPOLE2c		9:45	oil	CS	✓		

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
[signature]	4/25/12 3:30			[signature]	4/25/12 3:30pm
Relinquished By:	Date/Time	Received By:	Date/Time / Shipper:	Airbill No.:	
Relinquished By:	Date/Time	Received By:	Lab Comments:	Temp:	

G.P. W.O. _____

ATTACHMENT 2

Edgemont Survey & Sampling Documentation

Edgemont U.S. Army Reserve Center

EPole2
04/23/2002

Three transformers mounted on a pole south of EPole1. The pole is located next to a military equipment park that is downgrade from The Area Maintenance Support Activity #31, which is the building in the background of this picture.

Transformers were labeled with a black marker as a, b, and c. The transformer in the foreground of the picture is 'a', the middle one is 'b', and the one farthest in the back is 'c'.

IDW was placed in a plastic bag, labeled as EPole2 and placed in the DOT-shippable 5-gallon pail for Edgemont IDW.

EPole4
04/23/2002

Three transformers mounted on a pole next to the Organizational Maintenance Shop (OMS), which is the building in the right of this picture.

Transformers were labeled with a marker as a, b, and c (from left to right, as viewed in this photo). 'a', and 'b' are visible, 'c' is blocked from view by the bucket truck.

IDW was placed in a plastic bag, labeled as EPole4 and placed in the DOT-shippable 5-gallon pail for Edgemont IDW.

Edgemont U.S. Army Reserve Center

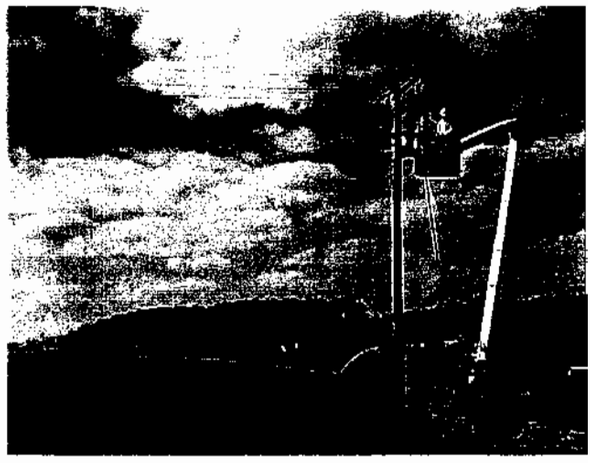
EPole3
04/23/2002

Three transformers mounted on a pole next to the Area Maintenance Support Activity (AMSA) building, which is the building in the left of this picture.

Transformers were labeled with a marker as a, b, and c (from right to left, as viewed in this photo). 'a', and 'c' are visible, 'b' is mostly blocked from view by the pole.

IDW was placed in a plastic bag, labeled as EPole3 and placed in the DOT-shippable 5-gallon pail for Edgemont IDW.

EPole5
04/23/2002



Three transformers mounted on a pole at the end of the road leading from the USARC main parking lot. The road passes the K-Span building (the dome Shaped building in the background of the picture) The pole is located off to the right just before the Road dead ends.

Transformers were labeled with a marker as a, b, and c . 'a' is not visible, because the pole is in the way. 'b' is in the left of the picture and 'c' is the transformer that is being sampled in the picture. If looking at the transformers from the road, the labeling goes from right to left (a,b,c).

IDW was placed in a plastic bag, labeled as EPole5 and placed in the DOT-shippable 5-gallon pail for Edgemont IDW.

Edgemont U.S. Army Reserve Center

The 5-gal pail of IDW was placed in the storage building between the AMSA & OMS buildings. Kendra Borka's business card was affixed to the top of the pail and included her phone numbers.

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPAD1
GPL ID: 204159-009-009-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/17/2002
Time Analyzed 12:34
Analysis Batch 53886

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	80000000	ug/kg	U	10000
PCB-1221	BQL	80000000	ug/kg	U	10000
PCB-1232	BQL	80000000	ug/kg	U	10000
PCB-1242	BQL	80000000	ug/kg	U	10000
PCB-1248	BQL	80000000	ug/kg	U	10000
PCB-1254	820000000	80000000	ug/kg		10000
PCB-1260	BQL	80000000	ug/kg	U	10000

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE1a
GPL ID: 204159-010-010-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 22:57
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	9500	ug/kg	U	1
PCB-1221	BQL	9500	ug/kg	U	1
PCB-1232	BQL	9500	ug/kg	U	1
PCB-1242	BQL	9500	ug/kg	U	1
PCB-1248	BQL	9500	ug/kg	U	1
PCB-1254	BQL	9500	ug/kg	U	1
PCB-1260	27000	9500	ug/kg	P	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE1b
GPL ID: 204159-011-011-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 23:24
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	8500	ug/kg	U	1
PCB-1221	BQL	8500	ug/kg	U	1
PCB-1232	BQL	8500	ug/kg	U	1
PCB-1242	BQL	8500	ug/kg	U	1
PCB-1248	BQL	8500	ug/kg	U	1
PCB-1254	BQL	8500	ug/kg	U	1
PCB-1260	7900	8500	ug/kg	JP	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE1c
GPL ID: 204159-012-012-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/13/2002
Time Analyzed 23:52
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	8300	ug/kg	U	1
PCB-1221	BQL	8300	ug/kg	U	1
PCB-1232	BQL	8300	ug/kg	U	1
PCB-1242	BQL	8300	ug/kg	U	1
PCB-1248	BQL	8300	ug/kg	U	1
PCB-1254	BQL	8300	ug/kg	U	1
PCB-1260	7500	8300	ug/kg	JP	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE2a
GPL ID: 204159-013-013-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 00:20
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	7900	ug/kg	U	1
PCB-1221	BQL	7900	ug/kg	U	1
PCB-1232	BQL	7900	ug/kg	U	1
PCB-1242	BQL	7900	ug/kg	U	1
PCB-1248	BQL	7900	ug/kg	U	1
PCB-1254	BQL	7900	ug/kg	U	1
PCB-1260	BQL	7900	ug/kg	U	1

Summary of Analytical Results

Client ID EPOLE2b
GPL ID: 204159-014-014-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 00:48
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	6000	ug/kg	U	1
PCB-1221	BQL	6000	ug/kg	U	1
PCB-1232	BQL	6000	ug/kg	U	1
PCB-1242	BQL	6000	ug/kg	U	1
PCB-1248	BQL	6000	ug/kg	U	1
PCB-1254	BQL	6000	ug/kg	U	1
PCB-1260	BQL	6000	ug/kg	U	1

Summary of Analytical Results

Client ID EPOLE2c
GPL ID: 204159-015-015-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 01:16
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	8700	ug/kg	U	1
PCB-1221	BQL	8700	ug/kg	U	1
PCB-1232	BQL	8700	ug/kg	U	1
PCB-1242	BQL	8700	ug/kg	U	1
PCB-1248	BQL	8700	ug/kg	U	1
PCB-1254	BQL	8700	ug/kg	U	1
PCB-1260	BQL	8700	ug/kg	U	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE4a
GPL ID: 204159-016-016-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 01:44
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	7500	ug/kg	U	1
PCB-1221	BQL	7500	ug/kg	U	1
PCB-1232	BQL	7500	ug/kg	U	1
PCB-1242	BQL	7500	ug/kg	U	1
PCB-1248	BQL	7500	ug/kg	U	1
PCB-1254	BQL	7500	ug/kg	U	1
PCB-1260	BQL	7500	ug/kg	U	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE4b
GPL ID: 204159-017-017-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 03:08
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	7600	ug/kg	U	1
PCB-1221	BQL	7600	ug/kg	U	1
PCB-1232	BQL	7600	ug/kg	U	1
PCB-1242	BQL	7600	ug/kg	U	1
PCB-1248	BQL	7600	ug/kg	U	1
PCB-1254	BQL	7600	ug/kg	U	1
PCB-1260	15000	7600	ug/kg	P	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE4c
GPL ID: 204159-018-018-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 03:36
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	8300	ug/kg	U	1
PCB-1221	BQL	8300	ug/kg	U	1
PCB-1232	BQL	8300	ug/kg	U	1
PCB-1242	BQL	8300	ug/kg	U	1
PCB-1248	BQL	8300	ug/kg	U	1
PCB-1254	BQL	8300	ug/kg	U	1
PCB-1260	56000	8300	ug/kg	P	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE3a
GPL ID: 204159-019-019-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 04:04
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	9100	ug/kg	U	1
PCB-1221	BQL	9100	ug/kg	U	1
PCB-1232	BQL	9100	ug/kg	U	1
PCB-1242	BQL	9100	ug/kg	U	1
PCB-1248	BQL	9100	ug/kg	U	1
PCB-1254	BQL	9100	ug/kg	U	1
PCB-1260	42000	9100	ug/kg	P	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE3b
GPL ID: 204159-020-020-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 00:00
Prep Batch 54304

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 04:32
Analysis Batch 53864

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	7000	ug/kg	U	1
PCB-1221	BQL	7000	ug/kg	U	1
PCB-1232	BQL	7000	ug/kg	U	1
PCB-1242	BQL	7000	ug/kg	U	1
PCB-1248	BQL	7000	ug/kg	U	1
PCB-1254	BQL	7000	ug/kg	U	1
PCB-1260	40000	7000	ug/kg	P	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE3c
GPL ID: 204159-021-021-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 05:56
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	9200	ug/kg	U	1
PCB-1221	BQL	9200	ug/kg	U	1
PCB-1232	BQL	9200	ug/kg	U	1
PCB-1242	BQL	9200	ug/kg	U	1
PCB-1248	BQL	9200	ug/kg	U	1
PCB-1254	BQL	9200	ug/kg	U	1
PCB-1260	43000	9200	ug/kg	P	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE5a
GPL ID: 204159-022-022-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 07:20
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	5200	ug/kg	U	1
PCB-1221	BQL	5200	ug/kg	U	1
PCB-1232	BQL	5200	ug/kg	U	1
PCB-1242	BQL	5200	ug/kg	U	1
PCB-1248	BQL	5200	ug/kg	U	1
PCB-1254	BQL	5200	ug/kg	U	1
PCB-1260	1800	5200	ug/kg	JP	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE5b
GPL ID: 204159-023-023-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 18:36
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	6000	ug/kg	U	1
PCB-1221	BQL	6000	ug/kg	U	1
PCB-1232	BQL	6000	ug/kg	U	1
PCB-1242	BQL	6000	ug/kg	U	1
PCB-1248	BQL	6000	ug/kg	U	1
PCB-1254	BQL	6000	ug/kg	U	1
PCB-1260	9100	6000	ug/kg	P	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID EPOLE5c
GPL ID: 204159-024-024-1/1
Matrix: Liquid
Date Collected: 04/23/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 19:04
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	9300	ug/kg	U	1
PCB-1221	BQL	9300	ug/kg	U	1
PCB-1232	BQL	9300	ug/kg	U	1
PCB-1242	BQL	9300	ug/kg	U	1
PCB-1248	BQL	9300	ug/kg	U	1
PCB-1254	BQL	9300	ug/kg	U	1
PCB-1260	BQL	9300	ug/kg	U	1

DAILY CONSTRUCTION QUALITY CONTROL REPORT

CONTRACTORS NAME: **BAY ASSOCIATES ENVIRONMENTAL, INC.** DATE: 4-23-2002

CONTRACTORS ADDRESS: **P.O. Box 21009**
Baltimore, MD 21228

REPORT NO: 20423-1

CONTRACT NO: **DACA65-01-D-0017**
D.O. #0005

PROJECT NAME: **PCB SURVEY - various locations in Pennsylvania**

LOCATION OF WORK: **Edgemont USARC, Pennsylvania**

WEATHER: Sunny, windy RAIN: _____ INCHES TEMP: _____ MAX. 40 MIN.

WIND DIRECTION: Varies OTHER WEATHER CONDITIONS: _____

1)

	CONTRACTORS OR SUBCONTRACTOR	C = CONT S = SUB	AREA OF RESPONSIBILITY
1	BAY ASSOCIATES ENVIRONMENTAL, INC.	C	ENVIRONMENTAL CONTRACTOR
2	HARRY B. MILLER CO., INC.	S	ELECTRICAL

2) WORK PERFORMED TODAY (INDICATE IDENTITY OF CONTRACTOR AND SUB-CONTRACTORS, LOCATION AND DESCRIPTION OF WORK): H+ Safety meeting 8:34.

Harry B Miller - Sub
John Pontier
Chris Seymour
Angela Peyton
Keldra Bortka
Jessica Lackey
} Edgemont USARC 8:00 start electrical sub arrive 8:30

Start pad mount
Then 16 pole mount

3) SAMPLES COLLECTED:

E Pad 1 - 8:55 done
E Pole 1 - 9:25 done
E Pole 2 - 10:50 done
E Pole 3 - 12:20 done → LUNCH
E Pole 4 - 3:00 done

DAILY CONSTRUCTION QUALITY CONTROL REPORT

4) RESULTS OF SURVEILLANCE (INCLUDE SATISFACTORY WORK COMPLETED, OR DEFICIENCIES WITH ACTION TO BE TAKEN):

Satisfactory work completed
15 pole & transformer.
1 pad

Start 8AM
Complete 3PM

plan to meet at N. Penn.
4/24 at 7:45 AM.

5) VERBAL INSTRUCTIONS GIVEN BY GOVERNMENT PERSONNEL (INCLUDE NAME, TIME, PLACE, INSTRUCTIONS AND RESULTANT ACTIONS):

→ DO NOT REENERGIZE Edge Pole 2
(took picture of connecting piece)
per Kendra Borka 99th Regional Environmental Specialist.

→ Count actually 16 total (per her recollection - Kendra Borka)
15 pole + 1 pad

DAILY CONSTRUCTION QUALITY CONTROL REPORT

6) JOB SAFETY (INCLUDE DEFICIENCIES AND CORRECTIVE ACTIONS):

Safety meeting performed,
NO INCIDENTS TO REPORT

Sampling Log Transformer Sampling at Edgemont USARC, Pennsylvania

Sample No.	Sample Location	Date	Sample Location		Sample Collection		Sampler's Initials	Sample Size	Type of Analysis	Pole or Pad Mounted	Photo Taken & Logged	Sample Labeled	COC Complete	Decon. Complete
			Start Time	End Time	Start Time	End Time								
EPAD1	Edge-Pad 1	4/23	8:45	9:02	8:58	9:00	CS	40ml	PCB	PAD	✓	✓	✓	✓ bagged
EPole1 a	Edge Pole 1a	4/23	9:15	9:50	9:36	9:38	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole1 b	Edge Pole 1b		9:15	9:50	9:30	9:35	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole1 C	Edge Pole 1c		9:15	9:50	9:25	9:28	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole2 A	Edge Pole 2		10:00	10:50	10:05	10:07	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole2 B	Edge Pole 2		10:00	10:50	10:10	10:13	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole2 C	Edge Pole 2		10:00	10:50	10:25	10:28	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole4 A	Edge Pole 4		11:00	11:45	11:30	11:38	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole4 B	Edge Pole 4		11:00	11:45	11:20	11:25	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole4 C	Edge Pole 4		11:00	11:45	11:11	11:18	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole3 A	Edge Pole 3		11:45	12:30	12:09	12:14	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole3 B	Edge Pole 3		11:45	12:30	12:04	12:08	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole3 C	Edge Pole 3		11:45	12:30	NOON	12:02	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole5 A	Edge Pole 5		2:00	2:30	2:08	2:09	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole5 B	Edge Pole 5		2:00	2:30	2:09	2:13	CS	40ml	PCB	Pole	✓	✓	✓	✓
EPole5 C	Edge Pole 5		2:00	2:30	2:14	2:25	CS	40ml	PCB	Pole	✓	✓	✓	✓

Samples collected by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

Photographic Log Transformer Sampling at Edgemont USARC, Pennsylvania

Date	Time	Roll Number	Picture Number	Photographer *(Initials)*	Site Location	Direction facing	Sample No. Documented	Additional Comments
4/23	9:45	DIGIT	#10	jdl	Pad #1 Edgem	SE	EPad 1	
4/23	9:21	DIGIT	#11	jdl	Pole #1 Edgem	ENE	EPole 1a " " 1b " " 1c	
4/23	10:04	DIGIT	#12	jdl	Pole #2 Edge.	SE	EPole 2	
4/23	11:12	DIGIT	#13	jdl	Pole #4 Edge	NE	EPole 4	
4/23	11:15	DIGIT	#14	jdl	Pole #3 Edge.	S	EPole 3	
4/23	2:15	DIGIT	#15	jdl	Pole #5 Edge	W	EPole 5	K-span USARC in background
4/23		DIGIT	16	jdl				storage IDW

Photos taken by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

GPL LABORATORIES, LLLP

202 Perry Parkway
Gaithersburg, MD 20877
(301) 926-6802
Fax (301) 840-1209

Contract #/Billing Reference: EDGEMONT USARC UNO-0005

1 of 2 Pgs.

EDGEMONT USARC / AMSA

Project: PCB Sampling & Analysis
Client: US Army Corps of Engineers
Send Results To: Bay Associates Environmental
Address: PO Box 21009
Baltimore, MD. 21228
Phone: 410-418-4880

Turnaround Time	Normal
# of Containers	1ea
Container Type	40ml
Preservative Used	4°C
Type of Analysis	PCB

EDGEMONT Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	PCB	Lab Cooler No.	CLIENT COMMENTS
EPAD1	4/26	8:55	Oil	CS	X		
EPole1a		9:38					
EPole1b		9:34					
EPole1c		9:25					
EPole2a		10:07					
EPole2b		10:23					
EPole2c		10:28					
EPole4a		11:38					
EPole4b		11:25					
EPole4c		11:17					
EPole3a		12:14					
EPole3b		12:08					

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
[signature]	4/27/16 5:30			[signature]	4/27/16 3:30pm
Relinquished By:	Date/Time	Received By:	Date/Time	Shipper:	Airbill No.:
Relinquished By:	Date/Time	Received By:	Lab Comments:		Temp:

G.P. W.O. _____

GPI LABORATORIES, LLLP

20 [illegible]ry Parkway
Gaithers[illegible]g, MD 20877
(301) 926-6802
Fax (301) 840-1209

Contract #/Billing Reference: EDGEMONT USARC UND-0005

2 of 2 Pgs.

EDGEMONT USARC / AMSA

Project: PCB Sampling & Analysis
Client: US Army Corps of Engineers
Send Results To: Bay Associates Environmental
Address: PO Box 21009
Baltimore MD 21228
Phone: 410-418-4880

Turnaround Time	Normal
# of Containers	1 eq.
Container Type	40ml
Preservative Used	4°C
Type of Analysis	PCB

EDGEMONT Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	PCB	Lab Cooler No.	CLIENT COMMENTS
EPb63c	4/23/02	12:02	oil	CS	✓		
EPb65a		2:09			✓		
EPb65b		2:13			✓		
EPb65c		2:25			✓		

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
[signature]	4/24/02 3:31			[signature]	4/25/02 7:50
Relinquished By:	Date/Time	Received By:	Date/Time	Shipper:	Airbill No.:
Relinquished By:	Date/Time	Received By:	Lab Comments:		Temp:

G.P. W.O.

ATTACHMENT 3

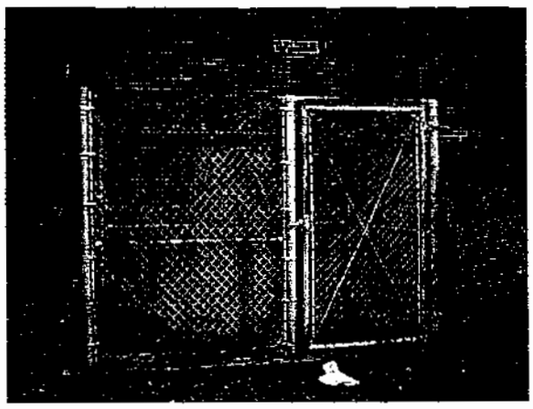
Horsham Survey & Sampling Documentation

Horsham Memorial USARC

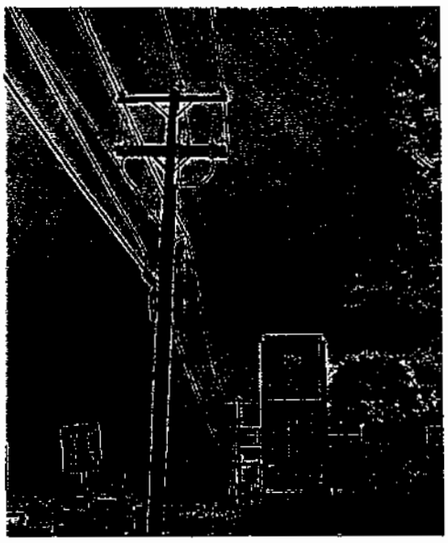
HPad1
04/25/2002

Pad mount transformer located next to the main USARC building

IDW was placed in a plastic bag, labeled as HPad1 and placed in a DOT-shippable 5-gallon pail for Horsham IDW.



Disconnects for the pad mount located on the pole by Easton Street, next to the Coastal gas station



The 5 gallon pail of IDW was placed in the haz-shed in the sub shop, located in the AMSA maintenance building. Kendra Borka's business card was affixed to the top of the pail and included her phone numbers.

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID HPAD1
GPL ID: 204159-029-029-1/1
Matrix: Liquid
Date Collected: 04/25/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 21:24
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	8400	ug/kg	U	1
PCB-1221	BQL	8400	ug/kg	U	1
PCB-1232	BQL	8400	ug/kg	U	1
PCB-1242	BQL	8400	ug/kg	U	1
PCB-1248	BQL	8400	ug/kg	U	1
PCB-1254	BQL	8400	ug/kg	U	1
PCB-1260	81000	8400	ug/kg	P	1

DAILY CONSTRUCTION QUALITY CONTROL REPORT

CONTRACTORS NAME: **BAY ASSOCIATES ENVIRONMENTAL, INC.** DATE: 3-28-2002

CONTRACTORS ADDRESS: **P.O. Box 21009**
Baltimore, MD 21228

REPORT NO: ~~3477~~ 020125-1

CONTRACT NO: **DACA65-01-D-0017**
D.O. #0005

PROJECT NAME: **PCB SURVEY - various locations in Pennsylvania**

LOCATION OF WORK: **Horsham Memorial USARC, Pennsylvania**

WEATHER: Cloudy RAIN: 0 INCHES TEMP: _____ MAX. 40 MIN.

WIND DIRECTION: _____ OTHER WEATHER CONDITIONS: _____

1)

	CONTRACTORS OR SUBCONTRACTOR	C = CONT S = SUB	AREA OF RESPONSIBILITY
1	BAY ASSOCIATES ENVIRONMENTAL, INC.	C	ENVIRONMENTAL CONTRACTOR
2	HARRY B. MILLER CO., INC.	S	ELECTRICAL

2) WORK PERFORMED TODAY (INDICATE IDENTITY OF CONTRACTOR AND SUB-CONTRACTORS, LOCATION AND DESCRIPTION OF WORK):

disconnect and sample 1 pad mount

Jess, John, Chris } 7:30

Kendra - 7:50

3) SAMPLES COLLECTED:

1 Pad mount

DAILY CONSTRUCTION QUALITY CONTROL REPORT

4) RESULTS OF SURVEILLANCE (INCLUDE SATISFACTORY WORK COMPLETED, OR DEFICIENCIES WITH ACTION TO BE TAKEN):

Pole with disconnects on 611 near abandoned gas station.

Electrician contacting PECO to see if we can disconnect

PECO Electrician arrives at 9:00 AM

5) VERBAL INSTRUCTIONS GIVEN BY GOVERNMENT PERSONNEL (INCLUDE NAME, TIME, PLACE, INSTRUCTIONS AND RESULTANT ACTIONS):

Meeting taking place, can't disconnect until 9 AM

DAILY CONSTRUCTION QUALITY CONTROL REPORT

6) JOB SAFETY (INCLUDE DEFICIENCIES AND CORRECTIVE ACTIONS):

No deficiencies

Sampling Log Transformer Sampling at Horsham Memorial USARC, Pennsylvania

Sample No.	Sample Location	Date	Sample Location		Sample Collection		Sampler's Initials	Sample Size	Type of Analysis	Pole or Pad Mounted	Photo Taken & Logged	Sample Labeled	COC Complete	Decon. Complete
			Start Time	End Time	Start Time	End Time								
HPAD1	HPAD1	4/25	9:10	9:20	9:13	9:15	CS	40ml	PCB	PAD	✓	✓	✓	✓

Samples collected by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

Photographic Log Transformer Sampling at Horsham Memorial USARC, Pennsylvania

Date	Time	Roll Number	Picture Number	Photographer *(Initials)*	Site Location	Direction facing	Sample No. Documented	Additional Comments
4/25	7:40	DIGIT	33	JdI	Horsham	W	HPAD1	transformer
4/25	7:42	DIGIT	34	JdI	Horsham	W	HPAD1	disconnects
4	9:20	4	35	JdI	4			PECCO
4	9:25	4	36	JdI	4			PECCO

Photos taken by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

GPI LABORATORIES, LLP

20 ry Parkway
Gaithersburg, MD 20877
(301) 926-6802
Fax (301) 840-1209

Contract #/Billing Reference: Horsham Memorial UNO-005

1 of 1 Pgs.

Horsham MEMORIAL USARC

Project: PCB sampling + Analysis
Client: US Army Corps of Engineers
Send Results To: Bay Associates Environmental
Address: PO Box 21009
Baltimore MD 21228
Phone:

Turnaround Time	NORM
# of Containers	1
Container Type	40M
Preservative Used	4°C
Type of Analysis	PCB

Hm Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	PCB	Lab Cooler No.	CLIENT COMMENTS
HPAD1	4/25	9:15	OL	CS	✓		

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
[signature]	4/25/01 3:30			[signature]	4/25/01 3:39
Relinquished By:	Date/Time	Received By:	Date/Time / Shipper:	Airbill No.:	
Relinquished By:	Date/Time	Received By:	Lab Comments:	Temp:	

G.P. W.O. _____

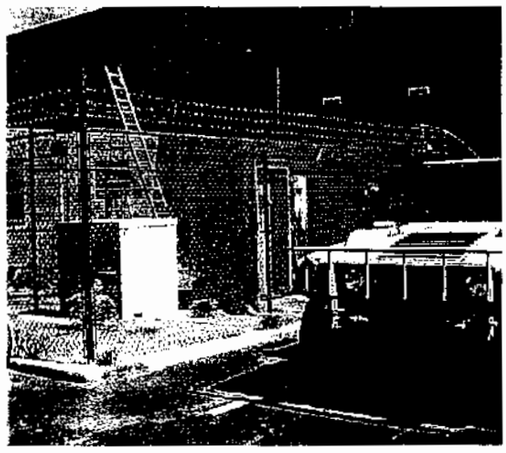
ATTACHMENT 4

Germantown Survey & Sampling Documentation

Germantown Veterans Memorial USARC

GVPad1
04/24/2002

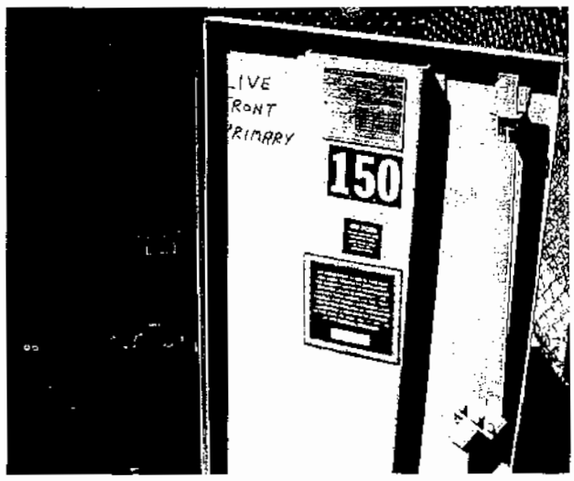
Pad mount transformer located behind the main USARC building. Transformer is the newer unit on the left of the photo.



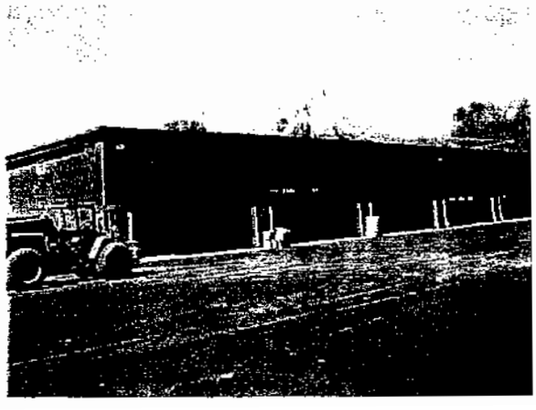
BAE labeled the transformer with a paint marker as GVPad1.

IDW was placed in a plastic bag, labeled as GVPad1 and placed in a DOT-shippable 5-gallon pail for Germantown IDW.

Prior to BAE arriving on-site, the transformer had been labeled on the inside of the cabinet door as containing NO PCBs.



The 5-gal pail of IDW was placed in a storage building to the left of the facility's large parking area.



GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID GVPAD1
GPL ID: 204159-030-030-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 21:52
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	6800	ug/kg	U	1
PCB-1221	BQL	6800	ug/kg	U	1
PCB-1232	BQL	6800	ug/kg	U	1
PCB-1242	BQL	6800	ug/kg	U	1
PCB-1248	BQL	6800	ug/kg	U	1
PCB-1254	BQL	6800	ug/kg	U	1
PCB-1260	BQL	6800	ug/kg	U	1

DAILY CONSTRUCTION QUALITY CONTROL REPORT

CONTRACTORS NAME: **BAY ASSOCIATES ENVIRONMENTAL, INC.** DATE: 4/24/02

CONTRACTORS ADDRESS: **P.O. Box 21009**
Baltimore, MD 21228

REPORT NO: 020424-2

CONTRACT NO: **DACA65-01-D-0017**
D.O. #0005

PROJECT NAME: **PCB SURVEY - various locations in Pennsylvania**

LOCATION OF WORK: **Germantown Veterans Memorial USARC, Pennsylvania**

WEATHER: Sunny RAIN: _____ INCHES TEMP: 50 MAX. 40 MIN.

WIND DIRECTION: _____ OTHER WEATHER CONDITIONS: windy

1)

	CONTRACTORS OR SUBCONTRACTOR	C = CONT S = SUB	AREA OF RESPONSIBILITY
1	BAY ASSOCIATES ENVIRONMENTAL, INC.	C	ENVIRONMENTAL CONTRACTOR
2	HARRY B. MILLER CO., INC.	S	ELECTRICAL

2) WORK PERFORMED TODAY (INDICATE IDENTITY OF CONTRACTOR AND SUB-CONTRACTORS, LOCATION AND DESCRIPTION OF WORK):

Kendra
Angela
John
Chris
Jess. } arrive 10:55

3) SAMPLES COLLECTED:

PCB - 1 pad.

DAILY CONSTRUCTION QUALITY CONTROL REPORT

4) RESULTS OF SURVEILLANCE (INCLUDE SATISFACTORY WORK COMPLETED, OR DEFICIENCIES WITH ACTION TO BE TAKEN):

Satisfactory work completed

5) VERBAL INSTRUCTIONS GIVEN BY GOVERNMENT PERSONNEL (INCLUDE NAME, TIME, PLACE, INSTRUCTIONS AND RESULTANT ACTIONS):

None to report

DAILY CONSTRUCTION QUALITY CONTROL REPORT

6) JOB SAFETY (INCLUDE DEFICIENCIES AND CORRECTIVE ACTIONS):

No deficiencies to report

Sampling Log Transformer Sampling at Germantown Veterans Memorial, Pennsylvania

Sample No.	Sample Location	Date	Sample Location		Sample Collection		Sampler's Initials	Sample Size	Type of Analysis	Pole or Pad Mounted	Photo Taken & Logged	Sample Labeled	COC Complete	Decon. Complete
			Start Time	End Time	Start Time	End Time								
GV PAD1	GV PAD1	4/24	10:57	11:20	11:13	11:16	CS	40ml	~~8~~ PCB	PAD	✓	✓	✓	✓

Samples collected by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

Photographic Log Transformer Sampling at Germantown Veterans Memorial USARC, Pennsylvania

r behind USARC bld

Date	Time	Roll Number	Picture Number	Photographer *(Initials)*	Site Location	Direction facing	Sample No. Documented	Additional Comments
4/24	10:58	DIGIT ~~22~~	23	jdl	Germantown	W	GVPAD1	close-up MEP ab wrong Thing
4/24	10:58	DIGIT ~~23~~	24	jdl	Germantown	NW	GVPAD1	~~older~~ newer unit on MEP ~~left~~ left
4/24	11:10	DIGIT	25	jdl	Germantown	S	GVPAD1	actual transformer "No PCB" Labels
4/24	11:10	DIGIT	26	jdl	Germantown	S	GVPAD1	farther away
4/24	11:15	DIGIT	27 ~~28~~	jdl	"			27 close-up, 28, oms bldg wide view DW Storage

Photos taken by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

GPJ LABORATORIES, LLLP

20 ry Parkway
Gaithersburg, MD 20877
(301) 926-6802
Fax (301) 840-1209

GERMANTOWN VETERANS MEMORIAL USARC

Contract #/Billing Reference: GERMANTOWN VETERANS MEMORIAL UNO-005

1 of 1 Pgs.

Project: PCB Sampling & Analysis
Client: US Army Corps of Engineers
Send Results To: Bay Associates Environmental
Address: PO Box 21009
Baltimore MD 21228
Phone: 410-418-4880

GPJ Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Turnaround Time: NORM	# of Containers: 1 ea	Container Type: 40ml	Preservative Used: 4°C	Type of Analysis: PCB	Lab Cooler No.	CLIENT COMMENTS
GVPAD1	4/24	11:16	Oil	CS					✓		

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
[signature]	4/25/06 3:30			[signature]	4/25/06 3:30 pm
Relinquished By:	Date/Time	Received By:	Date/Time	Shipper:	Airbill No.:
Relinquished By:	Date/Time	Received By:	Lab Comments:		Temp:

G.P. W.O. _____

ATTACHMENT 5

Philadelphia Survey & Sampling Documentation

DAILY CONSTRUCTION QUALITY CONTROL REPORT

CONTRACTORS NAME: **BAY ASSOCIATES ENVIRONMENTAL, INC.** DATE: 04/24/07

CONTRACTORS ADDRESS: **P.O. Box 21009**
Baltimore, MD 21228

REPORT NO: 20424-3

CONTRACT NO: **DACA65-01-D-0017**
D.O. #0005

PROJECT NAME: **PCB SURVEY - various locations in Pennsylvania**

12:45

LOCATION OF WORK: **Philadelphia Memorial AFRC, Pennsylvania**

WEATHER: Sunny RAIN: 0 INCHES TEMP: 65 MAX. 60 MIN.

WIND DIRECTION: Calm OTHER WEATHER CONDITIONS:

1)

	CONTRACTORS OR SUBCONTRACTOR	C = CONT S = SUB	AREA OF RESPONSIBILITY
1	BAY ASSOCIATES ENVIRONMENTAL, INC.	C	ENVIRONMENTAL CONTRACTOR
2	HARRY B. MILLER CO., INC.	S	ELECTRICAL

2) WORK PERFORMED TODAY (INDICATE IDENTITY OF CONTRACTOR AND SUB-CONTRACTORS, LOCATION AND DESCRIPTION OF WORK):

Angela
John - S/D
Kendra
Jess
Chris

3) SAMPLES COLLECTED:

None - two dry type transformers in electrical room

DAILY CONSTRUCTION QUALITY CONTROL REPORT

4) RESULTS OF SURVEILLANCE (INCLUDE SATISFACTORY WORK COMPLETED, OR DEFICIENCIES WITH ACTION TO BE TAKEN):

NO WORK COMPLETED

Transformers were dry types and did not need to be sampled

5) VERBAL INSTRUCTIONS GIVEN BY GOVERNMENT PERSONNEL (INCLUDE NAME, TIME, PLACE, INSTRUCTIONS AND RESULTANT ACTIONS):

Angelee Peyton - USACE - Norfolk - NO SAMPLING — Dry type transformer

DAILY CONSTRUCTION QUALITY CONTROL REPORT

6) JOB SAFETY (INCLUDE DEFICIENCIES AND CORRECTIVE ACTIONS):

Transformers not properly identified prior to survey - site missed during site visit. Improperly identified by ~~[illegible]~~ USACE / 99th

ATTACHMENT 6

Bristol Survey & Sampling Documentation

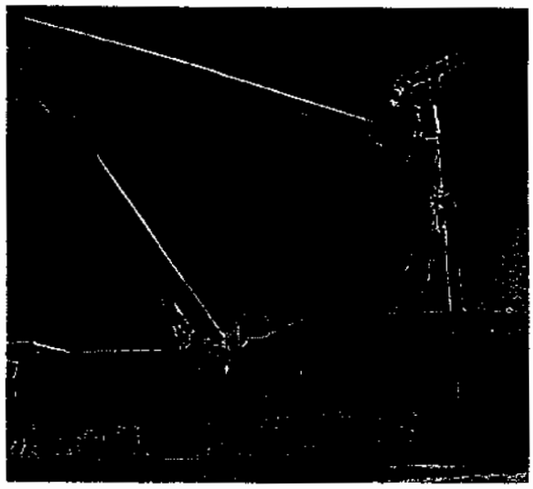
Bristol Veterans Memorial USARC

BPole1
04/24/2002

Pole mount single transformer located in the Organizational Maintenance Shop (OMS) area.

BAE labeled the transformer with a paint marker as BPole1.

IDW was placed in a plastic bag, labeled as BPole1 and placed in a DOT-shippable 5-gallon pail for Bristol IDW.

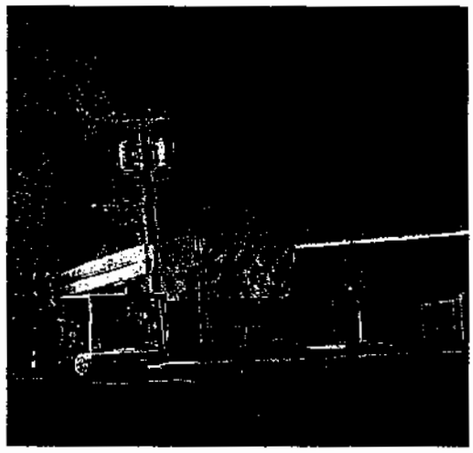


BPole2
04/24/2002

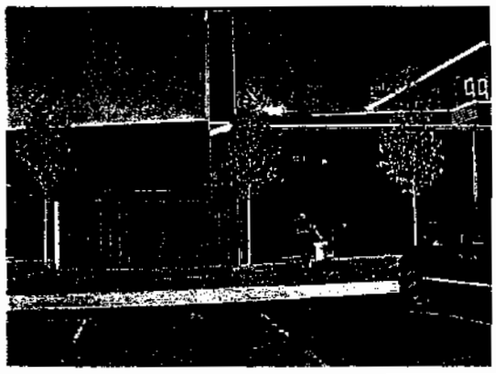
Pole mount triple transformers located next to the main USARC building.

BAE labeled the transformer with a marker as a, b, and c (from right to left, as viewed in this photo). 'a' is to the right in the photo, 'c' is to the left of the photo, and 'b' is in line with the pole, but is mostly blocked from view by the pole.

IDW was placed in a plastic bag, labeled as BPole2 and placed in a DOT-shippable 5-gallon pail for Bristol IDW.



The 5 gallon pail of IDW was placed in the mechanical room located next to the wood fence. Kendra Borka's business card was affixed to the top of the pail and included her phone numbers.



GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID BPOLE1
GPL ID: 204159-025-025-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 19:32
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	9300	ug/kg	U	1
PCB-1221	BQL	9300	ug/kg	U	1
PCB-1232	BQL	9300	ug/kg	U	1
PCB-1242	BQL	9300	ug/kg	U	1
PCB-1248	BQL	9300	ug/kg	U	1
PCB-1254	BQL	9300	ug/kg	U	1
PCB-1260	BQL	9300	ug/kg	U	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID BPOLE2a
GPL ID: 204159-026-026-1/I
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 20:00
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	7800	ug/kg	U	1
PCB-1221	BQL	7800	ug/kg	U	1
PCB-1232	BQL	7800	ug/kg	U	1
PCB-1242	BQL	7800	ug/kg	U	1
PCB-1248	BQL	7800	ug/kg	U	1
PCB-1254	BQL	7800	ug/kg	U	1
PCB-1260	BQL	7800	ug/kg	U	1

Summary of Analytical Results

Client ID BPOLE2b
GPL ID: 204159-027-027-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 20:28
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	7800	ug/kg	U	1
PCB-1221	BQL	7800	ug/kg	U	1
PCB-1232	BQL	7800	ug/kg	U	1
PCB-1242	BQL	7800	ug/kg	U	1
PCB-1248	BQL	7800	ug/kg	U	1
PCB-1254	BQL	7800	ug/kg	U	1
PCB-1260	BQL	7800	ug/kg	U	1

GPL LABORATORIES, LLLP

Summary of Analytical Results

Client ID BPOLE2c
GPL ID: 204159-028-028-1/1
Matrix: Liquid
Date Collected: 04/24/2002
Date Received: 04/26/2002

Prep Method: SW3580A
Prep Date: 04/30/2002
Prep Time: 12:05
Prep Batch 54309

Analytical Method: SW8082
Date Analyzed: 05/14/2002
Time Analyzed 20:56
Analysis Batch 53873

Parameter	Result	Rep Limit	Units	Qualifier	D.F.
PCB-1016	BQL	6500	ug/kg	U	1
PCB-1221	BQL	6500	ug/kg	U	1
PCB-1232	BQL	6500	ug/kg	U	1
PCB-1242	BQL	6500	ug/kg	U	1
PCB-1248	BQL	6500	ug/kg	U	1
PCB-1254	BQL	6500	ug/kg	U	1
PCB-1260	BQL	6500	ug/kg	U	1

DAILY CONSTRUCTION QUALITY CONTROL REPORT

CONTRACTORS NAME: **BAY ASSOCIATES ENVIRONMENTAL, INC.** DATE: 04-24-02

CONTRACTORS ADDRESS: **P.O. Box 21009**
Baltimore, MD 21228

REPORT NO: 20424-4

CONTRACT NO: **DACA65-01-D-0017**
D.O. #0005

PROJECT NAME: **PCB SURVEY - various locations in Pennsylvania**

LOCATION OF WORK: **Bristol Veterans Memorial USARC, Pennsylvania**

WEATHER: _____ RAIN: _____ INCHES TEMP: _____ MAX. _____ MIN.

WIND DIRECTION: _____ OTHER WEATHER CONDITIONS: _____

1)

	CONTRACTORS OR SUBCONTRACTOR	C = CONT S = SUB	AREA OF RESPONSIBILITY
1	BAY ASSOCIATES ENVIRONMENTAL, INC.	C	ENVIRONMENTAL CONTRACTOR
2	HARRY B. MILLER CO., INC.	S	ELECTRICAL

2) WORK PERFORMED TODAY (INDICATE IDENTITY OF CONTRACTOR AND SUB-CONTRACTORS, LOCATION AND DESCRIPTION OF WORK):

John-Sub
Chris
Jody
Angela
Kendra } arrive 7:00 finish sampling 3:00

3) SAMPLES COLLECTED:

PCB samples- See sample log
start BPOLE1 (single)
BPOLE2 (triple)

DAILY CONSTRUCTION QUALITY CONTROL REPORT

4) RESULTS OF SURVEILLANCE (INCLUDE SATISFACTORY WORK COMPLETED, OR DEFICIENCIES WITH ACTION TO BE TAKEN):

All work completed satisfactory

5) VERBAL INSTRUCTIONS GIVEN BY GOVERNMENT PERSONNEL (INCLUDE NAME, TIME, PLACE, INSTRUCTIONS AND RESULTANT ACTIONS):

None to report

DAILY CONSTRUCTION QUALITY CONTROL REPORT

6) JOB SAFETY (INCLUDE DEFICIENCIES AND CORRECTIVE ACTIONS):

No deficiencies

Sampling Log Transformer Sampling at Bristol Veterans Memorial USARC, Pennsylvania

Sample No.	Sample Location	Date	Sample Location		Sample Collection		Sampler's Initials	Sample Size	Type of Analysis	Pole or Pad Mounted	Photo Taken & Logged	Sample Labeled	COC Complete	Decon. Complete
			Start Time	End Time	Start Time	End Time								
BPOLE1	BPOLE1	4/24	2:00	2:25	2:15	2:20	CS	40ml	PCB	Pole	✓	✓	✓	✓
BPOLE2 a	BPOLE 2	4/24	2:30	3:00	2:40	2:45	CS	40ml	PCB	Pole	✓	✓	✓	✓
BPole2 b	BPOLE 2	4/24	2:30	3:00	2:45	2:50	CS	40ml	PCB	Pole	✓	✓	✓	✓
BPole2 c	BPOLE 2	4/24	2:30	3:00	2:50	2:58	CS	40ml	PCB	Pole	✓	✓	✓	✓

Samples collected by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

Photographic Log Transformer Sampling at Bristol Veterans Memorial USARC, Pennsylvania

Date	Time	Roll Number	Picture Number	Photographer *(Initials)*	Site Location	Direction facing	Sample No. Documented	Additional Comments
4/24	2:01	DIGIT	29	jdl	Bristol	North	BPOLE2 a,b,c	USARC - on right. triple
4/24	2:05	DIGIT	30	jdl	Bristo	SW	BPOLE1	single MEP
4/24	2:10	DIGIT	31	jdl	Bristol	—	BPOLE1	picture as truck + guys
4/24	2:15	"	32	jdl	"			IDW storage

Photos taken by: Bay Associates Environmental, Inc. for the US Army Corps of Engineers – Norfolk District

GPI LABORATORIES, LLLP

202 [illegible]y Parkway
Gaithersburg, MD 20877
(301) 926-6802
Fax (301) 840-1209

Contract #/Billing Reference: Bristol Veterans Memorial UVD-005

Page 1 of 1 Pgs.

BRISTOL VETERANS MEMORIAL USACE

Project: PCB Sampling & Analysis
Client: US Army Corps of Engineers
Send Results To: Bay Associates Environmental
Address: Po Box 21009
Baltimore MD 21228
Phone: 410-418-4880

BVM Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	PCB	Lab Cooler No.	CLIENT COMMENTS
BPDE1	4/24	2:20	Oil	CS	✓		
BPDE2a	4/24	2:45	Oil	CS	✓		
BPDE2b	4/24	2:50	Oil	CS	✓		
BPDE2c	4/24	2:58	Oil	CS	✓		

Turnaround Time: 1 WEEK
# of Containers: 1 ea
Container Type: 40ml
Preservative Used: HCl
Type of Analysis:

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
Chris Seyer	4/25/08 3:30				4/25/08 3:30
Relinquished By:	Date/Time	Received By:	Date/Time / Shipper:	Airbill No.:	
Relinquished By:	Date/Time	Received By:	Lab Comments:	Temp:	

G.P. W.O. _____

ATTACHMENT 7

Laboratory QA/QC Data

Draft

Fence-line Soils Investigation Report, Horsham Memorial USARC, Horsham, Pennsylvania

Contract No. DACA31-94-D0025
Delivery Order No. 0146

Prepared for

U.S. Army Corps of Engineers - Baltimore District
Engineering Division - HTRW Branch
10 South Howard Street
Baltimore, Maryland 21201

Prepared by

EA Engineering, Science, and Technology
15 Loveton Circle
Sparks, Maryland 21152

May 1999 *60957.73*

EA Engineering, Science, and Technology, Inc.
Eastern Division
15 Loveton Circle
Sparks, Maryland 21152
TEL: (410) 771-4950

LETTER OF TRANSMITTAL

TO: USACE- Baltimore District
Engineering Division–HTRW Branch
10 South Howard Street, 10th Floor
Baltimore, MD 21201

DATE: 10 May 1999	JOB NO. 60957.73/0002
ATTENTION: **Ms. Nancy Flaherty CENAB-EN-HM**	
RE: Contract No. DACA31-94D-0025, D.O. 0146	
Draft Fence-line Soils Investigation Report	
Horsham Memorial USARC	
Horsham, Pennsylvania	

WE ARE SENDING YOU:		X	Attached				Under separate cover via ____ the following items:		
	Shop drawings		Prints		Plans		Samples		Specifications
	Copy of letter		Change order				Other:		

COPIES	DATE	NO.	DESCRIPTION
4	5/10/99	1	Draft Fence-line Soils Investigation Report, Horsham Memorial USARC, Horsham, PA

THESE ARE TRANSMITTED as checked below:

X	For approval		Approved as submitted		Resubmit copies for approval
	For your use		Approved as noted		Submit copies for distribution
	As requested		Returned for corrections		Return corrected prints
	For review and comment		Other:		
	FOR BIDS DUE:		PRINTS RETURNED AFTER LOAN TO US		

REMARKS: EA is pleased to provide USACE–Baltimore District and the 99th RSC Engineers with copies of the above listed document. Should you have any questions or comments regarding this submittal please do not hesitate to call me at 410-329-5151.

COPY TO: Ben Myers, EA (1 copy)

SIGNED:

Vincent A. Williams – Project Manager

If enclosures are not as noted, kindly notify us at once.

60957.73/0002

Draft

Fence-Line Soils Investigation Report, Horsham Memorial USARC, Horsham, Pennsylvania

Contract No. DACA31-94-0025
Delivery Order No. 0146

Prepared for

U.S. Army Corps of Engineers - Baltimore District
Engineering Division - HTRW Branch
10 South Howard Street
Baltimore, Maryland 21201

Prepared by

EA Engineering, Science, and Technology
15 Loveton Circle
Sparks, Maryland 21152

Ben Myers — Date
Project Engineer/Task Manager

Vince Williams — Date
Project Manager

Paul Caprio, P.G. — Date
Senior Technical Review

May 1999

CONTENTS

CONTENTS (CONT'D)

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

EA Engineering Science, and Technology, Inc., was contracted by the U.S. Army Corps of Engineers--Baltimore District, under Contract No. DACA31-94-0025, Delivery Order No. 0146, to perform soil sampling and analysis activities at the Horsham Memorial U.S. Army Reserve Center (USARC), Horsham, Pennsylvania.

Information received from the Baltimore District indicated that petroleum hydrocarbons were used as weed control along the property boundary fence. Field investigations conducted in 1995 of a former debris storage area located along the boundary fence indicated the presence of total petroleum hydrocarbons-diesel range organics above Pennsylvania Interim Cleanup Standards for Contaminated Soils (December 1993). Due to the close proximity of Hallowell Elementary School, the objective of this project was to further assess the presence or absence and residual concentrations of petroleum hydrocarbons along the fence line.

On the USARC facility side of the fence, soil samples were collected at 50-ft intervals, at depths of 0-6 in, 6 in. - 2 ft, and 2-4 ft. On the school side of the fence, soil samples were collected at 50-ft intervals, at a depth of 0-6 in..

A total of 46 soil samples (including one duplicate sample) were collected at the Horsham Memorial USARC Site. All samples were field screened for VOCs and analyzed for total PAHs and PCBs using immunoassay field screening kits. Ten of the samples (and the duplicate) were analyzed by an offsite laboratory for TCL VOCs, SVOCs, pesticides/PCBs, and TAL Metals.

Total PAHs were detected in the majority of samples analyzed by immunoassay, and PCBs were detected in one of the samples. The offsite laboratory reported concentrations of methylene chloride and acetone in each of the ten samples, and toluene in three of the samples. Low-level, estimated SVOC concentrations, consisting mainly of PAH compounds, were reported in six of the ten samples. Low-level PCB/pesticide concentrations were detected in two of the samples. A variety of metals were also detected in the samples.

The analytical results were compared to both Pennsylvania Act 2 medium-specific concentrations (MSCs) and standards/action levels presented in *Closure Requirements for Underground Storage Tank Systems*. None of the reported VOC, SVOC, or PCB/pesticide concentrations exceeded their respective limits or action levels. One TAL metal, vanadium, was reported at concentrations above its MSC. However, the background soil concentration of vanadium given for eastern Pennsylvania is also above the MSC. Therefore, the elevated concentrations of vanadium appear to be indigenous to the area, and not due to the activities of the USARC.

Based on the available data, no evidence exists to suggest that past site practices at the Horsham Memorial USARC facility have significantly impacted the quality of soils along the fence line between the USARC property and Hallowell Elementary School.

1.0 INTRODUCTION

1.1 INTRODUCTION

EA Engineering Science, and Technology, Inc., was contracted by the U.S. Army Corps of Engineers–Baltimore District to perform soil sampling and analysis activities at the Horsham Memorial U.S. Army Reserve Center (USARC), Horsham, Pennsylvania. This report details the site activities that were performed. Site information contained herein is based on information gathered from the field investigation and from USACE–Baltimore District.

1.2 SITE LOCATION AND BACKGROUND

The Horsham Memorial USARC is located at 936 Easton Road (Route 611), Horsham, PA (Figure 1-1). The Facility is located in an urban area with surrounding properties either in commercial use or undeveloped. The area of concern is grass and scrub/tree covered ground along a 660-ft section of chain-link fence (Figure 1-2). Hallowell Elementary School is located adjacent to the property on the other side of the fence. It has been reported by USACE personnel and previous site investigations that petroleum hydrocarbons were used for weed control along the fence line.

The Horsham Memorial USARC facility is approximately 15 acres in size and has reportedly been in operation since the late 1950s or early 1960s. This facility has a reserve center and a vehicle maintenance building with a vehicle wash pad. Limited vehicle maintenance activities are performed at this site. Small quantities of hazardous materials are temporarily stored onsite. An underground storage tank located next to the vehicle maintenance building was removed during the late 1980's/early 1990's.

1.3 PREVIOUS INVESTIGATIONS

A Focused Site Inspection report prepared by USACE-Baltimore District (October 1995) detailed investigations of a debris storage area and hazardous material/contaminated soil storage area.

The debris storage area was located along the fence line to the east of the vehicle maintenance building and appears to have been used as a storage area for some time. An unsealed container, covered with a tarpaulin, was staged in this area to contain paint waste, used paint brushes, thinner, etc. Soil samples were collected to assess the potential presence of contaminants associated with the storage or disposal of paints, cleaners, and other chemicals.

The hazardous material and contaminated soil storage area was located within 20 feet of the fence line north of the vehicle maintenance building. The area consisted of a hazardous material storage shed and drums containing diesel contaminated soil. Some soil stains were visible. Soil samples were collected to assess the potential presence of contaminants associated with the storage or disposal of hazardous materials or diesel-contaminated soil.

The investigation involved the collection and analysis of soil samples from eight soil borings. Samples from 0-1 ft and 4-5 ft below grade were collected and analyzed for volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), and lead. Table 1-1 presents a summary of the analytes detected during the investigation. The conclusion of this report was that further investigation and more extensive sample collection should be performed at the site. This was due to four of six locations sampled for total petroleum hydrocarbons-diesel range organics reporting concentrations above Pennsylvania Interim Cleanup Standards for Contaminated Soils (December 1993).

1.4 PROJECT OBJECTIVE

Due to the close proximity of the elementary school and the information that petroleum hydrocarbons were used for weed control along the property boundary fence, the objectives of this project were to (1) further assess the presence or absence and residual concentrations of petroleum hydrocarbons along the fence line between the USARC facility and Hallowell Elementary School, and (2) quantify residual concentrations of potential chemicals-of-concern (COCs).

1.5 PROJECT SCOPE OF WORK

The scope of work for the fence line soil investigation at the Horsham USARC site included the collection of soil samples at 50-ft intervals along the 660-ft boundary fence on the east side of the USARC facility. Soil samples were to be collected on the facility side of the fence at depths of 0-6 in., 6 in. - 2 ft, and 2-4 ft. Samples on the elementary school side of the fence were to be collected at a depth of 0-6 in. All of the samples were to be screened in the field for VOCs, using either a flame-ionization detector (FID) or photoionization detector (PID), and for polycyclic aromatic hydrocarbons (PAHs) and PCBs, using field immunoassay kits. Based on the results of the PAH and PCB immunoassay analysis, 10% of the samples (total of 5 samples) were to be sent offsite for laboratory analysis for Target Compound List (TCL) semi-volatile organic compounds (SVOCs), pesticides/PCBs, and Target Analyte List (TAL) metals.

During the sample collection activities at the site, a representative of the Pennsylvania Department of Environmental Protection (PADEP) Storage Tank Cleanup Section, Land Recycling and Cleanup Program, requested that the soil samples sent to the offsite laboratory also be analyzed for VOCs, by EnCore™ sample collection methods. In order to provide a complete data set, the samples selected for offsite SVOC, pesticide/PCB, and metals analysis were obtained from the same sampling locations as the samples selected for offsite VOC analysis. To accommodate this, the determining factor for which samples were sent to the analytical laboratory was subsequently changed, in the field, from the PAH/PCB immunoassay analytical results to the results of the VOC field screening and visual observations (stained soil) during the soil sampling effort. To be conservative, USACE – Baltimore District and EA decided to collect and send a total of 10 samples to the laboratory for VOC, SVOC, pesticide/PCB, and metals analysis.

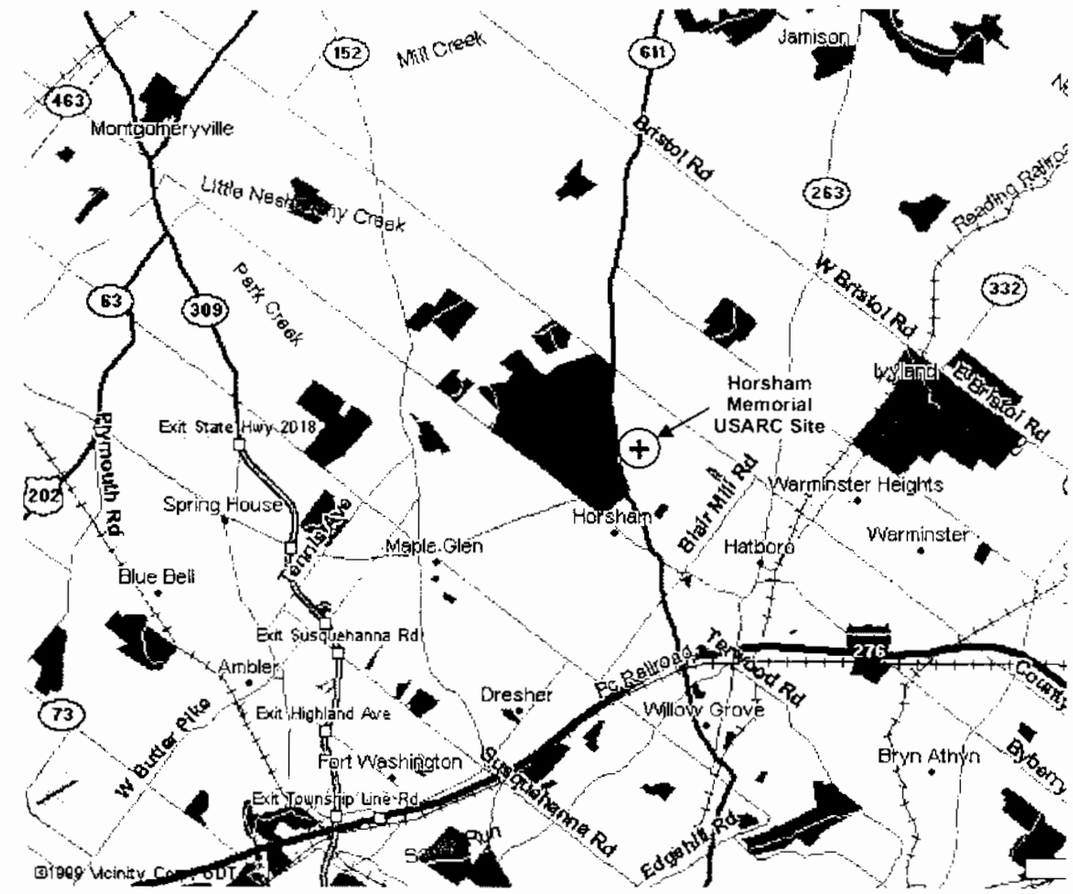


Figure 1-1. Site Location Map.

P:\Projects\Federal\DOD\Army\Projects\6095773\0002\Sitefoc.cdr

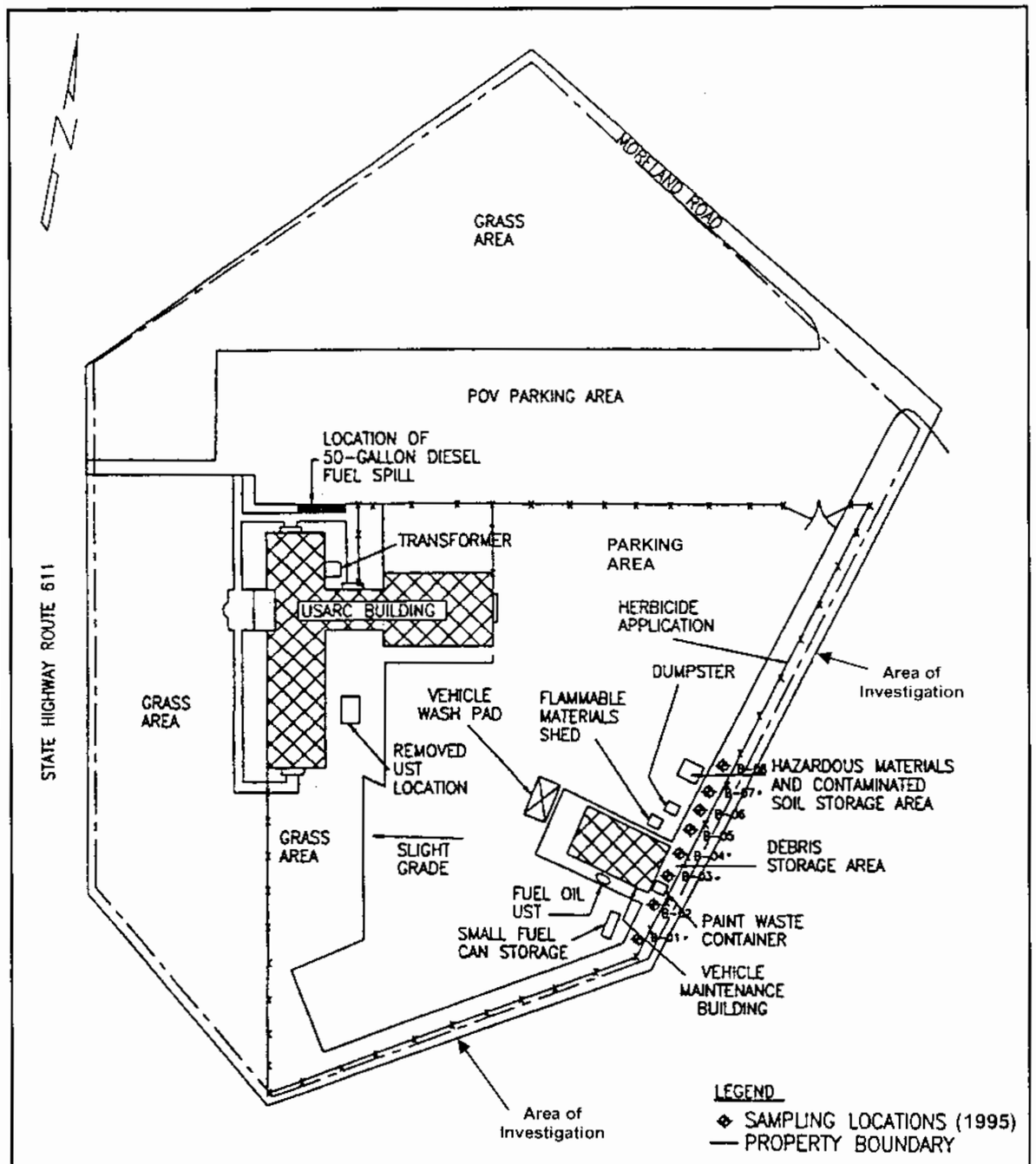


Figure 1-2. Horsham Memorial USARC Site Map. Depicting 1995 Soil Sample Locations.

P:\Projects\Federal\DOD\Army\Projects\6095773\0002\Sitemap.cdr

TABLE 1-1. SUMMARY OF DETECTED ANALYTES FROM 1995 SITE INVESTIGATION

Sampling Location	Analysis				
	TPH GRO (mg/kg)	TPH DRO (mg/kg)	VOCs	PCBs Aroclor-1254 (ug/kg)	PCBs Aroclor-1260 (ug/kg)
Diesel Storage Area					
B-01		1500			
QC Split		1200			
B-02		250			
B-03		9900			
B-04	890	1000			
Composite B-01 to B-04	NA	NA	NA	39	170
QC Split				75	230
Hazardous Materials and Contaminated Soil Storage Area					
B-05					
B-06		75			
B-07		800			
B-08					
Composite B-05 to B-08	NA	NA	NA		70

Notes
1. Analyte detections all from 0.0 to 1.5 foot depths with the exception of lead detections.
2. Lead values ranged from 44.9 to 312 mg/kg in.
3. Chromatographic fingerprints TPH GRO not indicative of gasoline but of a heavier petroleum product.
4. Chromatographic fingerprints TPH DRO not indicative of diesel but of a heavier petroleum product.

2.0 FIELD ACTIVITIES

Field activities for the Horsham Memorial USARC project were conducted on 23-24 February 1999. The field activities included the collection of up to 52 soil samples using a hand auger along the fence line located on the east side of the USARC facility. These samples were analyzed for total PAHs and PCBs by immunoassay analysis, and for TCL VOCs, SVOCs, pesticides/PCBs, and TAL metals at an offsite laboratory, using standard EPA methodologies.

The following sections detail the field activities and the immunoassay screening analysis procedures.

2.1 SOIL SAMPLING

The soil sampling locations on both sides of the fence were defined using a tape measure and marked using surveyor's flags. Sample locations were set 50 ft apart starting at the corner of the fence nearest Moreland Road. A total of 26 sample locations were marked (13 on each side of the fence). The sampling locations are detailed on Figure 2-1.

The sample locations were numbered with odd numbered locations on the facility side of the fence and even numbered locations on the school side of the fence. On the facility side of the fence (west side), three soil samples were collected at each of the 13 sampling locations (total of 39 samples): one from the 0-6 in. interval (designated in the sample ID with an "A"), one from the 6 in. - 2 ft interval (designated with a "B"), and one from the 2-4 ft interval (designated with a "C"). On the elementary school side of the fence (east side), one soil sample was collected at each of the 13 sampling locations from the 0-6 in. interval (designated with an "A").

On the facility side of the fence, a hand auger was used to advance a soil boring for sample collection. A soil sample was collected using the hand auger bucket from the 0-6 in. interval. One soil jar was filled for headspace screening as discussed in Section 2.1.1, and the remaining soil was composited and placed in three 4 oz soil jars for immunoassay and laboratory analysis. Following the collection of this sample, the hand auger was advanced to a depth of 2 ft. The second soil sample was collected in the 6 in. - 2 ft interval, as described above. If this sampling location was marked for further VOC analysis, an En Core™ soil sampler was used to collect a VOC soil sample at a depth of 2 ft. The procedures for collecting the soil samples with the En Core™ sampler are discussed in Section 2.1.2. Following the collection of the En Core™ sample, the hand auger was used to advance the soil boring to a depth of 4 ft. The third soil sample was collected from the 2-4 ft interval, as described above. Although a total of 52 soil samples were to be collected (39 on the facility side of the fence and 13 on the school side of the fence), in some locations on the facility side of the fence, soil samples were not collected due to an abundance of large cobbles encountered in the subsurface. These sample location numbers included 5, 15, 23, and 25.

On the school side of the fence, one soil sample was collected using the hand auger from each location in the 0-6 in. interval, as described above.

As stated above, soil samples were collected for offsite laboratory VOC analysis using En Core™ sampling methodology from selected locations. The selected locations were to be dependent upon the results of the VOC field screening analysis using a PID (as stated in Section 1.5). However, the results of the field screening did not indicate the presence of elevated VOC concentrations in any of the samples. Additionally, no evidence of stained soils was observed. Therefore, the samples selected for offsite laboratory analysis were obtained from the 6 in. - 2 ft interval, at sampling locations that were spaced evenly along the entire length of the fence line. The 6 in. - 2 ft interval was selected because it was thought that surface soils may be too weathered and COCs may not have leached down to the 2-4 ft interval. The sample locations selected were 1B, 3B, 7B, 9B, 11B, 13B, 17B, 19B, 21B, and 25B. In order to provide a complete data set, the soil samples for TCL SVOCs, pesticides/PCBs, and TAL metals were also collected from these sampling locations.

Following the collection of the soil samples, the borehole was backfilled and re-marked for later identification. The hand auger bucket and sample collection equipment were decontaminated using methanol, liquinox, and de-ionized water prior to beginning the next borehole. All sampling activities were conducted using rubber gloves and decontaminated sampling equipment to minimize exposure to contaminated materials and to avoid sample cross contamination.

Further details regarding sample handling are discussed in Section 2.1.3.

2.1.1 Headspace Analysis

Each soil sample was field screened for VOCs using a PID. The sample collected for field screening purposes was placed in a 4 oz soil jar, filled to no more than 80% of capacity, and sealed with aluminum foil beneath the lid. The sample was then allowed to equilibrate in a warm environment for a minimum of 15 minutes. The container lid was then removed, the tip of the PID was pushed through the aluminum foil seal, and a reading was taken. Headspace readings were recorded in a field log book.

2.1.2 En Core Sample Collection Procedures

En Core sampling was used to collect the soil samples for VOC analysis at sample locations 1B, 3B, 7B, 9B, 11B, 13B, 17B, 19B, 21B, and 25B. The En Core sampling technique is a standardized sampling method that ensures similar sampling procedures for every sample collected. The En Core sampler is a single use device and is not cleaned and/or reused. Each sample collected was accomplished with its own En Core sampler and cap. A single En Core T-Handle was used throughout the entire sampling process. After hand augering to a depth of 2 ft, an En Core sampling unit, consisting of a sampler body and a re-usable "T" handle, was used to collect a soil sample. Using the T-Handle, the sampler was pushed into the soil until the coring body was completely full. The 5 gm sampler was used for all samples collected. Following collection of the sample, the coring body was capped, sealed, and removed from the "T" handle. Each sealed sampler was then labeled, placed in a zip-lock sampler bag, packed on ice, and shipped to EA Laboratories for analysis.

2.1.3 Sample Handling/Chain-of-Custody

As stated above, a total of three soil sample jars were collected per sample from each of the sampling locations. Soil samples from each location were screened for total PAHs and PCBs by EPA Methods SW846 4035 and 4020, respectively, using immunoassay kits. A description of the analyses, manufacturer's information, and analytical procedures and results is presented in Section 2.2.

Soil samples from ten sampling locations at the 6 in. - 2 ft interval were also sent to an offsite laboratory for further analysis. These locations included numbers 1, 3, 7, 9, 11, 13, 17, 19, 21, and 25. As mentioned in Section 2.1.2, an additional soil sample was collected from each of these locations by En Core sampler for offsite laboratory VOC analysis. A duplicate sample was collected from location 13 for QA/QC purposes. The soil samples were sealed immediately upon collection to prevent the loss of constituents of concern, packaged in ice, and hand delivered under standard chain-of-custody procedures to EA Laboratories, Sparks, Maryland. The 10 soil samples and one duplicate sample were analyzed for TCL VOCs by Method 5035, SVOCs by Method 8270, PCBs/pesticides by Method 8080, and TAL Metals by Methods 6010/7000.

Table 2-1 presents a list of the soil samples collected, analyses including method numbers, and number of samples.

2.2 IMMUNOASSAY ANALYSIS

Screening analyses of soil samples were conducted in accordance with the Standard Operating Procedures (SOPs) outlined in the *Final Letter Plan for Soil Sampling and Analysis, Horsham Memorial USARC, Horsham, PA* (EA 1999), and presented in Appendix A. Deviations from the immunoassay analysis SOP occurred at the direction of the manufacturer as described in this section.

Samples were screened for total PAHs and PCBs by EPA Methods 4035 and 4020, respectively, using RaPID Assay Test Kits and an Ohmicron RPA-I RaPID Analyzer™ spectrophotometer from Strategic Diagnostics, Inc. The lower method detection limits, as approved under EPA SW846, are 200 parts per billion (ppb) and 500 ppb for total PAHs and PCBs, respectively.

Soil samples were weighed in disposable foil muffin cups, placed in a laboratory oven, and dried overnight at 150 °C. The samples were weighed again after drying, and the percent moisture of the samples was calculated. Samples were then crushed using a mortar and pestle (both the mortar and pestle were covered with heavy-duty aluminum foil to reduce cross-contamination of the soil samples). Ten grams (± 0.1 gm) of the crushed samples were emptied into an extraction jar, to which 20 mL of 100% methanol solution was added (the methanol is pre-measured and contained in a glass ampule).

The samples were shaken for one minute and allowed to settle for one minute. After which, the clear extractant over the settling soil was removed with a disposable bulb pipette, placed in a filtration barrel, and filtered with the filtration plunger. After filtration, the filtered extracts were

added to diluents. (A single filtered extractant could be used for both total PAH and PCB analyses since the same volume and the same percent methanol solution is required for both tests.)

After the appropriate amount of standards, controls, and sample extracts were added, the reagents were added and procedures were followed according to the SOP included in Appendix A. After a final 20 minute incubation period, stopping solution was added, and the results were read at a 450 nanometers (nm) wavelength within 15 minutes of stopping the reaction.

The spectrophotometer created a printout with calibrator data, a calibration curve, control data, and sample data. An absorbence and concentration are given for each sample number. To find the actual concentration, the number was multiplied by the dilution factor. Under normal situations, the dilution factor was 100 and 2000 for total PAH and PCB, respectively. If the results for the samples were high (i.e., 2-50 ppm for total PAH, or 50-1000 ppm for PCB) an additional dilution was performed for more accurate results.

At various points in the analysis process, data were recorded on a Laboratory Analysis Log, provided in Appendix A. This log included sample number, wet and dry weights for the percent moisture calculation, analyte and lot number, extraction date and time, weight of soil sample, dilution factor, test tube number (to assist with sample tracking), starting and ending times for the first and second incubations, the date and time analyzed, the analyzer reading, and the actual concentration in ppb. This information was recorded for all analyzed samples and for the control samples.

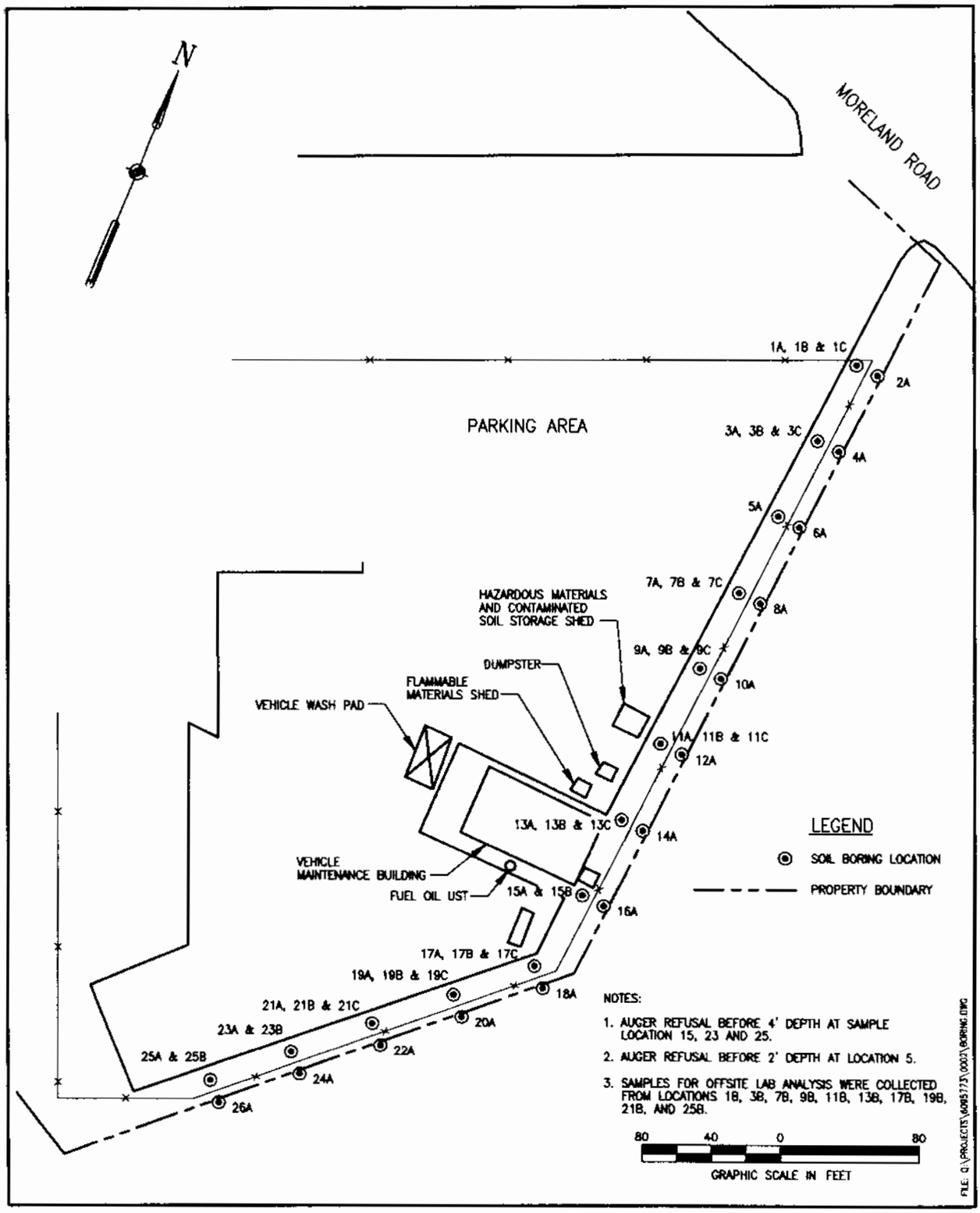


Figure 2-1. SOIL SAMPLE LOCATIONS, FEBRUARY 1999

TABLE 2-1. LIST OF SOIL SAMPLES AND ANALYSES
HORSHAM MEMORIAL USARC, HORSHAM, PENNSYLVANIA

Sample ID	Analytical Parameters							
	VOCs PID	PAH Immuno	PCBs Immuno	VOCs 5035	SVOCs 8270	PCBs/ Pest 8080	Metals 6010/7000	Dups
1A	X	X	X					
1B	X	X	X	X	X	X	X	
1C	X	X	X					
2A	X	X	X					X
3A	X	X	X					X
3B	X	X	X	X	X	X	X	
3C	X	X	X					
4A	X	X	X					
5A	X	X	X					X
6A	X	X	X					X
7A	X	X	X					
7B	X	X	X	X	X	X	X	
7C	X	X	X					
8A	X	X	X					
9A	X	X	X					X
9B	X	X	X	X	X	X	X	
9C	X	X	X					X
10A	X	X	X					
11A	X	X	X					
11B	X	X	X	X	X	X	X	
11C	X	X	X					
12A	X	X	X					
13A	X	X	X					
13B	X	X	X	X	X	X	X	X
13C	X	X	X					
14A	X	X	X					
15A	X	X	X					
15B	X	X	X					
16A	X	X	X					
17A	X	X	X					
17B	X	X	X	X	X	X	X	
17C	X	X	X					
18A	X	X	X					
19A	X	X	X					
19B	X	X	X	X	X	X	X	
19C	X	X	X					
20A	X	X	X					
21A	X	X	X					
21B	X	X	X	X	X	X	X	
21C	X	X	X					
22A	X	X	X					
23A	X	X	X					
23B	X	X	X					
24A	X	X	X					
25A	X	X	X					
25B	X	X	X	X	X	X	X	
26A	X	X	X					

3.0 ANALYTICAL RESULTS

A total of 46 soil samples were collected at the Horsham Memorial USARC Site (45 soil samples and 1 duplicate soil sample). All samples were analyzed using immunoassay field screening kits, and 10 of the samples (and the duplicate) were analyzed by an offsite laboratory for TCL VOCs, SVOCs, pesticides/PCBs, and TAL Metals.

The analytical results were compared with Pennsylvania Act 2 "Land Recycling Program" Medium-specific Concentrations (MSCs). Under PADEP Act 2 guidance, several environmental remediation standards are available for comparison to sample data including background standards, Statewide Health Standards, site-specific standards, or a combination of the three standards. The sample results were compared to PADEP Act 2 Statewide health standards as taken from the Pennsylvania Bulletin Volume 27, Number 33 Part II (16 August 1997). In the PADEP Act 2 guidance, the Statewide Health Standards are referred to as medium specific concentrations (MSCs) which must be achieved in order to demonstrate attainment and receive a release of liability at a site. A residential scenario was used as a conservative approach since surrounding property use is residential and future plans for the site are not known. Separate values known as the soil to ground water (STG) numeric values and the direct contact (DC) numeric values are used as screening criteria for constituents in soil. A determination of the appropriate criteria (STG versus DC) was made for each constituent reported in the soil. The MSCs for the compounds detected at the Horsham USARC site are listed on the analytical results tables.

In addition to comparing the analytical results with the Pennsylvania Act 2 MSCs, the results were also compared to standards/action levels presented in *Closure Requirements for Underground Storage Tank Systems*, effective April 1 1998, as requested by the Pennsylvania Department of Environmental Protection. This comparison is presented below in Section 3.4.

The following sections present the analytical results from the immunoassay analysis and offsite laboratory analysis, and also present a comparison between the two sets of data and the chemical-specific MSCs.

3.1 IMMUNOASSAY ANALYTICAL RESULTS

The immunoassay analysis was conducted at EA's Baltimore, Maryland office in a controlled environment. The soil samples were extracted, filtered, and diluted on 26 February 1999. Samples were analyzed on 1 March 1999 for both total PAHs, and PCBs. Six samples were out of the calibration range for total PAHs; therefore, the six samples were re-analyzed at a dilution factor of 1000 on 2 March 1999. Table 3-1 presents the analytical results from the immunoassay analyses. Appendix A presents the raw data collected from the immunoassay analyses.

3.1.1 Polycyclic Aromatic Hydrocarbons (PAHs)

Total PAH screening results ranged from non-detect (sample locations 9A, 9B, 9C, 11B, 11C, 17C, 19C, 21B, and 21C) to 5,890 µg/kg (sample location 25A) on the USARC facility side of the fence. Total PAH results ranged from 74 µg/kg (sample location 12A) to 5,640 µg/kg

(sample location 24A) on the school side of the fence. These results have been compared to the analytical results from the offsite laboratory in Section 3.3. Since the screening data was reported as total PAHs, compound-specific comparisons to MSCs could not be performed.

3.1.2 Polychlorinated Biphenyls (PCBs)

PCB field-screening results were non-detect, with the exception of sample location 13A. Sample location 13A indicated a concentration of 940 µg/kg, which is below the MSC of 4,400 µg/kg Aroclor 1254). The MSC for PCB-Aroclor 1254 was used as the total PCB MSC because it is the most conservative (lowest) of the seven regulated aroclors, as presented in Table 3-2. Further discussion is presented in Section 3.3.

3.2 OFFSITE LABORATORY ANALYTICAL RESULTS

Ten soil samples plus one duplicate were analyzed for TCL VOCs by Method 5035, SVOCs by Method 8270, pesticides/PCBs by Method 8080, and TAL Metals by Methods 6010/7000. The duplicate sample was collected at sample location 13B.

Table 3-3 presents a summary of the offsite laboratory analytical results. The laboratory narrative, chain-of-custody forms, and complete analytical results data tables are presented in Appendix B.

3.2.1 Volatile Organic Compounds

Acetone, methylene chloride, and toluene were the only VOCs detected in the soil samples, and in each incidence, sample concentrations were below the respective MSCs. Acetone and methylene chloride were detected in the soil samples at maximum concentrations of 370 µg/kg and 350 µg/kg, respectively. The MSC is 10,000,000 µg/kg for acetone, and 670,000 µg/kg for methylene chloride. Toluene was detected in samples 11B (16 µg/kg), 21B (12 µg/kg), 25B (5 µg/kg), but results are below the MSC of 7,600,000 µg/kg.

3.2.2 Semi-volatile Organic Compounds

SVOCs were detected at low-level estimated concentrations in samples 3B, 9B, 17B, 19B, 25B, and DUP, and in each case results are below the MSCs presented in Table 3-4. Chrysene was detected in 25B (220 µg/kg) and DUP (84 µg/kg). Di-n-octyl phthalate was detected in 9B (150 µg/kg), 17B (110 µg/kg), and 19B (110 µg/kg). Fluoranthene was detected in 3B (100 µg/kg), 25B (410 µg/kg), and DUP (140 µg/kg). Pyrene was detected in 3B (87 µg/kg), 25B (360 µg/kg), and DUP (150 µg/kg).

Additional SVOCs were detected at low-level estimated concentrations solely in sample 25B: benzo[a]pyrene (160 µg/kg), benzo[b]fluoranthene (170 µg/kg), benzo[ghi]perylene (130 µg/kg), benzo[k]fluoranthene (170 µg/kg), benzo[a]anthracene (160 µg/kg), indeno[1,2,3-cd]pyrene (130 µg/kg), and phenanthrene (210 µg/kg). All SVOCs detected in sample 25B are below established MSCs.

3.2.3 Pesticides / PCBs

Pesticides/PCBs were detected in samples 13B and 25B, however, the concentrations were below the established MSCs (where applicable). Sample 13B contained endrin aldehyde at a concentration of 7.7 µg/kg (no MSC), endrin ketone at 4.5 µg/kg (no MSC), and aroclor 1260 at 150 µg/kg (MSC of 30,000 µg/kg). Sample 25B contained heptachlor epoxide at 12 µg/kg (MSC of 2,000 µg/kg).

3.2.4 Metals

Metals were detected in all samples. Results were below MSCs, with the exception of vanadium. Vanadium was detected each of the samples collected at the following concentrations: 1B (64.4 mg/kg), 3B (41.3 mg/kg), 7B (82.7 mg/kg), 9B (142 mg/kg), 11B (31.7 mg/kg), 13B (97.0 mg/kg), 17B (76.2 mg/kg), 19B (96.4 mg/kg), 21B (28.7 mg/kg), 25B (119 mg/kg), and DUP (40.5 mg/kg). The MSC for vanadium is 13 mg/kg.

Although the vanadium concentrations detected in each of the site samples was above the MSC for vanadium, the background concentration of vanadium in the southeast area of Pennsylvania is reported to be 70-500 mg/kg, as presented in *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States* (Shacklette and Boerngen, 1984). Additionally, vanadium was also detected in the method blank. The concentrations detected in the field samples are therefore not thought to be a result of past site use at the Horsham Memorial USARC.

3.3 COMPARISON OF IMMUNOASSAY AND OFFSITE ANALYTICAL RESULTS

The original intent of the immunoassay analysis was to field screen for elevated total PAH and PCB concentrations, in order to select the samples with the highest total PAH and/or PCB concentrations for confirmatory offsite laboratory analysis. However, as previously mentioned, this rationale changed in the field and the offsite laboratory samples were selected based on the field screening VOC results. Therefore, in order to best use the immunoassay results, and since no MSC exists for total PAHs, the immunoassay results were compared with the offsite analytical results to qualitatively assess the potential for an exceedance of a compound-specific PAH MSC in one or more of the samples analyzed only by immunoassay.

PAHs were detected in three of the ten samples analyzed by the offsite laboratory. None of the compounds detected exceeded its respective MSC. The immunoassay results for the ten samples indicated total PAH concentrations from non-detect to 3720 µg/kg. Table 3-4 provides a listing of both immunoassay and laboratory analytical results. The immunoassay results for all samples collected ranged between non-detect and 5,890 µg/kg. The range of immunoassay results from the ten samples analyzed both by immunoassay and by offsite laboratory is similar to the range of immunoassay results for all of the samples collected. Therefore, since the PAH concentrations detected by the offsite laboratory were all low-level estimated concentrations that were well below the respective MSCs, and since the range of immunoassay results of the ten offsite samples appears to be reasonably representative of the range of all immunoassay results,

it may be concluded that no individual PAH compounds contained in the 46 samples collected would exceed MSCs if analyzed by the offsite laboratory.

The disparity between total PAH concentrations identified by immunoassay analysis and concentrations of individual PAHs reported by the offsite laboratory may be due to the higher method detection limits specified by Method 8270. The immunoassay method detects individual PAH compounds as a group. Consequently, lower concentrations of individual PAH compounds that are not detectable by Method 8270, may be detected by the immunoassay method. This results in a reported concentration of total PAHs that is higher than indicated by individually detected PAH compounds.

3.4 COMPARISON OF ANALYTICAL RESULTS TO STATE-SPECIFIC STANDARDS/ACTION LEVELS

It was requested by PADEP personnel that the analytical results reported for the samples collected at Horsham memorial USARC be compared to standards/action levels presented in the Technical Document *Closure Requirements for Underground Storage Tank Systems*, effective April 1 1998. These standards and action levels are presented in Table 3-5.

Since the exact type of waste oil used as weed control along the fence line is unknown, the parameters that were identified to be tested for in the soil were taken from the lists for both fuel oil and used motor oil. These parameter lists are presented on pages 29 and 30 of the Technical Document referenced above. Since only ten of the soil samples collected (and one duplicate) were analyzed by the methods specified in the PADEP document, only these analytical results were compared to the specified standards/action levels.

All specified compounds detected in the soil samples submitted to the offsite laboratory were below the standards/action levels for unsaturated soil given in Table 3-4.

TABLE 3-1. FIELD-SCREENING RESULTS FOR SOIL
HORSHAM MEMORIAL USARC, HORSHAM, PA

Sample Number	Percent Moisture	TOTAL PAH		TOTAL PCB	
		Dilution Factor	Concentration (ug/kg)	Dilution Factor	Concentration (ug/kg)
1A	13.7	100	1462	2000	nd
1B (LAB)	16.3	100	2436	2000	nd
2A	15.5	100	3644	2000	nd
2A-DUPLICATE	15.5	100	3673	2000	nd
3A	18.3	100	5019 E	2000	nd
3A-DUPLICATE	18.3	100	4914	2000	nd
3A*	18.3	1000	2710	NA	NA
3B (LAB)	14.1	100	1993	2000	nd
4A	16.7	100	1828	2000	nd
5A	16	100	1340	2000	nd
5A-DUPLICATE	16	100	1324	2000	nd
6A	16.2	100	5866 E	2000	nd
6A*	16.2	1000	3380	NA	NA
6A-DUPLICATE*	16.2	1000	4390	NA	NA
7A	17.3	100	1070	2000	nd
7B (LAB)	15.6	100	81	2000	nd
7C	18.1	100	71	2000	nd
8A	21.9	100	4731	2000	nd
9A	15.9	100	nd	2000	nd
9A-DUPLICATE	15.9	100	nd	2000	nd
9B(LAB)	19.4	100	nd	2000	nd
9C	11.8	100	nd	2000	nd
9C-DUPLICATE	11.8	100	nd	2000	nd
10A	21.5	100	3980	2000	nd
11A	16	100	147	2000	nd
11B (LAB)	18.5	100	nd	2000	nd
11C	11.2	100	nd	2000	nd
12A	13.2	100	74	2000	nd
13A	14.1	100	2871	2000	940
13B (LAB)	16.8	100	1070	2000	nd
(13B DUP) (LAB)	15.9	100	2589	2000	nd
13C	14.7	100	116	2000	nd

TABLE 3-1. FIELD-SCREENING RESULTS FOR SOIL
HORSHAM MEMORIAL USARC, HORSHAM, PA

Sample Number	Percent Moisture	TOTAL PAH		TOTAL PCB	
		Dilution Factor	Concentration (ug/kg)	Dilution Factor	Concentration (ug/kg)
14A	15.9	100	1620	2000	nd
15A	16.8	100	1451	2000	nd
15B	18.6	100	239	2000	nd
16A	20.9	100	2399	2000	nd
17A	16.9	100	1787	2000	nd
17B (LAB)	17.3	100	107	2000	nd
17C	19.7	100	nd	2000	nd
18A	16.5	100	111	2000	nd
19A	17	100	2319	2000	nd
19B (LAB)	17.1	100	93	2000	nd
19C	15.3	100	nd	2000	nd
20A	17.2	100	2166	2000	nd
21A	15.5	100	256	2000	nd
21B (LAB)	14	100	nd	2000	nd
21C	13.1	100	nd	2000	nd
22A	12.2	100	898	2000	nd
23A	23.1	100	130	2000	nd
23B	27.4	100	143	2000	nd
24A	22.5	100	7587 E	2000	nd
24A*	22.5	1000	5640	NA	NA
25A	17.1	100	7697 E	2000	nd
25A*	17.1	1000	5890	NA	NA
25B	20.5	100	5866 E	2000	nd
25B* (LAB)	20.5	1000	3720	NA	NA
26A	15.6	100	6272 E	2000	nd
26A*	15.6	1000	4460	NA	NA

E Analytical result for PAH analysis was not within calibration range.
* Sample extract was diluted and re-analyzed.
(LAB) Sample also analyzed at offsite laboratory for SVOCs.
NA Not Analyzed

TABLE 3-2. CALCULATION OF MEDIUM-SPECIFIC CONCENTRATION FOR PCBs

Regulated Substance	CASRN	Residential	Non-Residential	
		0' - 15'	Surface Soil, 0' - 2'	Subsurface Soil, 2' - 15'
PCB-1016 (AROCLOR)	12674112	15,000	200,000	10,000,000
PCB-1221 (AROCLOR)	11104282	36,000	160,000	10,000,000
PCB-1232 (AROCLOR)	11141165	36,000	160,000	10,000,000
PCB-1242 (AROCLOR)	53469219	36,000	160,000	10,000,000
PCB-1248 (AROCLOR)	12672296	9,900	44,000	10,000,000
PCB-1254 (AROCLOR)	**11097691**	**4,400**	**44,000**	**10,000,000**
PCB-1260 (AROCLOR)	11096825	30,000	130,000	190,000,000

Notes:
Concentrations are in ppb.
Historical data at the site shows evidence of both PCB-1254 and PCB-1260;
therefore, the most conservative of the two aroclors will be used as guidance criteria.

Table 3-3 Summary of Detected Analytes in Confirmatory Samples

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901535 1B 02/23/99				9901536 3B 02/23/99				9901537 7B 02/23/99				9901538 9B 02/23/99				9901539 11B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
VOCs																						
Acetone	10,000,000	ug/kg	89		11	1	92		11	1	140		11	1	110		12	1	120		12	1
Methylene chloride	670,000	ug/kg	120		5	1	300	E	5	1	180		5	1	140		6	1	310	E	6	1
Toluene	7,600,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1	6	U	6	1	16		6	1
SVOCs																						
Benzo[a]pyrene	2,500	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	410	U	410	1	410	U	410	1
Benzo[b]fluoranthene	25,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	410	U	410	1	410	U	410	1
Benzo[ghi]perylene	13,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	410	U	410	1	410	U	410	1
Benzo[k]fluoranthene	250,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	410	U	410	1	410	U	410	1
Benz[a]anthracene	25,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	410	U	410	1	410	U	410	1
Chrysene	2,500,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	410	U	410	1	410	U	410	1
Di-n-octyl phthalate	4,400,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	150	J	410	1	410	U	410	1
Fluoranthene	8,800,000	ug/kg	400	U	400	1	100	J	400	1	400	U	400	1	410	U	410	1	410	U	410	1
Indeno[1,2,3-cd]pyrene	25,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	410	U	410	1	410	U	410	1
Phenanthrene	6,600,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	410	U	410	1	410	U	410	1
Pyrene	6,600,000	ug/kg	400	U	400	1	87	J	400	1	400	U	400	1	410	U	410	1	410	U	410	1
PCBs / PESTICIDES																						
Endrin aldehyde		ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0	4.1	U	4.1	1.0
Endrin ketone		ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0	4.1	U	4.1	1.0
Heptachlor epoxide	2,000	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0	2.1	U	2.1	1.0
Aroclor 1260	30,000	ug/kg	40	U	40	1.0	40	U	40	1.0	40	U	40	1.0	42	U	42	1.0	41	U	41	1.0
METALS																						
Aluminum	190,000	mg/kg	16800		65.0	10.0	13400		61.0	10.0	15800		66.0	10.0	20100		67.0	10.0	14900		68.0	10.0
Antimony	88	mg/kg	0.58	BN	0.12	1.0	0.22	BN	0.11	1.0	0.56	BN	0.12	1.0	1.1	N	0.12	1.0	0.42	BN	0.12	1.0
Arsenic	12	mg/kg	4.9		0.23	1.0	4.0		0.22	1.0	3.9		0.23	1.0	2.2		0.24	1.0	1.1	B	0.24	1.0
Barium	15,000	mg/kg	115		0.70	1.0	84.6		0.65	1.0	86.6		0.70	1.0	61.7		0.72	1.0	59.3		0.72	1.0
Beryllium	4	mg/kg	0.85		0.070	1.0	0.69		0.065	1.0	0.67		0.070	1.0	0.75		0.072	1.0	0.40	B	0.072	1.0
Calcium		mg/kg	766		2.6	1.0	872		2.4	1.0	325		2.6	1.0	459		2.6	1.0	342		2.7	1.0
Chromium	1,100[1]	mg/kg	56.8		0.082	1.0	32.4		0.076	1.0	68.1		0.082	1.0	145		0.084	1.0	19.7		0.085	1.0
Cobalt	13,000	mg/kg	12.6		0.82	1.0	10.7		0.76	1.0	24.8		0.82	1.0	12.8		0.84	1.0	11.0		0.85	1.0
Copper	190,000	mg/kg	21.5	E	0.23	1.0	16.2	E	0.22	1.0	21.3	E	0.23	1.0	38.6	E	0.24	1.0	7.6	E	0.24	1.0
Iron	66,000	mg/kg	31300	*	61.0	10.0	19800	*	56.0	10.0	31200	*	61.0	10.0	44900	*	62.0	10.0	12400	*	63.0	10.0
Lead	500	mg/kg	46.7	N*	0.12	1.0	37.4	N*	0.11	1.0	28.4	N*	0.12	1.0	56.0	N*	0.12	1.0	62.4	N*	0.12	1.0
Magnesium		mg/kg	1470		4.1	1.0	1450		3.8	1.0	1340		4.1	1.0	1160		4.2	1.0	880		4.2	1.0
Manganese	10,000	mg/kg	483		0.93	1.0	349		0.87	1.0	294		0.94	1.0	178		0.96	1.0	239		0.97	1.0
Nickel	4,400	mg/kg	16.5		0.23	1.0	11.5		0.22	1.0	16.0		0.23	1.0	17.1		0.24	1.0	6.0		0.24	1.0
Potassium		mg/kg	353	*	8.3	1.0	431	*	7.7	1.0	291	*	8.3	1.0	137	*	8.5	1.0	77.9	B*	8.6	1.0
Selenium	1,100	mg/kg	1.2		0.23	1.0	0.76		0.22	1.0	1.3		0.23	1.0	1.7		0.24	1.0	0.30	B	0.24	1.0
Sodium		mg/kg	110	B	9.5	1.0	101	B	8.8	1.0	94.2	B	9.5	1.0	103	B	9.7	1.0	123		9.8	1.0
Vanadium	13	mg/kg	**64.4**		0.35	1.0	**41.3**		0.33	1.0	**82.7**		0.35	1.0	**142**		0.36	1.0	**31.7**		0.36	1.0
Zinc	66,000	mg/kg	53.0		1.4	1.0	51.3		1.3	1.0	46.0		1.4	1.0	50.3		1.4	1.0	141		1.4	1.0
Mercury	19	mg/kg	0.090	B	0.051	1.0	0.090	B	0.049	1.0	0.050	U	0.050	1.0	0.10	B	0.052	1.0	0.070	B	0.054	1.0
Thallium	18	mg/kg	0.11	U	0.11	1.0	0.12	U	0.12	1.0	0.11	U	0.11	1.0	0.12	U	0.12	1.0	0.12	U	0.12	1.0

U - Not detected N - MS outside of control limits B - Between IDL and CRDL E - Serial dilution outside of control limits

[1] The MSC for Chromium VI is used

Bolded Values indicate exceedance of MSC.

Table 3-3 Summary of Detected Analytes in Confirmatory Samples

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901540 13B 02/23/99				9901541 17B 02/23/99				9901542 19B 02/23/99				9901543 21B 02/23/99				9901544 25B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
VOCs																						
Acetone	10,000,000	ug/kg	45		11	1	92		11	1	120		12	1	93		11	1	370	J	12	1
Methylene chloride	670,000	ug/kg	310	E	5	1	260	E	5	1	350	E	6	1	280	E	6	1	190		6	1
Toluene	7,600,000	ug/kg	5	U	5	1	5	U	5	1	6	U	6	1	12		6	1	5	J	6	1
SVOCs																						
Benzo[a]pyrene	2,500	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	160	J	420	1
Benzo[b]fluoranthene	25,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	170	J	420	1
Benzo[ghi]perylene	13,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	130	J	420	1
Benzo[k]fluoranthene	250,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	170	J	420	1
Benz[a]anthracene	25,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	160	J	420	1
Chrysene	2,500,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	220	J	420	1
Di-n-octyl phthalate	4,400,000	ug/kg	400	U	400	1	110	J	400	1	110	J	400	1	390	U	390	1	420	U	420	1
Fluoranthene	8,800,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	410	J	420	1
Indeno[1,2,3-cd]pyrene	25,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	130	J	420	1
Phenanthrene	6,600,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	210	J	420	1
Pyrene	6,600,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1	390	U	390	1	360	J	420	1
PCBs / PESTICIDES																						
Endrin aldehyde		ug/kg	7.7	P	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0	3.9	U	3.9	1.0	4.3	U	4.3	1.0
Endrin ketone		ug/kg	4.5	P	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0	3.9	U	3.9	1.0	4.3	U	4.3	1.0
Heptachlor epoxide	2,000	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	1.9	U	1.9	1.0	12	P	2.1	1.0
Aroclor 1260	30,000	ug/kg	150		40	1.0	41	U	41	1.0	41	U	41	1.0	39	U	39	1.0	43	U	43	1.0
METALS																						
Aluminum	190,000	mg/kg	15900		65.0	10.0	15500		65.0	10.0	20300		67.0	10.0	10500		6.5	1.0	23000		70.0	10.0
Antimony	88	mg/kg	0.63	BN	0.12	1.0	0.62	BN	0.12	1.0	0.53	BN	0.12	1.0	0.27	BN	0.12	1.0	1.2	N	0.13	1.0
Arsenic	12	mg/kg	3.0		0.23	1.0	2.1		0.23	1.0	2.5		0.24	1.0	1.0	B	0.23	1.0	5.0		0.25	1.0
Barium	15,000	mg/kg	52.0		0.69	1.0	65.5		0.69	1.0	89.6		0.72	1.0	27.9		0.70	1.0	188		0.75	1.0
Beryllium	4	mg/kg	0.43	B	0.069	1.0	0.52	B	0.070	1.0	0.76		0.072	1.0	0.57	B	0.070	1.0	1.2		0.075	1.0
Calcium		mg/kg	487		2.5	1.0	627		2.5	1.0	513		2.6	1.0	337		2.5	1.0	1160		2.8	1.0
Chromium	1,100[1]	mg/kg	85.0		0.081	1.0	82.1		0.081	1.0	96.8		0.084	1.0	24.4		0.081	1.0	136		0.088	1.0
Cobalt	13,000	mg/kg	15.3		0.81	1.0	11.1		0.81	1.0	17.5		0.84	1.0	2.7	B	0.81	1.0	28.7		0.88	1.0
Copper	190,000	mg/kg	27.7	E	0.23	1.0	23.5	E	0.23	1.0	33.9	E	0.24	1.0	10.2	E	0.23	1.0	46.2	E	0.25	1.0
Iron	66,000	mg/kg	31400	*	60.0	10.0	26800	*	60.0	10.0	32300	*	62.0	10.0	10000	*	60.0	10.0	40700	*	65.0	10.0
Lead	500	mg/kg	35.8	N*	0.12	1.0	36.9	N*	0.12	1.0	29.5	N*	0.12	1.0	6.5	N*	0.12	1.0	58.1	N*	0.13	1.0
Magnesium		mg/kg	970		4.1	1.0	829		4.1	1.0	967		4.2	1.0	408		4.1	1.0	1780		4.4	1.0
Manganese	10,000	mg/kg	243		0.93	1.0	152		0.93	1.0	144		0.96	1.0	40.2		0.93	1.0	858		1.0	1.0
Nickel	4,400	mg/kg	14.3		0.23	1.0	12.8		0.23	1.0	21.7		0.24	1.0	3.9	B	0.23	1.0	33.4		0.25	1.0
Potassium		mg/kg	270	*	8.2	1.0	149	*	8.2	1.0	185	*	8.5	1.0	39.7	B*	8.2	1.0	571	*	8.9	1.0
Selenium	1,100	mg/kg	1.2		0.23	1.0	0.79		0.23	1.0	0.78		0.24	1.0	0.38	B	0.23	1.0	1.3		0.25	1.0
Sodium		mg/kg	97.5	B	9.4	1.0	101	B	9.4	1.0	101	B	9.7	1.0	88.4	B	9.4	1.0	115	B	10.2	1.0
Vanadium	13	mg/kg	**97.0**		0.35	1.0	**76.2**		0.35	1.0	**96.4**		0.36	1.0	**28.7**		0.35	1.0	**119**		0.38	1.0
Zinc	66,000	mg/kg	34.8		1.4	1.0	26.9		1.4	1.0	60.8		1.4	1.0	15.4		1.4	1.0	128		1.5	1.0
Mercury	19	mg/kg	0.060	B	0.053	1.0	0.050	U	0.050	1.0	0.060	U	0.060	1.0	0.050	B	0.054	1.0	0.15	B	0.054	1.0
Thallium	18	mg/kg	0.12	U	0.12	1.0	0.11	U	0.11	1.0	0.12	U	0.12	1.0	0.11	U	0.11	1.0	0.21	B	0.13	1.0

U - Not detected N - MS outside of control limits B - Between IDL and CRDL E - Serial dilution outside of control limits

[1] The MSC for Chromium VI is used

Bolded Values indicate exceedance of MSC

Table 3-3 Summary of Detected Analytes in Confirmatory Samples

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901545 DUP 02/23/99				IB903081 Method Blank 03/08/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
VOCs										
Acetone	10,000,000	ug/kg	110		10	1	10	U	10	1
Methylene chloride	670,000	ug/kg	250	E	5	1	5	U	5	1
Toluene	7,600,000	ug/kg	5	U	5	1	5	U	5	1
SVOCs										
Benzo[a]pyrene	2,500	ug/kg	390	U	390	1	330	U	330	1
Benzo[b]fluoranthene	25,000	ug/kg	390	U	390	1	330	U	330	1
Benzo[ghi]perylene	13,000,000	ug/kg	390	U	390	1	330	U	330	1
Benzo[k]fluoranthene	250,000	ug/kg	390	U	390	1	330	U	330	1
Benz[a]anthracene	25,000	ug/kg	390	U	390	1	330	U	330	1
Chrysene	2,500,000	ug/kg	84	J	390	1	330	U	330	1
Di-n-octyl phthalate	4,400,000	ug/kg	390	U	390	1	330	U	330	1
Fluoranthene	8,800,000	ug/kg	140	J	390	1	330	U	330	1
Indeno[1,2,3-cd]pyrene	25,000	ug/kg	390	U	390	1	330	U	330	1
Phenanthrene	6,600,000	ug/kg	390	U	390	1	330	U	330	1
Pyrene	6,600,000	ug/kg	150	J	390	1	330	U	330	1
PCBs / PESTICIDES										
Endrin aldehyde		ug/kg	4.0	U	4.0	1.0	3.3	U	3.3	1.0
Endrin ketone		ug/kg	4.0	U	4.0	1.0	3.3	U	3.3	1.0
Heptachlor epoxide	2,000	ug/kg	2.0	U	2.0	1.0	1.7	U	1.7	1.0
Aroclor 1260	30,000	ug/kg	40	U	40	1.0	33	U	33	1.0
METALS										
Aluminum	190,000	mg/kg	14700		63.0	10.0	5.6	U	5.6	1.0
Antimony	88	mg/kg	0.18	BN	0.11	1.0	0.10	U	0.10	1.0
Arsenic	12	mg/kg	4.2		0.22	1.0	0.20	U	0.20	1.0
Barium	15,000	mg/kg	87.3		0.67	1.0	0.60	U	0.60	1.0
Beryllium	4	mg/kg	0.71		0.067	1.0	0.060	U	0.060	1.0
Calcium		mg/kg	893		2.5	1.0	-2.4	B	2.2	1.0
Chromium	1,100[1]	mg/kg	34.1		0.078	1.0	0.080	B	0.070	1.0
Cobalt	13,000	mg/kg	9.1		0.78	1.0	0.70	U	0.70	1.0
Copper	190,000	mg/kg	16.4	E	0.22	1.0	-0.32	B	0.20	1.0
Iron	66,000	mg/kg	20800	*	58.0	10.0	5.2	U	5.2	1.0
Lead	500	mg/kg	43.8	N*	0.11	1.0	0.10	U	0.10	1.0
Magnesium		mg/kg	1410		3.9	1.0	3.5	U	3.5	1.0
Manganese	10,000	mg/kg	351		0.90	1.0	0.80	U	0.80	1.0
Nickel	4,400	mg/kg	12.9		0.22	1.0	0.20	U	0.20	1.0
Potassium		mg/kg	434	*	8.0	1.0	7.1	U	7.1	1.0
Selenium	1,100	mg/kg	0.86		0.22	1.0	0.20	U	0.20	1.0
Sodium		mg/kg	109	B	9.1	1.0	8.1	U	8.1	1.0
Vanadium	13	mg/kg	**40.5**		0.34	1.0	0.65	B	0.30	1.0
Zinc	66,000	mg/kg	55.4		1.3	1.0	1.2	U	1.2	1.0
Mercury	19	mg/kg	0.080	B	0.053	1.0				
Thallium	18	mg/kg	0.12	U	0.12	1.0				

U = Not detected N = MS outside of control limits B = Between IDL and CRDL E = Serial dilution outside of control limits

[1] The MSC for Chromium VI is used

Bolded Values indicate exceedance of MSC

TABLE 3-4. COMPARISON OF IMMUNOASSAY AND LABORATORY DATA FOR POLYCYCLIC AROMATIC HYDROCARBONS IN SOIL SAMPLES COLLECTED AT THE HORSHAM MEMORIAL USARC SITE

Sample ID	Total PAH Immunoassay Result (µg/kg)	Total PAHs Detected by Laboratory (µg/kg)
1B	2,436	ND
3B	1,993	187
7B	81	ND
9B	ND	ND
11B	ND	ND
13B	1,070	ND
17B	107	ND
19B	93	ND
21B	ND	ND
25B	3,720	2,120
DUP (13B)	2,589	234

Notes:
DUP = Duplicate sample collected in the field.
ND = Not Detected

TABLE 3-5. STANDARDS/ACTION LEVELS FOR CONFIRMATORY SAMPLES COLLECTED AT UST CLOSURE SITE ASSESSMENTS

Parameter	Unsaturated Soil Standard/Action Level (mg/kg)	Standard for Reuse of Soil On-site (mg/kg)
Anthracene	230	230
Benzene	0.5	0.5
Benzo[a]anthracene	25/320	25/110
Benzo[a]pyrene	2.5/46	2.5/11
Benzo[b]fluoranthene	25/160	25/110
Benzo[ghi]perylene	180	180
Chrysene	220	220
Cumene	18/37	18/37
Dibromoethane, 1,2- (Ethylene Dibromide)	0.005	0.005
Dichloroethane 1,2-	0.5	0.5
Ethyl Benzene	70	70
Fluorene	380	380
Indeno[1,2,3-cd]pyrene	25/28,000	25/110
Lead (Total)	450	450
MTBE	2	2
Naphthalene	5	5
Phenanthrene	11,000	11,000
Pyrene	220	220
Toluene	100	100
Xylenes (Total)	1,000	1,000

Note: Table reproduced from *Closure Requirements for Underground Storage Tank Systems*, effective April 1 1998, PADEP.

4.0 SUMMARY AND CONCLUSIONS

The objectives of the fence line soil investigation at the Horsham Memorial USARC site were to assess the presence or absence of petroleum hydrocarbons along the fence line between the USARC facility and Hallowell Elementary School, and quantify residual concentrations of COCs identified.

The original project scope of work included that the selection of samples to be sent to the offsite laboratory would be based on the immunoassay results. At the request of PADEP during the field event, VOC sampling by the EnCore™ sampler and analysis by EPA Method 5035 were also conducted. Because of the inclusion of the EnCore™ sampling method and the desire to create a complete set of analytical results from the same sample location, the determining factor by which samples were sent to the offsite laboratory was changed from the results of the immunoassay analysis to the results of the PID VOC headspace screening.

A total of 46 soil samples were collected along the 660 ft fence line at 50 ft intervals. The samples were collected at depth intervals of 0-6 in., 6 in. - 2 ft, and 2-4 ft. All of the samples were analyzed for total PAHs and PCBs by immunoassay, and 11 of the samples (including one duplicate) were also analyzed for TCL VOCs, SVOCs including PAHs, pesticides/PCBs, and TAL metals. Because, no elevated levels of VOCs were detected by PID field screening, and no evidence of stained soil was observed, the samples submitted to the laboratory were selected from locations spaced along the entire length of the fence line.

The laboratory analytical results reported detectable concentrations of acetone, methylene chloride and toluene; low-level estimate concentrations of PAHs and other SVOCs; several PCBs/pesticides; and, a variety of metals. These analytical results were compared to PADEP Act 2 Statewide health standards and standards/action levels presented in *Closure Requirements for Underground Storage Tank Systems*. The concentration of each compound or metal detected was below its respective regulatory level, with the exception of vanadium. Vanadium was detected in each sample analyzed for metals at concentrations above MSCs, but at or below typical background concentrations for southeastern Pennsylvania. Therefore, the concentrations of vanadium are likely due to background levels, and not from activities associated with the site.

Although several of the samples analyzed by immunoassay reported total PAH concentrations higher than the total PAH concentrations of those samples submitted for laboratory analysis, the total PAHs concentrations of both sample types were within the same range and the individual PAH concentrations reported by the offsite laboratory were considerably lower than the respective MSCs. Therefore, it may be concluded that the concentrations of individual PAHs in all of the samples collected are likely to be below PADEP Act 2 MSCs. The disparity between total PAH concentrations identified by immunoassay analysis and concentrations of individual PAHs reported by the offsite laboratory is most likely be due to the higher method detection limits specified by Method 8270.

Based on the available data, no evidence exists to suggest that past site practices at the Horsham Memorial USARC facility have significantly impacted the quality of soils along the fence line between the USARC property and Hallowell Elementary School.

APPENDIX A

IMMUNOASSAY KIT INFORMATION AND ANALYTICAL DATA

********** S D I **********

[redacted] Wait 30 Minutes
[redacted]-01-99 10:09:01

[redacted]

********** S D I **********

PROTOCOL : PAHS

[redacted]

TECH ID : KME
LOT # : [redacted]
EXP DATE: [redacted]

Data Reduct: Lin.Regression
Xformation: Ln/LgtB
Read Mode : Absorbance
Wavelength : 450 nm
Units : PPB

EQUATION OF LINE :

Slope = -0.720
Intercept = 2.121
Corr (r) = 0.9972

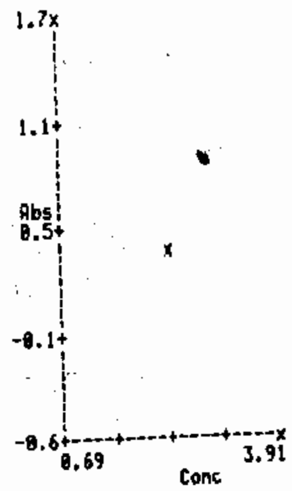
Transformed Data :

Conc	Abs
0.69	1.672
2.30	0.362
3.91	-0.647

Calibrator Data:

Conc		Abs Diff	%CV	Predic %Diff
0.00		1.241		
		1.219		
	Mean	1.230	1.3	
2.00		1.034		1.88
		-0.115		-6.1
		1.037		1.85
		-0.155		-8.4
	Mean	1.036	0.2	1.86
		-0.135		-7.2
10.00		0.721		11.70
		1.705		14.6
		0.729		11.30
		1.302		11.5
	Mean	0.725	0.7	11.50
		1.502		13.1
50.00		0.429		45.19
		-4.811		-10.6
		0.417		48.11
		-1.890		-3.9
	Mean	0.423	2.1	46.62
		-3.379		-7.2

Cal. Curve :



Control Data :

Ctrl#	Abs	Conc
1	0.573	23.01

ID: CONTROL-PAH-3/1/99-12:55

Samples Data :

Spl#	Abs	Conc	ID
1	0.473	36.44	2A
2	0.472	36.73	2A-DUP
3	0.624	18.20	4A
4	0.378	58.66Hi	6A
5	0.420	47.31	8A
6	0.455	39.80	10A
7	1.122	0.74	12A
8	0.650	16.20	14A
9	0.563	23.99	16A
10	0.673	14.62	1A
			9A
12	1.142	0.54nd	9A-DUP
13	1.185	0.20nd	7B
14	1.062	1.47	11A
15	1.160	0.38nd	11B
16	0.524	28.71	13A
17	0.740	10.70	13B
18	0.675	14.51	15A
19	1.004	2.39	15B
20	0.629	17.87	17A
21	0.408	50.19Hi	3A
22	0.412	49.14	3A-DUP
23	0.740	10.70	7A
24	0.547	25.89	(13B DUP)
25	1.089	1.11	18A
26	0.586	21.66	20A
27	0.777	8.98	22A
28	0.331	75.87Hi	24A
29	0.366	62.72Hi	26A
30	1.124	0.71	7C
			9C
32	1.208	0.07nd	9C DUP
33	1.215	0.04nd	11C
34	1.085	1.16	13C
35	1.162	0.37nd	17C
36	1.170	0.31nd	19C
37	1.187	0.19nd	21C
38	0.378	58.66Hi	25B
39	0.568	24.36	1B
40	0.604	19.93	3B
41	0.692	13.40	5A
42	0.695	13.24	5A-DUP
43	1.115	0.81	7B
44	1.093	1.07	17B
45	0.571	23.19	19A
46	1.104	0.93	19B
47	0.995	2.56	21A
48	1.202	0.10nd	21B
49	1.074	1.30	23A
50	1.065	1.43	23B
51	0.329	76.97Hi	25A

END OF RUN 3/1/99
03-01-99 ~~13:48:20~~ 12:55

3-01-99 18:26:15

********** S D I **********

PROTOCOL : PCB

TECH ID : KMB
LOT # : BK00229
EXP DATE:

Data Reduct: Lin.Regression
Formation: Ln/Lgtb
Read Mode : Absorbance
Wavelength : 450 nm
Units : PPB

EQUATION OF LINE :

Slope = -0.845
Intercept = 0.456
Corr (r) = 0.9928

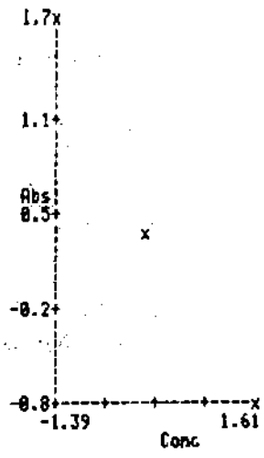
Transformed Data :

Conc	Abs
-1.39	1.727
0.00	0.271
1.61	-0.818

Calibrator Data:

Conc	Abs	%CV	Predic %Diff
0.00	1.657		
	1.645		
Mean	1.651	0.5	
0.25	1.379		0.25
	0.081		0.6
	1.425		0.19
	-0.856		-28.6
Mean	1.402	2.3	0.22
	-0.828		-12.5
1.00	0.954		1.18
	0.183		15.5
	0.919		1.31
	0.311		23.7
Mean	0.937	2.6	1.25
	0.245		19.7
5.00	0.515		4.37
	-0.626		-14.3
	0.496		4.67
	-0.333		-7.1
Mean	0.505	2.7	4.52
	-0.483		-10.7

Cal. Curve :



Control Data :

Ctrl#	Abs	Conc
1	0.611	3.22

ID: CONTROL-PCB-3/1/99-1742

Samples Data :

Spl#	Abs	Conc
1	1.688	0.02nd
ID: 2A		
2	1.624	0.01nd
ID: 2A-DUP		
3	1.622	0.01nd
ID: 4A		
4	1.648	0.00nd
ID: 6A		
5	1.623	0.01nd
ID: 8A		
6	1.645	0.00nd
ID: 10A		
7	1.629	0.01nd
ID: 12A		
8	1.605	0.03nd
ID: 14A		
9	1.639	0.01nd
ID: 16A		
10	1.647	0.00nd
ID: 1A		
11	1.641	0.00nd
ID: 9A		
12	1.623	0.01nd
ID: 9A-DUP		
13	1.687	nd
ID: 9B		
14	1.623	0.01nd
ID: 11A		
15	1.667	nd
ID: 11B		
16	1.237	0.47
ID: 13A		
17	1.601	0.03nd
ID: 13B		
18	1.610	0.02nd
ID: 15A		
19	1.645	0.00nd
ID: 15B		
20	1.642	0.00nd
ID: 17A		
21	1.630	0.01nd
ID: 3A		
22	1.624	0.01nd
ID: 3A-DUP		
23	1.588	0.04nd
ID: 7A		
24	1.621	0.02nd
ID: (13B DUP)		
25	1.664	nd
ID: 18A		
26	1.598	0.03nd
ID: 20A		
27	1.658	nd
ID: 22A		
28	1.654	nd
ID: 24A		
29	1.584	0.04nd
ID: 24A		
30	1.627	0.01nd
ID: 7C		
31	1.616	0.03nd
ID: 9C		
32	1.606	0.03nd
ID: 9C DUP		
33	1.688	nd
ID: 11C		
34	1.543	0.07nd
ID: 13C		
35	1.677	nd
ID: 17C		
36	1.533	0.08nd
ID: 19C		
37	1.609	0.02nd
ID: 21C		
38	1.551	0.07nd
ID: 25B		
39	1.594	0.03nd
ID: 1B		
40	1.559	0.06nd
ID: 3B		
41	1.553	0.07nd
ID: 5A		
42	1.548	0.07nd
ID: 5A-DUP		
43	1.618	0.02nd
ID: 7B		
44	1.717	nd
ID: 17B		
45	1.568	0.06nd
ID: 19A		
46	1.603	0.03nd
ID: 19B		
47	1.587	0.04nd
ID: 21A		
48	1.596	0.03nd
ID: 21B		
49	1.594	0.03nd
ID: 23A		
50	1.585	0.04nd
ID: 23B		
51	1.585	0.04nd
ID: 25A		

END OF RUN 1742
03-01-99 ~~18:33:06~~

********* S D I *********

lease Wait 30 Minutes
3-02-99 12:12:30

PAH DILUTIONS

)3-02-99 15:02:07

********* S D I *********

'ROTOCOL : PAHS

'ECH ID : KME
.OT # : 86124JRR
EXP DATE: 5/22

ata Reduct:Lin.Regression
:formation: Ln/LgtB
ead Mode : Absorbance
avelength : 450 nm
nits : PPB

EQUATION OF LINE :

lope = -0.659
ntercept = 1.938
orr (r) = 0.9978

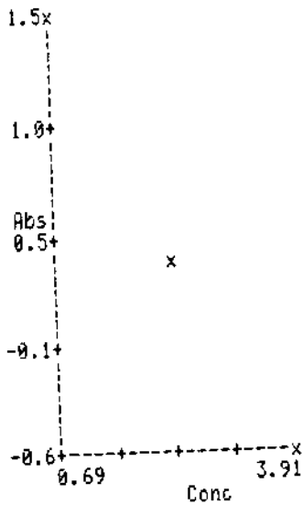
ransformed Data :

Conc	Abs
0.69	1.529
2.30	0.327
3.91	-0.591

alibrator Data:

Conc	Abs	%CV	Predic
	Diff		%Diff
0.00	1.210		
	1.198		
Mean	1.204	0.7	
2.00	0.981		2.00
	0.005		0.2
	0.998		1.72
	-0.276		-16.0
Mean	0.990	1.3	1.86
	-0.139		-7.5
10.00	0.690		12.16
	2.160		17.8
	0.710		10.96
	0.962		8.8
Mean	0.700	2.0	11.55
	1.547		13.4
50.00	0.436		44.86
	-5.141		-11.5
	0.422		48.28
	-1.723		-3.6
Mean	0.429	2.2	46.53
	-3.469		-7.5

Cal. Curve :



Control Data :

Ctrl#	Abs	Conc
1	0.534	26.73

ID: CONTROL-PAH-3/2/99-1326

Samples Data :

Spl#	Abs	Conc
1	0.912	3.38

ID: 6A

2	0.872	4.39

ID: 6A-DUP

3	0.942	2.71

ID: 3A

4	0.831	5.64

ID: 24A

5	0.869	4.46

ID: 26A

6	0.897	3.72

ID: 25B

7	0.823	5.89

ID: 25A

END OF RUN 13:56
03-02-99 ~~15:05:44~~ kme 2/2/99

LABORATORY ANALYSIS LOG

Analyst: KME

	Sample Number	Wet Wt. (g)	Dry Wt. (g)	(1) % Moisture	Analyte	Lot Number	Extraction Date	Extraction Time	Weight of Soil Sample (g)	(2) Dilution Factor
1	2A	22.6	19.1	15.5	PAH	861247RE	2/26/99	10:00	10.0 g	100
2	4A	20.4	17.0	16.7						
3	6A	25.9	21.7	16.2						
4	8A	22.4	17.5	21.9						
5	10A	23.3	18.3	21.5						
6	12A	23.4	20.3	13.2						
7	14A	22.6	19.0	15.9						
8	16A	24.9	19.7	20.9						
9	1A	22.6	19.5	13.7						
10	9A	20.1	16.9	15.9						
11	9B	29.4	23.7	19.4						
12	11A	20.6	17.3	16.0						
13	11B	18.9	15.4	18.5						
14	13A	19.8	17.0	14.1						
15	13B	23.2	19.3	16.8						
16	15A	21.4	17.8	16.8						
17	15B	24.2	19.7	18.6						
18	17A	22.5	18.7	16.9						
19	3A	26.2	21.4	18.3						
20	7A	23.7	19.6	17.3						
21	13BDUP	22.7	19.1	15.9						
22	18A	27.9	23.3	16.5						
23	20A	19.8	16.4	17.2						
24	22A	22.1	19.4	12.2						
25	24A	18.7	14.5	22.5						
26	26A	21.2	17.9	15.6						
27	7C	23.8	19.5	18.1						
28	9C	19.5	17.2	11.8						
29	11C	23.2	20.6	11.2						
30	13C	23.2	19.8	14.7						
31	17C	27.9	22.4	19.7						
32	19C	24.8	21.0	15.3						
33	21C	22.1	19.2	13.1						
34	25B	21.5	17.1	20.5	↓	↓	↓	↓	↓	↓

(1) % Moisture = [(Weight of wet soil) - (Weight of dry soil)] x 100% / (Weight of wet soil)

(2) Dilution Factor is given in blocks 4a and 4b of the RaPID Prep Flowchart

(3) Incubation Time should be 15 min. for TNT and PCB, and 30 min. for PAH screening.

LABORATORY ANALYSIS LOG

Analyst: KME

	Sample Number	Test Tube No.	[3] Incubation 1 Start Time	[3] Incubation 1 End Time	[4] Incubation 2 Start Time	[4] Incubation 2 End Time	Date Analyzed	[5] Time Analyzed	Analyzer Reading	[6] Actual Conc. (ppb)
1	2A	1/1D	11:30	12:00	12:25	12:45	3/1/99	12:55	36.44/3673	3644/3673
2	4A	2							1828	1828
3	6A	3							58.66 Hi	5866 Hi
4	8A	4							47.31	4731
5	10A	5							39.80	3980
6	12A	6							0.74	74
7	14A	7							16.20	1620
8	K6A	8							23.99	2399
9	1A	9							14.62	1462
10	9A	10/10D							0.61nd/0.59nd	nd/nd
11	9B	11							0.20nd	nd
12	11A	12							1.47	147
13	11B	13							0.38nd	nd
14	13A	14							28.71	2871
15	13B	15							10.70	1070
16	15A	16							14.51	1451
17	15B	17							2.39	239
18	17A	18							17.87	1787
19	5A	19/19D							80.19Hi/49.14	8019Hi/4914
20	7A	20							10.70	1070
21	13B Dup	21							25.89	2589
22	18 A	22							1.11	111
23	20 A	23							21.66	2166
24	22 A	24							8.98	898
25	24 A	25							75.87Hi	7587 Hi
26	26 A	26							62.72Hi	6272 Hi
27	7C	27							0.71	71
28	9C	28/28D							0.11nd/0.07nd	nd/nd
29	11C	29							0.04nd	nd
30	13C	30							1.16	116
31	17C	31							0.37nd	nd
32	19C	32							0.31nd	nd
33	21C	33							0.19nd	nd
34	25B	34							58.66Hi	5866 Hi

[4] Incubation Time should be 20 min.

[5] Time Analyzed should be 15 min. after end of Incubation.

[6] Actual Concentration = (Analyzer Reading) x (Dilution Factor)

LABORATORY ANALYSIS LOG

Analyst: KME

	Sample Number	Wet Wt. (g)	Dry Wt. (g)	[1] % Moisture	Analyte	Lot Number	Extraction Date	Extraction Time	Weight of Soil Sample (g)	[2] Dilution Factor
1	1B	23.9	20.0	16.3	PAH	861247ERB	2/26/97	10:00	10.0g	100
2	3B	22.0	18.9	14.1	↓	↓	↓	↓	↓	↓
3	5A	26.9	22.6	16.0						
4	7B	21.8	18.4	15.6						
5	17B	20.8	17.2	17.3						
6	19A	25.2	21.5	17.0						
7	19B	22.8	18.9	17.1						
8	21A	23.8	20.1	15.5						
9	21B	23.6	20.3	14.0						
10	23A	19.5	15.0	23.1						
11	23B	17.9	13.0	27.4						
12	25A	22.2	18.4	17.1	↓	↓	↓	↓	↓	↓
13	CONTROL-PAH-3/4/97-EST	—	—	—	PAH	861247ERB	—	—	—	—
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										

[1] % Moisture = [(Weight of wet soil) - (Weight of dry soil)] x 100% / (Weight of wet soil)

[2] Dilution Factor is given in blocks 4a and 4b of the RaPID Prep Flowchart

[3] Incubation Time should be 15 min. for TNT and PCB, and 30 min. for PAH screening.

LABORATORY ANALYSIS LOG

Analyst: KME

	Sample Number	Test Tube No.	[3] Incubation 1 Start Time	[3] Incubation 1 End Time	[4] Incubation 2 Start Time	[4] Incubation 2 End Time	Date Analyzed	[5] Time Analyzed	Analyzer Reading	[6] Actual Conc. (ppb)
1	1B	35	11:30	12:00	12:25	12:46	3/1/99	12:55	24.36	24.36
2	3B	36							19.93	1993
3	5A	37/37D							13.40/13.24	1340/1324
4	7B	38							0.81	81
5	17B	39							1.07	107
6	19A	40							23.19	2319
7	19B	41							0.93	93
8	21A	42							2.56	256
9	21B	43							0.10 nd	nd
10	23A	44							1.30	130
11	23B	45							1.43	143
12	25A	46							76.97 Hi	7697 Hi
13	CONTROL-PAU-3/1/99-1255	C	11:30	12:00	12:25	12:45	3/1/99	12:55	23.01	23.01
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										

[4] Incubation Time should be 20 min.

[5] Time Analyzed should be 15 min. after end of Incubation.

[6] Actual Concentration = (Analyzer Reading) x (Dilution Factor)

LABORATORY ANALYSIS LOG

Analyst: KME

	Sample Number	Wet Wt. (g)	Dry Wt. (g)	[1] % Moisture	Analyte	Lot Number	Extraction Date	Extraction Time	Weight of Soil Sample (g)	[2] Dilution Factor
1	2A	22.6	19.1	15.5	PCB	BK0029	2/26/99	10:00	10.0	2000
2	4A	20.4	17.0	16.7						
3	6A	25.9	21.7	16.2						
4	8A	22.4	17.5	21.9						
5	10A	23.3	18.3	21.5						
6	12A	23.4	20.3	13.2						
7	14A	22.6	19.0	15.9						
8	16A	24.9	19.7	20.9						
9	1A	22.6	19.5	13.7						
10	9A	20.1	16.9	15.9						
11	9B	29.4	23.7	19.4						
12	11A	20.6	17.3	16.0						
13	11B	18.9	15.4	18.5						
14	13A	19.8	17.0	14.1						
15	13B	23.2	19.3	16.8						
16	15A	21.4	17.8	16.8						
17	15B	24.2	19.7	~~18.6~~ 18.5						
18	17A	22.5	18.7	~~16.9~~ 16.8						
19	3A	26.2	21.4	~~18.3~~ 18.3						
20	7A	23.7	19.6	~~17.5~~ 17.3						
21	13B DUP	22.7	19.1	~~15.9~~ 15.9						
22	18A	27.9	23.3	~~16.5~~ 16.5						
23	20A	19.8	16.4	~~17.2~~ 17.2						
24	22A	22.1	19.4	~~12.2~~ 12.2						
25	24A	18.7	14.5	~~22.5~~ 22.5						
26	26A	21.2	17.9	~~15.6~~ 15.6						
27	7C	23.8	19.5	~~18.1~~ 18.1						
28	9C	19.5	17.2	~~11.8~~ 11.8						
29	11C	23.2	20.6	~~11.2~~ 11.2						
30	13C	23.2	19.8	~~14.7~~ 14.7						
31	17C	27.9	22.4	~~19.7~~ 19.7						
32	19C	24.8	21.0	~~15.5~~ 15.5						
33	21C	22.1	19.2	13.1						
34	25B	21.5	17.1	20.5						

[1] % Moisture = [(Weight of wet soil) - (Weight of dry soil)] x 100% / (Weight of wet soil)

[2] Dilution Factor is given in blocks 4a and 4b of the RaPID Prep Flowchart

[3] Incubation Time should be 15 min. for TNT and PCB, and 30 min. for PAH screening.

LABORATORY ANALYSIS LOG

Analyst: KME

	Sample Number	Test Tube No.	(3) Incubation 1 Start Time	Incubation 1 End Time	(4) Incubation 2 Start Time	Incubation 2 End Time	Date Analyzed	(5) Time Analyzed	Analyzer Reading	(6) Actual Conc. (ppb)
1	2A	1/1D	1635	1656	~~510~~ 1710	1730	3/1/99	17:42	0.02nd/[illegible]	nd/nd
2	4A	2							0.01nd	nd
3	6A	3							0.00nd	nd
4	8A	4							0.01nd	nd
5	10A	5							0.00nd	nd
6	12A	6							0.01nd	nd
7	14A	7							0.03nd	nd
8	16A	8							0.01nd	nd
9	1A	9							0.00nd	nd
10	9A	10/10D							0.00nd/[illegible]	nd/nd
11	9B	11							nd	nd
12	11A	12							0.01nd	nd
13	11B	13							nd	nd
14	13A	14							0.47	940
15	13B	15							0.03nd	nd
16	15A	16							0.02nd	nd
17	15B	17							0.00nd	nd
18	17A	18							0.00nd	nd
19	3A	19/19D							0.01nd/[illegible]	nd/nd
20	7A	20							0.04nd	nd
21	~~13B Dup~~ [illegible]	21							0.02nd	nd
22	18 A	22							nd	nd
23	20 A	23							0.03nd	nd
24	22 A	24							nd	nd
25	24 A	25							nd	nd
26	26 A	26							0.04nd	nd
27	7C	27							0.01nd	nd
28	9C	28/28D							0.05nd/0.03nd	nd/nd
29	11C	29							nd	nd
30	13C	30							0.07nd	nd
31	17C	31							nd	nd
32	19C	32							0.08nd	nd
33	21C	33							0.02nd	nd
34	25B	34							0.07nd	nd

(4) Incubation Time should be 20 min.

(5) Time Analyzed should be 15 min. after end of Incubation.

(6) Actual Concentration = (Analyzer Reading) x (Dilution Factor)

LABORATORY ANALYSIS LOG

Analyst: KME

	Sample Number	Wet Wt. (g)	Dry Wt. (g)	(1) % Moisture	Analyte	Lot Number	Extraction Date	Extraction Time	Weight of Soil Sample (g)	(2) Dilution Factor
1	1B	23.9	20.0	16.3	PCB	BK0027	2/6/99	10:00	10.0	2000
2	3B	22.0	18.9	14.1						
3	5A	24.9	22.6	16.0						
4	7B	21.8	18.4	15.6						
5	17B	20.8	17.2	17.3						
6	19A	25.2	21.5	17.0						
7	19B	22.8	18.9	17.1						
8	21A	23.8	20.1	15.5						
9	21B	23.6	20.3	14.0						
10	23A	19.5	15.0	23.1						
11	23B	17.9	13.0	27.4						
12	25A	22.2	18.4	17.1						
13	CONTROL-PCB - 2/6/99 1745	—	—	—	PCB			—	—	—
14										
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16										
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(1) % Moisture = [(Weight of wet soil) - (Weight of dry soil)] x 100% / (Weight of wet soil)

(2) Dilution Factor is given in blocks 4a and 4b of the RaPID Prep Flowchart

(3) Incubation Time should be 15 min. for TNT and PCB, and 30 min. for PAH screening.

LABORATORY ANALYSIS LOG

Analyst: KME

	Sample Number	Test Tube No.	(3) Incubation 1 Start Time	(3) Incubation 1 End Time	(4) Incubation 2 Start Time	(4) Incubation 2 End Time	Date Analyzed	(5) Time Analyzed	Analyzer Reading	(6) Actual Conc. (ppb)
1	1B	35	1635	1650	1710	1730	3/1/99	1742	0.03nd	nd
2	3B	36							0.06nd	nd
3	5A	37/37D							0.07nd/[illegible]	nd/nd
4	7B	38							0.02nd	nd
5	17B	39							nd	nd
6	19A	40							0.06nd	nd
7	19B	41							0.03nd	nd
8	21A	42							0.04nd	nd
9	21B	43							0.03nd	nd
10	23A	44							0.03nd	nd
11	23B	45							0.04nd	nd
12	25A	46							0.04nd	nd
13	CONTROL-PCB-3/1/99-[illegible]	C	↓	↓	↓	↓	↓	↓	3.22	3.22
14										
15										
16										
17										
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(4) Incubation Time should be 20 min.

(5) Time Analyzed should be 15 min. after end of Incubation.

(6) Actual Concentration = (Analyzer Reading) x (Dilution Factor)

Analyst: KMF

	Sample Number	Wet Wt. (g)	Dry Wt. (g)	(1) % Moisture	Analyte	Lot Number	Extraction Date	Extraction Time	Weight of Soil Sample (g)	(2) Dilution Factor
1	6A				PAH	[illegible]	2/26/99	10:00	10.0g	1000
2	3A	see original data sheet for first dilution time 3/2/99								
3	24A									
4	26A									
5	25B									
6	25A						↓	↓	↓	↓
7	CONTROL-PAH-3/2/99-135[illegible]	—	—	—	↓	↓	—	—	—	—
8										

LABORATORY ANALYSIS LOG

Analyst: KMF

	Sample Number	Wet Wt. (g)	Dry Wt. (g)	[1] % Moisture	Analyte	Lot Number	Extraction Date	Extraction Time	Weight of Soil Sample (g)	[2] Dilution Factor
1	6A				PAH	[illegible]	2/26/99	10:00	10.0g	1000
2	3A				↓	↓	↓	↓	↓	↓
3	24A				↓	↓	↓	↓	↓	↓
4	26A				↓	↓	↓	↓	↓	↓
5	25B				↓	↓	↓	↓	↓	↓
6	25A				↓	↓	↓	↓	↓	↓
7	CONTROL-PAH - 3/2/99 - 1350	—	—	—	↓	↓	—	—	—	—
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see original data sheet for first dilution time 3/2/99

[1] % Moisture = [(Weight of wet soil) - (Weight of dry soil)] x 100% / (Weight of wet soil)

[2] Dilution Factor is given in blocks 4a and 4b of the RaPID Prep Flowchart

[3] Incubation Time should be 15 min. for TNT and PCB, and 30 min. for PAH screening.

LABORATORY ANALYSIS LOG

Analyst: KME

	Sample Number	Test Tube No.	[3] Incubation 1 Start Time	[3] Incubation 1 End Time	[4] Incubation 2 Start Time	[4] Incubation 2 End Time	Date Analyzed	[5] Time Analyzed	Analyzer Reading	[6] Actual Conc. (ppb)
1	6A	1/1D	13:05	13:35	13:50	14:10	3/2/99	13:56	3.38/4.37	3380/4370
2	3A	2	↓	↓	↓	↓	↓	↓	2.71	2710
3	24A	3	↓	↓	↓	↓	↓	↓	5.64	5640
4	26A	4	↓	↓	↓	↓	↓	↓	4.46	4460
5	25B	5	↓	↓	↓	↓	↓	↓	3.72	3720
6	25A	6	↓	↓	↓	↓	↓	↓	5.89	5890
7	control run 3/2/99 1356	C	↓	↓	↓	↓	↓	↓	26.73	26.73
8										
9										
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[4] Incubation Time should be 20 min.

[5] Time Analyzed should be 15 min. after end of Incubation.

[6] Actual Concentration = (Analyzer Reading) x (Dilution Factor)

LABORATORY PROTOCOL FOR IMMUNOASSAY FIELD-SCREENING ANALYSIS

SET UP

1. Allow reagents to come to room temperature (approximately 1 hour).
2. Turn on Ohmicron RPA-I RaPID Analyzer™ spectrophotometer 30 minutes before use.

PREPARATION OF THE SOIL

1. Label foil muffin cups (mini aluminum cupcake "papers").
2. Break up clumps of soil in the sample. Weigh approximately 15 g of sample or more in the muffin cup. Record weight (for percent moisture). Place muffin cup into muffin tin (mini muffin bakeware).
3. Dry samples in well-vented oven overnight (approximately 8 hours) in muffin tins at 150°F.
4. Next morning, remove muffin tins from oven and allow samples to cool.
5. Weigh sample. Record weight (for percent moisture).
6. Grind sample with mortar and pestle. (When grinding sample, line mortar with aluminum foil to limit cross-contamination of the samples. Cover pestle with aluminum foil as well.)
7. Place unused weigh canoe on pan balance.
8. Press ON/MEMORY button on pan balance. Balance will beep and display 0.0.
9. Weigh out 10 ± 0.1 grams of sample using the wooden spatula.
10. If balance turns off prior to completing weighing, use empty weigh canoe to re-tare, then continue.

EXTRACTION

1. Uncap extraction jar and place on flat surface. Using a wooden spatula, transfer 10 grams of sample from the weigh canoe into the extraction jar.
2. Open ampule of methanol using the ampule cracker, and pour the entire contents into the extraction jar.
3. Recap the extraction jar and shake vigorously for one (1) minute.
4. Allow to settle for 1 minute or until a clear solvent layer is observed above the sample.
5. Repeat steps 1 through 4 for each sample to be tested.

FILTRATION

1. Label the top of the filtration plunger.
2. Insert the bulb pipette into top (liquid) layer in extraction jar and draw up sample. Transfer at least 1/2 bulb capacity into the filtration barrel.
3. Press plunger firmly into barrel until adequate filtered sample is available or until unit snaps together. Place on flat surface.
4. Repeat steps 1 through 3 for each sample to be tested.

DILUTION

1. Label the diluent vials with the same information as on the filtration plunger.
2. Add 250 µL of filtered extract to a vial of PAH Extract Diluent (12.25 mL). Cap vial. Invert several times to mix. *Dilution Factor = 100.*
3. Add 25 µL of filtered extract to a vial of PCB Extract Diluent (25 mL). Cap vial. Invert several times to mix. *Dilution Factor = 2,000.*

PREPARATION OF PAH ENZYME CONJUGATE

1. Reconstitute as directed.

PREPARATION OF THE TEST TUBES

1. Remove upper rack from the magnetic base.
2. Label test tubes for the standards, control, and samples.
3. Add the following to the bottom of the designated test tubes by inserting the pipet tip all the way into the tube without touching the sides or the bottom of the tube:

Tube Number	Content
1, 2	Diluent/Zero Standard, 0 ppb
3, 4	Standard 1
5, 6	Standard 2
7, 8	Standard 3
9	Control
10	Sample 1
↓	↓
60	Sample 51

For PAH, add 250 µL.

For PCB, add 200 µL.

ADDITION OF REAGENTS

1. Add 250 µL of the appropriate enzyme conjugate (deliver gently) to each test tube. (When adding the enzyme conjugate and magnetic particles, aim the pipet tip 1/4" to 1/2" below the tube rim without touching the rim or tube wall with the pipet tip; deliver liquid gently.)
2. For the PAH, add 500 µL of thoroughly mixed PAH antibody coupled magnetic particles. Vortex for 1 – 2 seconds. Incubate for *30 minutes* at room temperature.
3. For the PCB, add 500 µL of thoroughly mixed PCB antibody coupled magnetic particles to the appropriate test tubes. Vortex for 1 2 seconds. Incubate for *15 minutes* at room temperature.
4. Combine the upper rack with the magnetic base. Press all tubes into the base. Allow 2 minutes for the particles to separate.
5. *Do not separate the upper rack from the lower base.* Invert the test tubes and pour out contents. Blot the test tube rims gently.
6. Add 1 mL of washing solution down the inside wall of each test tube. Wait 2 minutes.
7. Invert the test tubes and pour out the contents. Blot the test tube rims gently.
8. Again, add 1 mL of washing solution to each test tube. Wait 2 minutes.
9. Invert the test tubes and pour out the contents. Blot the test tube rims gently.
10. Lift the upper rack (with its tubes) off the magnetic base. Add 500 µL of color reagent down the inside wall of the test tube. Vortex for 1 – 2 seconds.
11. Incubate for 20 minutes at room temperature. Record time for beginning and end of incubation period.
12. During incubation, add 1 mL of washing solution to a clean test tube for use as an instrument blank.
13. After incubation, add 500 µL of stopping solution to each tube.
14. Read results at 450 nm within *15 minutes* after adding the stopping solution.
15. Record time of analysis.
16. Multiply results of extracted soil samples by appropriate factor.

PAH DILUTION (For samples 2 ppm to 50 ppm):

1. Add 250 µL of filtered extract to a vial of PAH extract diluent (12.5 mL) according to original dilution instructions and mix thoroughly.
2. Add 250 µL of diluted extract (from 1st dilution) to 2.25 mL of PAH RaPID Assay diluent and mix thoroughly. *Dilution Factor = 1000.*
3. Proceed as directed.

PCB DILUTION (For samples 50 ppm to 1000 ppm)

1. Add 25 µL of filtered extract to a vial of PCB extract diluent (25 mL) according to original dilution instructions and mix thoroughly.
2. Add 25 µL of diluted extract (from 1st dilution) to 2.5 mL of PCB RaPID Assay diluent and mix thoroughly. *Dilution Factor = 200,000.*
3. Proceed as directed.

Strategic Diagnostics Inc.

Sample Extraction Kit User's Guide

Intended Use

For use in conjunction with the appropriate immunoassay test kit. Each Sample Extraction Kit Contains materials to process twelve (12) soil or wipe samples.

Principle

The reagents contained in the Sample Extraction Kit have been optimized for fast, efficient removal of compounds from soil or surfaces and convenient preparation of the sample for immunoassay testing at levels of interest to the investigator. The system allows for reliable, convenient and cost effective determinations at the field testing or remediation site.

Customer Support

If there are any questions regarding this procedure, please call the SDI Technical Services Department at 1-800-544-8881 or (302)-456-6789, before running samples to avoid costly mistakes.

Extraction Solvents

Extraction Solution - 100% Methanol

per kit: 12 ampules containing 20 mL each for use with:

- EnSys® PCB Soil and Wipe Test Systems (Item # 7020301, 7020601, 7021301 or 7021201)
- EnSys Petro Soil Test Systems (Item # 7042301 and 7043001)
- EnSys PAH Soil Test Systems (Item # 7061301 and 7060501)
- EnSys Penta Soil Test Systems (Item # 7000301)
- PCB RaPID Assay® (Item # A00133 and A00134)
- PAH RaPID Assay (Item # A00156 and A00157)
- Carcinogenic PAHs RaPID Assay (Item # A00200 and A00201)
- TNT RaPID Assay (Item # A00186)

Extraction Solution - 100% Methanol

per kit: 12 ampules containing 10 mL each for use with:

- EnviroGard® PCB in Soil and Wipe Test Kits (Item # 7020800, 7021600, 7021500 and 7021600)
- EnviroGard PAH in Soil Test Kit (Item # 7060600)
- EnviroGard Petroleum Hydrocarbons (BTEX) in Soil Test Kits (Item # 7004000)
- EnviroGard Petroleum Hydrocarbons (TPH) in Soil Test Kits (Item # 7042000)
- EnviroGard DDT in Soil Test Kits (Item # 7310000)

Extraction Solution - 90% Methanol

per kit: 12 ampules containing 20 mL each for use with:

- EnviroGard Chlordane in Soil test Kit (Item # 7311000)
- EnviroGard Toxaphene in Soil test Kit (Item # 7420000)
- EnviroGard Lindane in Soil Test Kit (Item # 7630000)

Extraction Solution - 75% Methanol

per kit: 12 ampules containing 10 mL each for use with:

- BTEX RaPID Assay (Item # A00161 and A00162)

Extraction Solution - 75% Methanol with Sodium Hydroxide

per kit: 12 ampules containing 20 mL each for use with:

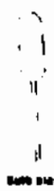
- Pentachlorophenol RaPID Assay (Item # A00110 and A00111)

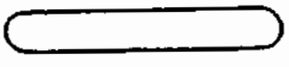
Extraction Solution - 100% Methanol with Surfactant

per kit: 12 ampules containing 10 mL each for use with:

- Cyclodienes RaPID Assay (Item # A00216)

Description of Contents





Wooden spatula

Template

Filter Modules

per kit: 12 filter plungers and barrels

Wooden Spatulas

per kit: 12 each (not in PCB Wipe Kit)

Weigh Canoes

per kit: 12 each (not in PCB Wipe Kit)

Disposable Transfer Pipettes

per kit : 12 each

Extraction Jars

per kit: 12 each with 3 bearings per jar (no bearings in PCB Wipe Kit)

Ampule Crackers

per kit: 3 each

Wipe Template

per kit: 12 each 10 cm by 10 cm plastic templates (PCB Wipe Kit only)

Gauze Wipes

per kit: 12 each (PCB Wipe Kit only)

Protective Gloves

per kit: 24 each (PCB Wipe Kit Only)

Sample Dilution

RaPID Assay Test Systems

- BTEX Extract Diluent: 12 vials containing 4.5 mL each (Item #I00654).
- PCB Extract Diluent: 12 vials containing 25 mL each. One (1) 25 µL disposable pipet with 12 tips (Item #I00538).
- Pentachlorophenol Extract Diluent: 12 vials containing 25 mL each. One (1) 50 µL disposable pipet with 12 tips (Item #I00479).
- PAH Extract Diluent: 12 vials containing 12.25 mL each (Item #I00623).
- Carcinogenic PAHs Extract Diluent: 12 vials containing 9.8 mL each (Item #I00798).
- TNT Extract Diluent: 12 vials containing 25 mL each. One (1) 50 µL disposable pipet with 12 tips (Item #I00745).
- Cyclodienes Extract Diluent: 12 vials containing 12.25 mL each (Item #I01024).

EnSys Soil Test Systems

- Dilution ampules provided dependent upon detection levels of interest.

EnviroGard Soil Test Systems

- No additional dilution materials required.

Reagent Storage and Stability

Store all reagents and components in a dry well ventilated area at 2-30°C.
Reagents may be used until the expiration date shown on the vials.
Consult local, state and federal regulations for proper disposal of all reagents.

Materials Not Provided

In addition to the materials provided, the following items will be necessary for the procedure:

- stopwatch or clock with second hand
- permanent marking pen
- protective gloves
- digital balance (available from SDI, Item # A00131)

Sample Information

This kit was validated for use with soil samples. Other types of sample matrices and solid wastes may require different procedures to efficiently extract compounds of interest. Contact SDI's Technical Services Department for application guidance.

Procedural Notes and Precautions

Do not use any reagent beyond its stated shelf life.

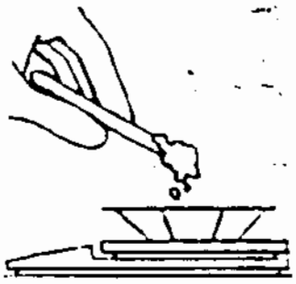
Continuous agitation of the soil sample in the presence of the extraction solution for the prescribed time is important for good extraction efficiency. Use of a timer or stopwatch to assure adequate shaking time is recommended.

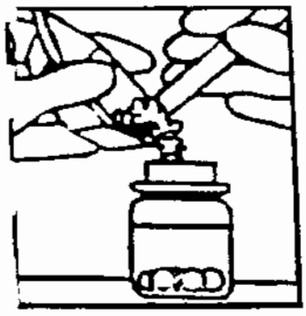
Avoid contact of extraction solution (methanol) with skin and mucous membranes. If this reagent comes in contact with skin wash with water.

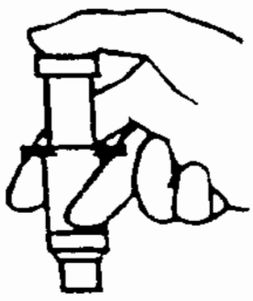
Limitations

The Sample Extraction Kit, when used in conjunction with the appropriate test kit, will provide screening results. Results may need to be confirmed by a non-immunological method.

Soil Extraction Procedure







WEIGH SAMPLE

1. Place unused weigh canoe on pan balance.
2. Press ON/MEMORY button on pan balance. Balance will beep and display 0.0.
3. Weigh out 10 ± 0.1 grams of sample using the wooden spatula.
4. If balanced turns off prior to completing weighing, use empty weigh canoe to re-tare then continue.
5. Repeat steps 1-4 for each sample to be tested.

EXTRACTION

1. Uncap extraction jar and place on flat surface. Using a wooden spatula, transfer 10 grams of sample from the weigh boat into the extraction jar.
2. Open solvent ampule and pour the entire contents into the extraction jar.
3. Recap the extraction jar and shake vigorously for one (1) minute.
4. Allow to settle for one (1) minute or until a clear solvent layer is observed above the sample.
5. Repeat steps 1-4 for each sample to be tested.

FILTRATION

1. Insert bulb pipet into top (liquid) layer in extraction jar and draw up sample. Transfer at least ½ bulb capacity into the filtration barrel. *Do not use more than one full bulb.*
2. Press plunger firmly into barrel until adequate filtered sample is available or unit snaps together. Place on flat surface.
3. Repeat steps 1-3 for each sample to be tested.

DILUTION

EnviroGard - Use the filtered extract as "SAMPLE" in the User's Guide Procedure.

EnSys - If the instructions start with Phase 1 *Extraction and Preparation of the Sample* in the User's Guide, skip to Phase 2 *Sample and Standard Preparation* and follow the remainder of the assay procedure and data interpretation. If the instructions start at Phase 1 *Sample & Standard Preparation*, continue with the instructions, as written.

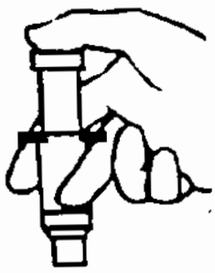
Note: Kit may contain additional ampules in order to achieve your test levels. Always transfer filtered sample to the dilution ampule labeled with the lowest PPM level and then transfer from this ampule to the next higher level dilution ampule.

RaPID Assay - Dilute the filtered extract into the appropriate Extract Diluent as described below or follow customized dilution procedure provided by the SDI Technical Services Department.

RaPID Assay Dilution

Contaminant	Extract Volume (µL)	Extract Diluent (mL)	Test Range (ppm)
PCB	25	25	0.5 to 10.0 (Aroclor 1254)
PAH	250	12.25	0.2 to 5.0 (Phenanthrene)
caPAH	200	9.8	0.01 to 0.5 (Benzo[a]pyrene
BTEX/TPH	500	4.5	0.9 to 30 (Total BTEX)
Pentachlorophenol	50	25	0.1 to 10.0 (PCP)
TNT	50	25	0.25 to 5.0 (TNT)
Cyclodienes	250	12.5	0.1 to 2.0 (Dieldrin)

Wipe Extraction Procedure



WIPE SAMPLE

1. Wearing the protective gloves provided, uncap the extraction jar.
2. Using an ampule cracker, open solvent ampule and pour the entire contents into the extraction jar.
3. Soak gauze pad in extraction jar containing solvent.
4. Remove gauze wipe from solvent and squeeze excess from pad back into extraction jar.
5. Hold clean template on surface to be wiped.
6. Wipe entire exposed area for 15-20 seconds. Wipe should be damp when finished.
7. Place wipe back into same extraction jar and cap tightly.
8. Remove and discard protective gloves.
9. Repeat steps 1-8 for each sample to be tested.

EXTRACTION

1. Shake each jar vigorously for one (1) minute.
2. Repeat step 1 for each sample to be tested.

FILTRATION

1. Disassemble filtration plunger from filtration barrel.
2. Insert bulb pipet into top (liquid) layer in extraction jar and draw up sample. Transfer at least ½ bulb capacity into the filtration barrel. *Do not use more than one full bulb.*
3. Press plunger firmly into barrel until adequate filtered sample is available or unit snaps together. Place on flat surface.
4. Repeat steps 1-3 for each sample to be tested.

DILUTION

EnviroGard - Use the filtered extract as "SAMPLE" in the User's Guide Procedure.

EnSys - If the instructions start with Phase 1 *Extraction and Preparation of the Sample* in the User's Guide, skip to Phase 2 *Sample and Standard Preparation* and follow the remainder of the assay procedure and data interpretation. If the instructions start at Phase 1 *Sample & Standard Preparation*, continue with the instructions, as written.

Note: Kit may contain additional ampules in order to achieve your test levels. Always transfer filtered sample to the dilution ampule labeled with the lowest PPM level and then transfer from this ampule to the next higher level dilution ampule.

RaPID Assay - Dilute the filtered extract into the appropriate Extract Diluent as described below or follow customized dilution procedure provided by the SDI Technical Services Department.

RaPID Assay Dilution

Contaminant	Extract Volume (µL)	Extract Diluent (mL)	Test Range (µg/100cm²)
PCB	25	25	5 to 100 (Aroclor 1254)

Assistance

For ordering or technical assistance contact:
Strategic Diagnostics Inc.
111 Pencader Drive
Newark, Delaware 19702-3322

(800)544-8881
(302)456-6789
Fax(302)456-6782
www.sdix.com
techservice@sdix.com

OHMICRON
...The Quality Difference

Product Profile

PCB RaPID Assay®

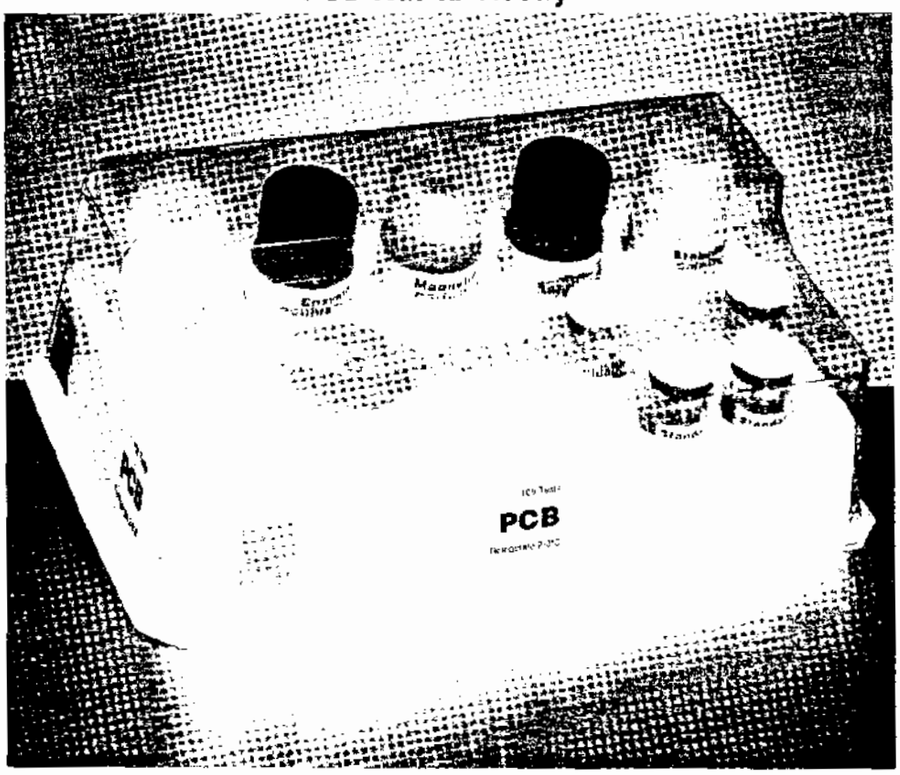
General Description

Polychlorinated biphenyls (PCBs) were marketed under the trade name Aroclor® from 1930 to 1977 for use in transformers, capacitors, printing inks, paints, pesticides and many other applications. The Toxic Substances Control Act (TOSCA, 1976), declared PCBs to be toxic and carcinogenic and banned manufacture.

PCBs are classified by the US EPA as Group B2 contaminants, a probable human carcinogen based on sufficient evidence in animals and inadequate data in human studies (US EPA, 1991). PCBs do not readily degrade in the environment and tend to bioaccumulate. The EPA has set a Maximum Contaminant Level for PCB in drinking water of 0.5 ppb and various levels in soil.

Current EPA-approved methods for the detection of PCBs are costly and require lengthy sample preparation, large volume extraction and solvent exchange. The PCB RaPID Assay® eliminates the need for clean-up steps and GC/ECD instrumentation.

The PCB RaPID Assay applies the principles of enzyme linked immunosorbent assay (ELISA) to the determination of PCBs. ELISAs use selective antibodies which are attached to solid supports, in combination with sensitive enzyme reactions. The immunochemical reaction provides high selectivity due to the extraordinary discriminatory capabilities of antibodies. The powerful catalytic ability of the enzyme provides highly sensitive detection. These features produce an analytical system capable of detecting very low levels of chemicals.



Features

Rapid – 60 results in less than 45 minutes.

Precise – within and between assay %CV <5% at 4.4 ppb.

Accurate – highly selective immunochemical method.

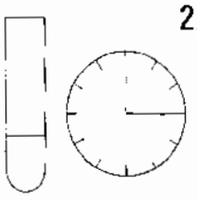
Efficient – rapid results can cut costs by allowing better personnel and equipment utilization.

Sensitive – least detectable dose in water of 0.2 ppb as Aroclor 1254 (90% B/Bo).

Test Range – water: 0.5 to 10.0 ppb as Aroclor 1254.
soil: 0.5 to 10.00 ppm.

PCB RaPID Assay® — Assay Protocol

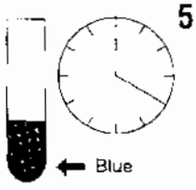
1. Add 200 µL of prepared sample, 250 µL enzyme conjugate, and 500 µL antibody coupled magnetic particles.



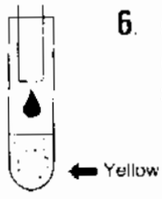
2. Incubate for 15 minutes.

3. Using the RaPID magnetic separator, decant, wash and vortex (2x).

4. Add 500 µL color reagent.



5. Incubate 20 minutes. Blue color develops.



6. Stop the reaction and read color at 450 nm. Solution turns yellow.

Performance

Specificity

The proprietary antibody used in this assay was developed to detect PCBs. The cross-reactivity with different Aroclors can be expressed as the least detectable dose (LDD) which is estimated at 90% B/B0.

Compound	LDD Water (ppb)	LDD Soil (ppm)	50% B/Bo Water (ppb)	50% B/Bo Soil (ppm)
Aroclor 1254	0.20	0.50	3.60	3.60
Aroclor 1260	0.20	0.30	2.30	2.30
Aroclor 1248	0.22	0.42	4.22	4.22
Aroclor 1242	0.34	0.80	8.80	8.80
Aroclor 1262	0.36	0.64	4.74	4.74
Aroclor 1232	0.84	2.24	18.76	18.76
Aroclor 1268	0.92	2.30	21.80	21.80
Aroclor 1016	0.94	2.70	25.60	25.60
Aroclor 1221	13.54	26.60	162.60	162.60

Precision

Water samples were fortified with Aroclor 1254 at different levels and assayed in singlicate five times over five days. The following results were obtained (n=25):

Sample #	1	2	3	4
Mean	0.86	3.10	4.36	8.04
% CV [a]	8.5	6.2	4.6	4.9
% CV [b]	15.7	6.1	0.6	2.5

[a] within assay [b] between assay

Recovery

Four water samples, taken from a small creek, local pond, well and municipal water source were fortified with various levels of Aroclor 1254 and assayed with this system. The following results were obtained (n=12):

Spike (ppb)	Recovery Mean ± S.D.	%
1.0	0.86 ± 0.08	86
3.0	3.18 ± 0.28	106
4.0	4.32 ± 0.36	108
8.0	7.68 ± 0.66	96
Average		99

Solvent Tolerances

The following solvents do not interfere with this assay when their concentration in the sample is at, or lower, than those listed.

Solvent	Maximum Conc. Tolerated
Acetone	5%
Acetonitrile	2%
DMF	5%
Methanol	10%
Methylene Chloride	0.2%

Results

When using the RPA-I RaPID Analyzer™, results are reported in ppb PCB. If read in a standard spectrophotometer, results from the calibrators are plotted on graph paper and used to determine final results. It is recommended that a control be included in each run. A positive control (3.0 ppb) is supplied with the PCB RaPID® Assay kit.

As with any analytical technique (GC, HPLC, etc.), positive results requiring some action should be confirmed by an alternate technology.

Ordering Information

PCB Products

RaPID Assay kit, 30 and 100 tests
Sample Diluent, 100 mL
Proficiency Samples
Sample Extraction kit, 20 tests

For ordering or technical assistance contact:

Sales Department
Ohmicron Environmental Diagnostics, Inc.
1-800-544-8881
1-215-860-5115
Fax 1-215-860-5213

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L00043

RAPID PREP™ FLOWCHART: PCB SOIL EXTRACTION PROTOCOL

1

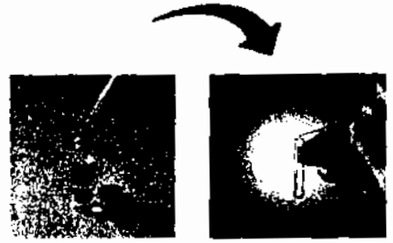
2

Disregard Soil Extraction steps 1 – 3, refer to User's Guide included in Sample Extraction Kit

3

4a *DILUTION SCHEME*
For samples 500 ppb to 10 ppm:
Add 25 µL of filtered extract to a vial of PCB Extract Diluent (25 mL).
Cap and mix by by inverting several times.
Factor = 2000.

4b *DILUTION SCHEME*
For samples 50 ppm to 1000 ppm:
Add 25 µL of filtered extract to a vial of PCB Extract Diluent (25 mL).
Mix.
Add 25 µL of diluted extract (from 1st dilution) to 2.5 mL of PCB RaPID Assay Diluent.
Mix thoroughly.
Factor = 200,000.



5 *ASSAY*
Analyze diluted extract as "sample" according to the PCB RaPID Assay procedure (see reverse).

Multiply results of extracted soil samples by appropriate factor.

For Ordering or Technical Assistance Contact:

SDI
Strategic Diagnostics Inc.
111 Pencader Drive
Newark, DE 19702
Phone: (800) 544-8881
Fax: (302) 456-6782

PCB Rapid Assay Kits
Part # A00133 30 Tests
 # A00134 100 Tests
RaPID Prep Soil Collection Kit A00127
RaPID Prep PCB Sample Extraction Kit A00137

PCB FLOWCHART: SOIL PROTOCOL

1

Remove upper rack from magnetic base.

Label test tubes for Standards, Control, and Samples.

Tube #	Content
1, 2	Diluent/Zero Standard, 0 ppb
3, 4	Standard 1, 0.25 ppb
5, 6	Standard 2, 1.0 ppb
7, 8	Standard 3, 5.0 ppb
9	Control
10	Sample 1
11	Sample 2

Add 200 µL of either Standards, Control or Diluted Soil Extract to the **bottom** of each test tube by inserting the pipet tip all the way into the tube without touching the sides or the bottom of the tube.

Add 250 µL of PCB Enzyme Conjugate down the inside wall of each tube by aiming the pipet tip 1/4" to 1/2" below the tube rim without touching the rim or tube wall with the pipet tip; deliver liquid gently.

3

Add 500 µL of **thoroughly** mixed PCB Antibody Coupled Magnetic Particles down the inside wall of each tube by using the technique described in Box 2. *Vortex* for 1 to 2 seconds (at low speed to minimize foaming).

4

Incubate 15 minutes at room temperature (15°-30°C).

5

Combine the upper rack with the magnetic base; **press all tubes into base;** allow 2 minutes for the particles to separate.

6

Do **not** separate upper rack from lower base. Using a smooth motion, *invert* the combined rack assembly over a sink and pour out the tube contents; keep inverted and **gently** blot the test tube rims on several layers of paper toweling.

7

Add 1 mL of Washing Solution down the inside wall of each tube. Vortex each tube. *Wait 2 minutes.* Using a smooth motion, invert the combined rack assembly over a sink and pour out the tube contents; keep inverted and **gently** blot the test tube rims on several layers of paper toweling.
Repeat this step.

8

Lift the upper rack (with its tubes) off the magnetic base; *add* 500 µL of Color Reagent down the inside wall of each tube by using the technique described in Box 2. *Vortex* for 1 to 2 seconds (at low speed to minimize foaming).

9

Incubate for 20 minutes at room temperature (15 - 30° C). During this period, add 1 mL of Washing Solution into a clean tube for use as an instrument blank in Step 10.

10

Add 500µL of Stopping Solution down the inside wall of each tube by using the technique previously described. *Read* results at 450nm within 15 minutes after adding the Stopping Solution. *Multiply* results of extracted soil samples by the appropriate factor.
[**Safety Caution:** Stopping Solution contains 0.5% sulfuric acid.]

For Ordering or Technical Assistance Contact:

Strategic Diagnostics Inc.
111 Pencader Drive
Newark, DE 19702
Phone: (800) 544-8881
Fax: (302) 456-6782

PCB Rapid Assay Kits
Part # A00133 30 Tests
 # A00134 100 Tests
RaPID Prep Soil Collection Kit A00127
RaPID Prep PCB Sample Extraction Kit A00137

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Product Profile

Total BTEX RaPID Assay®

General Description

Volatile organic compounds (VOCs), such as benzene, toluene, ethylbenzene and xylene (BTEX), are principal pollutants in petroleum contaminated sites. The adverse effects of VOCs vary widely depending on the compound, or mixture of compounds, their concentrations and exposure rates. Benzene has been shown to be a multiorgan carcinogen, a human leukemogen, a mutagen and a neurotoxin. Other BTEX components have these effects to varying degrees.

Petroleum-derived fuels, such as gasoline, jet fuel, diesel fuel and kerosene, are complex mixtures of organic compounds, predominantly hydrocarbons. Their compositions vary depending on the source of the crude oil and the refining process. As a result of their widespread use, VOCs are the most prevalent chemicals at contaminated sites across the United States and abroad. Contamination of soil and groundwater by refined petroleum products occurs frequently during their transport, processing and storage. A General Accounting Office survey identified one of the most prevalent sources of groundwater contamination as leaking underground storage tanks.

Soil and groundwater contamination by one or more VOCs are the primary focus of major characterizations, assessments and remedial actions for petroleum contaminated sites.

The RaPID Assay kit for Total BTEX offers a rapid, field-portable and cost-effective method of determining light fuel concentrations. Fuels or solvents containing BTEX or closely related aromatics can be detected using this kit. Gasoline, diesel fuel, kerosene, fuel oil and jet fuels can be detected at levels consistent with state and federal clean-up standards. The specificity and sensitivity of the test offer key advantages over current field methods and costs and time savings over laboratory methods.

The Total BTEX RaPID Assay applies the principles of enzyme linked immunosorbent assay (ELISA) to the determination of Total BTEX and closely related compounds. ELISAs use selective antibodies attached to solid supports in combination with sensitive enzyme reactions. The immunochemical reaction provides high selectivity for light aromatics due to the extraordinary discriminatory capabilities of antibodies. The powerful catalytic ability of the enzyme provides highly sensitive detection

Features

Rapid – 50 results in less than 60 minutes after sample preparation.

Precise – %CV 17% at 1 ppm in soil.
%CV 12% at 10 ppm in soil.

Accurate – highly selective immunochemical method.

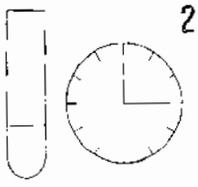
Efficient – rapid results can cut costs by allowing better personnel and equipment utilization.

Sensitive – least detectable dose is 0.02 ppm as Total BTEX Standard (90% B/B_0) in water.

Test Range – water: 0.02 to 3.0 ppm as Total BTEX Standard
soil: 0.2 to 30 ppm.

Total BTEX RaPID Assay® — Assay Protocol

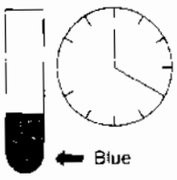
1 Add 200 µL of prepared sample, 250 µL enzyme conjugate, and 500 µL antibody coupled magnetic particles.



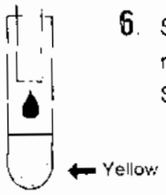
2. Incubate for 15 minutes.

3. Using the RaPID magnetic separator, decant and wash.

4. Add 500 µL color solution. Vortex.



5 Incubate 20 minutes. Blue color develops.



6. Stop the reaction and read color at 450 nm. Solution turns yellow.

Performance

Specificity

The Total BTEX RaPID Assay has an estimated minimum detectable concentration, based on a 90% B/B_0, of 0.02 ppm Total BTEX.

The cross reactivity of the Total BTEX RaPID Assay for various petroleum hydrocarbons can be expressed as the least detectable dose (LDD) which is estimated at 90% B/B_0, or as the concentration estimated (Inhibitory Concentration) at 50% B/B_0 (IC_{50}).

Compound	LDD Soil (ppm)	LDD Water (ppm)	IC_{50} Soil (ppm)	IC_{50} Water (ppm)
Total BTEX*	0.2	0.02	6.5	0.65
m-Xylene	0.3	0.03	18.0	1.80
p-Xylene	1.3	0.13	31.0	3.10
o-Xylene	2.2	0.22	47.0	4.70
Ethylbenzene	2.4	0.24	78.0	7.80
Toluene	4.4	0.44	74.0	7.40
Benzene	5.9	0.59	510.0	51.0
Naphthalene	0.3	0.03	5.9	0.59
1,2,4-Trimethylbenzene	0.4	0.04	11.5	1.15
Anthracene	0.6	0.06	26.0	2.60
Styrene	0.7	0.07	280.0	28.0
Hexachlorobenzene	0.8	0.08	NR	NR
Phenanthrene	0.8	0.08	16.0	1.60
Creosote	1.0	0.10	47.8	4.78
1,3,5-Trimethylbenzene	1.4	0.14	35.0	3.50
Acenaphthene	1.7	0.17	62.0	6.20
n-Propylbenzene	2.7	0.27	47.0	4.70
n-Hexane	6.3	6.30	NR	NR
n-Octane	34.0	3.40	NR	NR
n-Nonane	44.0	4.40	NR	NR
n-Heptane	23.5	2.35	720	72
Cyclohexane	83.0	8.30	NR	NR
n-Decane	135	13.5	NR	NR
Methylene Chloride	NR	NR	NR	NR
Trichloroethylene	NR	NR	NR	NR
Gasoline	4.3	0.43	421	42.1
Mineral Spirits	11.2	1.12	249	24.9
Diesel	12.9	1.29	162	16.2
Kerosene	15.0	1.50	240	24.0
Jet A-Fuel	27.0	2.70	335	33.5
Household Lubricant	158	15.8	NR	NR

* Total BTEX is defined as equivalent parts of benzene, toluene, ethylbenzene and *m*-, *o*- and *p*-xylene (i.e. 1 ppm Total BTEX is composed of 1 ppm each of benzene, toluene, ethyl benzene and *m*-, *o*- and *p*-xylene.) Alternatively, Results can be expressed as the sum of the components by multiplying the repeated value by 6.

NR = No Reactivity up to 100 ppm.
B = the mean absorbance value for standards or samples
B_0 = the mean absorbance value for the Zero Standard

Recovery

Four (4) drinking and well water samples were spiked with various levels of Total BTEX and then assayed using the Total BTEX RaPID Assay. The following results were obtained:

Amount of Total BTEX Added (ppm)	Recovery Mean (ppm)	Recovery S.D. (ppm)	Recovery %
0.15	0.13	0.02	88
0.50	0.52	0.07	105
1.00	1.12	0.13	112
1.50	1.67	0.19	111
Average			104

Precision

The following results were obtained in water:

Control	1	2	3	4
Replicates	5	5	5	5
Days	5	5	5	5
n	25	25	25	25
Mean (ppm)	0.10	0.51	1.82	2.30
% CV[a]	24.3	17.1	12.6	17.3
% CV[b]	9.6	4.4	4.8	18.5

[a] (within assay)
[b] (between assay)

The following results were obtained in soil:

Control	1	2
Replicates	10	10
Mean (ppm)	0.94	0.2
% CV	17.0	12.0

Results

When using the RPA-I RaPID Analyzer™, results are reported in ppm Total BTEX. If read in a standard spectrophotometer, results from the calibrators are plotted on graph paper and used to determine final results. It is recommended that a control be included in each run. A positive control (2.1 ppm) is supplied with the Total BTEX RaPID Assay kit.

As with any analytical technique (GC, HPLC, etc.) results requiring some action should be confirmed by an alternative technology.

Ordering Information

Products

Total BTEX RaPID Assay Kit, 30 Tubes
Total BTEX RaPID Assay Kit, 100 Tubes
Sample Diluent, 100 mL
Proficiency Samples
Sample Extraction Kit, 20 Tests
Total BTEX Soil System, 20 Tests
Total BTEX Soil System, 80 Tests

For ordering or technical assistance call:
Ohmicron Environmental Diagnostics, Inc.
(800) 544-8881
(215) 860-5115
Fax (215) 860-5213

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RAPID PREP™ FLOWCHART: TOTAL BTEX SOIL EXTRACTION PROTOCOL

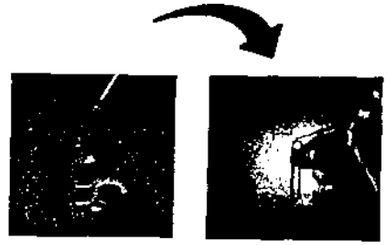
Disregard Soil Extraction steps 1 – 3, refer to User's Guide included in Sample Extraction Kit

4a *DILUTION SCHEME*

For samples 0.9 ppm to 30 ppm:
Add 500 µL of filtered extract to a vial of Total BTEX Extract Diluent (4.5 mL).
Cap and mix by by inverting several times.
Factor = 10.

4b *DILUTION SCHEME*

For samples 9 ppm to 300 ppm:
Add 500 µL of filtered extract to a vial of Total BTEX Extract Diluent (4.5 mL).
Mix.
Add 500 µL of diluted extract (from 1st dilution) to 4.5 mL of Total BTEX RaPID Assay Diluent.
Mix thoroughly.
Factor =100.



5 *ASSAY*

Analyze diluted extract as "sample" according to the Total BTEX RaPID Assay procedure (see reverse).

Multiply results of extracted soil samples by appropriate factor.

For Ordering or Technical Assistance Contact:

Strategic Diagnostics Inc.
111 Pencader Drive
Newark, DE 19702
Phone: (800) 544-8881
Fax: (302) 456-6782

Part # A00161	30 Tests
# A00162	100 Tests
RaPID Prep Soil Collection Kit	A00127
RaPID Prep Total BTEX Sample Extraction Kit	A00165

TOTAL BTEX FLOWCHART: SOIL PROTOCOL

1

Remove upper rack from magnetic base.

Label test tubes for Standards, Control, and Samples.

Tube #	Content
1, 2	Diluent/Zero Standard, 0 ppm
3, 4	Standard 1 0.09 ppm
5, 6	Standard 2 0.35 ppm
7, 8	Standard 3 3.0 ppm
9	Control
10	Sample 1
11	Sample 2

Add 200 µL of either Standards, Control or Diluted Soil Extract to the **bottom** of each test tube by inserting the pipet tip all the way into the tube without touching the sides or the bottom of the tube.

2

Add 250 µL of Total BTEX Enzyme Conjugate down the inside wall of each tube by aiming the pipet tip 1/4" to 1/2" below the tube rim without touching the rim or tube wall with the pipet tip; deliver liquid gently.

3

Add 500 µL of **thoroughly** mixed Total BTEX Antibody Coupled Magnetic Particles down the inside wall of each tube by using the technique described in Box 2. Vortex for 1 to 2 seconds (at low speed to minimize foaming).

4

Incubate for 15 Minutes at Room Temperature (15° - 30°C).

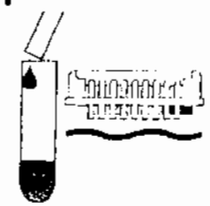
5

Combine the upper rack with the magnetic base; **press all tubes into base;** allow 2 minutes for the particles to separate.

6

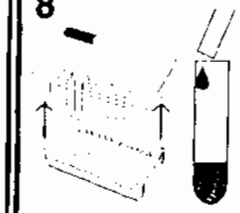
Do not separate upper rack from lower base. Using a smooth motion, *invert* the combined rack assembly over a sink and pour out the tube contents; keep inverted and **gently** blot the test tube rims on several layers of paper toweling.

7



Add 1 mL of Washing Solution down the inside wall of each tube. Wait 2 minutes. Using a smooth motion, slowly invert the combined rack assembly over a sink and pour out the tube contents; keep inverted and **gently** blot the test tube rims on several layers of paper toweling. **Repeat this step.**

8

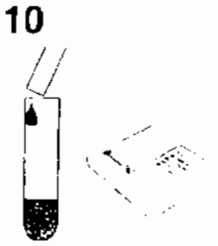


Lift the upper rack (with its tubes) off the magnetic base; add 500 µL of Color Reagent down the inside wall of each tube by using the technique previously described. Vortex for 1 to 2 seconds (at low speed to minimize foaming).

9

Incubate for 20 minutes at room temperature (15°-30° C). During this period, add 1 mL of Washing Solution into a clean tube for use as an instrument blank in Step 10.

10



Add 500 µL of Stopping Solution down the inside wall of each tube by using the technique previously described. Read results at 450 nm within 15 minutes after adding the Stopping Solution.
Multiply results of extracted soil samples by appropriate factor.

For Ordering or Technical Assistance Contact:

Strategic Diagnostics Inc.
111 Pencader Drive
Newark, DE 19702
Phone: (800) 544-8881
Fax: (302) 456-6782

Part # A00161 30 Tests
 # A00162 100 Tests
RaPID Prep Soil Collection Kit A00127
RaPID Prep Total BTEX Sample Extraction Kit A00165

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Product Profile

PAHs RaPID Assay®

General Description

Polynuclear or polycyclic aromatic hydrocarbons (PAHs) are a group of compounds composed of two or more fused rings. The U.S. EPA has identified 16 unsubstituted PAHs as priority pollutants.

Some of the four, five and six-ring PAHs such as chrysene, benzo[a]pryene and indeno[1,2,3-c,d]pryene are considered to be probable or possible human carcinogens. Benzo[a]pyrene is the most potent carcinogen among PAHs. The two and three-ring PAHs, such as naphthalene, anthracene and phenanthrene, are noncarcinogenic and are found as a component of certain grades of fossil fuels. They are referred to as the fuel PAHs. PAHs are introduced into the environment as a product of natural and fossil fuel combustion.

As a source of environmental contamination, PAHs are a serious problem at manufactured gas plants (MGP), coking operations, wood preserving sites that use creosote and petrochemical waste disposal sites. They are also commonly found in fuel products such as heating oil, diesel fuel and No. 6 fuel oil. The large number of these sites contaminated by PAHs in soil and groundwater has led federal and state agencies to mandate their clean-up. These agencies have set various regulatory levels for PAHs in soil, however, the usual concentrations of interest are 1 ppm to 10 ppm.

The current EPA-approved methods for the detection of PAHs are costly and require lengthy sample preparation, and large volume extraction. The PAHs RaPID Assay® eliminates the need for clean-up steps and GC/MS or HPLC instrumentation.

The PAHs RaPID Assay applies the principles of enzyme linked immunosorbent assay (ELISA) to the determination of PAHs. ELISAs use selective antibodies attached to solid supports in combination with sensitive enzyme reactions. The immunochemical reaction provides high selectivity due to the extraordinary discriminatory capabilities of antibodies. The powerful catalytic ability of the enzyme provides highly sensitive detection. These features produce an analytical system capable of detecting very low levels of chemicals.

Features

Rapid – 50 results in 60 minutes after sample preparation.

Precise – within and between assay %CV <15% at 5.10, 20 and 40 ppb.

Accurate – highly selective immunochemical method.

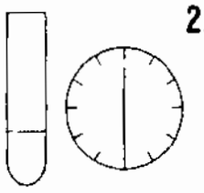
Efficient – rapid results can cut costs by allowing better personnel and equipment utilization.

Sensitive – least detectable dose in soil of 70 ppb as Phenanthrene (90% B/Bo).

Test Range – assay: 0.7 to 50.0 ppb as Phenanthrene; soil: 70 ppb to 5.0 ppm as Phenanthrene.

PAHs RaPID Assay® — Assay Protocol

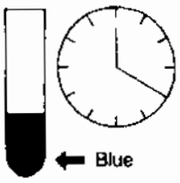
1. Add 250 µL of prepared sample, 250 µL enzyme conjugate, and 500 µL antibody coupled magnetic particles. Vortex.



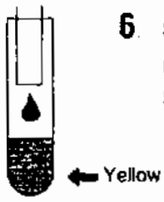
2. Incubate for 30 minutes.

3. Using the RaPID Magnetic Separator, decant, wash and vortex (2x).

4. Add 500 µL color solution.



5. Incubate 20 minutes. Blue color develops.



6. Stop the reaction and read color at 450 nm. Solution turns yellow.

Performance PAHs

Specificity

The cross reactivity of the PAHs RaPID Assay for various polynuclear aromatic hydrocarbons and petroleum products can be expressed as the least detectable dose (LDD) which is estimated at 90% B/Bo, or as the dose required to displace 50% (50% B/Bo).

Compound	LDD Water (ppb)	LDD Soil (ppm)	50% B/Bo Water (ppb)	50% B/Bo Soil (ppm)
Phenanthrene	0.93	.07	21.9	1.65
Fluoranthene	0.42	.032	6.3	.47
Benzo[a]pyrene	0.66	.050	9.2	.69
Pyrene	0.26	.020	10.2	.77
Chrysene	0.53	.040	10.4	.78
Anthracene	0.71	.054	14.6	1.1
Indeno[1,2,3-c,d]pyrene	1.03	.078	36.2	2.72
1,2 Benzanthracene	1.02	.077	37.8	2.84
Fluorene	2.19	.165	46.8	3.52
Benzo[b]fluoranthene	1.21	.091	72.1	5.42
Acenaphthylene	13.3	1.0	594	44.7
Benzo[k]fluoranthene	1.02	.077	697	52.4
Acenaphthalene	1.71	1.29	915	68.8
1,12-Benzoperylene	19.5	1.47	>1,333	>100
Naphthalene	86.4	6.50	>1,333	>100
1,2:5,6-Dibenzanthracene	34.1	2.57	>1,333	>100
Creosote	1.46	.11	21.9	1.65
Fuel Oil #6	6.65	.50	71.4	5.37
Heating Oil	17.08	1.28	388	29.2
Diesel Fuel	26.06	1.96	661	49.7
Gasoline	13.30	100	>13,333	>1000
Kerosene	1662.5	125	>13,333	>1000
Jet A Fuel		>1000	>13,333	>1000

100ppm Diesel =1ppm Rapid
Soil values are 100 times higher)

Recovery

Diluted soil extracts were spiked with various levels of PAHs (as Phenanthrene) and then assayed using the PAHs RaPID Assay. The following results were obtained:

Amount of PAHs Added (ppb)	Recovery Mean (ppb)	Recovery S.D. (ppb)	Recovery %
5.0	5.48	0.80	110
7.5	8.67	1.31	116
20.0	21.98	3.01	110
40.0	42.08	4.80	105
Average			110

Precision

The following results were obtained:

Control	1	2	3	4
Replicates	5	5	5	5
Days	5	5	5	5
n	25	25	25	25
Mean (ppb)	5.48	8.67	21.98	42.08
% CV[a]	9.2	7.2	5.6	5.5
% CV[b]	12.5	14.5	13.7	10.9

[a] (within assay)
[b] (between assay)

Results

When using the RPA-I RaPID Analyzer™, results are reported in ppb PAHs. If read in a standard spectrophotometer, results from the calibrators are plotted on graph paper and used to determine final results. It is recommended that a control be included in each run. A positive control (25.0 ppb) is supplied with the PAHs RaPID Assay kit. If soil samples are run, results should be multiplied by the appropriate factor.

As with any analytical technique (GC, HPLC, etc.) results requiring some action should be confirmed by an alternative technology.

Ordering Information

PAHs Products

RaPID Assay kit, 30 and 100 tubes
Sample Diluent, 100 mL
Proficiency Samples
Sample Extraction kit, 20 tests
PAHs Soil System, 20 tests
PAHs Soil System, 80 Tests

For ordering or technical assistance contact:

Sales Department
Ohmicron Environmental Diagnostics, Inc.
1-800-544-8881
(215) 860-5115
Fax (215) 860-5213

RAPID PREP™ FLOWCHART: PAH's SOIL EXTRACTION PROTOCOL

1

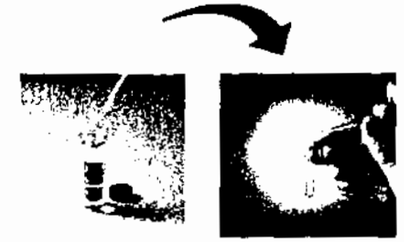
2

Disregard Soil Extraction steps 1 – 3, refer to User's Guide included in Sample Extraction Kit

3

4a *DILUTION SCHEME*
For samples 200 ppb to 5 ppm:
Add 250 µL of filtered extract to a vial of PAH's Extract Diluent (12.25 mL).
Cap and mix by by inverting several times.
Factor = 100.

4b *DILUTION SCHEME*
For samples 2 ppm to 50 ppm: (see Environmental User's Guide
Add 250 µL of filtered extract to a vial of PAH's Extract Diluent (12.25 mL).
Mix.
Add 25o µL of diluted extract (from 1st dilution) to 2.25 mL of PAH's RaPID Assay Diluent.
Mix thoroughly.
Factor = 1,000.



5 *ASSAY*
Analyze diluted extract as "sample" according to the PAH's RaPID Assay procedure (see reverse).

Multiply results of extracted soil samples by appropriate factor.

For Ordering or Technical Assistance Contact:

Strategic Diagnostics Inc.
111 Pencader Drive
Newark, DE 19702
Phone: (800) 544-8881
Fax: (302) 456-6782

Part # A00156 30 Tests
 # A00157 100 Tests
RaPID Prep Soil Collection Kit A00127
RaPID Prep PAH's Sample Extraction Kit A00160

PAH's FLOWCHART: SOIL PROTOCOL

1

Prepare PAH's Enzyme conjugate for use.
- reconstitute as directed
  or
- thaw previously prepared frozen aliquots

Remove upper rack from magnetic base.

Label test tubes for Standards, Control, and Samples.

Tube #	Content
1, 2	Diluent/Zero Standard, 0 ppb
3, 4	Standard 1 2.0 ppb
5, 6	Standard 2 10.0 ppb
7, 8	Standard 3 50.0 ppb
9	Control
10	Sample 1
11	Sample 2

Add 250 µL of either Standards, Control or Diluted Soil Extract to the **bottom** of each test tube by inserting the pipet tip all the way into the tube without touching the sides or the bottom of the tube.

2

Add 250 µL of PAH's Enzyme Conjugate down the inside wall of each tube by aiming the pipet tip 1/4" to 1/2" below the tube rim without touching the rim or tube wall with the pipet tip; deliver liquid gently.

3

Add 500 µL of **thoroughly** mixed PAH's Antibody Coupled Magnetic Particles down the inside wall of each tube by using the technique described in Box 2. Vortex for 1 to 2 seconds (at low speed to minimize foaming).

4

Incubate for 30 Minutes at Room Temperature (15° - 30°C).

5

Combine the upper rack with the magnetic base; **press all tubes into base;** allow 2 minutes for the particles to separate.

6

Do **not** separate upper rack from lower base. Using a smooth motion, *invert* the combined rack assembly over a sink and pour out the tube contents; keep inverted and **gently** blot the test tube rims on several layers of paper toweling.

7

Add 1 mL of PAH's Washing Solution down the inside wall of each tube. *Vortex* each tube. Wait 2 minutes. Using a smooth motion, invert the combined rack assembly over a sink and pour out the tube contents; keep inverted and **gently** blot the test tube rims on several layers of paper toweling.
Repeat this step.

8

Lift the upper rack (with its tubes) off the magnetic base; add 500 µL of Color Reagent down the inside wall of each tube by using the technique previously described. Vortex for 1 to 2 seconds (at low speed to minimize foaming).

9

Incubate for 20 minutes at room temperature (15 - 30 C). During this period, add 1 mL of Washing Solution into a clean tube for use as an instrument blank in Step 10.

10

Add 500 µL of Stopping Solution down the inside wall of each tube by using technique previously described. Read results at 450 nm within 15 minutes after adding the Stopping Solution. Multiply results of extracted soil samples by appropriate factor.

For Ordering or Technical Assistance Contact:

gnostics, Inc.

Strategic Diagnostics Inc.
111 Pencader Drive
Newark, DE 19702
Phone: (800) 544-8881
Fax: (302) 456-6782

Part # A00156 30 Tests
 # A00157 100 Tests
RaPID Prep Soil Collection Kit A00127
RaPID Prep PAH's Sample Extraction Kit A00160

APPENDIX B

LABORATORY ANALYTICAL DATA

LABORATORY DATA REPORT

Prepared for:

99th USARC - Horsham

Prepared by:

EA Laboratories
19 Loveton Circle
Sparks, MD 21152

Report 990201

March 1999

TABLE OF CONTENT
99th USARC - Horsham
EA Laboratories Report 990201

TABLE OF CONTENT
99th USARC - Horsham
EA Laboratories Report 990201

TABLE OF CONTENT
99th USARC - Horsham
EA Laboratories Report 990201

TABLE OF CONTENT
99th USARC - Horsham
EA Laboratories Report 990201

TABLE OF CONTENT
99th USARC - Horsham
EA Laboratories Report 990201

1. NARRATIVE

EA Laboratories
ANALYTICAL NARRATIVE

Client: **EA Eng., Sci., & Tech., Inc.**
Site: **99th USARC - Horsham**
Project number: **61140.01**

EA Laboratories Report: **990201**
Laboratory Project Manager: **Natasha K. Sullivan**
Report Date: **23 March 1999**

This report contains the results of the analysis of 11 soil samples collected on 23 February 1999 in support of the referenced project.

SAMPLE RECEIPT

The samples arrived intact by hand at EA Laboratories on 24 February 1999. Upon receipt, the samples were inspected and compared with the chain-of-custody record. The samples were then logged into the laboratory computer system with assigned laboratory accession numbers and released for analysis.

Client Sample Designation	EA Lab Number
1B	9901535
3B	9901536
7B	9901537
9B	9901538
11B	9901539
13B	9901540
17B	9901541
19B	9901542
21B	9901543
25B	9901544
DUP	9901545

Following this narrative section are a description of analytical methods used (Table 1), glossaries of data qualifiers (Tables 2 and 3), and the original chain-of-custody record. Analytical results and quality control information are summarized in the appended data package which has been formatted to be consistent with the deliverable requirements of this project.

QUALITY CONTROL

The following sections are ordered as the data appears in this report. They contain observations made during sample analysis, summarize the results of quality control measurements, and address the impact on data usability based upon project Data Quality Objectives. For each fractional analysis the narrative includes:

- Sample chronology: This section summarizes the sample history by fraction including the sample preparation method and date, analytical method, and analysis date. Anything unusual about the

samples, digestates, or extracts is identified. Holding time compliance is evaluated in this section.

- Laboratory method performance: All quality control criteria for method performance must be met for all target analytes for data to be reported. These criteria generally apply to instrument tune, calibration, method blanks, and Laboratory Control Samples (LCS). In some instances where method criteria fail, useable data can be obtained and are reported with client approval. The narrative will then include a thorough discussion of the impact on data quality.

- Sample performance: Quality control field samples are analyzed to determine any measurement bias due to the sample matrix based on evaluation of matrix spikes (MS), matrix spike duplicates (MSD), and laboratory duplicates (D). If acceptance criteria are not met, matrix interferences are confirmed either by reanalysis or by inspection of the LCS results to verify that laboratory method performance is in control. Data are reported with appropriate qualifiers or discussion.

VOLATILES by GC/MS - SOIL (EA9901535 - EA9901545)

Sample Chronology: Eleven samples and associated quality control were analyzed on 04 - 05 March 1999 for the project list of analytes by USEPA SW-846, Methods 5035/8260B. All holding times were met.

The batch MS/MSD was performed on another client's sample. All data associated with these QC analyses have been included in this report to fulfill reporting requirements. However, recoveries were not evaluated since they do not apply to the samples associated with this report.

Laboratory Method Performance: All laboratory method performance criteria was met for the reported samples.

Sample Performance: All quality control criteria were met for the reported samples with the following exceptions:

- all samples, with the exception of samples 1B and 21B, had one or more surrogate recoveries above the upper QC limits. These samples could not be reanalyzed due to insufficient sample volumes. These high recoveries may be indicative of a positive matrix bias for certain target analytes.

- samples 3B, 11B, 13B, 17B, 19B, 21B and DUP had reportable concentrations of methylene chloride above instrument calibration range. Sample 25B had a reportable concentration of acetone above the instrument calibration range. However, dilutions for these samples could not be completed due to insufficient sample volumes.

EA Laboratories
ANALYTICAL NARRATIVE

Client: **EA Eng., Sci., & Tech., Inc.**
Site: **99th USARC - Horsham**
Project number: **61140.01**

EA Laboratories Report: **990201**
Laboratory Project Manager: **Natasha K. Sullivan**
Report Date: **23 March 1999**

SEMIVOLATILES by GC/MS - SOIL (EA9901535 - EA9901545)

Sample Chronology: The samples and associated quality control were extracted on 01 March 1999 by SW-846 Method 3550C. The extracts were analyzed on 03 and 04 March 1999 for the Target Compound List of analytes by SW-846 Method 8270C. All holding times were met.

Duplicate LCSs were extracted and analyzed in lieu of an MS/MSD.

Method Performance: All laboratory method performance criteria were met for the reported samples with the following exceptions:

The LCS/LCSD had the recoveries for the control analytes phenol (109%,107%) and 4-chloro-3-methylphenol (98%,101%) just above the upper QC limits of 97% and 96%, respectively. The LCS also had the recovery of 2-chlorophenol above the upper QC limit of 98% at 99%. These recoveries are not indicative of a measurement bias.

Sample Performance: All quality control criteria were met for the reported samples.

CHLORINATED PESTICIDES/PCBs by GC - SOIL (EA9901535 - EA9901545)

Sample Chronology: The samples and associated quality control were extracted on 01 March 1999 by SW-846 Method 3550. The extracts were analyzed on 7-8 March 1999 for the project list of analytes by SW-846 Methods 8081A/8082. All sample holding times were met.

No MS/MSDs were extracted with the samples, however, duplicate LCSs were extracted and analyzed along with the samples.
Laboratory Method Performance: All laboratory method performance criteria were met for the reported samples.

Sample Performance: All quality control criteria were met for the reported samples.

METALS - SOIL (EA9901535-EA9901545)

Sample Chronology: Eleven samples were prepared (SW846 method 3050/7471M) on 5-8 March 1999 and analyzed for TAL metals by SW846 method 6010/7841/7471 on 9-19 March 1999.

Laboratory Method Performance: All laboratory method performance criteria were met for the reported samples.

Sample Performance: All quality control criteria were met for the reported samples with the following exceptions:

EA Laboratories
ANALYTICAL NARRATIVE

Client: **EA Eng., Sci., & Tech., Inc.**
Site: **99th USARC - Horsham**
Project number: **61140.01**

EA Laboratories Report: **990201**
Laboratory Project Manager: **Natasha K. Sullivan**
Report Date: **23 March 1999**

The recovery of antimony (32.2%,30.3%) and lead (176.4%-MS only) in the matrix spike and matrix spike duplicate is outside of the control limits (75%-125%), indicating the potential for bias to the sample data.

The RPD of the lead (29.3%), iron (23.9%), and potassium (37.1%) duplicates is above the upper control limit (20%).

CERTIFICATION OF RESULTS

The Laboratory certifies that this report meets the project requirements for analytical data as stated in the Analytical Task Order (ATO) and the chain-of-custody. In addition, the Laboratory certifies that the data as reported meet the Data Quality Objectives for precision, accuracy, and completeness specified for this project or as stated in EA Laboratories Quality Assurance program for other than the conditions detailed above. Release of the data contained in this report has been authorized by the appropriate Laboratory Manager as verified by the following signature.

March 23, 1999
Natasha K. Sullivan, Laboratory Project Manager

010001

Matrix	Reference
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997
SO	EPA, 1997

Revised: July 18, 1997/mew
Supersedes: February 10, 1997/ams

TABLE 1. ANALYTICAL METHODS

Parameter	Method	Reference Method	EAL Method SOP	Matrix	Reference
SAMPLE PREPARATION					
Metals Digestion	Nitric Acid - Hydrogen Peroxide	3050A	EAL-M-3050A	SO	EPA, 1997
Organics Extraction	Soxhlet Extraction	3540A	EAL-M-3540A	SO	EPA, 1997
Volatile Organics Preparation	Purge and trap	5030A	EAL-M-5030A-P	SO	EPA, 1997
ORGANICS					
Acid Extractable Organics	Gas Chromatography/Mass Spectrometry	8270B	EAL-M-8270B	SO	EPA, 1997
Base-Neutral Extractable Organics	Gas Chromatography/Mass Spectrometry	8270B	EAL-M-8270B	SO	EPA, 1997
Halogenated Hydrocarbon Pesticides	Gas Chromatography - ECD	8080A	EAL-M-8080A	SO	EPA, 1997
Polychlorinated Biphenyls	Gas Chromatography - ECD	8082	EAL-M-8081A/8082	SO	EPA, 1997
Volatile Organics	GC/MS - Capillary Column Technique	8260B	EAL-M-8260B	SO	EPA, 1997
METALS					
Aluminum	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Arsenic	Atomic Absorption - Furnace	7060A	EAL-M-7060A	SO	EPA, 1997
Barium	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Beryllium	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997

TABLE 1. ANALYTICAL METHODS

Parameter	Method	Reference Method	EAL Method SOP	Matrix	Reference
Cadmium	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Calcium	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Chromium, Total	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Copper	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Iron	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Lead	Atomic Absorption - Furnace	7421		SO	EPA, 1997
Magnesium	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Manganese	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Mercury	Atomic Absorption - Cold Vapor	7471A	EAL-M-7471A-P	SO	EPA, 1997
Nickel	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Potassium	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Selenium	Atomic Absorption - Furnace	7740		SO	EPA, 1997
Silver	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Sodium	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Thallium	Atomic Absorption - Furnace	7841		SO	EPA, 1997

TABLE 1. ANALYTICAL METHODS

Parameter	Method	Reference Method	EAL Method SOP	Matrix	Reference
Vanadium	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997
Zinc	Atomic Emission - ICP	6010A	EAL-M-6010A	SO	EPA, 1997

Matrix codes:

SO - Soils, sludges, sediments, wastes

References:

EPA, 1997 United States Environmental Protection Agency. June 1997. Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846, 3rd edition. including UPDATE III. U.S. EPA, Washington, D.C.

TABLE 2. LABORATORY ORGANIC ANALYSIS DATA QUALIFIERS [1]

Qualifiers other than those listed below may be required to properly define the results. If used, they are given an alphabetic designation not already specified in this table or in a project/program document. such as a Quality Assurance Project Plan or a contract Statement of Work. Each additional qualifier is fully described in the Analytical Narrative section of the laboratory report.

U Indicates a target compound was analyzed for but not detected. The sample Reporting Limit (RL) is corrected for dilution and, if a soil sample, for percent moisture, if reported on a dry weight basis.

J Indicates an estimated value. This qualifier is used under the following circumstances:

1) when estimating a concentration for tentatively identified compounds (TICs) in GC/MS analyses, where a 1:1 response is assumed,
2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the RL but greater than the method detection limit (MDL).

B This qualifier is used when the analyte is found in the associated method blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. For GC/MS analyses, this qualifier is used for a TIC, as well as, for a positively identified target compound.

E This qualifier identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

D When applied, this qualifier identifies all compound concentrations reported from a secondary dilution analysis.

A This qualifier indicates that a TIC is a suspected aldol-condensation product.

N Indicates presumptive evidence of a compound. This qualifier is only used for GC/MS TICs, where the identification is based on a mass spectral library search. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N qualifier is not used.

P When applied, this qualifier indicates a reported value from a GC analysis when there is greater than 25% difference for detected concentrations between the two GC columns.

---

(1) These Data Qualifiers are added by the laboratory to provide additional information for the reported results. ***They should not be confused with the qualifiers applied to the reported data as a result of a data validation process performed independently of the laboratory reporting procedure.***

TABLE 3. LABORATORY INORGANIC ANALYSIS DATA QUALIFIERS [1]

C ***(Concentration) qualifiers:***

B	Reported value is less than the project-specified Reporting Limit (RL), but greater than the method-specified Instrument Detection Limit (IDL) or Method Detection Limit (MDL).
U	Analyte analyzed for but not detected (concentration is less than the method-specified Instrument Detection Limit (IDL) or Method Detection Limit (MDL).

Q ***(Quality control) qualifiers:***

E	Reported value is estimated because of presence of interference.
M	Duplicate injection precision not met.
N	Spiked sample recovery is not within control limits.
S	Reported value is determined by the method of standard additions (MSA).
W	Postdigestion spike for furnace Atomic Absorption Spectrophotometric (AAS) AAS analysis is out of control limits (85-115%) and sample absorbance is less than 50% of spike absorbance.
*	Duplicate analyses is not within control limits.
+	Correlation coefficient for MSA is less than 0.995.

M ***(Method) qualifiers:***

P	Inductively Coupled Plasma (ICP)
A	Flame AAS
F	Furnace AAS
CV	Cold Vapor AAS
AV	Automated Cold Vapor AAS
AS	Semiautomated Spectrophotometric
C	Manual Spectrophotometric
T	Titrimetric
NR	Analyte is not required to be determined.

(1) These Data Qualifiers are added by the laboratory to provide additional information for the reported results. ***They should not be confused with the qualifiers applied to the reported data as a result of a data validation process performed independently of the laboratory reporting procedure.***

2. CHAIN-OF-CUSTODY

020000

Chain of Custody Record

EA Laboratories
19 Loveton Circle
Sparks, MD 21152
Telephone: (410) 771-4920
Fax: (410) 771-4407

Company Name: EA Eng.
Project No. 60957.73
Dept.: 2121 Task: 0002
Sample Storage Location: VA1 / I7
Page 1 of 1

Project Manager or Contact: Vince Williams
Phone: 771 4950
Project Name: 99th USARC - Horsham
ATO Number:
Report #: 990201

Report Deliverables: 1 2 3 (4) (D) E
EDD: (Yes)/No FASTANDARD
DUE TO CLIENT: 3-17-99 ~~DBASE~~ Excel

Parameters/Method Numbers for Analysis

Date	Time	Water	Soil	Sample Identification (19 Characters)	No. of Containers	SVOCs Method 8270	TCL PCBs/Pests 8081/8082	TAL Metals 6010/7000	VOCs (Encore Samples) 5035/8260	EA Labs Accession Number
2/23/99	1200		X	1B	3	X	X	X	X	9901535
2/23/99	1040		X	3B	3	X	X	X	X	9901536
2/23/99	1345		X	7B	3	X	X	X	X	9901537
2/23/99	1355		X	9B	3	X	X	X	X	9901538
2/23/99	0900		X	11B	3	X	X	X	X	9901539
2/23/99	0910		X	13B	3	X	X	X	X	9901540
2/23/99	0930		X	17B	3	X	X	X	X	9901541
2/23/99	0955		X	19B	3	X	X	X	X	9901542
2/23/99	1000		X	21B	3	X	X	X	X	9901543
2/23/99	1115		X	25B	3	X	X	X	X	9901544
2/23/99			X	DUP	3	X	X	X	X	9901545

Additional column headings: Need the by Geeth; * VA AND ?

Remarks: LPM: MS BUU
All samples to be run for TCL SVOCs, PCBs/Pests, and TAL metals. 5-gram encore samples to be run for VOCs by method.
Please make sure that the highlighted compounds on the attached sheet are covered under the listed analyses.

AS per Vince Williams Report attached compounds for VOA & P SVOA plus TCL analytes 3/3/99 3/3/99

X ~~SEE ATTACHED LIST FOR SVOA COMPOUNDS~~) and VOA compounds

Only one Encore provide Run Low level and Dexsulf ... low level 4727

Not enough sample for MS/MSD, Do duplicate ...

L15634

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	2/23/99 1400	[signature]	2/24/99 1000		

Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time	Airbill Number:
		Janita Corum	2/24/99 1030	

Cooler Temp. N/A pH: __ Yes __ No Comments: Custody Seals Intact ☐ Yes ☐ No None

Sample Shipped by: (Circle) Fed Ex. Puro. UPS (Hand Carried) Other:

NOTE: Please indicate method number for analyses requested. This will help clarify any questions with laboratory techniques.

WHITE—EA Laboratories YELLOW—EA Laboratories PINK—Project Manager *Shaded Areas for Lab Use Only*

990213

000001

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901535 1B 02/23/99				9901536 3B 02/23/99				9901537 7B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
1,1,1-Trichloroethane	10,000,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
1,1,2,2-Tetrachloroethane	5,500	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
1,1,2-Trichloroethane	20,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
1,1-Dichloroethane	200,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
1,1-Dichloroethene	6,400	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
1,2-Dibromoethane	210	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
1,2-Dichloroethane	12,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
1,2-Dichloroethene, total	670,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
1,2-Dichloropropane	16,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
2-Butanone	10,000,000	ug/kg	11	U	11	1	11	U	11	1	11	U	11	1
2-Hexanone		ug/kg	11	U	11	1	11	U	11	1	11	U	11	1
4-Methyl-2-pentanone		ug/kg	11	U	11	1	11	U	11	1	11	U	11	1
Acetone	10,000,000	ug/kg	**89**		11	1	**92**		11	1	**140**		11	1
Benzene	38,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Bromodichloromethane	8,600	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Bromoform	290,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Bromomethane	95,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Carbon disulfide	10,000,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Carbon tetrachloride	21,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Chlorobenzene	4,400,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Chloroethane	10,000,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Chloroform	14,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Chloromethane	180,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
cis-1,3-Dichloropropene		ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Dibromochloromethane		ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Ethylbenzene	10,000,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Isopropylbenzene	170,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Methylene chloride	670,000	ug/kg	**120**		5	1	**300**	E	5	1	**180**		5	1
Naphthalene	8,800,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Styrene	10,000,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
tert-Butyl methyl ether	10,000,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Tetrachloroethene	340,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Toluene	7,600,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
trans-1,3-Dichloropropene		ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Trichloroethene	190,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Vinyl chloride	3,800	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1
Xylenes, total	10,000,000	ug/kg	5	U	5	1	5	U	5	1	5	U	5	1

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Summary Table 1. Volatile results for samples in report 990261 Page 2 of 4.

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901538 9B 02/23/99				9901539 11B 02/23/99				9901540 13B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
1,1,1-Trichloroethane	10,000,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
1,1,2,2-Tetrachloroethane	5,500	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
1,1,2-Trichloroethane	20,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
1,1-Dichloroethane	200,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
1,1-Dichloroethene	6,400	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
1,2-Dibromoethane	210	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
1,2-Dichloroethane	12,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
1,2-Dichloroethene, total	670,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
1,2-Dichloropropane	16,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
2-Butanone	10,000,000	ug/kg	12	U	12	1	12	U	12	1	11	U	11	1
2-Hexanone		ug/kg	12	U	12	1	12	U	12	1	11	U	11	1
4-Methyl-2-pentanone		ug/kg	12	U	12	1	12	U	12	1	11	U	11	1
Acetone	10,000,000	ug/kg	110		12	1	120		12	1	45		11	1
Benzene	38,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Bromodichloromethane	8,600	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Bromoform	290,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Bromomethane	95,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Carbon disulfide	10,000,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Carbon tetrachloride	21,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Chlorobenzene	4,400,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Chloroethane	10,000,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Chloroform	14,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Chloromethane	180,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
cis-1,3-Dichloropropene		ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Dibromochloromethane		ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Ethylbenzene	10,000,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Isopropylbenzene	170,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Methylene chloride	670,000	ug/kg	140		6	1	310	E	6	1	310	E	5	1
Naphthalene	8,800,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Styrene	10,000,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
tert-Butyl methyl ether	10,000,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Tetrachloroethene	340,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Toluene	7,600,000	ug/kg	6	U	6	1	16		6	1	5	U	5	1
trans-1,3-Dichloropropene		ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Trichloroethene	190,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Vinyl chloride	3,800	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1
Xylenes, total	10,000,000	ug/kg	6	U	6	1	6	U	6	1	5	U	5	1

U Not detected J Estimated B Found in blank D Diluted E Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901541 17B 02/23/99				9901542 19B 02/23/99				9901543 21B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
1,1,1-Trichloroethane	10,000,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
1,1,2,2-Tetrachloroethane	5,500	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
1,1,2-Trichloroethane	20,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
1,1-Dichloroethane	200,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
1,1-Dichloroethene	6,400	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
1,2-Dibromoethane	210	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
1,2-Dichloroethane	12,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
1,2-Dichloroethene, total	670,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
1,2-Dichloropropane	16,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
2-Butanone	10,000,000	ug/kg	11	U	11	1	12	U	12	1	11	U	11	1
2-Hexanone		ug/kg	11	U	11	1	12	U	12	1	11	U	11	1
4-Methyl-2-pentanone		ug/kg	11	U	11	1	12	U	12	1	11	U	11	1
Acetone	10,000,000	ug/kg	**92**		11	1	**120**		12	1	**93**		11	1
Benzene	38,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Bromodichloromethane	8,600	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Bromoform	290,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Bromomethane	95,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Carbon disulfide	10,000,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Carbon tetrachloride	21,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Chlorobenzene	4,400,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Chloroethane	10,000,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Chloroform	14,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Chloromethane	180,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
cis-1,3-Dichloropropene		ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Dibromochloromethane		ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Ethylbenzene	10,000,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Isopropylbenzene	170,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Methylene chloride	670,000	ug/kg	**260**	**E**	5	1	**350**	**E**	6	1	**280**	**E**	6	1
Naphthalene	8,800,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Styrene	10,000,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
tert-Butyl methyl ether	10,000,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Tetrachloroethene	340,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Toluene	7,600,000	ug/kg	5	U	5	1	6	U	6	1	**12**		6	1
trans-1,3-Dichloropropene		ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Trichloroethene	190,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Vinyl chloride	3,800	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1
Xylenes, total	10,000,000	ug/kg	5	U	5	1	6	U	6	1	6	U	6	1

U Not detected J Estimated B Found in blank D Diluted E Outside of calibration range

Summary Table 1 - Volatile results for samples in report 9903011. Page 4 of 4.

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901544 25B 02/23/99				9901545 DUP 02/23/99				VB903045 Method Blank 03/05/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
1,1,1-Trichloroethane	10,000,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
1,1,2,2-Tetrachloroethane	5,500	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
1,1,2-Trichloroethane	20,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
1,1-Dichloroethane	200,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
1,1-Dichloroethene	6,400	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
1,2-Dibromoethane	210	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
1,2-Dichloroethane	12,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
1,2-Dichloroethene, total	670,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
1,2-Dichloropropane	16,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
2-Butanone	10,000,000	ug/kg	12	U	12	1	10	U	10	1	10	U	10	1
2-Hexanone		ug/kg	12	U	12	1	10	U	10	1	10	U	10	1
4-Methyl-2-pentanone		ug/kg	12	U	12	1	10	U	10	1	10	U	10	1
Acetone	10,000,000	ug/kg	370	E	12	1	110		10	1	10	U	10	1
Benzene	38,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Bromodichloromethane	8,600	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Bromoform	290,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Bromomethane	95,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Carbon disulfide	10,000,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Carbon tetrachloride	21,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Chlorobenzene	4,400,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Chloroethane	10,000,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Chloroform	14,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Chloromethane	180,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
cis-1,3-Dichloropropene		ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Dibromochloromethane		ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Ethylbenzene	10,000,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Isopropylbenzene	170,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Methylene chloride	670,000	ug/kg	190		6	1	250	E	5	1	5	U	5	1
Naphthalene	8,800,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Styrene	10,000,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
tert-Butyl methyl ether	10,000,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Tetrachloroethene	340,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Toluene	7,600,000	ug/kg	5	J	6	1	5	U	5	1	5	U	5	1
trans-1,3-Dichloropropene		ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Trichloroethene	190,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Vinyl chloride	3,800	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1
Xylenes, total	10,000,000	ug/kg	6	U	6	1	5	U	5	1	5	U	5	1

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901535 HB 02/23/99				9901536 3B 02/23/99				9901537 7B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
1,2,4-Trichlorobenzene	2,200,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
1,2-Dichlorobenzene	3,800,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
1,3-Dichlorobenzene	5,900,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
1,4-Dichlorobenzene	750,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2,2'-oxybis(1-Chloropropane)		ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2,4,5-Trichlorophenol	22,000,000	ug/kg	2000	U	2000	1	2000	U	2000	1	2000	U	2000	1
2,4,6-Trichlorophenol	1,600,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2,4-Dichlorophenol	660,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2,4-Dimethylphenol	4,400,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2,4-Dinitrophenol	440,000	ug/kg	2000	U	2000	1	2000	U	2000	1	2000	U	2000	1
2,4-Dinitrotoluene	58,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2,6-Dnitrotoluene	220,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2-Chloronaphthalene	18,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2-Chlorophenol	330,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2-Methyl-4,6-dinitrophenol		ug/kg	2000	U	2000	1	2000	U	2000	1	2000	U	2000	1
2-Methylnaphthalene	8,800,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2-Methylphenol	330,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
2-Nitroaniline	13,000	ug/kg	2000	U	2000	1	2000	U	2000	1	2000	U	2000	1
2-Nitrophenol	14,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
3,3'-Dichlorobenzidine	40,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
3-Nitroaniline	13,000	ug/kg	2000	U	2000	1	2000	U	2000	1	2000	U	2000	1
4-Bromophenyl phenyl ether		ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
4-Chloro-3-methylphenol	1,100,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
4-Chloroaniline	880,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
4-Chlorophenyl phenyl ether		ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
4-Methylphenol	330,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
4-Nitroaniline	13,000	ug/kg	2000	U	2000	1	2000	U	2000	1	2000	U	2000	1
4-Nitrophenol	14,000,000	ug/kg	2000	U	2000	1	2000	U	2000	1	2000	U	2000	1
Acenaphthene	13,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Acenaphthylene	13,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Anthracene	66,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Benzo[a]pyrene	2,500	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Benzo[b]fluoranthene	25,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Benzo[ghi]perylene	13,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Benzo[k]fluoranthene	250,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Benzyl butyl phthalate	10,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Benz[a]anthracene	25,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
bis(2-Chloroethoxy)methane		ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
bis(2-Chloroethyl) ether	960	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1

U Not detected J Estimated B Found in blank D Diluted E Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901535 1B 02/23/99				9901536 3B 02/23/99				9901537 7B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
bis(2-Ethylhexyl) phthalate	1,300,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Carbazole		ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Chrysene	2,500,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Di-n-butyl phthalate	10,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Di-n-octyl phthalate	4,400,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Dibenzofuran		ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Dibenz[a,h]anthracene	2,500	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Diethyl phthalate	10,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Dimethyl phthalate		ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Fluoranthene	8,800,000	ug/kg	400	U	400	1	**100**	J	400	1	400	U	400	1
Fluorene	8,800,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Hexachlorobenzene	11,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Hexachlorobutadiene	44,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Hexachlorocyclopentadiene	1,500,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Hexachloroethane	220,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Indeno[1,2,3-cd]pyrene	25,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Isophorone	10,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
N-Nitrosodi-n-propylamine	2,600	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
N-Nitrosodiphenylamine	3,700,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Naphthalene	8,800,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Nitrobenzene	110,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Pentachlorophenol	150,000	ug/kg	2000	U	2000	1	2000	U	2000	1	2000	U	2000	1
Phenanthrene	6,600,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Phenol	130,000,000	ug/kg	400	U	400	1	400	U	400	1	400	U	400	1
Pyrene	6,600,000	ug/kg	400	U	400	1	**87**	J	400	1	400	U	400	1

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901538 9B 02/23/99				9901539 11B 02/23/99				9901540 13B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
1,2,4-Trichlorobenzene	2,200,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
1,2-Dichlorobenzene	3,800,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
1,3-Dichlorobenzene	5,900,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
1,4-Dichlorobenzene	750,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2,2'-oxybis(1-Chloropropane)		ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2,4,5-Trichlorophenol	22,000,000	ug/kg	2000	U	2000	1	2100	U	2100	1	2000	U	2000	1
2,4,6-Trichlorophenol	1,600,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2,4-Dichlorophenol	660,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2,4-Dimethylphenol	4,400,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2,4-Dinitrophenol	440,000	ug/kg	2000	U	2000	1	2100	U	2100	1	2000	U	2000	1
2,4-Dinitrotoluene	58,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2,6-Dinitrotoluene	220,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2-Chloronaphthalene	18,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2-Chlorophenol	330,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2-Methyl-4,6-dinitrophenol		ug/kg	2000	U	2000	1	2100	U	2100	1	2000	U	2000	1
2-Methylnaphthalene	8,800,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2-Methylphenol	330,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
2-Nitroaniline	13,000	ug/kg	2000	U	2000	1	2100	U	2100	1	2000	U	2000	1
2-Nitrophenol	14,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
3,3'-Dichlorobenzidine	40,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
3-Nitroaniline	13,000	ug/kg	2000	U	2000	1	2100	U	2100	1	2000	U	2000	1
4-Bromophenyl phenyl ether		ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
4-Chloro-3-methylphenol	1,100,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
4-Chloroaniline	880,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
4-Chlorophenyl phenyl ether		ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
4-Methylphenol	330,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
4-Nitroaniline	13,000	ug/kg	2000	U	2000	1	2100	U	2100	1	2000	U	2000	1
4-Nitrophenol	14,000,000	ug/kg	2000	U	2000	1	2100	U	2100	1	2000	U	2000	1
Acenaphthene	13,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Acenaphthylene	13,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Anthracene	66,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Benzo[a]pyrene	2,500	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Benzo[b]fluoranthene	25,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Benzo[ghi]perylene	13,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Benzo[k]fluoranthene	250,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Benzyl butyl phthalate	10,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Benz[a]anthracene	25,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
bis(2-Chloroethoxy)methane		ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
bis(2-Chloroethyl) ether	960	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901538 9B 02/23/99				9901539 11B 02/23/99				9901540 13B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
bis(2-Ethylhexyl) phthalate	1,300,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Carbazole		ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Chrysene	2,500,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Di-n-butyl phthalate	10,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Di-n-octyl phthalate	4,400,000	ug/kg	150	J	410	1	410	U	410	1	400	U	400	1
Dibenzofuran		ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Dibenz[a,h]anthracene	2,500	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Diethyl phthalate	10,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Dimethyl phthalate		ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Fluoranthene	8,800,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Fluorene	8,800,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Hexachlorobenzene	11,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Hexachlorobutadiene	44,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Hexachlorocyclopentadiene	1,500,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Hexachloroethane	220,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Indeno[1,2,3-cd]pyrene	25,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Isophorone	10,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
N-Nitrosodi-n-propylamine	2,600	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
N-Nitrosodiphenylamine	3,700,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Naphthalene	8,800,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Nitrobenzene	110,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Pentachlorophenol	150,000	ug/kg	2000	U	2000	1	2100	U	2100	1	2000	U	2000	1
Phenanthrene	6,600,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Phenol	130,000,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1
Pyrene	6,600,000	ug/kg	410	U	410	1	410	U	410	1	400	U	400	1

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901541 17B 02/23/99				9901542 19B 02/23/99				9901543 21B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
1,2,4-Trichlorobenzene	2,200,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
1,2-Dichlorobenzene	3,800,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
1,3-Dichlorobenzene	5,900,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
1,4-Dichlorobenzene	750,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2,2'-oxybis(1-Chloropropane)		ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2,4,5-Trichlorophenol	22,000,000	ug/kg	2000	U	2000	1	2000	U	2000	1	1900	U	1900	1
2,4,6-Trichlorophenol	1,600,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2,4-Dichlorophenol	660,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2,4-Dimethylphenol	4,400,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2,4-Dinitrophenol	440,000	ug/kg	2000	U	2000	1	2000	U	2000	1	1900	U	1900	1
2,4-Dinitrotoluene	58,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2,6-Dinitrotoluene	220,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2-Chloronaphthalene	18,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2-Chlorophenol	330,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2-Methyl-4,6-dinitrophenol		ug/kg	2000	U	2000	1	2000	U	2000	1	1900	U	1900	1
2-Methylnaphthalene	8,800,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2-Methylphenol	330,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
2-Nitroaniline	13,000	ug/kg	2000	U	2000	1	2000	U	2000	1	1900	U	1900	1
2-Nitrophenol	14,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
3,3'-Dichlorobenzidine	40,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
3-Nitroaniline	13,000	ug/kg	2000	U	2000	1	2000	U	2000	1	1900	U	1900	1
4-Bromophenyl phenyl ether		ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
4-Chloro-3-methylphenol	1,100,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
4-Chloroaniline	880,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
4-Chlorophenyl phenyl ether		ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
4-Methylphenol	330,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
4-Nitroaniline	13,000	ug/kg	2000	U	2000	1	2000	U	2000	1	1900	U	1900	1
4-Nitrophenol	14,000,000	ug/kg	2000	U	2000	1	2000	U	2000	1	1900	U	1900	1
Acenaphthene	13,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Acenaphthylene	13,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Anthracene	66,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Benzo[a]pyrene	2,500	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Benzo[b]fluoranthene	25,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Benzo[ghi]perylene	13,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Benzo[k]fluoranthene	250,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Benzyl butyl phthalate	10,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Benz[a]anthracene	25,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
bis(2-Chloroethoxy)methane		ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
bis(2-Chloroethyl) ether	960	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1

U Not detected J Estimated B Found in blank D Diluted E Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901541 17B 02/23/99				9901542 19B 02/23/99				9901543 21B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
bis(2-Ethylhexyl) phthalate	1,300,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Carbazole		ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Chrysene	2,500,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Di-n-butyl phthalate	10,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Di-n-octyl phthalate	4,400,000	ug/kg	110	J	400	1	110	J	400	1	390	U	390	1
Dibenzofuran		ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Dibenz[a,h]anthracene	2,500	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Diethyl phthalate	10,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Dimethyl phthalate		ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Fluoranthene	8,800,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Fluorene	8,800,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Hexachlorobenzene	11,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Hexachlorobutadiene	44,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Hexachlorocyclopentadiene	1,500,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Hexachloroethane	220,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Indeno[1,2,3-cd]pyrene	25,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Isophorone	10,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
N-Nitrosodi-n-propylamine	2,600	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
N-Nitrosodiphenylamine	3,700,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Naphthalene	8,800,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Nitrobenzene	110,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Pentachlorophenol	150,000	ug/kg	2000	U	2000	1	2000	U	2000	1	1900	U	1900	1
Phenanthrene	6,600,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Phenol	130,000,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1
Pyrene	6,600,000	ug/kg	400	U	400	1	400	U	400	1	390	U	390	1

U Not detected J Estimated B Found in blank D Diluted E Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901544 25B 02/23/99				9901545 DUP 02/23/99				SB903013 Method Blank 03/01/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
1,2,4-Trichlorobenzene	2,200,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
1,2-Dichlorobenzene	3,800,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
1,3-Dichlorobenzene	5,900,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
1,4-Dichlorobenzene	750,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2,2'-oxybis(1-Chloropropane)		ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2,4,5-Trichlorophenol	22,000,000	ug/kg	2100	U	2100	1	2000	U	2000	1	1700	U	1700	1
2,4,6-Trichlorophenol	1,600,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2,4-Dichlorophenol	660,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2,4-Dimethylphenol	4,400,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2,4-Dinitrophenol	440,000	ug/kg	2100	U	2100	1	2000	U	2000	1	1700	U	1700	1
2,4-Dinitrotoluene	58,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2,6-Dinitrotoluene	220,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2-Chloronaphthalene	18,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2-Chlorophenol	330,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2-Methyl-4,6-dinitrophenol		ug/kg	2100	U	2100	1	2000	U	2000	1	1700	U	1700	1
2-Methylnaphthalene	8,800,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2-Methylphenol	330,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
2-Nitroaniline	13,000	ug/kg	2100	U	2100	1	2000	U	2000	1	1700	U	1700	1
2-Nitrophenol	14,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
3,3'-Dichlorobenzidine	40,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
3-Nitroaniline	13,000	ug/kg	2100	U	2100	1	2000	U	2000	1	1700	U	1700	1
4-Bromophenyl phenyl ether		ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
4-Chloro-3-methylphenol	1,100,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
4-Chloroaniline	880,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
4-Chlorophenyl phenyl ether		ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
4-Methylphenol	330,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
4-Nitroaniline	13,000	ug/kg	2100	U	2100	1	2000	U	2000	1	1700	U	1700	1
4-Nitrophenol	14,000,000	ug/kg	2100	U	2100	1	2000	U	2000	1	1700	U	1700	1
Acenaphthene	13,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Acenaphthylene	13,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Anthracene	66,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Benzo[a]pyrene	2,500	ug/kg	160	J	420	1	390	U	390	1	330	U	330	1
Benzo[b]fluoranthene	25,000	ug/kg	170	J	420	1	390	U	390	1	330	U	330	1
Benzo[ghi]perylene	13,000,000	ug/kg	130	J	420	1	390	U	390	1	330	U	330	1
Benzo[k]fluoranthene	250,000	ug/kg	170	J	420	1	390	U	390	1	330	U	330	1
Benzyl butyl phthalate	10,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Benz[a]anthracene	25,000	ug/kg	160	J	420	1	390	U	390	1	330	U	330	1
bis(2-Chloroethoxy)methane		ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
bis(2-Chloroethyl) ether	960	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901544 25B 02/23/99				9901545 DUP 02/23/99				SB903013 Method Blank 03/01/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
bis(2-Ethylhexyl) phthalate	1,300,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Carbazole		ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Chrysene	2,500,000	ug/kg	220	J	420	1	84	J	390	1	330	U	330	1
Di-n-butyl phthalate	10,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Di n-octyl phthalate	4,400,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Dibenzofuran		ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Dibenz[a,h]anthracene	2,500	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Diethyl phthalate	10,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Dimethyl phthalate		ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Fluoranthene	8,800,000	ug/kg	410	J	420	1	140	J	390	1	330	U	330	1
Fluorene	8,800,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Hexachlorobenzene	11,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Hexachlorobutadiene	44,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Hexachlorocyclopentadiene	1,500,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Hexachloroethane	220,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Indeno[1,2,3-cd]pyrene	25,000	ug/kg	130	J	420	1	390	U	390	1	330	U	330	1
Isophorone	10,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
N-Nitrosodi-n-propylamine	2,600	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
N-Nitrosodiphenylamine	3,700,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Naphthalene	8,800,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Nitrobenzene	110,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Pentachlorophenol	150,000	ug/kg	2100	U	2100	1	2000	U	2000	1	1700	U	1700	1
Phenanthrene	6,600,000	ug/kg	210	J	420	1	390	U	390	1	330	U	330	1
Phenol	130,000,000	ug/kg	420	U	420	1	390	U	390	1	330	U	330	1
Pyrene	6,600,000	ug/kg	360	J	420	1	150	J	390	1	330	U	330	1

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901535 1B 02/23/99				9901536 3B 02/23/99				9901537 7B 02/23/99				9901538 9B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
4,4'-DDD	75,000	ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0
4,4'-DDE	53,000	ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0
4,4'-DDT	53,000	ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0
Aldrin	1,100	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
alpha-BHC	2,800	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
alpha-Chlordane	13,000[1]	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
beta-BHC	9,900	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
delta-BHC	66,000	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
Dieldrin	1,100	ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0
Endosulfan I	1,300,000	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
Endosulfan II	1,300,000	ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0
Endosulfan sulfate	1,300,000	ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0
Endrin	66,000	ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0
Endrin aldehyde		ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0
Endrin ketone		ug/kg	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.0	U	4.0	1.0	4.2	U	4.2	1.0
gamma-BHC	16,000	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
gamma-Chlordane	13,000[1]	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
Heptachlor	4,000	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
Heptachlor epoxide	2,000	ug/kg	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.1	U	2.1	1.0
Methoxychlor	1,100,000	ug/kg	20	U	20	1.0	20	U	20	1.0	20	U	20	1.0	21	U	21	1.0
Toxaphene	16,000	ug/kg	200	U	200	1.0	200	U	200	1.0	200	U	200	1.0	210	U	210	1.0
Aroclor 1016	15,000	ug/kg	40	U	40	1.0	40	U	40	1.0	40	U	40	1.0	42	U	42	1.0
Aroclor 1221	36,000	ug/kg	80	U	80	1.0	79	U	79	1.0	79	U	79	1.0	83	U	83	1.0
Aroclor 1232	36,000	ug/kg	40	U	40	1.0	40	U	40	1.0	40	U	40	1.0	42	U	42	1.0
Aroclor 1242	36,000	ug/kg	40	U	40	1.0	40	U	40	1.0	40	U	40	1.0	42	U	42	1.0
Aroclor 1248	9,900	ug/kg	40	U	40	1.0	40	U	40	1.0	40	U	40	1.0	42	U	42	1.0
Aroclor 1254	4,400	ug/kg	40	U	40	1.0	40	U	40	1.0	40	U	40	1.0	42	U	42	1.0
Aroclor 1260	30,000	ug/kg	40	U	40	1.0	40	U	40	1.0	40	U	40	1.0	42	U	42	1.0

[1] The MSC for Chlordane is used because it is the only value available.

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901539 11B 02/23/99				9901540 13B 02/23/99				9901541 17B 02/23/99				9901542 19B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
4,4'-DDD	75,000	ug/kg	4.1	U	4.1	1.0	4.0	U	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0
4,4'-DDE	53,000	ug/kg	4.1	U	4.1	1.0	4.0	U	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0
4,4'-DDT	53,000	ug/kg	4.1	U	4.1	1.0	4.0	U	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0
Aldrin	1,100	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
alpha-BHC	2,800	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
alpha-Chlordane	13,000[1]	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
beta-BHC	9,900	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
delta-BHC	66,000	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
Dieldrin	1,100	ug/kg	4.1	U	4.1	1.0	4.0	U	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0
Endosulfan I	1,300,000	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
Endosulfan II	1,300,000	ug/kg	4.1	U	4.1	1.0	4.0	U	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0
Endosulfan sulfate	1,300,000	ug/kg	4.1	U	4.1	1.0	4.0	U	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0
Endrin	66,000	ug/kg	4.1	U	4.1	1.0	4.0	U	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0
Endrin aldehyde		ug/kg	4.1	U	4.1	1.0	7.7	P	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0
Endrin ketone		ug/kg	4.1	U	4.1	1.0	4.5	P	4.0	1.0	4.1	U	4.1	1.0	4.1	U	4.1	1.0
gamma-BHC	16,000	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
gamma-Chlordane	13,000[1]	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
Heptachlor	4,000	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
Heptachlor epoxide	2,000	ug/kg	2.1	U	2.1	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0	2.0	U	2.0	1.0
Methoxychlor	1,100,000	ug/kg	21	U	21	1.0	20	U	20	1.0	20	U	20	1.0	20	U	20	1.0
Toxaphene	16,000	ug/kg	210	U	210	1.0	200	U	200	1.0	200	U	200	1.0	200	U	200	1.0
Aroclor 1016	15,000	ug/kg	41	U	41	1.0	40	U	40	1.0	41	U	41	1.0	41	U	41	1.0
Aroclor 1221	36,000	ug/kg	82	U	82	1.0	80	U	80	1.0	81	U	81	1.0	81	U	81	1.0
Aroclor 1232	36,000	ug/kg	41	U	41	1.0	40	U	40	1.0	41	U	41	1.0	41	U	41	1.0
Aroclor 1242	36,000	ug/kg	41	U	41	1.0	40	U	40	1.0	41	U	41	1.0	41	U	41	1.0
Aroclor 1248	9,900	ug/kg	41	U	41	1.0	40	U	40	1.0	41	U	41	1.0	41	U	41	1.0
Aroclor 1254	4,400	ug/kg	41	U	41	1.0	40	U	40	1.0	41	U	41	1.0	41	U	41	1.0
Aroclor 1260	30,000	ug/kg	41	U	41	1.0	150		40	1.0	41	U	41	1.0	41	U	41	1.0

[1] The MSC for Chlordane is used because it is the only value available

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901543 21B 02/23/99				9901544 25B 02/23/99				9901545 DUP 02/23/99				PB903013 Method Blank 03/01/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
4,4'-DDD	75,000	ug/kg	3.9	U	3.9	1.0	4.3	U	4.3	1.0	4.0	U	4.0	1.0	3.3	U	3.3	1.0
4,4'-DDE	53,000	ug/kg	3.9	U	3.9	1.0	4.3	U	4.3	1.0	4.0	U	4.0	1.0	3.3	U	3.3	1.0
4,4'-DDT	53,000	ug/kg	3.9	U	3.9	1.0	4.3	U	4.3	1.0	4.0	U	4.0	1.0	3.3	U	3.3	1.0
Aldrin	1,100	ug/kg	1.9	U	1.9	1.0	2.1	U	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
alpha-BHC	2,800	ug/kg	1.9	U	1.9	1.0	2.1	U	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
alpha-Chlordane	13,000[1]	ug/kg	1.9	U	1.9	1.0	2.1	U	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
beta BHC	9,900	ug/kg	1.9	U	1.9	1.0	2.1	U	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
delta-BHC	66,000	ug/kg	1.9	U	1.9	1.0	2.1	U	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
Dieldrin	1,100	ug/kg	3.9	U	3.9	1.0	4.3	U	4.3	1.0	4.0	U	4.0	1.0	3.3	U	3.3	1.0
Endosulfan I	1,300,000	ug/kg	1.9	U	1.9	1.0	2.1	U	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
Endosulfan II	1,300,000	ug/kg	3.9	U	3.9	1.0	4.3	U	4.3	1.0	4.0	U	4.0	1.0	3.3	U	3.3	1.0
Endosulfan sulfate	1,300,000	ug/kg	3.9	U	3.9	1.0	4.3	U	4.3	1.0	4.0	U	4.0	1.0	3.3	U	3.3	1.0
Endrin	66,000	ug/kg	3.9	U	3.9	1.0	4.3	U	4.3	1.0	4.0	U	4.0	1.0	3.3	U	3.3	1.0
Endrin aldehyde		ug/kg	3.9	U	3.9	1.0	4.3	U	4.3	1.0	4.0	U	4.0	1.0	3.3	U	3.3	1.0
Endrin ketone		ug/kg	3.9	U	3.9	1.0	4.3	U	4.3	1.0	4.0	U	4.0	1.0	3.3	U	3.3	1.0
gamma-BHC	16,000	ug/kg	1.9	U	1.9	1.0	2.1	U	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
gamma-Chlordane	13,000[1]	ug/kg	1.9	U	1.9	1.0	2.1	U	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
Heptachlor	4,000	ug/kg	1.9	U	1.9	1.0	2.1	U	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
Heptachlor epoxide	2,000	ug/kg	1.9	U	1.9	1.0	12	P	2.1	1.0	2.0	U	2.0	1.0	1.7	U	1.7	1.0
Methoxychlor	1,100,000	ug/kg	19	U	19	1.0	21	U	21	1.0	20	U	20	1.0	17	U	17	1.0
Toxaphene	16,000	ug/kg	190	U	190	1.0	210	U	210	1.0	200	U	200	1.0	170	U	170	1.0
Aroclor 1016	15,000	ug/kg	39	U	39	1.0	43	U	43	1.0	40	U	40	1.0	33	U	33	1.0
Aroclor 1221	36,000	ug/kg	78	U	78	1.0	85	U	85	1.0	79	U	79	1.0	67	U	67	1.0
Aroclor 1232	36,000	ug/kg	39	U	39	1.0	43	U	43	1.0	40	U	40	1.0	33	U	33	1.0
Aroclor 1242	36,000	ug/kg	39	U	39	1.0	43	U	43	1.0	40	U	40	1.0	33	U	33	1.0
Aroclor 1248	9,900	ug/kg	39	U	39	1.0	43	U	43	1.0	40	U	40	1.0	33	U	33	1.0
Aroclor 1254	4,400	ug/kg	39	U	39	1.0	43	U	43	1.0	40	U	40	1.0	33	U	33	1.0
Aroclor 1260	30,000	ug/kg	39	U	39	1.0	43	U	43	1.0	40	U	40	1.0	33	U	33	1.0

[1] The MSC for Chlordane is used because it is the only value available

U - Not detected J - Estimated B - Found in blank D - Diluted E - Outside of calibration range

Summary Table 4. Metal results for samples in report 990201. Page 1 of 4.

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901535 1B 02/23/99				9901536 3B 02/23/99				9901537 7B 02/23/99				9901538 9B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
Aluminum	190,000	mg/kg	16800		65.0	10.0	13400		61.0	10.0	15800		66.0	10.0	20100		67.0	10.0
Antimony	88	mg/kg	0.58	BN	0.12	1.0	0.22	BN	0.11	1.0	0.56	BN	0.12	1.0	1.1	N	0.12	1.0
Arsenic	12	mg/kg	4.9		0.23	1.0	4.0		0.22	1.0	3.9		0.23	1.0	2.2		0.24	1.0
Barium	15,000	mg/kg	115		0.70	1.0	84.6		0.65	1.0	86.6		0.70	1.0	61.7		0.72	1.0
Beryllium	4	mg/kg	0.85		0.070	1.0	0.69		0.065	1.0	0.67		0.070	1.0	0.75		0.072	1.0
Cadmium	110	mg/kg	0.070	U	0.070	1.0	0.070	U	0.070	1.0	0.070	U	0.070	1.0	0.070	U	0.070	1.0
Calcium		mg/kg	766		2.6	1.0	872		2.4	1.0	325		2.6	1.0	459		2.6	1.0
Chromium	1,100[1]	mg/kg	56.8		0.082	1.0	32.4		0.076	1.0	68.1		0.082	1.0	145		0.084	1.0
Cobalt	13,000	mg/kg	12.6		0.82	1.0	10.7		0.76	1.0	24.8		0.82	1.0	12.8		0.84	1.0
Copper	190,000	mg/kg	21.5	E	0.23	1.0	16.2	E	0.22	1.0	21.3	E	0.23	1.0	38.6	E	0.24	1.0
Iron	66,000	mg/kg	31300	*	61.0	10.0	19800	*	56.0	10.0	31200	*	61.0	10.0	44900	*	62.0	10.0
Lead	500	mg/kg	46.7	N*	0.12	1.0	37.4	N*	0.11	1.0	28.4	N*	0.12	1.0	56.0	N*	0.12	1.0
Magnesium		mg/kg	1470		4.1	1.0	1450		3.8	1.0	1340		4.1	1.0	1160		4.2	1.0
Manganese	10,000	mg/kg	483		0.93	1.0	349		0.87	1.0	294		0.94	1.0	178		0.96	1.0
Nickel	4,400	mg/kg	16.5		0.23	1.0	11.5		0.22	1.0	16.0		0.23	1.0	17.1		0.24	1.0
Potassium		mg/kg	353	*	8.3	1.0	431	*	7.7	1.0	291	*	8.3	1.0	137	*	8.5	1.0
Selenium	1,100	mg/kg	1.2		0.23	1.0	0.76		0.22	1.0	1.3		0.23	1.0	1.7		0.24	1.0
Silver	1,100	mg/kg	0.12	U	0.12	1.0	0.11	U	0.11	1.0	0.12	U	0.12	1.0	0.12	U	0.12	1.0
Sodium		mg/kg	110	B	9.5	1.0	101	B	8.8	1.0	94.2	B	9.5	1.0	103	B	9.7	1.0
Vanadium	13	mg/kg	**64.4**	*	0.35	1.0	**41.3**	*	0.33	1.0	**82.7**	*	0.35	1.0	**142**	*	0.36	1.0
Zinc	66,000	mg/kg	53.0		1.4	1.0	51.3		1.3	1.0	46.0		1.4	1.0	50.3		1.4	1.0
Mercury	19	mg/kg	0.090	B	0.051	1.0	0.090	B	0.049	1.0	0.050	U	0.050	1.0	0.10	B	0.052	1.0
Thallium	18	mg/kg	0.11	U	0.11	1.0	0.12	U	0.12	1.0	0.11	U	0.11	1.0	0.12	U	0.12	1.0

[1] The MSC for Chromium VI is used because it is more conservative

U = Not detected N = MS outside of control limits B = Between IDL and CRDL E = Serial dilution outside of control limits

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901539 11B 02/23/99				9901540 13B 02/23/99				9901541 17B 02/23/99				9901542 19B 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
Aluminum	190,000	mg/kg	14900		68.0	10.0	15900		65.0	10.0	15500		65.0	10.0	20300		67.0	10.0
Antimony	88	mg/kg	0.12	UN	0.12	1.0	0.63	BN	0.12	1.0	0.62	BN	0.12	1.0	0.53	BN	0.12	1.0
Arsenic	12	mg/kg	1.1	B	0.24	1.0	3.0		0.23	1.0	2.1		0.23	1.0	2.5		0.24	1.0
Barium	15,000	mg/kg	59.3		0.72	1.0	52.0		0.69	1.0	65.5		0.69	1.0	89.6		0.72	1.0
Beryllium	4	mg/kg	0.40	B	0.072	1.0	0.43	B	0.069	1.0	0.52	B	0.070	1.0	0.76		0.072	1.0
Cadmium	110	mg/kg	0.070	U	0.070	1.0	0.070	U	0.070	1.0	0.070	U	0.070	1.0	0.070	U	0.070	1.0
Calcium		mg/kg	342		2.7	1.0	487		2.5	1.0	627		2.5	1.0	513		2.6	1.0
Chromium	1,100[1]	mg/kg	19.7		0.085	1.0	85.0		0.081	1.0	82.1		0.081	1.0	96.8		0.084	1.0
Cobalt	13,000	mg/kg	11.0		0.85	1.0	15.3		0.81	1.0	11.1		0.81	1.0	17.5		0.84	1.0
Copper	190,000	mg/kg	7.6	E	0.24	1.0	27.7	E	0.23	1.0	23.5	E	0.23	1.0	33.9	E	0.24	1.0
Iron	66,000	mg/kg	12400	*	63.0	10.0	31400	*	60.0	10.0	26800	*	60.0	10.0	32300	*	62.0	10.0
Lead	500	mg/kg	62.4	N*	0.12	1.0	35.8	N*	0.12	1.0	36.9	N*	0.12	1.0	29.5	N*	0.12	1.0
Magnesium		mg/kg	880		4.2	1.0	970		4.1	1.0	829		4.1	1.0	967		4.2	1.0
Manganese	10,000	mg/kg	239		0.97	1.0	243		0.93	1.0	152		0.93	1.0	144		0.96	1.0
Nickel	4,400	mg/kg	6.0		0.24	1.0	14.3		0.23	1.0	12.8		0.23	1.0	21.7		0.24	1.0
Potassium		mg/kg	77.9	B*	8.6	1.0	270	*	8.2	1.0	149	*	8.2	1.0	185	*	8.5	1.0
Selenium	1,100	mg/kg	0.30	B	0.24	1.0	1.2		0.23	1.0	0.79		0.23	1.0	0.78		0.24	1.0
Silver	1,100	mg/kg	0.12	U	0.12	1.0	0.12	U	0.12	1.0	0.12	U	0.12	1.0	0.12	U	0.12	1.0
Sodium		mg/kg	123		9.8	1.0	97.5	B	9.4	1.0	101	B	9.4	1.0	101	B	9.7	1.0
Vanadium	13	mg/kg	**31.7**		0.36	1.0	**97.0**		0.35	1.0	**76.2**		0.35	1.0	**96.4**		0.36	1.0
Zinc	66,000	mg/kg	141		1.4	1.0	34.8		1.4	1.0	26.9		1.4	1.0	60.8		1.4	1.0
Mercury	19	mg/kg	0.070	B	0.054	1.0	0.060	B	0.053	1.0	0.050	U	0.050	1.0	0.060	U	0.060	1.0
Thallium	18	mg/kg	0.12	U	0.12	1.0	0.12	U	0.12	1.0	0.11	U	0.11	1.0	0.12	U	0.12	1.0

[1] The MSC for Chromium VI is used because it is more conservative.

U = Not detected N = MS outside of control limits B = Between IDL and CRDL E = Serial dilution outside of control limits

Analyte	MSC for Residential Soil 0 - 15 feet	Units	9901543 21B 02/23/99				9901544 25B 02/23/99				9901545 DUP 02/23/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
Aluminum	190,000	mg/kg	10500		6.5	1.0	23000		70.0	10.0	14700		63.0	10.0
Antimony	88	mg/kg	0.27	BN	0.12	1.0	1.2	N	0.13	1.0	0.18	BN	0.11	1.0
Arsenic	12	mg/kg	1.0	B	0.23	1.0	5.0		0.25	1.0	4.2		0.22	1.0
Barium	15,000	mg/kg	27.9		0.70	1.0	188		0.75	1.0	87.3		0.67	1.0
Beryllium	4	mg/kg	0.57	B	0.070	1.0	1.2		0.075	1.0	0.71		0.067	1.0
Cadmium	110	mg/kg	0.070	U	0.070	1.0	0.080	U	0.080	1.0	0.070	U	0.070	1.0
Calcium		mg/kg	337		2.5	1.0	1160		2.8	1.0	893		2.5	1.0
Chromium	1,100[1]	mg/kg	24.4		0.081	1.0	136		0.088	1.0	34.1		0.078	1.0
Cobalt	13,000	mg/kg	2.7	B	0.81	1.0	28.7		0.88	1.0	9.1		0.78	1.0
Copper	190,000	mg/kg	10.2	E	0.23	1.0	46.2	E	0.25	1.0	16.4	E	0.22	1.0
Iron	66,000	mg/kg	10000	*	60.0	10.0	40700	*	65.0	10.0	20800	*	58.0	10.0
Lead	500	mg/kg	6.5	N*	0.12	1.0	58.1	N*	0.13	1.0	43.8	N*	0.11	1.0
Magnesium		mg/kg	408		4.1	1.0	1780		4.4	1.0	1410		3.9	1.0
Manganese	10,000	mg/kg	40.2		0.93	1.0	858		1.0	1.0	351		0.90	1.0
Nickel	4,400	mg/kg	3.9	B	0.23	1.0	33.4		0.25	1.0	12.9		0.22	1.0
Potassium		mg/kg	39.7	B*	8.2	1.0	571	*	8.9	1.0	434	*	8.0	1.0
Selenium	1,100	mg/kg	0.38	B	0.23	1.0	1.3		0.25	1.0	0.86		0.22	1.0
Silver	1,100	mg/kg	0.12	U	0.12	1.0	0.13	U	0.13	1.0	0.11	U	0.11	1.0
Sodium		mg/kg	88.4	B	9.4	1.0	115	B	10.2	1.0	109	B	9.1	1.0
Vanadium	13	mg/kg	**28.7**		0.35	1.0	**119**		0.38	1.0	**40.5**		0.34	1.0
Zinc	66,000	mg/kg	15.4		1.4	1.0	128		1.5	1.0	55.4		1.3	1.0
Mercury	19	mg/kg	0.050	B	0.054	1.0	0.15	B	0.054	1.0	0.080	B	0.053	1.0
Thallium	18	mg/kg	0.11	U	0.11	1.0	0.21	B	0.13	1.0	0.12	U	0.12	1.0

[1] The MSC for Chromium VI is used because it is more conservative

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Analyte	MSC for Residential Soil 0 - 15 feet	Units	CB903051 Method Blank 03/05/99				FB903082 Method Blank 03/08/99				IB903081 Method Blank 03/08/99			
			Result	Qual	Limit	Dil	Result	Qual	Limit	Dil	Result	Qual	Limit	Dil
Aluminum	190,000	mg/kg									5.6	U	5.6	1.0
Antimony	88	mg/kg									0.10	U	0.10	1.0
Arsenic	12	mg/kg									0.20	U	0.20	1.0
Barium	15,000	mg/kg									0.60	U	0.60	1.0
Beryllium	4	mg/kg									0.060	U	0.060	1.0
Cadmium	110	mg/kg									0.060	U	0.060	1.0
Calcium		mg/kg									-2.4	B	2.2	1.0
Chromium	1,100[1]	mg/kg									0.080	B	0.070	1.0
Cobalt	13,000	mg/kg									0.70	U	0.70	1.0
Copper	190,000	mg/kg									-0.32	B	0.20	1.0
Iron	66,000	mg/kg									5.2	U	5.2	1.0
Lead	500	mg/kg									0.10	U	0.10	1.0
Magnesium		mg/kg									3.5	U	3.5	1.0
Manganese	10,000	mg/kg									0.80	U	0.80	1.0
Nickel	4,400	mg/kg									0.20	U	0.20	1.0
Potassium		mg/kg									7.1	U	7.1	1.0
Selenium	1,100	mg/kg									0.20	U	0.20	1.0
Silver	1,100	mg/kg									0.10	U	0.10	1.0
Sodium		mg/kg									8.1	U	8.1	1.0
Vanadium	13	mg/kg									0.65	B	0.30	1.0
Zinc	66,000	mg/kg									1.2	U	1.2	1.0
Mercury	19	mg/kg	0.050	U	0.050	1.0								
Thallium	18	mg/kg					0.10	U	0.10	1.0				

[1] The MSC for Chromium VI is used because it is more conservative.

U = Not detected N = MS outside of control limits B = Between IDL and CRDL E = Serial dilution outside of control limits

Pennsylvania Department of Environmental Protection
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428
October 24, 2000

Southeast Regional Office

610-832-5949
Fax 610-832-6143

Ms. Darlene Stringos-Walker
99th R.S.C.
ATTN: AFRC-CPA-EN-E
5 Lobaugh Street
Oakdale, PA 15071-5001

Re: Fenceline Soils Investigation
Horsham Memorial USARC

Dear Ms. Walker:

The Pennsylvania Department of Environmental Protection (Department) has reviewed the Fenceline Soils Investigation Report for the Horsham Memorial USARC, in Horsham Pennsylvania, prepared by EA Engineering, Science, and Technology (EA), and offers the following comments and recommendations for your consideration:

1. MSCs referenced in the tables were established to evaluate Direct Contact Exposure to each contaminant. Under Act 2 each contaminant of concern in soil should be evaluated using the Direct Contact Numeric Values and the Soil to Groundwater Numeric Values. The report should compare the results with both of the values.

2. The Department agrees that a sufficient number of soil samples were collected to determine if residual contamination due to weed control activities is of concern. The Department also concurs with the conclusion that none of the analytical results exceed the relevant Medium Specific Concentration for contaminated soils (including soil to groundwater numeric values).

3. Some of the samples collected along the school side of the fence contained elevated levels of Total PAH, according to the screening test. However, none of these samples were analyzed by an offsite lab. Please explain this apparent discrepancy.

4. The purpose of this investigation was to evaluate the presence of contaminants of concern related to weed control along the fenceline. Despite this objective, samples were not analyzed for herbicides. Since this investigation involves a fence separating an elementary school from the USARC facility, the Department believes that herbicide analysis is warranted. Therefore, the Department recommends additional analysis of surface soil samples for herbicides. When the Department conducted screening of the North Penn USARC Site 01 (Fenceline), in Worcester Township, Montgomery County our subcontract laboratory used EPA Method 8151A for herbicide analyses.

The Department is not able to conclude that this site should be placed on the list of resolved sites at this time, due to the concerns listed above. If the military would like to gain resolution quickly for this site, additional sampling and analysis should be conducted. The Department may be conducting some additional characterization activities at the Horsham Memorial USARC property in the future, in association with our evaluation of Study Program List sites. If further site characterization is needed for one or more of these sites, the Department would be willing to conduct the needed work to complete the evaluation of the fenceline as part of the Study Program site evaluation

If you have any questions, please feel free to contact me at 610-832-6206.

Sincerely,

Dustin A. Armstrong
Project Officer
Environmental Cleanup

cc: Mr. Beitler
Mr. Sheehan
Ms. Pantelidou
Mr. Moulder
Mr. Beard
File
Re 30 (GJE00)298

Pennsylvania Department of Environmental Protection

Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

September 20, 2001

Southeast Regional Office

610-832-5949
Fax 610-832-6143

Mr. John Prizner, Jr.
Colonel, U.S. Army Reserve
Deputy Chief of Staff, Engineer
Department of the Army
Headquarters, 99th Regional Support Command
5 Lobaugh Street
Oakdale, PA 15071-5001

Re: Horsham Memorial USARC - Site 12
Horsham Township
Montgomery County, PA

Dear Colonel Prizner:

The Department has reviewed the September 1999 *Fence-Line Soils Investigation Report*, received June 2000 and the June 2001 *Analytical Results: Fence-Line Soils Investigation for Herbicide Analysis* received in July 2001, regarding the above captioned site. This information indicates that there is no evidence that a release occurred at this site.

After a Record of Change Form is completed, this site will be moved from the List of Scheduled Sites to the List of Resolved Sites under the July 4, 1998 Multi-Site Agreement among PA DEP and the Military Components.

It should be noted that this determination apples only to the Fence-Line Site within the Horsham USARC property. The Department may evaluate other sites within the property in the future.

Sincerely,

Bruce D. Beitler
Regional Manager
Environmental Cleanup

cc: Mr. Snyder
Mr. Orwan
Mr. Moulder
Mr. Rock
Ms. Stringos-Walker, USARC
Ms. Watson
Mr. Sheehan
Ms. Pantelidou
Mr. Armstrong
Re 30 (GJC01)263-1

Montgomery County
Horsham Township
Horsham Memorial USARC Facility

ASBESTOS-CONTAINING MATERIAL, LEAD-BASED PAINT, AND RADON INSPECTIONS

PREPARED FOR:

U.S. ARMY RESERVE 99TH RSC

PREPARED BY:

SKELLY AND LOY, INC.
MONROEVILLE/HARRISBURG, PA
MORGANTOWN, WV

REVISED
APRIL 2005

MONTGOMERY COUNTY
HORSHAM TOWNSHIP
HORSHAM MEMORIAL USARC FACILITY

ASBESTOS-CONTAINING MATERIAL, LEAD-BASED PAINT, AND RADON INSPECTIONS

Prepared For:

U.S. ARMY RESERVE 99th RSC

Prepared By:

SKELLY and LOY, Inc.
2500 Eldo Road, Suite 2
Monroeville, PA 15146-1456

Revised April 2005

TABLE OF CONTENTS

List of Tables

List of Figures

1.0 INTRODUCTION

Skelly and Loy, Inc. conducted asbestos-containing material (ACM), lead-based paint, and radon inspections at the Horsham Memorial USARC facility, located at 936 Easton Road, Horsham Township, Montgomery County, Pennsylvania. Figure 1 provides the project location. The purposes of these inspections were to identify interior and exterior ACM, lead-based paint, and radon gas levels present in the structures located on the property.

The Horsham Memorial USARC facility is comprised of two structures, a main building and motor pool building. These buildings are surrounded by a paved parking lot. The main building is comprised of two floors consisting of offices, a drill hall, a former firing range, a band room, classrooms, bathrooms, and storage areas. The motor pool building is comprised of one level consisting of offices and a vehicle maintenance area. Both buildings were sampled for ACM, lead-based paint, and radon gas.

Inspection methodologies, analytical results, and recommendations for the ACM, lead-based paint, and radon abatement, if required, are included in the following sections.

2.0 ACM INSPECTION

Skelly and Loy, Inc. completed an asbestos inspection of the Horsham Memorial USARC facility on November 15, 2004. The inspection was completed in accordance with appropriate state and federal regulations, and appropriate safety and hygiene protocols were observed during all site activities. The objective was to document the presence of ACM in the building materials used in the construction of each structure. Samples were collected from each building interior and exterior. The roofs were not sampled as per request of the U.S. Army Reserve 99th RSC because they will not be renovated. The building floor plans and asbestos bulk sample locations are shown on Figure 2.

The asbestos inspection included visual and tactile assessments of materials suspected of containing asbestos, with suspect ACM being sampled and submitted for

laboratory analysis. Samples were analyzed using Polarized Light Microscopy (PLM) via United States Environmental Protection Agency (USEPA) Method 600.

2.1 Inspection Methodology

Luke R. Marsh (Pennsylvania Asbestos Certification #034206) and Chris M. Ireland (Pennsylvania Asbestos Certification #037571), USEPA-accredited and Pennsylvania Department of Labor and Industry-licensed asbestos inspectors, conducted all ACM inspection activities at the Horsham Memorial USARC Facility. The inspection included a tactile assessment of accessible areas of suspect ACM. In general, suspect ACM typically includes, but is not limited to: ceiling tile, wallboard, building insulation, piping insulation, duct wrap insulation, window caulking, and cement flue patching. Upon identification of a suspect material, a sampling scheme was developed that included the collection of at least one to ten samples per homogeneous material. A homogeneous material is defined as a material that is consistent in appearance and texture. The number of samples collected per homogeneous material was determined by the quantity and type of suspect material.

During the inspection, the quantity of suspect ACM was documented. The material was assessed as either friable or non-friable. Friable material can be crumbled or reduced to powder by crushing with hand pressure. Damaged material has the potential to become more easily friable. Homogeneous materials were categorized in accordance with USEPA National Emissions Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulation, 40 Code of Federal Regulations (CFR) 61, as either Category I Non-Friable ACM, Category II Non-Friable ACM, or Regulated Asbestos-containing Material (RACM). These categories are defined below:

- Category I Non-Friable ACM - Asbestos-containing packing, gaskets, floor covering, and asphalt roofing products containing more than one percent asbestos.
- Category II Non-Friable ACM - Any material, excluding Category I Non-Friable ACM, containing more than one percent asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

- RACM - Friable asbestos material, Category I Non-Friable ACM that has become friable. Category I Non-Friable asbestos material that will be or has been subject to sanding, grinding, cutting, or abrading. Category II Non-Friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation.

2.2 Analytical Results

Table 1 lists and characterizes all samples analyzed. Figure 2 provides the locations of all the samples taken at the site. Samples H-03, H-05, H-08, H-09, H-10, H-15, H-16, H-17, H-18, H-21, and H-22 were each divided into two samples by the laboratory (e.g., H-03 and H-03A). These samples are located in the same locations, but were separated into two separate materials (e.g., floor tile and mastic under the floor tile) by the laboratory.

Sample results are reported by percent and type of asbestos identified via laboratory analysis. Copies of the analytical results and chain-of-custody documentation are included in Appendix A. Materials identified to contain greater than one percent asbestos by weight are considered to be ACM. Based upon the information gathered, the following summary of findings and conclusions is presented:

- Twenty-three samples were collected and submitted for analysis.
- Four of the samples analyzed were identified as ACM.
- Three of the samples were assessed as non-friable.
- One of the samples was assessed as friable.
- Skelly and Loy was unable to attain a sample of the 2-inch diameter electrical wiring that travels between the electrical panel in room 108 and the transformer located outside the building near room 108 and hallway 3; it is assumed to be ACM and should be treated as such.
- Skelly and Loy had limited access to sampling above the sheet rock ceiling, but managed to do so through existing access holes.
- The roof of the main building was not sampled, as per the request of the U.S. Army Reserve 99th RSC. This roof will not be renovated.

2.3 Basis of Cost Estimates

A total cost estimate for the abatement of ACM is also included in Table 1. Skelly and Loy uses current accepted industry standard cost estimates for ACM abatement. These costs are generally high estimates, and are provided to assist the property owner when choosing an ACM abatement contractor; they are not intended to be used for bidding purposes. Below is a breakdown of the current industry abatement costs utilized in determining the estimates in Table 1.

Flooring, Ceiling, Plaster, and Roofing Cost Estimates

- CAT I and CAT II Non-Friable ACM - approximately $3.00 per square foot
- RACM - approximately $6.00 per square foot

Pipe Insulation Cost Estimates

- CAT I and CAT II Non-Friable ACM - approximately $12.00 per linear foot
- RACM - approximately $12.00 per linear foot

Window Cost Estimates

- CAT I and CAT II Non-Friable ACM - approximately $100.00 per window (< 30 linear feet ACM per window)
- CAT I and CAT II Non-Friable ACM - approximately $250.00 per large window (> 30 linear feet ACM per window)

TABLE 1
Asbestos Analysis Results
Horsham Memorial USARC Facility

Homogeneous Material/Type	Building	Sample Number	Results (%-Type)	Location (Rooms)	Location (Area)	Estimated Quantity	Friability	Estimated Abatement Cost
White Pipe Wrap	Main Building	H-01	ND					
White Roof Board	Main Building	H-02	ND					
Black / Tan 9 x 9 Floor Tile	Main Building	H-03	3.0 - C	Foyer 1, 2; Halls 1, 2, 3, 4, 5; Rooms 104, 109, 110	Floor	3,023 Sq. Ft.	CAT I - NF	$9,069.00
Black Mastic	Main Building	H-03A	ND					
Black Mastic on Cove Base	Main Building	H-04	ND					
Black Floor Edging	Main Building	H-05	ND					
Black Mastic	Main Building	H-05A	ND					
White Plaster Board	Main Building	H-06	ND					
White Ceiling Plaster Board	Main Building	H-07	ND					
White 12 x 12 Floor Tile	Main Building	H-08	ND					
Black Mastic	Main Building	H-08A	ND					
Black Floor Edging	Main Building	H-09	ND					
Black Mastic	Main Building	H-09A	ND					

RACM = Regulated Asbestos Containing Material
C = Chrysotile Asbestos
F = Friable
NF = Non-Friable
ND = None Detected
ln. ft. = Linear Feet
Sq. Ft. = Square Feet

TABLE 1
Asbestos Analysis Results
Horsham Memorial USARC Facility

Homogeneous Material/Type	Building	Sample Number	Results (%-Type)	Location (Rooms)	Location (Area)	Estimated Quantity	Friability	Estimated Abatement Cost
Black / Tan 9 x 9 Floor Tile	Main Building	H-10	5.0 - C	Foyer 3; Halls 6 & 7; Rooms 201, 201B, 202, 203, 204, 204B, 205, 206, 207A, 207B, 209, 210, 211, 212, 213	Floor	8,612 Sq. Ft.	CAT I - NF	$25,836.00
Black Mastic	Main Building	H-10A	ND					
White Corner Pipe Insulation	Main Building	H-11	ND					
White Foam Pipe Insulation	Main Building	H-12	ND					
White Foam Pipe Insulation	Main Building	H-13	ND					
Gray Aerosol Pipe Wrap	Main Building	H-14	7.0 - C	Hall 5	Above Ceiling	115 ln. ft.	RACM	$1,380.00
Black / White 12 x 12 Floor Tile	Main Building	H-15	ND					
Pale Yellow Mastic	Main Building	H-15A	ND					
Black Floor Edging	Main Building	H-16	ND					
Amber Mastic	Main Building	H-16A	ND					
Black Floor Edging	Main Building	H-17	ND					
Black Mastic	Main Building	H-17A	ND					
Black Floor Edging	Main Building	H-18	ND					

RACM = Regulated Asbestos Containing Material
C = Chrysotile Asbestos
F = Friable
NF = Non-Friable
ND = None Detected
ln. ft. = Linear Feet
Sq. Ft. = Square Feet

TABLE 1
Asbestos Analysis Results
Horsham Memorial USARC Facility

Homogeneous Material/Type	Building	Sample Number	Results (%-Type)	Location (Rooms)	Location (Area)	Estimated Quantity	Friability	Estimated Abatement Cost
Black Mastic	Main Building	H-18A	7.0 - C	Foyers 1, 2, 3; Halls 1-7; Rooms 109, 110, 201, 201B, 202, 203, 204, 204B, 205, 206, 207A, 207B, 209, 210, 211, 212, 213	Floor	11,635 Sq. Ft.	CAT I - NF	Already included with samples H-03 and H-10
Tan Wall Divider	Main Building	H-19	ND					
Tan 12 x 12 Floor Tile	Motor Pool	H-20	ND					
Green 12 x 12 Floor Tile	Motor Pool	H-21	ND					
Amber Mastic	Motor Pool	H-21A	ND					
Gray 12 x 12 Floor Tile	Motor Pool	H-22	ND					
Amber Mastic	Motor Pool	H-22A	ND					
White Plasterboard	Motor Pool	H-23	ND					
						TOTAL ESTIMATED ABATEMENT COST		$36,285.00

RACM = Regulated Asbestos Containing Material
C = Chrysotile Asbestos
F = Friable
NF = Non-Friable
ND = None Detected
ln. ft. = Linear Feet
Sq. Ft. = Square Feet

2.4 Recommendations

Skelly and Loy recommends that all work activities that may potentially disturb ACM should be performed in accordance with all local, state, and federal regulations. It is required that the USEPA, Occupational Safety and Health Administration (OSHA), Department of Labor and Industry, and the Department of Health be notified if asbestos abatement is to be performed.

This report is accurate to the best knowledge of the inspectors. The inspectors and Skelly and Loy assume no liability for financial or health consequences resulting from actions or lack of actions taken by clients as a result of this inspection.

3.0 LEAD-BASED PAINT INSPECTION

Analytical Laboratory Services, Inc. (ALSI) performed a lead-based paint inspection at the Horsham Memorial USARC facility on November 15 and 16, 2004. The purpose of this inspection was to identify painted building components containing lead-based paints on the interiors and exteriors of the buildings at the Horsham Memorial USARC facility.

3.1 Inspection Methodology

ALSI personnel (see Appendix B, page 16) conducted a room-by-room and exterior lead-based paint inspection of the main building and motor pool building using an x-ray radiation fluorescence (XRF) spectrum analyzer. The following building components were sampled for lead-based paint:

- Drywall walls and ceilings;
- Plaster walls and ceilings;
- Brick, block, or concrete walls;
- Ceramic tile on walls;
- Doors and door frames;
- Structural steel;
- Stairway components;
- Floors, painted or varnished;

- Windows and window frames; and
- Exterior walls and doors.

In accordance with Housing and Urban Development (HUD) guidelines, lead-based paints are painted items that produce a XRF test result of equal to or greater than 1.0 mg/cm^2.

Lead-containing paints are painted items that produce a XRF test result from 0.0 – 0.99 mg/cm^2. This is consistent with OSHA standards since OSHA uses air-sampling data, not XRF results, for compliance purposes.

3.2 Analytical Results

ALSI sampled a total of 427 building components throughout each building at the Horsham Memorial USARC facility. Three hundred twenty-six of these building components tested positive for lead-based paint and/or lead-containing paint. Seventy-seven of the 326 positive samples were positive for lead-based paint. Figure 3 provides the locations and types of building components identified as containing lead-based paint.

Analytical results are included in ALSI's Lead-Based Paint Inspection Report included in Appendix B. The positive samples containing lead-based paint are noted in Table 4.1 of the Lead-Based Paint Inspection Report. The positive samples containing lead-containing paint are noted in Table 4.2 of the report. The majority of the positive samples containing lead-based paint and lead-containing paint were located on the walls, doors, door frames, window sills and frames, ceilings, and radiators in the main building and motor pool building.

The conditions of painted building components containing lead-based paint and/or lead-containing paint were classified as "good" to "poor" during the assessment. A "good" assessment was given to paint that was not chipped, cracked, peeled, or damaged in any way. A "poor" assessment was given to paint that was chipped, cracked, peeled, or damaged.

3.3 Recommendations

Although there are no current regulations regarding building materials containing lead-based paint and/or lead-containing paint, Skelly and Loy recommends that areas covered with lead-based paint and/or lead-containing paint be repainted. If renovation and/or demolition activities are planned for those building components identified as containing lead-based paint, the OSHA *Lead in Construction Standard,* 29 CFR 1926.62, must be followed during construction. In addition, it is recommended that a Maintenance Plan be developed requiring periodic inspections of the building components covered with lead-based paint and/or lead-containing paint.

4.0 RADON INSPECTION

Skelly and Loy's radon inspector Luke R. Marsh (Examination ID# 20401012003) completed a radon inspection at the Horsham Memorial USARC facility between November 15 and 17, 2004. The purposes of this inspection were to identify and quantify the presence and level of radon gas inside the main building and the motor pool building. The sampling was performed in the lowest level (1st floor) of each building, where there is potential for radon gas to enter through cracks in the foundation walls and/or floor drains.

4.1 Inspection Methodology

During the inspection, Skelly and Loy personnel used ProChek^{TM} radon test kits, a USEPA-listed radon test kit from Air Chek, Inc., to identify and quantify the presence of radon gas. Test kits were placed in randomly selected rooms of the first floors of both buildings, approximately two to six feet above the ground (within the normal breathing zone). Floor plans and sample locations are shown on Figure 4. During the radon inspection, all doors and windows remained closed. Eleven test kits were left undisturbed for at least 48 hours, collected, and sent to Air Chek, Inc. for analysis.

4.2 Analytical Results

Analytical results are included in Appendix C. The analytical results are also summarized in Table 2. The results are reported in picocuries per liter (pCi/L) of air. According to the analytical results, the average radon level for the main building was less than 1.32 pCi/L. The average radon level detected in the motor pool building was 0.55 pCi/L. The most current USEPA-recommended standard action level for radon in buildings and homes is 4.0 pCi/L of air.

The average indoor radon level, according to the Pennsylvania Department of Environmental Protection (PADEP), within the zip code 19044, is 4.4 pCi/L. Compared to other buildings within the zip code area, the Horsham Memorial USARC facility buildings have a lower indoor radon level (<1.32 pCi/L and 0.55 pCi/L) than the local average indoor radon level.

TABLE 2
Radon Analysis Results
Horsham Memorial USARC Facility

Sample Location (Room #)	Radon Cassette ID. #	Analysis Results
Main Building Drill Hall	4000064	2.0 pCi/L
Main Building Room 101	4000071	1.7 pCi/L
Main Building Room 124	4000072	1.2 pCi/L
Main Building Room 111	4000073	<0.3 pCi/L
Main Building Room 120	4000077	1.9 pCi/L
Motor Pool Building Room 3	4000079	0.6 pCi/L
Main Building Room 119	4000083	0.9 pCi/L
Main Building Room 105	4000085	2.4 pCi/L
Motor Pool Building Room 4	4000086	0.5 pCi/L
Main Building Stairwell-N	4000088	0.9 pCi/L
Main Building Room 118	4000089	0.6 pCi/L

The analytical results of the radon inspection at the Horsham Memorial USARC facility buildings indicate that the radon level in the main building and the motor pool building do not exceed the USEPA-recommended level of 4.0 pCi/L. It also indicates

that the indoor radon level is lower than the average indoor radon level of 4.4 pCi/L within the facility's zip code area.

4.3 Recommendations

No recommendations for any mitigation measures to reduce the radon levels in the main building or the motor pool building are necessary.

5.0 SUMMARY AND RECOMMENDATIONS

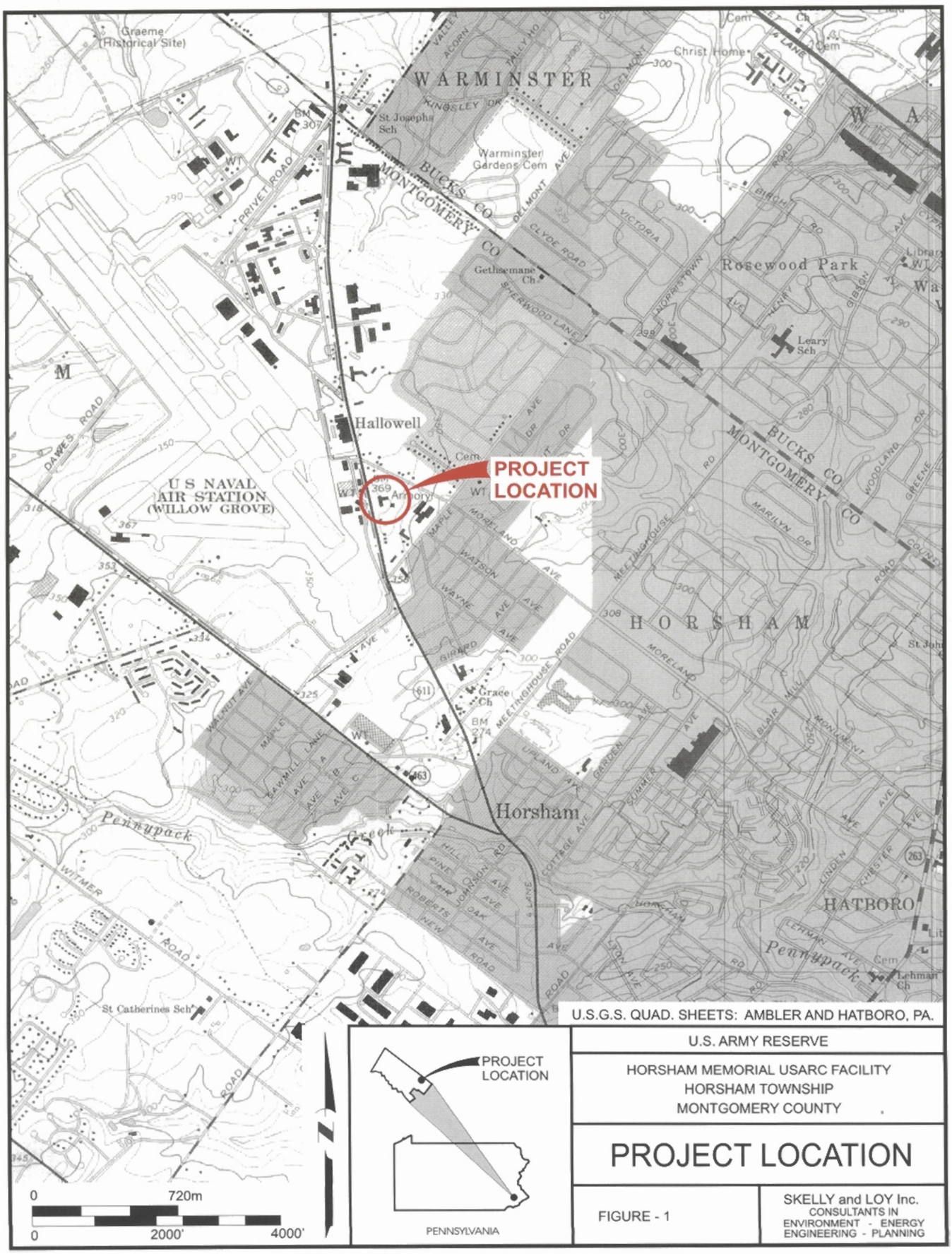
Skelly and Loy completed asbestos-containing material, lead-based paint, and radon inspections at the Horsham Memorial USARC facility. During these inspections, samples were taken and analyzed.

Skelly and Loy collected 23 suspect ACM samples from the buildings at this USARC facility. Four of the suspect ACM samples analyzed were identified as ACM, and of those four identified, three were assessed as non-friable and one as friable. Based on the analytical results, Skelly and Loy recommends that all work activities that may potentially disturb ACM be performed in accordance with all local, state, and federal regulations. It is required that the USEPA, OSHA, the Department of Labor and Industry, and the Department of Health be notified if asbestos abatement is to be performed. Table 1 provides an estimate for the abatement cost. The estimated abatement cost for the Horsham Memorial USARC facility is $36,285.00.

ALSI sampled a total of 427 building components for lead-based paint and lead-containing paint at the Horsham Memorial USARC facility. Three hundred twenty-six of these building components tested positive for lead-based paint and/or lead-containing paint. Based on the analytical results, Skelly and Loy recommends that the OSHA *Lead in Construction Standard,* 29 CFR 1926.62, be followed during renovation or demolition activities for the building components identified as containing lead-based paint and/or lead-containing paint. If these building components are to remain in place, it is recommended that they be repainted and be periodically inspected and included in a Maintenance Plan to prevent possible exposure.

Skelly and Loy placed 11 ProChek™ radon test kits in randomly selected rooms of the first floors of the main building and the motor pool building. The average indoor radon gas level at the USARC buildings were <1.32 pCi/L in the main building and 0.55 pCi/L in the motor pool building. The average indoor radon levels do not exceed the USEPA-recommended level for mitigation set at 4.0 pCi/L or the local indoor radon level average of 4.4 pCi/L. Based on the analytical results, there are no recommendations for radon mitigation measures at the Horsham Memorial USARC facility.

FIGURES



U.S.G.S. QUAD. SHEETS: AMBLER AND HATBORO, PA.

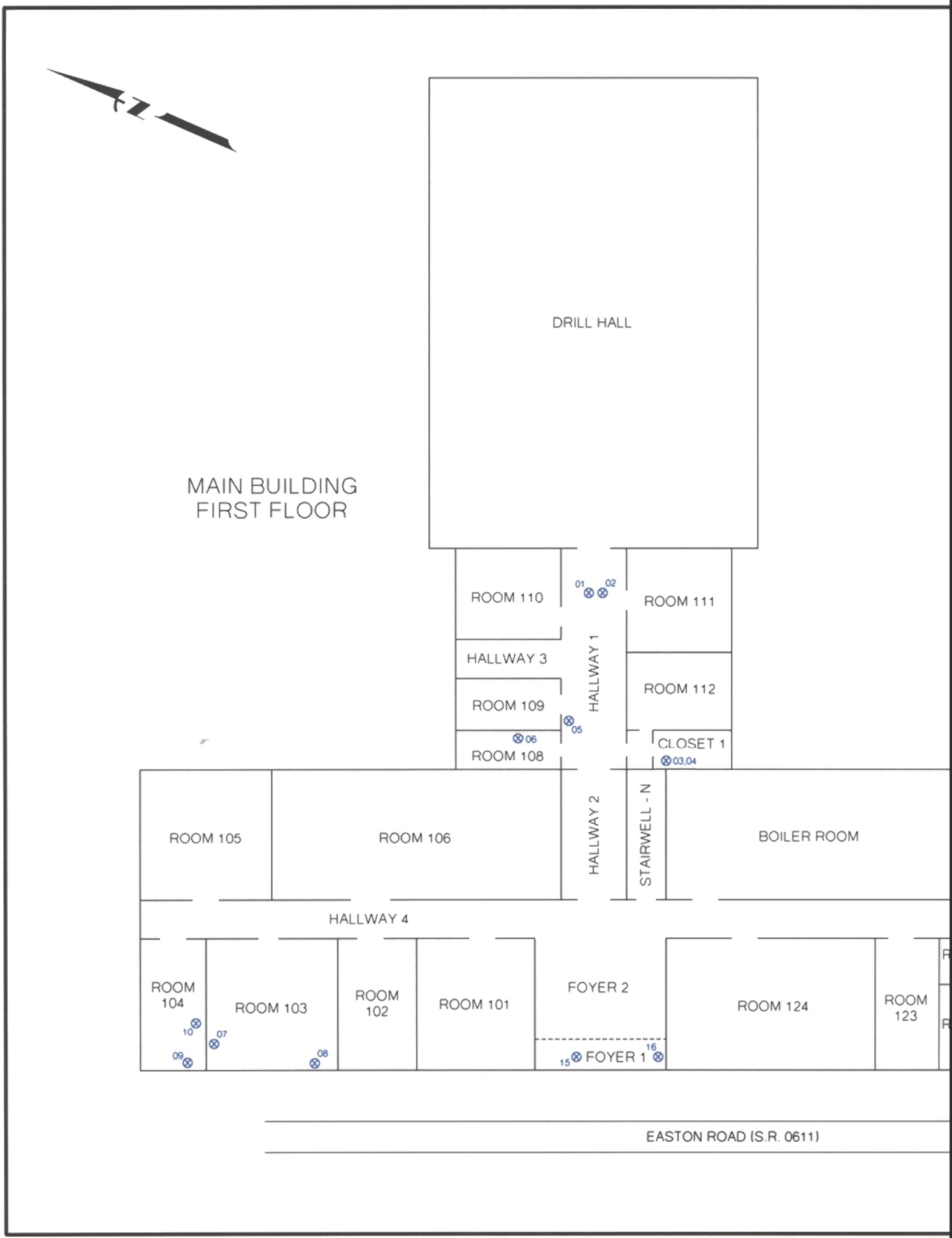
U.S. ARMY RESERVE

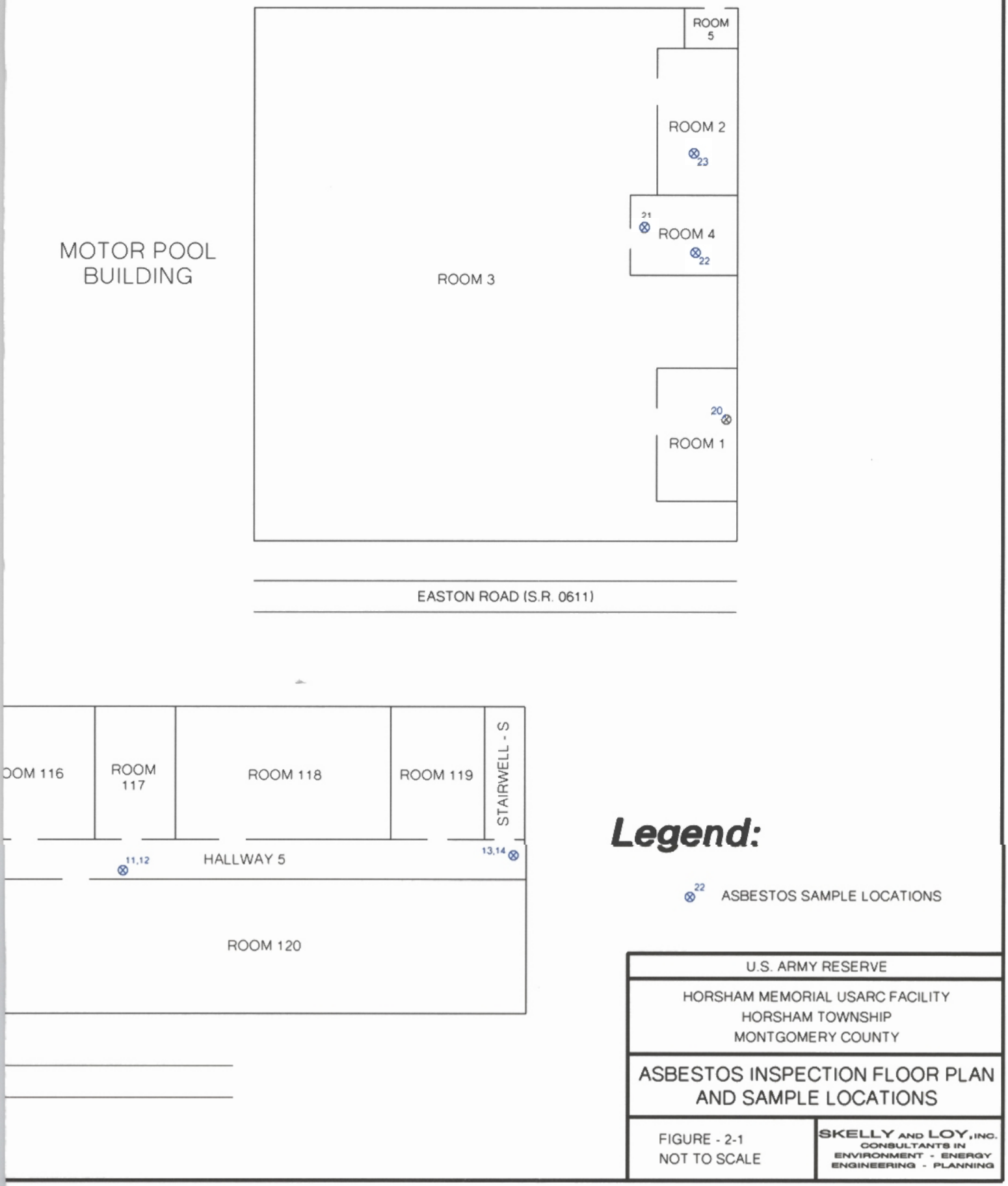
HORSHAM MEMORIAL USARC FACILITY
HORSHAM TOWNSHIP
MONTGOMERY COUNTY

PROJECT LOCATION

FIGURE - 1

SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


DRILL HALL
MAIN BUILDING
FIRST FLOOR
ROOM 110
01
02
ROOM 111
HALLWAY 3
HALLWAY 1
ROOM 112
ROOM 109
05
06
ROOM 108
CLOSET 1
03,04
ROOM 105
ROOM 106
HALLWAY 2
STAIRWELL - N
BOILER ROOM
HALLWAY 4
ROOM 104
10
09
ROOM 103
07
08
ROOM 102
ROOM 101
FOYER 2
15
FOYER 1
16
ROOM 124
ROOM 123
EASTON ROAD (S.R. 0611)



U.S. ARMY RESERVE

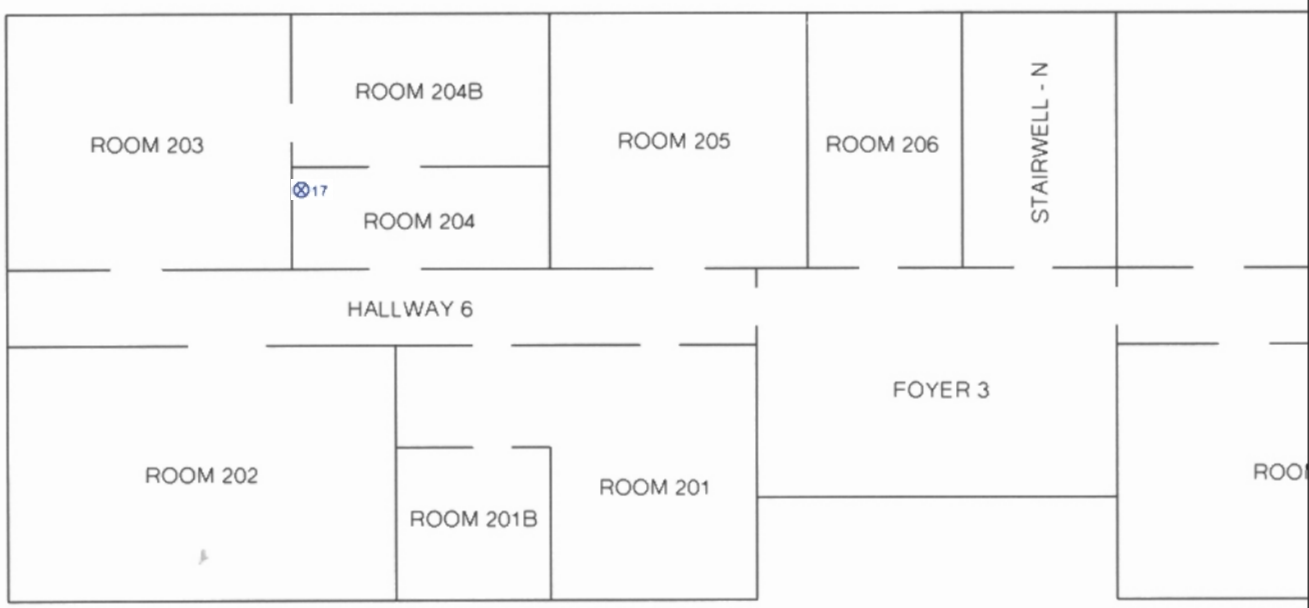
HORSHAM MEMORIAL USARC FACILITY
HORSHAM TOWNSHIP
MONTGOMERY COUNTY

ASBESTOS INSPECTION FLOOR PLAN AND SAMPLE LOCATIONS

FIGURE - 2-1
NOT TO SCALE

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

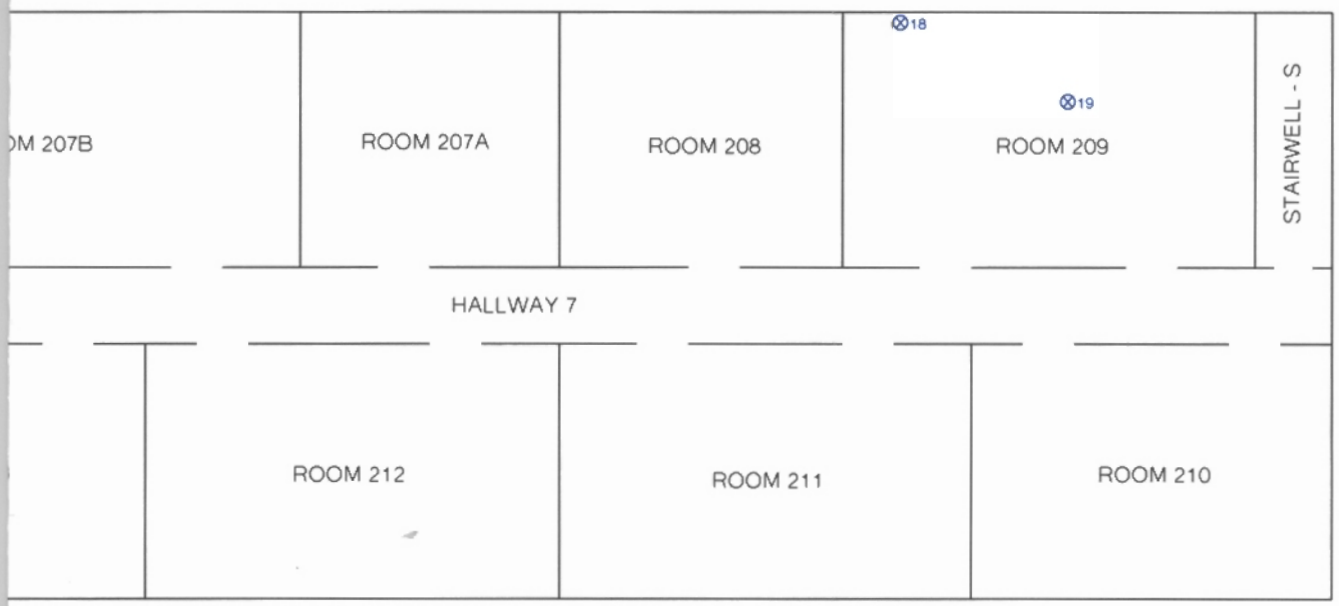
MAIN BU
SECOND



Legend:

⊗22 ASBESTOS SAMPLE LOCATIONS

ING
OOR



0611)

U.S. ARMY RESERVE

HORSHAM MEMORIAL USARC FACILITY
HORSHAM TOWNSHIP
MONTGOMERY COUNTY

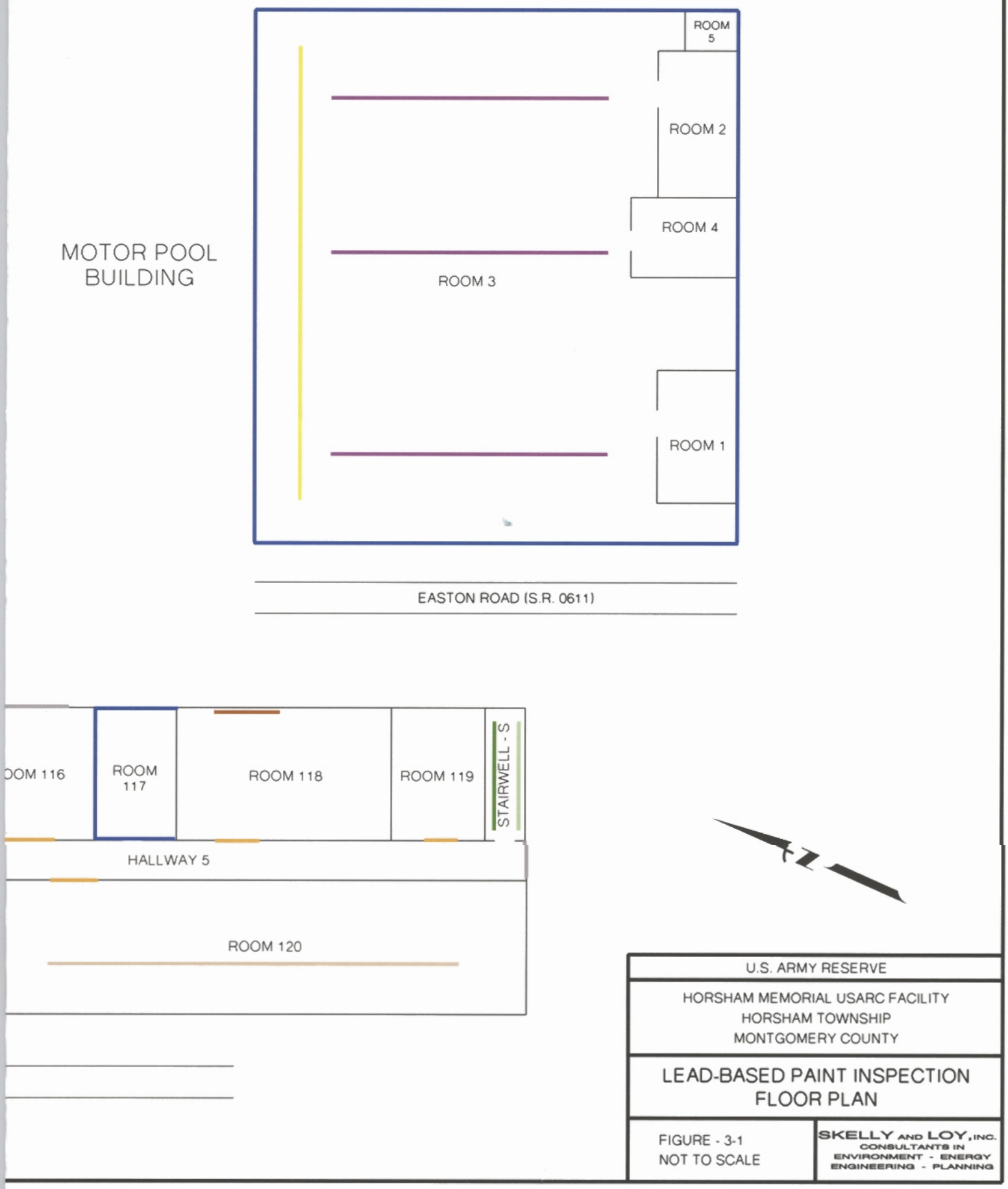
ASBESTOS INSPECTION FLOOR PLAN AND SAMPLE LOCATIONS

FIGURE - 2-2
NOT TO SCALE

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

Legend:

- CEILING
- DOOR
- DOOR FRAME
- FLOOR
- GARAGE DOOR FRAME
- RADIATOR
- WALL
- SUPPORT COLUMN
- WINDOW SILL
- STAIR HANDRAIL
- STAIR STRINGER
- STAIR TREAD



U.S. ARMY RESERVE

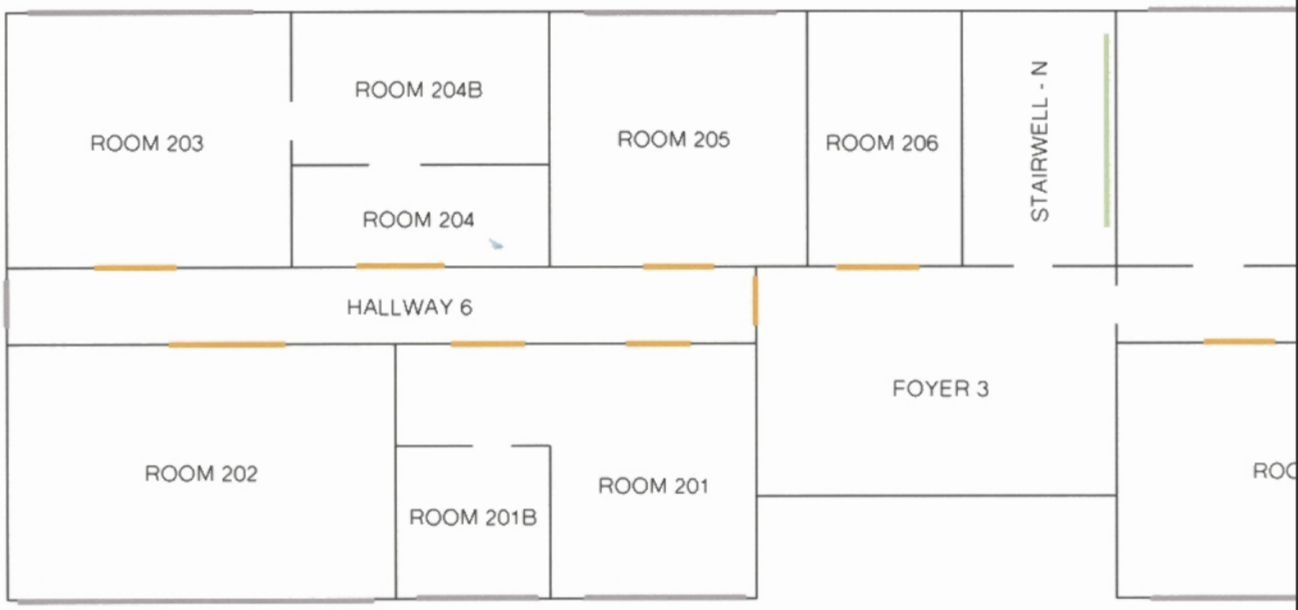
HORSHAM MEMORIAL USARC FACILITY
HORSHAM TOWNSHIP
MONTGOMERY COUNTY

LEAD-BASED PAINT INSPECTION FLOOR PLAN

FIGURE - 3-1
NOT TO SCALE

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

MAIN BU
SECOND

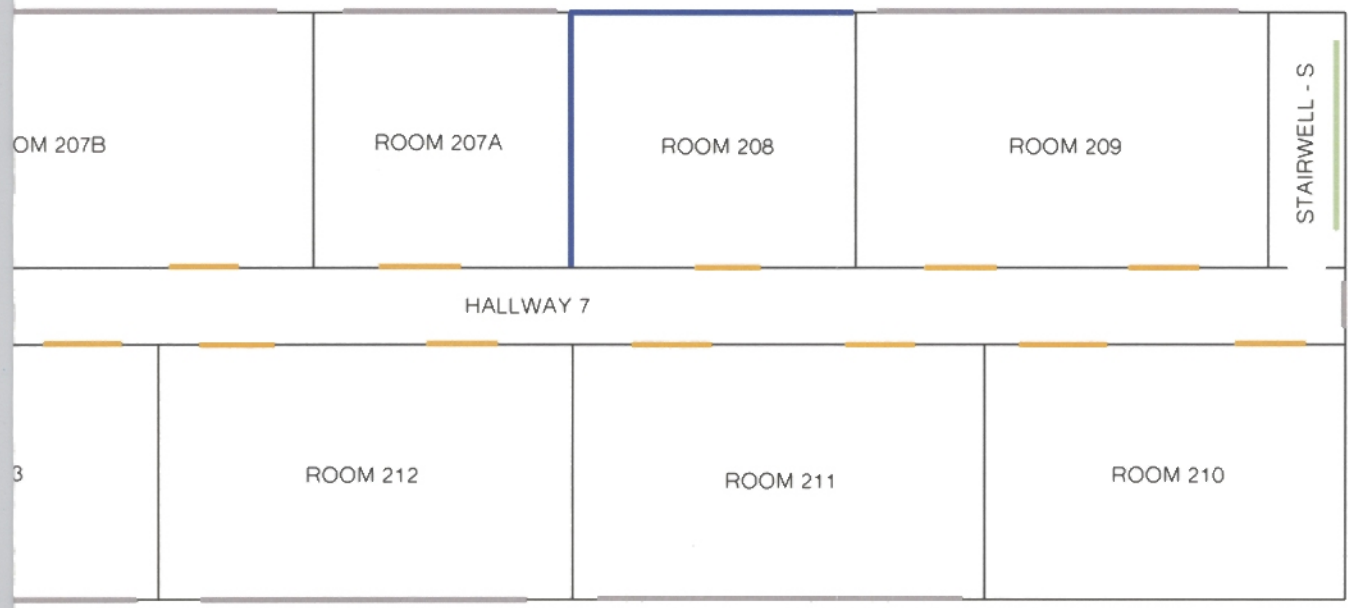


Legend:

- DOOR FRAME
- WALL
- WINDOW SILL
- STAIR HANDRAIL

EASTON ROAD

DING
OOR



0611)

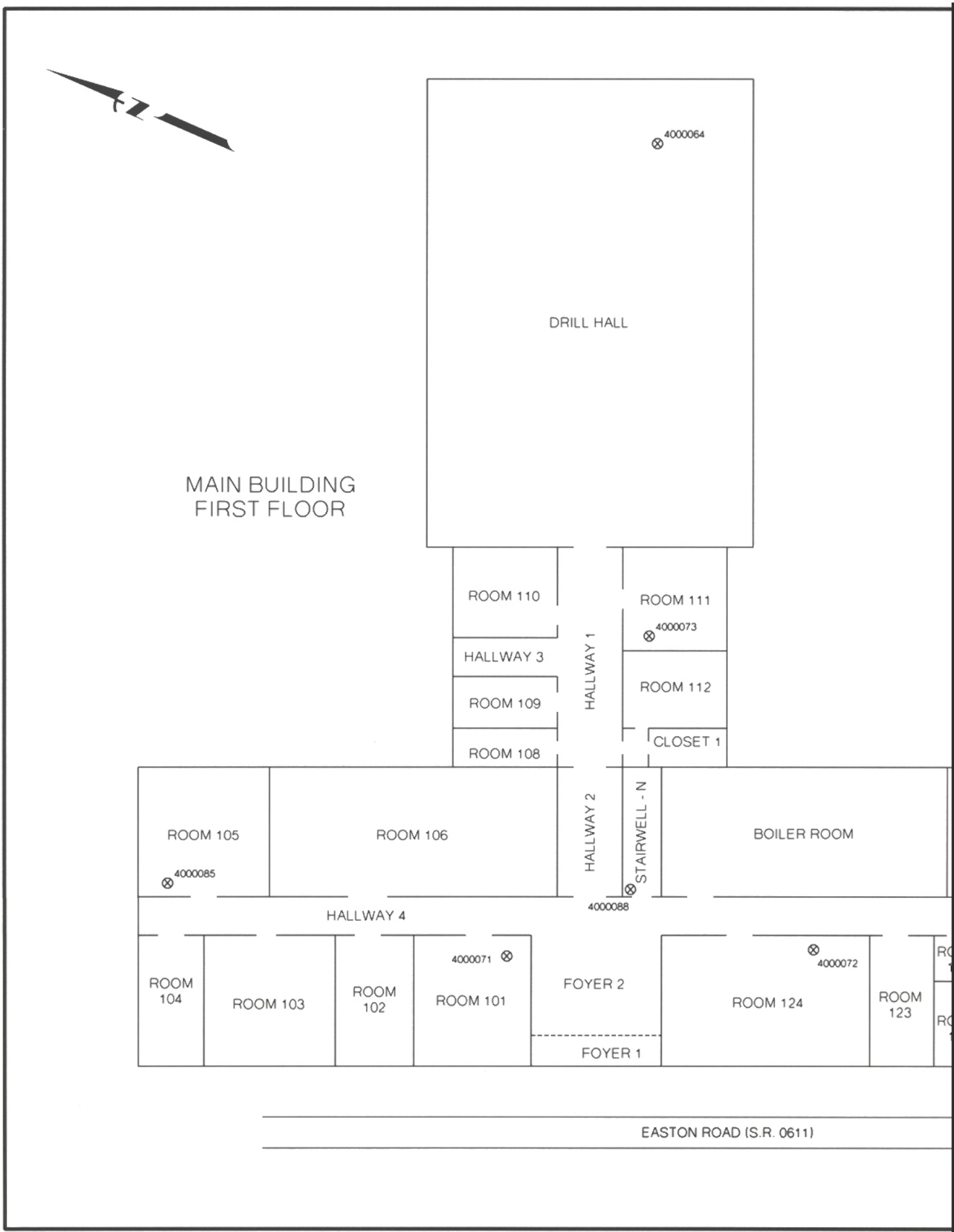
U.S. ARMY RESERVE

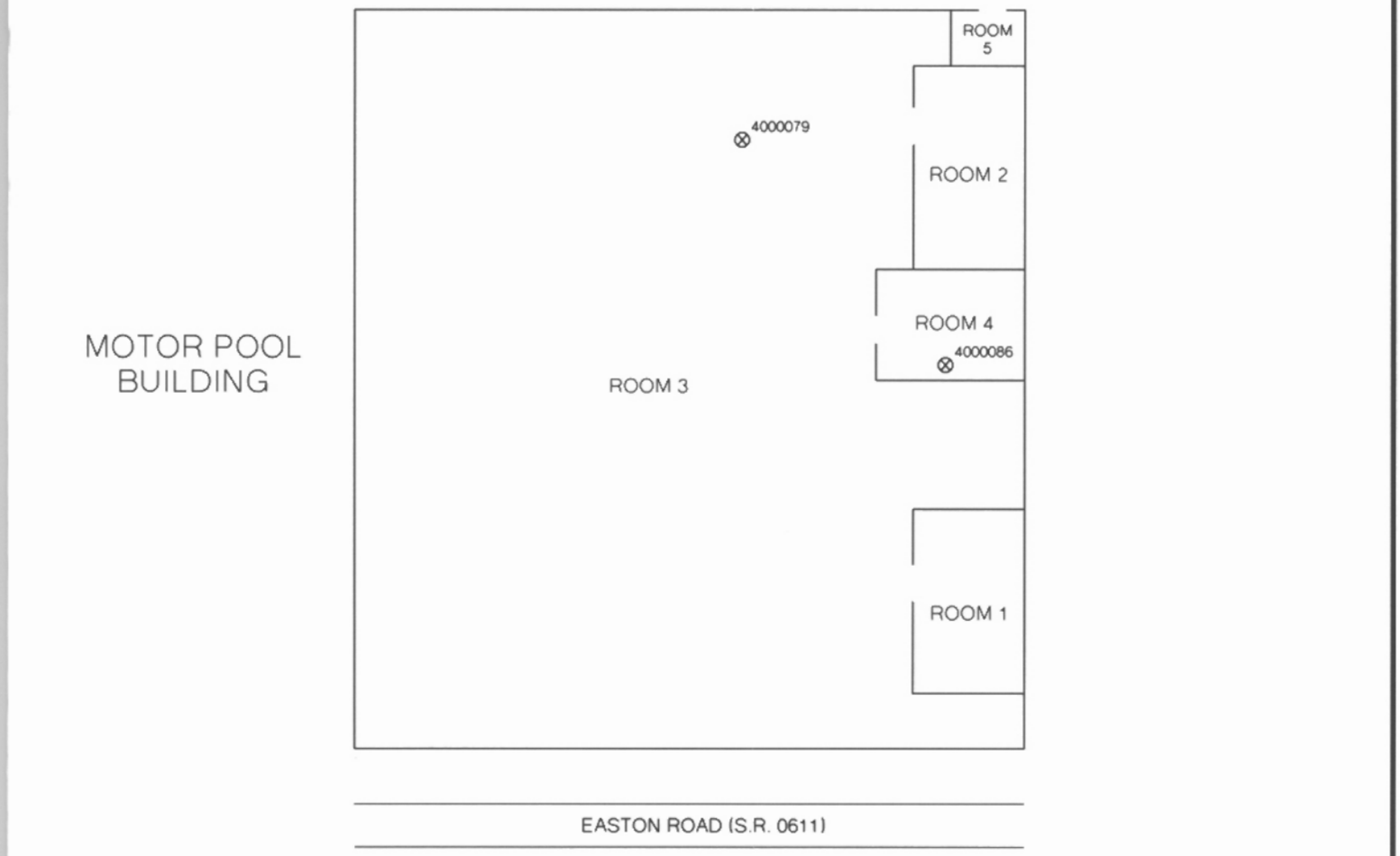
HORSHAM MEMORIAL USARC FACILITY
HORSHAM TOWNSHIP
MONTGOMERY COUNTY

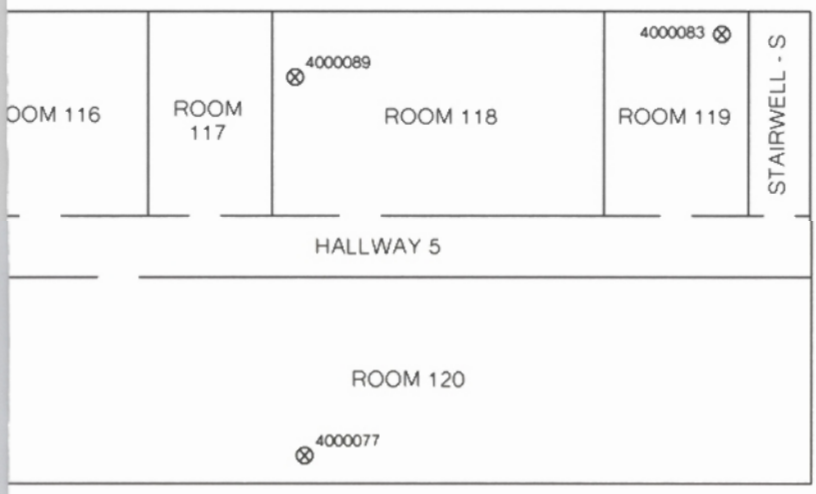
LEAD-BASED PAINT INSPECTION
FLOOR PLAN

FIGURE - 3-2
NOT TO SCALE

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


4000064
DRILL HALL
MAIN BUILDING
FIRST FLOOR
ROOM 110
ROOM 111
4000073
HALLWAY 3
HALLWAY 1
ROOM 112
ROOM 109
CLOSET 1
ROOM 108
ROOM 105
ROOM 106
HALLWAY 2
STAIRWELL - N
BOILER ROOM
4000085
4000088
HALLWAY 4
4000071
4000072
ROOM 104
ROOM 103
ROOM 102
ROOM 101
FOYER 2
ROOM 124
ROOM 123
FOYER 1
EASTON ROAD (S.R. 0611)





Legend:

4000089 RADON INSPECTION SAMPLE LOCATIONS

U.S. ARMY RESERVE

HORSHAM MEMORIAL USARC FACILITY
HORSHAM TOWNSHIP
MONTGOMERY COUNTY

RADON INSPECTION FLOOR PLAN AND SAMPLE LOCATIONS

FIGURE - 4
NOT TO SCALE

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

APPENDIX A

Asbestos Analytical Results and
Chain-of-Custody Documentation

ALLEGHENY ASBESTOS ANALYSIS, INC.
416 ANTHONY STREET
CARNEGIE, PENNSYLVANIA 15106
412-278-5400 FAX: 412-278-5404

Report Date: November 22, 2004
Job Number: 375-04-14528
Date Analyzed: November 19, 2004

RESULTS OF POLARIZED LIGHT ANALYSIS

Client: Skelly and Loy
Address: 2500 Eldo Road – Suite 2
Monroeville, PA 15146
Attention: Chris Ireland

Project: Horsham USARC

LAB I.D.	SAMPLE NUMBER	SAMPLE DESCRIPTION	DATE RECEIVED	ASBESTOS FIBERS PRESENT (Type & Approximate Percent)	TOTAL PERCENT ASBESTOS PRESENT	OTHER FIBROUS MATERIAL PRESENT (Type &Approx %)	NON-FIBROUS MATERIAL (Type & Percent)
B07336	H-01	Gray insulation	11-18-04	ND	ND	Cellulose = 5% Mineral Wool = 35%	Calcite, Opaques, others = 60%
B07337	H-02	Light gray plaster	11-18-04	ND	ND	Cellulose = 2%	Calcite, Opaques, Gypsum, others = 98%
B07338	H-03	Black floor tile	11-18-04	Chrysotile = 3%	3%		Calcite, Opaques, others = 97%
B07339	H-03A	Black mastic	11-18-04	ND	ND	Cellulose = 5%	Opaques, Bitumen, others = 95%
B07340	H-04	Brown mastic	11-18-04	ND	ND	Cellulose = 5%	Opaques, others = 95%
B07341	H-05	Black floor tile	11-18-04	ND	ND	Cellulose = 2%	Calcite, Opaques, others = 98%
B07342	H-05A	Black mastic	11-18-04	ND	ND	Cellulose = 5%	Opaques, Bitumen, others = 95%
B07343	H-06	White plasterboard	11-18-04	ND	ND	Cellulose = 12%	Calcite, Opaques, Gypsum, others = 88%
B07344	H-07	White plasterboard	11-18-04	ND	ND	Cellulose = 12%	Calcite, Gypsum, Opaques, others = 88%
B07345	H-08	White/gray floor tile	11-18-04	ND	ND	Cellulose = 2%	Opaques, Calcite, others = 98%
B07346	H-08A	Black mastic	11-18-04	ND	ND	Cellulose = 7%	Opaques, Bitumen, others = 93%
B07347	H-09	Black floor tile	11-18-04	ND	ND	Cellulose = 2%	Calcite, Opaques, others = 98%
B07348	H-09A	Black mastic	11-18-04	ND	ND	Cellulose = 5%	Opaques, Bitumen, others = 95%
B07349	H-10	Gray floor tile	11-18-04	Chrysotile = 5%	5%		Calcite, Opaques, others = 95%

LAB I.D.	SAMPLE NUMBER	SAMPLE DESCRIPTION	DATE RECEIVED	ASBESTOS FIBERS PRESENT (Type & Approximate Percent)	TOTAL PERCENT ASBESTOS PRESENT	OTHER FIBROUS MATERIAL PRESENT (Type &Approx %)	NON-FIBROUS MATERIAL (Type & Percent)
B07350	H-10A	Black mastic	11-18-04	ND	ND	Cellulose = 5%	Opaques, Bitumen, others = 95%
B07351	H-11	Gray insulation	11-18-04	ND	ND	Cellulose = 5% Mineral Wool = 35%	Calcite, Opaques, others = 60%
B07352	H-12	White insulation	11-18-04	ND	ND	Cellulose = 3%	Perlite, Opaques, others = 97%
B07353	H-13	Gray insulation	11-18-04	ND	ND	Cellulose = 5% Mineral Wool = 35%	Calcite, Opaques, others = 60%
B07354	H-14	Gray insulation	11-18-04	Chrysotile = 7%	7%	Cellulose = 83%	Opaques, others = 10%
B07355	H-15	Gray floor tile	11-18-04	ND	ND	Cellulose = 2%	Calcite, Opaques, others = 98%
B07356	H-15A	Pale yellow mastic	11-18-04	ND	ND	Cellulose = 5%	Opaques, others = 95%
B07357	H-16	Black floor tile	11-18-04	ND	ND	Cellulose = 2%	Calcite, Opaques, others = 98%
B07358	H-16A	Amber mastic	11-18-04	ND	ND	Cellulose = 7%	Opaques, others = 93%
B07359	H-17	Black floor tile	11-18-04	ND	ND	Cellulose = 3%	Calcite, Opaques, others = 97%
B07360	H-17A	Black mastic	11-18-04	ND	ND	Cellulose = 5%	Opaques, Bitumen, others = 95%
B07361	H-18	Black floor tile	11-18-04	ND	ND	Cellulose = 3%	Calcite, Opaques, others = 97%
B07362	H-18A	Black mastic	11-18-04	Chrysotile = 7%	7%	Cellulose = 8%	Opaques, Bitumen, others = 85%
B07363	H-19	White plasterboard	11-18-04	ND	ND	Cellulose = 12%	Calcite, Gypsum, Opaques, others = 88%
B07364	H-20	Beige floor tile	11-18-04	ND	ND	Cellulose = 1%	Calcite, Opaques, others = 99%
B07365	H-20A	No sample present	11-18-04				
B07366	H-21	Blue-green floor tile	11-18-04	ND	ND	Cellulose = 1%	Calcite, Opaques, others = 99%
B07367	H-21A	Amber mastic	11-18-04	ND	ND	Cellulose = 7%	Opaques, others = 93%
B07368	H-22	Gray floor tile	11-18-04	ND	ND	Cellulose = 1%	Calcite, Opaques, others = 99%

LAB I.D.	SAMPLE NUMBER	SAMPLE DESCRIPTION	DATE RECEIVED	ASBESTOS FIBERS PRESENT (Type & Approximate Percent)	TOTAL PERCENT ASBESTOS PRESENT	OTHER FIBROUS MATERIAL PRESENT (Type &Approx %)	NON-FIBROUS MATERIAL (Type & Percent)
B07369	H-22A	Amber mastic	11-18-04	ND	ND	Cellulose = 5%	Opaques, others = 95%
B07370	H-23	White plasterboard	11-18-04	ND	ND	Cellulose = 12%	Calcite, Gypsum, Opaques, others = 88%

Samples are analyzed according to the U.S. EPA "Method for the Determination of Asbestos in Bulk Insulation Samples: EPA 600/R-93-116). Bulk sample report relates to only those items tested. All samples are retained for 90 days. Tile, Vinyl, Foam, Plastic and Fine Powder samples may contain Asbestos fibers of such small diameter that these fibers may not be detected by PLM. Such samples should be analyzed by XRD, TEM or SEM for greater certainty of Asbestos content. NVLAP LAB CODE NUMBER 901003

THIS REPORT SHALL NOT BE REPRODUCED WITHOUT THE APPROVAL OF ALLEGHENY ASBESTOS ANALYSIS, INC.
THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY NVLAP OR ANY AGENCY OF THE UNITED STATES GOVERNMENT.

ND = None Detected
NA = Not Analyzed

ANALYST: Mark Stahlbock

AUTHORIZED SIGNATURE: _____

Allegheny Asbestos Analysis, Inc.

416 ANTHONY STREET • CARNEGIE, PA 15106
(412) 278-5400 • FAX: (412) 278-5404

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Luke R. Marsh
Phone #: 412 856 1676
FAX #: 412 856 5730

Company Name & Address: Skelly & Loy, Inc. 2500 Eth Rd, Suite 2 Monroeville, PA 15146

Project #: 375-04-14528
Project Name: Hirsham USARC

Project Location:
Sampler Signature:

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME
	H - 01	1						X				X		11/15/04	800-1000
	H - 02														
	H - 03														
	H - 04														
	H - 05														
	H - 06														
	H - 07														
	H - 08														
	H - 09														
	H - 10														
	H - 11														

ANALYSIS REQUEST

BTEX, MTBE	TPH	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI	AA	AAGF	P.L.M	P.C.M.	T.E.M.
										X		

SPECIAL HANDLING

Turn around # of days	Fax ASAP	Report TWC direct	Hold
6	X		

	Date:	Time:	Received by:
Relinquished by:	11/16/04	1330	
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS

Allegheny Asbestos Analysis, Inc.

416 ANTHONY STREET • CARNEGIE, PA 15106
(412) 278-5400 • FAX: (412) 278-5404

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Luke R. Marsh
Phone #: 412 856 1676
FAX #: 412 856 5730

Company Name & Address: Skelly & Loy, Inc. 2500 Eldo Rd, Suite 2 Monroeville, PA 15146

Project #: 3355-04-144528
Project Name: Horsham USARC

Project Location:
Sampler Signature:

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME
	H - 12	1						X				X		11/8/04	1330
	H - 13														
	H - 14														
	H - 15														
	H - 16														
	H - 17														
	H - 18														
	H - 19														
	H - 20														
	H - 21														
	H - 22														

ANALYSIS REQUEST

BTEX, MTBE	TPH	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI	AA	AAGF	P.L.M	P.C.M.	T.E.M.
										X		

SPECIAL HANDLING

Turn around # of days	Fax ASAP	Report TWC direct	Hold
6	X		

Relinquished by:	Date:	Time:	Received by:
	11/18/04	1330	
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS

Allegheny Asbestos Analysis, Inc.

416 ANTHONY STREET • CARNEGIE, PA 15106
(412) 278-5400 • FAX: (412) 278-5404

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Luke R. Mulsh
Phone #: 412 856 1636
FAX #: 412 856 5730

Company Name & Address: Skelly & Loy, Inc. 2300 Eld Rd, Suite 2 Monroeville, PA 15146

Project #: 375-044-145288
Project Name: Horsham USARC

Project Location:
Sampler Signature: [signature]

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX, MTBE	TPH	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI	AA	AAGF	P.LM	P.C.M.	T.E.M.	SPECIAL HANDLING: Turn around # of days	Fax ASAP	Report TWC direct	Hold
	H-23	1						X				X		11/15/04	0900 1000											X			6	X		

Relinquished by:	Date:	Time:	Received by:
[signature]	11/18/04	1330	[signature]
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS

APPENDIX B

Lead-Based Paint Inspection Report

ANALYTICAL LABORATORY SERVICES, INC.
Environmental ✦ Industrial Hygiene ✦ Field Services
www.analyticallab.com

Lead Sampling Survey

2 Battalion, 228 Aviation
936 Easton Road
Horsham, PA 10944

Prepared For:	**Mr. Luke Marsh** **Skelly and Loy Incorporated** **2500 Eldo Road, Suite 2** **Monroeville, PA 15146**
Prepared By:	**Analytical Laboratory Services, Inc. (ALSI)**
Survey Location:	**2 Battalion, 228 Aviation** **936 Easton Road** **Horsham, PA 10944**
Survey Dates:	**November 15 & 16, 2004**
Report Date:	**December 13, 2004**
ALSI Project #:	**0411534**

Daniel J. Larson, CIH
Director, Environmental Health & Safety

Table of Contents

Section 1.0
Introduction

Section 1.0 Introduction

Analytical Laboratory Services, Inc. (ALSI) was retained by Skelly and Loy Inc. to perform a lead sampling survey at the 2 Battalion, 228 Aviation building located at 936 Easton Road, Horsham, PA 10944. ALSI personnel Mr. Tim O'Brien and Ms. Janelle Carper conducted the survey on November 15 & 16, 2004. Mr. O'Brien is a Pennsylvania Department of Labor and Industry (PADOLI) licensed LBP inspector. This property is scheduled for renovations. The purpose of this survey was to generally characterize the site including identifying the types of building materials containing lead for compliance with the Occupational Safety and Health Administration (OSHA) lead in construction standard (29 CFR 1926.62). This sampling survey included representative testing of all building components.

The objectives of the survey and sampling were as follows:

1. Inspect interior and exterior building components for lead based paint (LBP) and lead containing paint (LCP);

2. Sample selected painted components using an X-ray radiation fluorescence (XRF) spectrum analyzer.

Section 2.0
Background

Section 2.0 Background

Lead-Based Paint

Lead compounds (chemicals consisting of lead in combination with other elements such as oxygen and chromium) such as white lead and lead chromate were widely used as pigments in paint. Lead is also commonly present in varnishes and primers. Although the use of LBP, in particular on interior surfaces, has declined over the years, most housing units and industrial buildings built before 1978 contain some lead-based paint.

The major source of lead exposure for most adults is occupational exposure. For infants and young children, however, surface dust and soil are the major lead hazard, because children play on floors and in outside play spaces that may be contaminated with lead. They frequently put fingers, toys, and other objects in their mouth. The surface dust and soil exposure pathways are often derived from lead-based paint. Air is another important pathway for lead deriving from lead-based paint, although lead may be in airborne dust during refinishing or renovation activities or because of windblown surface dust. Finally, children are often exposed to lead, which is brought into the house on the work clothes of parents.

Regulatory Overview

Current Environmental Protection Agency (EPA), Housing and Urban Development (HUD), and PADOLI LBP regulations apply only to child occupied facilities and target housing. The definition of a child occupied facility is a location where a child (6 years old or younger) spends at least two days a week for a minimum of three hours per day. The definition of target housing is housing constructed prior to 1978, or any zero-bedroom dwelling. The definition of abatement is a set of measures designed to eliminate or reduce LBP hazards in accordance with standards established by the EPA. The term includes the following:

1. The removal of LBP and lead-contaminated dust.
2. The permanent containment or encapsulation of LBP.
3. The replacement of lead-painted surfaces or fixtures.
4. The removal or covering of lead-contaminated soil.
5. The preparation, cleanup, disposal and post abatement clearance testing activities associated with these measures.
6. Less than full abatement whereby the sources of lead contamination are reduced sufficiently to create a lead-safe environment rather than a lead-free environment.

Abatement does not include renovation and remodeling or landscaping activities by contractors whose primary intent is not to permanently eliminate or reduce lead-based hazards, but is instead to repair, restore or remodel a given structure or dwelling. The term does not include renovation and remodeling activities conducted by homeowners.

Occupation Safety and Health Administration (OSHA) standards are based on personal exposure data obtained from air sampling. Lead paint sampling by XRF is useful to evaluate the potential for lead exposure. XRF testing does not replace the OSHA requirement for air sampling to evaluate worker exposure. Maintenance work involving potential lead exposure is covered by the OSHA lead in construction standard 29 CFR 1926.62.

Section 3.0
Methodology

Section 3.0 Methodology

All sampling was conducted by using a properly calibrated MAP (Metals Analysis Probe) 4 Spectrum Analyzer. The MAP 4 is a portable, measuring instrument that uses x-ray fluorescence to test for lead in paint. The MAP 4 gives immediate, on-site results. Laboratory analysis is sometimes recommended if XRF results are inconclusive (e.g. HUD inspection). For this project no paint chip samples were collected. Therefore, all inconclusive results are to be considered at a minimum LCP. All LBP testing was performed with reference to the Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, June 1995 (Revised 1997), pursuant to Title X of the Housing and Community Development Act of 1992 issued by the U.S. Department of Housing and Urban Development (HUD). The HUD action level of 1.0 mg/cm^2, for LBP measured by XRF, was used to define LBP.

The "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" manual developed by the HUD sets forth various methods for lead based paint inspections. The most conclusive, therefore, preferred method is collection of paint film samples for laboratory analysis by Atomic Absorption (AA) or Inductively Coupled Plasma (ICP). The collection of paint film samples is time consuming, costly, and requires the repair of surfaces where the sample was collected. As an alternative the EPA and HUD recognized and recommended method is the use of a portable XRF spectrum analyzer provided the XRF is used in accordance with the XRF "Performance Characteristic Sheet" developed by the manufacturer.

The technology behind the XRF is to expose the painted surface to other high-energy radiation (e.g., gamma rays), which causes the lead in the paint to emit x-rays at a characteristic frequency. The intensity of this radiation is measured by the XRF's detector and converted to a number, which represents the concentration of lead in the paint. Results are reported in mg/cm^2.

While the XRF method of surveying is not without limitations, the speed, cost efficiency, and nondestructive nature or the testing is a useful "first step" in the lead based paint inspection process. All XRF readings, especially less than 1.0 mg/cm^2, should be considered qualitative since the reliability of data decreases as lead content decreases especially when results are less than 1.0 mg/cm^2.

The sampling strategy used in this survey is as follows:

- An evaluation of the condition of the property.
- Draw a floor plan and assign wall numbers per room
- Determine a testing combination (room type, building component type, and substrate). Certain building components that are adjacent to each other can be grouped together into a single testing combination based on the homogenous appearance of the building components.
- At least one of each different building component was sampled. In most areas many components were tested.

The HUD action level of 1.0 mg/cm^2, for LBP measured by XRF, was used to derive final LBP conclusions and recommendations. ALSI utilizes the following definitions:

- **Lead Based Paint (LBP)** - Painted items that produce a XRF test result of equal to or greater than 1.0 mg/cm^2. This is the HUD definition.

- **Lead Containing Paint (LCP)** – Painted items that produce a XRF test result from 0.0 – 0.99 mg/cm^2. This is consistent with OSHA standards since OSHA uses air-sampling data not XRF results for compliance purposes.

Section 4.0
Results of Survey

Section 4.0 Results of Survey

The following table summarizes lead-based paint findings from this inspection. Positive XRF readings were located at the following locations:

Table 4.1 Summary of Lead Based Paint (LBP) Positive Results (=/>1.0 mg/cm^2)
936 Easton Road Horsham, PA 10944.
Date: 11/15-16/04

Room Name	Wall Number	Paint Color	Building Component Tested	Result K-Shell mg/cm^2	Result
Room 105	3	Peach	Window Sill	1.20	LBP
Room 104	1	Black	Door Frame	1.33	LBP
Room 103	1	White	Door Frame	1.33	LBP
	3	White	Window Sill	1.28	LBP
Room 102	3	White	Door Frame	1.14	LBP
Room 101	1	Black	Door Frame	1.15	LBP
Room 124	3	Peach	Window Sill	1.70	LBP
Room 123	1	Black	Door Frame	2.19	LBP
	3	Peach	Window Sill	1.53	LBP
Room 122	3	Peach	Wall	1.55	LBP
	4	Peach	Wall	1.93	LBP
	1	Black	Door Frame	1.17	LBP
Room 120	1	Tan	Door Frame	1.30	LBP
		White	Ceiling	2.05	LBP
		White	Ceiling	2.45	LBP
Room 121	2	Tan	Door Frame	1.14	LBP
Room 118	1	Tan	Door Frame	1.70	LBP
	3	White	Radiator	1.04	LBP
Room 119	1	Tan	Door Frame	1.24	LBP
Room 117	1	Dark Green	Wall	8.64	LBP
	2	Dark Green	Wall	7.43	LBP
	3	Dark Green	Wall	7.31	LBP
Room 116	1	Black	Door Frame	1.20	LBP
	3	Peach	Window Sill	1.12	LBP
Boiler Room	1	Grey	Stair Stringer	9.57	LBP
		Grey	Stair Tread	13.40	LBP
		Grey	Stair Handrail	2.05	LBP
Room 108	1	Black	Door Frame	1.18	LBP
	4	Yellow	Wall	2.69	LBP
Room 109	1	Black	Door Frame	1.31	LBP
	3	White	Window Sill	1.01	LBP
Room 111	1	Yellow	Door Frame	1.62	LBP
Room 112	1	Black	Door Frame	1.51	LBP
		Dark Green	Wall	6.66	LBP
	2	Dark Green	Wall	7.69	LBP
Drill Hall	3	Black	Door	1.52	LBP
		Black	Door Frame	2.41	LBP
		Black	Garage Door Frame	2.71	LBP
Room 203	1	Black	Door Frame	1.29	LBP

Table 4.1 Summary of Lead Based Paint (LBP) Positive Results (=/>1.0 mg/cm^2)
936 Easton Road Horsham, PA 10944.
Date: 11/15-16/04

Room Name	Wall Number	Paint Color	Building Component Tested	Result K-Shell mg/cm^2	Result
Room 203	3	White	Window Sill	1.76	LBP
Room 202	1	Black	Door Frame	1.14	LBP
	3	Peach	Window Sill	1.17	LBP
Room 204	1	Black	Door Frame	1.15	LBP
Room 201	1	Black	Door Frame	1.24	LBP
	3	Peach	Window Sill	1.21	LBP
Room 205	1	Black	Door Frame	1.36	LBP
	3	Peach	Window Sill	1.00	LBP
Hallway Four	1	Red	Door Frame	1.01	LBP
	3	Yellow	Window Sill	1.70	LBP
Room 206	1	Black	Door Frame	1.24	LBP
Room 207-A	1	Black	Door Frame	1.10	LBP
	3	Pink	Window Sill	1.22	LBP
Room 213	1	Black	Door Frame	1.23	LBP
	3	Peach	Window Sill	1.53	LBP
Room 212	1	Black	Door Frame	1.15	LBP
	3	Peach	Window Sill	1.15	LBP
Room 207	1	Black	Door Frame	1.42	LBP
	3	Pink	Window Sill	1.06	LBP
Room 208	1	Black	Door Frame	1.17	LBP
	2	Dark Green	Wall	6.24	LBP
	3	Dark Green	Wall	7.57	LBP
Room 209	1	Black	Door Frame	1.31	LBP
	3	Peach	Window Sill	1.31	LBP
Room 210	1	Black	Door Frame	1.23	LBP
Hallway Five	3	Tan	Window Sill	1.31	LBP
Stairwell One	2	Grey	Stair Tread	1.08	LBP
		Grey	Floor	1.08	LBP
	2	Black	Stair Handrail	3.79	LBP
Stairwell Two	2	Black	Stair Handrail	5.44	LBP
Vehicle Pool	1	Tan	Wall	1.36	LBP
	2	Tan	Wall	1.96	LBP
	3	Tan	Wall	1.93	LBP
	4	Tan	Wall	1.25	LBP
		Yellow	Floor	7.97	LBP
		Yellow	Support Column	14.71	LBP
Room 211	1	Black	Door Frame	1.17	LBP
	3	Peach	Window Sill	1.06	LBP

4.1 Notes:

1. For detailed listing of tested components refer to Appendix B "XRF Results, as tested".
2. See floor plans for wall number locations.

The following tables summarize lead-containing paint findings from this inspection. Positive XRF readings for lead-containing paint were located at the following locations:

Table 4. 2 Summary of Lead Containing Paint (LCP) Positive Results (0.0-0.99 mg/cm^2)
936 Easton Road Horsham, PA 10944
Date: 11/15-16/04

Room Name	Wall Number	Paint Color	Building Component Tested	Result K-Shell mg/cm^2	Result
Room 105	1	Black	Door Frame	0.42	LCP
		Varnish	Door	0.10	LCP
	3	Peach	Radiator	0.43	LCP
	4	Green	Wall Mural	0.25	LCP
		Grey	Floor	0.23	LCP
		Grey	Ceiling	0.02	LCP
Room 104	1	White	Wall	0.03	LCP
	3	White	Radiator	0.85	LCP
		Black	Window Frame	0.39	LCP
Room 103	1	White	Wall	0.35	LCP
		Varnish	Door	0.15	LCP
	2	White	Wall	0.22	LCP
	3	White	Wall	0.59	LCP
		White	Radiator	0.82	LCP
		Black	Window Frame	0.46	LCP
	4	White	Wall	0.40	LCP
		White	Ceiling	0.09	LCP
Room 102	1	White	Wall	0.11	LCP
		Black	Door Frame	0.83	LCP
		Varnish	Door	0.15	LCP
	3	White	Wall	0.43	LCP
		Black	Window Frame	0.25	LCP
		White	Window Sill	0.74	LCP
		White	Radiator	0.42	LCP
	4	White	Wall	0.58	LCP
Room 101	1	White	Wall	0.10	LCP
		Varnish	Door	0.02	LCP
	2	White	Wall	0.47	LCP.
	3	White	Wall	0.41	LCP
		Black	Window Frame	0.48	LCP
		White	Window Sill	0.91	LCP
	4	White	Wall	0.08	LCP
		White	Ceiling	0.27	LCP
Hallway One	2	Yellow	Wall	0.10	LCP
		Yellow	Wall	0.39	LCP
	3	Black	Door	0.21	LCP
		Black	Door Frame	0.20	LCP
	4	Yellow	Wall	0.22	LCP
		Yellow	Radiator	0.93	LCP
		White	Ceiling	0.36	LCP
	4	Yellow	Ceiling	0.22	LCP

Table 4. 2 Summary of Lead Containing Paint (LCP) Positive Results (0.0-0.99 mg/cm^2)
936 Easton Road Horsham, PA 10944
Date: 11/15-16/04

Room Name	Wall Number	Paint Color	Building Component Tested	Result K-Shell mg/cm^2	Result
Room 124	1	Peach	Wall	0.06	LCP
		Black	Door Frame	0.20	LCP
	2	Peach	Wall	0.03	LCP
		Peach	Wall	0.43	LCP
	3	Black	Window Frame	0.53	LCP
		Peach	Radiator	0.97	LCP
	4	Peach	Wall	0.29	LCP
		White	Ceiling	0.30	LCP
Room 123	1	Peach	Wall	0.24	LCP
	2	Peach	Wall	0.13	LCP
	3	Peach	Wall	0.02	LCP
		Black	Window Frame	0.14	LCP
		Peach	Radiator	0.93	LCP
	4	Peach	Wall	0.35	LCP
		White	Ceiling	0.23	LCP
Room 122	1	Peach	Wall	0.17	LCP
	2	Peach	Wall	0.04	LCP
		Grey	Floor	0.31	LCP
		White	Ceiling	0.28	LCP
Room 120	1	White	Wall	0.34	LCP
		Varnish	Door	0.02	LCP
		White	Wall	0.40	LCP
	2	White	Wall	0.41	LCP
	3	White	Wall	0.15	LCP
		White	Wall	0.15	LCP
		White	Radiator	0.05	LCP
	4	White	Wall	0.26	LCP
		Green	Floor	0.46	LCP
Room 121	3	White	Wall	0.43	LCP
	4	White	Wall	0.07	LCP
		Green	Floor	0.20	LCP
		White	Ceiling	0.03	LCP
Vault	1	White	Wall	0.17	LCP
		White	Metal Cage	0.08	LCP
	3	White	Wall	0.69	LCP
Room 118	1	Blue	Wall	0.14	LCP
	2	Blue	Wall	0.41	LCP
	3	Black	Window Frame	0.15	LCP
		White	Window Sill	0.84	LCP
	4	Blue	Wall	0.17	LCP

Table 4. 2 Summary of Lead Containing Paint (LCP) Positive Results (0.0-0.99 mg/cm^2)
936 Easton Road Horsham, PA 10944
Date: 11/15-16/04

Room Name	Wall Number	Paint Color	Building Component Tested	Result K-Shell mg/cm^2	Result
Room 119	1	Peach	Wall	0.52	LCP
		Varnish	Door	0.38	LCP
	2	Peach	Wall	0.28	LCP
	3	Peach	Window Sill	0.91	LCP
		White	Ceiling	0.01	LCP
Room 117	1	Green	Wall	0.21	LCP
		Varnish	Door	0.02	LCP
		Black	Door Frame	0.64	LCP
	2	Peach	Wall	0.10	LCP
		Green	Wall	0.18	LCP
	3	Peach	Wall	0.09	LCP
		Green	Wall	0.33	LCP
		Peach	Radiator	0.97	LCP
		Black	Window Frame	0.27	LCP
		Peach	Window Sill	0.95	LCP
	4	Green	Wall	0.14	LCP
		White	Ceiling	0.37	LCP
Room 116	1	Peach	Wall	0.36	LCP
	2	Peach	Wall	0.26	LCP
	3	Peach	Radiator	0.81	LCP
	4	Peach	Wall	0.02	LCP
Hallway Two	1	Yellow	Wall	0.29	LCP
		Yellow	Door	0.60	LCP
		Yellow	Door Frame	0.85	LCP
	2	Yellow	Wall	0.19	LCP
		Yellow	Wall	0.51	LCP
	4	Yellow	Wall	0.41	LCP
		White	Ceiling	0.35	LCP
Foyer/Hallway Three	1	Yellow	Door	0.66	LCP
		Yellow	Door Frame	0.75	LCP
	2	Yellow	Wall	0.10	LCP
		White	Ceiling	0.04	LCP
Boiler Room	1	White	Wall	0.38	LCP
		White	Wall	0.14	LCP
	2	White	Wall	0.27	LCP
	3	White	Wall	0.36	LCP
		Black	Door	0.10	LCP
		White	Wall	0.15	LCP
	4	White	Wall	0.12	LCP
	3	White	Window Sill	0.80	LCP

Table 4. 2 Summary of Lead Containing Paint (LCP) Positive Results (0.0-0.99 mg/cm^2)
936 Easton Road Horsham, PA 10944
Date: 11/15-16/04

Room Name	Wall Number	Paint Color	Building Component Tested	Result K-Shell mg/cm^2	Result
Room 108	1	Yellow	Wall	0.23	LCP
		Varnish	Door	0.05	LCP
	2	Yellow	Wall	0.24	LCP
	3	Yellow	Window Sill	0.23	LCP
		White	Ceiling	0.28	LCP
Room 109	2	White	Wall	0.18	LCP
	3	White	Wall	0.62	LCP
	4	Brown	Wall	0.14	LCP
		White	Ceiling	0.12	LCP
Room 111	1	White	Wall	0.78	LCP
		Varnish	Door	0.03	LCP
	2	White	Wall	0.22	LCP
	3	White	Wall	0.25	LCP
		Black	Door	0.23	LCP
		Black	Door Frame	0.36	LCP
	4	White	Wall	0.19	LCP
		White	Ceiling	0.12	LCP
Room 112	1	Tan	Wall	0.27	LCP
		Green	Wall	0.27	LCP
	2	Tan	Wall	0.65	LCP
	3	Tan	Wall	0.35	LCP
	4	White	Wall	0.35	LCP
		Green	Floor	0.20	LCP
		White	Ceiling	0.13	LCP
Drill Hall	1	Tan	Wall	0.05	LCP
		White	Wall	0.33	LCP
	3	Tan	Wall	0.32	LCP
		Black	Garage Door	0.66	LCP
		White	Wall	0.17	LCP
	4	Tan	Wall	0.57	LCP
		Green	Floor	0.10	LCP
Room 203	1	Varnish	Door	0.06	LCP
	3	Black	Window Frame	0.05	LCP
		White	Radiator	0.98	LCP
Room 202	1	Varnish	Door	0.03	LCP
	3	Peach	Wall	0.05	LCP
		Black	Window Frame	0.21	LCP
		Peach	Radiator	0.21	LCP
	4	Peach	Wall	0.16	LCP
		White	Ceiling	0.01	LCP.

Table 4. 2 Summary of Lead Containing Paint (LCP) Positive Results (0.0-0.99 mg/cm^2)
936 Easton Road Horsham, PA 10944
Date: 11/15-16/04

Room Name	Wall Number	Paint Color	Building Component Tested	Result K-Shell mg/cm^2	Result
Room 204	1	Peach	Wall	0.11	LCP
	2	Peach	Wall	0.12	LCP
	4	Tan	Door Frame	0.92	LCP
Room 204-B	1	Tan	Wall	0.04	LCP
	3	Tan	Wall	0.05	LCP
		Tan	Window Sill	0.08	LCP
		Tan	Radiator	0.25	LCP
Room 201	1	Peach	Wall	0.14	LCP
		Varnish	Door	0.13	LCP
	3	Peach	Wall	0.21	LCP
		Black	Window Frame	0.28	LCP
		White	Ceiling	0.06	LCP
Room 205	1	Peach	Wall	0.07	LCP
		Varnish	Door	0.22	LCP
	2	Peach	Wall	0.20	LCP
	3	Peach	Wall	0.27	LCP
	4	Peach	Wall	0.34	LCP
		Red	Radiator	0.44	LCP
Hallway Four	1	Red	Door	0.72	LCP
	2	Yellow	Wall	0.11	LCP
		Yellow	Wall	0.03	LCP
	3	Yellow	Wall	0.19	LCP
		Black	Window Frame	0.19	LCP
Room 206	1	Peach	Wall	0.26	LCP
	2	Peach	Wall	0.14	LCP
	4	Peach	Wall	0.13	LCP
Room 207- A	1	Peach	Wall	0.27	LCP
	2	Peach	Wall	0.09	LCP
	3	Peach	Wall	0.12	LCP
		Yellow	Radiator	0.39	LCP
Room 213	1	Peach	Wall	0.21	LCP
		Varnish	Door	0.21	LCP
	2	Peach	Wall	0.27	LCP
	3	Peach	Radiator	0.44	LCP
Room 212	1	Peach	Wall	0.23	LCP
	3	Black	Window Frame	0.42	LCP
		Peach	Radiator	0.40	LCP
		White	Ceiling	0.04	LCP
Room 207	1	Varnish	Door	0.20	LCP
	2	Peach	Wall	0.04	LCP
	3	Yellow	Radiator	0.15	LCP
	4	Peach	Wall	0.39	LCP

Table 4. 2 Summary of Lead Containing Paint (LCP) Positive Results (0.0-0.99 mg/cm^2)
936 Easton Road Horsham, PA 10944
Date: 11/15-16/04

Room Name	Wall Number	Paint Color	Building Component Tested	Result K-Shell mg/cm^2	Result
Room 208	1	Peach	Wall	0.46	LCP
		Green	Wall	0.21	LCP
		Varnish	Door	0.09	LCP
	2	Peach	Wall	0.42	LCP
		Green	Wall	0.42	LCP
		Varnish	Door	0.06	LCP
		Tan	Door Frame	0.98	LCP
	3	Peach	Window Sill	0.98	LCP
		Green	Wall	0.36	LCP
		White	Ceiling	0.46	LCP
Room 209	1	Peach	Wall	0.29	LCP
	3	Peach	Wall	0.13	LCP
		Peach	Radiator	0.70	LCP
	4	Peach	Wall	0.13	LCP
		White	Ceiling	0.25	LCP
Room 210	1	Varnish	Door	0.28	LCP
	2	Peach	Wall	0.41	LCP
	3	Peach	Wall	0.36	LCP
		Peach	Window Sill	0.13	LCP
		Peach	Radiator	0.11	LCP
		White	Ceiling	0.24	LCP
Hallway Five	1	Yellow	Wall	0.22	LCP
		Tan	Door	0.27	LCP
		Tan	Door Frame	0.93	LCP
	2	Yellow	Wall	0.09	LCP
	3	Yellow	Wall	0.25	LCP
		Black	Window Frame	0.21	LCP
	4	Yellow	Wall	0.37	LCP
		Yellow	Wall	0.47	LCP
2nd Floor Foyer		White	Ceiling	0.13	LCP
Stairwell One	1	Yellow	Wall	0.17	LCP
	2	Yellow	Wall	0.50	LCP
	4	Yellow	Wall	0.25	LCP
Stairwell Two	1	Yellow	Wall	0.04	LCP
	2	Yellow	Wall	0.09	LCP
		Black	Radiator	0.78	LCP
	4	Yellow	Wall	0.21	LCP

Table 4. 2 Summary of Lead Containing Paint (LCP) Positive Results (0.0-0.99 mg/cm^2)
936 Easton Road Horsham, PA 10944
Date: 11/15-16/04

Room Name	Wall Number	Paint Color	Building Component Tested	Result K-Shell mg/cm^2	Result
Vehicle Pool	1	Tan	Garage Door Frame	0.60	LCP
		Tan	Garage Door	0.41	LCP
		Tan	Garage Door	0.37	LCP
	2	Black	Door Frame	0.51	LCP
Room 211	1	Varnish	Door	0.20	LCP
	3	Peach	Wall	0.16	LCP
		Peach	Radiator	0.11	LCP
	4	Peach	Wall	0.12	LCP
			Ceiling	0.26	LCP

4.2 Notes:

1. For detailed listing of tested components refer to Appendix B "XRF Results, as tested".
2. See floor plans for wall number locations.

Lead Paint – Additional Comments

The HUD action level of 1.0 mg/cm^2 is a regulatory standard and not a health based one. Components tested by XRF with results between zero and 1.0 mg/cm^2 may still contain small amounts of lead. The OSHA may consider components which tested between zero and 1.0 mg/cm^2 (as well as greater than 1.0 mg/cm^2) as a lead hazard depending on airborne exposures during activities which disturb the lead. Please refer to 29 CFR 1926.62 OSHA lead in construction standard for further guidance.

Section 5.0
Conclusions & Recommendations

Section 5.0 Conclusions & Recommendations

The following conclusions and recommendations are based on the sampling results and survey conditions, as they existed at the time of the survey.

Lead-Based Paint/Lead Containing Paint

1. LBP and LCP were found throughout the 2 Battalion, 228 Aviation Building. See Section 4.0 and Appendix B for locations.

2. Any contractor who performs renovation or demolition activities at this location must follow the OSHA lead in construction standard, 29 CFR 1926.62 and all state, federal and local regulations. Contractors who bid on work to be performed at this location should provide proof of employee training and have a competent person on site who can identify potential lead hazards and make appropriate recommendations for employee safety and regulatory compliance.

Appendix A
Professional Certifications

Appendix A. Professional Certifications

Daniel J. Larson, CIH

- Certified Industrial Hygienist, American Board of Industrial Hygiene, #CP7086
- B.A. University of Tennessee, 1985
- M.S. West Virginia University, 1999
- Member, American Academy of Industrial Hygiene
- Member, American Industrial Hygiene Association

Timothy J. O'Brien, Industrial Hygienist

- EPA (Model Curriculum) AHERA Certified Asbestos Inspector, Certificate #027146
- Pennsylvania Certified Asbestos Inspector, Certification #020554
- EPA (Model Curriculum) Certified Lead Risk Assessor, Certificate #10090
- Pennsylvania Certified Lead Risk Assessor, Certificate #001102

Appendix B
XRF Results as Tested

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/15/04	Room 105	1	Wall	Peach	Good	-0.23	No	No
			Door Frame	Black	Poor	0.42	No	Yes
			Door	Varnish	Good	0.10	No	Yes
		2	Wall	Peach	Good	-0.86	No	No
		3	Wall	Peach	Good	-0.81	No	No
			Window Frame	Black	Good	-0.04	No	No
			Window Sill	Peach	Fair	1.20	Yes	Yes
			Radiator	Peach	Good	0.43	No	Yes
		4	Wall	Peach	Good	-0.60	No	No
			Wall Mural	Green	Good	0.25	No	Yes
			Floor	Grey	Poor	0.23	No	Yes
			Ceiling	White	Good	0.02	No	Yes
	Room 104	1	Wall	White	Good	0.03	No	Yes
			Door Frame	Black	Poor	1.33	Yes	Yes
		2	Door	Varnish	Good	-0.56	No	No
		3	Wall	White	Good	-0.07	No	No
			Radiator	White	Fair	0.85	No	Yes
			Window Frame	Black	Good	0.39	No	Yes
		4	Wall	White	Good	-0.19	No	No
			Ceiling	White	Good	-0.15	No	No
	Room 103	1	Wall	White	Good	0.35	No	Yes
			Door Frame	Black	Poor	1.33	Yes	Yes
			Door	Varnish	Good	0.15	No	Yes
		2	Wall	White	Good	0.22	No	Yes
		3	Wall	White	Good	0.59	No	Yes
			Radiator	White	Good	0.82	No	Yes
			Window Frame	Black	Good	0.46	No	Yes
			Window Sill	White	Good	1.28	Yes	Yes
		4	Wall	White	Good	0.40	No	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/15/04	Room 103		Ceiling	White	Good	0.09	No	Yes
	Room 102	1	Wall	White	Good	0.11	No	Yes
			Door Frame	Black	Poor	0.83	No	Yes
			Door	Varnish	Good	0.15	No	Yes
		2	Wall	White	Good	-0.03	No	No
			Door Frame	White	Poor	1.14	Yes	Yes
		3	Wall	White	Good	0.43	No	Yes
			Window Frame	Black	Good	0.25	No	Yes
			Window Sill	White	Good	0.74	No	Yes
			Radiator	White	Good	0.42	No	Yes
		4	Wall	White	Good	0.58	No	Yes
			Ceiling	White	Good	-0.40	No	No
	Room 101	1	Wall	White	Fair	0.10	No	Yes
			Door Frame	Black	Poor	1.15	Yes	Yes
			Door	Varnish	Good	0.02	No	Yes
		2	Wall	White	Fair	0.47	No	Yes
		3	Wall	White	Fair	0.41	No	Yes
			Window Frame	Black	Good	0.48	No	Yes
			Window Sill	White	Good	0.91	No	Yes
			Radiator	White	Good	-0.03	No	No
		4	Wall	White	Fair	0.08	No	Yes
			Ceiling	White	Good	0.27	No	Yes
	Hallway One	2	Wall	Yellow	Good	0.10	No	Yes
			Wall	Yellow	Good	0.39	No	Yes
		3	Door	Black	Fair	0.21	No	Yes
			Door Frame	Black	Good	0.20	No	Yes
		4	Wall	Yellow	Good	0.22	No	Yes
			Radiator	Yellow	Fair	0.93	No	Yes
			Ceiling	White	Good	0.36	No	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/15/04	Hallway One	4	Wall	Yellow	Good	0.22	No	Yes
	Room 124	1	Wall	Peach	Good	0.06	No	Yes
			Door	Varnish	Good	-0.24	No	No
			Door Frame	Black	Good	0.20	No	Yes
		2	Wall	Peach	Good	0.03	No	Yes
			Wall	Peach	Poor	0.43	No	Yes
		3	Window Frame	Black	Good	0.53	No	Yes
			Window Sill	Peach	Fair	1.70	Yes	Yes
			Radiator	Peach	Good	0.97	No	Yes
		4	Wall	Peach	Good	0.29	No	Yes
			Ceiling	White	Good	0.30	No	Yes
	Room 123	1	Wall	Peach	Fair	0.24	No	Yes
			Door	Varnish	Good	-0.15	No	No
			Door Frame	Black	Poor	2.19	Yes	Yes
		2	Wall	Peach	Fair	0.13	No	Yes
		3	Wall	Peach	Poor	0.02	No	Yes
			Window Frame	Black	Good	0.14	No	Yes
			Window Sill	Peach	Poor	1.53	Yes	Yes
			Radiator	Peach	Poor	0.93	No	Yes
		4	Wall	Peach	Good	0.35	No	Yes
			Ceiling	White	Good	0.23	No	Yes
	Room 122	1	Wall	Peach	Good	0.17	No	Yes
			Door	Varnish	Good	-0.07	No	No
			Door Frame	Black	Poor	1.17	Yes	Yes
		2	Wall	Peach	Good	0.04	No	Yes
		3	Wall	Peach	Good	1.55	Yes	Yes
		4	Wall	Peach	Good	1.93	Yes	Yes
			Floor	Grey	Poor	0.31	No	Yes
			Ceiling	White	Good	0.28	No	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/15/04	Room 120	1	Wall	White	Good	0.34	No	Yes
			Door Frame	Tan	Poor	1.30	Yes	Yes
			Door	Varnish	Fair	0.02	No	Yes
			Wall	White	Good	0.40	No	Yes
		2	Wall	White	Good	0.41	No	Yes
		3	Wall	White	Poor	0.15	No	Yes
			Wall	White	Poor	0.15	No	Yes
			Radiator	White	Good	0.05	No	Yes
		4	Wall	White	Fair	0.26	No	Yes
			Floor	Green	Poor	0.46	No	Yes
			Floor	Green	Poor	-0.31	No	No
			Ceiling	White	Good	2.05	Yes	Yes
			Ceiling	White	Good	2.45	Yes	Yes
	Room 121	1	Wall	White	Good	-0.04	No	No
		2	Door	Varnish	Good	-0.55	No	No
			Door Frame	Tan	Poor	1.14	Yes	Yes
		3	Wall	White	Poor	0.43	No	Yes
		4	Wall	White	Fair	0.07	No	Yes
			Floor	Green	Poor	0.20	No	Yes
			Ceiling	White	Good	0.03	No	Yes
	Vault	1	Wall	White	Good	0.17	No	Yes
			Metal Cage	White	Good	0.08	No	Yes
		2	Wall	White	Good	-0.10	No	No
		3	Wall	White	Good	0.69	No	Yes
			Floor	Grey	Poor	-0.06	No	No
			Ceiling	White	Good	-0.85	No	No
	Room 118	1	Wall	Blue	Good	0.14	No	Yes
			Wall	White	Good	-0.28	No	No
			Door	Varnish	Good	-0.09	No	No

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/15/04	Room 118	1	Door Frame	Tan	Poor	1.70	Yes	Yes
		2	Wall	Blue	Good	0.41	No	Yes
		3	Wall	Blue	Fair	-0.26	No	No
			Window Frame	Black	Good	0.15	No	Yes
			Window Sill	White	Good	0.84	No	Yes
			Radiator	White	Good	1.04	Yes	Yes
		4	Wall	Blue	Good	0.17	No	Yes
			Ceiling	White	Good	-0.08	No	No
	Room 119	1	Wall	Peach	Good	0.52	No	Yes
			Door	Varnish	Good	0.38	No	Yes
			Door Frame	Tan	Poor	1.24	Yes	Yes
		2	Wall	Peach	Good	0.28	No	Yes
		3	Wall	Peach	Poor	-0.00	No	No
			Window Frame	Black	Good	-0.50	No	No
			Window Sill	Peach	Poor	0.91	No	Yes
		4	Wall	Peach	Good	-0.01	No	No
			Ceiling	White	Good	0.01	No	Yes
	Room 117	1	Wall	Peach	Good	-0.06	No	No
			Wall	Green	Good	0.21	No	Yes
			Wall	Dark Green	Good	8.64	Yes	Yes
			Door	Varnish	Good	0.02	No	Yes
			Door Frame	Black	Good	0.64	No	Yes
		2	Wall	Peach	Good	0.10	No	Yes
			Wall	Green	Good	0.18	No	Yes
			Wall	Dark Green	Good	7.43	Yes	Yes
		3	Wall	Peach	Poor	0.09	No	Yes
			Wall	Green	Good	0.33	No	Yes
			Wall	Dark Green	Good	7.31	Yes	Yes
			Radiator	Peach	Fair	0.97	No	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/15/04	Room 117	3	Window Frame	Black	Good	0.27	No	Yes
			Window Sill	Peach	Poor	0.95	No	Yes
		4	Wall	Peach	Good	-0.03	No	No
			Wall	Green	Good	0.14	No	Yes
			Wall	Dark Green	Good	7.69	Yes	Yes
			Ceiling	White	Poor	0.37	No	Yes
			Floor	Green	Good	-0.39	No	No
	Room 116	1	Wall	Peach	Fair	0.36	No	Yes
			Door	Varnish	Good	-0.13	No	No
			Door Frame	Black	Poor	1.20	Yes	Yes
		2	Wall	Peach	Good	0.26	No	Yes
		3	Wall	Peach	Good	-0.12	No	No
			Radiator	Peach	Fair	0.81	No	Yes
			Window Frame	Black	Good	-0.25	No	No
			Window Sill	Peach	Poor	1.12	Yes	Yes
		4	Wall	Peach	Good	0.02	No	Yes
			Ceiling	White	Good	-0.09	No	No
	Hallway Two	1	Wall	Yellow	Good	0.29	No	Yes
			Door	Yellow	Poor	0.60	No	Yes
			Door Frame	Yellow	Fair	0.85	No	Yes
		2	Wall	Yellow	Good	0.19	No	Yes
			Wall	Yellow	Good	0.51	No	Yes
		4	Wall	Yellow	Good	-0.21	No	No
			Wall	Yellow	Good	0.41	No	Yes
			Ceiling	White	Good	0.35	No	Yes
	Foyer/Hallway Three	1	Wall	Yellow	Good	-0.19	No	No
			Door	Yellow	Poor	0.66	No	Yes
			Door Frame	Yellow	Poor	0.75	No	Yes
		2	Wall	Yellow	Good	0.10	No	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/15/04	Foyer/Hallway Three	2	Door	Varnish	Good	-0.00	No	No
		3	Wall	Yellow	Good	-0.10	No	No
		4	Wall	Yellow	Good	-0.53	No	No
			Ceiling	White	Good	0.04	No	Yes
	Boiler Room	1	Wall	White	Poor	0.38	No	Yes
			Wall	White	Poor	0.14	No	Yes
		2	Wall	White	Poor	0.27	No	Yes
		3	Wall	White	Poor	0.36	No	Yes
			Door	Black	Good	0.10	No	Yes
			Wall	White	Poor	0.15	No	Yes
		4	Wall	White	Poor	0.12	No	Yes
			Floor	Brown	Poor	-0.10	No	No
		3	Window Sill	White	Good	0.80	No	Yes
		1	Stair Stringer	Grey	Good	9.57	Yes	Yes
			Stair Tread	Grey	Poor	13.40	Yes	Yes
			Stair Handrail	Grey	Fair	2.05	Yes	Yes
			Ceiling	White	Good	-0.50	No	No
	Room 108	1	Wall	Yellow	Good	0.23	No	Yes
			Door	Varnish	Good	0.05	No	Yes
			Door Frame	Black	Good	1.18	Yes	Yes
		2	Wall	Yellow	Good	0.24	No	Yes
		3	Wall	Yellow	Good	-0.22	No	No
			Window Sill	Yellow	Poor	0.23	No	Yes
		4	Wall	Yellow	Good	2.69	Yes	Yes
			Ceiling	White	Good	0.28	No	Yes
	Room 109	1	Wall	White	Good	-0.27	No	No
			Door	Varnish	Good	-0.16	No	No
			Door Frame	Black	Good	1.31	Yes	Yes
		2	Wall	White	Good	0.18	No	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm²	Lead-Based Paint	Lead-Containing Paint
11/15/04	Room 109	3	Wall	White	Good	0.62	No	Yes
			Window Sill	White	Poor	1.01	Yes	Yes
		4	Wall	Brown	Good	0.14	No	Yes
			Ceiling	White	Good	0.12	No	Yes
	Room 111	1	Wall	White	Good	0.78	No	Yes
			Door	Varnish	Good	0.03	No	Yes
			Door Frame	Yellow	Poor	1.62	Yes	Yes
		2	Wall	White	Good	0.22	No	Yes
		3	Wall	White	Good	0.25	No	Yes
			Door	Black	Fair	0.23	No	Yes
			Door Frame	Black	Good	0.36	No	Yes
		4	Wall	White	Good	0.19	No	Yes
			Ceiling	White	Good	0.12	No	Yes
			Floor	Grey	Poor	-0.67	No	No
	Room 112	1	Wall	Tan	Good	0.27	No	Yes
			Door	Varnish	Good	-0.13	No	No
			Door Frame	Black	Good	1.51	Yes	Yes
			Wall	Green	Good	0.27	No	Yes
			Wall	Dark Green	Good	6.66	Yes	Yes
		2	Wall	Tan	Poor	0.65	No	Yes
			Wall	Green	Good	-0.17	No	No
			Wall	Dark Green	Good	7.69	Yes	Yes
		3	Wall	Tan	Poor	0.35	No	Yes
		4	Wall	White	Good	0.35	No	Yes
			Ceiling	White	Good	0.13	No	Yes
			Floor	Green	Good	0.20	No	Yes
	Drill Hall	1	Wall	Tan	Good	0.05	No	Yes
			Wall	White	Good	0.33	No	Yes
		3	Wall	Tan	Poor	0.32	No	Yes

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2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/15/04	Drill Hall	3	Door	Black	Good	1.52	Yes	Yes
			Door Frame	Black	Good	2.41	Yes	Yes
			Garage Door Frame	Black	Good	2.71	Yes	Yes
			Garage Door	Black	Poor	0.66	No	Yes
			Wall	White	Good	0.17	No	Yes
		4	Wall	Tan	Good	0.57	No	Yes
			Floor	Green	Poor	0.10	No	Yes
11/16/04	Room 203	1	Door	Varnish	Good	0.06	No	Yes
			Door Frame	Black	Good	1.29	Yes	Yes
		3	Window Frame	Black	Good	0.05	No	Yes
			Window Sill	White	Fair	1.76	Yes	Yes
			Radiator	White	Fair	0.98	No	Yes
	Room 202	1	Wall	Peach	Good	-0.50	No	No
			Door Frame	Black	Fair	1.14	Yes	Yes
			Door	Varnish	Good	0.03	No	Yes
		2	Wall	Peach	Poor	-0.06	No	No
		3	Wall	Peach	Poor	0.05	No	Yes
			Window Sill	Peach	Poor	1.17	Yes	Yes
			Window Frame	Black	Good	0.21	No	Yes
			Radiator	Peach	Good	0.21	No	Yes
		4	Wall	Peach	Good	0.16	No	Yes
			Ceiling	White	Good	0.01	No	Yes
	Room 204	1	Wall	Peach	Good	0.11	No	Yes
			Door Frame	Black	Good	1.15	Yes	Yes
			Door	Varnish	Good	-0.09	No	No
		2	Wall	Peach	Good	0.12	No	Yes
		3	wall	Peach	Good	-0.19	No	No
			Door	Varnish	Good	-0.17	No	No
			Door Frame	Varnish	Good	-0.10	No	No

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/16/04	Room 204	4	Wall	Peach	Good	-0.21	No	No
			Door	Varnish	Good	-0.24	No	No
			Door Frame	Tan	Good	0.92	No	Yes
			Ceiling	White	Good	-0.50	No	No
	Room 204-B	1	Wall	Tan	Good	0.04	No	Yes
		2	Wall	Tan	Good	-0.33	No	No
			Door	Varnish	Good	-0.16	No	No
		3	Wall	Tan	Good	0.05	No	Yes
			Window Frame	Black	Good	-0.02	No	No
			Window Sill	Tan	Good	0.08	No	Yes
			Radiator	Tan	Good	0.25	No	Yes
		4	Wall	Tan	Good	-0.17	No	No
	Room 201	1	Wall	Peach	Good	0.14	No	Yes
			Door	Varnish	Good	0.13	No	Yes
			Door Frame	Black	Good	1.24	Yes	Yes
		2	Wall	Peach	Good	-0.24	No	No
		3	Wall	Peach	Poor	0.21	No	Yes
			Window Frame	Black	Good	0.28	No	Yes
			Window Sill	Peach	Poor	1.21	Yes	Yes
			Radiator	Peach	Good	-0.09	No	No
		4	Wall	Peach	Good	-0.57	No	No
			Ceiling	White	Good	0.06	No	Yes
	Room 205	1	Wall	Peach	Good	0.07	No	Yes
			Door	Varnish	Good	0.22	No	Yes
			Door Frame	Black	Fair	1.36	Yes	Yes
		2	Wall	Peach	Good	0.20	No	Yes
		3	Wall	Peach	Good	0.27	No	Yes
			Window Frame	Black	Good	-0.07	No	No
			Window Sill	Peach	Poor	1.00	Yes	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/16/04	Room 205	4	Wall	Peach	Good	0.34	No	Yes
			Ceiling	White	Good	-0.22	No	No
	Hallway Four	1	Wall	Yellow	Good	-0.01	No	No
			Door	Red	Good	0.72	No	Yes
			Door Frame	Red	Good	1.01	Yes	Yes
		2	Wall	Yellow	Good	0.11	No	Yes
			Wall	Yellow	Good	0.03	No	Yes
		3	Wall	Yellow	Good	0.19	No	Yes
			Window Frame	Black	Good	0.19	No	Yes
			Window Sill	Yellow	Poor	1.70	Yes	Yes
		4	Wall	Yellow	Good	-0.04	No	No
			Wall	Yellow	Good	-0.07	No	No
	Room 206	1	Wall	Peach	Good	0.26	No	Yes
			Door Frame	Black	Poor	1.24	Yes	Yes
		2	Wall	Peach	Good	0.14	No	Yes
		1	Door	Varnish	Good	-0.04	No	No
		4	Wall	Peach	Good	0.13	No	Yes
	Room 207-A	1	Wall	Peach	Fair	0.27	No	Yes
			Door Frame	Black	Poor	1.10	Yes	Yes
		2	Wall	Peach	Good	0.09	No	Yes
		3	Wall	Peach	Good	0.12	No	Yes
			Window Frame	Black	Good	-0.23	No	No
			Window Sill	Pink	Good	1.22	Yes	Yes
			Radiator	Yellow	Good	0.39	No	Yes
		4	Wall	Peach	Good	-0.42	No	No
			Ceiling	White	Good	-0.10	No	No
	Room 213	1	Wall	Peach	Good	0.21	No	Yes
			Door	Varnish	Good	0.21	No	Yes
			Door Frame	Black	Poor	1.23	Yes	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/16/04	Room 213	2	Wall	Peach	Good	0.27	No	Yes
		3	Wall	Peach	Poor	-0.07	No	No
			Window Sill	Peach	Poor	1.53	Yes	Yes
			Radiator	Peach	Good	0.44	No	Yes
		4	Wall	Peach	Good	-0.59	No	No
			Ceiling	White	Good	-0.04	No	No
	Room 212	1	Wall	Peach	Good	0.23	No	Yes
			Door	Varnish	Good	-0.63	No	No
			Door Frame	Black	Poor	1.15	Yes	Yes
		2	Wall	Peach	Good	-0.37	No	No
		3	Wall	Peach	Poor	-0.07	No	No
			Window Frame	Black	Good	0.42	No	Yes
			Window Sill	Peach	Poor	1.15	Yes	Yes
			Radiator	Peach	Good	0.40	No	Yes
		4	Wall	Peach	Fair	-0.46	No	No
			Ceiling	White	Good	0.04	No	Yes
	Room 207	1	Wall	Peach	Good	-0.17	No	No
			Door	Varnish	Good	0.20	No	Yes
			Door Frame	Black	Poor	1.42	Yes	Yes
		2	Wall	Peach	Good	0.04	No	Yes
		3	Wall	Peach	Poor	-0.10	No	No
			Window Sill	Pink	Poor	1.06	Yes	Yes
			Radiator	Yellow	Good	0.15	No	Yes
		4	Wall	Peach	Good	0.39	No	Yes
	Room 208	1	Wall	Peach	Fair	0.46	No	Yes
			Wall	Green	Good	0.21	No	Yes
			Wall	Dark Green	Good	8.18	Yes	Yes
			Door	Varnish	Good	0.09	No	Yes
			Door Frame	Black	Poor	1.17	Yes	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/16/04	Room 208	2	Wall	Peach	Good	0.42	No	Yes
			Wall	Green	Good	0.42	No	Yes
			Wall	Dark Green	Good	6.24	Yes	Yes
			Door	Varnish	Good	0.06	No	Yes
			Door Frame	Tan	Poor	0.98	No	Yes
		3	Wall	Peach	Fair	-0.33	No	No
			Window Sill	Peach	Poor	0.98	No	Yes
			Wall	Green	Good	0.36	No	Yes
			Wall	Dark Green	Good	7.57	Yes	Yes
			Ceiling	White	Good	0.46	No	Yes
			Floor	Green	Good	-0.43	No	No
	Room 209	1	Wall	Peach	Good	0.29	No	Yes
			Door	Varnish	Good	-0.01	No	No
			Door Frame	Black	Poor	1.31	Yes	Yes
		2	Wall	Peach	Good	0.00	No	No
		3	Window Frame	Black	Good	-0.72	No	No
			Window Sill	Peach	Good	1.31	Yes	Yes
			Wall	Peach	Poor	0.13	No	Yes
			Radiator	Peach	Good	0.70	No	Yes
		4	Wall	Peach	Good	0.13	No	Yes
			Ceiling	White	Good	0.25	No	Yes
	Room 210	1	Wall	Peach	Good	-0.21	No	No
			Door Frame	Black	Fair	1.23	Yes	Yes
			Door	Varnish	Good	0.28	No	Yes
		2	Wall	Peach	Good	0.41	No	Yes
		3	Wall	Peach	Poor	0.36	No	Yes
			Window Sill	Peach	poor	0.13	No	Yes
			Radiator	Peach	Poor	0.11	No	Yes
		4	Wall	Peach	Good	-0.20	No	No

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/16/04	Room 210		Ceiling	White	Good	0.24	No	Yes
	Hallway Five	1	Wall	Yellow	Good	0.22	No	Yes
			Door	Tan	Fair	0.27	No	Yes
			Door Frame	Tan	Fair	0.93	No	Yes
		2	Wall	Yellow	Good	0.09	No	Yes
			Wall	Yellow	Good	-0.05	No	No
		3	Wall	Yellow	Good	0.25	No	Yes
			Window Frame	Black	Good	0.21	No	Yes
			Window Sill	Tan	Poor	1.31	Yes	Yes
		4	Wall	Yellow	Good	0.37	No	Yes
			Wall	Yellow	Good	0.47	No	Yes
	2nd Floor Foyer		Ceiling	White	Good	0.13	No	Yes
	Stairwell One	1	Wall	Yellow	Good	0.17	No	Yes
		2	Wall	Yellow	Good	0.50	No	Yes
			Stair Tread	Grey	Poor	1.08	Yes	Yes
			Floor	Grey	Poor	1.08	Yes	Yes
		2	Stair Handrail	Black	Poor	3.79	Yes	Yes
		3	Wall	Tan	Poor	-0.11	No	No
		4	Wall	Yellow	Good	0.25	No	Yes
	Stairwell Two	1	Wall	Yellow	Good	0.04	No	Yes
		2	Wall	Yellow	Good	0.09	No	Yes
			Radiator	Black	Good	0.78	No	Yes
			Stair Tread	Grey	Poor	-0.39	No	No
			Floor	Grey	Fair	-0.52	No	No
			Stair Handrail	Black	Good	5.44	Yes	Yes
		3	Wall	Yellow	Good	-0.02	No	No
		4	Wall	Yellow	Good	0.21	No	Yes
	Vehicle Pool	1	Wall	Tan	Fair	1.36	Yes	Yes
			Garage Door Frame	Tan	Poor	0.60	No	Yes

Client: Skelly and Loy Inc.
2500 Eldo Road Suite 2
Monroeville, PA 15146

XRF Results

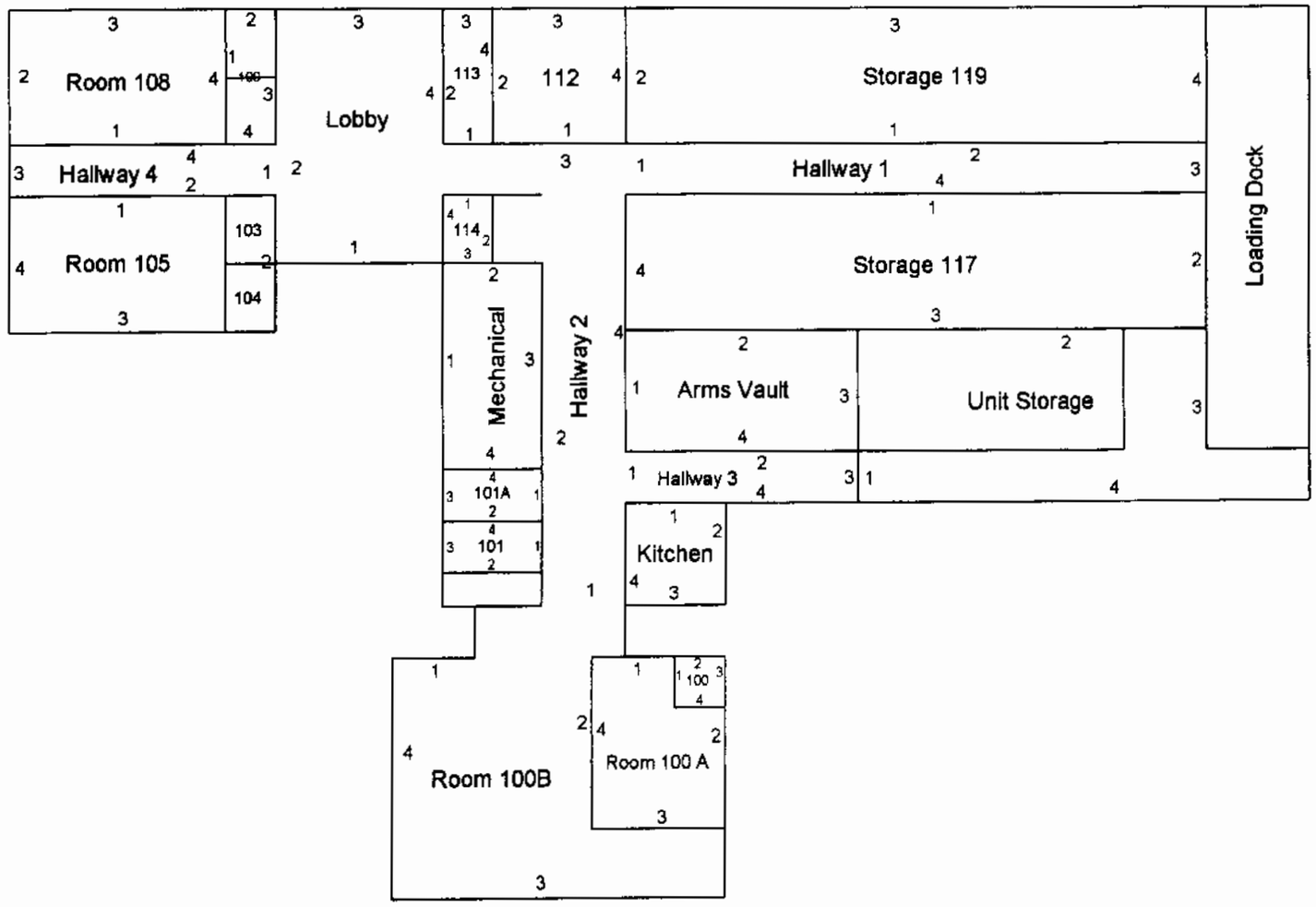
Address: 936 Easton Road
Horsham, PA 10944

Date Sampled	Room Name	Wall Number	Building Component Tested	Paint Color	Paint Condition	Result K-shell mg/cm^2	Lead-Based Paint	Lead-Containing Paint
11/16/04	Vehicle Pool	1	Garage Door	Tan	Poor	0.41	No	Yes
			Garage Door	Tan	Poor	0.37	No	Yes
		2	Wall	Tan	Fair	1.96	Yes	Yes
			Door	Black	Good	-0.02	No	No
			Door Frame	Black	Good	0.51	No	Yes
		3	Wall	Tan	Good	1.93	Yes	Yes
			Window Frame	Black	Good	-0.05	No	No
		4	Wall	Tan	Fair	1.25	Yes	Yes
			Floor	Yellow	Poor	7.97	Yes	Yes
			Support Column	Yellow	Fair	14.71	Yes	Yes
11/15/04	Room 104	2	Wall	White	Good	-0.13	No	No
11/16/04	Room 205	4	Radiator	Red	Good	0.44	No	Yes
	Room 211	1	Wall	Peach	Fair	-0.27	No	No
			Door Frame	Black	Poor	1.17	Yes	Yes
			Door	Varnish	Good	0.20	No	Yes
		2	Wall	Peach	Good	-0.17	No	No
		3	Wall	Peach	Poor	0.16	No	Yes
			Window Sill	Peach	Poor	1.06	Yes	Yes
			Radiator	Peach	Good	0.11	No	Yes
		4	Wall	Peach	Good	0.12	No	Yes
			Ceiling	White	Good	0.26	No	Yes

Appendix C
Floor Plans

2 Battalion, 228 Aviation
936 Easton Rd.
Horsham, PA 10944

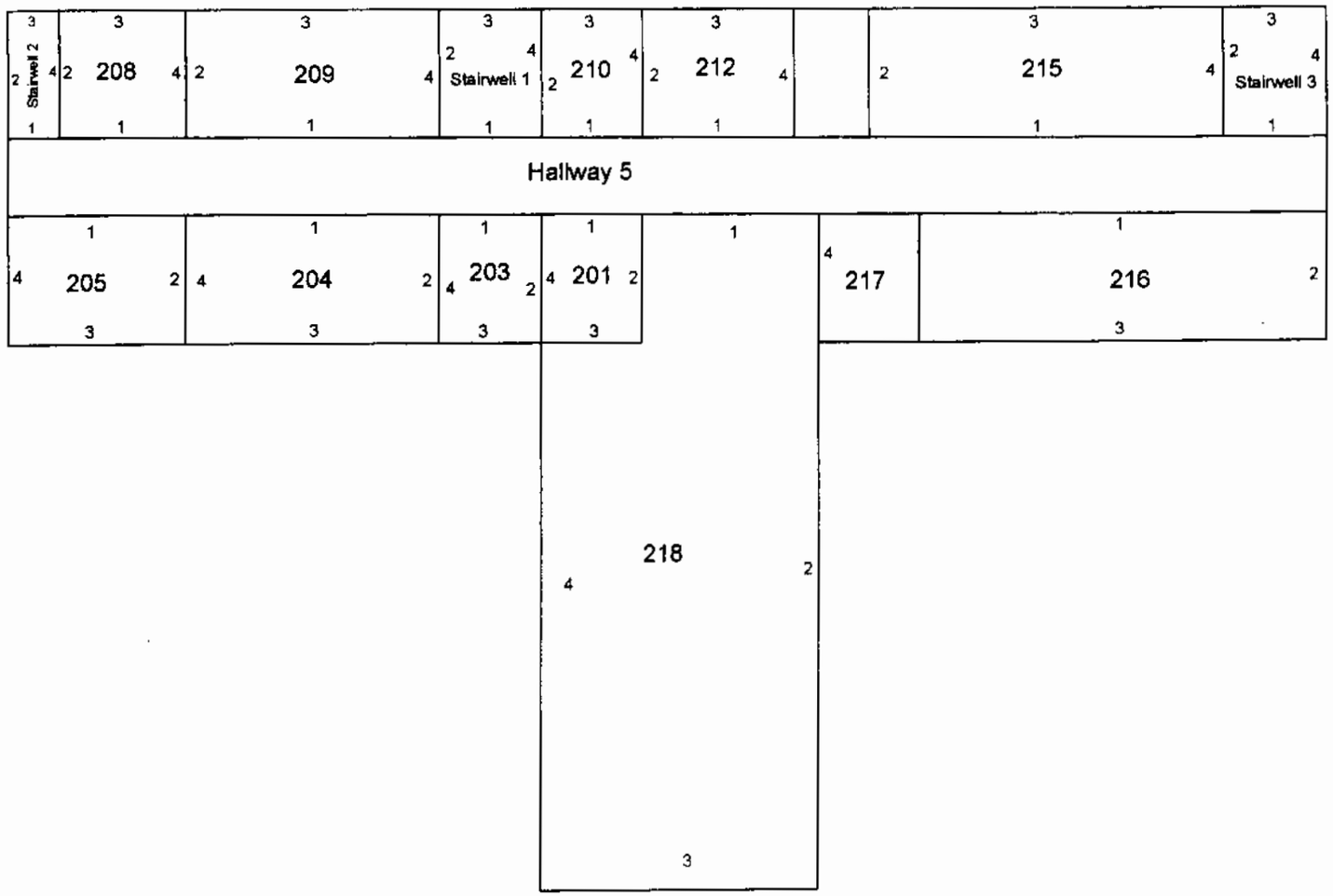
1st Floor



*Note: Numbers in rooms represent wall numbers.

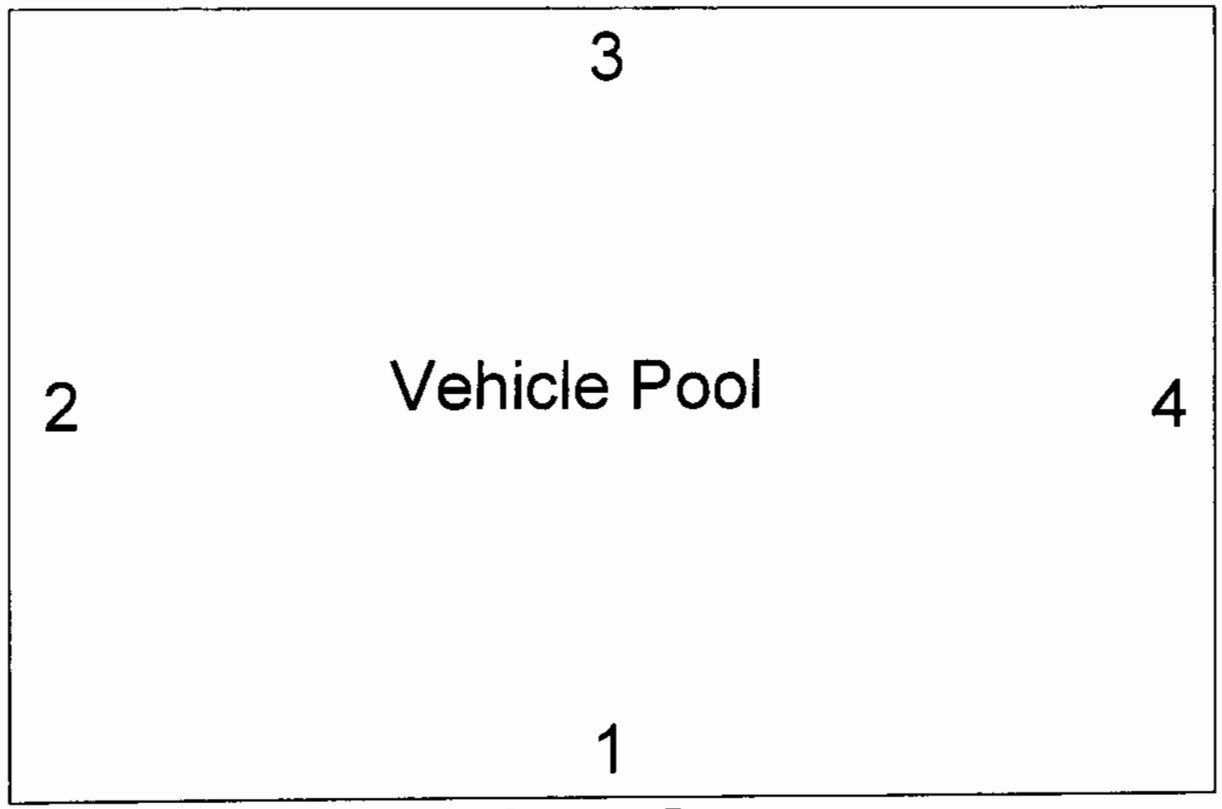
2 Battalion, 228 Aviation
936 Easton Rd.
Horsham, PA 10944

2nd Floor



*Note: Numbers in rooms represent wall numbers.

2 Battalion, 228 Aviation
936 Easton Rd.
Horsham, PA 10944



*Note: Numbers in rooms represent wall numbers.

Appendix D
References

Appendix D. References

1. **OSHA** Lead Standard (Construction). Code of Federal Regulations, Title 29, Chapter XVII , Part 1926, Section 62.

2. **USEPA** Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, June 1995, pursuant to Title X of the Housing and Community Development Act of 1992 issued by the U.S. Department of Housing and Urban Development (HUD).

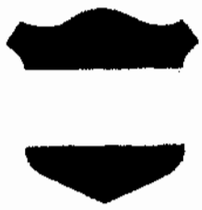
APPENDIX C

Radon Analytical Results

P3402 / SKELLY AND LOY, INC

4000064	2.0	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	4.1%	70
4000071	1.7	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	4.0%	70
4000072	1.2	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	1.8%	70
4000073	< 0.3	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	3.3%	70
4000077	1.9	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	4.0%	70
4000079	0.6	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	3.3%	70
4000083	0.9	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	4.1%	70
4000085	2.4	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	3.4%	70
4000086	0.5	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	3.3%	70
4000088	0.9	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	4.1%	70
4000089	0.6	49	2004-11-15 @ 12 pm	2004-11-17 @ 1 pm	2004-11-23	5.5%	60

Air Chek, Inc. 1936 Butler Bridge Rd, Fletcher, NC 28732-8792 Phone: (828) 684-0893 Fax: (828) 684-8498



99th Regional Support Command
Customer Support Team Number 1
N.A.S. J.R.B Willow Grove
Willow Grove, Pennsylvania

Horsham Memorial USAR Center
936 Easton Road
Horsham, Pennsylvania

Installation Restoration Program
Installation Action Plan

ACRONYM LIST

Acronym	
A-106	A-106 Report (U. S. Army Environmental Fund Tracking
AMSA	Area Maintenance Support Activity
DSERTS	Defense Site Environmental Restoration Tracking System
FS	Feasibility Study
FY	Fiscal Year
IRA	Interim Remedial Action
IRP	Installation Restoration Program
OMAR	Operations and Maintenance - Army Reserve
OMS	Organizational Maintenance Shop
PA	Preliminary Assessment
PADEP	Pennsylvania Department of Environmental Protection
RA	Remedial Action
RD	Remedial Design
REM	Removal Action
RI	Remedial Investigation
RMIS	Restoration Management Information System
SC	Site Closure
SI	Site Investigation
TCLP	Toxicity Characteristic Leachate Procedure
USAR	United States Army Reserve
USACE	U. S. Army Corps of Engineers
USAEC	U. S. Army Environmental Center
USATHAMA	United States Army Toxic and Hazardous Materials Agency
UST	Underground Storage Tank

Summary

Status

The facility is not currently listed on any federal compliance docket.

Total Number of RMIS Sites

There are eleven (11) RMIS Sites at the facility.

Different Site Types

There are a total of four (4) different site types:

1. Out-of-service subsurface structures used for waste disposal, including abandoned USTs,
2. Structures used for hazardous materials/hazardous waste storage,
3. Perimeter portions of the property affected by surficial waste disposal,
4. Contaminated soils.

Most Widespread Contaminants of Concern

The most widespread contaminants of concern are POLs.

Media of Concern

The primary media of concern is soil. Surficial contamination has been documented at the facility property line.

Completed Removal Action/Interim Remedial Action/Remedial Action

None.

Current IRP Phase

Remedial Design.

Projected IRP Phase

Remedial Design.

Identified Possible Removal Action/Interim Remedial Action/Remedial Action

The Fenceline Soil Contamination Site is a candidate for a Removal Action and a Remedial Action.

Funding

Prior Year Funds:

Fiscal Year	Phase	Funding
1995	Preliminary Assessment (OMS Service Pit Closure)	$5,000
1995	Preliminary Assessment, Site Investigation (Fenceline Soil Contamination)	$25,000

Current Year Funds:

Fiscal Year	Phase	Funding
1996	Remedial Investigation (Fenceline Soil Contamination)	$36,000

Future Funding Requirements:

Fiscal Year	Phase	Funding
1997	Removal Action, Remedial Design (Fenceline Soil Contamination)	$36,000
1998	Remedial Action	$93,000
1999	Site Closure	$7,000

Duration

Installation Restoration Program Inception: FY 1995

Projected Completion: FY 1999

Installation Information

Installation Locale

The Horsham Memorial USAR Center is located at 936 Easton Road, Horsham, Pennsylvania 19044-3399.

Command Organization

Command of the facility is divided as follows:

- ***Real Property Ownership:*** Fort Indiantown Gap, Annville, Pennsylvania until approximately 1 October 1996, at which time real property ownership will transfer to the 99th Regional Support Command, Oakdale, Pennsylvania.
- ***Regionalized BASOPS Support:*** the 99th Regional Support Command Customer Support Team #1 (CST #1), N.A.S. Willow Grove, Willow Grove, Pennsylvania is the first echelon of BASOPS Support. CST #1 reports to the Office of the Deputy Chief of Staff - Engineer, 99th Regional Support Command, Oakdale, Pennsylvania.
- ***Unit Command and Control:*** the 99th Regional Support Command, Oakdale, Pennsylvania.

Lead Executing IRP Agency

The United States Army Environmental Center (USAEC) has been the lead IRP agency for activities performed to date. The Baltimore District, United States Army Corps of engineers (Baltimore District USACE) has been the execution support agency for IRP activities.

Regulator Participation

There has not been any federal, state or local environmental agency coordination for IRP actions to date. Coordination with the Commonwealth of Pennsylvania Department of Environmental Protection (PADEP) will occur as each project enters the Feasibility Study stage.

Regulatory Status

No current regulatory agency involvement.

Significant Changes to IRP from Previous Year

One site has been closed since the Fiscal Year 1995 Installation Action Plan submission:

1. OMS Service Pit Closure.

Additional information about the Fenceline Soil Contamination has been obtained. Contaminants of concern are listed on the Relative Risk Site Evaluation sheet in Appendix E. This is the only active IRP project at the facility.

Installation Description

Current Activity Status

Fort Indiantown gap currently maintains real property ownership of the facility. However, real property control will transfer to the 99th Regional Support Command on or about 1 October 1996.

Historic Activity Status

The facility was constructed in approximately 1955. It was used as the headquarters for the 157th Separate Infantry Brigade (Mechanized). It was used in that capacity until 1 October 1995. Since that time, it has been used as administrative office space for 79th ARCOM and 99th RSC units.

Contamination Assessment

Studies to Date

The Baltimore District, United States Army Corps of Engineers (Baltimore District USACE) has managed the following contamination assessment projects:

Fenceline Soil Contamination - Preliminary Assessment, Site Investigation, Remedial Investigation. The site was found to have contaminants in excess of cleanup standards.

OMS Service Pit Closure - Preliminary Assessment, Site Investigation, Site Closure.

RMIS Site Descriptions

SITE 1 - TRANSFORMER

This site has been assessed using Operations and Maintenance - Army Reserve funds.

SITE 2 - VEHICLE WASH RACK

This site is being managed using Operations and Maintenance - Army Reserve funds.

SITE 3 - BATTERY STORAGE SHED

This site is being managed using Operations and Maintenance - Army Reserve funds.

SITE 4 - POL SHED

This site is being managed using Operations and Maintenance - Army Reserve funds.

SITE 5 - STORAGE AREA

This site is being managed using Operations and Maintenance - Army Reserve funds.

SITE 6 - PARTS CLEANER

This site is being managed using Operations and Maintenance - Army Reserve funds.

SITE 7 - FLAMMABLE MATERIALS LOCKER

This site is being managed using Operations and Maintenance - Army Reserve funds.

SITE 8 - FUEL OIL UST

This site is being managed using Operations and Maintenance - Army Reserve funds.

SITE 9 - DRUM STORAGE AREA

This site is being managed using Operations and Maintenance - Army Reserve funds.

SITE 11 - OMS SERVICE PIT CLOSURE

This site has been assessed and closed under the Installation Restoration Program.

SITE 12 - FENCELINE CONTAMINATION SITE

This site has undergone a Preliminary Assessment, Site Investigation and Remedial Investigation under the Installation restoration Program. It will require a Removal Action, Remedial Design and Remedial Action prior to Site Closure.

Schedule

Start Date of IRP at Installation

The Installation restoration Program at the facility commenced in FY 1991.

Past Phase Completion Milestones

A survey of past practices was performed under the direction of the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) in FY 1990 (Waste Site Characterization, Roy F. Weston, Inc., 10 August 1990). Although the report is labeled an RI/FS, it functions as a facility Preliminary Assessment only. This report defined many of the RMIS Sites used in this report.

The following RMIS Site-specific milestones have also been completed:

Phase	Site	Fiscal Year Completed
PA	Fenceline Soil Contamination	1994
	OMS Service Pit Closure	1995
SI	Fenceline Soil Contamination	1995
	OMS Service Pit Closure	1995
SC	OMS Service Pit Closure	1995

Chart (See Appendix D)

Removal/Interim Remedial Action/Remedial Action Assessment

Sites/Clusters That Have Been Assessed

All sites have been assessed.

Past Removal Action/Interim Remedial Action/Remedial Action/Long Term Monitoring per Site/Clusters

There have been no past Removal Actions, Interim Remedial Actions or Long Term Monitoring performed under the Installation restoration Program.

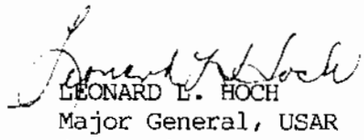
Future Removal Action/Interim Remedial Action/Remedial Action/Long Term Monitoring Opportunities

It is expected that a Removal Action and a Remedial Action will be required at the Fenceline Soil Contamination Site.

Innovative Means to Expedite Study Process to Remedial Action Phase

No innovative means to expedite the study process to the Remedial Action phase are expected.

Concurrence



LEONARD L. HOCH
Major General, USAR
Commanding

Attachment Cost Estimates

Site 12 - Fenceline Soil Contamination

Fiscal Year	Estimated Funds Required
1996	$37,000 (Requested)
1997	$36,000
1998	$93,000
1999	$7,000

Appendix A - Figures

Figure 1 Horsham Memorial USAR Center Location Map

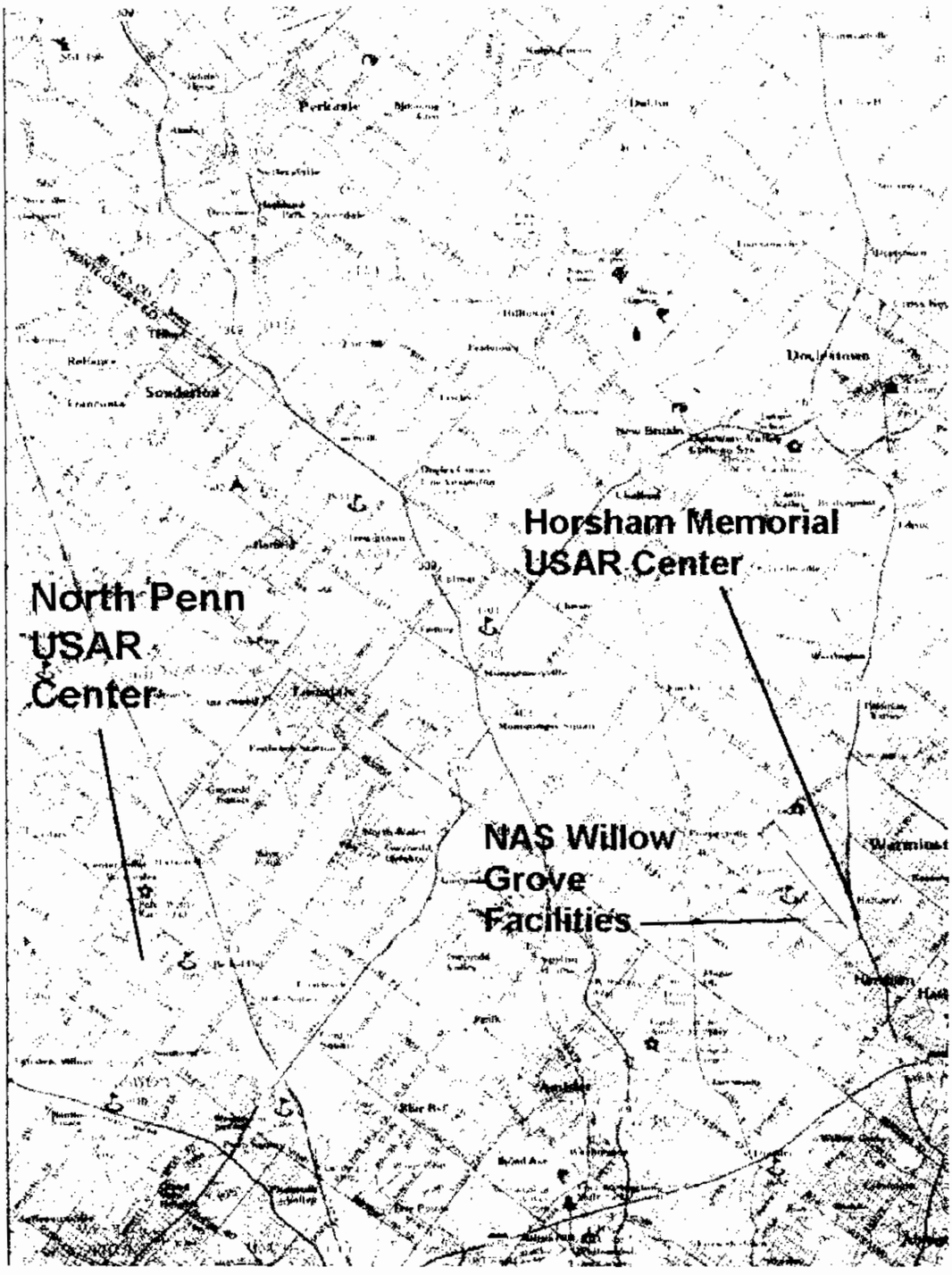
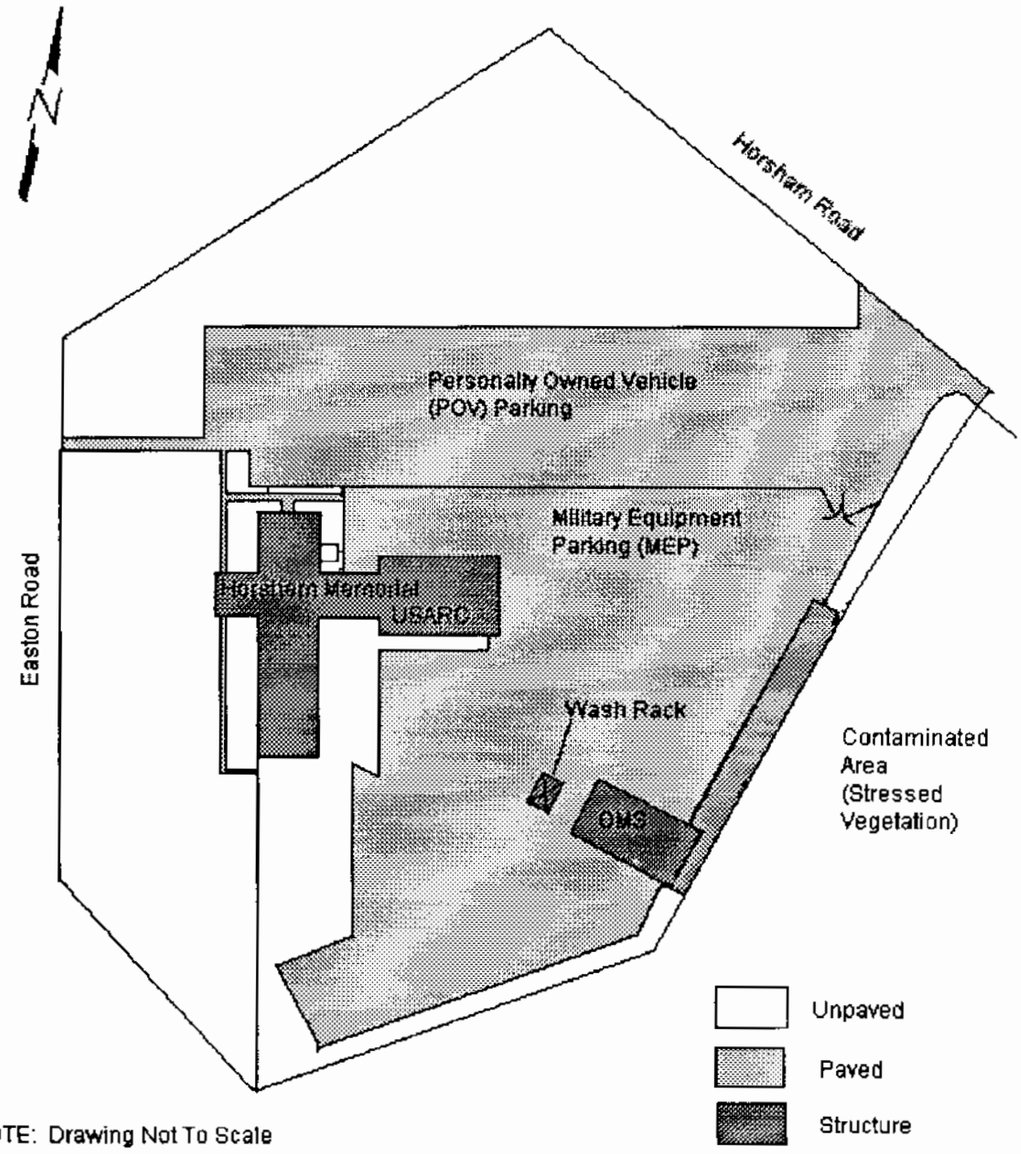


Figure 2 - Horsham Memorial USAR Center Site Plan



NOTE: Drawing Not To Scale

Appendix B - DSERTS Site Reports

DEFENSE SITE ENVIRONMENTAL RESTORATION TRACKING SYSTEM

SITE DATA REPORT

Report Date: 1996/04/02

Major Command: USARC
Installation: USARC HORSHAM 01 FFID: PA321041HN3500

Site Name	Alias	Description
SITE 1		TRANSFORMER
SITE 2		VEHICLE WASH RACK
SITE 3		BATTERY STORAGE SHED
SITE 4		POL SHED
SITE 5		STORAGE AREA
SITE 6		PARTS CLEANER
SITE 7		FLAMMABLE MATERIALS LOCKER
SITE 8		FUEL OIL UST
SITE 9		DRUM STORAGE AREA
SITE 11		OMS SERVICE PIT CLOSURE
SITE 12		FENCELINE CONTAMINATION SITE

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 1
Alias Name:
Description: TRANSFORMER

Statute: G Program: A On NPL: N
HRS Score: 0.00 DPM Score: 0.00
Site Type: ZZ Tank Number: 0 LTM: N
Contaminant(s): C3

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C				
Actual Start:	198901	------	------	------	------
Actual End:	198901	------	------	------	------
Est. Start:	------	------	------	------	------
Est. End:	------	------	------	------	------

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
------	198901	------

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 2
Alias Name:
Description: VEHICLE WASH RACK

Statute:	B	Program:	A	On NPL:	N
HRS Score:	0.00	DPM Score:	0.00		
Site Type:	DA	Tank Number:	0	LTM:	N
Contaminant(s):	C1 C5				

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C				
Actual Start:	198901				
Actual End:	198901				
Est. Start:					
Est. End:					

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
	198901	

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 3
Alias Name:
Description: BATTERY STORAGE SHED

Statute: D Program: A On NPL: N
HRS Score: 0.00 DPM Score: 0.00
Site Type: SA Tank Number: 0 LTM: N
Contaminant(s): A1

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C				
Actual Start:	198901				
Actual End:	198901				
Est. Start:					
Est. End:					

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
	198901	

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 4
Alias Name:
Description: POL SHED

Statute:	D	Program:	A	On NPL:	N
HRS Score:	0.00	DPM Score:	0.00		
Site Type:	SA	Tank Number:	0	LTM:	N
Contaminant(s):	Cl				

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C				
Actual Start:	198901	------	------	------	------
Actual End:	198901	------	------	------	------
Est. Start:	------	------	------	------	------
Est. End:	------	------	------	------	------

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
------	198901	------

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 5
Alias Name:
Description: STORAGE AREA

Statute:	D	Program:	A	On NPL:	N
HRS Score:	0.00	DPM Score:	0.00		
Site Type:	SA	Tank Number:	0	LTM:	N
Contaminant(s):	C1 C8 D2				

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C				
Actual Start:	198901	------	------	------	------
Actual End:	198901	------	------	------	------
Est. Start:	------	------	------	------	------
Est. End:	------	------	------	------	------

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
------	198901	------

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 6
Alias Name:
Description: PARTS CLEANER

Statute:	D	Program:	A	On NPL:	N
HRS Score:	0.00	DPM Score:	0.00		
Site Type:	SA	Tank Number:	0	LTM:	N
Contaminant(s):	C1				

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C				
Actual Start:	198901	------	------	------	------
Actual End:	198901	------	------	------	------
Est. Start:	------	------	------	------	------
Est. End:	------	------	------	------	------

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
------	198901	------

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 7
Alias Name:
Description: FLAMMABLE MATERIALS LOCKER

Statute:	D	Program:	A	On NPL:	N
HRS Score:	0.00	DPM Score:	0.00		
Site Type:	SA	Tank Number:	0	LTM:	N
Contaminant(s):	D2				

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C				
Actual Start:	198901	------	------	------	------
Actual End:	198901	------	------	------	------
Est. Start:	------	------	------	------	------
Est. End:	------	------	------	------	------

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
------	198901	------

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 8
Alias Name:
Description: FUEL OIL UST

Statute: F Program: A On NPL: N
HRS Score: 0.00 DPM Score: 0.00
Site Type: TU Tank Number: 1 LTM: N
Contaminant(s): C1

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C				
Actual Start:	198901	------	------	------	------
Actual End:	198901	------	------	------	------
Est. Start:	------	------	------	------	------
Est. End:	------	------	------	------	------

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
------	198901	------

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 9
Alias Name:
Description: DRUM STORAGE AREA

Statute: D Program: A On NPL: N
HRS Score: 0.00 DPM Score: 0.00
Site Type: SA Tank Number: 0 LTM: N
Contaminant(s): C1 D2

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C				
Actual Start:	198901	------	------	------	------
Actual End:	198901	------	------	------	------
Est. Start:	------	------	------	------	------
Est. End:	------	------	------	------	------

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
------	198901	------

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 11
Alias Name:
Description: OMS SERVICE PIT CLOSURE

Statute:	D	Program:	A	On NPL:	N
HRS Score:	0.00	DPM Score:	0.00		
Site Type:	CB	Tank Number:	0	LTM:	N
Contaminant(s):	B1				

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C	C	C	C	C
Actual Start:	199512	199512	199601	199602	199602
Actual End:	199512	199512	199602	199602	199603
Est. Start:	199506	199506	199508	199601	199503
Est. End:	199508	199508	199512	199603	199605

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
------	199603	199603

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Installation: USARC HORSHAM 01 FFID: PA321041HN3500
Major Command: USARC

Site Name: SITE 12
Alias Name:
Description: FENCELINE CONTAMINATION SITE

Statute:	D	Program:	A	On NPL:	N
HRS Score:	0.00	DPM Score:	0.00		
Site Type:	DA	Tank Number:	0	LTM:	N
Contaminant(s):	B1 B8				

PHASE STATUS:

Phase:	PA	SI	RI/FS	RD	RA
Status:	C	C	F	F	F
Actual Start:	199404	199504	------	------	------
Actual End:	199406	199508	------	------	------
Est. Start:	------	------	199603	199609	199809
Est. End:	------	------	199609	199612	200009

REMEDIAL ACTIONS:

IRA /FRA	Remedy	Status	Actual Start	Actual End	Est. Start	Est. End

There currently are no Remedial Actions

COMPLETION STATUS:

Remedy in Place	Response Complete	Site Closeout
------	------	------

IAG Dates:

Component	EPA	State	Local

Not Currently Covered by Any Existing IAG

ROD/DD:

ROD /DD	Action Type	Document Title

There are currently no RODs or DDs

Appendix C - A-106 Exhibit 2 Reports

RCS DD-P&L(A) 1383 REPORT PROJECT EXHIBIT

MACOM: RESERVE BSB: Record Status: ACTIVE
SUBCOM: 79 ASG: Date Entered: 01/10/95

Date Revised: 04/02/96

Date Discontinued:

Installation: HORSHAM MEMORIAL City: HORSHAM
Address: 926 EASTON ROAD
FFID: PA-2104PA046 Owner Type: GOGO State: PA Country: USA EPA: 03
Contact: STEPHEN FRITZ
Support Installation: FORT INDIANTOWN GAP Zip: 190443399
Telephone: 215-443-1795
Facility Type: RESERVE CENTER
Project Number: HRM195S017 Operable Unit: NONE
Pillar: RST
Local Project Number: Local Project ID Type:
Year Funding Required: 1995
Project Name: FENCELINE SOIL CONTAMINATION
Fiscal Year Completed:
Survey or Mitigation: M
Project Assessment: H Class: 1 Law/Reg: SFND
Project Status: DESIGN
Compliance Status: ESDP Pollution Category: RINV
Must Fund: Y
Program Area: ACTIVE - INSTALL. RESTORATION
MACOM Priority:
Initiation Reason: ECAS Instn Priority:
Discontinue Reason:

Plan/Design Scheduled Completion: 12/94
Work/Const Scheduled Completion: 09/96
Work/Constr Scheduled Start: 04/95
Final Compliance Required: 09/89

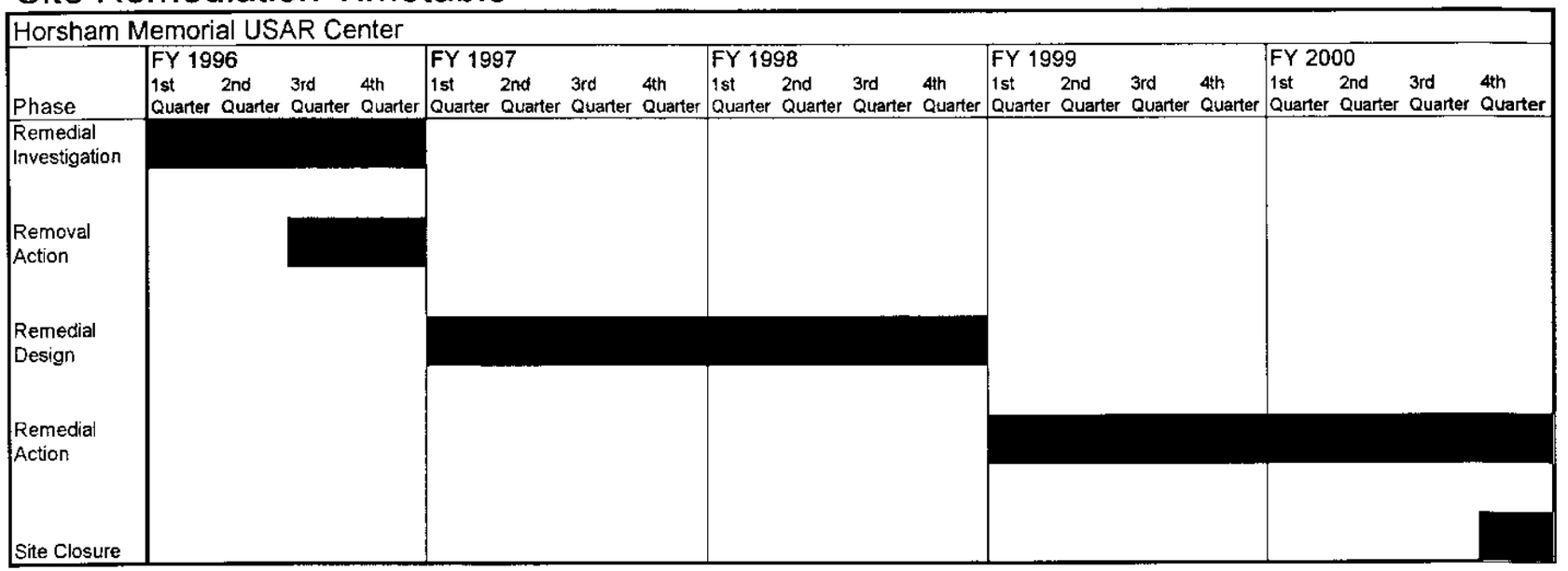
Fund Type: DERA - OMA
Total Est. Cost: 198

AMS Code	FY	Required	Prg/Bdgt	Obligated
788008.11	1994	2	0	0
788008.11	1995	25	25	25
788008.11	1996	37	37	0
788008.11	1997	36	36	0
788008.11	1998	93	93	0
788008.11	1999	7	7	0

Narrative:
COMPREHENSIVE ENVIRONMENTAL RESPONSIBILITY, COMPENSATION AND LIABILITY ACT/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (CERCLA/SARA): PROJECT TO REMEDIATE SURFICIAL CONTAMINATION RESULTING FROM PAST WASTE MANAGEMENT AND SECURITY PRACTICES. FY 1995
TO DELINEATE THE NATURE AND EXTENT OF CONTAMINATION; FY 1996 TO REMEDIATE AND OBTAIN SITE CLOSURE.

Appendix D - Timetable

Site Remediation Timetable



Appendix E - Relative Risk Site Assessment Sheets

RELATIVE RISK EVALUATION WORKSHEET - ARMY

Installation: Horsham Memorial Reserve Center
HRM195S017
RMIS Site Number: Site 12
Date: 25-Oct-95
Agreement (Circle One): Yes | No

1383 Title: Fenceline Soil Contamination
Site Description: Surficial Waste Disposal Site
POC: Stephen E. Fritz
Phone: (215) 443-1795

GROUND WATER

	Contaminant	Concentration (ug/l)	Standard (ug/l)	Factor
1	None Sampled			
2				
3				
4				
5				
			Total:	0

Pathway (Circle One): Evident | Potential | Confined
Rationale:
Receptor (Circle One): Evident | Potential | Confined
Rationale:

SURFACE WATER / SEDIMENT

	Contaminant	Concentration (ug/l)	Standard (ug/l)	Factor
1	None Sampled			
2				
3				
4				
5				
			Total:	0

Pathway (Circle One): Evident | Potential | Confined
Rationale:
Receptor (Circle One): Evident | Potential | Confined
Rationale:

SOIL

Site Characterization = MODERATE

	Contaminant	Concentration (mg/l)	Standard (mg/l)	Factor
1	PCBs	0.684	6.6	0.103636364
2	Gasoline Range Organics	9900	1000	9.9
3	Lead	312	400	0.78
4				
5				
6				
			Total:	10.78363636

Moderate (>2 and <100)

Pathway (Circle One): Evident | Potential | Confined
Rationale: Visual and Analytical Data
Receptor (Circle One): Evident | Potential | Confined
Rationale: Presence of Storm Drains

RISK = MODERATE

ANALYTICAL RESULTS

Fence-Line Soils Investigation
For
Herbicide Analysis

Horsham Memorial USARC
Horsham, Pennsylvania

Prepared for
The 99th Regional Support Command (RSC)
5 Lobaugh Street
Oakdale, PA 15071-5001

Prepared by
The GeoEnvironmental Engineering Section
Norfolk District
U.S. Army Corps of Engineers
803 Front Street
Norfolk, VA 23510-1096

June 2001

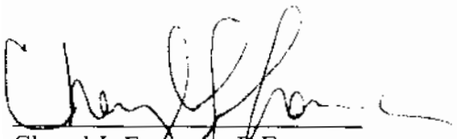
1.0 PROJECT DESCRIPTION: In response to a 24 October 2000 letter from the Pennsylvania Department of Environmental Protection (PA DEP), the 99th Regional Support Command (RSC), contracted Norfolk District U.S. Army Corps of Engineers (USACE) to collected fence-line surface soil samples for herbicide analysis by method 8151.

2.0 BACKGROUND: The Horsham Memorial USARC is located at 936 Easton Road, Horsham, PA. In 1999, EA Engineering Science, and Technology, Inc. (EA), was contracted by the Baltimore District USACE, to perform soil sampling at 50-ft intervals along the fence line. Ten samples were analyzed for TCL VOCs, TCL SVOCs, TAL Metals, Pesticides and PCBs. The results were compared to both the Pennsylvania Act 2 medium-specific concentrations (MSCs) and to the standards/action levels presented in Closure Requirements for *Underground Storage Tank Systems*. None of the compounds were detected above its MSC, except Vanadium, which appeared to be at or below background levels. Please refer to the September 1999 *Fence-Line Soils Investigation Report*, prepared by EA for additional information.

3.0 FIELD ACTIVITIES: Rob Reali and Chris Turner of the Norfolk District USACE arrived on site at 0930 hrs on 13 March 2001. Weather for this sampling event was mild and slightly overcast, with a temperature of approximately 55°F. Ten (10) soil samples, designated SS-1 through SS-10, were collected every 60 feet along the fenceline, beginning at the northern most point of the fence. Refer to Attachment 1 for approximate soil sampling locations. A stainless steel hand auger was advanced to a depth of 8 inches in each of the 10 boring locations. USACE representatives collected the soil immediately below the grassy, vegetative layer for laboratory analytical sampling. The samples were collected directly out of the hand auger bucket, and transferred into an appropriate container with a stainless steel lab spoon. The filled sample jars were placed on ice, and shipped via Federal Express to Accutest Laboratories in New Jersey. All sampling equipment was decontaminated between sampling intervals.

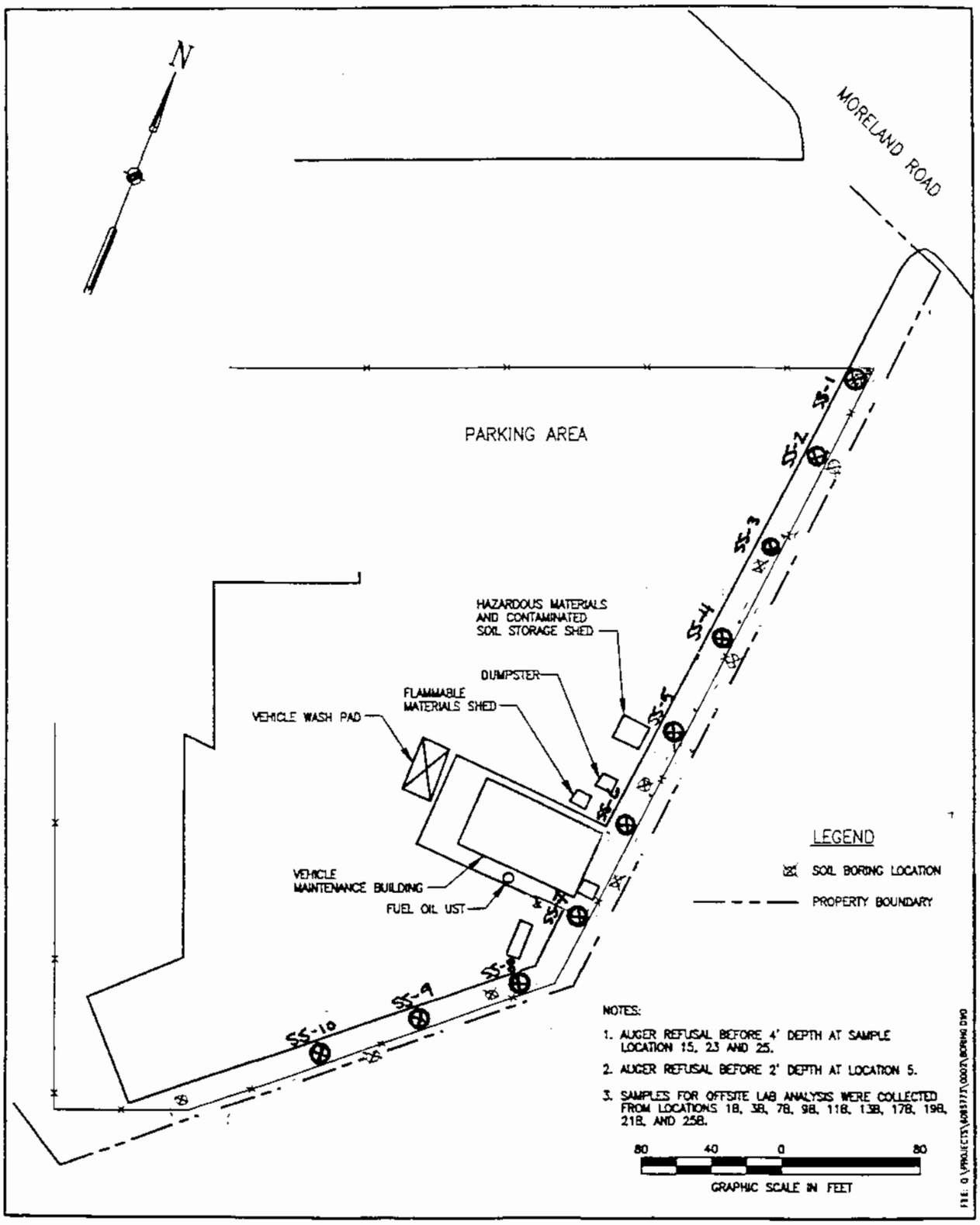
4.0 ANALYTICAL RESULTS: Each sample was analyzed by EPA SW846 Method 8151 for herbicides, however, none of the herbicide compounds were detected above their detection limit. The laboratory analytical report for this sampling event is included as Attachment 2.

Prepared by:



6/14/01

Cheryl L Fromme, P.E. Date
Environmental Engineer
GeoEnvironmental Engineering Section
Norfolk District USACE



Attachment 1

ACCUTEST.

TABLE OF CONTENTS

COMMERCIAL B LABORATORY DATA DELIVERABLES

New Jersey • Fresh Ponds Corporate Village • Building B • 2235 Route 130 • Dayton, NJ 08810 • tel: 908 329 0200 • fax: 908 329 3499 • http://www.accutest.com

ACCUTEST

04/03/01

Technical Report for

Army Corps of Engineers, Norfolk

Horsham, VA

Accutest Job Number: E87390

Report to:

Army Corps of Engineers, Norfolk
803 Front Street
CENAO-EN-G
Norfolk, VA 23510

ATTN: Cheryl Fromme

Total number of pages in report: 17

Vincent J. Pugliese
President

ACCUTEST

Sample Summary

Army Corps of Engineers, Norfolk

Horsham, VA

Job No: E87390

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
E87390-1	03/13/01	10:35	03/14/01	SO	Soil	SS-1
E87390-2	03/13/01	10:40	03/14/01	SO	Soil	SS-2
E87390-3	03/13/01	10:55	03/14/01	SO	Soil	SS-3
E87390-4	03/13/01	11:00	03/14/01	SO	Soil	SS-4
E87390-5	03/13/01	11:05	03/14/01	SO	Soil	SS-5
E87390-6	03/13/01	11:15	03/14/01	SO	Soil	SS-6
E87390-7	03/13/01	11:22	03/14/01	SO	Soil	SS-7
E87390-8	03/13/01	11:27	03/14/01	SO	Soil	SS-8
E87390-9	03/13/01	11:33	03/14/01	SO	Soil	SS-9
E87390-10	03/13/01	11:40	03/14/01	SO	Soil	SS-10

New Jersey • Fresh Ponds Corporate Village • Building B • 2235 Route 130 • Dayton, NJ 08810 • tel: 732-329-0200 • fax: 732-329-3499 • http://www.accutest.com

Report of Analysis

Client Sample ID:	SS-1		
Lab Sample ID:	E87390-1	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	80.0
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31700.D	1	03/26/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	21	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	4.2	ug/kg	
93-76-5	2,4,5-T	ND	4.2	ug/kg	
75-99-0	Dalapon	ND	4.2	ug/kg	
1918-00-9	Dicamba	ND	21	ug/kg	
120-36-5	Dichloroprop	ND	21	ug/kg	
88-85-7	Dinoseb	ND	21	ug/kg	
94-74-6	MCPA	ND	2100	ug/kg	
93-65-2	MCPP	ND	2100	ug/kg	
87-86-5	Pentachlorophenol	ND	2.1	ug/kg	
94-82-6	2,4-DB	ND	21	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	80%		49-158%
19719-28-9	2,4-DCAA	91%		49-158%

002 2

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS-2		
Lab Sample ID:	E87390-2	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	80.0
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31701.D	1	03/26/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	21	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	4.2	ug/kg	
93-76-5	2,4,5-T	ND	4.2	ug/kg	
75-99-0	Dalapon	ND	4.2	ug/kg	
1918-00-9	Dicamba	ND	21	ug/kg	
120-36-5	Dichloroprop	ND	21	ug/kg	
88-85-7	Dinoseb	ND	21	ug/kg	
94-74-6	MCPA	ND	2100	ug/kg	
93-65-2	MCPP	ND	2100	ug/kg	
87-86-5	Pentachlorophenol	ND	2.1	ug/kg	
94-82-6	2,4-DB	ND	21	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	78%		49-158%
19719-28-9	2,4-DCAA	90%		49-158%

3

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS-3		
Lab Sample ID:	E87390-3	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	79.6
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31702.D	1	03/26/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	21	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	4.2	ug/kg	
93-76-5	2,4,5-T	ND	4.2	ug/kg	
75-99-0	Dalapon	ND	4.2	ug/kg	
1918-00-9	Dicamba	ND	21	ug/kg	
120-36-5	Dichloroprop	ND	21	ug/kg	
88-85-7	Dinoseb	ND	21	ug/kg	
94-74-6	MCPA	ND	2100	ug/kg	
93-65-2	MCPP	ND	2100	ug/kg	
87-86-5	Pentachlorophenol	ND	2.1	ug/kg	
94-82-6	2,4-DB	ND	21	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	82%		49-158%
19719-28-9	2,4-DCAA	95%		49-158%

4

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS-4		
Lab Sample ID:	E87390-4	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	79.9
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31703.D	1	03/26/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	22	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	4.4	ug/kg	
93-76-5	2,4,5-T	ND	4.4	ug/kg	
75-99-0	Dalapon	ND	4.4	ug/kg	
1918-00-9	Dicamba	ND	22	ug/kg	
120-36-5	Dichloroprop	ND	22	ug/kg	
88-85-7	Dinoseb	ND	22	ug/kg	
94-74-6	MCPA	ND	2200	ug/kg	
93-65-2	MCPP	ND	2200	ug/kg	
87-86-5	Pentachlorophenol	ND	2.2	ug/kg	
94-82-6	2,4-DB	ND	22	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	77%		49-158%
19719-28-9	2,4-DCAA	95%		49-158%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS-5		
Lab Sample ID:	E87390-5	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	82.1
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31704.D	1	03/26/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	20	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	3.9	ug/kg	
93-76-5	2,4,5-T	ND	3.9	ug/kg	
75-99-0	Dalapon	ND	3.9	ug/kg	
1918-00-9	Dicamba	ND	20	ug/kg	
120-36-5	Dichloroprop	ND	20	ug/kg	
88-85-7	Dinoseb	ND	20	ug/kg	
94-74-6	MCPA	ND	2000	ug/kg	
93-65-2	MCPP	ND	2000	ug/kg	
87-86-5	Pentachlorophenol	ND	2.0	ug/kg	
94-82-6	2,4-DB	ND	20	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	78%		49-158%
19719-28-9	2,4-DCAA	81%		49-158%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS-6		
Lab Sample ID:	E87390-6	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	81.9
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31705.D	1	03/26/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	19	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	3.8	ug/kg	
93-76-5	2,4,5-T	ND	3.8	ug/kg	
75-99-0	Dalapon	ND	3.8	ug/kg	
1918-00-9	Dicamba	ND	19	ug/kg	
120-36-5	Dichloroprop	ND	19	ug/kg	
88-85-7	Dinoseb	ND	19	ug/kg	
94-74-6	MCPA	ND	1900	ug/kg	
93-65-2	MCPP	ND	1900	ug/kg	
87-86-5	Pentachlorophenol	ND	1.9	ug/kg	
94-82-6	2,4-DB	ND	19	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	60%		49-158%
19719-28-9	2,4-DCAA	78%		49-158%

7

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS-7		
Lab Sample ID:	E87390-7	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	76.7
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31706.D	1	03/26/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	22	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	4.4	ug/kg	
93-76-5	2,4,5-T	ND	4.4	ug/kg	
75-99-0	Dalapon	ND	4.4	ug/kg	
1918-00-9	Dicamba	ND	22	ug/kg	
120-36-5	Dichloroprop	ND	22	ug/kg	
88-85-7	Dinoseb	ND	22	ug/kg	
94-74-6	MCPA	ND	2200	ug/kg	
93-65-2	MCPP	ND	2200	ug/kg	
87-86-5	Pentachlorophenol	ND	2.2	ug/kg	
94-82-6	2,4-DB	ND	22	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	73%		49-158%
19719-28-9	2,4-DCAA	84%		49-158%

8

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS-8		
Lab Sample ID:	E87390-8	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	80.1
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31707.D	1	03/27/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	20	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	4.1	ug/kg	
93-76-5	2,4,5-T	ND	4.1	ug/kg	
75-99-0	Dalapon	ND	4.1	ug/kg	
1918-00-9	Dicamba	ND	20	ug/kg	
120-36-5	Dichloroprop	ND	20	ug/kg	
88-85-7	Dinoseb	ND	20	ug/kg	
94-74-6	MCPA	ND	2000	ug/kg	
93-65-2	MCPP	ND	2000	ug/kg	
87-86-5	Pentachlorophenol	ND	2.0	ug/kg	
94-82-6	2,4-DB	ND	20	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	80%		49-158%
19719-28-9	2,4-DCAA	93%		49-158%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS-9		
Lab Sample ID:	E87390-9	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	82.7
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31708.D	1	03/27/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	20	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	4.0	ug/kg	
93-76-5	2,4,5-T	ND	4.0	ug/kg	
75-99-0	Dalapon	ND	4.0	ug/kg	
1918-00-9	Dicamba	ND	20	ug/kg	
120-36-5	Dichloroprop	ND	20	ug/kg	
88-85-7	Dinoseb	ND	20	ug/kg	
94-74-6	MCPA	ND	2000	ug/kg	
93-65-2	MCPP	ND	2000	ug/kg	
87-86-5	Pentachlorophenol	ND	2.0	ug/kg	
94-82-6	2,4-DB	ND	20	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	81%		49-158%
19719-28-9	2,4-DCAA	91%		49-158%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS-10		
Lab Sample ID:	E87390-10	**Date Sampled:**	03/13/01
Matrix:	SO - Soil	**Date Received:**	03/14/01
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	71.7
Project:	Horsham, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF31709.D	1	03/27/01	YYX	03/17/01	OP9099	GEF1814
Run #2							

Herbicide List

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	23	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	4.6	ug/kg	
93-76-5	2,4,5-T	ND	4.6	ug/kg	
75-99-0	Dalapon	ND	4.6	ug/kg	
1918-00-9	Dicamba	ND	23	ug/kg	
120-36-5	Dichloroprop	ND	23	ug/kg	
88-85-7	Dinoseb	ND	23	ug/kg	
94-74-6	MCPA	ND	2300	ug/kg	
93-65-2	MCPP	ND	2300	ug/kg	
87-86-5	Pentachlorophenol	ND	2.3	ug/kg	
94-82-6	2,4-DB	ND	23	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	76%		49-158%
19719-28-9	2,4-DCAA	88%		49-158%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SO

Chain of Custody Record

EA Laboratories
19 Loveton Circle
Sparks, MD 21152
Telephone: (410) 771-4920
Fax: (410) 771-4407

Company Name: Army Corp of Engineers
Project No.:
Dept.: Task:
Sample Storage Location:

Project Manager or Contact: C. Fromme
Phone: 757 441 7142
Project Name: Horsham
ATO Number:

Page 1 of 1
Report #:

Report Deliverables: 1 2 3 4 D E
EDD: Yes/No
DUE TO CLIENT: ______

Parameter/Method Numbers for Analysis

Date	Time	Water	Soil	Sample Identification 19 Characters	No. of Containers	Herbicides 8151	EA Labs Accession Number	Remarks
3/13	1035		X	SS-1	2	X	E82390-1	LPM:
3/13	1040		↓	SS-2	2	X	-2	
3/13	1055		↓	SS-3	2	X	-3	
3/13	1100		↓	SS-4	2	X	-4	7U
3/13	1105		↓	SS-5	2	X	-5	
3/13	1115		↓	SS-6	2	X	-6	
3/13	1122		↓	SS-7	2	X	-7	
3/13	1127		↓	SS-8	2	X	-8	
3/13	1133		↓	SS-9	2	X	-9	
3/13	1140		↓	SS-10	2	X	-10	
								Rec'd 2x ~4oz NAD per spx; QC ok + T/A pending conf. 4/rep. 3/14/01

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	3/13 1200	[signature]	3/13 1200	FedX	3/14/01 1200
Relinquished by: (Signature)	**Date/Time**	**Received by Laboratory: (Signature)**	**Date/Time**	**Airbill Number:**	
FedX	3/14/01 0930	[signature]		8270 4819 6517	

Cooler Temp. 2-2C pH: ☐ Yes ☐ No Comments: Custody Seals Intact ☒ Yes ☐ No

Sample Shipped by: (Circle) Fed Ex. (circled) Puro. UPS Hand Carried Other:

NOTE: Please indicate method number for analyses requested. This will help clarify any questions with laboratory techniques.

WHITE—EA Laboratories YELLOW—EA Laboratories PINK—Project Manager *Shaded Areas for Lab Use Only*

GC

SUPPORT DATA SUMMARY

Semivolatile Surrogate Recovery Summary

Job Number: E87390
Account: COEVANO Army Corps of Engineers, Norfolk
Project: Horsham, VA

Method: SW846 8151 **Matrix:** SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 [a]	S1 [b]
E87390-1	EF31700.D	80.0	91.0
E87390-2	EF31701.D	78.0	90.0
E87390-3	EF31702.D	82.0	95.0
E87390-4	EF31703.D	77.0	95.0
E87390-5	EF31704.D	78.0	81.0
E87390-6	EF31705.D	60.0	78.0
E87390-7	EF31706.D	73.0	84.0
E87390-8	EF31707.D	80.0	93.0
E87390-9	EF31708.D	81.0	91.0
E87390-10	EF31709.D	76.0	88.0
OP9099-BS1	EF31422.D	88.0	97.0
OP9099-MB2	EF31570.D	105.0	117.0
OP9099-MS	EF31425.D	33.0* [c]	35.0* [c]
OP9099-MSD	EF31426.D	19.0* [c]	22.0* [c]
OP9099-MB1	EF31421.D	114.0	115.0

Surrogate Compounds	Recovery Limits
S1 = 2,4-DCAA	49-158%

(a) Recovery from GC signal #1
(b) Recovery from GC signal #2
(c) Outside the QC limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: E87390
Account: COEVANO Army Corps of Engineers, Norfolk
Project: Horsham, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9099-MS	EF31425.D	1	03/07/01	CBD	03/04/01	OP9099	GEF1806
OP9099-MSD	EF31426.D	1	03/07/01	CBD	03/04/01	OP9099	GEF1806
F9061-1	EF31522.D	1	03/13/01	CBD	03/10/01	OP9099	GEF1809

The QC reported here applies to the following samples: **Method:** SW846 8151

E87390-1, E87390-2, E87390-3, E87390-4, E87390-5, E87390-6, E87390-7, E87390-8, E87390-9, E87390-10

CAS No.	Compound	F9061-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
94-75-7	2,4-D	ND		191	85.9	45	58.0	29	39* [a]	27-142/34
93-72-1	2,4,5-TP (Silvex)	ND		191	91.6	48	72.0	36	24	33-144/37
93-76-5	2,4,5-T	ND		191	65.8	34	47.9	24* [a]	31	26-115/39

CAS No.	Surrogate Recoveries	MS	MSD	F9061-1	Limits
19719-28-9	2,4-DCAA	33%* [a]	19%* [a]	70%	49-158%
19719-28-9	2,4-DCAA	35%* [a]	22%* [a]	75%	49-158%

(a) Outside the QC limits.

Blank Spike Summary

Job Number: E87390
Account: COEVANO Army Corps of Engineers, Norfolk
Project: Horsham, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9099-BS1	EF31422.D	1	03/07/01	CBD	03/04/01	OP9099	GEF1806

The QC reported here applies to the following samples: **Method:** SW846 8151

E87390-1, E87390-2, E87390-3, E87390-4, E87390-5, E87390-6, E87390-7, E87390-8, E87390-9, E87390-10

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
94-75-7	2,4-D	166	163	98	57-115
93-72-1	2,4,5-TP (Silvex)	166	179	108	60-145
93-76-5	2,4,5-T	166	152	91	41-135

CAS No.	Surrogate Recoveries	BSP	Limits
19719-28-9	2,4-DCAA	88%	49-158%
19719-28-9	2,4-DCAA	97%	49-158%

Method Blank Summary

Job Number: E87390
Account: COEVANO Army Corps of Engineers, Norfolk
Project: Horsham, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9099-MB1	EF31421.D	1	03/07/01	CBD	03/04/01	OP9099	GEF1806

The QC reported here applies to the following samples: **Method:** SW846 8151

OP9099-BS1, OP9099-MS, OP9099-MSD

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	17	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	3.3	ug/kg	
93-76-5	2,4,5-T	ND	3.3	ug/kg	
75-99-0	Dalapon	ND	3.3	ug/kg	
1918-00-9	Dicamba	ND	17	ug/kg	
120-36-5	Dichloroprop	ND	17	ug/kg	
88-85-7	Dinoseb	ND	17	ug/kg	
94-74-6	MCPA	ND	1700	ug/kg	
93-65-2	MCPP	ND	1700	ug/kg	
87-86-5	Pentachlorophenol	ND	1.7	ug/kg	
94-82-6	2,4-DB	ND	17	ug/kg	

CAS No.	Surrogate Recoveries		Limits
19719-28-9	2,4-DCAA	114%	49-158%
19719-28-9	2,4-DCAA	115%	49-158%

Method Blank Summary

Job Number: E87390
Account: COEVANO Army Corps of Engineers, Norfolk
Project: Horsham, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9099-MB2	EF31570.D	1	03/14/01	CBD	03/10/01	OP9099	GEF1809

The QC reported here applies to the following samples: **Method:** SW846 8151

E87390-1, E87390-2, E87390-3, E87390-4, E87390-5, E87390-6, E87390-7, E87390-8, E87390-9, E87390-10

CAS No.	Compound	Result	RL	Units	Q
94-75-7	2,4-D	ND	17	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	3.3	ug/kg	
93-76-5	2,4,5-T	ND	3.3	ug/kg	
75-99-0	Dalapon	ND	3.3	ug/kg	
1918-00-9	Dicamba	ND	17	ug/kg	
120-36-5	Dichloroprop	ND	17	ug/kg	
88-85-7	Dinoseb	ND	17	ug/kg	
94-74-6	MCPA	ND	1700	ug/kg	
93-65-2	MCPP	ND	1700	ug/kg	
87-86-5	Pentachlorophenol	ND	1.7	ug/kg	
94-82-6	2,4-DB	ND	17	ug/kg	

CAS No.	Surrogate Recoveries		Limits
19719-28-9	2,4-DCAA	105%	49-158%
19719-28-9	2,4-DCAA	117%	49-158%

In cooperation with the
U.S. NAVY

Hydrogeological Investigation at Site 5, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania

by Ronald A. Sloto

Water-Resources Investigations Report 01-4263

U.S. Department of the Interior
U.S. Geological Survey

New Cumberland, Pennsylvania
2002

U.S. DEPARTMENT OF THE INTERIOR
GALE A. NORTON, Secretary

U.S. GEOLOGICAL SURVEY
Charles G. Groat, Director

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U.S. Geological Survey
215 Limekiln Road
New Cumberland, Pennsylvania 17070-2424
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Internet Address: http://pa.water.usgs.gov

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U.S. Geological Survey
Branch of Information Services
Box 25286, Denver Federal Center
Denver, Colorado 80225-0286
Telephone: 1-888-ASK-USGS

CONTENTS

ILLUSTRATIONS

ILLUSTRATIONS—Continued

TABLES

CONVERSION FACTORS AND ABBREVIATIONS

Multiply	By	To obtain
	Length	
inch (in)	2.54	centimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
	Area	
acre	0.4047	hectare
	Volume	
gallon (gal)	3.785	liter
cubic foot (ft^3)	0.02832	cubic meter
	Flow rate	
gallon per minute (gal/min)	0.06309	liter per second
gallon per day (gal/d)	0.003785	cubic meter per day
	Mass	
pound, avoirdupois (lb)	0.4536	kilogram
	Density	
pound per cubic foot (lb/ft^3)	16.02	kilogram per cubic meter

Sea level: In this report, “sea level” refers to the National Geodetic Vertical Datum of 1929—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Abbreviated concentration units used in report:

- cm, centimeter
- kg/ft^3, kilogram per cubic foot
- µg, microgram
- µg/kg, microgram per kilogram
- µg/L, microgram per liter

HYDROGEOLOGICAL INVESTIGATION AT SITE 5, WILLOW GROVE NAVAL AIR STATION/JOINT RESERVE BASE, HORSHAM TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA

by Ronald A. Sloto

ABSTRACT

The U.S. Geological Survey conducted borehole geophysical logging, collected and analyzed water-level data, and sampled sections of a rock core to determine the concentration of volatile organic compounds in the aquifer matrix of the Stockton Formation. Borehole geophysical logs were run in three monitor wells. At well 05MW04I, the vertical gradient was upward at depths above 42 feet below land surface (ft bls), downward between 42 and 82 ft bls, and upward below 82 ft bls. At well 05MW05I, a downward vertical gradient was present. At well 05MW12I, the vertical gradient was downward above 112 ft bls and upward below 112 ft bls.

Three water-bearing fractures in a 17-foot long rock core from 23.5 to 40.5 ft bls were identified and sampled. Three samples were analyzed from each water-bearing fracture—at the fracture face, 2 centimeters (cm) below the fracture, and 4 cm below the fracture. Fifteen compounds were detected; however, concentrations of seven compounds were less than 1 microgram per kilogram (μg/kg) when detected. Concentrations of benzene (from 0.39 to 3.3 μg/kg), 1,1-dichloroethene (1,1-DCE) (from 0.15 to 13 μg/kg), 1,1,1-trichloroethane (TCA) (from 0.17 to 22 μg/kg), and trichloroethylene (TCE) (from 0.092 to 9.6 μg/kg) were detected in all samples. The highest concentrations detected were for toluene, which was detected at a concentration of 32 and 86 μg/kg in the samples from unweathered sandstone at 2 and 4 cm below the fracture, respectively. Concentrations generally decreased with distance below the fracture in the mudstone samples. Concentrations of benzene and toluene increased with distance below the fractures in the unweathered sandstone samples. Concentrations of 1,1-DCE, TCA, and TCE were higher in the mudstone samples than in the samples from sandstone. Toluene concentrations were higher in unweathered sandstone than in weathered sandstone or mudstone.

The effect of the pumping of Horsham Water and Sewer Authority public supply well 26 (HWSA-26), 0.2 mile southwest of the base boundary, on ground-water levels on the base was determined by shutting the well down for 6 days to allow water levels to recover. Water levels in 22 nearby wells were measured. The only well (02MW01I) that showed an unambiguous response to the shutdown of well HWSA-26 is 1,350 feet directly along strike from well HWSA-26. The recovery of well 05MW11I in response to the shutdown of well HWSA-26 is masked by recharge from snowmelt but probably does not exceed about 0.2 feet on the basis of the water level in well 05MW11I, which showed a response to the pumping of well HWSA-26 that ranged from 0.5 to 0.15 foot.

Horizontal gradients differ with depth, and the rate and direction of ground-water flow and contaminant movement is depth dependent. The potentiometric-surface map for water levels measured in wells screened between 5 and 44 ft bls in the aquifer shows a ground-water mound that is the high point on a regional ground-water divide. From this divide, ground water flows both northwest toward Park Creek and southeast toward Pennypack Creek. The hydraulic gradient around this mound is relatively flat to the southeast and particularly flat to the northwest. The potentiometric-surface map for water levels measured in wells screened between 40 and 100 ft bls in the aquifer shows a very flat hydraulic gradient. Differences in the elevation of the potentiometric surface are less than 2 feet. The potentiometric-surface map for water levels measured in wells screened between 105 and 179 ft bls in the aquifer shows a steep hydraulic gradient between Sites 5 and 2 and a relatively flat hydraulic gradient between Sites 5 and 3. Water levels measured on October 7, 1999, showed downward vertical head gradients for all well clusters at Site 5. Vertical gradients ranged from 0.01 at well cluster 05MW10 to 0.2 at cluster 05MW11. Most gradients were between 0.01 and 0.026. Vertical head gradients vary with time. The variability is caused by a difference in the magnitude of water-level fluctuations between shallow and the deep fractures. The difference in the magnitude of water-level fluctuations is because of differences in lithology and aquifer storativity.

INTRODUCTION

The Willow Grove Naval Air Station/Joint Reserve Base (NAS/JRB) is in Horsham Township, Montgomery County, Pa., and is shown on the U.S. Geological Survey (USGS) Ambler 7.5-minute topographic quadrangle map (fig. 1). In addition to its primary use as a reserve Naval Air Station, this 1,000-acre facility also supports U.S. Marine and U.S. Army activities. The U.S. Air Force has property holdings within the base boundary and shares common facilities with the U.S. Navy.

Sites with possible contamination at the Willow Grove NAS/JRB (fig. 1), also referred to as the base in this report, were identified by the U.S. Navy as part of a preliminary assessment program (Halliburton NUS Environmental Corporation, 1993). A hydrogeological investigation is being conducted as part of the U.S. Navy's Installation Restoration Program to address ground-water contamination at these sites. The U.S. Navy requested the USGS provide technical assistance to their hydrogeological investigation. Specifically, the USGS was asked to conduct borehole geophysical logging, to collect and analyze water-level data, and to sample sections of a rock core to determine the concentration of volatile organic compounds (VOC's) in the aquifer matrix. This information is being used to further identify the sources and pathways of contamination and to evaluate management strategies for improving water quality. The USGS conducted this study during 1999-2001. This work is a continuation of the Phase I and II borehole geophysical logging by the USGS (Conger, 1997; 1999).

Purpose and Scope

This report presents an interpretation of borehole geophysical logs and heatpulse-flowmeter measurements for three monitor wells, provides an analysis of regional and site-specific water-level data, provides an analysis of water-level data from a shutdown test on Horsham Water and Sewer Authority (HWSA) supply well 26, and provides analytical data and interpretations from rock-core samples analyzed for VOC's. The USGS prepared this report as part of the hydrogeological investigations at the Willow Grove NAS/JRB in cooperation with the U.S. Navy.

Hydrogeologic Setting

The Willow Grove NAS/JRB is in the Gettysburg-Newark Lowlands Section of the Piedmont Physiographic Province. The site and surrounding area are underlain by the Stockton Formation, which consists of sedimentary rocks of Triassic age. The Stockton Formation is subdivided into three units known as the lower arkose, middle arkose, and upper shale members (Rima and others, 1962). The middle arkose member crops out at the Willow Grove NAS/JRB, where it consists of fine- to medium-grained arkosic sandstone interbedded with red siltstone and mudstone. Quartz and feldspar are the dominant minerals. The Stockton Formation is about 6,000 ft thick at the Bucks-Montgomery County border. The middle arkose member has a maximum thickness of 4,200 ft (Rima and others, 1962). Bedding in the Stockton Formation at the base generally strikes N. 76° E. and dips about 7° NW. (Brown and Root Environmental, Inc., 1998). Vertical fractures are common.

The rocks of the Stockton Formation form a complex, heterogeneous aquifer with partially connected zones of high permeability. The aquifer is composed of a series of gently dipping lithologic units with different hydraulic properties, and permeability commonly differs from one lithologic unit to another.

Ground water in the weathered zone moves through intergranular openings that have formed as a result of weathering. In some places, permeability of the weathered zone may be poor because of a high percentage of clay derived from weathering of mudstone and siltstone. Ground-water storage and movement within the unweathered part of the Stockton Formation primarily occurs through a network of interconnecting secondary openings such as fractures, bedding planes, and joints. Primary porosity that originally may have been present has been almost eliminated by compaction and cementation.

Wells greater than 100 ft deep may be multi-aquifer wells penetrating several major water-producing zones with different hydraulic properties. Each water-bearing zone usually has a different hydraulic head (water level). The head in a deep, open-hole well is the composite of the heads in the water-bearing zones penetrated. This can cause heads in some wells to be different than heads in adjacent wells of different depths. Where differences in head are present among water-bearing

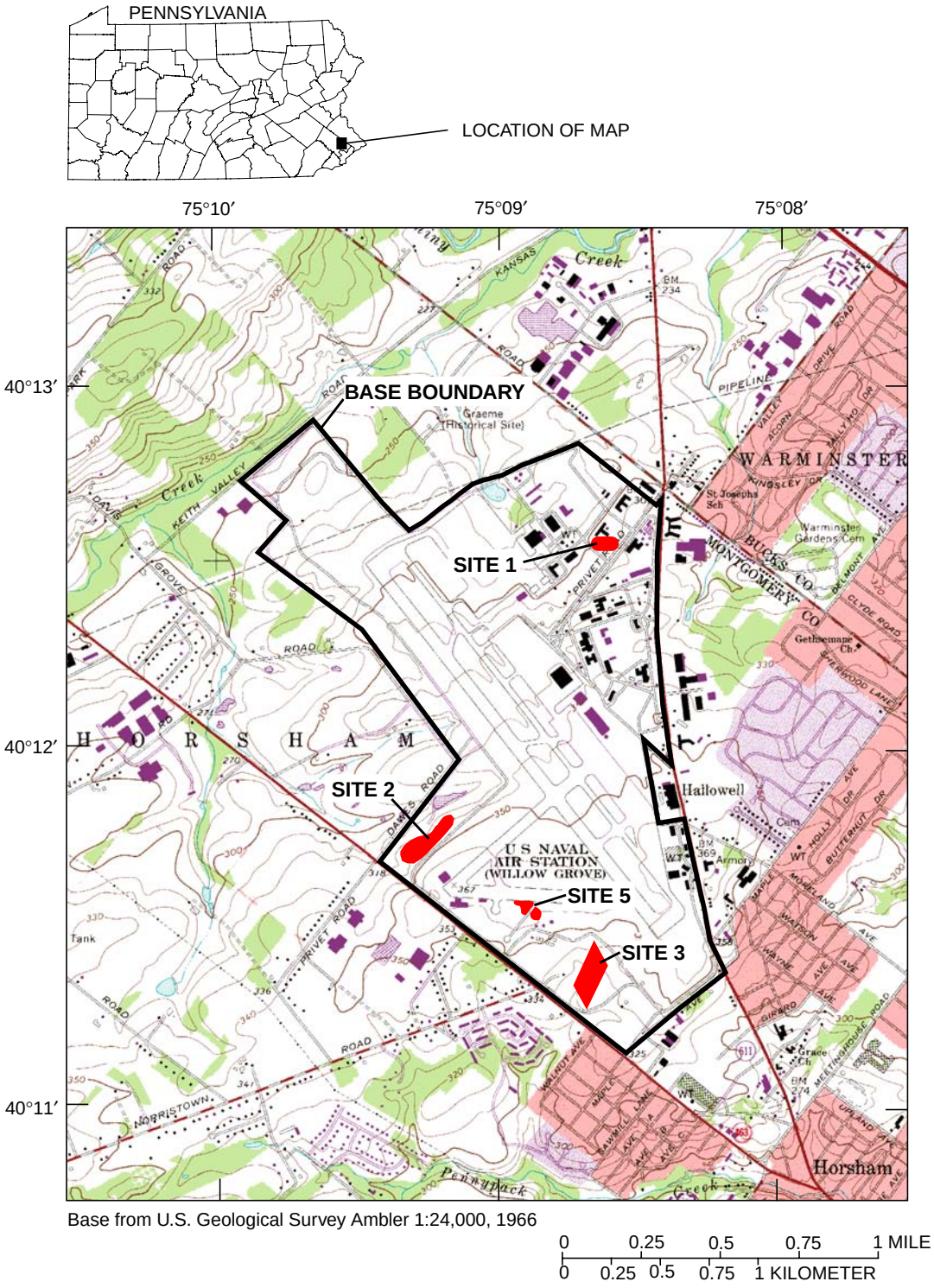


Figure 1. Location of the Willow Grove Naval Air Station/Joint Reserve Base and sites of possible ground-water contamination, Horsham Township, Montgomery County, Pennsylvania.

zones, water in the well bore flows in the direction of decreasing head. Wells that connect several water-bearing zones may act as conduits for the transport of contaminants (Sloto and others, 1996).

Ground water at the base originates from infiltration of local precipitation and inflow of ground water from upgradient areas. Ground-water levels fluctuate with seasonal variations in recharge and also are affected by pumping of nearby wells. Water in the upper part of the aquifer generally is under unconfined (water-table) conditions; ground water in the deeper part of the aquifer may be confined or partially confined. Local artesian conditions are common.

Well-Identification System

Two well-identification numbering systems are used in this report to maintain consistency with previous studies. U.S. Navy well-identification numbers are used for wells at the Willow Grove NAS/JRB. Navy well-identification numbers consist of a site-designation number, the letters MW, a sequentially assigned well-cluster number, and a depth-interval letter (S for shallow, I for intermediate). Well 05MW01S would indicate a shallow well in well cluster 1 at Site 5. The USGS well-identification number consists of a county-abbreviation prefix followed by a sequentially assigned number. The prefix MG denotes a well in Montgomery County. A cross-reference between site and USGS well-identification numbers is given in table 1. Locations of the wells are shown on figure 2.

Previous Investigations

The geology and hydrology of the Stockton Formation in southeastern Pennsylvania were described by Rima and others (1962). Sloto and others (1996) described the use of borehole geophysical methods to determine the extent of aquifer cross-contamination by VOC's through open boreholes in the Stockton Formation in adjacent Hatboro Borough and Warminster Township. Previous studies at the Willow Grove NAS/JRB were conducted by Halliburton NUS Environmental Corporation (1993) and Brown and Root Environmental, Inc. (1997; 1998). USGS reports by Conger (1997; 1999) describe the interpretation of borehole geophysical logs collected at the base. Sloto, Goode, and Way (2001) presented a potentiometric-surface map of the Willow Grove NAS/JRB and vicinity. Sloto, Goode, and Frasch (2002) describe a hydrogeologic investigation conducted at the base supply wells.

Acknowledgments

Borehole geophysical logging and borehole television surveys were done by Randall Conger and Philip Bird of the USGS Pennsylvania District. Water-level data for wells off the base were collected by Daniel Goode of the USGS Pennsylvania District and John Way of Lock Haven University. Most water-level data presented in this report were provided by TetraTech NUS, Inc. The use of these data are appreciated greatly. Daniel Goode conducted and collected data for the test of HWSA well 26. The cooperation of the HWSA for shutting down well 26 for a hydraulic test is appreciated greatly. Personnel from the Philadelphia Suburban Water Company assisted with the test. The cooperation of domestic well owners who allowed access to their wells for water-level measurements gratefully is acknowledged.

BOREHOLE GEOPHYSICAL LOGS

Caliper, natural-gamma, single-point-resistance, fluid-resistivity, and fluid-temperature borehole geophysical logs were collected in three monitor wells during August 2000. The logs were used to locate water-bearing fractures, determine zones of vertical borehole-water movement, and determine the depth to set well screens.

Caliper logs provide a continuous record of average borehole diameter, which is related to fractures, lithology, and drilling technique. Caliper logs were used to identify fractures and possible water-bearing openings. Correlation of caliper logs with fluid-resistivity and fluid-temperature logs was used to identify water-producing and water-receiving fractures or zones. The term fracture used in association with the caliper-log interpretations might identify a change in borehole diameter that may not necessarily indicate a bedding-plane separation, lithologic contact, or water-producing or water-receiving zone but simply may indicate an enlargement of the borehole.

Natural-gamma logs, also called gamma-ray logs, record the natural-gamma radiation emitted from rocks penetrated by the borehole. Uranium-238, thorium-232, and the progeny of their decay series and potassium-40 are the most common emitters of natural-gamma radiation. These radio-

Table 1. *Record of selected wells, Willow Grove Naval Air Station/Joint Reserve Base and vicinity, Horsham Township, Montgomery County, Pennsylvania*

[Well depths given are for completed monitor wells. —, no data]

Site well-identification number	U.S. Geological Survey well-identification number	Well depth (feet)	Casing diameter (inches)	Open interval (feet below top of casing)
02MW01S	MG-1850	20	4	5-20
02MW01I	MG-1598	80	2	70-80
02MW02S	MG-1851	25	4	5-25
02MW03S	MG-1878	20	4	5-20
02MW03SI	MG-1852	55	2	40-55
02MW03I	MG-1628	150	2	140-150
02MW04S	MG-1593	44	2	34-44
02MW04I	MG-1594	115	2	105-115
03MW01S	MG-1853	32	4	12-32
03MW01SI	MG-1854	80	4	60-80
03MW01I	MG-1855	179	4	159-179
03MW02S	MG-1856	22.5	4	4.5-22.5
03MW02SI	MG-1857	65	4	55-65
03MW02I	MG-1629	144	2	134-144
03MW03S	MG-1858	20	4	5-20
03MW03I	MG-1859	168.5	4	148.5-168.5
03MW04S	MG-1860	35	4	5-35
03MW04SI	MG-1861	80	4	60-80
03MW04I	MG-1862	168	4	148-168
03MW05S	MG-1863	37	4	17-37
03MW05I	MG-1595	92	4	82-92
03MW06S	MG-1596	36	2	26-36
03MW06SI	MG-1877	85	2	75-85
03MW06I	MG-1597	150	2	140-150
03MW07S	MG-1630	44	2	34-44
05MW01S	MG-1599	32	4	12-32
05MW01SI	MG-1864	84.5	4	74.5-84.5
05MW01I	MG-1590	135	4	124-135
05MW02S	MG-1865	30	4	10-30
05MW03S	MG-1866	31	4	11-31
05MW03I	MG-1589	128	2	118-128
05MW04S	MG-1867	30	4	10-30
05MW04I	MG-1757	84.5	2	74.5-84.5
05MW05S	MG-1868	40	4	20-40
05MW05I	MG-1758	209.5	2	189.5-209.5
05MW06S	MG-1869	37.5	4	17.5-37.5
05MW06I	MG-1870	84	4	74-84
05MW07S	MG-1871	26	4	6-26
05MW07I	MG-1872	84	4	74-84
05MW08S	MG-1585	36	2	26-36
05MW08SI	MG-1873	65	2	55-65
05MW08I	MG-1586	99	2	89-99
05MW09S	MG-1588	32	2	27-32
05MW09SI	MG-1874	74	2	59-74
05MW09I	MG-1587	106	2	96-106

Table 1. *Record of selected wells, Willow Grove Naval Air Station/Joint Reserve Base and vicinity, Horsham Township, Montgomery County, Pennsylvania—Continued*

[Well depths given are for completed monitor wells. —, no data]

Site well-identification number	U.S. Geological Survey well-identification number	Well depth (feet)	Casing diameter (inches)	Open interval (feet below top of casing)
05MW10S	MG-1591	32	2	22-32
05MW10SI	MG-1875	94	2	79-94
05MW10I	MG-1592	126	2	116-126
05MW11S	MG-1634	25	2	20-25
05MW11SI	MG-1876	50	2	40-50
05MW11I	MG-1635	149	2	139-149
05MW12I	MG-1759	113.5	2	103.5-113.5
HWSA-26	MG-962	400	12	40-400
—	MG-1739	—	6	—
rock core	MG-1760	40.5	—	—

active elements may be concentrated in clays by adsorption, precipitation, and ion exchange. Fine-grained sediments, such as mudstone or siltstone, usually emit more gamma radiation than sandstone. Geophysical logging with a gamma probe can be conducted in the fluid filled, dry, cased, or uncased parts of the borehole. However, well casing reduces the gamma response. The gamma log is used to correlate lithologic units between wells (Keys, 1990).

Single-point-resistance logs record the electrical resistance between the borehole and an electrical ground at land surface. In general, resistance increases with grain size and decreases with borehole diameter, density of water-bearing fractures, and increasing dissolved-solids concentration of borehole water (Keys, 1990). A water-filled borehole is required for single-point-resistance logs, and they are run only for the saturated part of the formation below the casing. The single-point-resistance log is used to correlate lithology between wells and may help identify water-bearing fractures or zones.

Fluid-temperature logs provide a continuous record of the temperature of the water in the borehole. Fluid-temperture logs are used to identify water-producing and water-receiving zones and to determine intervals of vertical borehole flow. Water-producing and water-receiving zones usually are identified by sharp changes in temperature, and intervals of vertical borehole flow are identified by little or no temperature gradient.

Fluid-resistivity logs measure the electrical resistance of water in the borehole. Resistivity is the reciprocal of fluid conductivity, and fluid-resistivity logs reflect changes in the dissolved-solids concentration of the borehole water. Fluid-resistivity logs are used to identify water-producing and water-receiving zones and to determine intervals of vertical borehole flow. Water-producing and water-receiving zones usually are identified by sharp changes in resistivity. Intervals of vertical borehole flow usually are identified by a low-resistivity gradient between a water-producing and a water-receiving zone.

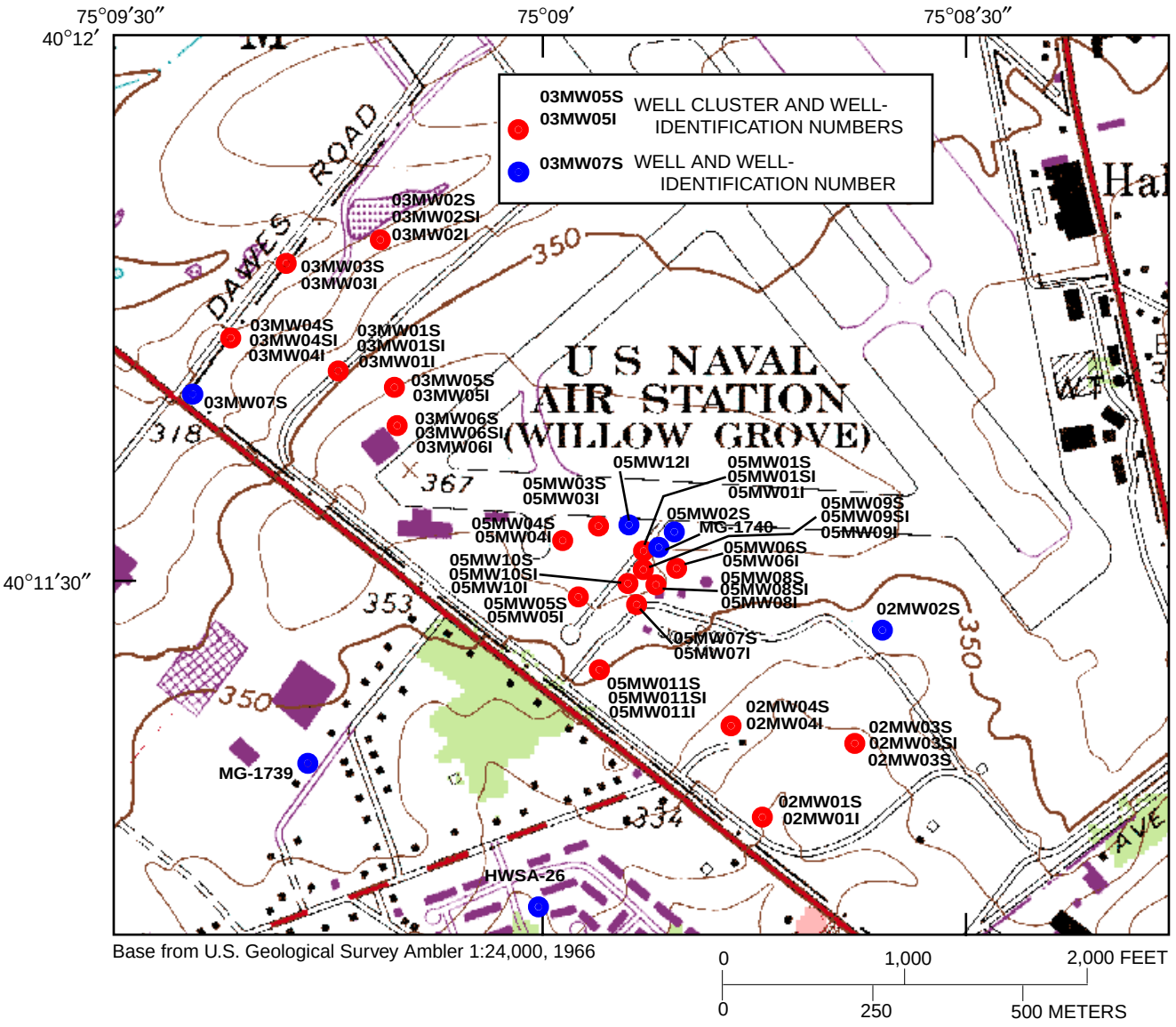


Figure 2. Locations of selected wells, Willow Grove Naval Air Station/Joint Reserve Base and vicinity, Horsham Township, Montgomery County, Pennsylvania.

Measurement of Vertical Borehole Flow

The direction and rate of borehole-water movement were measured with a high-resolution heatpulse flowmeter. The heatpulse flowmeter operates by diverting nearly all flow to the center of the tool where a heating grid slightly heats a thin zone of water. If vertical borehole flow is occurring, the water moves up or down the borehole to one of two sensitive thermistors (heat sensors). When a peak temperature is recorded by one of the thermistors, a measurement of direction and rate is calculated by the computer collecting the logging data. The range of flow measurement is about 0.01 to 1.5 gal/min in a 2- to 10-in. diameter borehole. Heatpulse-flowmeter measurements may be affected by poor seal integrity between the borehole and the flowmeter or contributions of water from storage within the borehole during pumping. If the seal between the borehole and the heatpulse flowmeter is not complete, some water can bypass the flowmeter, resulting in flow measurements that are less than the actual rate. The quantity of water bypassing the tool is a function of borehole size and shape and degree of fracturing. Although the heatpulse flowmeter is a calibrated tool, the data primarily are used as a relative indicator of fluid-producing zones.

Borehole Television Surveys

Borehole television surveys were conducted by lowering a waterproof video camera down the borehole and recording the image on video tape. The depth indicated on the video image may not correspond exactly to the geophysical logs because of minor slippage (generally up to plus or minus 1 ft) of the video cable.

Interpretation of Borehole Geophysical Logs

Well 05MW04I (MG-1757)

A suite of borehole geophysical logs (fig. 3) was collected in well 05MW04I by the USGS on August 10, 2000. The caliper log shows the well is 151 ft deep and is cased to 28 ft below land surface (bls). The caliper log shows major fractures at 40-42, 56-60, 70-82, and 100 ft bls. The fluid-temperature and fluid-resistivity logs indicate borehole flow and possible water-bearing zones at about 36, 70, 106, 113, 124, 133, and 140 ft bls.

Heatpulse-flowmeter measurements were made under nonpumping conditions at 36, 46, 66, 95, 124, and 142 ft bls (table 2). The geophysical logs and heatpulse-flowmeter measurements indicate complex water circulation in the borehole. Water enters the upper part of the borehole at a rate of 0.93 gal/min through a horizontal fracture at 40-42 ft bls and flows upward and downward. Water flowing upward exits the borehole through a horizontal fracture at 32 ft bls. Additional water (0.14 gal/min) enters the borehole through a vertical fracture at 56-60 ft bls and flows downward. Water flowing downward in the upper part of the borehole exits through a large vertical fracture at 70-82 ft bls (fig. 4). Water enters the lower part of the borehole at a rate of 0.18 gal/min through a horizontal fracture at 148 ft bls and flows upward. Water flowing upward in the lower part of the borehole exits the borehole through horizontal fractures at 132 (0.04 gal/min) and 114 ft bls (0.02 gal/min) and through the large vertical fracture at 70-82 ft bls. A total of 0.89 gal/min exits the borehole through the fracture at 70-82 ft bls. The water-bearing fractures in well 05MW04I are at 32, 40-42, 56-60, 70-82, 114, 132, and 148 ft bls; the principal water-bearing fractures are at 40-42 and 70-82 ft bls. Well 05MW04I was screened later from 74.5 to 84.5 ft below top of casing (btoc) to monitor the principle water-bearing fracture at 70-82 ft bls.

The borehole geophysical logs indicate upward and downward vertical gradients are present in the Stockton Formation at well 05MW04I. The vertical gradient is upward above 42 ft bls, downward between 42 and 82 ft bls, and upward below 82 ft bls.

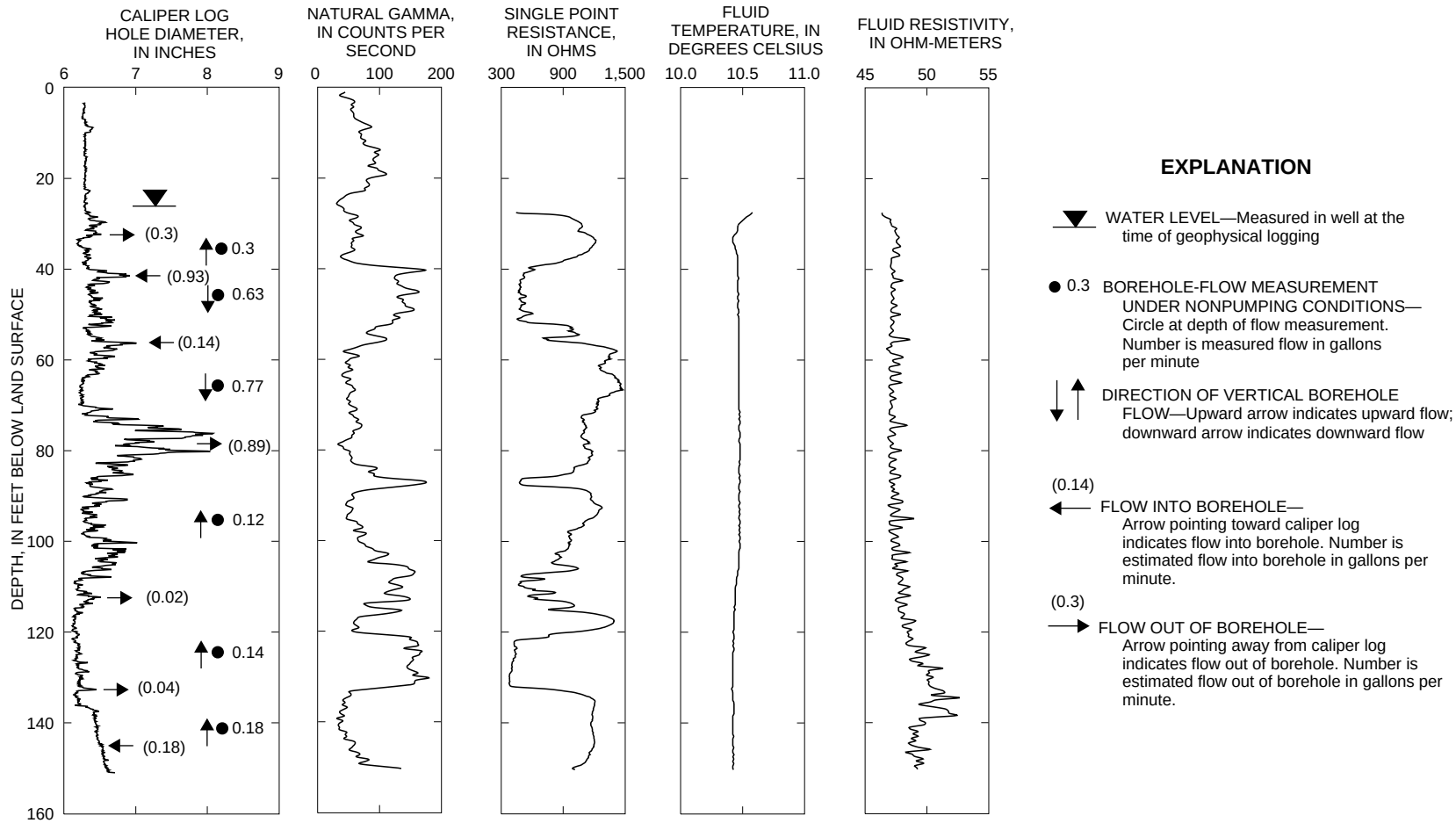


Figure 3. Borehole geophysical logs for well 05MW04I (MG-1757), Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

Table 2. *Heatpulse-flowmeter measurements made in well 05MW04I (MG-1757), Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania*

Depth (feet below land surface)	Flow (gallons per minute)	Flow direction
36	0.30	Up
46	.63	Down
66	.77	Down
95	.12	Up
124	.14	Up
142	.18	Up

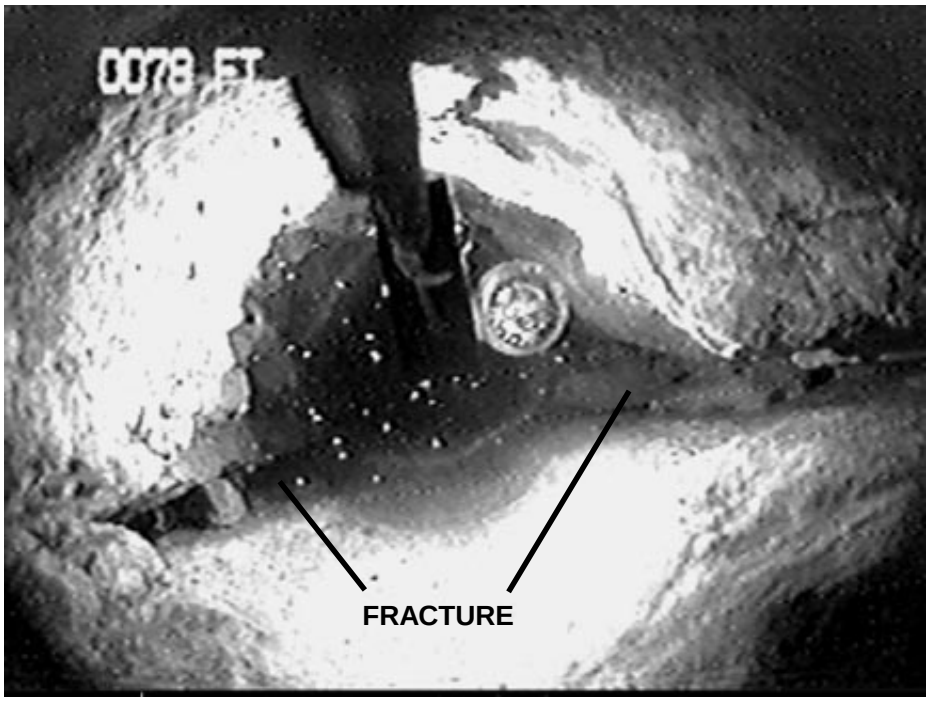


Figure 4. Image from borehole television survey showing vertical fracture at 78 feet below land surface in well 05MW04I (MG-1757), Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

Well 05MW05I (MG-1758)

A suite of borehole geophysical logs (fig. 5) was collected in well 05MW05I by the USGS on August 3, 2000. The caliper log shows the well is 250 ft deep and is cased to 18 ft bls. The caliper log shows major fractures at 52-58 and 142-148 ft bls. The fluid-temperature and fluid-resistivity logs indicate borehole flow and possible water-bearing zones at about 44, 68, 112, 174, and 190 ft bls.

Heatpulse-flowmeter measurements were made under nonpumping conditions at 30, 47, 65, 84, 100, 108, 124, 158, 180, 212, and 234 ft bls (table 3). On the basis of the geophysical logs and heatpulse-flowmeter measurements, water enters the upper part of the borehole through a large vertical fracture at 52-58 ft bls (0.1 gal/min) and flows downward. Water also enters the borehole through a horizontal fracture at 72 ft bls (0.3 gal/min) and a vertical fracture at 114 ft bls (0.1 gal/min) and flows downward. Some water exits the borehole through a large vertical fracture at 142-148 ft bls (0.2 gal/min) (fig. 6). Additional water enters the borehole through a horizontal fracture at 174 ft bls (0.2 gal/min) and flows downward. Water exits the borehole through horizontal fractures at 192 and 202-205 ft bls (0.3 gal/min) and 220-223 ft bls (0.2 gal/min). The water-bearing fractures in well 05WM05I are at 52-58, 72, 114, 142-148, 174, 192, 202-205, and 220-223 ft bls. The borehole geophysical logs indicate a downward vertical gradient is present in the Stockton Formation at well 05MW05I. Well 05MW05I was screened later from 189.5 to 209.5 ft btoc to monitor the water-bearing fractures at 192 and 202-205 ft bls.

Table 3. *Heatpulse-flowmeter measurements made in well 05MW05I (MG-1758), Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania*

[—, no flow]

Depth (feet below land surface)	Flow (gallons per minute)	Flow direction
30	0	—
47	0	—
65	.1	Down
84	.4	Down
100	[1].3	Down
108	[1].2	Down
124	.5	Down
158	[1].3	Down
180	.5	Down
212	.2	Down
234	0	—

[1] Flow rate may be affected by nearby pumping.

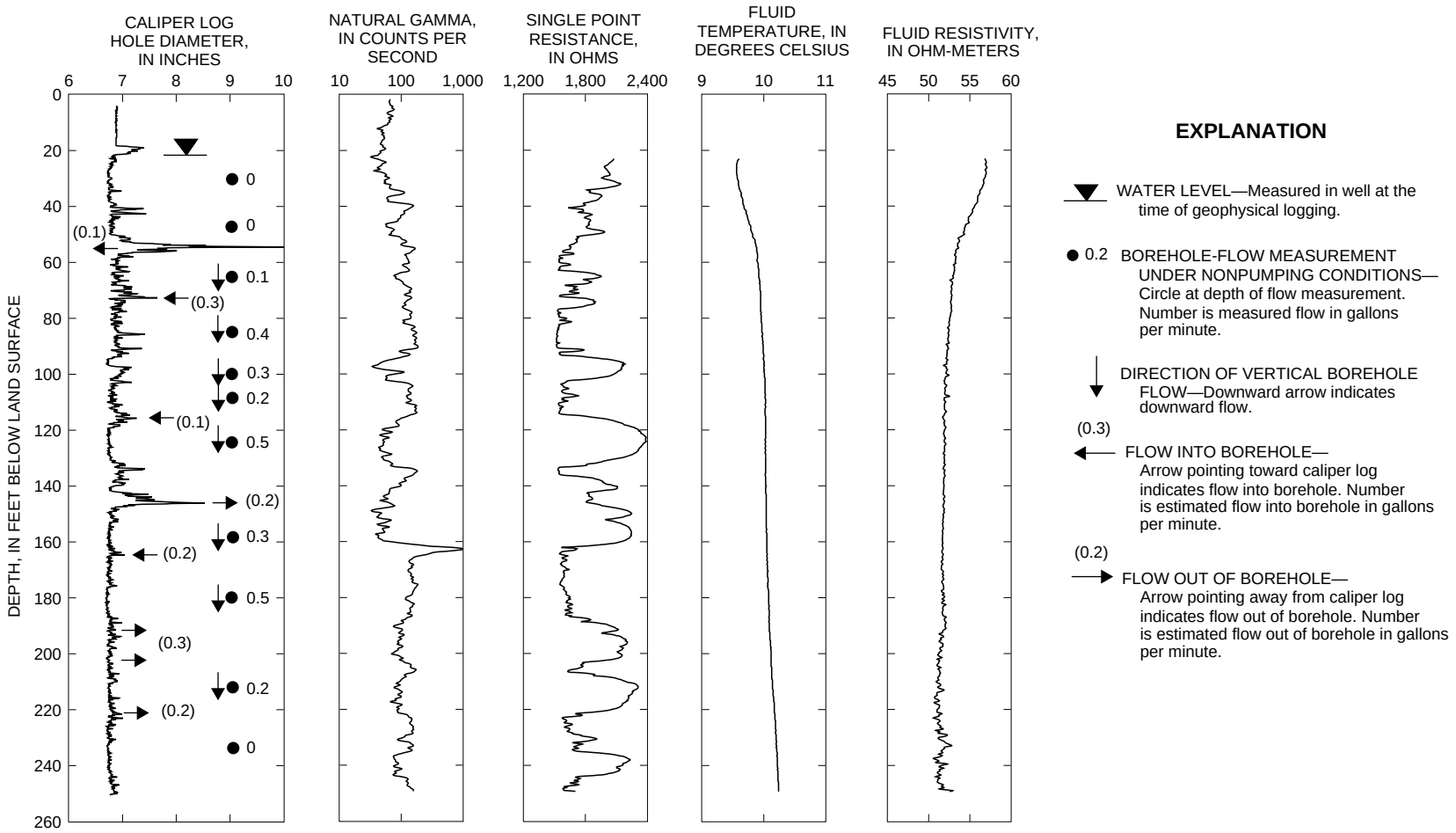


Figure 5. Borehole geophysical logs for well 05MW05I (MG-1758), Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

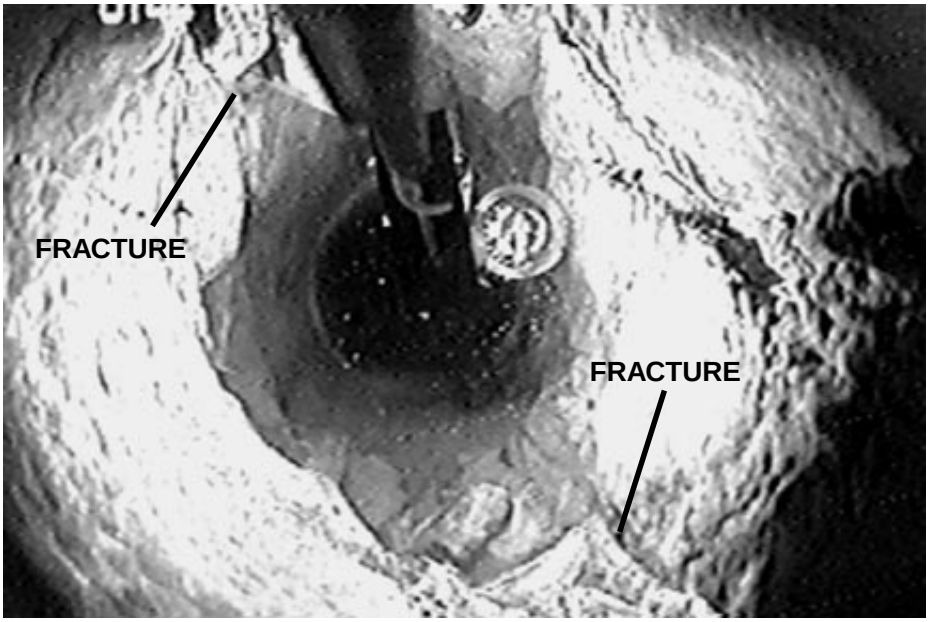


Figure 6. Image from borehole television survey showing vertical fracture at 142 feet below land surface in well 05MW05I (MG-1758), Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

Well 05MW12I (MG-1759)

A suite of borehole geophysical logs (fig. 7) was collected in well 05MW12I by the USGS on August 1, 2000. The caliper log shows the well is 149 ft deep and is cased to 28 ft bls. The caliper log shows major fractures at 88-92 and 109-112 ft bls. The fluid-temperature and fluid-resistivity logs indicate borehole flow and possible water-bearing zones at about 109, 120, and 129 ft bls.

Heatpulse-flowmeter measurements were made under nonpumping conditions at 49, 72, 81, 96, 100, 116, 132, 138, and 146 ft bls (table 4). On the basis of the geophysical logs and heatpulse-flowmeter measurements, water enters the upper part of the borehole at a rate of 1.48 gal/min through a vertical fracture at 36-38 ft bls (fig. 8) and flows downward. A minor quantity (less than 0.1 gal/min) of the water flowing downward exits the borehole, probably through fractures at 62 and 76 ft bls. Water also exits the borehole through the large vertical fracture at 88-92 ft bls (0.23 gal/min), but most water flowing downward exits the borehole through the large vertical fracture at 109-112 ft bls (1.42 gal/min total outflow). Water also enters the borehole near the bottom of the well (0.11 gal/min) and through a horizontal fracture at 140 ft bls (0.08 gal/min) and flows upward. About half the water flowing upward exits the borehole through a fracture at 119-126 ft bls (0.09 gal/min) and about half exits the borehole through the fracture at 109-112 ft bls (0.11 gal/min). The water-bearing fractures in well 05MW12I are at 36-38, 76, 88-92, 109-112, 119-123, 140, and 150 ft bls; the principal water-bearing fractures are at 109-112 and 119-123 ft bls. Well 05MW12I was screened later from 103.5 to 113.5 ft btoc to monitor the principle water-bearing fracture at 109-112 ft bls.

The borehole geophysical logs indicate upward and downward vertical gradients are present in the Stockton Formation at well 05MW12I. The vertical gradient is downward above 112 ft bls and upward below 112 ft bls.

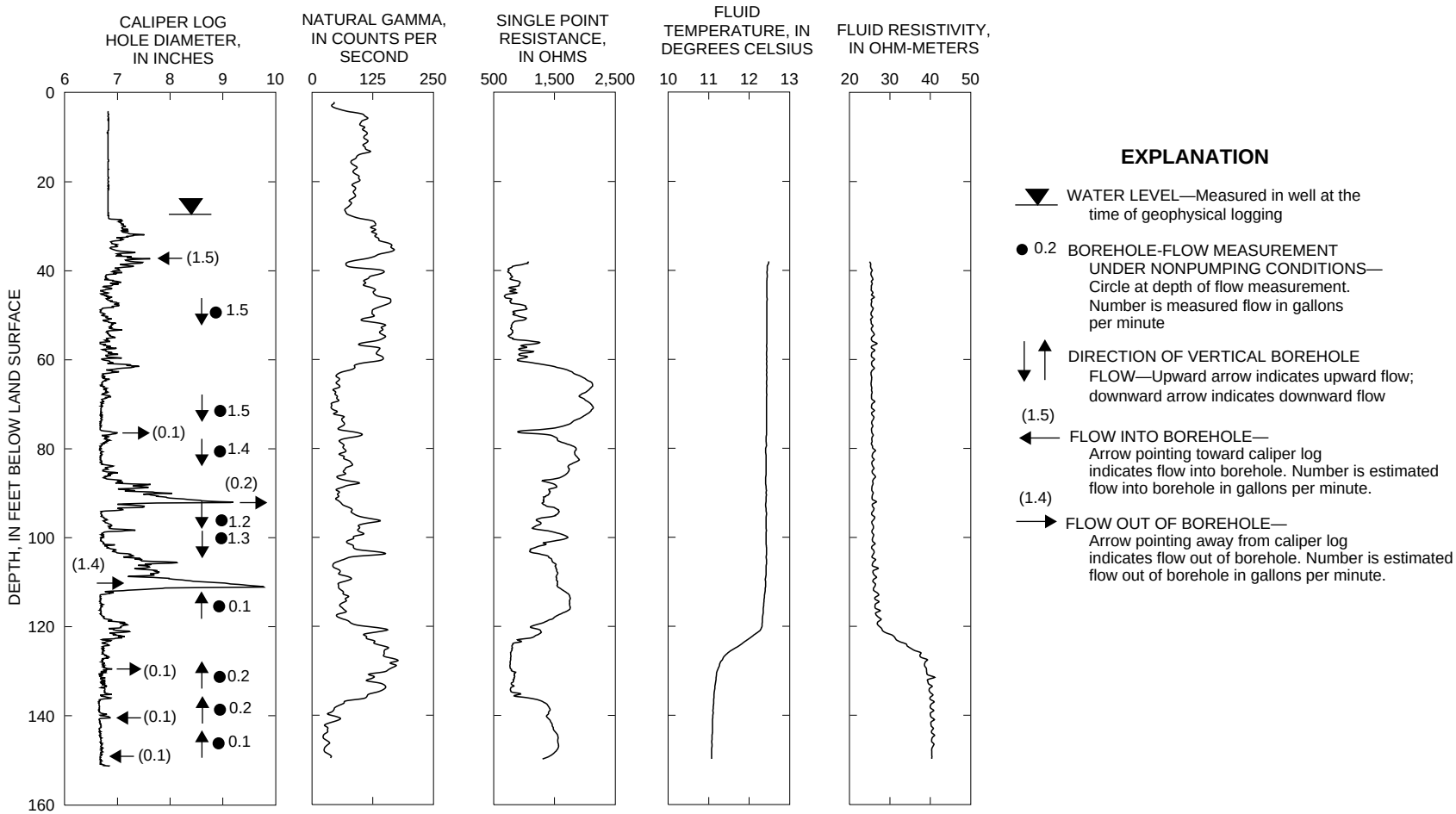


Figure 7. Borehole geophysical logs for well 05MW012I (MG-1759), Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

Table 4. *Heatpulse-flowmeter measurements made in well 05MW12I (MG-1759), Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania*

Depth (feet below land surface)	Flow (gallons per minute)	Flow direction
49	1.5	Down
72	1.5	Down
81	1.4	Down
96	1.2	Down
100	1.3	Down
116	.1	Up
132	.2	Up
138	.2	Up
146	.1	Up

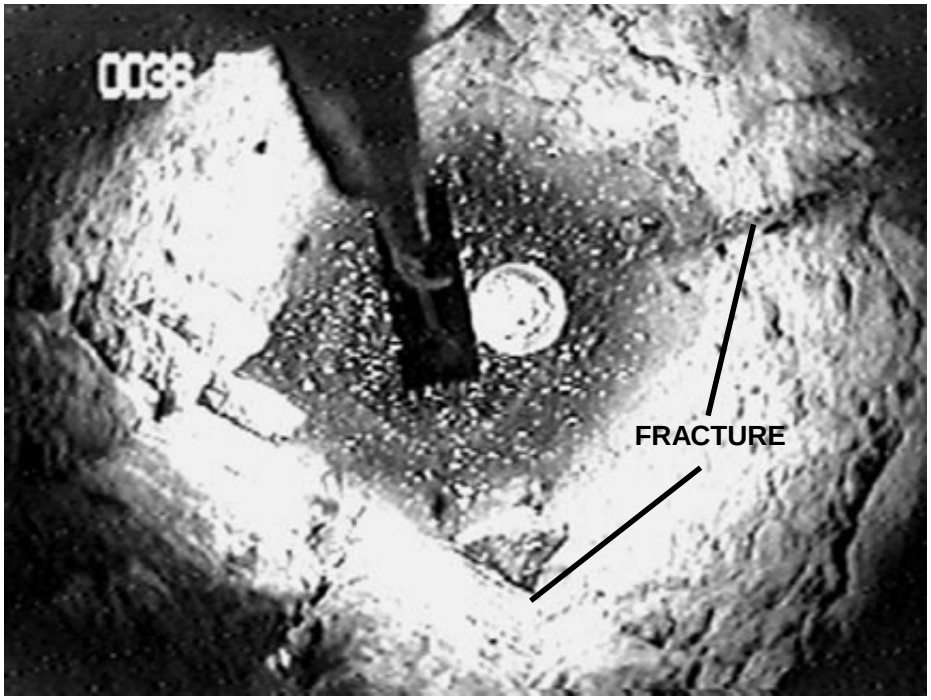


Figure 8. Image from borehole television survey showing vertical fracture at 36 feet below land surface in well 05MW12I (MG-1759), Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

ANALYSIS OF VOLATILE ORGANIC COMPOUNDS IN THE AQUIFER MATRIX

Ground water flows in fractures in the unweathered part of the Stockton Formation. If a chemical contaminant is released into the subsurface, water flowing in fractures may contain dissolved constituents from the release. A chemical concentration gradient is established between the water flowing in the fracture and immobile pore water in the aquifer matrix, causing a transfer of the contaminants from the fracture into the aquifer matrix by molecular diffusion (Parker and others, 1994; Parker and Sterling, 1999). To determine the extent of this transfer at Site 5, a rock core was obtained and sampled for VOC's.

On September 8, 2000, a driller contracted by the U.S. Navy drilled a core (MG-1760) at Site 5 between wells 05MW01S and 05MW01I. This is the area where analyses of soil and ground water showed the highest concentration of VOC's (Brown and Root Environmental, Inc., 1998, p. 7-9). The soil (weathered) zone extended from land surface to 23.5 ft bls. A 17-ft long core was recovered from 23.5 to 40.5 ft bls (fig. 9). Three water-bearing fractures in the core were identified by iron and manganese oxide staining on the fracture faces. One fracture was in mudstone at 30.8 ft bls, one fracture was at the contact between mudstone and weathered coarse-grained sandstone at 35.6 ft bls, and one fracture was in unweathered coarse-grained sandstone at 35.9 ft bls (fig. 10).

Three samples were obtained from each water-bearing fracture (fig. 10)—at the fracture face, 2 cm below the fracture, and 4 cm below the fracture. The rock was crushed, and approximately 5 grams of sample was placed into a 40-milliliter septum bottle with 1 gram of sodium bisulfate as a preservative. This procedure was done as quickly as possible to minimize volatilization. The bottle was sealed, weighed, packed in ice, and shipped to the USGS laboratory in Denver, Colo., for analysis. All samples were analyzed within 14 days of sample collection. Laboratory results are given in table 5.

All 15 compounds listed in table 5 were detected. However, concentrations of 1,2-dichloroethane; trans-1,2-dichloroethene; ethyl benzene; meta-, ortho-, and para-xylene; methylene chloride; and 1,1,2-trichloroethane were less than 1 µg/kg when detected. Concentrations of benzene (from 0.39 to 3.3 µg/kg), 1,1-dichloroethene (1,1-DCE) (from 0.15 to 13 µg/kg), 1,1,1-trichloroethane (TCA) (from 0.17 to 22 µg/kg), and trichloroethylene (TCE) (from 0.092 to 9.6 µg/kg) were

Table 5. *Analytical results for volatile organic compounds in samples from rock core MG-1760, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania*

[All concentrations are given in micrograms per kilogram; cm, centimeter; <, less than; E, estimated concentration]

Compound name	Mudstone			Weathered sandstone			Unweathered sandstone		
	Fracture face	2 cm below fracture	4 cm below fracture	Fracture face	2 cm below fracture	4 cm below fracture	Fracture face	2 cm below fracture	4 cm below fracture
Benzene	1.5	0.43	0.39	1.5	0.93	0.80	0.65	2.4	3.3
1,1-Dichloroethane	8.2	1.7	1.0	.64	.92	.63	.60	.56	<.07
1,2-Dichloroethane	.26	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
1,1-Dichloroethene	13	3.0	2.4	.91	1.4	1.2	1.0	1.0	.15 E
cis-1,2-dichloroethene	3.0	.64	.50	.087 E	.12 E	.10 E	.095 E	.10 E	<.1
trans-1,2-dichloroethene	.069 E	<.053	<.053	<.053	<.053	<.053	<.053	<.053	<.053
Ethyl benzene	<.08	<.08	<.08	<.08	<.08	<.08	<.08	<.08	.090 E
meta- and para-Xylene	<.15	<.15	<.15	<.15	<.15	<.15	<.15	<.15	.10 E
Methylene chloride	.48	<.2	<.2	<.2	<.2	.084 E	<.2	<.2	<.2
ortho-Xylene	<.08	<.08	<.08	.19 E	<.08	<.08	<.08	.38	.74
Tetrachloroethene	1.6	.59	2.2	<.07	.092 E	<.07	<.07	<.07	<.07
1,1,1-Trichloroethane	22	4.9	4.7	1.2	1.8	1.3	1.2	1.2	.17 E
1,1,2-Trichloroethane	.65	.15 E	.13 E	<.07	<.07	<.07	<.07	<.07	<.07
Trichloroethene	9.6	2.4	5.7	.45	.77	.57	.55	.56	.092 E
Toluene	<.33	<.4	.50 E	14	4.4	5.9	3.0	32	86 E

MUDSTONE

SECTION OF CORE (MUDSTONE) SAMPLED FOR VOLATILE ORGANIC COMPOUNDS

SECTION OF CORE (WEATHERED SANDSTONE) SAMPLED FOR VOLATILE ORGANIC COMPOUNDS

WEATHERED SANDSTONE

UNWEATHERED SANDSTONE

SECTION OF CORE (UNWEATHERED SANDSTONE) SAMPLED FOR VOLATILE ORGANIC COMPOUNDS

Figure 9. Photographs of sections from rock core MG-1760, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

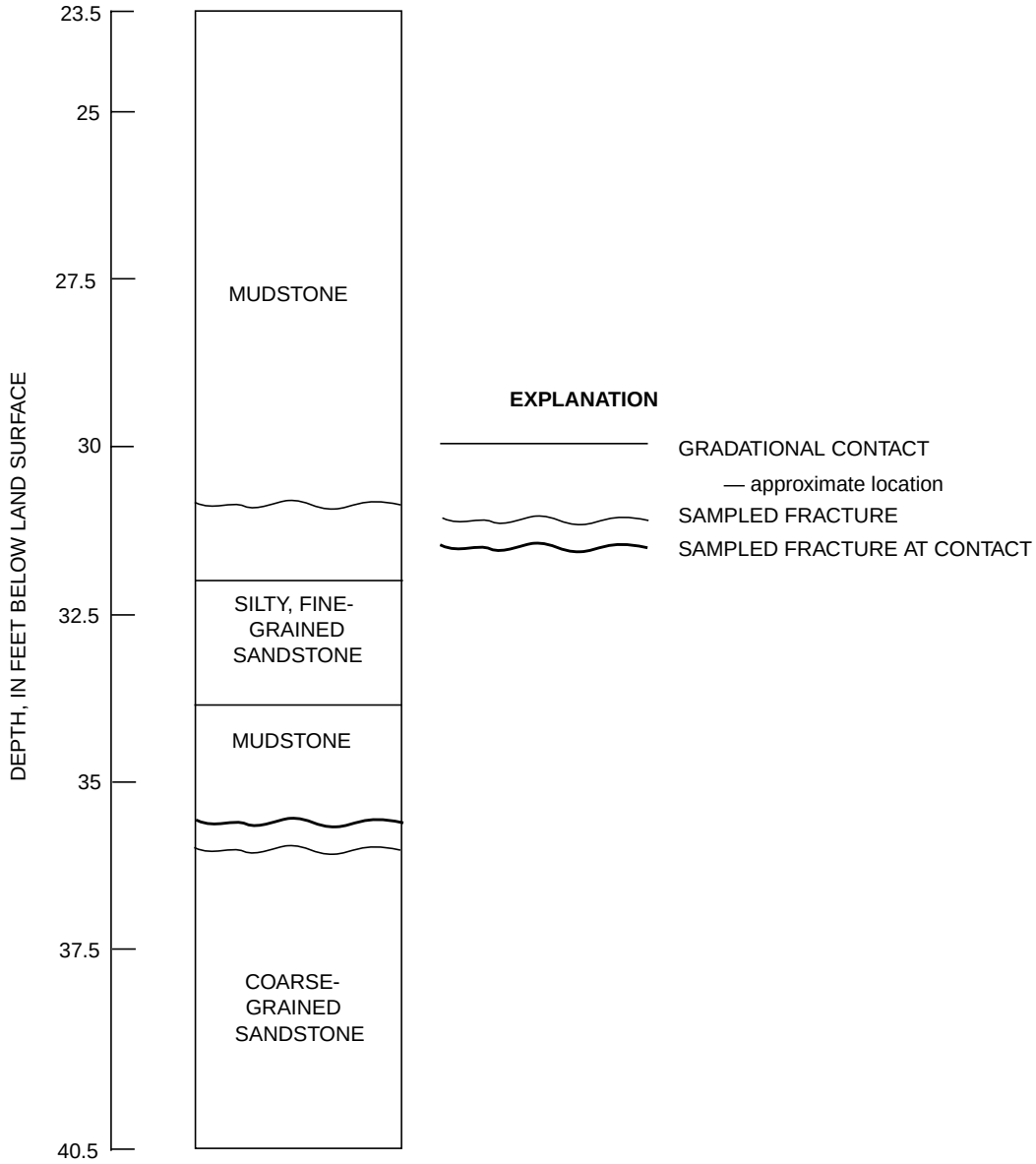


Figure 10. Geologic log of rock core MG-1760 and depths of sampled fractures, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

detected in all samples. The highest concentrations detected were for toluene, which was detected at a concentration of 32 and 86 µg/kg in the samples from unweathered sandstone at 2 and 4 cm below the fracture, respectively.

Concentrations of VOC's generally decreased with distance below the fracture in the mudstone samples. Concentrations of benzene and toluene increased with distance below the fractures in the unweathered sandstone samples. No pattern was evident in the weathered sandstone samples. Concentrations of 1,1-DCE, TCA, and TCE were higher in the mudstone samples than in the samples from the other rocks. Concentrations of toluene were higher in unweathered sandstone than in the other rocks. The distribution pattern may be related to the release history, which is unknown.

The volume of each compound per cubic foot of aquifer material (mudstone, weathered sandstone, and unweathered sandstone) can be determined by the following method. A representative section of the core was obtained with a diamond saw so that the top and bottom were parallel and were perpendicular to the sides. The diameter and length of each core section were measured, and the volume was calculated. Each core section was weighed, and its density was calculated (table 6). The mass of each compound per cubic foot of aquifer material can be calculated by multiplying the concentration in table 5 by the density in table 6 and then by the weight per volume of the compound to obtain the volume. For example, to determine the volume of TCE in 1 ft^3 of mudstone, the geometric mean concentration in mudstone (5.1 µg/kg) is multiplied by the density of mudstone (75 kg/ft^3) to obtain the mass of TCE, which is 382.5 µg. TCE weighs 1.46 kilograms per liter; therefore, 1 ft^3 of mudstone containing a mass of 382.5 µg of TCE contains $3.0X10^{-7}$ liters of TCE. The VOC concentration in the aquifer material is affected by spatial variability in concentration, matrix and fracture porosity, and partitioning between the free and dissolved phases.

The presence of contaminants in the aquifer matrix suggests that the contaminants cannot easily or rapidly be removed by water flowing in fractures. They may be a continuing source of low-level contamination to the ground-water system.

Table 6. *Density of rock types in rock core MG-1760, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania*

Rock type	Density	
	Kilograms per cubic foot	Pounds per cubic foot
Mudstone	75.0	165.3
Weathered sandstone	58.2	128.3
Unweathered sandstone	70.2	154.6

EFFECT OF PUMPING HORSHAM WATER AND SEWER AUTHORITY SUPPLY WELL 26 ON WATER LEVELS

The HWSA operates a public supply well (HWSA-26) 0.2 mi southwest of the base boundary (fig. 2). Well HWSA-26 is 400 ft deep and capable of producing 500 gal/min (Gilbert/Commonwealth, Inc., 1978). The well penetrates water-bearing zones at 160, 260, and below 260 ft bls, which is in the part of the Stockton Formation that is confined to semiconfined (Sloto and others, 1996). Well HWSA-26 pumps approximately 220,000 gal/d of water. The effect of pumping this well on groundwater levels on the base was unknown. To determine the effect of pumping well HWSA-26 on water levels, a hydraulic test was conducted.

Well HWSA-26 was shut down for 6 days to allow water levels to recover and then restarted. The well was removed from service at noon on January 25, 2000, and returned to service at 9 a.m. on January 31, 2000. Water levels in the vicinity of well HWSA-26 were measured for 1 week before the test, during the test, and for 1 week after the test. Water levels were measured by TetraTech NUS, Inc., in 10 wells using transducers and dataloggers and in 9 wells 3 times per day using electric water-level-measurement tapes. Water levels were measured by the USGS using transducers and dataloggers in well HWSA-26 after the pump was turned off and in well MG-1739, an operating domestic well near well HWSA-26. The transducer could not be placed lower than 51 ft btoc in well HWSA-26; therefore, no data could be collected until the water level rose to 51 ft btoc.

Wells measured during the test and the observed changes in water level during the shutdown period are listed in table 7. The only well that showed an unambiguous response to the shutdown of well HWSA-26 was well 02MW01I (fig. 11). Well 02MW01I is approximately 1,350 ft directly along strike from well HWSA-26. In the Stockton Formation, the effects of pumping a deep well are much more pronounced in the direction of strike than in the direction of dip (Sloto and others, 1996).

Four wells, 02MW01S, 02MW03I, 02MW04I, and 05MW11I, showed a rise in water level after well HWSA-26 was shut down. A comparison of climatic data (National Oceanic and Atmospheric Administration, 2000a; 2000b) with the hydrographs from these wells shows the rise in water level was most likely caused by recharge from snowmelt during a rise in temperature (fig. 12). Hydrographs from these wells and all the other wells, except well 02MW01I, showed no recovery in response to the shutdown of well HWSA-26 (figs. 13-17).

The hydrograph of well 05MW11I (fig. 12), however, does show a response to the pumping of well HWSA-26 and another well. While well HWSA-26 was pumping, the hydrograph of well 05MW11I shows two cycles of pumping and recovery each day, one ending around midnight and one ending around noon. While well HWSA-26 was not pumping, the hydrograph of well 05MW11I shows one cycle of pumping and recovery each day ending around midnight. It appears the pumping of well HWSA-26 contributes to both cycles of drawdown and recovery. Drawdown in well 05MW11I caused by the pumping of both wells ranged from 0.05 to 0.15 ft between January 18 and February 9. The recovery of well 05MW11I in response to the shutdown of well HWSA-26 is masked by recharge from snowmelt but probably does not exceed about 0.2 ft on the basis of fluctuations in the water level of well 05MW11I while well HWSA-26 is pumping. Well 05MW11I is in the well cluster nearest to the base boundary and is the well at Site 5 nearest to well HWSA-26. If extraction wells for remediation are drilled in this vicinity near the base boundary, off-base pumping possibly may cause some interference with the extraction wells.

Table 7. *Change in water level in wells measured January 25-31, 2000, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania*

[Data for Willow Grove monitor wells were provided by TetraTech NUS, Inc.; >, greater than; HWSA, Horsham Township Water and Sewer Authority; —, no data]

Site well-identification number	U.S. Geological Survey well-identification number	Frequency of measurement	Change in water level January 25-31, 2000 (feet)	Remarks
HWSA-26	MG-962	continuous	> 17.22	Pumped well
—	MG-1739	continuous	-.30	No effect
02MW01S	MG-1850	continuous	.60	Recharge from snowmelt
02MW01I	MG-1598	continuous	17.47	Affected by well HWSA-26
02MW04S	MG-1593	continuous	-.30	No effect
02MW04I	MG-1594	continuous	.38	Recharge from snowmelt
05MW01I	MG-1590	continuous	-.28	No effect
05MW03S	MG-1866	continuous	-.56	No effect
05MW03I	MG-1589	continuous	-.34	No effect
05MW06I	MG-1870	continuous	-.25	No effect
05MW011S	MG-1634	continuous	-.18	No effect
05MW11I	MG-1635	continuous	.60	Recharge from snowmelt and affected by well HWSA-26[1]
02MW03SI	MG-1852	3 times daily	-.10	No effect
02MW03I	MG-1628	3 times daily	.32	Recharge from snowmelt
03MW06S	MG-1596	3 times daily	-.36	No effect
03MW06SI	MG-1877	3 times daily	-.44	No effect
03MW06I	MG-1597	3 times daily	-.37	No effect
05MW01S	MG-1599	3 times daily	-.35	No effect
05MW01SI	MG-1864	3 times daily	-.30	No effect
05MW06S	MG-1869	3 times daily	-.65	No effect
05MW11SI	MG-1876	3 times daily	-.19	No effect

[1] Recovery in response to shutdown of well HWSA-26 is masked by recharge from snowmelt but probably is less than about 0.2 ft.

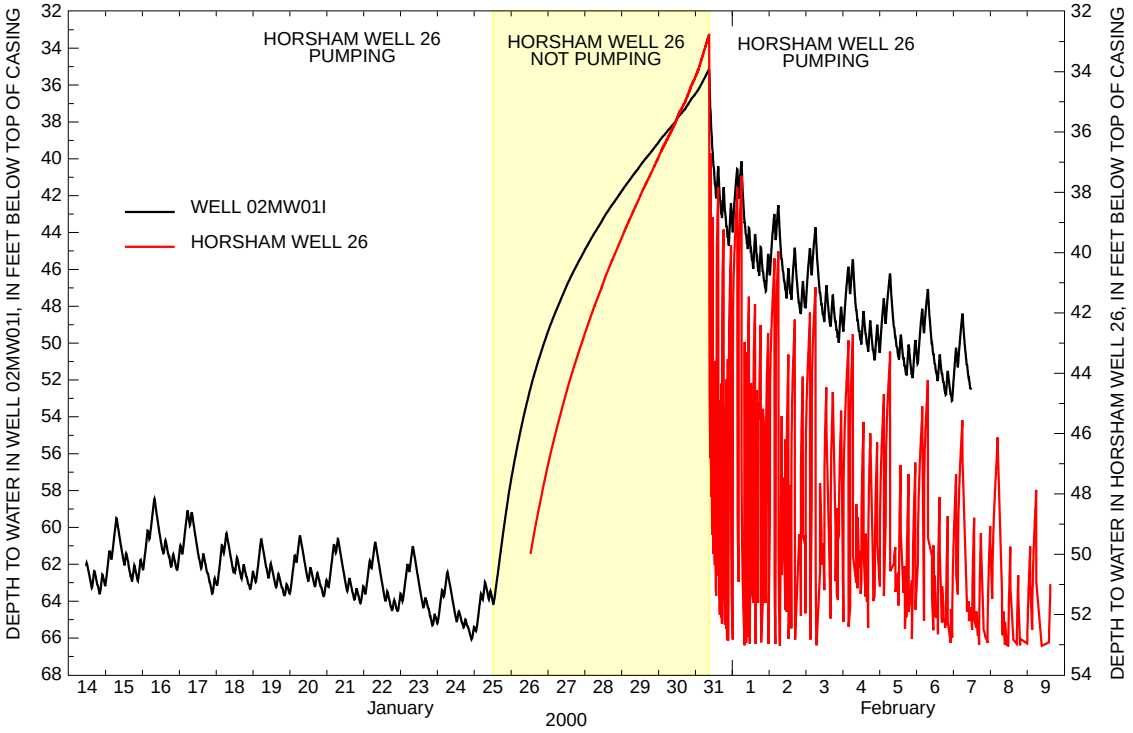


Figure 11. Hydrographs from Horsham Water and Sewer Authority well 26 and well 02MW01I, January 14 to February 9, 2000, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

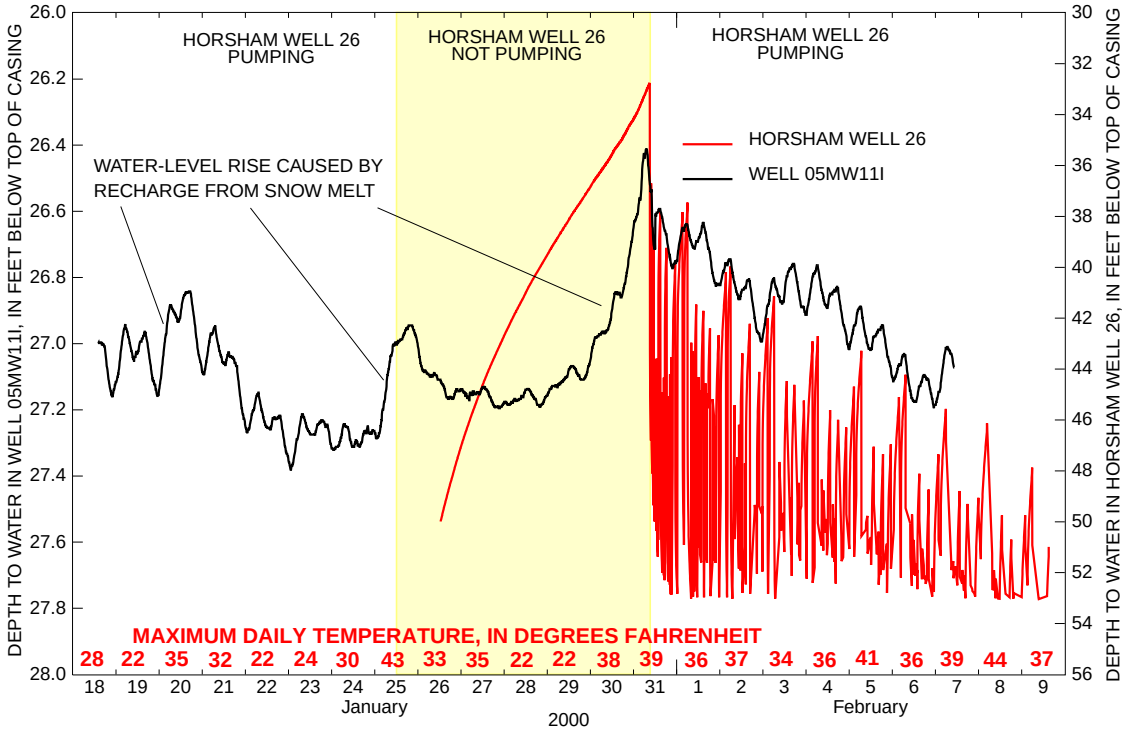


Figure 12. Hydrographs from Horsham Water and Sewer Authority well 26 and well 05MW11I, January 18 to February 9, 2000, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

[Temperature data from the National Oceanic and Atmospheric Administration station at Neshaminy Falls, Pennsylvania.]

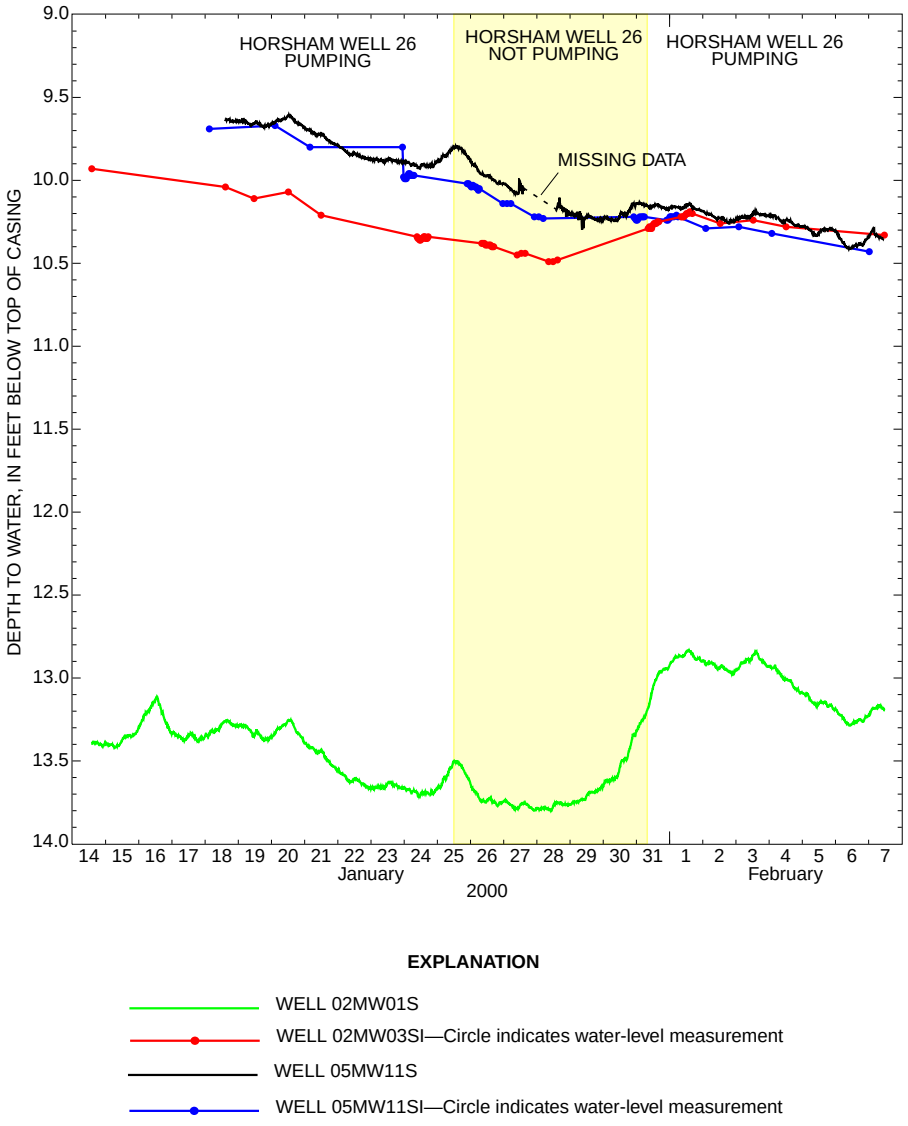


Figure 13. Hydrographs from wells 02MW01S, 02MW03SI, 05MW11S, and 05MW11SI, January 14 to February 7, 2000, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

[Water-level data were provided by TetraTech NUS, Inc.]

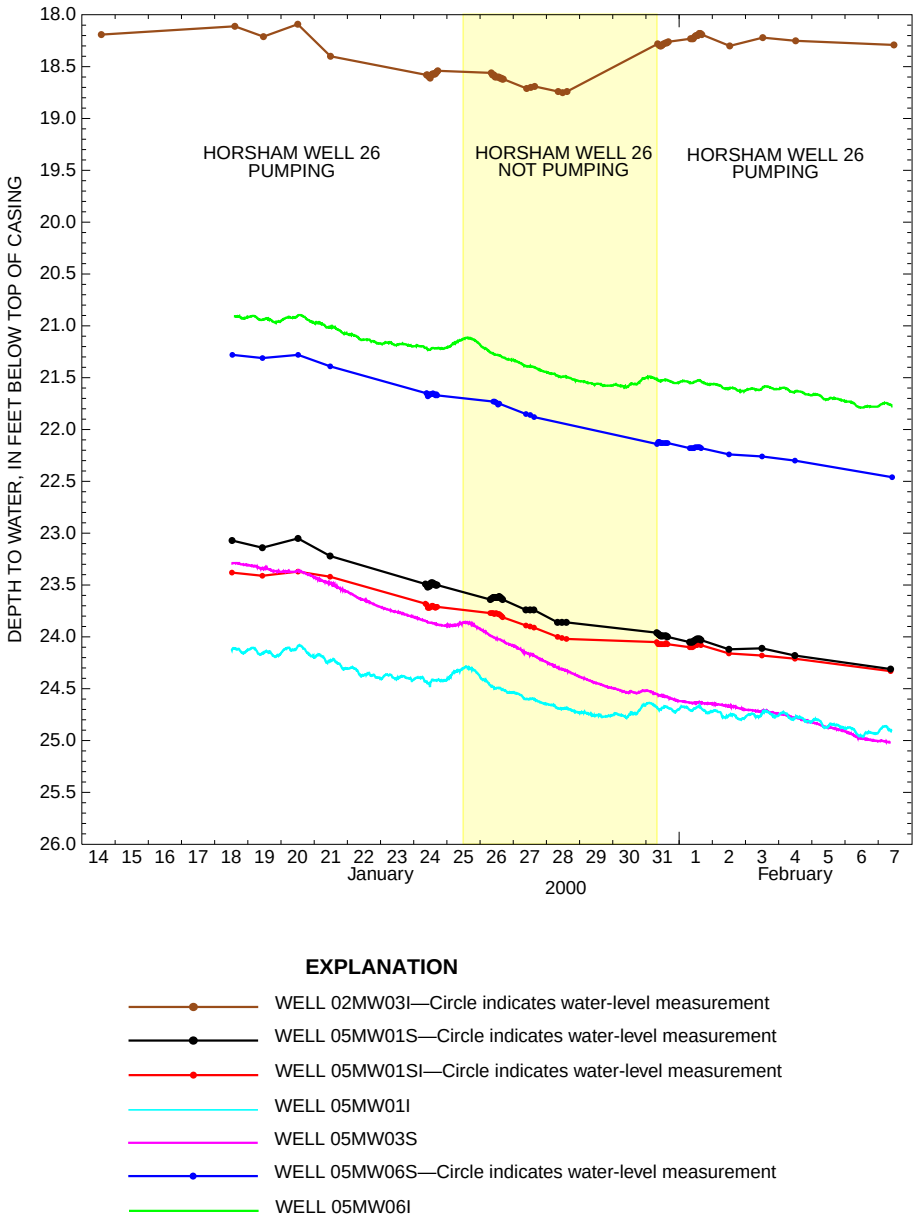


Figure 14. Hydrographs from wells 02MW03I, 05MW01S, 05MW01SI, 05MW01I, 05MW03S, 05MW06S, and 05MW06I, January 14 to February 7, 2000, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

[Water-level data were provided by TetraTech NUS, Inc.]

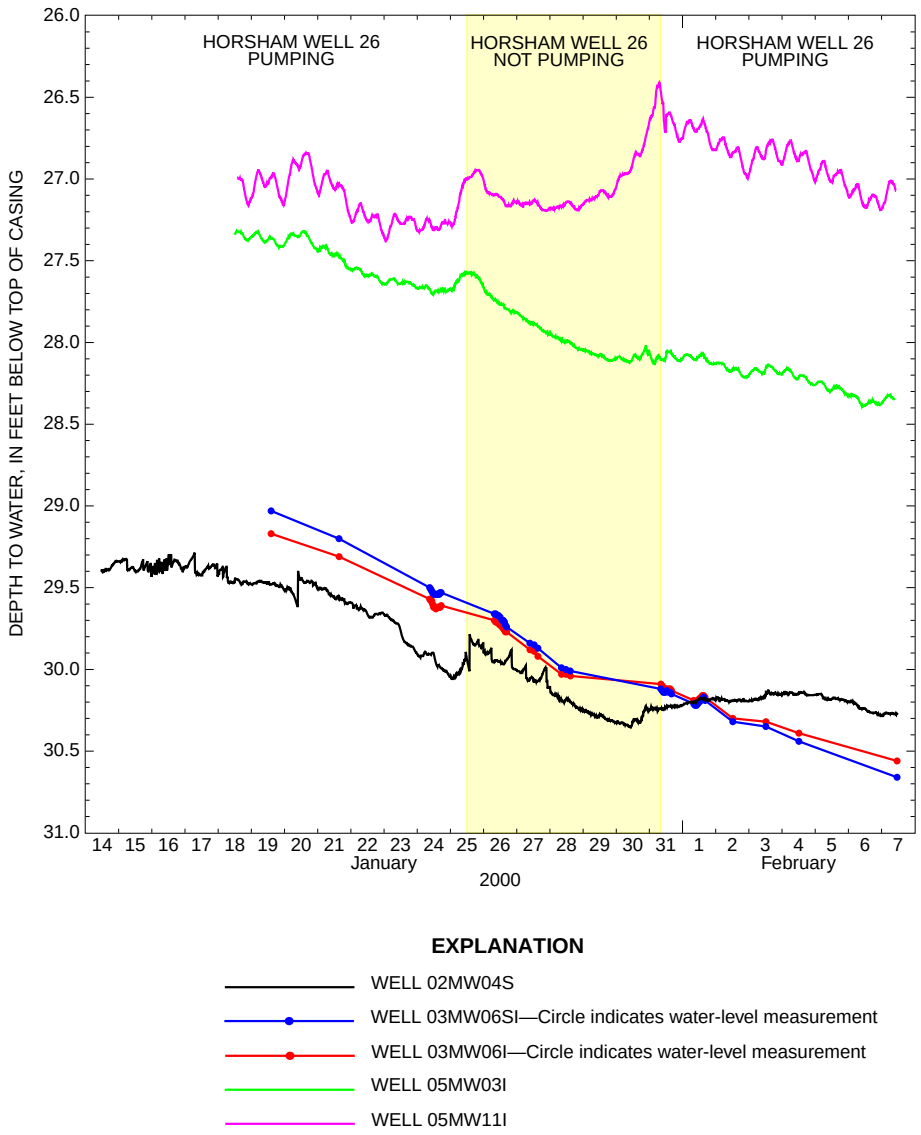


Figure 15. Hydrographs from wells 02MW04S, 03MW06SI, 03MW06I, 05MW03I, and 05MW11I, January 14 to February 7, 2000, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

[Water-level data provided were by TetraTech NUS, Inc.]

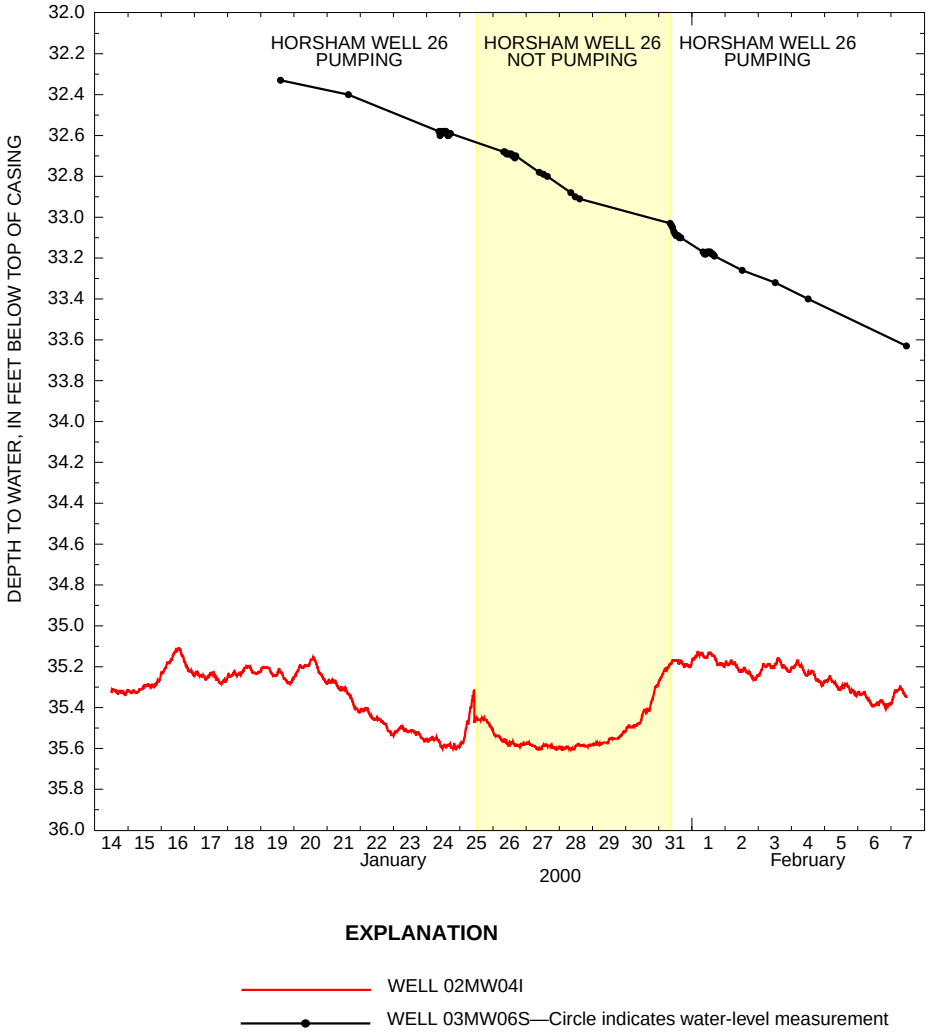


Figure 16. Hydrographs from wells 02MW04I and 03MW06S, January 14 to February 7, 2000, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

[Water-level data were provided by TetraTech NUS, Inc.]

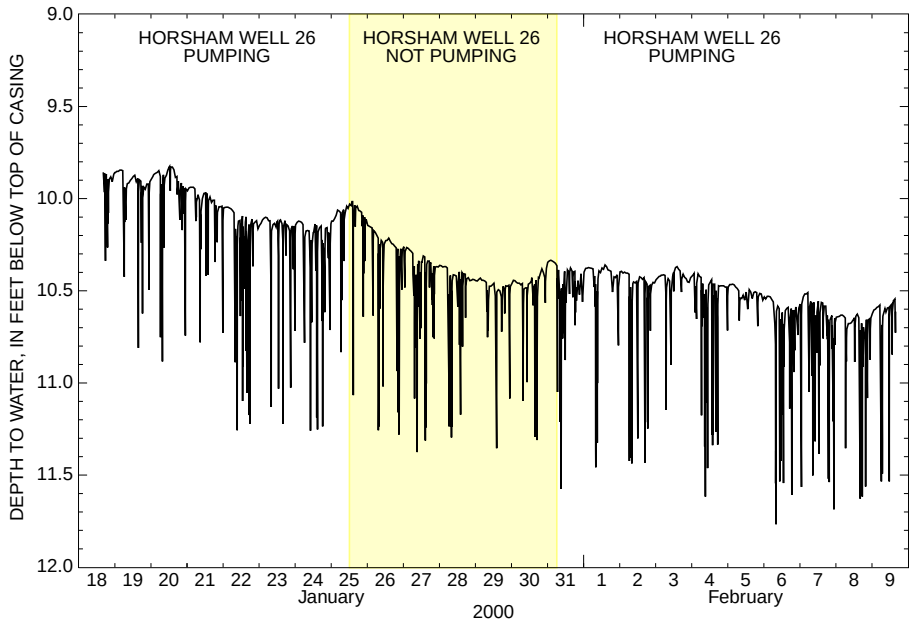


Figure 17. Hydrograph from well MG-1739, January 18 to February 9, 2000, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

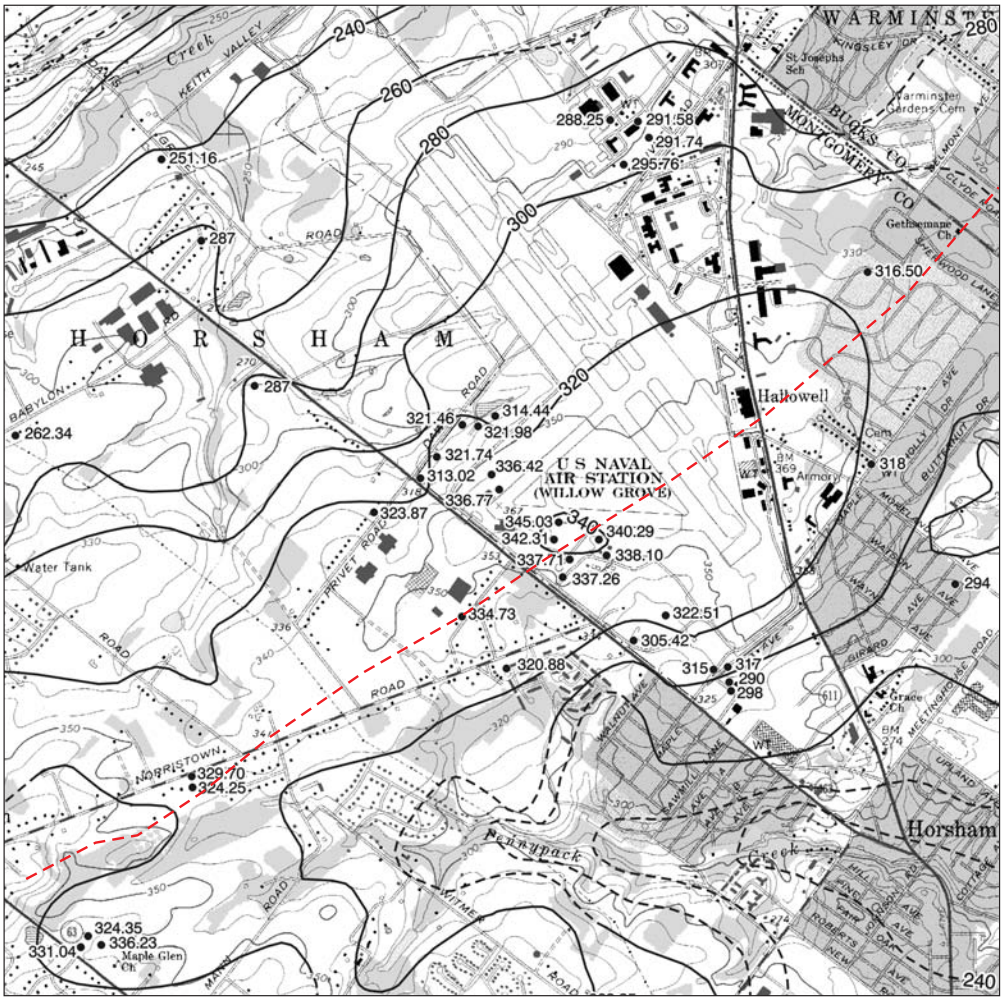
WATER LEVELS

Water-level data provide important information on the horizontal and vertical ground-water-flow directions and gradients. Water-level data from a monitor well cluster (wells drilled in close proximity) screened at different depths provide information on vertical gradients and the direction of vertical flow. Water-level data from monitor wells screened in the same depth interval provide information on horizontal gradients and the direction of horizontal flow.

Regional Potentiometric Surface

To understand how horizontal ground-water flow at Site 5 fits into a regional perspective, it is necessary to utilize water-level data from wells on-base and off-base. A map showing the regional potentiometric surface in the Stockton Formation at and in the vicinity of the Willow Grove NAS/JRB was prepared by Sloto, Goode, and Way (2001). A part of the map, reproduced here as figure 18, shows a regional ground-water divide running northeast-southwest approximately through the center of Site 5. From this divide, ground water flows both northwest toward Park Creek, a tributary to Little Neshaminy Creek, and southeast toward Pennypack Creek. The presence of this ground-water divide helps to explain the contaminant distribution patterns observed at Site 5; ground water flows northwest and southeast from Site 5. The location of this divide may shift to the northwest or the southeast because of variations in aquifer recharge and discharge. A shift in the divide to the northwest would cause more ground water at Site 5 to flow southeast. Likewise, a shift in the divide to the southeast would cause more ground water at Site 5 to flow northwest.

The high point on the divide (water-level elevations greater than 340 ft above sea level) was centered around wells 05MW02S, 05MW03S, and 05MW04S (fig. 18) during the time of water-level measurements on October 7, 1999 (table 8). From this high point, which appears as a ground-water mound, ground-water flow follows a radial pattern; the steepest gradients, however, are to the northwest and southeast.



Base from U.S. Geological Survey
Ambler 1:24,000, 1983
Hatboro 1:24,000, 1983

EXPLANATION

320 – – – POTENTIOMETRIC CONTOUR -- Shows elevation of the potentiometric surface as defined by measured water levels, elevations of streams, and topography. Dashed where approximately located. Contour interval is 20 feet. Altitude in feet above sea level.

– – – – – – – GROUND WATER DIVIDE

352.02 WATER-LEVEL MEASUREMENT SITE -- Symbol gives location of site. Number is elevation of water level measured in a drilled well in feet above sea level.

0 1/2 1 MILE

0 1/2 1 KILOMETER

Figure 18. Potentiometric surface and regional ground-water divide, October 7-8, 1999, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania. (Modified from Sloto, Goode, and Way (2001).)

Table 8. *Water levels measured October 7, 1999, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania*

Site identification number	U.S. Geological Survey well-identification number	Depth of well screen (feet below land surface)	Elevation of top of casing (feet above sea level)	Depth to water (feet below top of casing)	Elevation of water level (feet above sea level)
02MW01S	MG-1850	5-20	323.76	18.34	305.42
02MW01I	MG-1598	70-80	325.28	82.27	243.01
02MW02S	MG-1851	5-25	349.37	13.15	336.22
02MW03SI	MG-1852	40-55	333.66	11.15	322.51
02MW03I	MG-1628	140-150	333.55	19.37	314.18
02MW04S	MG-1593	34-44	349.96	34.14	315.82
02MW04I	MG-1594	105-115	349.54	40.45	309.09
03MW01S	MG-1853	12-32	347.49	22.64	324.85
03MW01SI	MG-1854	60-80	346.98	23.81	323.17
03MW01I	MG-1855	159-179	346.57	10.15	336.42
03MW02S	MG-1856	4.5-22.5	326.15	11.01	315.14
03MW02SI	MG-1857	55-65	326.33	11.89	314.44
03MW02I	MG-1629	134-144	326.38	4.40	321.98
03MW03S	MG-1858	5-20	312.96	4.82	308.14
03MW03I	MG-1859	148.5-168.5	314.08	-7.38	321.46
03MW04S	MG-1860	5-35	324.49	2.75	321.74
03MW04SI	MG-1861	60-80	323.87	12.72	311.15
03MW04I	MG-1862	148-168	323.93	-8.00	331.93
03MW05S	MG-1863	17-37	361.98	25.95	336.03
03MW05I	MG-1595	82-92	360.93	25.34	335.59
03MW06S	MG-1596	26-36	367.00	30.91	336.09
03MW06SI	MG-1877	75-85	366.86	29.21	337.65
03MW06I	MG-1597	140-150	366.82	30.05	336.77
03MW07S	MG-1630	34-44	324.90	11.88	313.02
05MW01S	MG-1599	12-32	364.11	24.87	339.24
05MW01SI	MG-1694	74.5-84.5	363.99	25.33	338.66
05MW01I	MG-1590	125-135	363.99	26.28	337.71
05MW02S	MG-1865	10-30	365.48	25.19	340.29
05MW03S	MG-1866	11-31	367.18	22.15	345.03
05MW03I	MG-1589	118-128	367.35	29.12	338.23
05MW04S	MG-1867	10-30	365.62	23.31	342.31
05MW05S	MG-1868	20-40	359.92	21.71	338.21
05MW06S	MG-1869	17.5-37.5	362.38	23.15	339.23
05MW06I	MG-1870	74-84	361.08	22.98	338.10
05MW07S	MG-1871	6-26	360.73	22.18	338.55
05MW07I	MG-1872	74-84	360.20	22.94	337.26
05MW08S	MG-1585	26-36	360.88	22.13	338.75
05MW08SI	MG-1873	55-65	360.92	22.92	338.00
05MW08I	MG-1586	89-99	361.02	23.07	337.95
05MW09S	MG-1588	27-32	361.91	22.85	339.06
05MW09SI	MG-1874	59-74	361.74	23.61	338.13
05MW09I	MG-1587	96-106	362.11	24.37	337.74
05MW10S	MG-1591	22-32	362.54	23.70	338.84
05MW10SI	MG-1875	79-94	362.44	24.35	338.09
05MW10I	MG-1592	116-126	362.48	24.84	337.64
05MW11S	MG-1634	20-25	349.50	11.75	337.75
05MW11SI	MG-1876	40-50	349.51	11.79	337.72
05MW11I	MG-1635	139-149	348.96	30.74	318.22

Potentiometric Surface at Site 5

To prepare a map of the potentiometric surface at Site 5, it is necessary to use water-level data from Sites 2, 3, and 5 (fig. 1). Because of vertical head gradients at these sites, water-level data were grouped into three depth ranges for contouring. Hydrographs from wells in the same depth range are similar. For example, hydrographs for wells 05MW08I (screened 89-99 ft bls), 05MW09I (screened 96-106 ft bls), and 05MW12I (screened 103.5-113.5 ft bls) show identical water-level fluctuations (fig. 19). Horizontal gradients differ with depth, and the rate and direction of ground-water flow and contaminant movement is depth dependent.

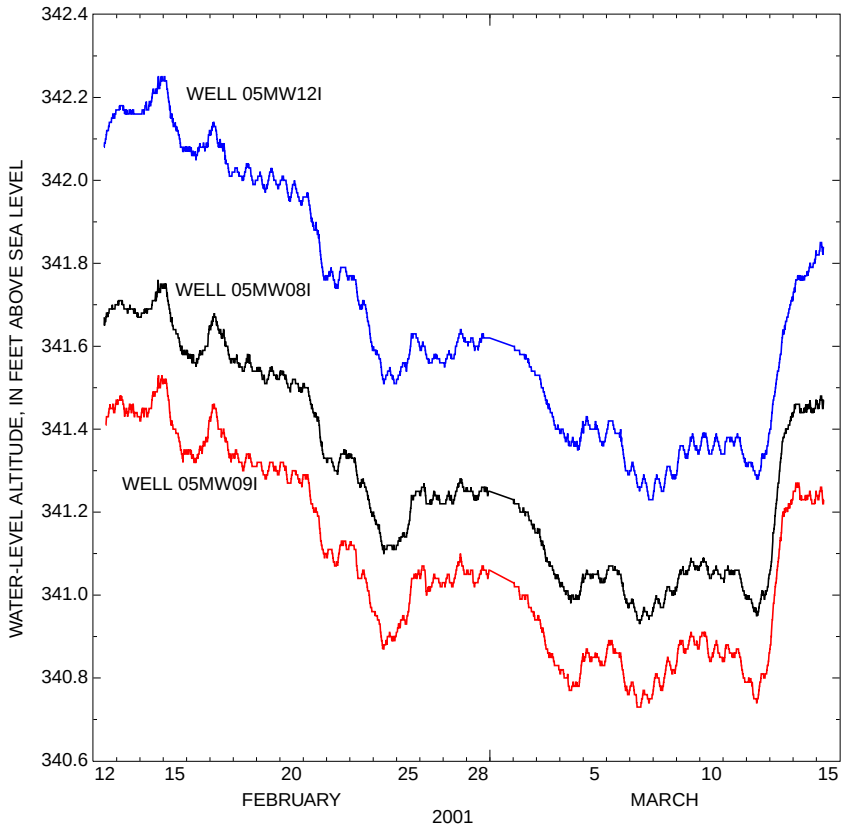


Figure 19. Hydrographs from wells 05MW08I, 05MW09I, and 05MW12I, February 12 to March 15, 2001, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

The potentiometric surface was mapped for each of the three depth ranges of the aquifer. The potentiometric surface as defined by water levels in wells screened between 5 and 44 ft bls is shown on figure 20. This interval is the shallowest of the three intervals, and the potentiometric surface represents the water table. The map shows a ground-water mound around wells 05MW02S, 05MW03S, and 05MW04S. This represents the high point on the regional ground-water divide. From this mound, the ground-water flow is radial. The hydraulic gradient around this mound is relatively flat to the southeast and particularly to the northwest.

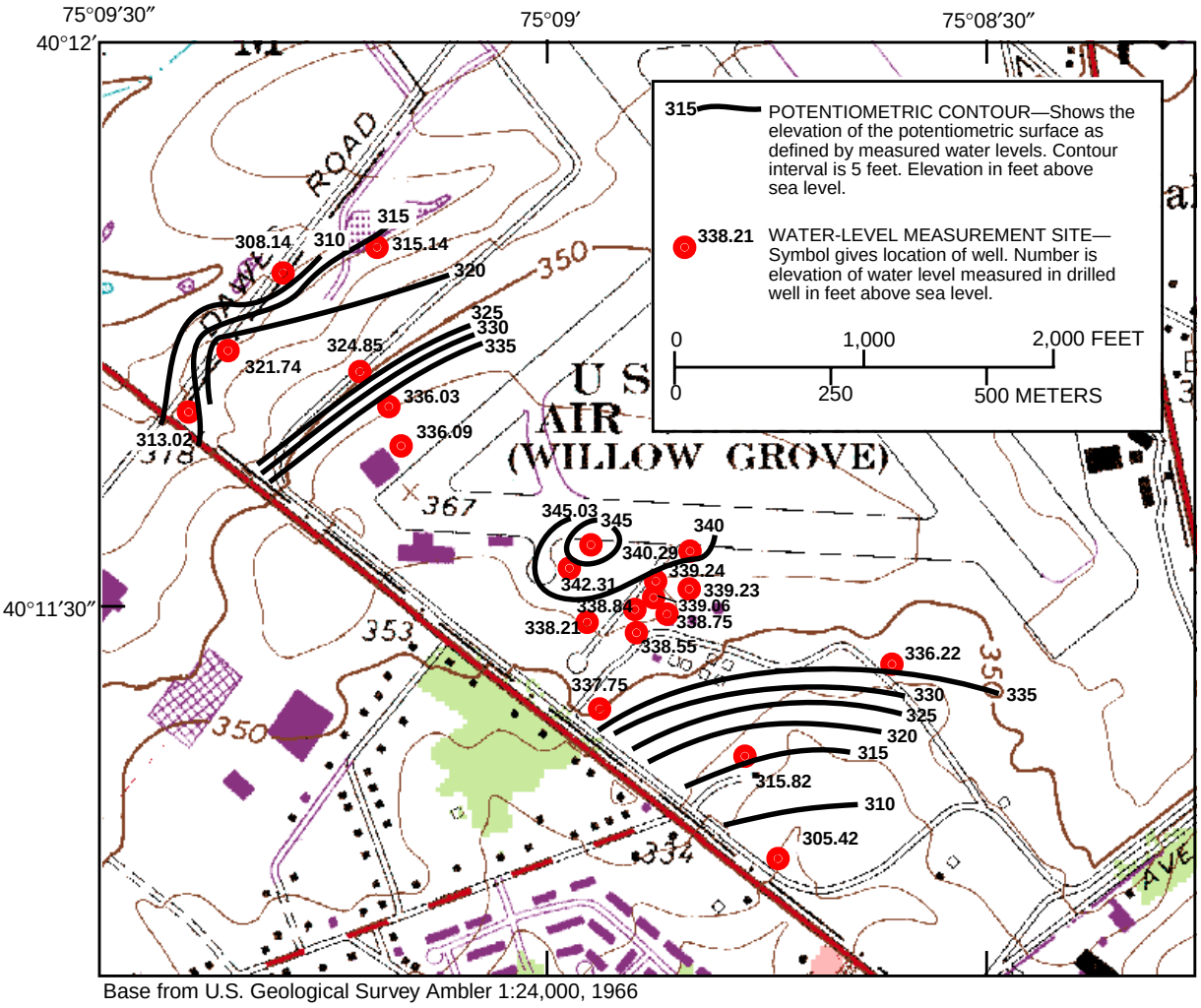
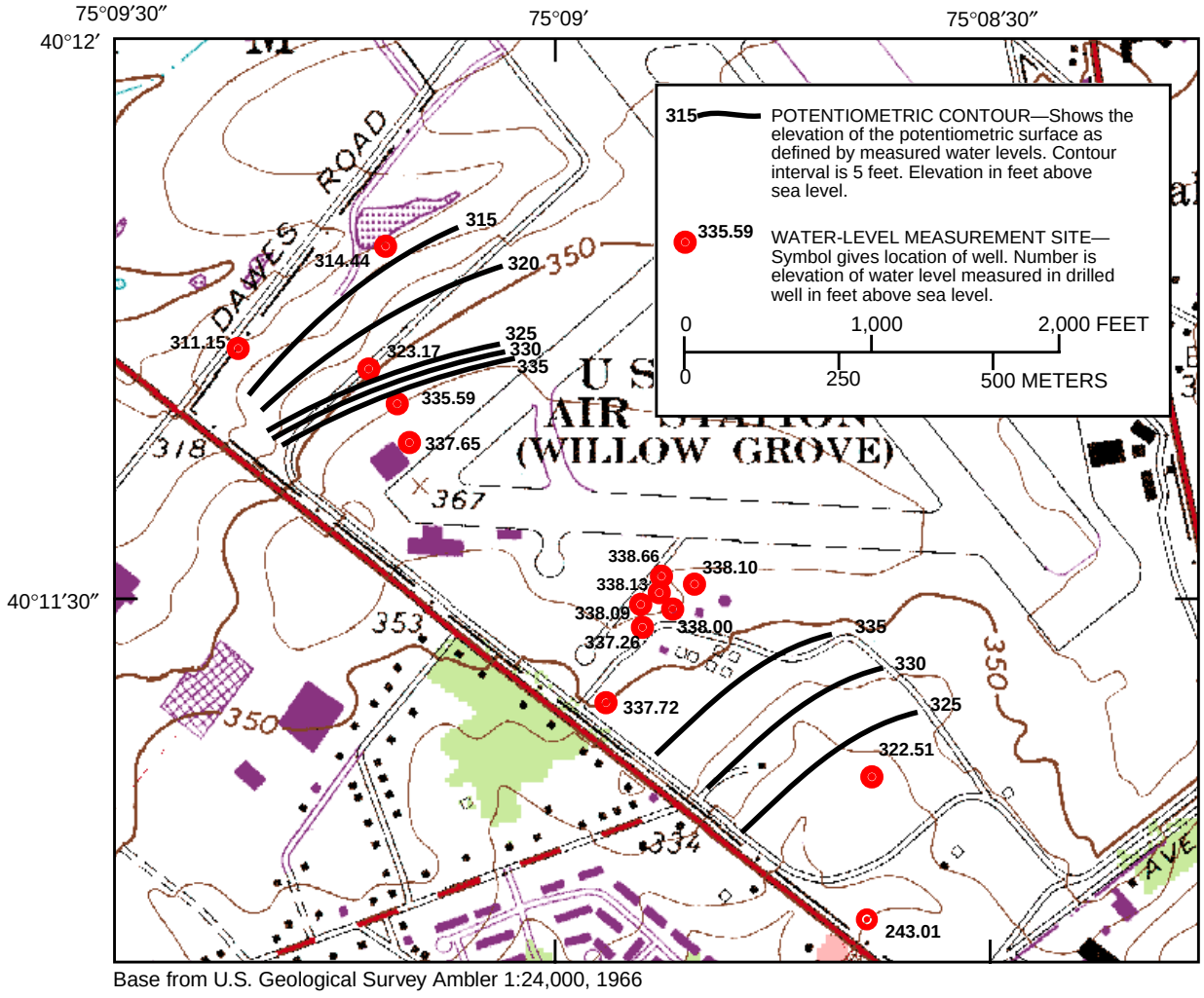


Figure 20. Potentiometric surface defined by water levels in wells screened between 5 and 44 feet below land surface, October 7, 1999, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

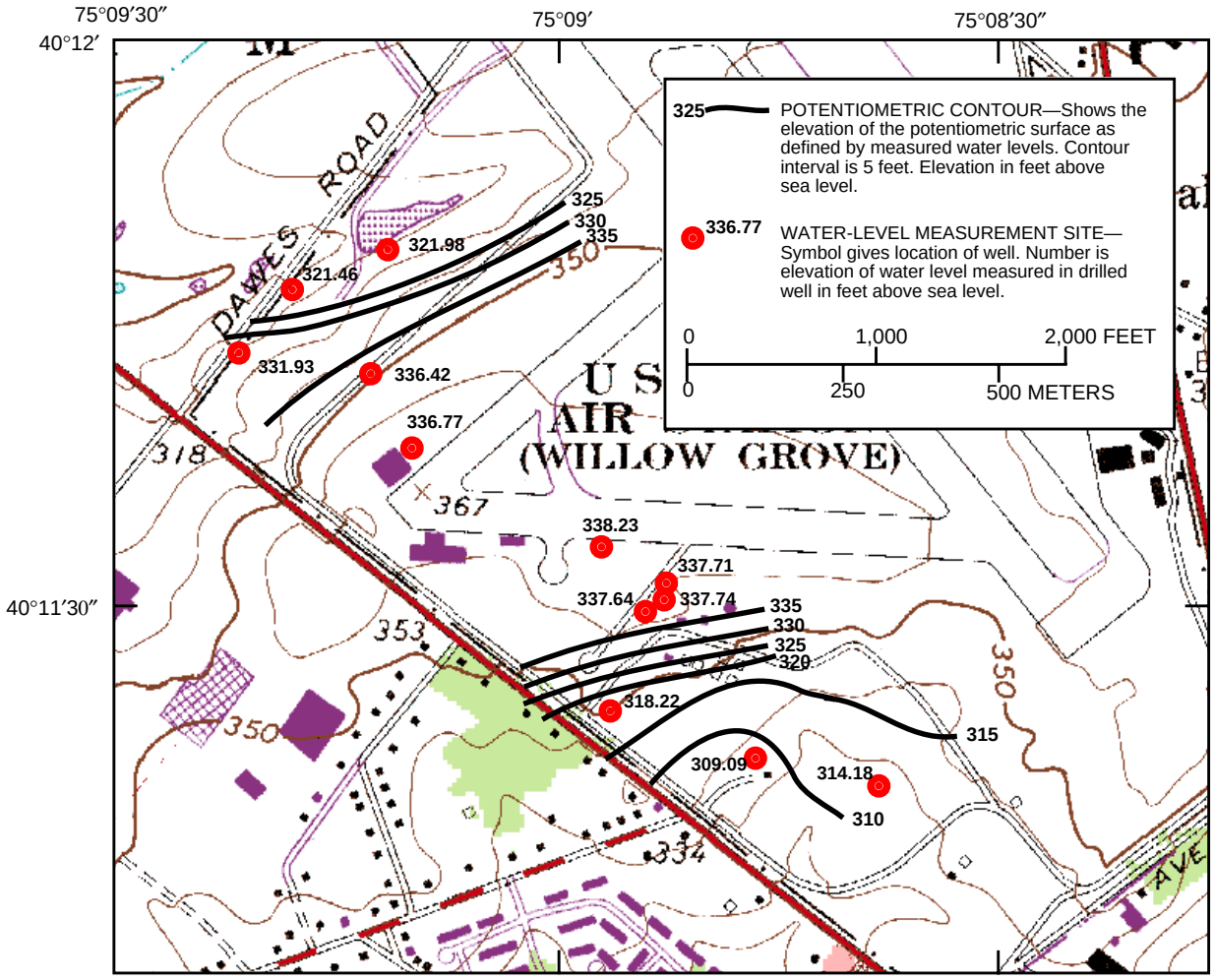
The potentiometric surface as defined by water levels in wells screened between 40 and 100 ft bls is shown on figure 21. The map shows a very flat hydraulic gradient at Site 5. Differences in the elevation of the potentiometric surface are less than 2 ft. The area of flat hydraulic gradient extends northwest to Site 3. The water level in well 02MW01I (elevation of 243.01) in the southeastern part of Site 2 is affected by the pumping of well HWSA-26 and is lower than water levels in other wells at Site 2.



Base from U.S. Geological Survey Ambler 1:24,000, 1966

Figure 21. Potentiometric surface defined by water levels in wells screened between 40 and 100 feet below land surface, October 7, 1999, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

The potentiometric surface defined by water levels in wells screened between 105 and 179 ft bls is shown on figure 22. The map shows a steep hydraulic gradient between Sites 5 and 2 and a relatively flat hydraulic gradient between Sites 5 and 3.



Base from U.S. Geological Survey Ambler 1:24,000 1966

Figure 22. Potentiometric surface defined by water levels in wells screened between 105 and 179 feet below land surface, October 7, 1999, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

Vertical Head Gradients

Water-level hydrographs for well cluster 05MW11 are shown on figure 23. The vertical flow gradient is downward from higher water levels (wells 05MW11S and 05MW11SI) to lower water levels (well 05MW11I). Wells 05MW11S (screened 20-25 ft bls) and 05MW11SI (screened 40-50 ft bls) are screened in the water table, and the water levels measured in these wells nearly are identical.

The vertical head gradient varies with time. The variability in the vertical head gradient is caused by a difference in the magnitude of water-level fluctuations between the shallow wells and the deep well. The difference in water level between August 9, 1999, and January 14, 2000, ranged from a difference of 27.93 ft on August 10, 1999, to a difference of 17.43 ft on January 14, 2000. The difference in the magnitude of water-level fluctuations is because of differences in lithology and aquifer storativity; the storativity at depth is less than the storativity in the shallow zone. The difference in response to recharge from Hurricane Floyd (September 16, 1999) is shown on figure 23. The maximum water-level rise was 7.92 ft in well 05MW11I and only 4.07 and 4.04 ft in wells 05MW11S and 05MW11SI, respectively.

Water levels measured on October 7, 1999 (table 8), showed downward vertical head gradients for all well clusters at Sites 5 and 2. These measurements are consistent with most heatpulse-flowmeter measurements made by Conger (1997), which showed downward flow. The downward vertical gradient at Site 5 is what would be expected in a ground-water divide/recharge area. Gradients ranged from 0.01 at well cluster 05MW10 to 0.2 at cluster 05MW11. Most gradients are between 0.01 and 0.026. The large downward gradient at well cluster 02MW01 at Site 2 (62.41 ft of water-level difference) is attributable to the pumping of well HWSA-26, which lowers the water level in well 02MW01I.

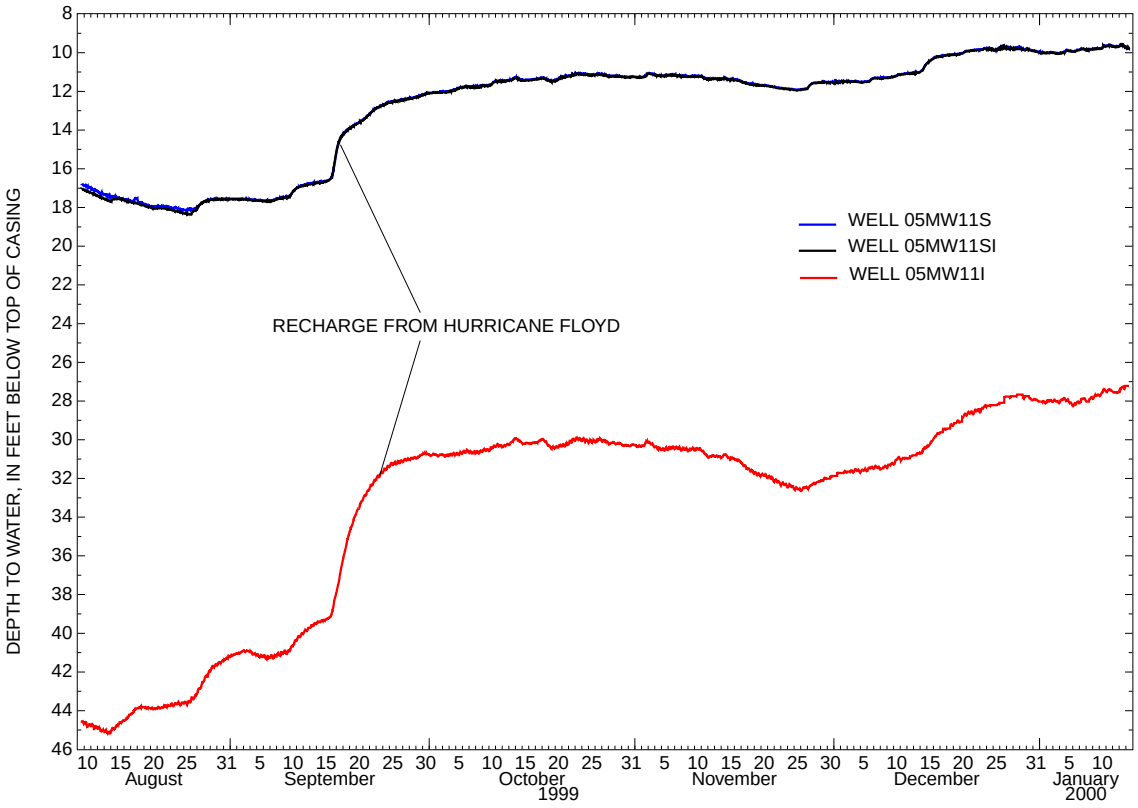


Figure 23. Hydrographs from wells 05MW11S, 05MW11SI, and 05MW11I, August 9, 1999, to January 14, 2000, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania.

The same vertical gradient pattern was observed for all well clusters at Site 3 except for well cluster 03MW06. The vertical head gradient is downward from wells screened at shallow depths (screened 4.5 to 35 ft bls) to wells screened at an intermediate depth (55 to 80 ft bls) and upward from wells with deep screens (134 to 179 ft bls) to the intermediate and shallow screened wells. This pattern was observed for well clusters 03MW01, 03MW02, and 03MW04. At well cluster 03MW05, a downward vertical head gradient was observed from the shallow screened well to the intermediate depth screened well; the well cluster lacks a deep screened well. At well cluster 03MW03, an upward vertical head gradient was observed from the deep screened well to the shallow screened well; the well cluster lacks a well screened at an intermediate depth. The pattern at well cluster 03MW06, which is the well cluster in Site 3 closest to Site 5, is different than the others in Site 3. The vertical head gradient is upward and downward from the intermediate zone, which has a higher head than either the shallow or deep zones.

SUMMARY

A hydrogeological investigation is being conducted as part of the U.S. Navy's Installation Restoration Program to address ground-water contamination at the Willow Grove NAS/JRB in Horsham Township, Montgomery County, Pa. The U.S. Navy requested the USGS provide technical assistance. Specifically, the USGS was asked to conduct borehole geophysical logging, to collect and analyze water-level data, and to sample sections of a rock core to determine the concentration of VOC's in the aquifer matrix. This information is being used to further identify the sources and pathways of contamination and to evaluate management strategies for improving water quality.

The Willow Grove NAS/JRB and surrounding area are underlain by the Stockton Formation, which forms a complex, heterogeneous aquifer with partially connected zones of high permeability. The aquifer is composed of a series of gently dipping lithologic units with different hydraulic properties, and permeability commonly differs from one lithologic unit to another.

Borehole geophysical logs were collected in three monitor wells. Well 05MW04I was logged to a depth of 151 ft. The principal water-bearing fractures are at 40-42 and 70-82 ft bls. The borehole geophysical logs indicate upward and downward vertical gradients are present; the vertical gradient is upward above 42 ft bls, downward between 42 and 82 ft bls, and upward below 82 ft bls. Well 05MW05I was logged to a depth of 250 ft. The water-bearing fractures in well 05WM05I are at 52-58, 72, 114, 142-148, 174, 192, 202-205, and 220-223 ft bls. The borehole geophysical logs indicate a downward vertical gradient is present. Well 05MW12I was logged to a depth of 149 ft. The principal water-bearing fracture is at 109-112 ft bls. The borehole geophysical logs indicate upward and downward vertical gradients are present; the vertical gradient is downward above 112 ft bls and upward below 112 ft bls.

Contaminants in ground water flowing in fractures may move by molecular diffusion into immobile aquifer pore water under a chemical concentration gradient. To determine the extent to which this occurred at Site 5, a 17-ft long rock core from 23.5 to 40.5 ft bls was obtained in the area where analyses of soil and ground water showed the highest concentration of VOC's. Three water-bearing fractures in the core were identified by iron and manganese oxide staining on the fracture faces. One fracture was in mudstone at 30.8 ft bls, one fracture was at the contact between mudstone and weathered coarse-grained sandstone at 35.6 ft bls, and one fracture was in unweathered coarse-grained sandstone at 35.9 ft bls. Three samples were analyzed from each water-bearing fracture—at the fracture face, 2 cm below the fracture, and 4 cm below the fracture. Fifteen VOC's were detected. However, concentrations of 1,2-dichloroethane; trans-1,2-dichloroethene; ethyl benzene; meta-, ortho-, and para-xylene; methylene chloride; and 1,1,2-trichloroethane were less than 1 μg/kg when detected. Concentrations of benzene (from 0.39 to 3.3 μg/kg), 1,1-DCE (from 0.15 to 13 μg/kg), TCA (from 0.17 to 22 μg/kg), and TCE (from 0.092 to 9.6 μg/kg) were detected in all samples. The highest concentrations detected were for toluene, which was detected at a concentration of 32 and 86 μg/kg in the samples from unweathered sandstone at 2 and 4 cm below the fracture, respectively.

Concentrations of VOC's generally decreased with distance below the fracture in the mudstone samples. Concentrations of benzene and toluene increased with distance below the fracture in the unweathered sandstone samples. No pattern was evident in the weathered sandstone samples. Concentrations of 1,1-DCE, TCA, and TCE were higher in the mudstone samples than in the samples from the other rocks. Toluene concentrations were

higher in unweathered sandstone than in the other rocks. The distribution pattern may be related to the release history, which is unknown.

The presence of contaminants in the aquifer matrix suggests that the contaminants cannot easily or rapidly be removed by water flowing in fractures. Contaminants in the matrix may be a continuing source of low-level contamination to the ground-water system.

The effect of the pumping of well HWSA-26, 0.2 mi southwest of the base boundary, on ground-water levels on the base was determined by conducting a hydraulic test. Well HWSA-26 was shut down for 6 days to allow water levels to recover and then restarted. Water levels in the vicinity of well HWSA-26 were measured for 1 week before the test, during the test, and for 1 week after the test. Water levels were measured in well HWSA-26 and 11 other wells using transducers and dataloggers and in 9 wells 3 times per day using electric water-level-measurement tapes.

The only well that showed an unambiguous response to the shutdown of well HWSA-26 was well 02MW01I, which is directly along strike from well HWSA-26. Four wells, 02MW01S, 02MW03I, 02MW04I, and 05MW11I, showed a rise in water level that occurred after well HWSA-26 was shut down. A comparison of climatic data with the hydrographs from these wells showed the rise in water level was most likely caused by recharge from snowmelt during a rise in temperature. The recovery of well 05MW11I in response to the shutdown of well HWSA-26 was masked by recharge from snowmelt but probably does not exceed about 0.2 ft. The water level in well 05MW11I showed a response to the pumping of well HWSA-26 that ranged from 0.5 to 0.15 ft. Well 05MW11I is in the well cluster nearest to the base boundary and is the well at Site 5 nearest to well HWSA-26. If extraction wells for remediation are drilled in this vicinity near the base boundary, off-base pumping possibly may cause some interference with the extraction wells.

A map of the regional potentiometric surface at and in the vicinity of the Willow Grove NAS/JRB shows a regional ground-water divide running northeast-southwest approximately through the center of Site 5. From this divide, ground water flows both northwest toward Park Creek and southeast toward Pennypack Creek. The high point on the divide was centered around wells 05MW02S, 05MW03S, and 05MW04S during the time of water-level measurements on October 7, 1999. From this high point, which appears as a ground-water mound, ground-water flow is radial; the steepest gradients, however, are to the northwest and southeast.

Three potentiometric-surface maps were prepared using water-level data from Sites 2, 3, and 5. Because of vertical head gradients at these sites, water-level data were grouped into three depth ranges for contouring. Horizontal gradients differ with depth, and the rate and direction of ground-water flow and contaminant movement varies with depth. The potentiometric-surface map based on water levels measured in wells screened between 5 and 44 ft bls shows a ground-water mound around wells 05MW02S, 05MW03S, and 05MW04S. This represents the high point on the regional ground-water divide. From this mound, horizontal ground-water flow follows a radial pattern. The hydraulic gradient around this mound is relatively flat to the southeast and particularly to the northwest. The potentiometric-surface map based on water levels measured in wells screened between 40 and 100 ft bls shows a very flat hydraulic gradient at Site 5. Differences in the elevation of the potentiometric surface are less than 2 ft. The area of flat hydraulic gradient extends northwest to Site 3. The water level in well 02MW01I (altitude of 243.01) in the southeastern part of Site 2 is affected by the pumping of well HWSA-26 and is much lower than water levels in other wells at Site 2. The potentiometric-surface map based on water levels measured in wells screened between 105 and 179 ft shows a steep hydraulic gradient between Sites 5 and 2 and a relatively flat hydraulic gradient between Sites 5 and 3.

Water levels measured on October 7, 1999, showed downward vertical head gradients for all well clusters at Sites 5 and 2. Gradients at Site 5 ranged from 0.01 at well cluster 05MW10 to 0.2 at well cluster 05MW11. Most gradients were between 0.01 and 0.026. The downward vertical gradient at Site 5 is what would be expected in a ground-water divide/recharge area.

Except for well cluster 03MW06, the same vertical gradient pattern was observed for all well clusters at Site 3. The vertical head gradient is downward from wells screened at shallow depths (screened 4.5 to 35 ft bls) to wells screened at an intermediate depth (55 to 80 ft bls) and upward from wells with deep screens (134 to 179 ft bls) to the intermediate and shallow screened wells. This

pattern was observed for well clusters 03MW01, 03MW02, and 03MW04. At well cluster 03MW05, a downward vertical head gradient was observed from the shallow screened well to the intermediate depth screened well; the well cluster lacks a deep screened well. At well cluster 03MW03, an upward vertical head gradient was observed from the deep screened well to the shallow screened well; the well cluster lacks a well screened at an intermediate depth. The pattern at well cluster 03MW06, which is the well cluster in Site 3 closest to Site 5, is different than the others in Site 3. The vertical head gradient is upward and downward from the intermediate zone, which has a higher water level than either the shallow or deep zones.

The vertical head gradient varies with time. The variability is caused by a difference in the magnitude of water-level fluctuations between the shallow wells and deep fractures. The difference in the magnitude of water-level fluctuations is because of differences in lithology and aquifer storativity. The storativity at depth is less than the storativity in the shallow zone.

REFERENCES CITED

Brown and Root Environmental, Inc., 1998, Phase II remedial investigation report for NASJRB Willow Grove, Pennsylvania: King of Prussia, Pa. [variously paginated].

_____1997, Phase II remedial investigation workplan for NASJRB Willow Grove, Pennsylvania: King of Prussia, Pa. [variously paginated].

Conger, R.W., 1997, Evaluation of geophysical logs, phase I, at Willow Grove Naval Air Station, Montgomery County, Pennsylvania: U.S. Geological Survey Open-File Report 97-631, 48 p.

_____1999, Evaluation of geophysical logs, phase II, at Willow Grove Naval Air Station Joint Reserve Base, Montgomery County, Pennsylvania: U.S. Geological Survey Open-File Report 99-73, 14 p.

Gilbert/Commonwealth, Inc., 1978, Hydrogeologic report well 26: Reading, Pa. [variously paginated].

Halliburton NUS Environmental Corporation, 1993, Remedial investigation report for sites 1, 2, 3, and 5, Naval Air Station, Willow Grove, Pennsylvania: Wayne, Pa. [variously paginated].

Keys, W.S., 1990, Borehole geophysics applied to ground-water investigations: U.S. Geological Survey Techniques of Water-Resources Investigations, book 2, chap. E2, 150 p.

National Oceanic and Atmospheric Administration, 2000a, Climatalogical Data Pennsylvania January 2000: v. 105, no. 1, 40 p.

_____2000b, Climatalogical Data Pennsylvania February 2000: v. 105, no. 2, 40 p.

Parker, B.L., Gillham, R.W., and Cherry, J.A., 1994, Diffusive disappearance of immiscible-phase organic liquids in fractured geologic media: Ground Water, v. 32, no. 6, p. 805-820.

Parker, B.L., and Sterling, S.N., 1999, Field verification of TCE, matrix diffusion in a fractured sandstone and implications for natural attenuation and remediation: Proceedings of the International symposium on dynamics of fluids in fractured rocks, p. 175-177.

Rima, D.R., Meisler, Harold, and Longwill, Stanley, 1962, Geology and hydrology of the Stockton Formation in southeastern Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 14, 111 p.

Sloto, R.A., Goode, D.J., and Frasch, S.M., 2002, Interpretation of borehole geophysical logs, aquifer-isolation tests, and water quality, supply wells 1 and 2, Willow Grove Naval Air Station/Joint Reserve Base, Horsham Township, Montgomery County, Pennsylvania: U.S. Geological Survey Water-Resources Investigations Report 01-4264, 64 p.

Sloto, R.A., Goode, D.J., and Way, J.C., 2001, Altitude and configuration of the regional potentiometric surface, Willow Grove Naval Air Station/Joint Reserve Base and vicinity, Horsham Township, Montgomery County, Pennsylvania, October 7-8, 1999: U.S. Geological Survey Open-File Report 01-149, 1 pl., scale 1:24,000.

Sloto, R.A., Macchiaroli, Paola, and Towle, M.T., 1996, Geohydrology of the Stockton Formation and cross-contamination through open boreholes, Hatboro Borough and Warminster Township, Pennsylvania: U.S. Geological Survey Water-Resources Investigations Report 96-4047, 49 p.

US Army Corps
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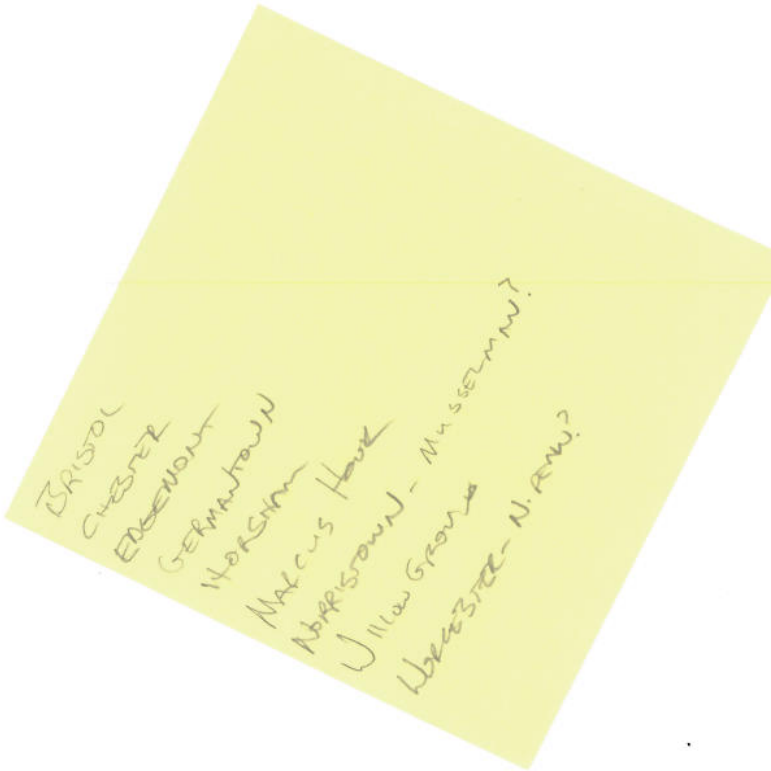
Baltimore District

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN 79TH ARMY RESERVE COMMAND PENNSYLVANIA



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Naval Air Station
Willow Grove, Pennsylvania 19090-5110

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U.S. Army Corps of Engineers
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Baltimore, Maryland 21203-1715

1 August 1995

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN

79TH ARMY RESERVE COMMAND

PENNSYLVANIA

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
79TH ARMY RESERVE COMMAND
PENNSYLVANIA

INTRODUCTION

The Natural Resource Management Plan (NRMP) is mandated by Army Regulation (AR) 420-74 which prescribes policies, procedures, and standards for the conservation, management, and restoration of land and the renewable natural resources of that land, consistent with, and in support of the military mission and national policies. The scope of the NRMP includes the conservation, management, and utilization of soils, water areas, croplands, rangelands, forests, fish and wildlife. The objective of the NRMP is to comply with environmental protection and enhancement policies and procedures as outlined in AR 200-1 (Environmental Protection and Enhancement) and to protect and improve the landscape including its flora and fauna.

This Programmatic NRMP has been prepared for the 79th Army Reserve Command (ARCOM) to address the conservation, utilization, and management of renewable natural resources at 32 U.S. Army Reserve sites located in Pennsylvania. This plan incorporates specific resource management plans for five resource categories where applicable within the 32 sites:

- Parts I and II - Land Management (general and grounds maintenance)

- Part III - Forest Management

- Part IV - Fish and Wildlife Management

- Part V - Outdoor Recreation and Cultural Values

A comprehensive approach will be used to address these categories on a broad command-wide scale. The information contained in this document can be combined with information in Technical Manuals 5-630, 5-631, 5-633, and 5-635 to develop site-specific NRMPs if desired. Sites will be grouped according to physiographic region so that best management practices (BMPs) can be addressed for sites with similar physical and biological conditions. According to AR 420-74, Parts I and II will be prepared by installations having 500 or more acres of improved, semi-improved and unimproved grounds combined, or 50 or more acres of improved grounds; Part III will be prepared by installations having 100 or more acres of commercial forest land; Part IV will be prepared by installations having land and water areas suitable for the management of fish and wildlife resources; and Part V will be prepared by installations with outdoor recreation programs which depend on maintenance and management of the natural resources. Because the 79th ARCOM sites do not meet the acreage requirements of AR 420-74, the preparation of a NRMP is not required. However, a NRMP is highly desirable. Therefore, a NRMP that addresses BMPs for grounds maintenance, forest management, fish and wildlife management, and recreational or cultural values, where applicable, is presented here.

The NRMP will also incorporate the requirements of the National Environmental Policy Act (NEPA; 40 CFR, Parts 1500 - 1508) and include preparation of an Environmental Assessment (EA). The effects of implementing the NRMP will be combined in one document which also addresses the effects of operating the USARC facilities. This document is entitled *79th Army Reserve Command Programmatic Environmental Assessment, Pennsylvania* August 1995. No previous NRMP has been prepared for the 79th ARCOM base operations (BASOPS) supported facilities.

CONTENTS

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART I
GENERAL

TABLE OF CONTENTS

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART I - GENERAL

The General aspects of the Natural Resource Management Plan (NRMP) will incorporate baseline environmental and natural resource inventory information which will be useful in identifying appropriate management measures. Technical Manual 5-630 is the guide that should be referenced for further information pertaining to Part I (General) and Part II (Land Management and Grounds Maintenance).

1.0 ARCOM DESCRIPTION

1.1 Mission.

This NRMP addresses 32 facilities including U. S. Army Reserve Centers (USARC), Armed Forces Reserve Centers (AFRC) and Area Maintenance Support Activities (AMSA) administered by the 79th ARCOM in central and eastern Pennsylvania. (See Appendix A, Figure 1). Army Reserve combat units, combat support and combat service support units occupy thirty-two facilities, conducting administrative, classroom, maintenance and limited training activities. Tenant units include Army Reserve, Navy and U. S. Marine Corps Reserve (USMCR) units.

The mission of the 79th ARCOM is to support the unit readiness objectives of the U. S. Army Reserve Command and the United States Army. The continued operation of the 79th ARCOM has a direct affect on national security. The Army Reserves, in conjunction with the National Guard, comprise a majority of the Army force structure under the "Total Army" concept. The 79th ARCOM provides its subordinate units aid to deployment and combat readiness missions. (A list of 79th ARCOM facilities in Pennsylvania is provided in Appendix C, Table 1).

1.2 Location Description.

The 79th ARCOM has BASOPS responsibility for facilities throughout central and eastern Pennsylvania and New Jersey. As a basis for analysis, the thirty-two sites in Pennsylvania have been sub-divided into five geographic regions. These regions were defined based on physiographic province, political boundaries, air quality regions, and dominant urban centers.

1.2.1 Philadelphia-Piedmont Upland Region.

This region lies in the extreme southeast corner of Pennsylvania. It includes the City and County of Philadelphia and Bucks, Montgomery, Chester and Delaware Counties. This region includes a narrow band of Atlantic Coastal Plain which incorporates lowlands and intermediate uplands just west of the Delaware River. Bristol, Chester, Marcus Hook, and Philadelphia are located in the Coastal Plain. Ten reserve facilities ("reserve facility" refers to Army Reserve hosted facilities) lie within this region:

FACILITY LOCATION	COUNTY	TYPE OF UNITS ASSIGNED
Bristol, PA	Philadelphia	Artillery unit
Chester, PA	Delaware	Medical replacement units
Edgemont, PA	Delaware	AMSA, Transportation units
Germantown, PA	Philadelphia	Three Infantry units
Horsham, PA	Montgomery	Infantry Brigade HQ
Marcus Hook, PA	Delaware	Marine AMSA
Norristown, PA	Philadelphia	Civil Affairs and Medical units
Willow Grove, PA	Montgomery	ARCOM HQ, AMSA and Aviation units
Worcester, PA	Montgomery	Transportation and Engineer units

1.2.2 Piedmont Lowlands Region.

This region is part of the Piedmont Province (Piedmont Lowland Section and Gettysburg-Newark Lowland Section). It encompasses Adams, York and Lancaster Counties. Three reserve facilities lie within this region:

FACILITY LOCATION	COUNTY	TYPE OF UNITS ASSIGNED
Gettysburg, PA	Adams	Infantry unit
Lancaster, PA	Lancaster	Transportation and Medical units
York, PA	York	Supply unit

1.2.3 Great Valley Region.

This region is part of the Ridge and Valley Physiographic Province. This region encompasses Franklin, Cumberland, Perry, Dauphin, Lebanon, Berks, Lehigh, Northampton Counties and portions of York County within the Harrisburg-Carlisle-Hershey Metropolitan Statistical Area (MSA). Six reserve facilities lie within this region:

FACILITY LOCATION	COUNTY	TYPE OF UNITS ASSIGNED
Bethlehem, PA	Lehigh	Armor and Military Police units
Chambersburg, PA	Franklin	Infantry unit
Greencastle, PA	Franklin	AMSA

FACILITY LOCATION	COUNTY	TYPE OF UNITS ASSIGNED
Harrisburg, PA	Dauphin	USAR School, Judge Advocate General (JAG), Infantry and Medical units, as well as Navy and Marines Corps Reserve units
New Cumberland, PA	York	AMSA, Engineer and Public Affairs units
Reading, PA	Berks	Transportation and Military History units

1.2.4 Eastern Appalachian Region.

This region is the northeastern quadrant of the Ridge and Valley Physiographic Province (Appalachian Mountain Section). This region encompasses Juniata, Snyder, Northumberland, Columbia, Schuylkill, Luzerne, Wyoming, Carbon, Monroe and Lackawanna Counties. Seven reserve facilities lie within this region:

FACILITY LOCATION	COUNTY	TYPE OF UNITS ASSIGNED
Ashley, PA	Luzerne	Military Police and Medical units
Bloomsburg, PA	Columbia	Supply unit
Schuylkill Haven, PA	Schuylkill	Engineer and Armor units
Scranton, PA	Lackawanna	Engineer, Medical, Supply units and a USAR School
West Hazelton, PA	Luzerne	Engineer unit
Wilkes-Barre, PA	Luzerne	AMSA
Wilkes-Barre, PA	Luzerne	Engineer and Cavalry units

1.2.5 Western Appalachian.

This region is in the northwestern quadrant of the Ridge and Valley Physiographic Province (Appalachian Mountain Section). This region encompasses Mifflin, Centre, Clinton, Lycoming, Union and Sullivan Counties. Six reserve facilities lie within this region:

FACILITY LOCATION	COUNTY	TYPE OF UNITS ASSIGNED
Bellefonte, PA	Centre	Quartermaster and PAARNG units
Lewisburg, PA	Union	Supply unit
Lewiston, PA	Mifflin	Service Support unit
FACILITY LOCATION	COUNTY	TYPE OF UNITS ASSIGNED

Lock Haven, PA	Clinton	AMSA and an Infantry Battalion HQ
State College, PA	Centre	Maintenance unit
Williamsport, PA	Lycoming	Infantry, Maintenance and Quartermaster units

1.3 Site Description.

Most sites contain only a few acres of impervious area within their boundaries surrounded by a maintained lawn. All USARCs and AMSAs have some degree of landscaping including deciduous/evergreen trees and shrubs. Army Reserve Centers are generally located in areas zoned for commercial activities. USARCs are built on sites ranging from three (3) to twenty-seven (27) acres and contain two buildings including the reserve center and organizational maintenance shop (OMS). Area Maintenance Support Activities (AMSA) and Armed Forces Reserve Centers (AFRC) are also located in zoned commercial/industrial areas. AMSAs occupy sites ranging from five (5) acres to forty-four (44) acres. Two sites (Greencastle, Harrisburg) are located adjacent to an athletic field. No improved grounds such as cemeteries, golf courses, parade or drill grounds, are associated with any of the USARCs, AFRCs or AMSAs. No semi-improved grounds such as airfields, drop zones, small arms ranges, firebreaks, road shoulders, picnic areas, or wildlife food plots are associated with any of the 79th ARCOM sites although Willow Grove is located within a Naval Air Station.

In the Unimproved Ground Classification, pavements and buildings are included as is non-merchantable forest land. On all sites, there is a range of approximately 2 to 10 acres of impervious area. Several sites containing NIKE missile silos contain limited areas of non-merchantable forest land (Edgemont, Bristol, Worcester). Several sites (Germantown, Woodhaven, Wilkes Barre AMSA) have no grass and are completely paved. See Appendix A, Figures 2 through 33 for reserve facility site maps.

2.0 PHYSIOGRAPHY

The following information includes baseline environmental data to provide a framework for management recommendations. Although this information is regionally generalized, site specific conditions are provided where possible.

2.1 Climate.

Weather is defined as the condition of the atmosphere with respect to wind, temperature, and moisture at a particular place and time. Climate is weather over an extended period (Godfrey, 1980). The Piedmont Physiographic Province, which contains most of the 79th ARCOM sites, is a strip of land one thousand miles long, and oriented north to south, thus it is interesting to note that its climate is generally similar across the entire range. The average annual temperature range for eastern and central Pennsylvania ranges from - 7 degrees Fahrenheit (F) to 104 degrees F. May through August is the warmest period with an average daytime maximum temperature of 84.2 degrees F. December through February is the coldest period with an average minimal temperature of 25.2 degrees F. The average relative humidity is

76%, with July through September being most humid. The average wind speed is 9.6 miles per hour, with January through March being the windiest time period. Prevailing wind direction is generally westerly. Average precipitation for the area is 39.93 inches with the heaviest precipitation during July through October. Areas in the Appalachian Highland regions have an average annual precipitation of over 40 inches.

2.2 Topography.

Most reserve facilities are built on graded flat terrain with little topographical variance, however, some facilities are located in rolling terrain (Edgemont, York, State College). The Lowland and Intermediate Upland Sections of the Atlantic Coastal Plain are characterized by a flat upper-terrace surface cut by narrow, steep-sided valleys to open, shallow valleys. This section includes the Delaware River Floodplain (Marcus Hook). Local relief is very low although elevations range from 0 feet (sea level) to 200 feet above sea level. This section includes Marcus Hook, Folsom, Philadelphia, Chester, and Bristol.

The Piedmont Physiographic Province includes three sections: Piedmont Upland, Piedmont Lowland, and Gettysburg-Newark Lowland Sections. The Piedmont Upland Section (Edgemont, Germantown, Horsham, Norristown, Willow Grove, and Worcester) is characterized by broad gently rolling hills and valleys with elevations ranging from 100 to 1220 feet. The Piedmont Lowland Section (Lancaster, York) is made up of broad, moderately dissected valleys separated by broad, low hills. Karstic terrain, characterized by sinkholes, is common due to the presence of carbonate underlying rock which dissolves due to contact with groundwater or percolating surface water. Elevation ranges from 170 feet to 630 feet. The Gettysburg-Newark Lowland Section (Gettysburg) includes rolling lowlands with isolated hills and highlands. Elevation ranges from 40 to 1355 feet.

The Great Valley Section, which is part of the Ridge and Valley Physiographic Province (Bethlehem, Chambersburg, Greencastle, Harrisburg, New Cumberland, Reading) is characterized by a very broad, moderately dissected valley having a gently undulating surface with karstic terrain in the southern half. The Appalachian Mountain Section is also part of the Ridge and Valley Province. It contains long narrow ridges and broad to narrow valleys with some karstic terrain. Elevations are more variable ranging from 300 to 3135 feet. This section includes the remainder of the sites.

2.3 Geology.

(See Figure A, Appendix B) Atlantic Coastal Plain geology is characterized by an underlying rock type of unconsolidated to poorly consolidated sand and gravel, underlain by schist, gneiss, and other metamorphic rocks. These quaternary (0 - 2 million years) and tertiary (2 - 67 million years) sands, gravels, silts, and clays make up the bulk of unconsolidated material. The unconsolidated deposits are underlain by complex, faulted and folded metamorphic rocks. The drainage patterns of the Coastal Plain are dendritic. The geologic origin of the Coastal Plain is derived from fluvial (river) erosion and deposition processes, however, the Delaware River floodplain also includes glacial meltwater deposits.

The three sections of the Piedmont Province differ geologically primarily in underlying rock types. The Piedmont Upland Section is underlain by lower Paleozoic (probably Ordovician and Cambrian, 435 - 570 million years) schist, gneiss, quartzite, and other metamorphic rocks.

Granite and pegmatite are also present, with much of the terrain weathered to saprolite (disintegrated rock). This area is extremely complex with faulting and folding. The drainage patterns are dendritic. The Piedmont Lowland Section is underlain by dominantly carbonate rocks (limestone, dolomite, marble), phyllitic shale, and phyllite with some sandstone of Cambrian age (500 - 570 million years). This area is also complexly folded and faulted with dendritic and karstic drainage patterns. The Gettysburg-Newark Lowland Section is underlain by red and gray shale, siltstone, sandstone, and conglomerate; diabase of Triassic and Jurassic age (195 - 240 million years). The area's geologic structure is half-graben, low monoclinal with dominantly northwest - dipping beds. This section has dendritic drainages as well. All the Piedmont sections originate from fluvial erosion of moderately to deeply weathered bedrock of either metamorphic, or carbonate origin, except for the Gettysburg-Newark Lowland Section which eroded from more resistant bedrock. All three sections have undergone some periglacial mass wasting.

The geology of the Ridge and Valley Province varies greatly between the Great Valley and Appalachian Mountain Sections. The Great Valley Section is underlain by shale and sandstone on the northwest side and limestone and dolomite on the southeast side. It is of Ordovician age (435 - 500 million years). The geologic structure is a mixture of thrust sheets, napes, overturned folds and steep faults with many third and fourth order folds. The drainage patterns are both dendritic and karstic with a geological origin from fluvial erosion, glacial erosion and deposition in the east, and solution of carbonate rocks. The Appalachian Mountain Section is underlain by a wide variety of sedimentary rocks including sandstone, siltstone, shale, conglomerate, limestone, dolomite, and others ranging in age from Pennsylvanian (285 - 325 million years) to Ordovician (435 - 500 million years). The geologic structure consists of open and closed plunging folds having narrow hinges and planar limbs with thrust, reserve, and strike - slip faults. The drainage patterns in this section include trellis, angulate, and some karstic drainage patterns. This physiography originated from fluvial erosion, periglacial mass wasting, glacial erosion and deposition in the north and east, and solution of carbonate rocks.

2.4 Soils.

Soils at the 79th ARCOM reserve facilities are described below and in Table 2 (Appendix C).

2.4.1 Coastal Plain.

Soils of the Coastal Plain are primarily of the Howell - Fallsington association with a substrata of marine clay or sand. These soil series have slopes ranging from 3 to 8 percent and 0 to 3 percent, respectively. Fallsington soils have many limitations for uses including on-site sewage disposal or use as building sites with basements due to presence of a high water table. Howell soils have few limitations and are excellent for farming.

2.4.2 Piedmont Upland Section.

This region includes soils of five associations:

a. Chester - Glenelg
b. Edgemont - Highfield
c. Glenelg - Manor

d. Highfield - Arendtsville - Myersville
e. Lehigh - Brecknock - Neshaminy

2.4.2.1 The Chester - Glenelg Association.

The Chester-Glenelg Association is found on slopes 3 to 15 percent and 0 to 20 percent, respectively. They are excellent for crops and timber. They have moderate limitations to construction and on-site waste disposal primarily because of slopes and shallow depth to bedrock.

2.4.2.2 The Edgemont - Highfield Association.

The Edgemont-Highfield Association is found on slopes ranging from 3 to 20 percent. These soil series are excellent for corn and alfalfa, and good for woodland. Both series have moderate limitations which result from steep slopes, depth to bedrock, and coarse rock fragments.

2.4.2.3 The Glenelg - Manor Association.

The Glenelg - Manor Association is present on slopes that are 6 to 20 and 3 to 20 percent, respectively. Although Glenelg soils are superior for agricultural purposes, both series have similarly moderate limitations to development including shallow depth to bedrock, steep slopes, or channery slopes. Manor soils are limited also by potential hazard of groundwater contamination.

2.4.2.4 The Highfield - Arendtsville - Myersville Association.

The Highfield - Arendtsville - Myersville Association is located on 3 to 20 percent slopes. They are excellent for agriculture with moderate limitations to development, primarily from steep slopes, and course rock fragments.

2.4.2.5 The Lehigh - Brecknock - Neshaminy Association.

The Lehigh - Brecknock - Neshaminy Association is present on 0 to 25 percent slopes. These soil series are fair to poor for agricultural uses. In general, they have slight to severe limitations for development and recreation, primarily from slow permeability, a seasonally high water table, steep slopes, depth to bedrock, and stoniness.

2.4.3 Piedmont Lowlands Section.

The Piedmont Lowlands Section includes soils weathered from carbonate sedimentary rocks with substrata of limestone or dolomite; calcareous shale, limestone and sandstone; or cherty limestone. There are nine soil associations which vary in slope and limitations for use. (See Table 2, Appendix C)

2.4.4 Gettysburg Newark Lowland Section.

The Gettysburg Newark Lowland Section soils are formed in materials weathered from non-carbonate, sedimentary rocks. The six soil associations of this region have substrata of reddish sandstone, shale, and siltstone. (Table 2, Appendix C)

2.4.5 Ridge and Valley Province.

2.4.5.1 The Great Valley Section.

The Great Valley Section contains 13 soil associations (Table 2, Appendix C) with substrata of yellowish and brownish sandstone, shale and siltstone.

2.4.5.2 The Appalachian Mountain Section.

The Appalachian Mountain Section contains soils characterized by both the Great Valley and Piedmont Uplands and are represented by the same soil associations (Table 2, Appendix C).

3.0 NATURAL RESOURCES.

3.1 Vegetative Communities.

3.1.1 Existing Vegetation.

Vegetation observed at the 32 reserve sites includes a mixture of planted/landscaped plants and native vegetation. USARCs, AFRCs and AMSAs sited in commercial, urban areas are usually landscaped with trees, shrubs, and primarily mowed lawns. The most common planted trees and shrubs include ***White Pine***, ***Pacific Yew***, ***Sugar Maple*** and ***Pin Oak***. (See Table 3, Appendix C for Master Plant List and scientific names.) Sites located in more rural regions, particularly sites with greater land area, generally contain native forest although it may be limited to small woodland islands.

Native forest habitat varies with physiographic zone. Eastern deciduous forest changes with microhabitat conditions such as slope and direction of exposure. The largest area of existing eastern deciduous forest was observed at the Edgemont USARC/AMSA site. Forest overstory species observed include ***Shagbark Hickory***, ***Black Cherry***, ***Mockernut Hickory***, ***American Elm***, ***Green Ash***, ***and Tulip Poplar***. Understory plants include ***Flowering Dogwood***, ***Smooth Arrowood***, ***Spicebush***, and ***Virginia Creeper***. Species indicative of edge communities (e.g. ***Poison Ivy*** and ***Blackberry***) were observed along the edge of the forest.

3.1.2 Native Forest Communities of Pennsylvania.

There are few cases, if any, where the first species of grasses, trees, and shrubs to appear on land remain indefinitely to mature into a climax vegetative community. Succession is a process of vegetational change in which plant communities replace one another until a climax equilibrium is reached (Godfrey, 1980). Throughout most of Pennsylvania, there is little virgin forest. Most areas of forest today have succeeded from a cleared state such as abandoned farmland or timberland. The rolling terrain of most of Pennsylvania (except the

Coastal Plain) places most of the state's surface in the middle range of the drainage continuum (Godfrey, 1980), also called mesic or well-drained. This drainage determines the vegetation which occupies specific regions.

In the herbaceous phase of succession, the opportunity for species to appear depends on the availability of seeds. Common volunteer species include ***Chickweed*** (*Stellaria Media*), ***Henbit*** (*Lamium amplexicaule*), ***Cranesbill*** (*Geranium Carolinianum*), ***Shepherd's Purse*** (*Capsilla bursa - pastoris*), and ***Wintercress*** (*Barberea sp.*). ***Crabgrass*** (*Digitarea saguinalis*) and ***Horseweed*** (*Erigeron canadensis*) are soon to follow. Some of the taller, easily recognizable species include ***Pokeweed*** (*Phytolacca americana*), ***Queen Anne's Lace*** (*Daucus carota*), and the ***berry briars*** (*Rubus spp.*). ***Ragweed*** (*Ambrosia sp.*) may also be present, especially on poorer soils. Other species including ***Fescues*** (*Festuca spp.*) are introduced weedy grasses which arrive at early successional stages. Several Asters (*Asteracea*) and ***Broomsedge*** (*Andropogon sp.*) are also invaders. Plants including ***Plantago Aristita*** (a plantian with no common name), ***Diodia Teres***, (no common name), and ***Aristida Dichotoma*** (*a three - awn grass*) are vegetative indicators of prior erosion.

By the second growing season, other species begin to dominate including Perennial Asters like ***Daisy Fleabane*** (*Erigeron annuus*), followed by a ***Broomsedge/Goldenrod*** (*Solidago sp.*) dominance.

Mesic woody succession begins around the fifth season when woody seedlings are visible above the broomsedge, goldenrod, and briars. Woody seedlings may be deciduous or coniferous. Coniferous species may include ***Eastern Red Cedar*** (*Juniperus virginianus*), or ***Virginia Pine*** (*Pinus virginianus*). These species are especially likely to colonize in the Coastal Plain and the Eastern Piedmont provinces. Deciduous pioneers include ***Red Maple*** (*Acer rubrum*), ***American Elm*** (*Ulmus americana*), ***Black Locust*** (*Robinia pseudoacacia*), ***Ashes*** (*Fraxinus spp.*), ***Cherries*** (*Prunus spp.*), ***Flowering Dogwood*** (*Cornus florida*), ***Tulip Popular*** (*Liriodendron tulipifera*), ***Sweetgum*** (*Liqiudambar styraciflua*), and ***Persimmon*** (*Diospyros virginiana*). Shrubs and vines may include ***Sumac*** (*Rhus sp.*), ***Black Haw*** (*Viburnum prunifolium*), ***Trumpet Creeper*** (*Campsis radicans*), and ***Poison Ivy*** (*Toxicodendron radicans*). In Pennsylvania, ***Pin Oak***, (*Quercus palustris*) also occurs as a pioneer.

One example of forest succession from a known point in time is located at the spot where Elon J. Farnsworth fell on July 3, 1863, the third and decisive day of the battle of Gettysburg. This area is now a northern Piedmont forest which has grown undisturbed since the battle. There are large (up to two feet in diameter) ***Black Locust*** and ***White Ashes*** which are beginning to die and decay. Occasional large ***Black Walnut*** (*Juglans nigra*) trees are present. These are the remains of forest pioneer species. ***Younger Red*** and ***Black Oaks*** are present. Together with the ***Ashes*** and a few ***Tulip Poplars***, the ***Oaks*** are expected to dominate the canopy for a long time. Eventually, scattered ***White Pine*** (*Pinus Strobus*) and ***Eastern Hemlock*** (*Tsuga canadensis*) will appear. Subdominants include ***Redbud*** (*Cercis canadensis*), ***Dogwood***, and ***American Elm***.

The mature forest will ultimately contain Oak-Hickory or Oak-Hickory-Beech associations. ***White Oak*** (*Quercus alba*), ***Red Oak*** (*Quercus rubra*), ***Black Oak*** (*Quercus velutina*), ***Southern Red Oak*** (*Quercus stellata*), ***Scarlet Oak*** (*Quercus coinea*), and ***Beech*** (*Fagus grandifolia*) are dominant. Subdominant canopy constituents include ***Mockernut Hickory***

(*Carya tomentosa*) ***Pignut and Shagbark Hickories*** (*Carya glabra* and *Carya ovata*), ***Tulip Popular***, and ***Red Maple***. Understory species include ***Black Gum*** (*Nyssa sylvatica*), ***Hornbeam*** (*Carpinus caroliniana*), ***Flowering Dogwood***, ***Redbud***, and ***Blueberries*** (*Vaccinium sp.*). ***Shadbush*** (*Amelanchier sp.*) and ***Mapleleaf Viburnum*** (*Viburnum acerifolium*) are the most common shrubs.

Herbs such as ***Jack in the Pulpit*** (*Arisaema triphyllum*), ***Mayapple*** (*podophyllum peltatum*), ***Skunk Cabbage*** (*Symplocarpus foctidus*), ***Blood Root*** (*Sanguinaria canadensis*) and many others occupy the forest floor.

Mature woodlots in Pennsylvania (See Figure B, Appendix B) are more numerous in number than in adjacent states probably because farmland is not being abandoned at a significant rate. Farmlands are, therefore, stable and may contain blocks of woodland that may be kept as sustained yield timber or firewood. Thus, the woodlots tend to be located on least farmable areas like hill crests: Some of these woodlots are dry areas (xeric) and some mesic, but observing mature vegetation helps distinguish the two soil types (Godfrey, 1980) as different species are indicators of wet and dry conditions.

3.2 Wildlife Food and Cover.

The presence of native vegetation determines the faunal (wildlife) community which occupies a site. Since most of the 79th ARCOM reserve sites are located in commercial/urban areas, only species adapted to living in urban conditions are expected to be observed. Vegetation provides critical habitat components such as food and cover needed for survival throughout an animal's life cycle. Native plants provide the specific types of food and shelter, nesting and hiding places that indigenous animals require to survive. For example gray squirrel require large amounts of acorns for food, and large trees (greater than 9 inches diameter at breast height) for nesting (Allen, 1982). Thus, gray squirrel presence depends on the availability of mature, mast - producing trees (e.g. oaks).

3.2.1 Observed Wildlife.

During site visits, urban wildlife was observed at most of the 79th ARCOM sites including a variety of songbirds and small mammals. (See Table 4, Appendix C.) Planting native species rather than introducing alien plants for landscaping will encourage native wildlife to inhabit a site by providing needed habitat components.

3.2.2 Native Vegetation for Wildlife.

Table 5 (Appendix C) lists the relative importance of common native plants in Pennsylvania for use as food and cover for native wildlife. Wildlife are divided into feeding groups that include waterbirds, marsh shorebirds, upland game birds, songbirds, fur and game mammals, small mammals, and browsers. These native plant species may be planted to enhance wildlife habitat and for landscaping purposes. Table 6 (Appendix C) lists common plants of the northeast U. S. that are valuable to birds and mammals as food and cover. This table emphasizes the flowering and fruiting periods of trees, shrubs, and vines so that landscape planting can incorporate color and season into habitat enhancement planning. Figure D (Appendix C) illustrates a habitat enhancing landscape planting plan. Table 7 (Appendix C) lists common trees and shrubs that are adaptable to urban conditions. This information is

adapted from Degraaf and Witman, 1979. A low numerator (stars) over a large denominator (users) indicates that the plant is used by many wildlife species, but only to a limited extent by each. A higher numerator and small denominator characterizes a plant of great importance to a limited segment of wildlife. This table is adapted from Martin, et al., 1951.

3.3 Rare, Threatened and Endangered Plants.

A survey of rare, threatened, and endangered plants was recently completed by the Pennsylvania Science Office of The Nature Conservancy (TNC) on the 79th ARCOM sites. Two sites contain listed species. (Personal communication with John Kunsman, September 1994.) ***Butternut*** (*Juglans cincerea*), a member of the walnut family, was identified at the Williamsport USARC. An unidentified species of ***Umbrella Sedge*** (*Cyperus sp.*) was located at the Marcus Hook marine AMSA. This species has been referred to a sedge expert to conclusively determine the species and its status. Refer to Appendix D for a list of Biota of Special Concern in Pennsylvania.

No rare, threatened or endangered invertebrates or vertebrates were observed during site visits to 79th ARCOM sites, nor are any expected to use on-site habitats.

3.4 Noxious and Poisonous Plants.

Pennsylvania Act 1982-74, as amended, requires landowners to comply with designated weed control areas and species listed as noxious weeds may not be planted or transported. There are ten species listed on the Noxious Weed Control List. See Appendix D for the Noxious Weed Control Act and List.

Poisonous plants of Pennsylvania include a number of species such as Poison Ivy, Poison Sumac, and others. A full list of these plants can be found in the publication, Poisonous Plants of Pennsylvania, by Robert J. Hill, available through the Pennsylvania State Book Store. Many of these species are not life threatening, but may cause serious skin reactions. Others, if ingested, may be fatal.

3.5 Drainage.

3.5.1 Surface Waters.

Proximity to surface water introduces important stormwater management considerations and surface/subsurface drainage considerations. Sheet flow from impervious surfaces contributes sediments and toxicants to adjacent and downstream waters resulting in an increased probability of reduced dissolved oxygen, increased turbidity, and increased nutrient, metal, and hydrocarbon levels in the aquatic environment. Normal operations of the existing facilities include parking lots, vehicle maintenance, the storage and use of products such as petroleum, oils and lubricants (POL), solvents, and cleaners, which could potentially contaminate surface water bodies through stormwater sheet flow or subsurface flow. Only four of the existing facilities (Marcus Hook, Reading, Williamsport, and Edgemont) are located directly adjacent to surface water bodies.

3.5.1.1 Philadelphia-Piedmont Upland Region.

The Delaware and Schuylkill Rivers are the major surface bodies of water in this region. The Marcus Hook AMSA is located directly adjacent to a surface body of water, the Delaware River. The Edgemont facility drains to Ridley Creek, a tributary to the Delaware River.

3.5.1.2 Piedmont Lowlands Region.

The Susquehanna River is the major surface body of water in the region. Numerous streams originating in the low hills drain into the Susquehanna River.

3.5.1.3 Great Valley Region.

There are several north-south flowing rivers in this region. In the east, the Delaware River forms the eastern boundary of Northampton County. The Lehigh River flows between Allentown and Bethlehem. The Schuylkill River flows through Reading while the Susquehanna River is located in the east adjacent to Harrisburg. Numerous streams flow south from the Appalachian Highlands, and several man-made recreational lakes are located in this region. At the Reading facility, overflow from the stormwater detention pond flows into Anjelica Creek, a tributary of the Schuylkill River.

3.5.1.4 Eastern Appalachian Region.

There are several north-south flowing rivers in this region. The Lehigh River flows south out of the region from the Poconos. The Schuylkill River flows south from its origin at Schuylkill Haven while the east branch of the Susquehanna River flows through Wilkes-Barre. Streams trickle down through the draws of the mountainous landscape of this region. Glacier-formed lakes dot the countryside, mainly in the Pocono Plateau.

3.5.1.5 Western Appalachian Region.

The Juniata River and the Western Branch of the Susquehanna River are the two major surface bodies of water in the region. Streams flow down the ridgelines into the valleys. Overflow from the stormwater retention pond at the Lewisburg Reserve Center drains to Buffalo Creek, a tributary of the Susquehanna. The Williamsport USARC is located adjacent to Miller's Run, also a tributary of the West Branch of the Susquehanna.

3.5.1.6 Wetlands.

Only one site (Ashley) contains jurisdictional wetlands subject to regulatory authority under Section 404 of the Clean Water Act (U. S. C . 1251 et seq). This wetland contains portions of palustrine emergent, shrub, and forested habitat. Greencastle and Gettysburg are located adjacent to wet depressions. Wetlands provide critical habitat to numerous insects and other invertebrates which are fed upon by small mammals and birds, and to specialists such as beaver and wood duck that require flowing or standing water. Wetlands are home to many Federally and State listed endangered species. In addition to providing critical habitat, wetlands function to absorb and attenuate flood waters, transform and retain nutrients and toxicants, trap sediments, provide production export to downstream waters, and play a role in groundwater discharge and recharge.

3.5.1.7 Best Management Practices.

Stormwater runoff from sites (pre and post construction) can adversely affect water quality by increasing rate and volume of runoff and by increasing pollutants carried in stormwaters. These impacts are directly related to the impervious area of the facility including roads and parking lots. Increases in runoff rates can cause swale erosion and localized flooding. Many pollutants such as organic chemicals (oils, petro-chemicals, etc.), heavy metals, (lead, etc.), and nutrients such as phosphorus and nitrogen from lawn fertilizers and other sources accumulate on impervious surfaces. Organic matter exerts a Biological Oxygen Demand (BOD) via decomposition in water. Pollutants affect water quality by reducing dissolved oxygen levels, promoting eutrophication, increasing turbidity, smothering macrophytes and benthic animal life, and bio-accumulating toxic chemicals. Stormwater quality and quantity management is necessary to minimize these impacts.

A three-point water quality management plan is recommended to minimize the adverse impacts of facility operations and/or future construction:

- An environmentally sensitive site design.

- Sediment and erosion control plan.

- Stormwater Management Plan.

Army regulations also mandate Stormwater Pollution Prevention Plans, POL Management Plans, and general practices for use of hazardous, toxic, or radioactive products as part of site Standard Operating Procedures.

3.5.1.8 Site Design.

Impervious surfaces should be constructed away from waterways and wetlands. A minimum 25-foot buffer is recommended from non-tidal wetlands and a 100-foot buffer is recommended from tidal wetlands and waterways. Buffers should be maintained from steep slopes as well.

3.5.1.9 Sediment and Erosion Control.

A sediment and erosion control plan should be developed to minimize erosion and prevent excess sedimentation of adjacent waters and wetlands. Sediment control measures should include the use of sediment traps, silt fence and berms during construction operations. Use of vegetated swales adjacent to existing parking areas will help to control nutrient and toxicant runoff, and minimize soil erosion by decreasing flow velocities.

3.5.1.10 Stormwater Management Plan.

A Stormwater Management (SWM) Plan should be designed to manage the quality and quantity of stormwater, runoff from impervious areas. Soil texture at each site should be determined for feasibility of SWM design (e.g., infiltration, detention, retention). In general,

SWM basins should be designed to manage the first one-half inch to one inch of runoff from all impervious surfaces on-site. Quality management may include planting hydrophytic (water-loving) vegetation, design of forebays or post-bays for additional sediment trapping, oil-water separators etc. (See Figure C, Appendix B).

3.5.2 Groundwater.

The majority of the land on a USARC is paved with stormwater exiting the site through storm drains. A small amount of recharge may enter the groundwater via the unpaved portions of the reserve facilities or through stormwater management ponds at Lewisburg, Lock Haven, and Reading. The Edgemont, Worcester, and Greencastle facilities utilize groundwater through on-site wells.

Only Germantown has known groundwater contamination, which was recently discovered during quarterly well monitoring. Interim remedial action , site characterization, etc., is being managed by the U. S. Army Corps of Engineers, Baltimore District. Operations of the existing facilities could potentially result in groundwater contamination due to the presence of USTs, and the storage and handling of POL and other hazardous substances. Leaking of USTs and spills of hazardous substances could result in groundwater contamination. These hazards can be minimized through compliance with State and Federal regulations and use of BMPs for hazardous materials.

3.6 Summary.

The purpose of this programmatic NRMP is to provide guidance in managing the grounds and natural resources inherent to USARCs, AFRCs, and AMSAs throughout the 79th ARCOM. Site specific management plans can be developed by reviewing this document and the Army Technical Manuals pertaining to development of the NRMP. An effective NRMP will require revisions every 3 to 5 years and should provide specific details relating to resource requirements such as man power, equipment, funding, etc. A maintenance and monitoring schedule should be developed for all activities.

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART II
LAND MANAGEMENT AND GROUNDS MAINTENANCE

TABLE OF CONTENTS

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART II - LAND MANAGEMENT AND GROUNDS MAINTENANCE

1.0 INTRODUCTION.

Properly applied maintenance principles and practices will supplement ongoing management efforts, conserve the natural resources on Department of Defense (DoD) lands, maintain and improve the appearance of grounds and promote operational safety and efficiency. The objective of this NRMP is to conserve, develop, manage and maintain all land under DoD jurisdiction in accordance with proven scientific methods, procedures and techniques to facilitate military missions and operations.

1.1 Planted Areas.

The reserve facilities of the 79th ARCOM contain only a few acres of impervious areas within their boundaries surrounded by maintained lawns. These sites have some degree of landscaping of deciduous or evergreen trees and shrubs and mowed lawns except the Germantown USARC, Woodhaven USARC, and Wilkes Barre AMSA which have no grass area and are completely paved. The most common planted trees and shrubs include White Pine, Pacific Yew, Sugar Maple and Pin Oak. The following species are also identified as being used for ground cover or landscaping in the northeastern United States.
(See also Appendix C, Tables 5 through 7).

Shade and Windbreak Trees.
Red Maple (*Acer rubrum*)
Sugar Maple (*Acer saccharum*)
White Oak (*Quercus alba*)
Red Oak (*Quercus borealis*)
White Pine (*Pinus strobus*)
Eastern Hemlock (*Tsuga canadensis*)
Norway Spruce (*Picea abies*)
White Fir (*Abies concolor*)

Ornamental Trees.
Blue Spruce (*Picea pungens glauca*)
American Holly (*Ilex opaca*)
Flowering Dogwood (*Cornus florida*)

Shrubs.
Common Lilac (*Syringa vulgaris*)
Spirea (*Spiraea vanhouttei*)
Arrowwood (*Viburnum dentatum*)
Japanese Yew (*Taxus cuspidata*)
Goldenbell (*Forsythia intermedia*)
Savin Juniper (*Juniperus sabina*)

1.2 Maintenance Services.

Service contracts are used to accomplish grounds maintenance work on lands not outleased. Legal aspects, negotiation and administration is the responsibility of the appropriate contracting officer. In order that monetary consideration may be adjusted, contracts should include a clause providing for negotiation of a change in price if the services under consideration are either diminished, increased, or eliminated. Contracts should include appropriate applicable conditions and specifications pertaining to land management and maintenance practices for the protection of the land involved. All work is to be performed exclusively between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday, unless otherwise authorized by the facility manager/supervisor and at no additional expense to the Government. The Government shall furnish without cost to the contractor, use of electrical and water utilities. A sample 79th ARCOM lawn maintenance contract is provided in Appendix D.

1.3 Irrigation Systems.

Irrigation is desirable to supplement natural rainfall in the maintenance of healthy vegetative growth, but only as a result of drought or to maintain new plantings. Use of native species should minimize the need for irrigation and help to conserve water. Before any irrigation project is undertaken, a schedule of priorities should be developed which takes into consideration the possible consequences of no irrigation or, in case of existing systems, the loss of irrigation capability. Permanent consequences such as loss of turf and landscape plantings should be weighed in formulation of these priority schedules.

1.3.1 Factors Affecting Irrigation.

Where irrigation is necessary, the following factors are of major importance and should be considered:

- The availability of existing water supplies and the feasibility of their use.

- The amount of water required, depending upon the type of plants or turf to be irrigated, climate, terrain, and soil conditions.

- The amount of money allocated to a project.

1.3.2 Irrigation Areas.

All equipment and system components should be selected with regard to maximum service and flexibility consistent with cost. Where there is a recognizable need for frequent water application in a fixed location, consideration should be given to permanent systems with automatic control capability. Areas such as athletic fields and training areas may require irrigation to maintain vigorous turf growth. For further description on design, water source alternatives, and selection alternatives see Army TM 5-630, Chapter 16.

1.3.3 Selection Considerations.

Once irrigation requirements have been quantified, the actual method of distribution and application may be selected and evaluated. Site conditions should be carefully considered to determine the type or types of irrigation best suited to the installation. Local irrigation practices will often provide an indication of which systems are the most feasible in a particular area. It is good practice and beneficial to community relations to provide systems for irrigation which are not considered wasteful in the area in which the reserve facility is located. Once a system is operational, its use and management should reflect good husbandry of water resources.

1.3.3.1 Codes and Regulations.

Any irrigation system installed as an addition to a potable water system must comply with the National Plumbing Code and public health regulations concerning backflow prevention devices and system materials.

1.3.3.2 Long-Range Suitability.

Utilization of an irrigation system will vary widely as a direct result of climatological conditions and turf usage. Estimates should be made to compare various systems over the projected life of a system in order to determine which is most desirable. When two or more systems are equally durable and are of approximately equal cost, preference should be given to the system which is the most aesthetically pleasing.

2.0 MANAGEMENT PRACTICES AND MAINTENANCE PROCEDURES.

2.1 Introduction.

Grounds will be maintained at the levels and intensities necessary to meet the designated use criteria, protect and enhance the natural resources, and ensure a pleasing appearance in harmony with the natural landscape. Designated turf areas will be seeded, renovated, fertilized, and irrigated to the degree required to maintain a permanent vegetative cover of desirable plants, necessary to support the intended use, but should take into account water quality considerations.

2.2 Planting.

All planting, pruning, cultivation, and other maintenance will conform to criteria set forth in Army TM 5-630. Trees and shrubs will be removed if they have become crowded or, if they are not essential for shade, windbreaks, screening of unsightly objects, or erosion control; complementary to architectural features of the building area; adapted to the locale. Existing and new foundation plantings will be limited to the minimum needed to complement the building design. Normally not more than one-fourth of an individual foundation perimeter will be planted with shrubs or trees. The expenditure of appropriated funds for shearing hedges and ornamental plants into formal or decorative designs is not usually authorized except as specifically prescribed in an approved planting plan. Climbing vines, shrubs, and trees which block or damage windows, eaves, gutters or other construction components will be eliminated. Plantings which reduce sight distances or otherwise constitute a traffic

hazard near street intersections, walks, and drives will not be permitted. Nonessential plantings which result in excessive lawn maintenance will be removed. Painting or whitewashing of tree trunks is not authorized. Lastly, planting and maintenance of flowerbeds, rose gardens, and nut or fruit trees for their edible products, except for wildlife food purposes, are not facilities engineering responsibilities.

2.3 Mowing, Edging, Trimming and Weeding.

Timely mowing will prevent noxious weeds from growing to seed. Mowing shall be accomplished to provide 1-1/2" height in months of May through September and a 2" height in October and November. To prevent damage to the turf all clippings will be removed from the mowed areas within (4) hours after being cut. Weeds and grasses adjacent to structures such as buildings, loading platforms, helipads, curbs and surfaced areas shall be trimmed. The trimming shall be accomplished using hand or power driven clippers or shears to remove all undesired vegetation. Weeds and grass in landscaped areas, such as flower beds and woody plant areas, and pavement seams and cracks shall be removed by hand pulling operation. All grass along concrete walks will be edged and trimmed. There shall be no more than 1/2 inch between grass and adjacent paved/cement surface. All trimmings will be removed within four (4) hours after being cut.

2.4 Irrigating Systems.

2.4.1 Installation.

Of equal importance with the design of an irrigation system is the accuracy of its installation. Care must be taken to insure that the installation is completed according to plans and specifications. After completion, construction and as-built plans of all permanent systems should be kept on file at the reserve facility. All pipes carrying non-potable water should be identified in the field and on the plans to prevent accidental cross-connections. All valve locations should be shown on the plans and should be referenced to three permanent landmarks wherever possible. If the installation has plumbing shop valve books, this information should also be included in them.

2.4.2 Operating Procedures.

The responsibility for operation, scheduling, and inspection of the system should be clearly defined. The knowledge gained in operating the system should be combined with the instructions of the designer to formulate a set of standard operating procedures for the system. These procedures, together with a copy of the as-built plans and emergency procedures should be made available to the facility manager. Final coordination should be made with all who assisted in the design to insure that the system is at optimal operation upon initial work acceptance.

2.4.3 Field Checks.

Field checks of ground moisture after the sprinkling cycle are beneficial in adjusting the system. Field operation tests can be performed using readily available materials. Hose system output can be measured by recording the time required to fill a garbage can of known capacity. The capacity in gallons is then divided by the minutes required to fill the container in order to

determine the rate in gallons per minute. Sprinklers can be measured by placing several cans in the spray pattern for an hour. After one hour, the depth collected in the cans is measured, and the output is expressed as inches per hour.

2.4.4 Water Meters.

Whenever economically feasible, an irrigation system should be equipped with a metering device. The meter can be used to provide valuable information that will aid in developing an optimal irrigation schedule.

2.4.5 Irrigation System Maintenance.

Routine maintenance should be scheduled as needed to prevent major breakdowns. Local conditions and the type of system will determine the frequency of maintenance required. Records should be kept on which components in any irrigation system experience failure. After a period of time, any trouble spots requiring remedial action should become evident. Seasonal irrigation needs should also be included as a section within a facility's Standard Operating Procedures. Where winter freezing is a possibility, the system should be designed so that it may be winterized to prevent damage from freezing.

2.5 Policing.

It is the responsibility of the facility manager/supervisor to ensure the terms and specifications of the grounds service contract are adhered to. Day-to-day police of litter, paper, bottles and cans from USARC grounds is a reserve facility responsibility.

2.6 Disease and Insect Control and Sanitation.

2.6.1. Herbicides.

The Herbicides Manual for Noncropland Weeds (TM 5-629) provides a thorough discussion and description of herbicides and their uses. Herbicides used in landscaped areas will be accomplished on a case-by-case basis and will be relatively non-toxic to trees, shrubs, and ground covers such as pachysandra, myrtle, English ivy, euonymus, and ajuga, and they should keep both annual and perennial weeds and grasses under control. An Integrated Pest management Program should be implemented which minimizes the use of chemical controls for weeds, insects, etc.

2.6.1.1 Precautions.

When herbicides are used, the support installation licensed personnel/contractor will use caution to spray only unwanted weeds and grasses and not the foliage of landscaped or native plants. Selective herbicides which may be safe for many plants may be toxic to some species. The phototoxicity warnings on pesticide container labels will be carefully observed.

2.6.1.2 Edging and Spot Sterilization.

Herbicides termed soil sterilants not only provide complete kill at application but also remain in the soil for varying periods of time during which they kill any introduced seeds or plants.

Soil sterilants will be used with extreme caution, if used at all, in landscape planting since their transport in water runoff after rain or irrigation or their drift during application may result in injury to desirable plants.

2.6.1.3 Plant Growth Retardants.

No one chemical or group of chemicals can be considered outstanding with all species and varieties of plants. Chemicals to retard shoot growth and development cannot be recommended as a maintenance practice. Growth retardants in landscape maintenance can be used to eliminate or decrease pruning and to reduce the growth rate of grass in order to save mowing costs.

2.6.2 Pesticides.

Insect and disease damage is often difficult to identify. When vegetation becomes unhealthy for reasons not readily explained by infertile soil, lack of moisture or other common causes, inspect leaves and branches carefully. Gypsy moth infestation is prevalent in the northeastern United States. Although no evidence of gypsy moths was identified at any 79th ARCOM sites, monitoring should be conducted at regular intervals. Severe infestations result in decimation of oak trees, their preferred food. The Military Entomology Operational Handbook, TM 5-632 contains valuable guidelines on insects which damage vegetation. These guidelines include, but are not limited to, biological characteristics, vegetation affected and control.

Use of chemical pesticides for the protection and control of vegetation is permitted on a case-by-case basis and only upon approval by the 79th ARCOM. Pesticide application and handling will be accomplished by support installation licensed personnel/contractors only and will be in accordance with acceptable guidance given in AR 200-1, AR 420-74, TM 5-629, TM 5-630, and TM 5-632, and Integrated Pest management Program guidance.

2.6.3 Fungicides.

Fungicides are substances which kill or inhibit fungi and other plant pathogens on or in plant tissue. Fungicides containing such heavy metals as mercury, cadmium, and zinc, which actually kill fungi spores, have been banned by the Environmental Protection Agency (EPA). Therefore, the majority of fungicides in common use are repellents or protectants which prevent the spores of fungi from germinating and infecting the foliage, fruit, or other parts of a plant. It is usually necessary to repeat applications of fungicide frequently in order to maintain a covering on the plant. The principle physical formulations of fungicides include: dusts, wettable powders, emulsions, chemical types, antibiotics, complex organic compounds, sulfur and copper.

2.6.4 Current Practices.

Use of herbicides, retardants, pesticides, or fungicides is permitted on a case-by-case basis and only upon approval by the 79th ARCOM. Aforementioned chemicals will be applied by licensed personnel only and will not be stored at the reserve site. Material Safety Data Sheets (MSDS) must be present before any chemical is used on site.

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART III
NATURAL RESOURCES FOREST MANAGEMENT

TABLE OF CONTENTS

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART III- NATURAL RESOURCES FOREST MANAGEMENT

1.0 INTRODUCTION.

The purpose of the Forest Management Plan is to provide guidance, standards, and technical aids to foresters, land managers, and others concerned with protection and management of forest land at Department of Defense installations. An in-depth Forest Management Plan is required of installations with 100 acres or more of merchantable timber land. Since the 79th ARCOM does not support any commercial forest land, general guidelines for forest management practices will be provided to promote the intent of implementing regulations and Executive Orders set forth in AR 200-1.

The goal of this Forest Management Plan is to provide protection of threatened and endangered species and to develop and maintain wildlife habitat within the constraints of normal forest management principles.

Only the Edgemont USARC/AMSA contains appreciable forest land. Several other facilities have small wooded patches and these facilities may extract useful management practices from this plan.

2.0 FOREST LAND.

The woodland occupied by 79th ARCOM sites is considered non-productive land not capable of producing 20 cubic feet per acre per year of harvestable timber. The Edgemont USARC/AMSA is an example of an early to mid-successional deciduous regrowth forest. Species present are indicative of past disturbances. Dominant overstory species observed include ***Shagbark Hickory*** (*Carya ovata*), ***Mockernut Hickory*** (*Carya tomentosa*), ***Black Cherry*** (*Prunus serotina*), ***American Elm*** (*Ulmus americana*), ***Green Ash*** (*Fraxinus pennsylvanica*), and ***Tulip Poplar*** (*Liriodendron tulipifera*). Understory species include ***Flowering Dogwood*** (*Cornus florida*), ***Smooth Arrowwood*** (*Viburnum dentatum*), ***Spicebush*** (*Lindera benzoin*), and ***Virginia Creeper*** (*Parthenocissus cinquefolia*). Species indicative of forest edge communities (e.g., ***Poison Ivy*** (*Toxicodendron radicans*), and ***Blackberry*** (*Rubus sp.*) were observed along the forest edge.

The average diameters at breast height (DBH) of overstory species is approximately eight inches. The canopy cover is characterized by 75 to 90 percent closure and a medium dense understory.

3.0 GENERAL BEST MANAGEMENT PRACTICES.

To ensure a constant source of hard mast (e.g., acorns), at least 50 percent of the forest should be oaks and hickories. Other sustainable species include American Beech, Blackgum, Tulip Poplar and Red Maple (See Table 3, Appendix C for scientific names). These hardwood species all provide fruits/seeds valuable in managing woodland habitat for mammals and birds (e.g., gray squirrel, deer, wild turkey).

Should active forest management be desired, clearcutting is not recommended as this results in forest fragmentation which is detrimental to forest interior dwelling birds. Selective harvesting is recommended to accomplish forest thinning, however a 125-year or longer rotation period should be utilized to allow physical maturity of the oaks and hickories.

Dead trees should be left standing to provide dens for cavity nesting species (e.g., gray squirrel, woodpeckers). Artificial nest boxes should be erected where there are less than two larger (15 inch or greater DBH) den trees per acre.

Periodic on-site Gypsy Moth surveys should be conducted as oaks are their preferred food. If egg mass density is determined to be a significant threat to on-site forest resources, a spray program can be implemented upon approval by the 79th ARCOM. Infestation should be controlled by use of the biological control Bt, and not by the insecticide dimilin.

4.0 MANAGEMENT FOR FOREST INTERIOR DWELLING BIRDS

Forest interior dwelling birds are species that require large tracts of deciduous or mixed coniferous and deciduous forest in which to breed successfully (Bushman and Therres, 1988). Nineteen such species of birds can be found breeding in the Coastal Plain and Piedmont. Steady declines in the populations of forest interior birds over the past 30 years resulting from forest clearing practice for development and agriculture, has resulted in efforts to protect the breeding habitat of these species.

The breeding ranges of eighteen of the nineteen species of forest interior dwelling birds incorporate 79th ARCOM facilities. Table 8 lists these species along with a summary of their requirements for nesting and feeding, minimum and optimum forest size, and forest age. Species-specific management requirements are also listed. Although contiguous forest patches of at least 250 acres are generally required to sustain viable populations of many of the forest interior birds listed in Table 8, most of these species have been found breeding in forest patches of less than 50 acres. Within the 79th ARCOM there are four sites (Edgemont, Bristol, Willow Grove and Worcester) that contain or are adjacent to contiguous forest which could support one or more of the forest interior species. Three of the four year-round resident forest interior dwelling species (Pileated and Hairy Woodpeckers, Red-shouldered Hawk) are likely within these forested tracts. With the exception of these species and the Barred Owl, the other fourteen forest interior birds would use these habitats only during the spring and summer breeding seasons.

Clearly, a single management strategy will not satisfy the habitat requirements of each species. However, to effectively manage forest interior breeding birds, one must protect large forest tracts so that different successional stages, each important to the different species, can occur. Forest tracts should be protected from clearcutting to insure the continued use by forest interior breeding species. This becomes increasingly important as development threatens to reduce the amount of forest adjacent to the large on-site forested areas. Following is a list of recommendations modified from Bushman and Therres (1988) that should be considered for effective management of large forested tracts:

- Survey forest tracts during the breeding season to determine the number of forest interior breeding species present within each patch.

- Minimize forest alterations and other disturbances during the breeding season whenever possible.

- Avoid fragmentation of large forest tracts by limiting clearing for agriculture, roads, and buildings.

- Selectively harvest the higher species diversity forests and riparian woodlands in lieu of clearcutting.

- The forest canopy should not be removed in excess of 30% clearing.

- Retain snags 10 inches DBH or greater. Remove snags which protrude above the forest canopy to discourage the parasitic Brown-headed Cowbird.

- Replacement or conversion of hardwood or mixed forests to pine dominant forest is discouraged.

- If clearcuts are necessary they should be planned in a manner that minimizes edge. Circular or square cuts produce the least amount of edge.

- During any cutting operations leave at least several uncut hardwood trees of 3 inch or greater DBH per acre. Cluster these young trees if possible.

- Leave uncut forested buffers along the steams and roadsides. The wider the buffer, the more benefit it will provide to forest interior birds.

- Forest tracts should be evaluated for susceptibility to Gypsy Moth induced mortality. If this threat is significant, infestation will be controlled by the use of Bt upon approval by the 79th ARCOM.

5.0 SUMMARY.

Facilities of the 79th ARCOM contain a limited amount of forest land. Those that do contain woodland should manage them for maximum habitat quality. Limited forest stand manipulation can be implemented to help sustain wildlife including forest interior dwelling birds. Additionally, forest habitat can be expanded by allowing lawn areas to revert to forest naturally, or by planting. Additional forest management practices and references can be found in Army Technical Manual 5-631.

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART IV
FISH AND WILDLIFE MANAGEMENT

TABLE OF CONTENTS

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART IV - FISH AND WILDLIFE MANAGEMENT

1.0 INTRODUCTION

The objectives of the fish and wildlife management plan are to provide, compatible with the military mission, the long range and annual plans of work for fish and wildlife habitat development and maintenance. The plan will integrate fish and wildlife management practices with other natural resource management work, with emphasis on the multiple use concept.

Although the 79th ARCOM sites are small, mostly urban facilities that support few wild animals, this report will incorporate suggestions for preservation and habitat enhancement where possible, to promote wise land stewardship and thereby meet the intent of AR 420-74 and Technical Manual 5-633. To accomplish this goal, management practices will be addressed to protect the natural beauty of open spaces within the ARCOM, and to improve and enhance areas that may directly or indirectly support fish and wildlife resources.

The 79th ARCOM facilities may use this information to design site-specific management plans based on available resources. No hunting or fishing is currently conducted on any 79th ARCOM facility and there are no existing cooperative agreements with State or Federal agencies, or local organizations concerning fish and/or wildlife management.

2.0 FISH AND WILDLIFE RESOURCES

2.1 General.

Due to their small size and safety constraints, hunting and fishing are not a management objective on Army Reserve facilities, thus this plan will focus on non-game species. Although species differ between physiographic zones in Pennsylvania, all the facilities, because of their urban settings, generally support the same types of mammals, birds, reptiles and amphibians. Sites located adjacent to waterways should reference Section 3.5 of Part I of the Natural Resources Management Plan for best management practices that promote good water quality and thereby protect fish habitat in nearby streams and rivers.

2.2 Description of Fish and Wildlife Areas.

Fish and wildlife areas include any open space land or open water areas that provide habitat for wild animals. Habitat includes the combination of food, water, cover and space required for an animal to carry out its life cycle including nesting/breeding areas. Appendix A, Figures 2 through 33 show a general layout of each site. Most sites contain mowed lawn with trees and shrubs as the only available habitat components. Some sites (Reading, Lock Haven) have stormwater management basins which could be enhanced to provide additional habitat. The larger former NIKE sites (Edgemont, Bristol, Worcester) contain open space or woodland to potentially support a larger variety of species, and several other sites (Williamsport, Marcus Hook) are located directly adjacent to waterways which provide aquatic habitat as well as a

water source for common species. The Ashley, Greencastle and Harrisburg sites include undeveloped land or land adjacent to a baseball field that could be enhanced for wildlife.

It is important to recognize that even the smallest, most urban sites can still support and do support wildlife including songbirds and small mammals. Even these sites can be enhanced to provide higher quality habitat while still supporting a military mission.

2.3 Existing and Observed Wildlife Resources.

2.3.1 Wildlife Food and Cover.

A list of vegetation observed during site visits is provided in Table 3, Appendix C. Most facilities already have a landscape planting plan which identifies the planted species on each site. Additional common species are described in the Natural Resource Management Plan Part I, General, Section 3.0 on common plant communities of Pennsylvania. Other native species of value to wildlife are provided in Appendix C, Tables 5, 6, and 7.

2.3.2 Native Wildlife.

Table 4, Appendix C, includes a list of species observed during site visits. Appendix C, Tables 9 through 12 contain lists of other native species of birds, mammals, reptiles and amphibians common to eastern and central Pennsylvania that may visit and use resources on 79th ARCOM facilities.

Numerous species of mammals, birds, reptiles, and amphibians likely utilize facility upland and wetland habitats. Mammals likely to be observed throughout the ARCOM field, lawn, or forest habitats include Virginia opossum; southeast shrew; eastern mole; several bats including gray myotis, silver haired bat, eastern pipistrel, red, big brown, and evening bats; red and gray fox; raccoon; eastern chipmunk; eastern gray squirrel; field mouse, white-footed mouse; Norway and black rat; eastern cottontail; groundhog; skunks; and white-tailed deer.

Numerous species of songbirds waterfowl and raptors utilize facility habitats. Canada Goose and mallards may use on-site puddles and feed in mowed fields. Vultures and hawks may be seen soaring overhead or perching in tall trees. Common songbirds such as sparrows, chickadees, titmice, woodpeckers, and mourning doves also use facility habitats.

Reptiles and amphibians are less frequently observed, but many species of snakes, lizards, skinks, turtles, frogs and toads, or salamanders are present in eastern and central Pennsylvania as well.

2.3.3 Threatened and Endangered Species.

No State or Federally listed rare, threatened, or endangered wildlife species were identified at any of the facilities during the site visits. To conclusively determine the presence or absence of these species, in-depth surveys are required. A list of Pennsylvania Biota of Special Concern is included in Appendix D. Questions concerning the lists or recorded observations should be directed to the Pennsylvania Department of Environmental Resources, Bureau of Forestry, Division of Forest Advisory Services (Natural Diversity Inventory).

3.0 WILDLIFE MANAGEMENT AND HABITAT IMPROVEMENT.

The following text outlines opportunities for the development of a wildlife management program throughout the 79th ARCOM. Facility managers/supervisors must choose appropriate management practices based on available site resources. Involving site employees, reservists, members of the community, conservation groups, and local, State, and Federal government agencies is highly recommended in the development and implementation of wildlife management programs. By including outside parties, there is a greater probability of managing habitats and ecosystems at a regional scale rather than in small disjointed habitat patches.

3.1 Management Goals and Strategies.

Various components are necessary to insure that site specific management programs are a success. This plan includes a set of broad habitat goals along with specific projects that can be implemented for various habitat types (e.g., fields, forest, or specific species). The following text explains integral components of a management program.

3.1.1 Inventory plant and animal species found on-site.

An important aspect of any management program is to develop a baseline inventory of plant and animal species located on each site. Species data obtained will be valuable in developing specific management objectives and for documenting changes in species richness and abundance as a result of having a wildlife management program.

Conducting an inventory also promotes participation from interested employees and others with experience in birding, wildflower enthusiasts, or amateur naturalists. Involving local groups such as the Audubon Society or local garden clubs and universities can develop positive community relationships while providing sources of assistance and information.

To provide a complete inventory of all plants and wildlife on site, a survey should be conducted at least once during each season to allow viewing of species present at various times of the year. After an initial inventory is complete, it should be reviewed periodically to monitor changes in species diversity and abundance. (Refer to TM 5-633 for inventory techniques).

3.1.2 Develop a site specific wildlife management plan.

Once baseline inventories are created, a habitat management plan can be developed for each site. Management plans need not be highly detailed or formal documents, but should identify specific objectives (e.g., management of habitat enhancement or species specific management) and include descriptions of the techniques chosen to achieve designated management goals, as well as an implementation schedule.

Management plans must address the four requisite habitat parameters: food, water, cover, and living/breeding space.

3.1.3 Implement Maintenance and Monitoring Programs.

Plans for maintenance of wildlife management programs and monitoring of implemented projects must be in place before the actual projects begin. Maintenance and monitoring are both integral parts of wildlife management programs.

Maintenance such as watering is required for most planting projects, at least initially, to insure successful plantings. Once plantings are established, minimal maintenance is typically required. Other projects involving seasonal mowing or disking require equipment, and that maintenance be performed according to a schedule. Monitoring is required for all projects to assess the condition of equipment, and use of habitat areas by wildlife. Nest box programs, in particular require rigorous monitoring on a weekly schedule during breeding season. Maintenance and monitoring will be addressed for specific management techniques where applicable throughout this report.

3.2 Habitat Enhancement Goals.

It is important when developing wildlife management programs, that an entire area be evaluated, particularly in reference to the specific plant communities and wildlife species that are being targeted. Independent projects such as placing nest boxes or planting trees and shrubs meet part of an animal's habitat requirement, however, if water and abundant space are not available, the species will not remain on site. Managing habitat types (e.g., forest, stream, field) and ensuring there is a diversity of vegetative cover types will lead to greater program success and increased diversity of wildlife. In addition, managing your site to allow wildlife to safely travel throughout an area will insure greater variety and breeding success.

Clear identification of site goals and objectives can help avoid conflicts between land use management and wildlife habitat enhancement goals. For example, excessive mowing and maintenance of grassed lawns, or use of exotic (non-native) plants in landscape designs may prevent the presence of many native wildlife species.

The following sections provide suggestions for different habitat enhancement projects that can be applied to sites within the 79th ARCOM. Many reserve sites are small, thus suggested projects for a particular habitat type may not be applicable.

3.2.1 Forest Projects.

As land is developed, forests become fragmented and the diversity of wildlife species utilizing small forested patches decreases. To enhance the value of forest patches or islands, a corridor system can be designed to connect isolated patches providing travel corridors for wildlife and increasing the availability of forest cover.

Forest interior birds, such as American Redstart and Ovenbird require large unbroken tracts of forest land (greater than 80 acres) for breeding. Some bird species require dense growth, some are found only in the canopy, others are ground nesters (refer to Forest Management Plan for Management Recommendations of Forest Interior Breeding Birds). Many species of hawks and owls nest in the forest and hunt over open fields.

Other wildlife such as Carolina Wren, Bob-White Quail, and Cottontail Rabbit are mot commonly found in "edge" habitat which is the brushy transition zone between the forest and open fields. Maintaining a well-balanced forest, with different aged stands of trees and different sized stands, will provide for many types of wildlife.

A forest management plan involves identifying the vegetation and animal species which are present, developing goals for the area (e.g., wildlife diversity), creating a budget for the program including both time and money considerations, and setting up an implementation schedule for the project. In addition, there are many people available to assist your facility with the development of the plan. State foresters or professors in the forest ecology department at local colleges can assist with the development of this plan. It should be understood by the forester that wildlife management is the main goal of the site. The following are steps which should be included in the development of the forest management plan. They provide guidance to get started and, if a forester is contacted to assist you, it will provide background for a site visit.

An inventory should be one of the first projects which is initiated in a forested site. The trees which provide the most benefits for wildlife (e.g., beech, hickories, oaks, cherry) should be marked for preservation. If the preferred species are extremely close together, the largest or healthiest specimens should be selected. Snags (dead standing wood) should also be identified for preservation. Once the entire site is reviewed, a plan can be developed to thin the trees and to produce more snags. Thinning the trees will "release" the selected specimens and allow them to branch out and use their energy to increase their mast (food) or fruit production. This practice will also open the closed canopy to encourage the growth of herbaceous plants, and small trees and shrubs which are important food plants. The understory vegetation will provide benefits for Box Turtle, lizards, Red-Eyed Vireos, and Ovenbirds, for example.

Thinning the trees can be completed by using the following two methods: selective cutting or girdling. Selective cutting involves cutting the trees down. In upland forest, leave the trees lying on the ground or create brush piles to provide cover and to enrich the soil as they decay. Girdling should be done on some of the larger trees which are not selected for preservation. This is done by making a two inch wide cut around the circumference of the tree to a depth which removes the bark and cambium (green layer under the bark). The tree will slowly die and a "snag" will be formed. A "snag" is a standing, dead tree which provides nesting sites for cavity nesting birds and provide perches for raptors and many other birds. As the tree decays, hollows may form and provide dens for fox, raccoons and squirrels. Insects burrow in the wood and provide a food source for species higher on the food chain such as woodpeckers.

Nest boxes can be erected in forest habitats to enhance habitat for forest cavity nesters. Refer to Appendix E for nest box designs.

3.2.2 Field/Lawn Projects.

Many reserve facilities are located on such small tracts that they must maintain a mowed lawn with landscaped plantings. On these sites, habitat enhancement may be limited to small-scale projects such as the addition of higher quality plants for food and cover, bird or bat nest boxes, and butterfly gardens, for example.

3.2.2.1 Delayed Mowing.

A variety of species are adapted to relatively open space with minimal amounts of cover. Maintaining these open areas in an early successional stage with periodic mowing will provide nesting cover for species such as bob-white quail, rabbits, mice and moles, all of which are important predator food species. Where possible, a "delayed mowing" schedule is preferable to allow wildlife to raise their young without being disturbed. Mowing in late summer or early fall (September/October) will insure that spring and summer nesting is completed and that the young of the year are strong enough to move away from the area. One of the factors limiting the populations of quail, meadowlarks, and other field nesting species is the destruction of the nests and brooding birds due to mowing lawns and fields at the wrong time of the year. Fawns and young rabbits also become victims if fields are mowed during the late spring and summer months. Their protection mechanism is to remain perfectly still and, unfortunately, the tractor operator is often unable to detect them in tall grass.

Adhering to the mowing dates is very important to avoid destroying nests, the young of the year, and even adults. The mowed field at Edgemont may be suitable for a delayed mowing program.

3.2.2.2 Field Border Management.

In large open areas such as at Edgemont or Bristol, field border management can provide additional food and cover resources around field edges, along roadways, or other areas that are traditionally managed as mowed lawns, but could be converted to low maintenance wildlife habitat. A field border strip approximately 20 to 50 feet wide can be planted with taller grasses, briers, and shrubs to form a transitional area between the forest and field. Species suitable for planting include raspberry, blackberry, wildflowers, and grasses. Be sure to check listings of local nuisance species before planting.

3.2.2.3. Butterfly and Hummingbird Gardens.

Another alternative for mowed areas and fields is to plant wildflower meadows that will supply nectar to butterflies and hummingbirds. Wildflower areas can also be included along an interpretive trail with signs that describe and identify plants. The meadows in bloom would also provide projects to be seen by a large number of full time employees and reservists to increase interest in the wildlife program. Native wildflower meadows can be planted in large field areas or in small garden areas near buildings. These areas would require a minimum of maintenance and mowing and species that would benefit include bees, birds, butterflies, hummingbirds, rabbits and rodents.

Some species of wildflowers beneficial to butterflies are butterfly bush, milkweed, bee balm, summer phlox, verbena, parsley, and mint. Additional wildflowers include asters, goldenrod, pearly everlasting and fleabane. Hummingbirds are attracted to bright red, tube-shaped flowers. Petunias, hollyhocks, gladiolus, trumpet creeper, bleeding hearts, paintbrushes, and cardinal flowers are a few of the species to include although you may need to experiment on which species are most successful in your area.

3.2.2.4 Nest Box Programs.

Many species of birds have declined in numbers due to loss of natural nesting cavities. To assist with providing suitable nest sites for cavity nesting species, artificial nest boxes can be erected. Species which prefer open habitat or edge habitat are Eastern Bluebirds, Carolina Wrens, Carolina Chickadees and Tufted Titmice. Bat boxes can also be erected. Remember that nest boxes must be monitored during the breeding season and maintained each year. Nest box programs are suitable for community outreach programs, scout groups, and school groups to assist with all phases of planning box placement, constructing boxes and monitoring.

Bat boxes provide cover for roosting bats. Bats are misunderstood mammals which are very beneficial to humans as a means of insect control (especially mosquitoes), in addition to being important members of several ecosystems. Many bat populations are declining due to loss of habitat, thus erecting boxes would help to provide both habitat and additional information regarding bat box management. Bat boxes can be erected near buildings or along field borders within reasonable proximity to a pond or stream. This placement will provide ready access to insect foraging.

Eastern Bluebirds nest in cavities located in open areas with perch sites nearby from which they hunt for insects. Along roadways or open areas on forest edges would provide excellent bluebird habitat. Boxes should be placed approximately 100 yards apart in open areas having short or sparse ground vegetation. (See Appendix E).

A nest box trail can be established along forest edges or property lines to attract **Chickadees, Wrens, and Tufted Titmice**. A nest box trail is simply a line of boxes which can be easily monitored by walking a designated pathway. The boxes should be placed on posts on the edge or just inside the wooded areas or vegetated fence lines with predator guards placed on each one. Spacing the boxes with a distance of 25 yards between each one will allow for the territorial requirements of the birds. (See Appendix E).

3.2.2.5 Food Plots.

To increase habitat diversity in field/lawn areas, **food plots** and/or **shrub plots** can be planted. Small plots can be planted with corn, millet, sorghum, or soybean to provide forage for deer and rabbit. Shrub plots provide cover and food for songbirds and small mammals. Shrubs including bearberry, red chokeberry, flowering or red-osier dogwood, smooth and staghorn sumac are fruiting/flowering species. Plantings should be done in early spring after danger of frost is over or during the fall growing season. Note: Keep in mind that food plots require preparing the plot and replanting each year.

3.3 Streams and Wetlands.

Numerous studies have documented the functional values of wetland ecosystems including nutrient/toxicant retention, groundwater recharge and discharge, flood flow alteration (abatement), sediment stabilization, primary production in energy cycling, and fish and wildlife habitat. The streams and wetlands on and adjacent to 79th ARCOM sites may provide habitat to fish, in addition to many insects, reptiles and amphibians. Birds and mammals may feed and use these water sources, as well. Usually in urban settings there is an influx of excessive pollutants to on-site streams resulting from uncontrolled runoff.

Best Management Practices for lawn fertilizer application, agriculture fertilizer applications, stormwater management, and waste disposal should be implemented at all sites.

For example:

- Use slow release fertilizers and disk into soil rather than surface spreading when possible.

- On-site stormwater management facilities should provide both quality and quantity management of runoff from all impervious surfaces. These facilities can be designed to enhance habitat by incorporating wetland design into stormwater basin design (See Figure C, Appendix B).

- Preserve or restore vegetated buffers, especially forested buffers along stream channels and wetlands to minimize erosion and enhance pollutant removal. Vegetated buffers to wetlands and streams, at least 50 feet wide (preferably wider), are recommended.

- Implement public educational programs promoting restricted use of lawn fertilizers, proper disposal of automobile and household substances, and planting of trees.

- Implement a water quality monitoring program, to assess stream parameters where streams enter and leave the site. This will provide documentation of water quality before the water enters the site and as it exits the site. Pertinent parameters include temperature, pH, dissolved oxygen, biological oxygen demand, total nitrogen, total phosphorus, turbidity, etc. Conduct fish and invertebrate surveys to further document water quality. Data can be collected and charted for use in conservation award submittals.

3.4 Miscellaneous and Future Projects.

3.4.1 Educational Opportunities.

Many schools are looking for sites which will complement and demonstrate the subjects being taught in class. Today, as more and more schools are including environmental studies in their curricula, visible demonstration of environmental consciousness is extremely important, especially in urban and rural residential areas. If teachers can show or involve the students in projects outside the classroom, their messages will be clearer to the students. Forests, wetlands, streams and other habitats can provide a unique opportunity to educate students on a variety of topics including wildlife that inhabits the area, plant species found in and around various ecosystems, the ecological benefits of wetlands, water quality studies, wildlife management techniques - the possibilities are many and site access often does not conflict with mission requirements.

3.4.2 Nature Trail Creation.

A nature trail which connects wetland, and forest with open field, and streamside habitats would provide a valuable educational experience by demonstrating the different type of habitats which are used by wildlife. Markers and/or a trail guide could be developed as educational tools for those using the trail. A species checklist in the trail guide would provide visitors with a challenge to see if they could observe all of the species found on the site. Nest boxes, perches and unique features such as stormwater management ponds could be explained using

the markers or guide. Plant species could also be identified, including trees, shrubs and wildflowers. The history of the property could also be included as part of the interpretive program. Employees/Reservists could provide much of the information for inclusion on signs or in trail guides. This project may be possible at Harrisburg, Reading, Edgemont, Lock Haven, Ashley, Williamsport, Gettysburg, or Greencastle.

A cooperative program could be developed between the reserve facility and a local high school class to create the nature trail. Once the trail is developed, nature hikes for schools, local community groups, and the families of reservists could be held demonstrating the value of urban wildlife programs.

Refer to Part V, Section 4.4 of the NRMP for an explanation of potential conservation award categories.

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART V
OUTDOOR RECREATION AND CULTURAL VALUES

TABLE OF CONTENTS

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
PART V-OUTDOOR RECREATION AND CULTURAL VALUES

1.0 INTRODUCTION

1.1 General.

Outdoor recreation resources are natural resources which provide opportunities for outdoor recreation of various intensities. There are no identified natural resource areas managed for multiple use that support intensive recreation within the 79th ARCOM. All areas that can support low intensity recreation need to be maintained or enhanced to provide recreational activities for U.S. Army Reserve personnel and their dependents.

1.2 Definitions & Application to the 79th ARCOM.

1.2.1 Outdoor Recreation Area.

An outdoor recreation area is a land or water area with characteristics that make it suitable for one or more specific outdoor recreation activities. It does not however, include athletic facilities such as ball fields. There are no identified outdoor recreation areas within the 79th ARCOM.

1.2.2 Concentrated Recreation Activities.

Concentrated recreation activities occur within limited areas which can accomodate intensive use. These activities include: camping (tent and trailer), picnicking, boating (requiring ramps, docks, piers or marinas), water-skiing, swimming, winter sports (skiing, sledding, skating), etc. There are no identified concentrated recreation areas within the 79th ARCOM.

1.2.3 Dispersed Recreation Activities.

Dispersed recreation activities occur within larger areas which can accommodate limited use. These activities include: hunting, fishing, boating, hiking, climbing, nature study, bird-watching, etc. The following installations of the 79th ARCOM have potential areas that could be further developed or enhanced to qualify as a dispersed recreation area for non-consumptive activities including nature study, bird watching or hiking. These include: Ashley, Bloomsburg, Bristol, Edgemont, Greencastle, Lock Haven, Williamsport, and Worcester. The Reading site is located adjacent to a hiking trail which can be utilized by reserve personnel.

1.2.4 Special Interest Area.

A special interest area is an area with an outstanding feature, natural or man-made, which contributes cultural value and may provide passive recreation opportunities. The Greencastle AMSA and Harrisburg USARC have access to ball fields that qualify as a special interest area.

1.2.5 Archeological, Historical, Geological, and Botanical Special Interest Areas.

This will be addressed in the appropriate sections of the Cultural and Natural Resource Management Plans respectively.

1.2.6 Scenic Area.

A scenic area is an area of outstanding natural beauty. The Marcus Hook Marine AMSA provides a special interest area due to its location on the Delaware River that is ideal for a picnic or just to watch the sunset. This area could be managed for the preservation and protection of its scenic importance in conjunction with its military mission.

1.2.7 Natural Resource Base.

The natural resource base consists of those natural and physical attributes which make up a land or water area. Among the attributes are soils, topography, drainage characteristics, water bodies, climate, vegetation, wildlife, and aesthetic appearance. The natural resource base, because of difficulties with one or more of these attributes, may preclude use of an area as an outdoor recreation area. On the other hand, the natural resource base can contribute to the value of an outdoor recreation area, or due to its own inherent value, it may cause an area to be designated a special interest area.

2.0 PLANNING OUTDOOR RECREATION AREAS

2.1 General.

In planning for outdoor recreation, it is important to first identify, the natural resource base and second, the needs and desires of potential users. Only when these factors have been given adequate consideration, can one select the appropriate area(s) for outdoor recreation. Additional references are included in Army Technical Manual 5-635.

2.2 Site Analysis.

Site analysis is fundamental to understanding the natural resource base and the manmade framework in which a reserve facility operates. Site analysis involves not only acquiring and documenting information about existing and proposed conditions (location, soils, topography, infrastructure), but also evaluating that information in terms of both advantages and disadvantages for selection of an outdoor recreation area. Site analysis should be coordinated with the facility master plan. For more detailed descriptions on site analysis of the 79th ARCOM, see Part 1 of the NRMP.

2.3 Program Analysis.

Determining which recreational activities are needed and desired by any population, civilian or military, can be the most difficult step in planning for outdoor recreation. It is important to know who are the potential users of an outdoor recreation area in order to estimate accurately both the type and the quantity of recreation facilities needed. In the case of the 79th ARCOM,

it is probable to determine that outdoor recreation areas will be used primarily by military personnel and their dependents. It is necessary to determine whether the potential users of the outdoor recreation area will participate more frequently in concentrated recreation activities (camping, boating, picnicking, etc.) or dispersed recreation activities (nature study, hiking, bird watching, etc.) and which activities are more feasible to the facility. It is most likely that dispersed recreational activities are more feasible and will be utilized more at 79th ARCOM BASOPS supported facilities.

2.4 Selection of Outdoor Recreation Areas.

2.4.1 Multiple Use Areas.

Wherever the natural resource base can sustain more than one recreation activity or where activities are compatible with one another, it is both economical and convenient to locate several activities in a single area. This reduces the number of support facilities such as shelters, restrooms, trash collection, and parking lots which otherwise must be provided for each activity. It also greatly economizes on the amount of required utilities.

2.4.2 Compatible Recreation Uses.

As a general rule those activities which are noisy or which may prove hazardous to non-participant require clear separation from other recreation activities. The majority of recreation activities profit from some interaction, even if only in terms of pedestrian connection with other recreation activities.

2.4.3 Compatible Land Uses.

Outdoor recreation areas should be located as near as possible to the majority of users. Areas used primarily for outdoor recreation must comply with the multiple use concept.

2.4.4 Potential for Expansion.

When areas are selected for outdoor recreation use, it is important to consider the future as well as present needs of the facility. It is suggested to make at least limited projections of future demand so that sites can be chosen which are large enough to encompass space for potential expansion.

2.4.5 Optimum Sites.

Every recreation activity has basic requirements which must be satisfied by the natural resources of an outdoor recreation area and by man-made improvements. For specific requirements on each activity and area refer to the Army TM 5-635.

2.5 Coordination.

When actual design and development of an outdoor recreation area begins, there are agencies at all levels which can be used for additional information and/or ideas. It is recommended that agencies of Federal, state, and local governments and the private sector be contacted for any needed information on design, construction, and guidelines. One of the more important

issues of this era are having facilities that are handicap accessible. All installations must confirm that they meet the requirements set forth by the Architectural Barriers Act, 42 U.S.C. 4151-4157 and the Americans with Disabilities Act of 1990, Public Law 101-336.

3.0 PROTECTION AND MAINTENANCE OF OUTDOOR RECREATION AREAS

As established in Appendix F of the Army Technical Manual 5-635 "Outdoor Recreation Cooperative Agreement" it is the installation's/facility's responsibility to " Maintain, operate and manage outdoor recreation resources..., and protect and preserve special interest areas."

3.1 Protection.

Since the quality and success of outdoor recreation areas is dependent upon the natural resource base, protection of that base, must be considered as a fundamental component of a site's development and management. This is especially true of special interest areas which are designated as such because their resources are judged unusual or irreplaceable. The principle protective device for recreational resources is appropriate kinds and amount of use.

3.1.1 Controlling Devices.

An obvious method of controlling the number of people who use an outdoor recreation area is to control or limit access. This may not apply to 79th ARCOM sites since use is limited to full-time employees, assigned reservists and their dependents. However, vehicular and pedestrian access may be limited by the number and location of roadways and pathways made available. In addition, entrances may be gated and closed when an area has reached capacity. Gates can be employed during times of anticipated peak usage, such as weekends or holidays, so that full-time gatekeepers are not necessary. Additional controlling devices should include limited access to non-consumptive activities (i.e. bird watching) or access at certain or specified hours of operation. Certain activities that require quiet or peacefulness cannot coincide with a drill or other tactical maneuvers. Other ways to encourage outdoor recreational activities is to establish plans to enhance natural areas including development of habitat that attracts wildlife, including planting specific types of vegetation (Specific vegetation practices will be addressed in Parts 1 and 4 of the NRMP) or providing nest boxes, etc.

3.1.2 Public Education.

Making outdoor recreation users aware that natural resources are not indestructible, should be the reserve facility's first step toward protection of recreational areas. The general public is becoming increasingly sensitive to the need for environmental protection as a result of depleted resources, however emphasis can also be stressed in recreational programs. When rules and regulations for the use of outdoor recreation areas are posted on signs or printed in brochures, it is helpful to provide a brief explanation of the concern for the natural resources and an appeal for the user to aid in their protection by not abusing any of these precious resources.

3.1.3 Critical Plant and Animal Habitat.

Under the Endangered Species Act of 1973 (28 December 1973 PL 93-205, 87 Stat. 884, and as amended 10 November 1978 by PL 95-632, 92 Stat 3751) the Federal Government is responsible for the protection of endangered and threatened native species of flora and fauna. Endangered and threatened species are being studied by the Pennsylvania Science Office of the Nature Conservancy. Two species of potential concern are currently under investigation: An ***Umbrella Sedge*** (*Cyperus Sp.*) identified at Marcus Hook and ***Butternut*** (*Juglans cinerea*) identified at Williamsport.

3.1.4 Special Interest Areas.

If a special interest area, particularly containing a critical habitat, is of extreme value, the best protection may be to prohibit use including any form of recreation. However, special interest areas may be able to accomodate use with careful administration.

3.2 Maintenance.

Good maintenance of outdoor recreation areas should be considered a form of protection for the natural resource base. It not only provides timely environmental repair but also encourages voluntary housekeeping by visitors. For specific requirements for maintenance procedures refer to the Army Technical Manual 5-635. Listed below are summaries of these procedures.

3.2.1 Sanitation.

Sanitary facilities of any kind require a high level of maintenance.

3.2.1.1 Trash Collection.

Adequate trash collection is essential to good maintenance. Trash cans should be convenient and readily visible to the public and collection trucks. Cans should be emptied frequently and kept clean. Where applicable, local community recycling programs must be adhered to.

3.2.1.2 Restrooms.

Recreationists prefer flush toilets, and these should be provided whenever possible. However, in low-use or primitive recreation areas, it may be necessary to use other facilities such as dry-pit privies or portable chemical toilets. Proper maintenance of the aforementioned facilities is essential.

3.2.2 Special Maintenance.

3.2.2.1 Vegetation.

Since existing vegetation contributes to the attractiveness of outdoor recreation areas, it is important to see that it is well-maintained. Mowing and/or mulching practices should take place on a regular basis. At the same time, all dead trees and branches which could prove dangerous should be removed from the area. Poisonous or undesirable plants should be removed from the

area, however, before plants are removed , consideration should be given to the intensity of use in an area and to the desire to maintain natural balance. Reference Parts I and IV of the Natural Resource Management Plan for further instruction on vegetation practices.

3.2.2.2 Trails.

All trails should be checked periodically for removal of fallen trees and branches as well as repairs necessitated by heavy use or by weather.

3.2.2.3 Outdoor Recreation Equipment.

These items (i.e. water fountains, picnic tables, barbecues) require periodic inspection on the performance of working parts and any needed repairs should be made promptly.

3.2.3 Environmental Repair.

Areas should be checked regularly for signs of erosion and sedimentation and for plant disease or destruction.

3.2.4 Maintenance Schedules.

Reserve facilities, as applicable, should develop a maintenance plan for its outdoor recreation areas. Intense-use outdoor recreation areas need daily care during their peak seasons

4.0 COMMUNITY INVOLVEMENT

4.1 Introduction.

Community involvement begins with the development of a particular program as identified by the needs of the particular reserve facility (i.e., a wildlife or nature program). Most sites have employees who have talents which are not generally known. These employees will provide a pool of knowledge which should be used. Finding and encouraging these people to become involved with projects will help in the development of an excellent program which will be a model for others to follow. These efforts help to improve morale, resulting in employees who feel they have a more comfortable, environmentally progressive, and aesthetically pleasing place to work. It will also improve the reserve facility's public relations image with local residents by demonstrating conservation efforts and environmental stewardship. It is encouraged that facilities involve members of the community (neighborhood associations, 4-H, church and scout groups), conservation groups, local, state, and Federal governmental agencies in the development and implementation of a program.

4.2 Educational Opportunities.

Most schools are looking for sites which will complement and demonstrate the subjects being taught in class. Today, as more and more schools are including environmental studies in their curricula, visible demonstration of environmental consciousness is extremely important, especially in rural residential areas. If teachers can show or involve students in projects

outside the classroom, their messages will be made clearer to the students. Reserve facility employees may give talks to students regarding environmentally conscious practices at the facility which could then be followed up by a field trip to the site to actually see the practices in action. A cooperative program with a school might include the creation of a nature trail. Once the trail is developed, nature hikes for schools, community groups, and reserve personnel and their families could be held. Students that helped with the development of the trail could serve as tour guides or they could create a brochure describing certain areas or aspects of interest along the trail.

4.3 Practices.

A good example of a community involvement program is a nest box program. It is an excellent initial project because nest boxes are highly visible, generally have a high rate of success, involve a large number of people provided that there are no safety hazards or liabilities associated with their presence on the site, and demonstrate a long-term commitment of the reserve facility to the environment in providing habitat. The public can assist in cleaning and/or repairing the boxes after they have been installed and in monitoring them on a regular basis. Similar to this program could be the creation of a butterfly or hummingbird garden. A planting day might be planned to enhance cover or habitat types. (Habitat fragmentation has lead to fewer species within remaining habitat patches.) Another project which may attract local groups is a photo contest. The winning entries could be used to create an exhibit for the main entrance to the reserve facility. Categories might include animals, plants and scenic areas found on the site, and pubic involvement activities. Currently, the Iowa Army Ammunition Plant has actively used volunteers to assist in enhancing wildlife habitat at the installation and the 94th ARCOM has developed a recycling and solid waste education program. Most of the installations of the 79th ARCOM have established a community involvement program. Some of these include allowing local groups to use facilities or the grounds of the installation to hold various activities or events. For a detailed list of these programs see Table 13, Appendix C.

4.4 Recognition.

An incentive to incorporate this type of program at a reserve facility is the possibility of being recognized by the Department of the Defense (DoD) with various environmental awards. The DoD recognizes installation, individual and team efforts with Environmental Quality, Natural Resource Conservation and Pollution Prevention awards each year. The Environmental Quality Awards are given on alternating years to an industrial installation and to a non-industrial installation based on achievements made during the calendar years prior to the presentation of the award. The purpose of this award is to recognize efforts to protect human health and the environment by achieving full and sustained compliance with all applicable environmental requirements and identifying and addressing, in a timely manner, the threats posed by contamination from past DoD operations.

The Natural Resource Conservation Awards are awarded by the Secretary of Defense to the installation of the Army, Navy or Air Force that conducted the most outstanding conservation program during the preceding three years. This award will be given on alternate years to a small installation (10,000 acres or less) and the next year to a large installation (more than 10,000 acres). The purpose of this award is to recognize efforts to promote natural resource conservation, including the identification, protection, and restoration of biological

resources and habitats: the sound management and use of the land and its resources; and the promotion of the conservation ethic.

The Pollution Prevention award is awarded on alternating years to an industrial or non-industrial installation based on achievements made during the calendar years prior to the presentation of the award. The purpose of this award is to recognize efforts to prevent pollution at the source, including practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other resources; and efforts to divert materials from the waste stream for recycling. The 79th ARCOM has already received the 1993 Department of Defense Energy Conservation Award for its efforts in turning off lights when not needed and renovations to make facilities more efficient.

References

Allen, Arthur W. 1982. Habitat Suitability Index Models: Gray Squirrel. FWS/OBS - 82/10.19.11 pp.

Bushman, E. S. and G. D. Therres, 1988. Habitat Management Guidelines for Forest Interior Breeding Birds of Coastal Maryland. MD DNR Forest, Park, and Wildlife Service, Wildlife Technical Publication. 88-1. 50 pp.

Degraaf, Richard M. and Gretchin Witman 1979. Trees, Shrubs and Vines for Attracting Birds. University of Massachusetts Press. 194 pp.

Godfrey, Michael A. 1980. A Sierra Club Naturalists Guide: The Piedmont. Sierra Club Books, CA. 498 pp.

Kricher, John C. and Gordon Morrison. 1988. Eastern Forests. Petersen Field Guide Series. Houghton Mifflin. Boston, MA. 368 pp.

Martin, A. C; Herbert S. Zim, and A. L. Nelson. 1951. American Wildlife and Plants, A Guide to Wildlife Food Habits. Dover Publication, NY, NY. 500 pp.

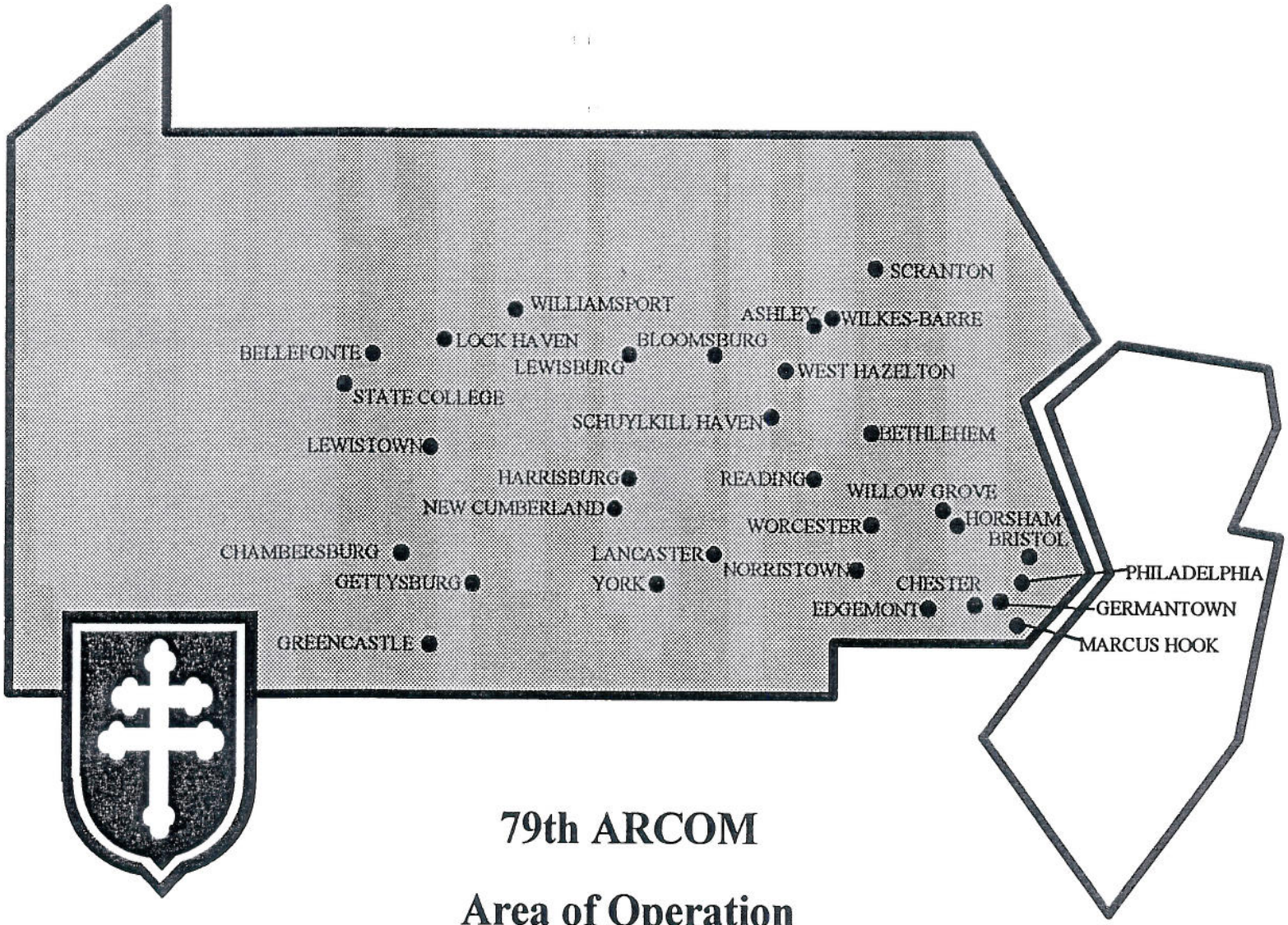
Pennsylvania Department of Environmental Resources. 1989. Physiographic Provinces of Pennsylvania (Map 13) Scale 1:2,000,000. DER # 382 - 3/92.

Robbins, C. S., et al. 1989. Habitat area requirements of breeding forest birds of the Middle Atlantic States. Wildlife Manager. No. 103. 34 pp.

U.S.D.A. Soil Conservation Service, Penn State University, and Pennsylvania DER. 1972. General Soil Map of Pennsylvania. Scale 1:750,000. # 1,R - 12115.

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
APPENDIX A
SITE MAPS
TABLE OF CONTENTS

FIGURE	DESCRIPTION
23	Reading USARC & AMSA
24	Schuylkill Haven USARC
25	Scranton USARC
26	State College USARC
27	West Hazelton USARC
28	Wilkes-Barre USARC
29	Wilkes-Barre Leased Site AMSA
30	Williamsport USARC
31	Willow Grove USARC & AMSA
32	Worcester USARC
33	York USARC



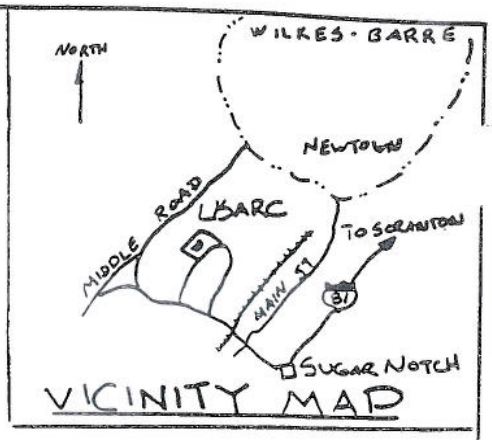
79th ARCOM

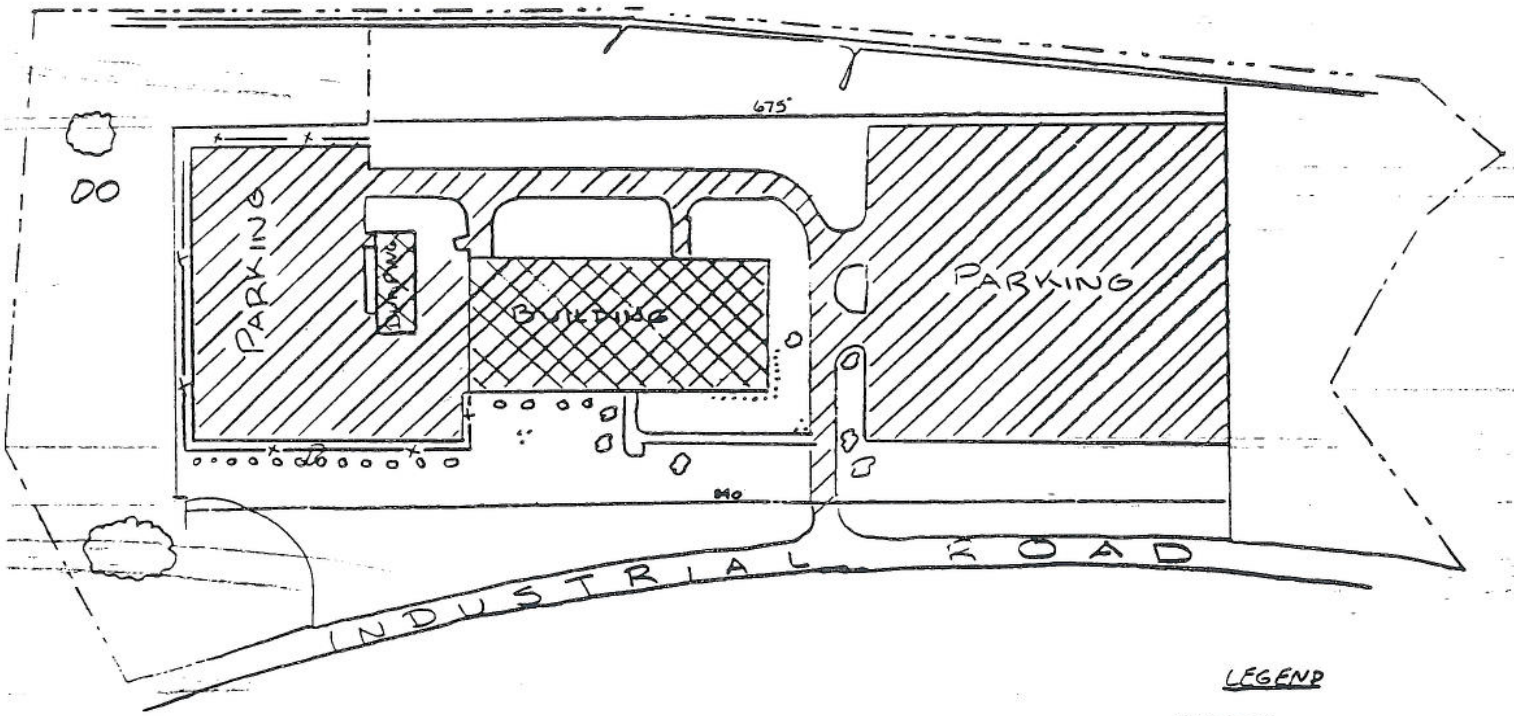
Area of Operation

Pennsylvania

August 1995

FIGURE #1





USARC ASHLEY
WHITEFORD RD SUGAR NOTCH

LEGEND

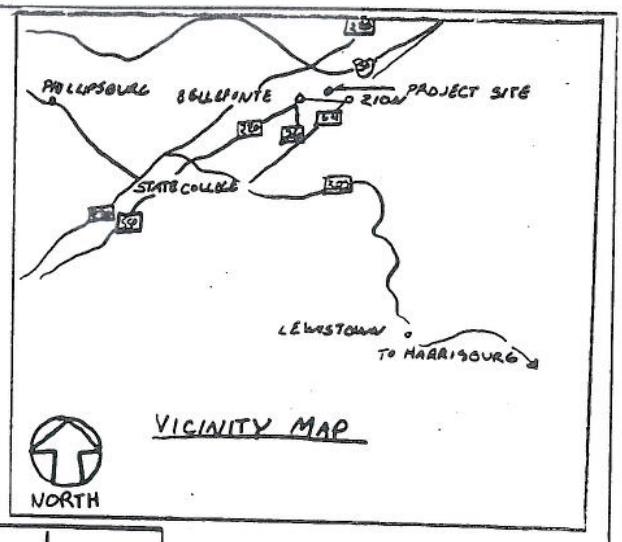
- BUILDING
- PAVEMENT
- GRASS
- FENCE LINE
- PROPERTY LINE
- TREES, BUSHES

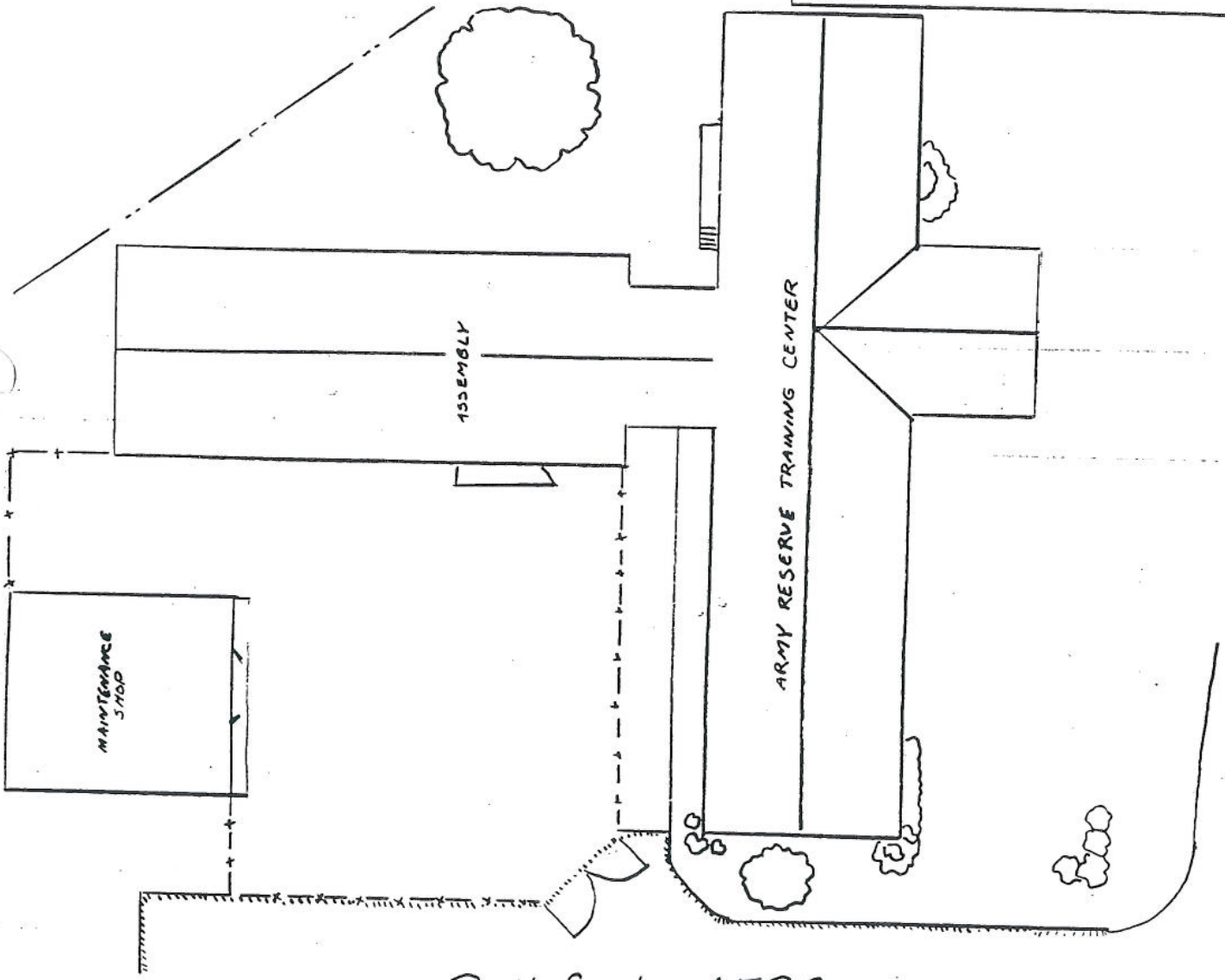
US Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715

Ashley USARC

Figure #2

September 1994





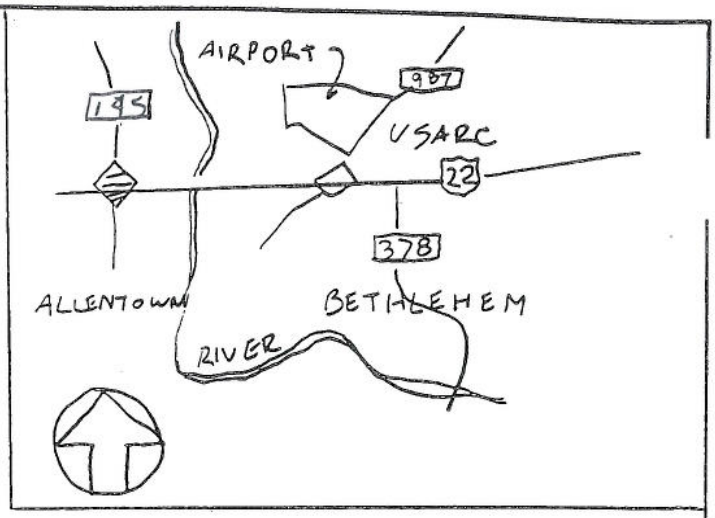
Bellefonte AFRC

US Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715

Bellefonte AFRC

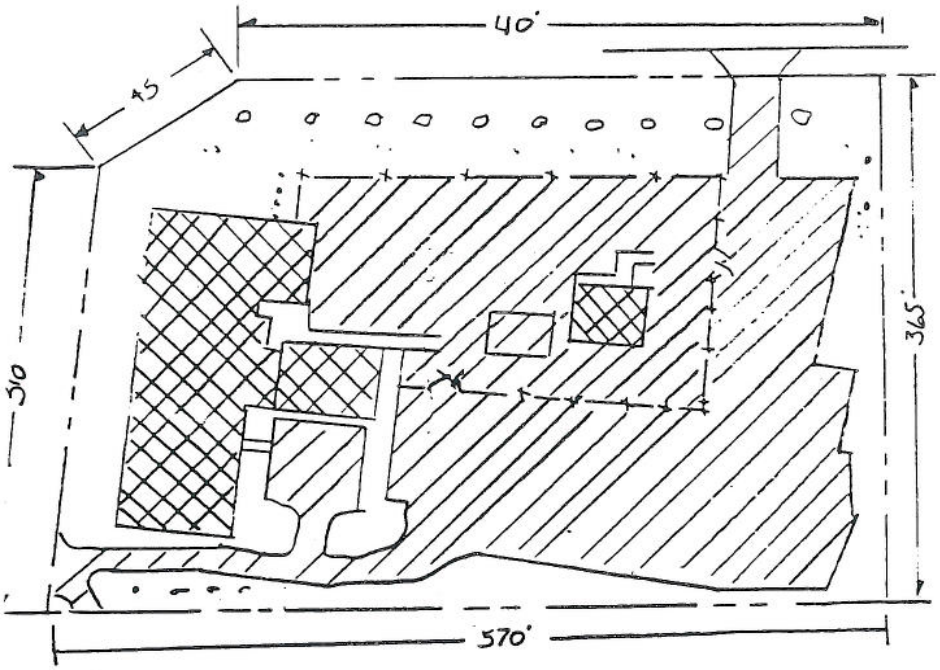
Figure #3

September 1994



VICINITY MAP

USARC ALLENTOWN - BETHLEHEM PA



USARC BETHLEHEM

2940 AIRPORT ROAD

BETHLEHEM, PA

100 50 0 100 200

LEGEND

BUILDING

PAVEMENT

GRASS

TREES, SHRUBS, HEDGES, BUSHES

FENCE LINE

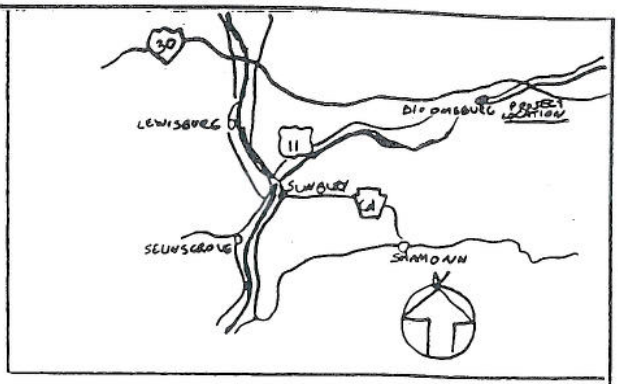
PROPERTY LINE

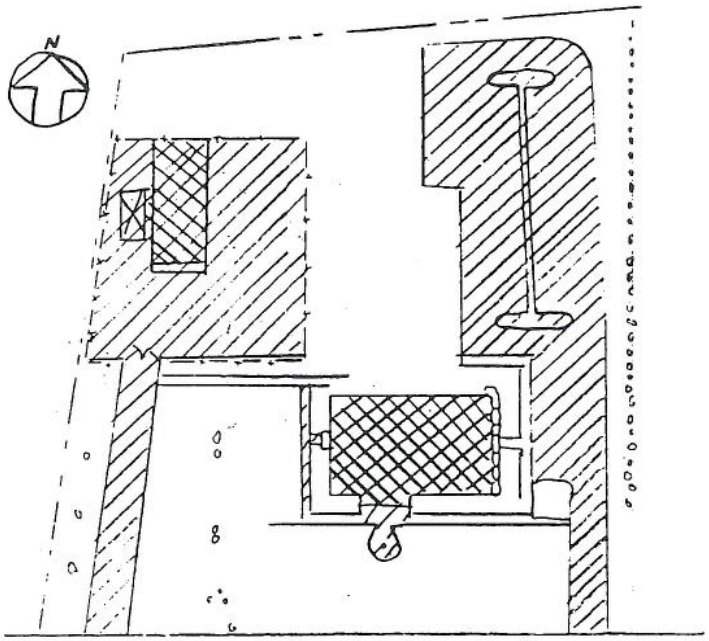
US Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715

Bethlehem USARC

Figure #4

September 1994





USARC BLOOMSBURG
1469 OLD BERWICK ROAD
BLOOMSBURG, PA

50 25 0 50 100

LEGEND

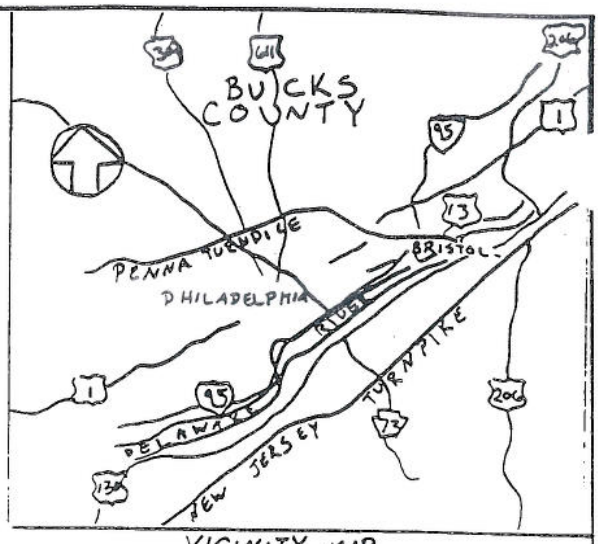
- BUILDING
- PAVEMENT
- BUSHES, TREES
- GRASS
- FENCE LINE
- PROPERTY LINE

US Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715

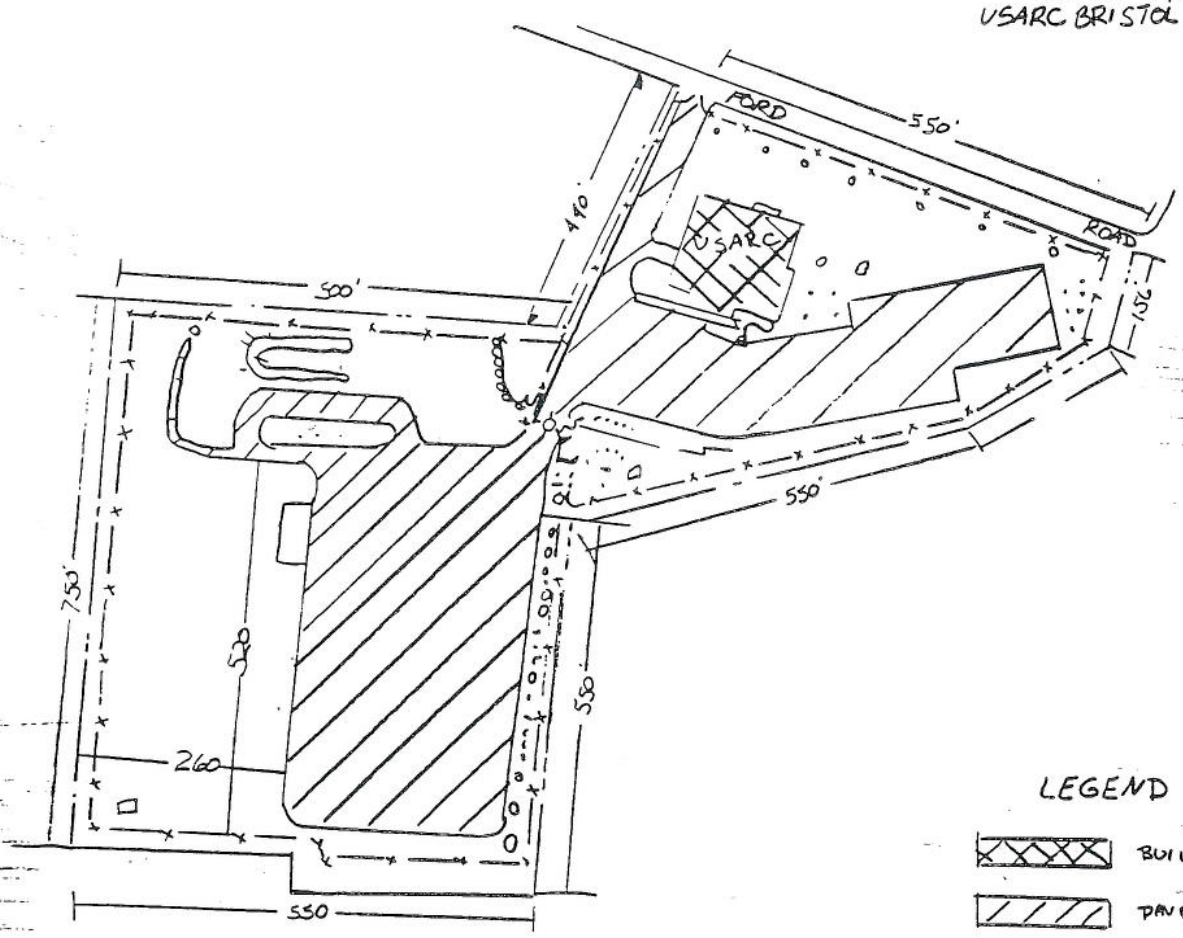
Bloomsburg USARC

Figure #5

September 1994



VICINITY MAP
USARC BRISTOL PA

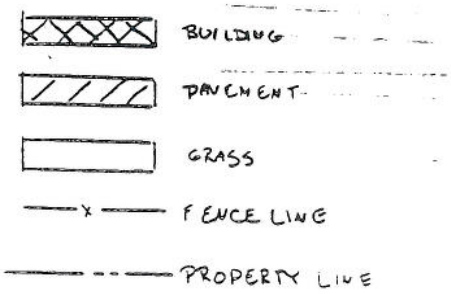


USARC BRISTOL

FORD ROAD

BRISTOL PA

LEGEND



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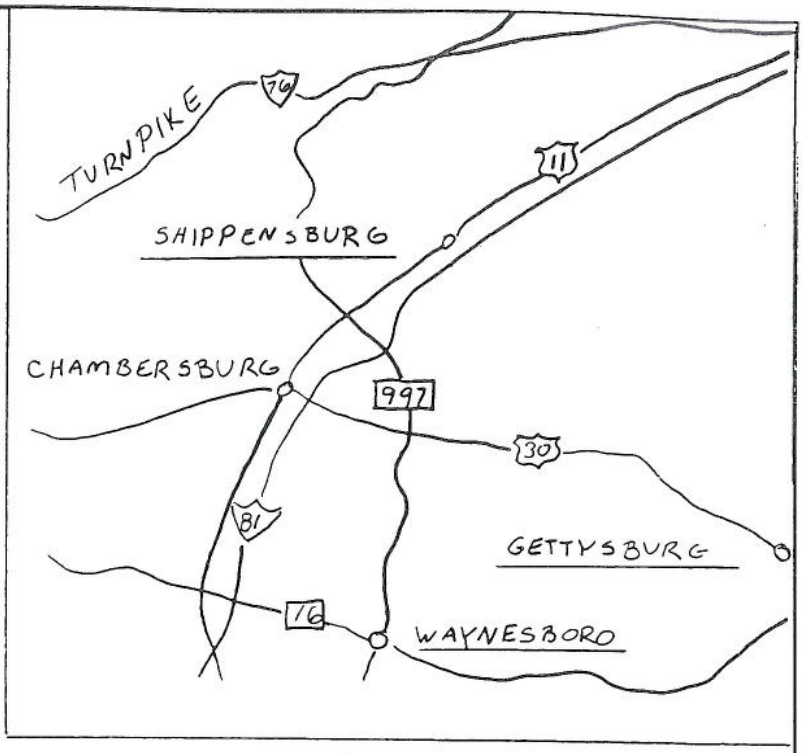
Bristol USARC

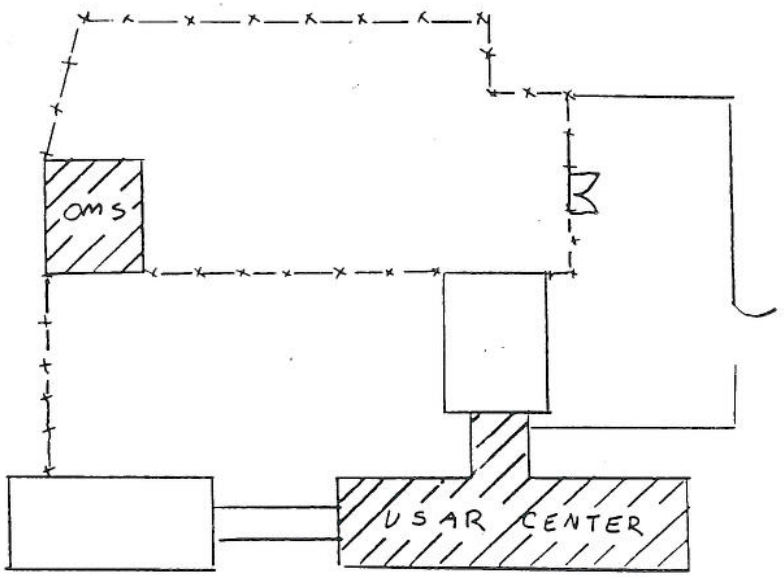
Figure #6

September 1994



VICINITY MAP

SCALE: 1" = 9 MI



CHAMBERSBURG USARC

SCALE: NONE

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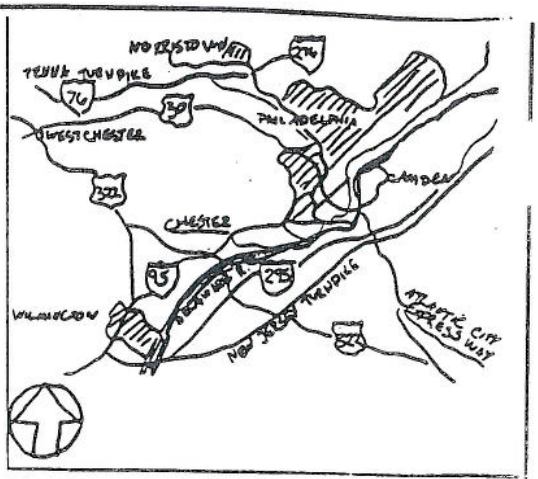
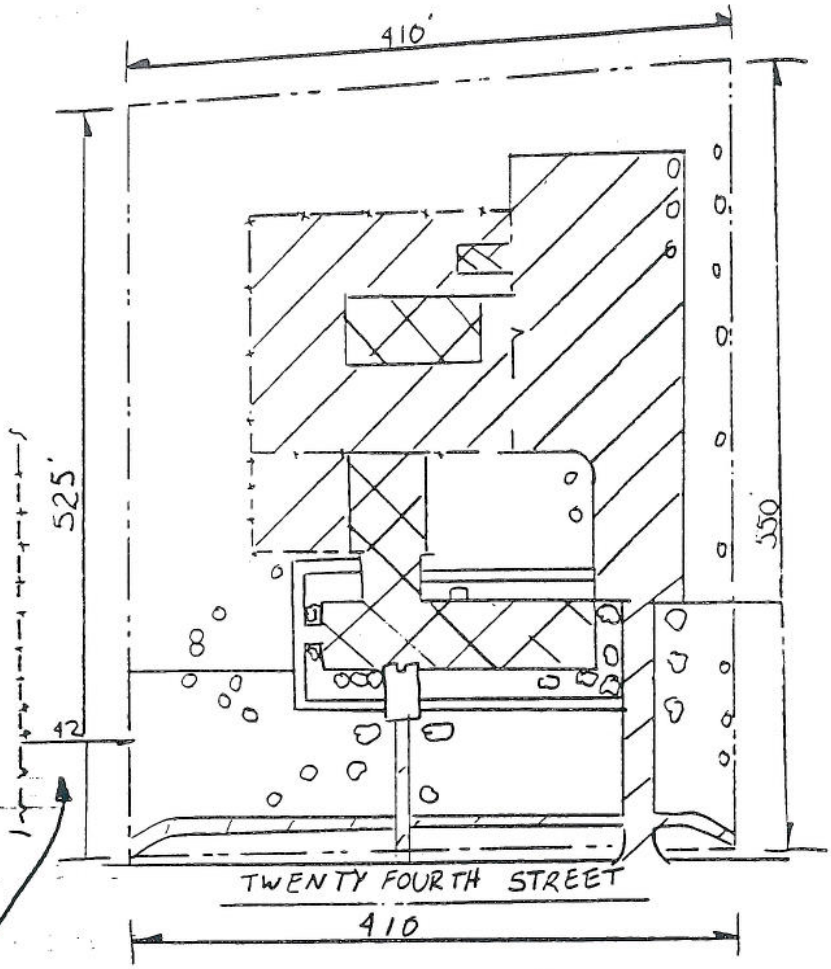
Chambersburg USARC

Figure #7

September 1994



VICINITY MAP
USARC CHESTER PA.



USARC CHESTER

500 W 24TH ST

CHESTER PA

100 50 0 100 200

LEGEND

- BUILDING
- PAVEMENT
- GRASS
- FENCE LINE
- PROPERTY LINE
- EVERGREENS, TREES

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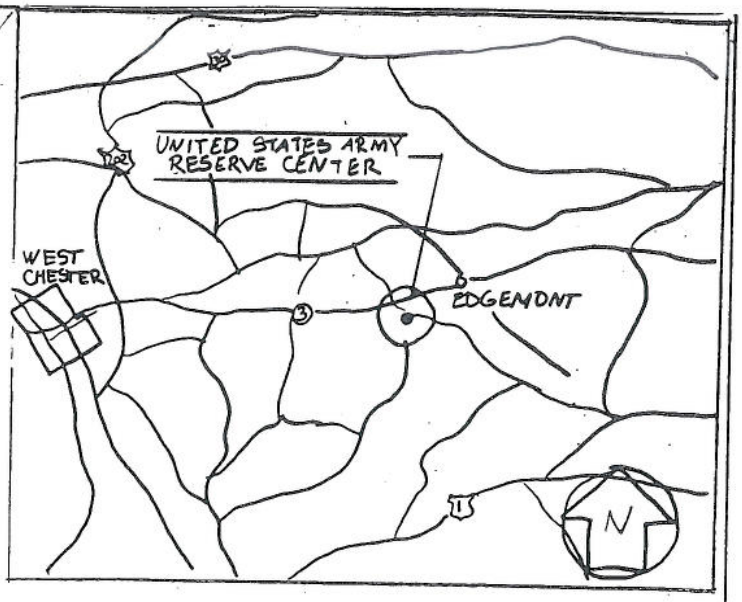
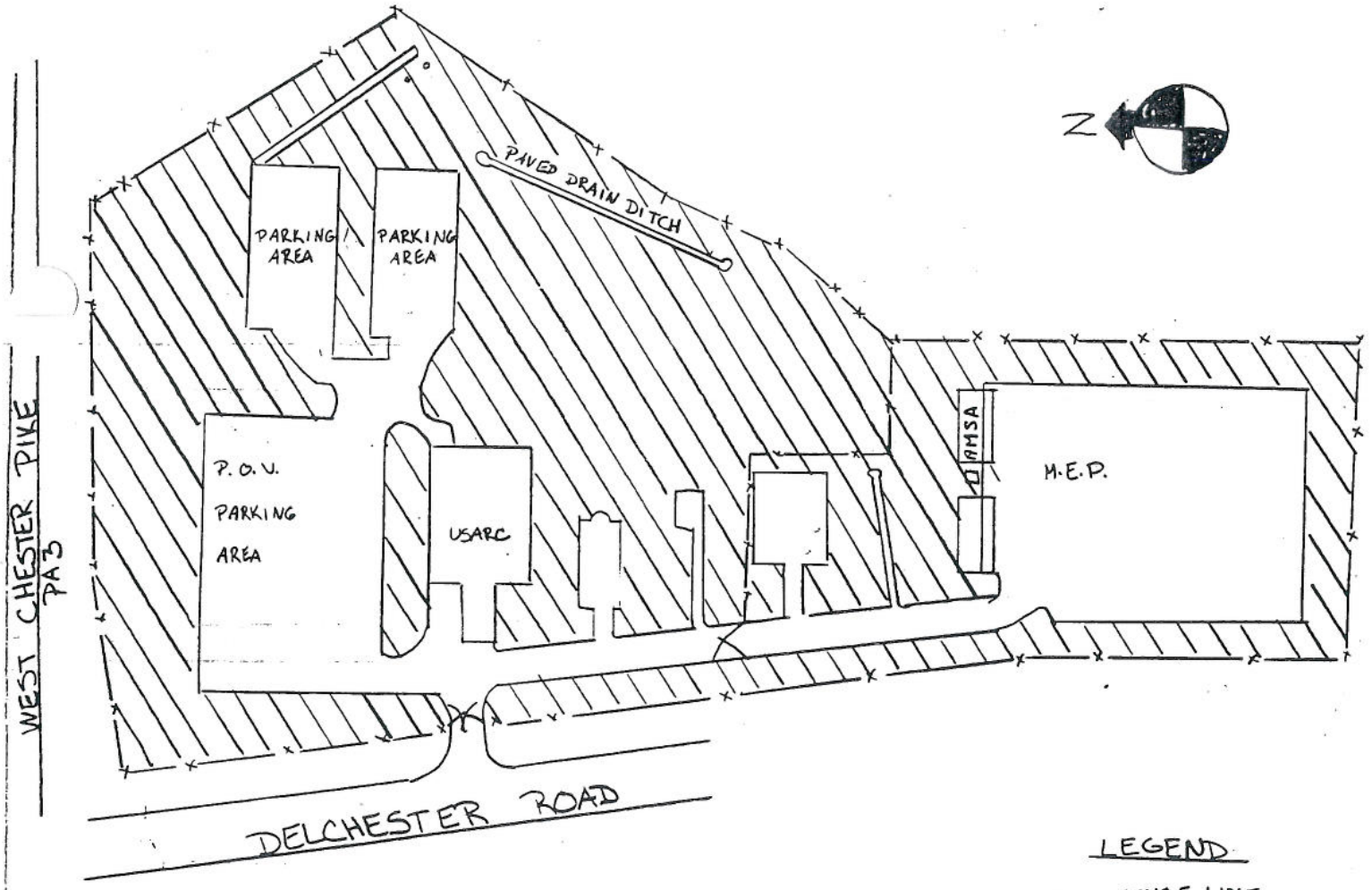
Chester USARC

Figure #8

September 1994





EDGEMONT USARC / AMSA

NOT TO SCALE

LEGEND

— × — FENCE LINE

GRASS AREA 15.0 ACRES

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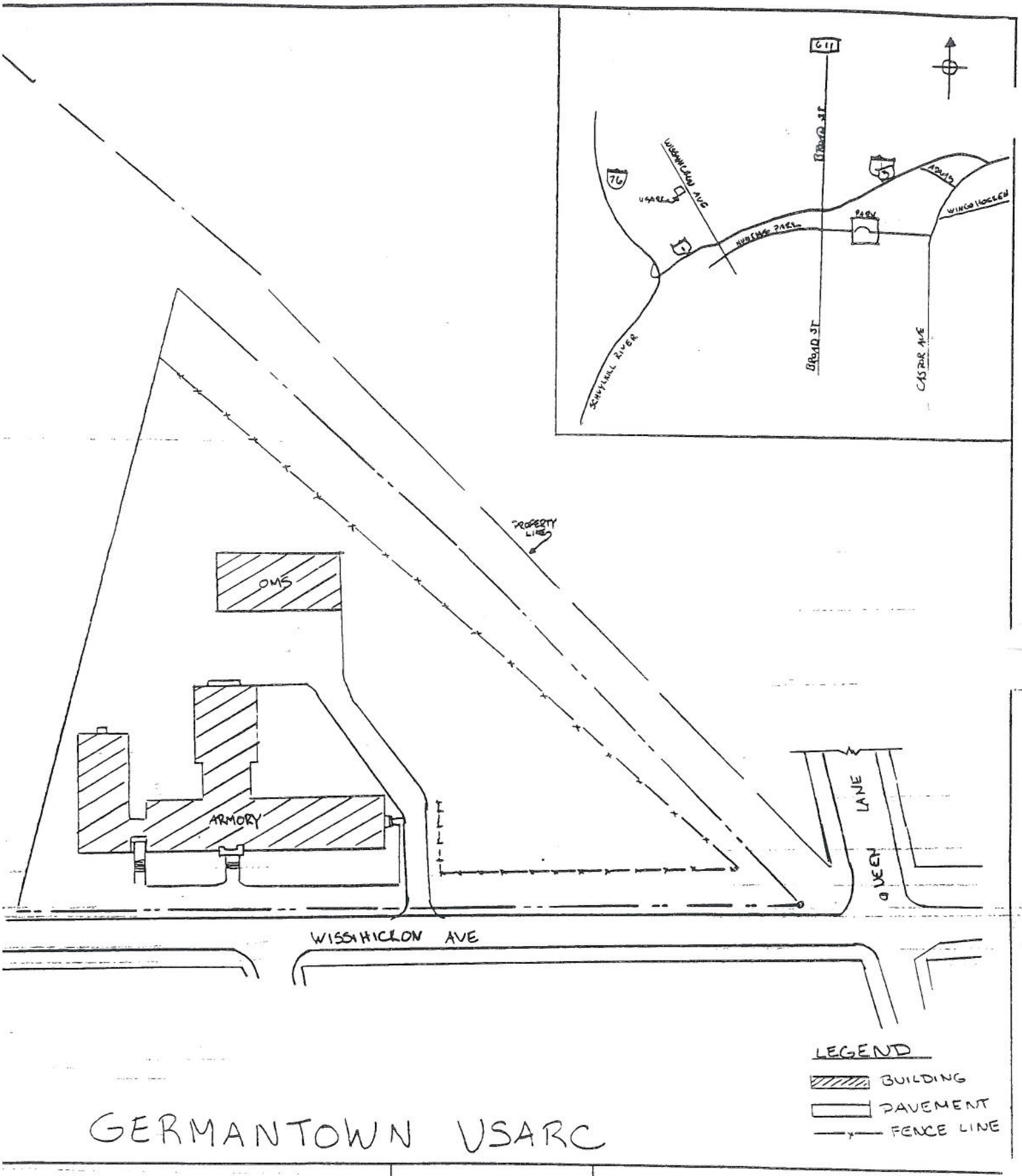
Edgemont USARC and AMSA

Figure #9

September 1994



GERMANTOWN USARC

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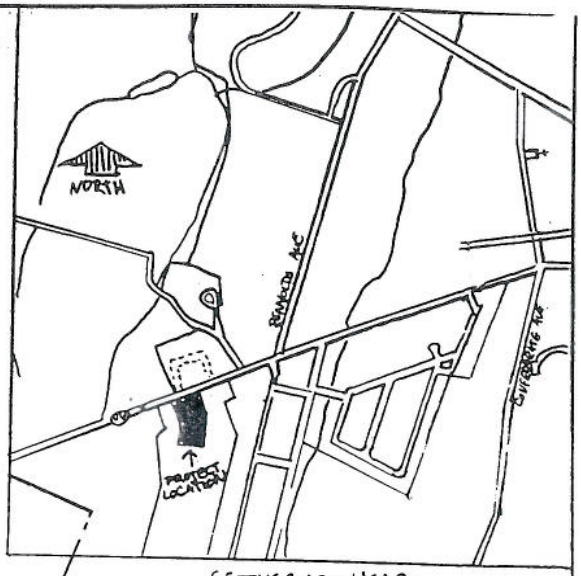
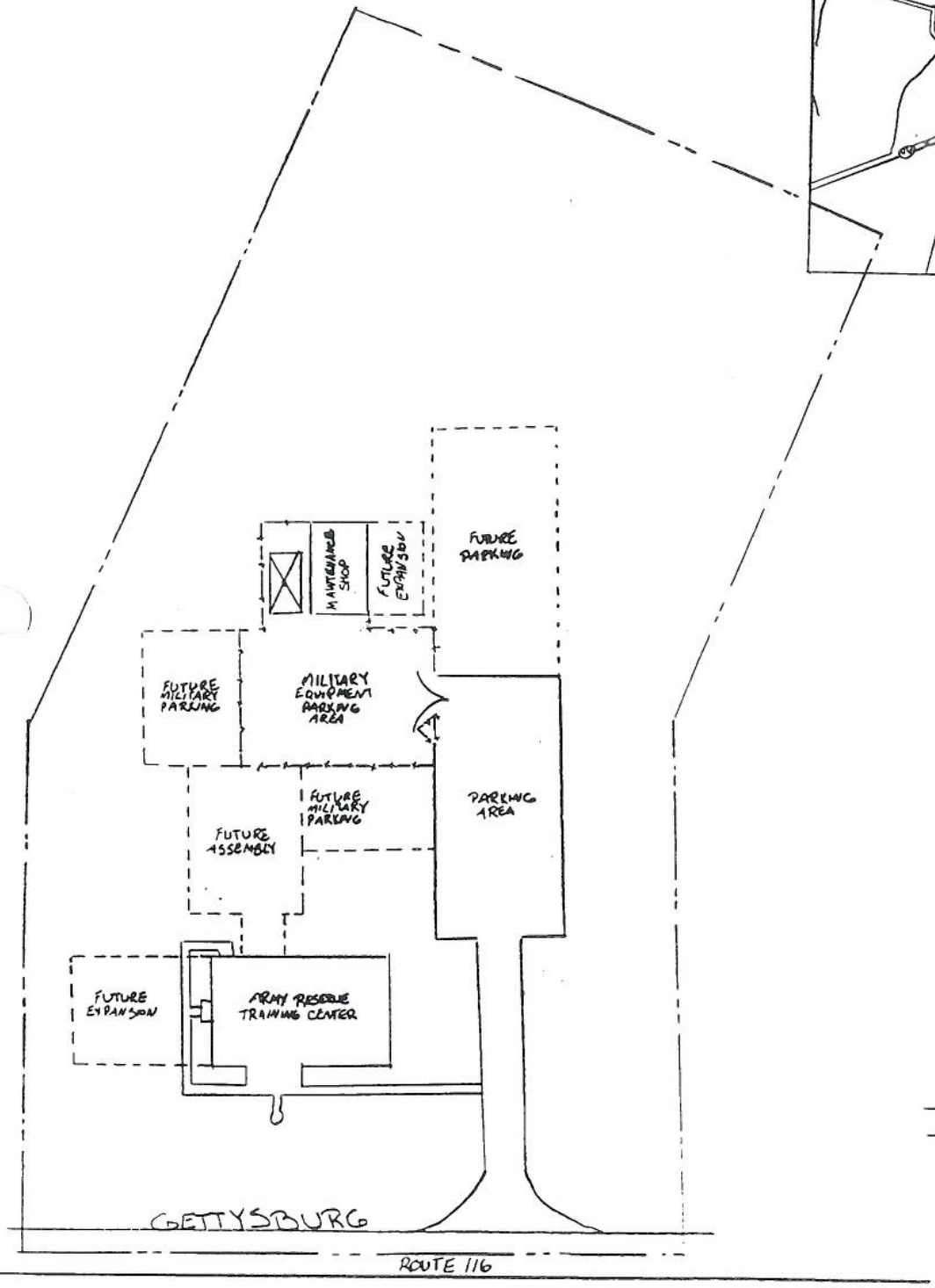
Germantown USARC

Figure #10

September 1994



GETTYSBURG USARC
LOCATION MAP



LEGEND

PROPERTY LINE

FENCE LINE

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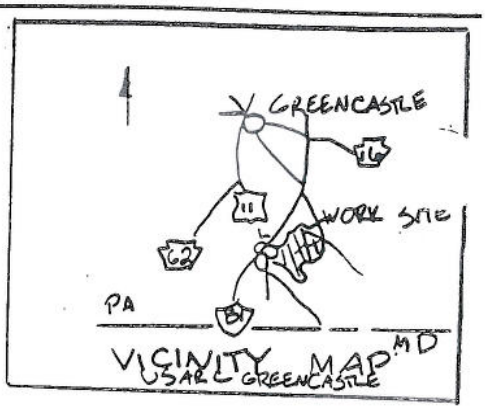
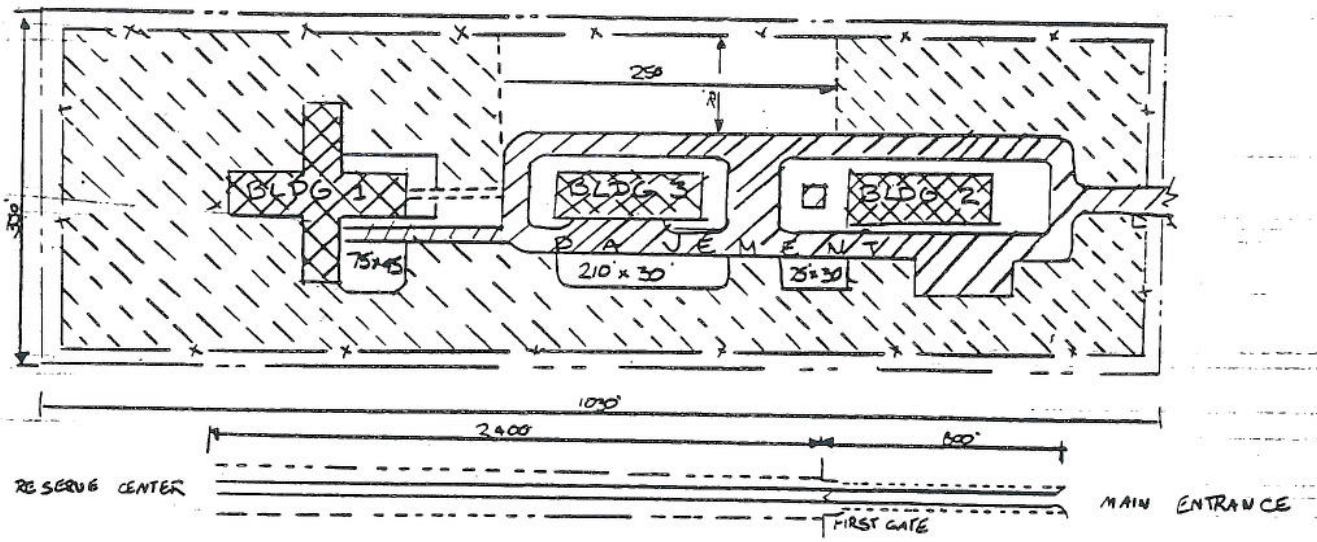
Gettysburg USARC

Figure #11

September 1994





USARC/AMSA GREENCASTLE
RTE 11 GREENCASTLE PA
SCALE - NONE

LEGEND

- BUILDING
- PAVEMENT
- STONES or GRAVEL SURFACE
- GRASS
- FENCE LINE
- PROPERTY LINE
- TREES, SHRUBS, BUSHES

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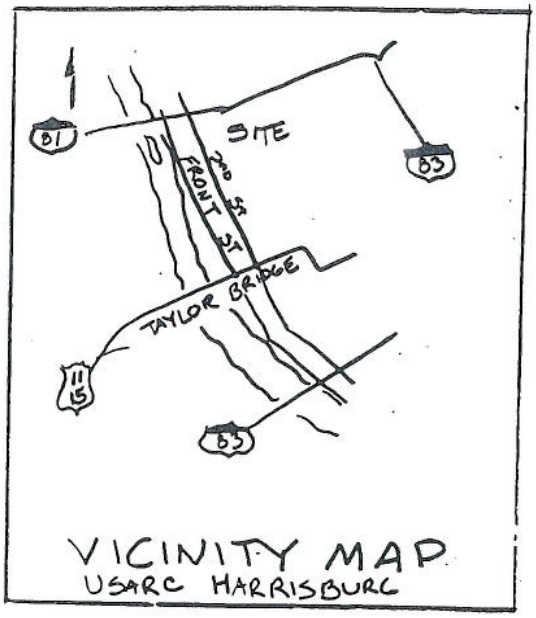
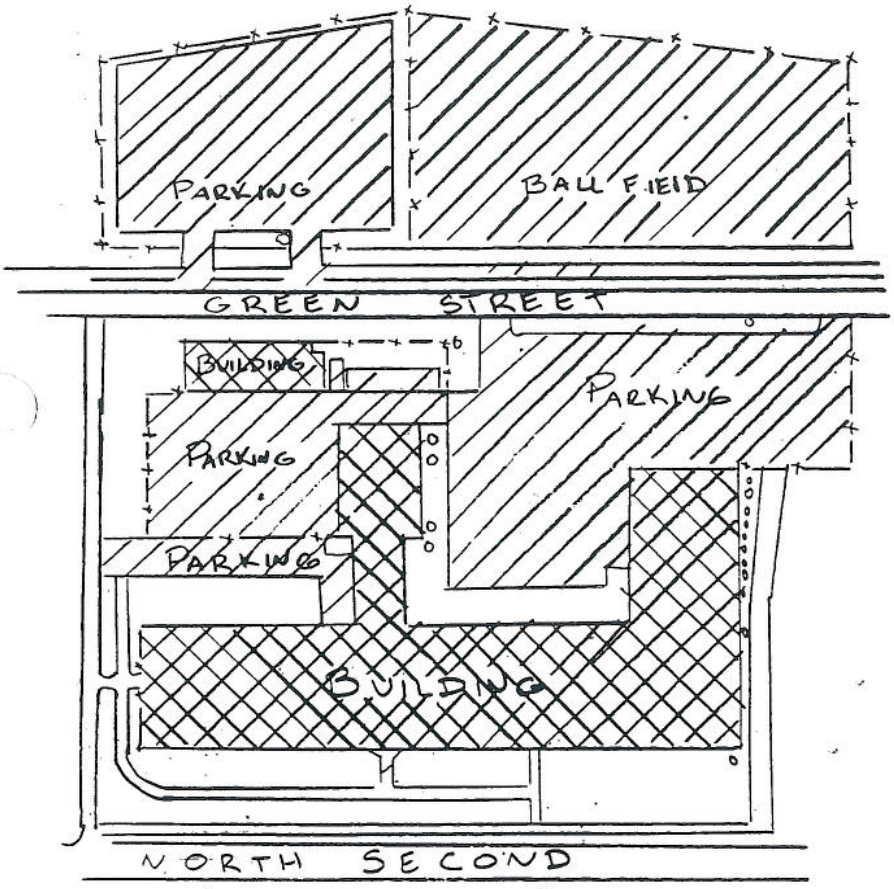
Greencastle USARC and AMSA

Figure #12

September 1994



VICINITY MAP
USARC HARRISBURG



LEGEND

BUILDING

TREES SHRUBS

PAVED AND OR MAINTAINED BY OTHERS

GRASS

HARRISBURG AFRC

2997 N. SECOND ST, HARRISBURG PA

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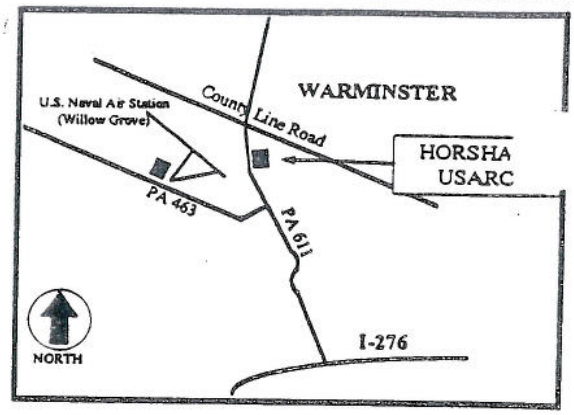
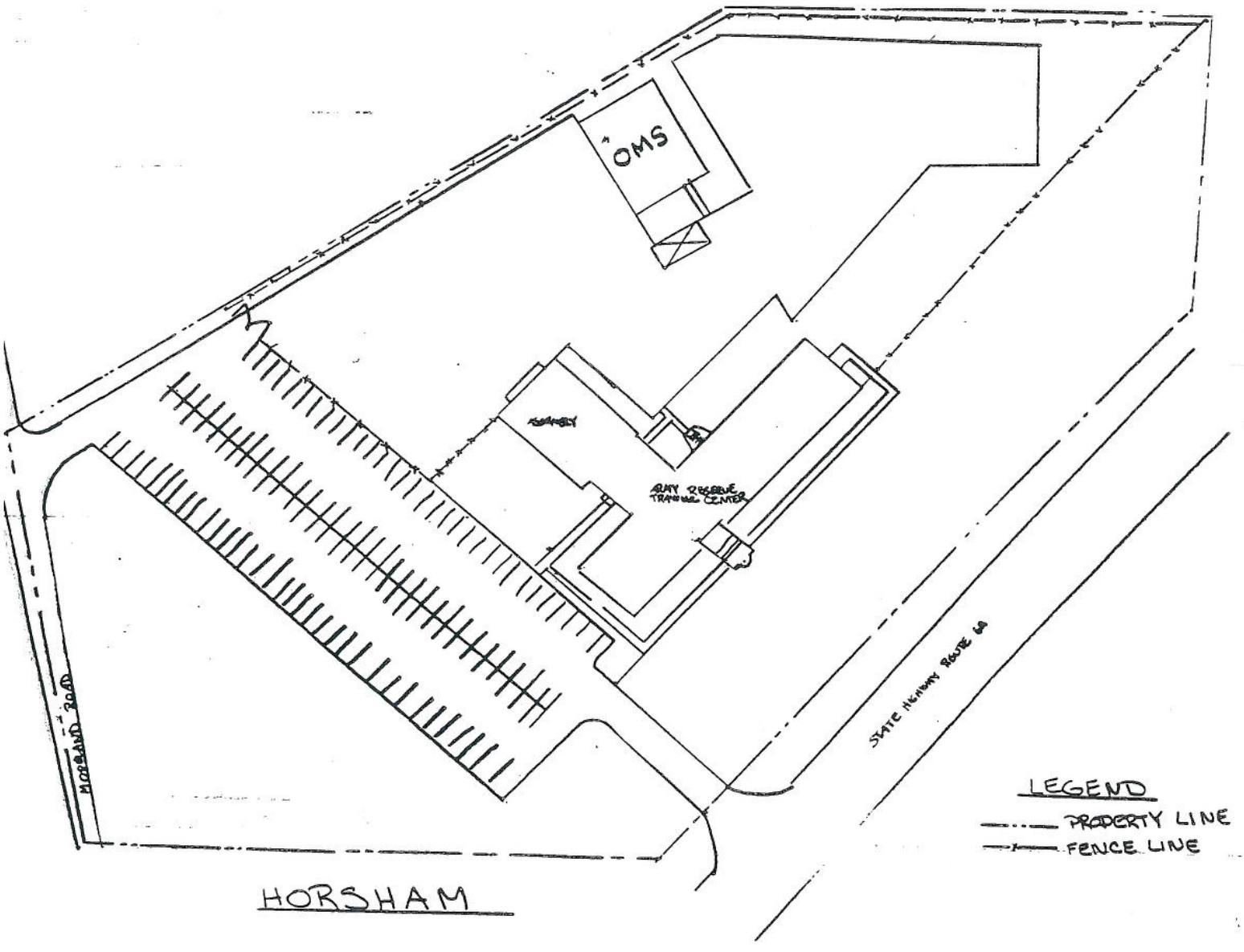
Harrisburg AFRC

Figure #13

September 1994





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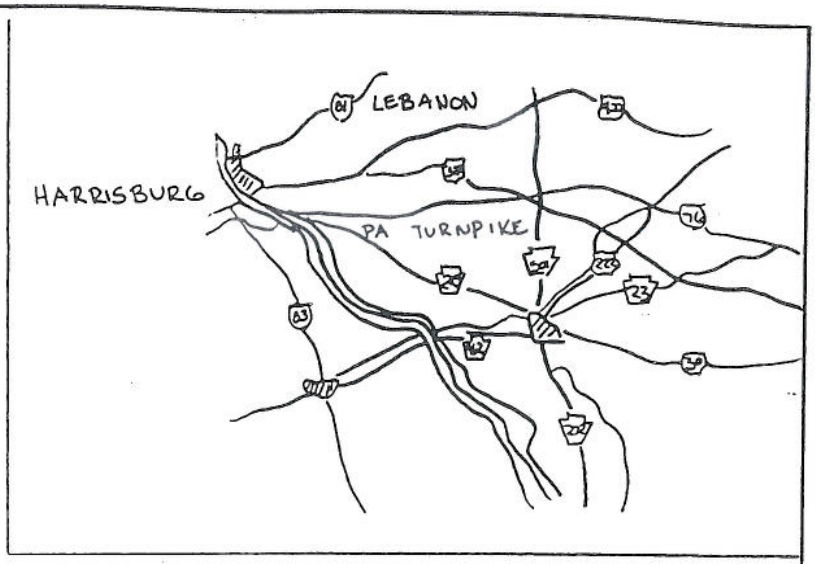
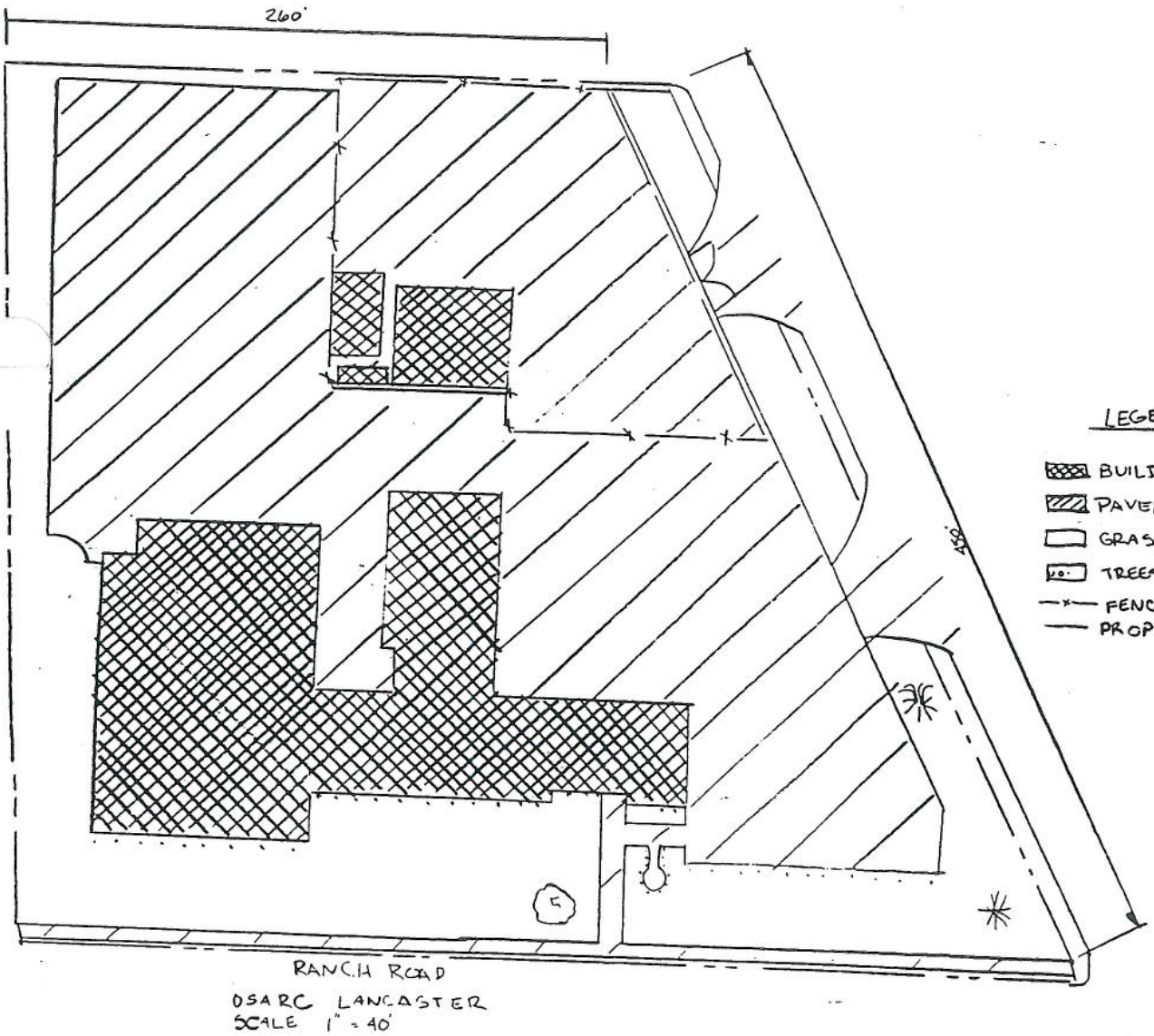
Horsham USARC

Figure #14

September 1994





LEGEND

- BUILDING
- PAVEMENT
- GRASS
- TREES, BUSHES
- FENCE LINE
- PROPERTY LINE

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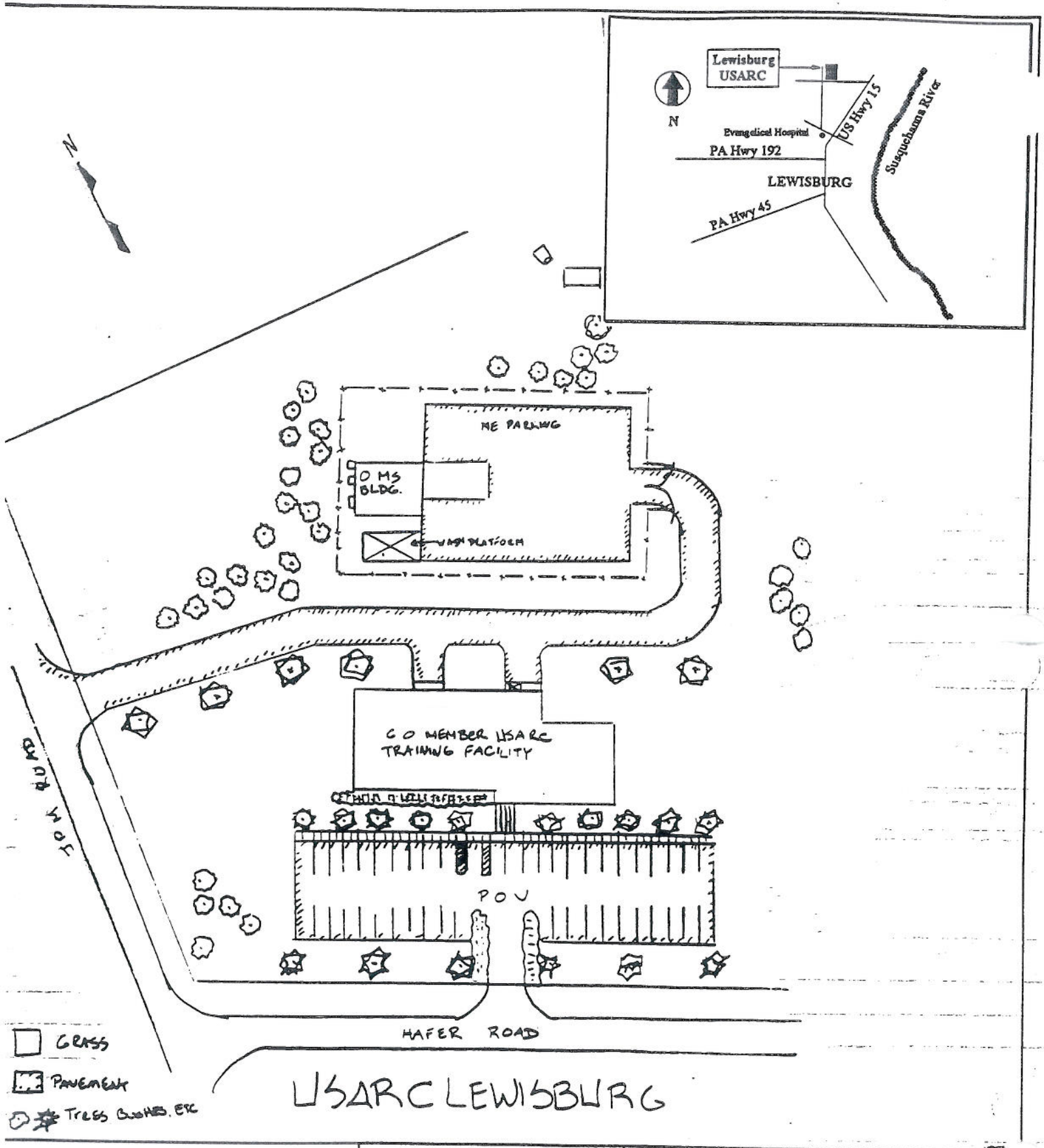
Lancaster USARC

Figure #15

September 1994



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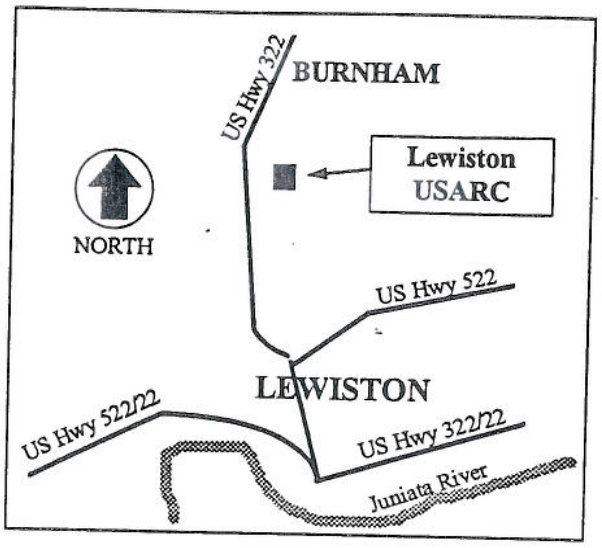
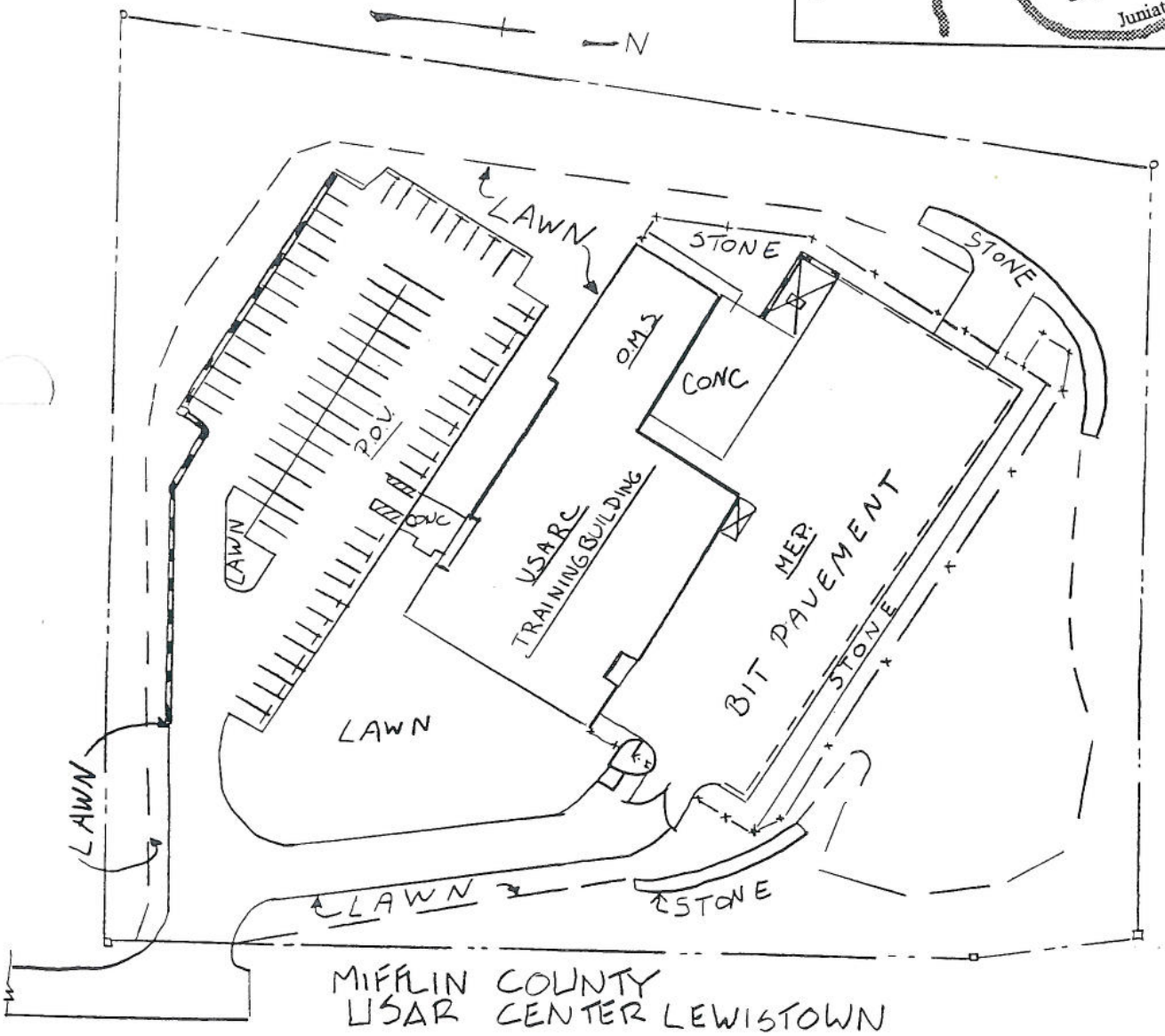
Lewisburg USARC

Figure #16

September 1994





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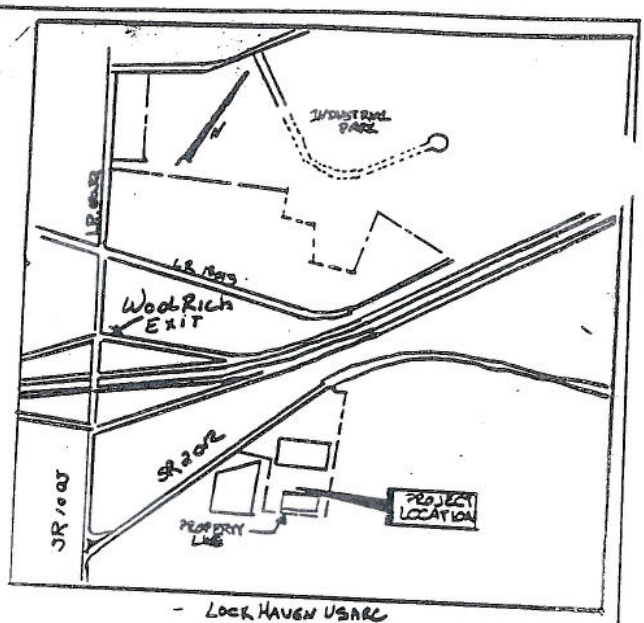
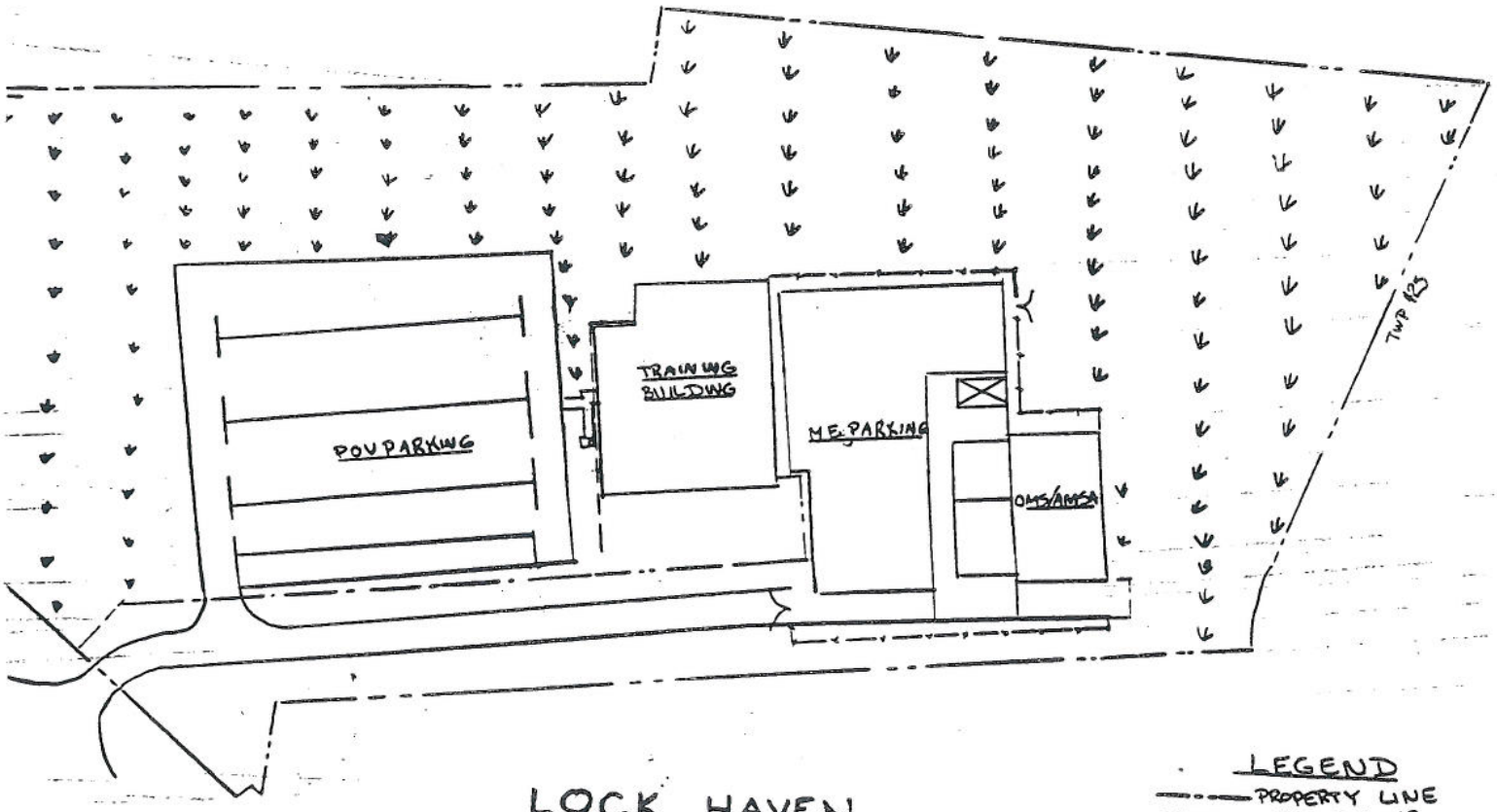
Lewistown USARC

Figure #17

September 1994



- LOCK HAVEN USARC
LOCATION MAP



LOCK HAVEN

LEGEND
PROPERTY LINE
FENCE LINE
GRASS

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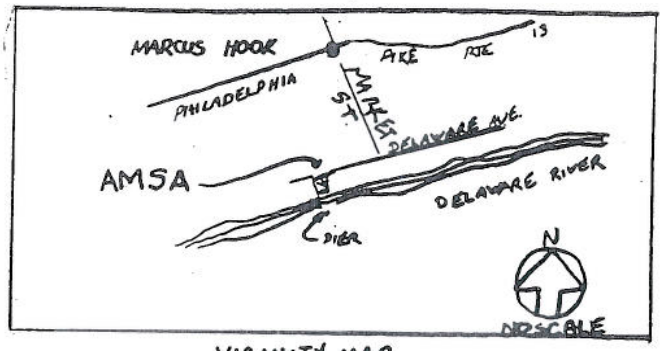
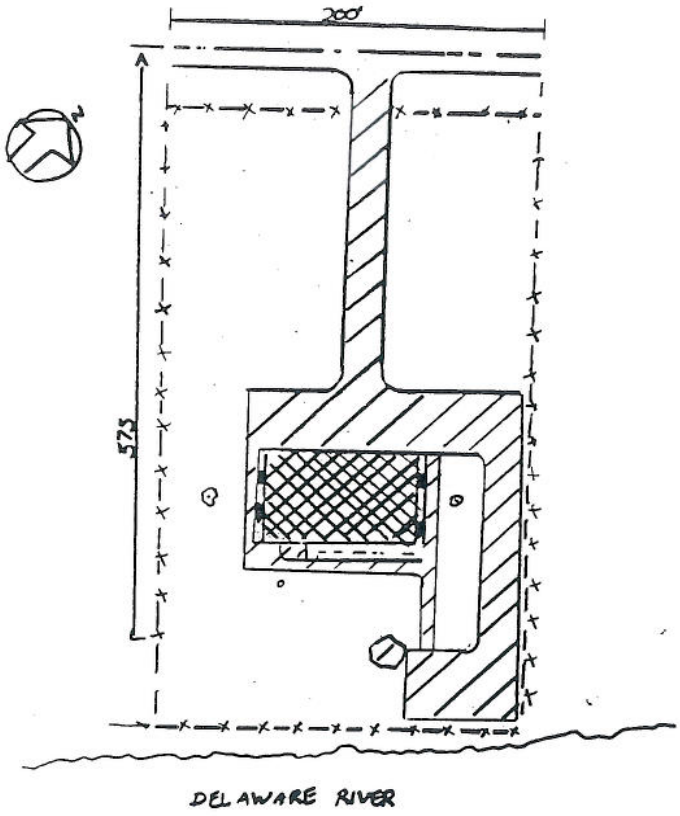
Lock Haven USARC and AMSA

Figure #18

September 1994



VICINITY MAP



AMSA MARCUS HOOK

BOY 385

MARKET ST & DELAWARE AVE

MARCUS HOOK, PA

50 35 0 30 60

LEGEND

BUILDING

PAVEMENT

GRASS

FENCE LINE

PROPERTY LINE

TREES, SHRUB

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Baltimore District
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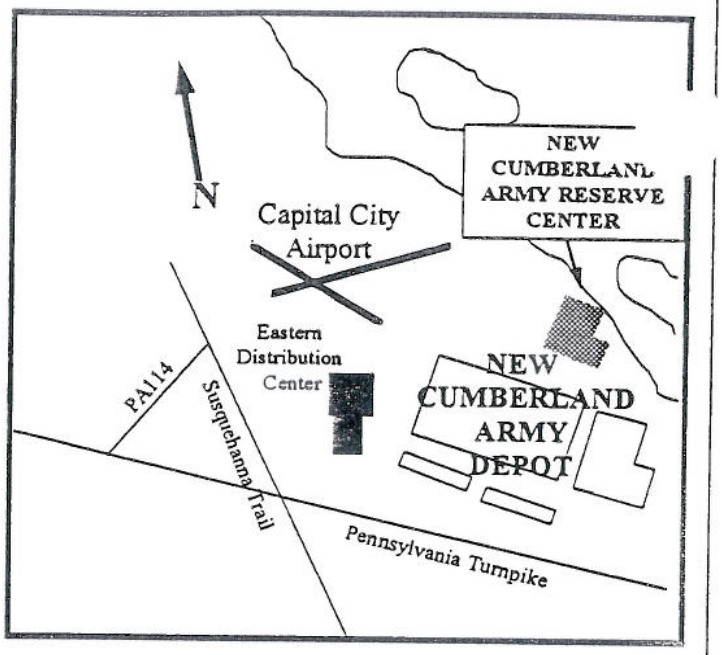
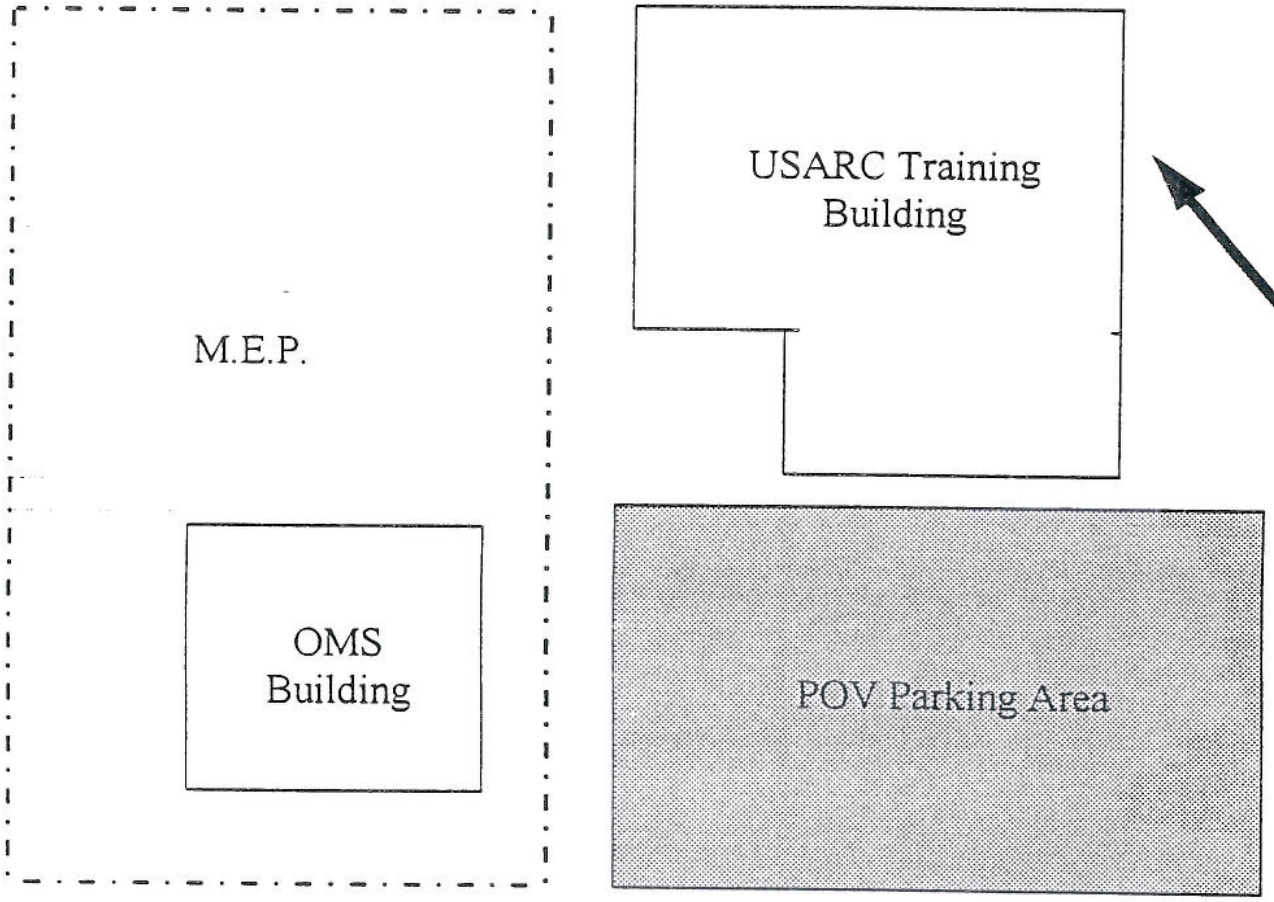
Marcus Hook AMSA

Figure #19

September 1994





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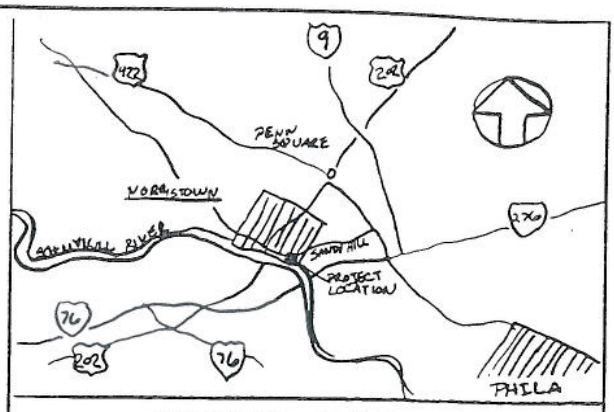
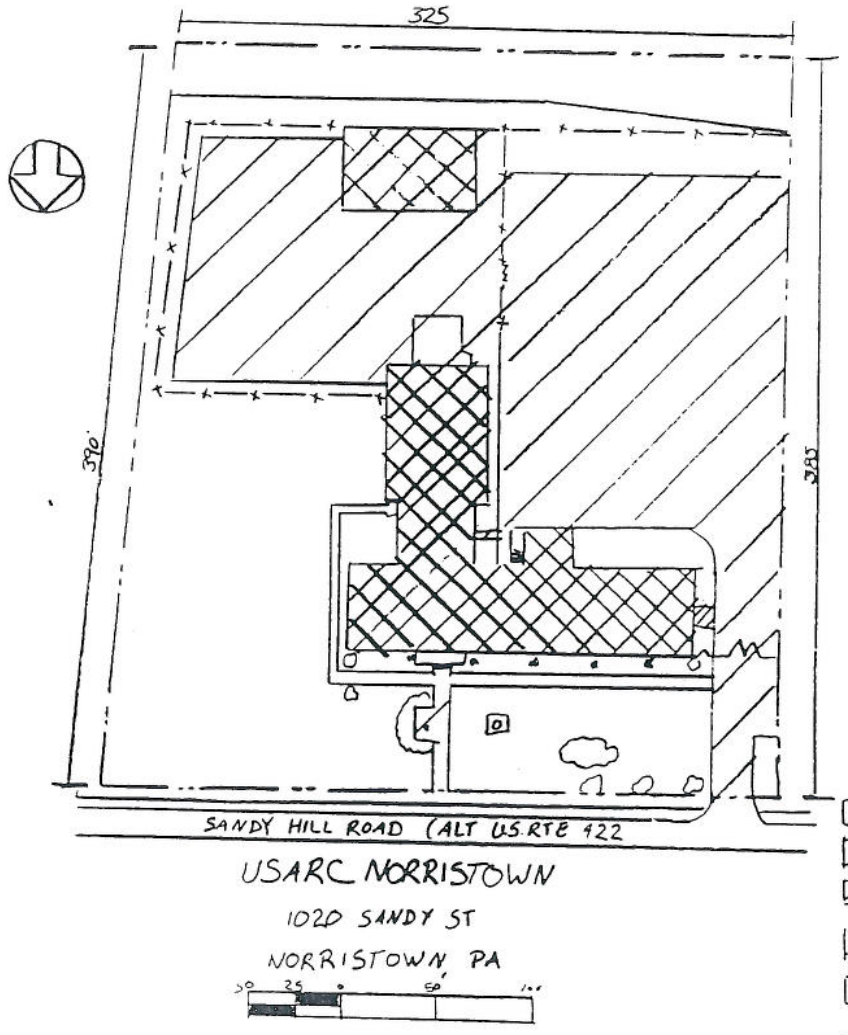
New Cumberland USARC

Figure #20

September 1994



VICINITY MAP
USARC NORRISTOWN



USARC NORRISTOWN
1020 SANDY ST
NORRISTOWN, PA

LEGEND
- EVERGREENS
- DECIDUOUS TREES OR SHRUBS
- BUILDING
- PAVEMENT
- GRASS
- FENCE LINE
- PROPERTY LINE

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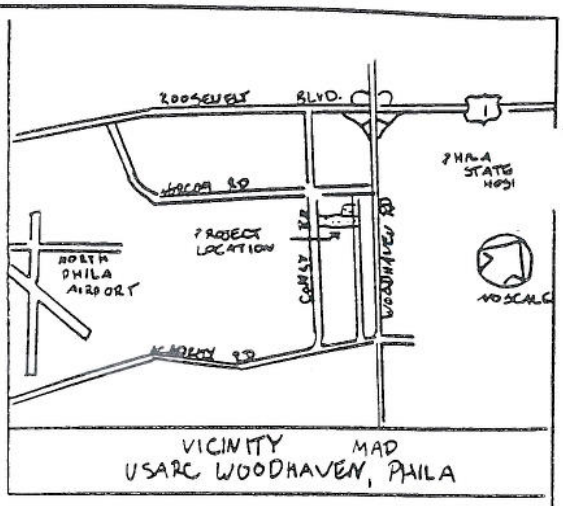
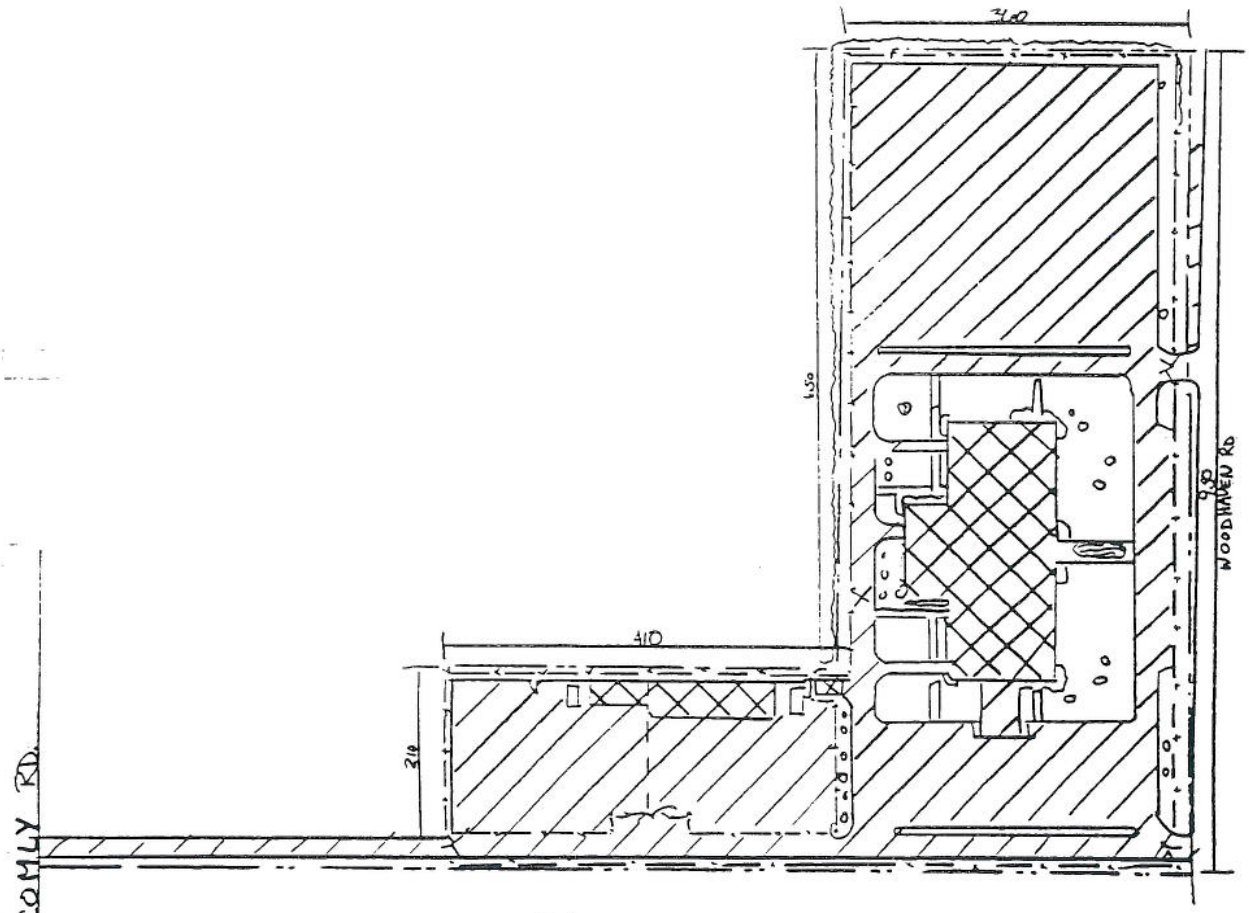
Norristown USARC

Figure #21

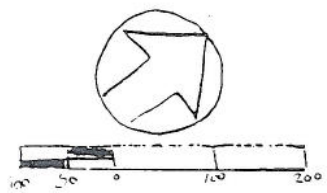
September 1994



VICINITY MAP
USARC WOODHAVEN, PHILA



USARC WOODHAVEN, PHILA



LEGEND

- DECIDUOUS SHRUBS OR TREES
- BUILDING
- PAVEMENT
- EVERGREEN SHRUBS
- FENCE LINE
- PROPERTY LINE

US Army Corps of Engineers
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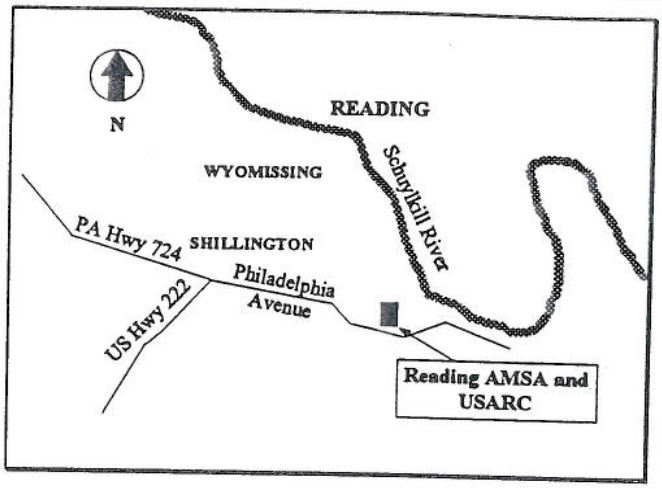
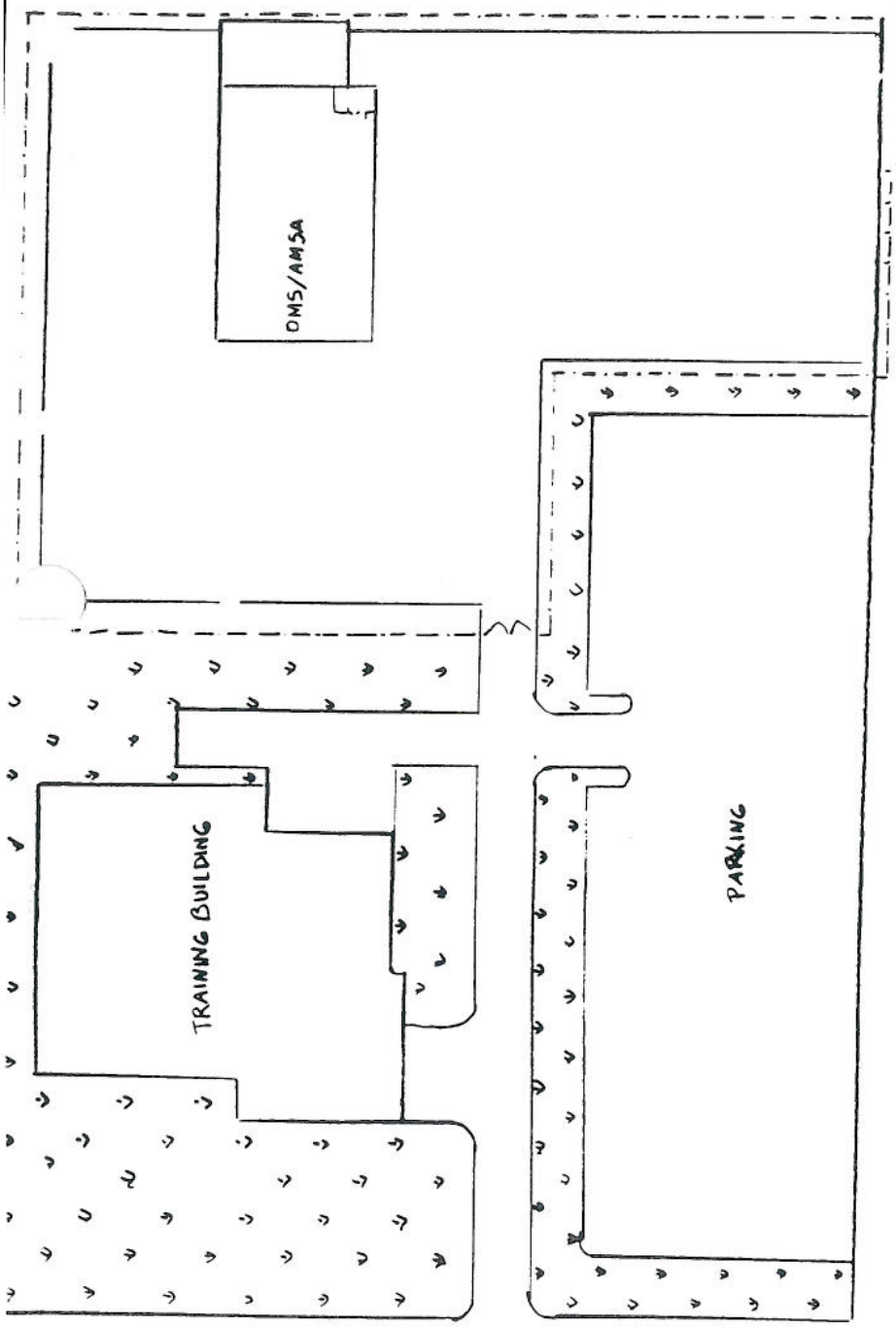
Philadelphia USARC

Figure #22

September 1994





N

USARC Reading and AMSA

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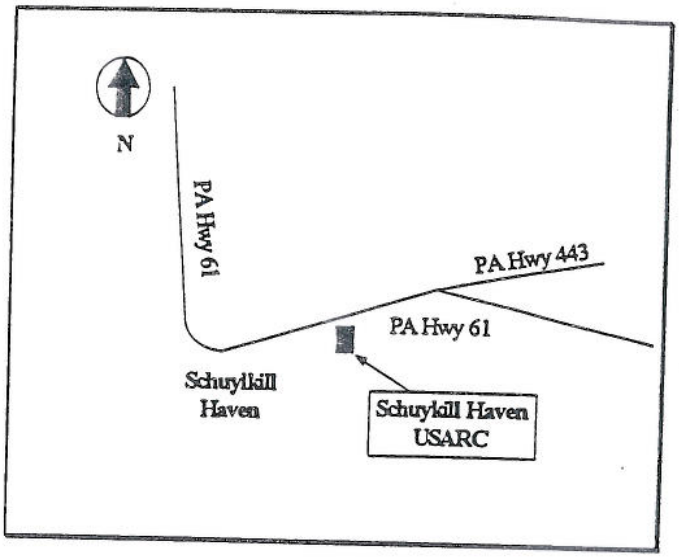
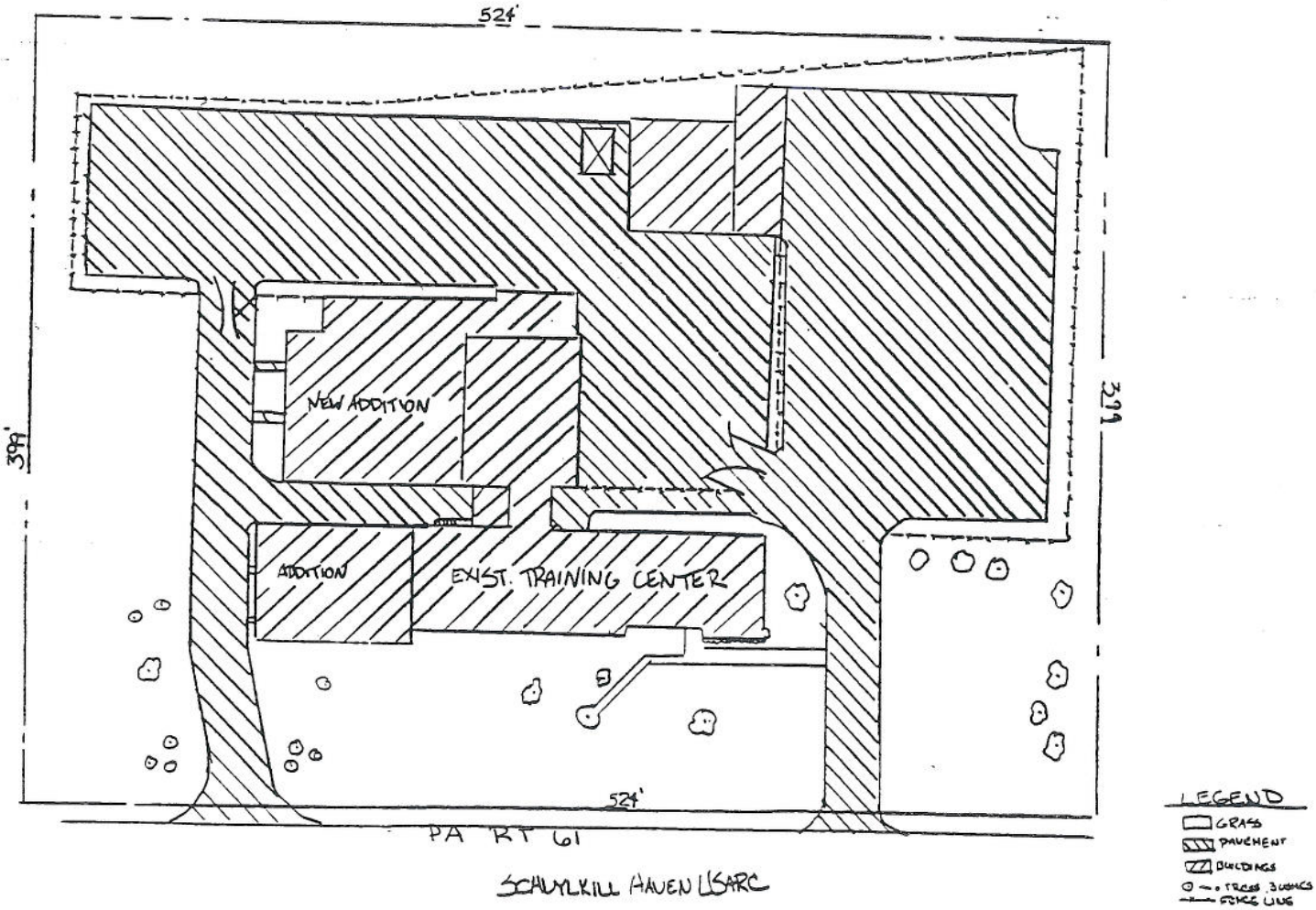
Reading USARC and AMSA

Figure #23

September 1994





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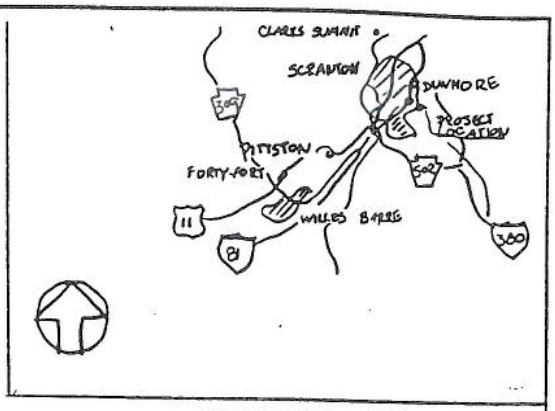
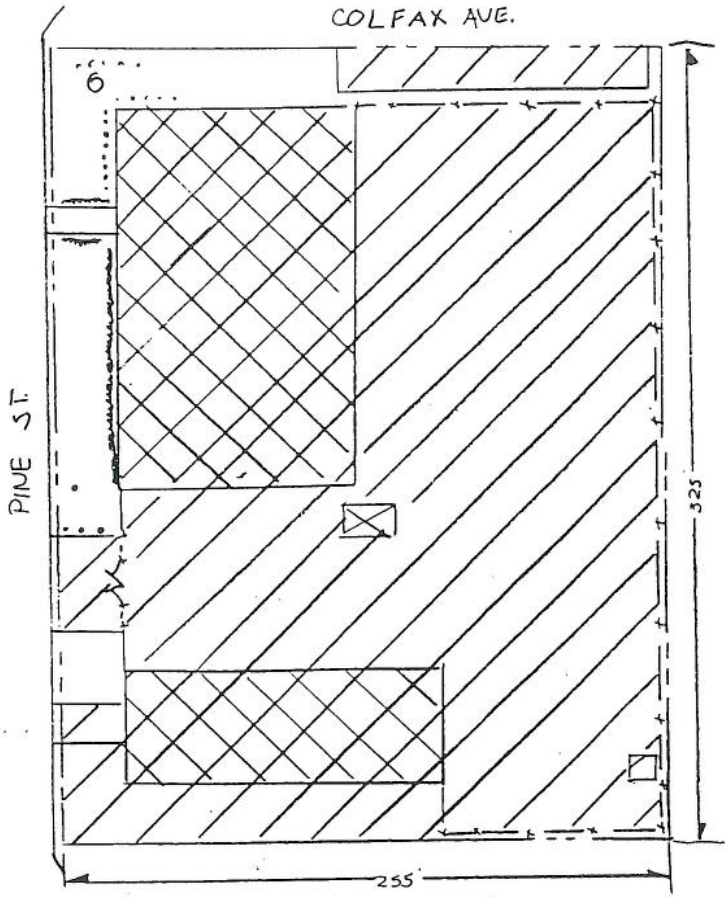
Schuylkill Haven USARC

Figure #24

September 1994



VICINITY MAP
USARC SCRANTON PA.



USARC SCRANTON
PINE ST & COLFAX AVE
SCRANTON, PA

50 25 0 50 100

LEGEND

- BUILDING
- PAVEMENT
- GRASS
- FENCING
- PROPERTY LINE
- HEDGES SHRUBS BUSHES

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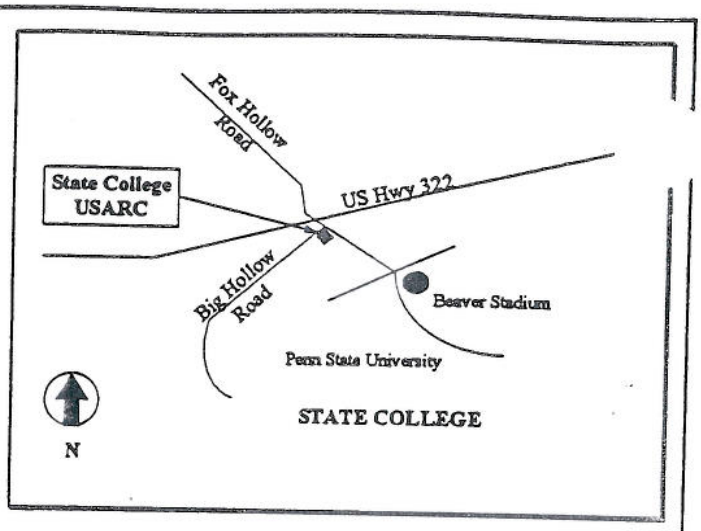
Baltimore, MD 21203-1715

Scranton USARC

Figure #25

September 1994



370'

500

420'

BIG HOLLOW ROAD

380'

FOX HOLLOW RD

BUILDING
PAVEMENT
GRASS

N

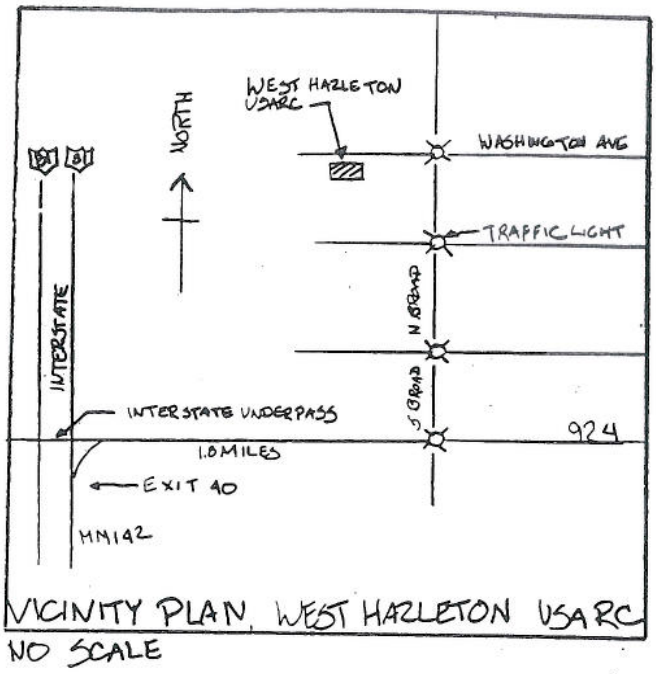
USARC State College

US Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715

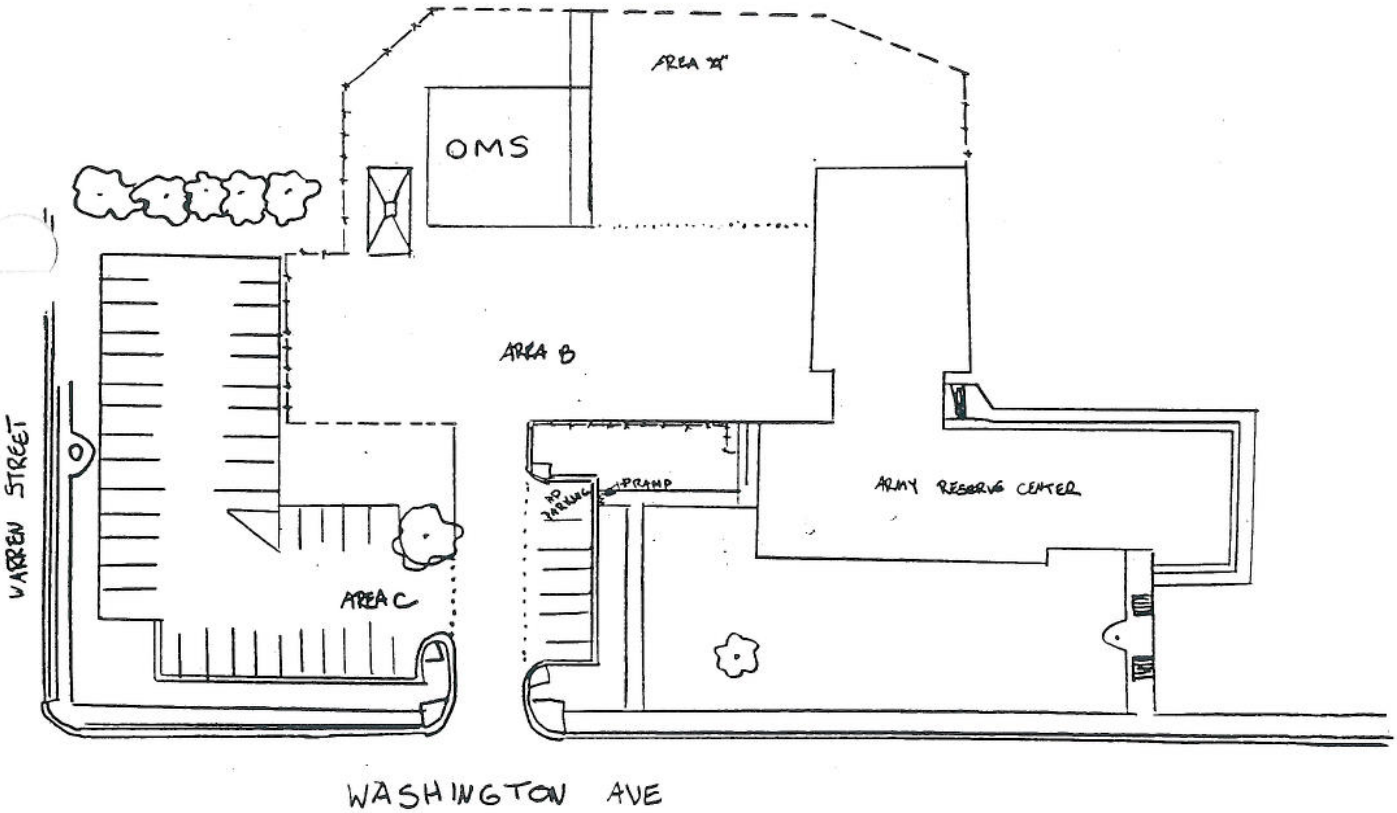
State College USARC

Figure #26

September 1994



VICINITY PLAN, WEST HAZLETON USARC
NO SCALE



WEST HAZLETON USARC

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Baltimore District
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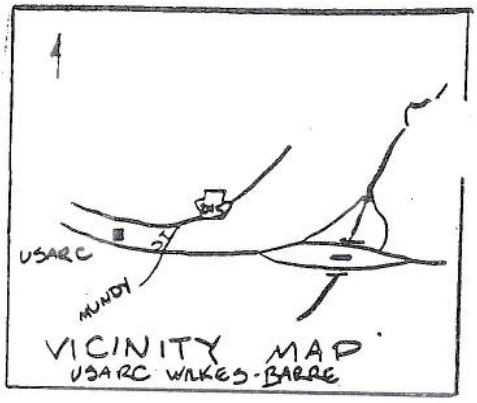
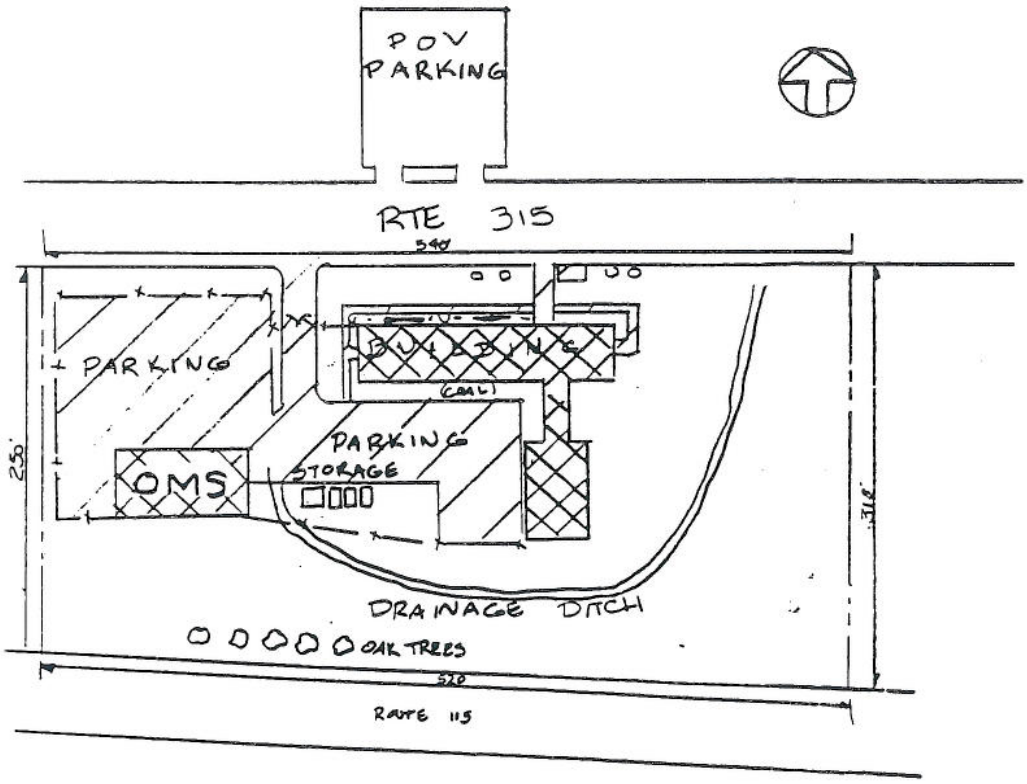
West Hazelton USARC

Figure #27

September 1994





LEGEND

PAVED
BUILDING
GRASS
FENCE
PROPERTY
HEDGES; BUSHS; SHRUB

USARC WILKES-BARRE
RTE 315 WILKES-BARRE, PA

NOT TO SCALE

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Baltimore District
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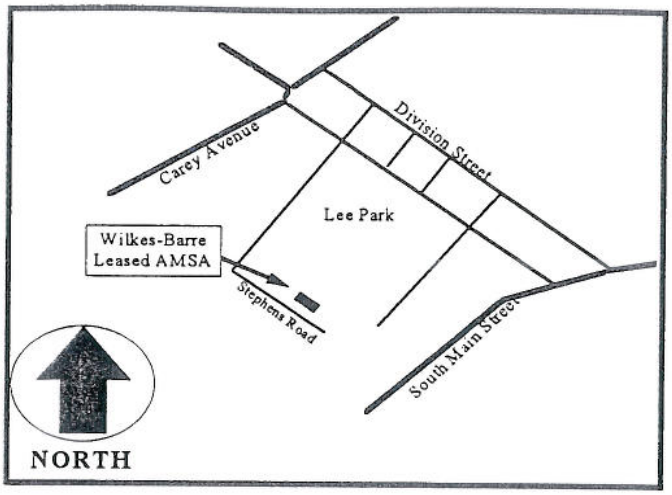
Baltimore, MD 21203-1715

Wilkes-Barre USARC

Figure #28

September 1994



N

Fenced, Gravel MEP Area

Separate Non-Military Activity

AMSA

Paved POV Parking Lot

Stephens Road

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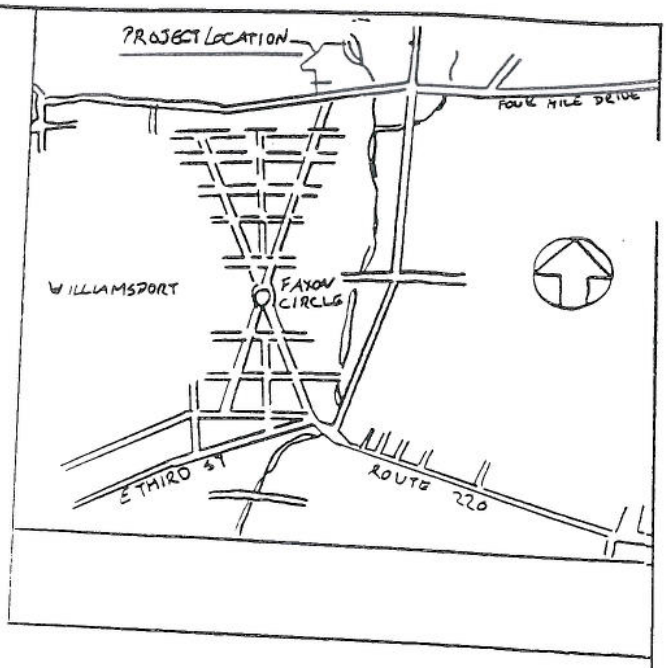
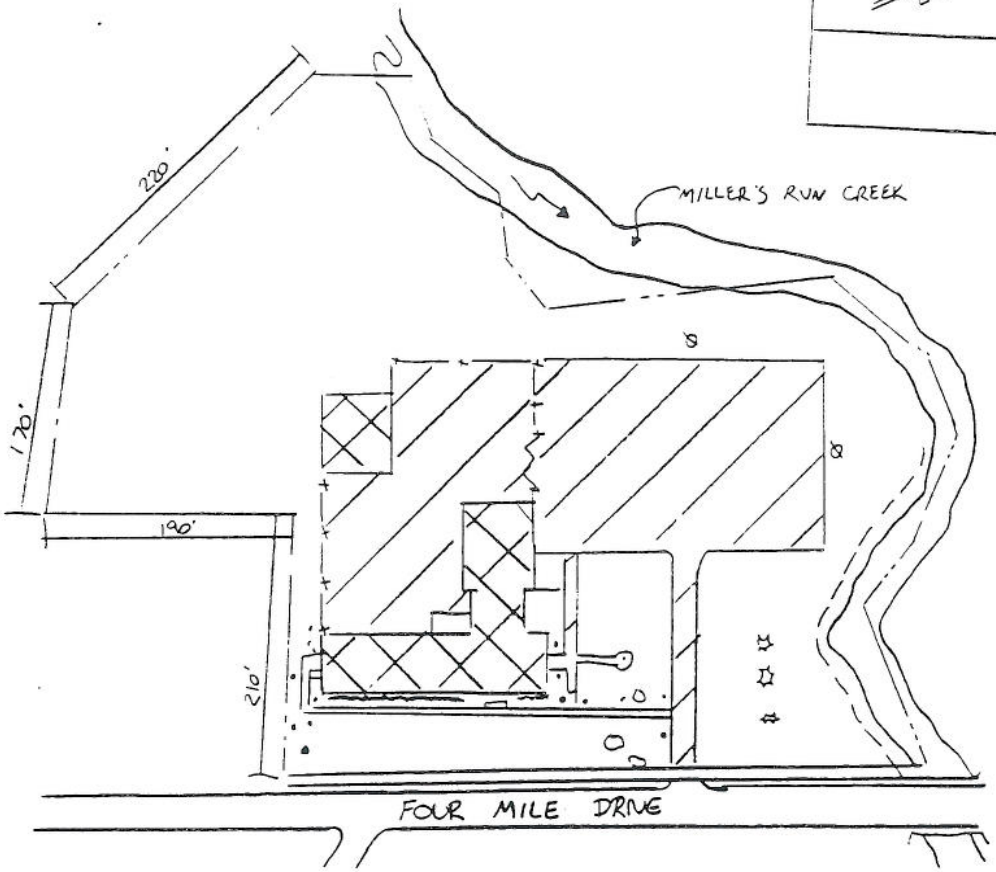
Wilkes-Barre Leased AMSA

Figure #29

September 1994





USARC WILLIAMSPORT

1605 FOUR MILE DR

WILLIAMSPORT, PA

100 50 0 100 200

LEGEND

- HEDGES, SHRUBS, BUSHES, TREES
- BUILDING
- PAVEMENT
- GRASS
- FENCE LINE
- PROPERTY LINE
- LIGHT POLE

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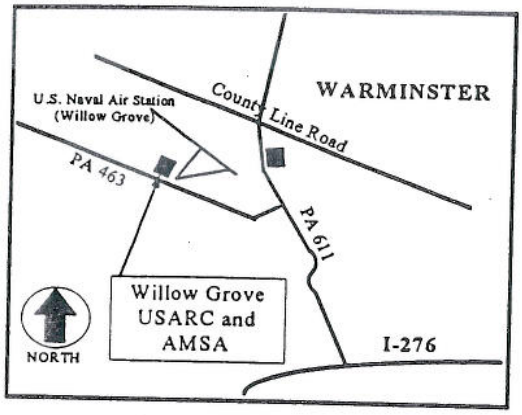
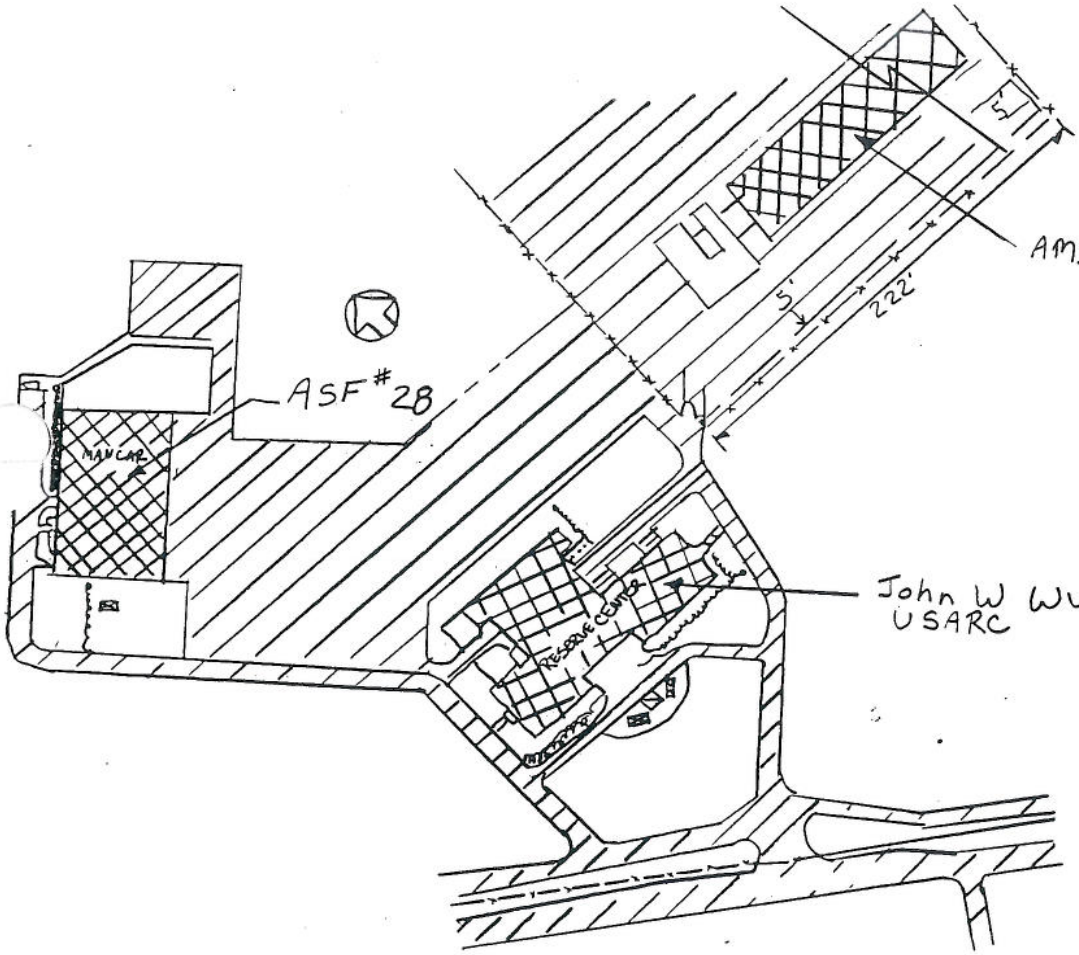
Williamsport USARC

Figure #30

September 1994





NOTE ENTRANCE TO RESERVE CENTER IS LOCATED ON RTE 611

WILLOW GROVE

50 25 0 50 100

LEGEND

- BUILDING
- PAVEMENT
- BUSHES
- GRASS
- SECURITY FENCE

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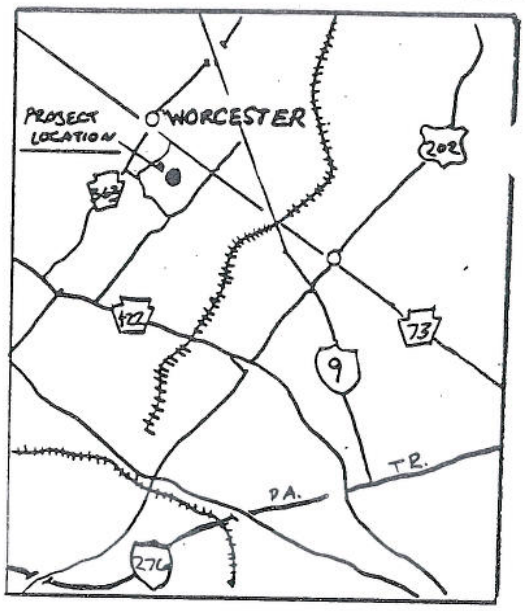
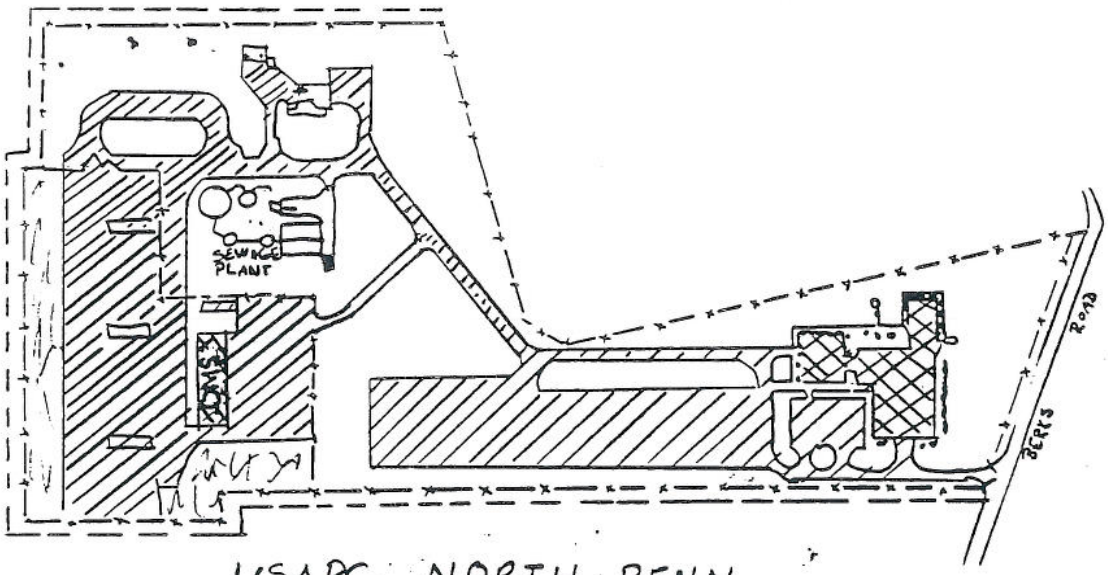
Willow Grove USARC and AMSA

Figure #31

September 1994





USARC NORTH PENN

POTSHOP & BERKS RD

WORCESTER, PA

200 100 0 200 400

LEGEND

BUILDINGS

PAVEMENT

GRASS

FENCE LINE

HEDGES, SHRUBS, BUSHES

SEEDED AREA

AREA OUTSIDE FENCE

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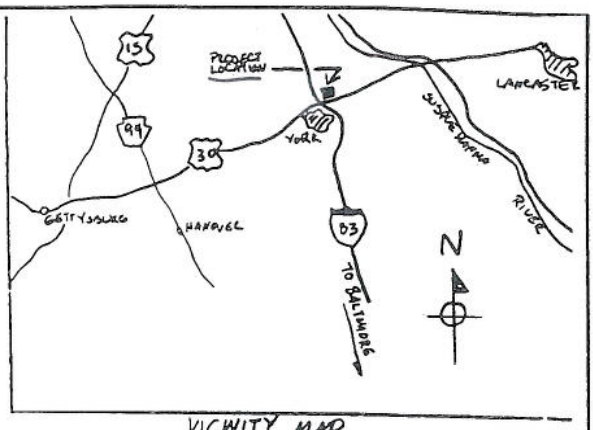
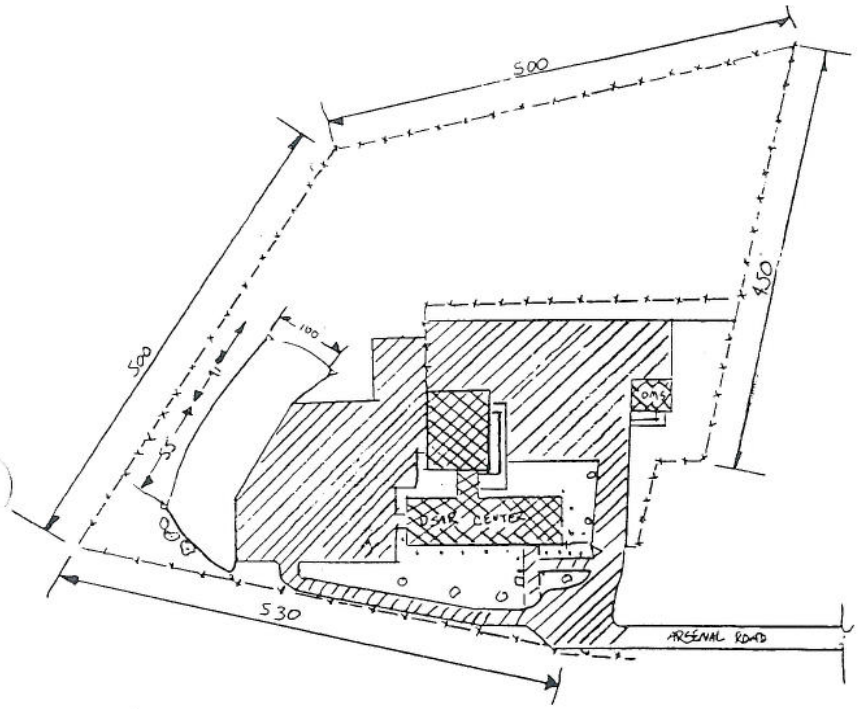
Worcester USARC

Figure #32

September 1994



VICINITY MAP
USARC YORK, PA



USARC YORK, PA
607 ARSENAL ROAD
YORK, PA 17402

LEGEND

- SHRUBS, BUSHES, HEDGES, TREES
- BUILDING
- PAVEMENT
- GRASS
- FENCE LINE
- PROPERTY LINE
- △ WOODEN STAKES

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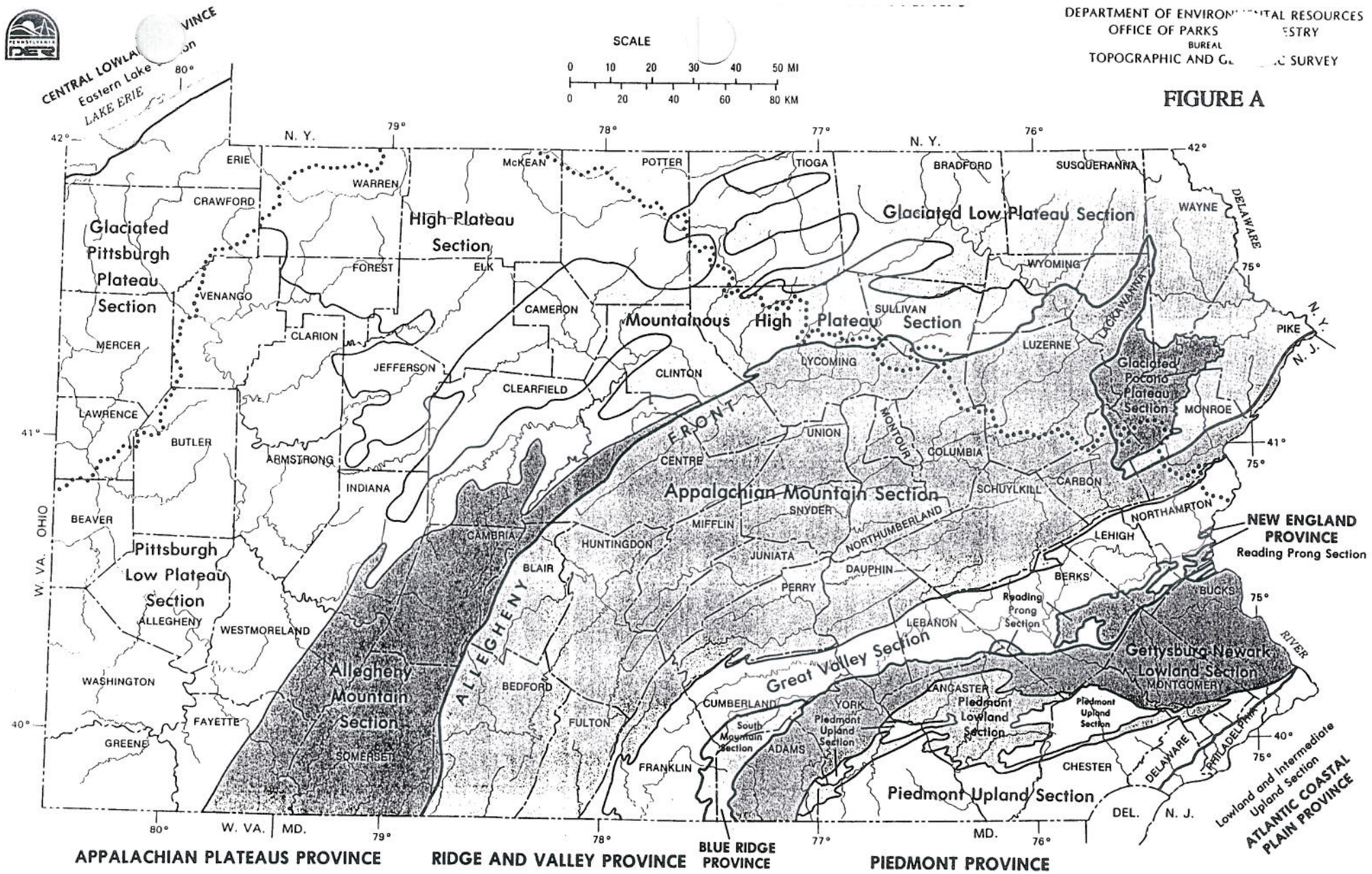
York USARC

Figure #33

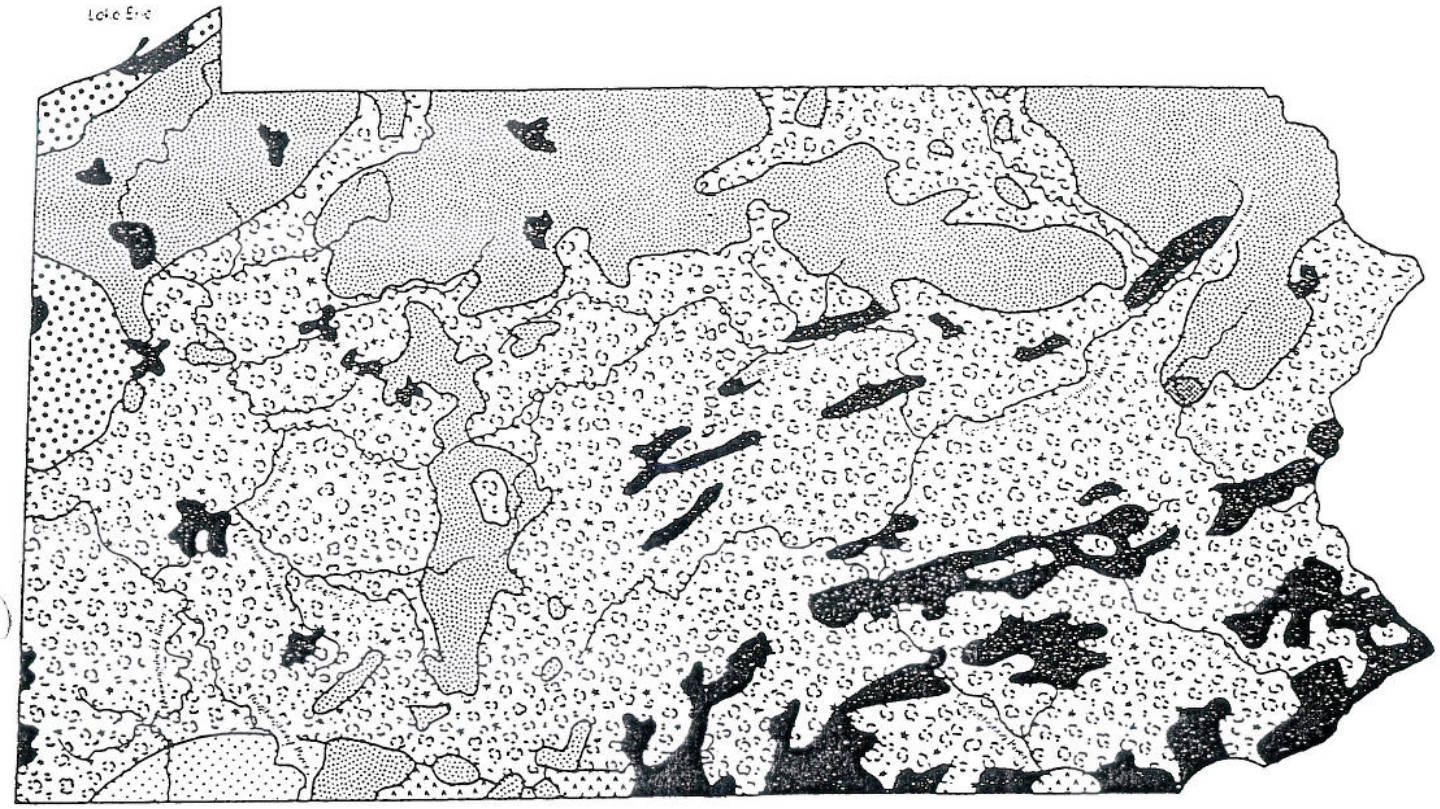
September 1994

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
APPENDIX B
FIGURES A THROUGH C

TABLE OF CONTENTS



ompiled by Thomas M. Berg, John H. Barnes, W. D. Sevon, Viktoras W. Skema, J. Peter Wilshusen, and Dawna S. Yannacci



Appalachian Oak Forest
Northern Hardwoods Forest
Beech-Maple Forest
Mixed Mesophytic Forest
Oak-Hickory-Pine Forest
Northern Hardwoods-Spruce Forest
Nonforest

Note: This map indicates potential natural vegetation, that is, not only plants that exist in Pennsylvania today but also those that would occur today if humans were not present and if plant succession were condensed into a single moment. It is as precise as possible in depicting the plant communities in Pennsylvania; unfortunately it is not possible to illustrate the great local variations caused by differences in topography and climate and by human activities.

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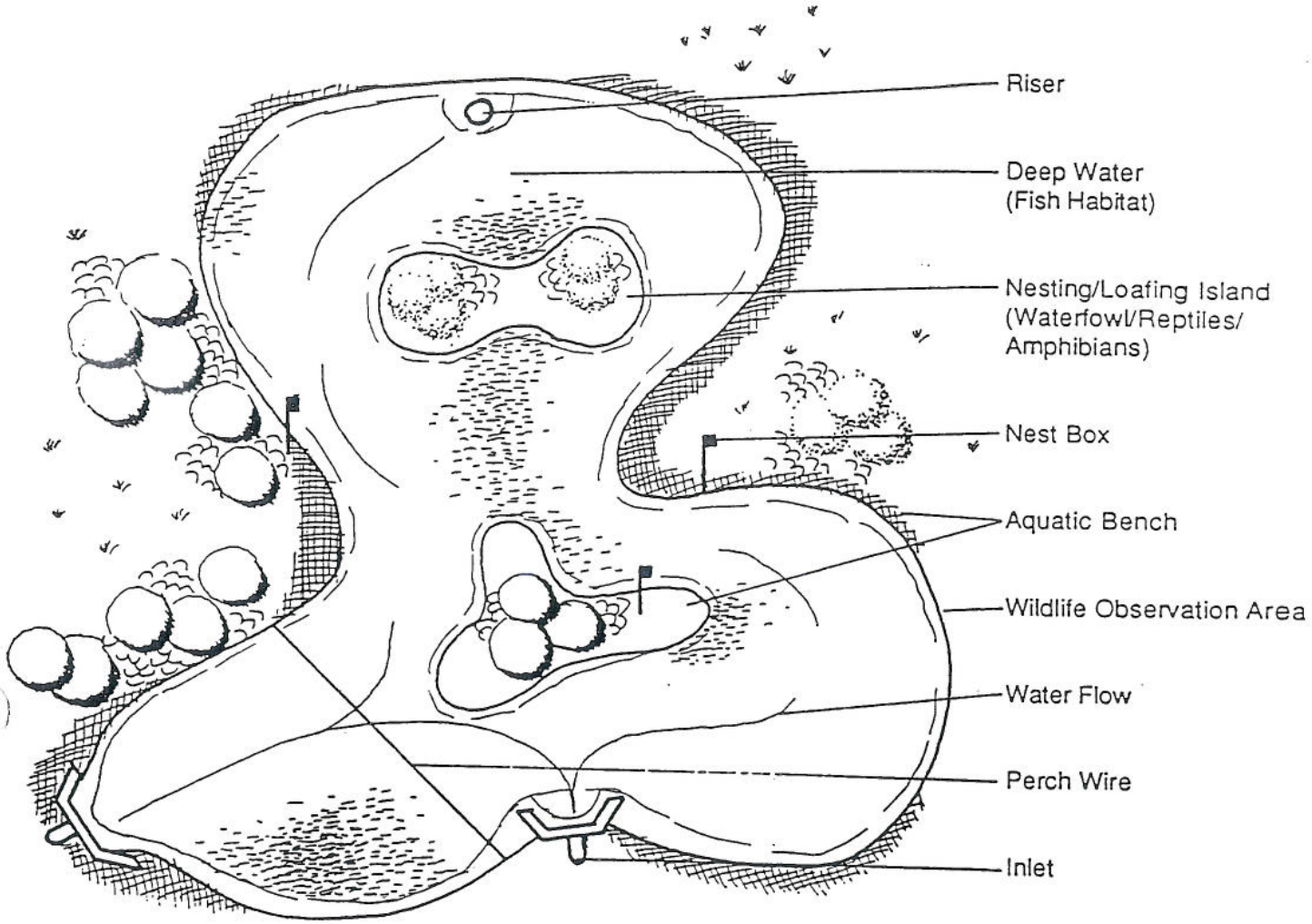
Figure B

Major Forest Types of Pennsylvania
Adapted from PADER



Adapted from: Daft-McCune-Walker
Natural Design and Development

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Baltimore District
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Figure C

Stormwater Management Pond
Incorporating Wildlife Habitat

PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA

PHYSIOGRAPHIC PROVINCE	PHYSIOGRAPHIC SECTION	DOMINANT TOPOGRAPHIC FORM	LOCAL RELIEF[1]	UNDERLYING ROCK TYPE	GEOLOGIC STRUCTURE	APPROXIMATE ELEVATION Min.	APPROXIMATE ELEVATION Max.	DRAINAGE PATTERN	BOUNDARIES	ORIGIN
ATLANTIC COASTAL PLAIN	Lowland and Intermediate Upland	Flat upper terrace surface cut by narrow, steep-sided valleys to open, shallow valleys; includes Delaware River floodplain.	Very low.	Unconsolidated to poorly consolidated sand and gravel, underlain by schist, gneiss, and other metamorphic rocks.	Unconsolidated deposits underlain by very complex, faulted and folded metamorphic rocks.	0	200	Dendritic.	*North:* Maximum limit of continuous deposits of Pensauken and Bridgeton Formations, undivided.	Fluvial erosion and deposition; Delaware River floodplain includes glacial meltwater deposits.
PIEDMONT	Piedmont Upland	Broad, gently rolling hills and valleys.	Low to moderate.	Schist, gneiss, quartzite, and other metamorphic rocks; ultramafic rocks, granite, and pegmatite are also present; much of terrain is weathered to saprolite.	Extremely complex; faulted and folded.	100	1,220	Dendritic.	*East:* Coastal Plain deposits. *North:* Lower Paleozoic carbonate rocks and Mesozoic red beds.	Fluvial erosion of deeply weathered metamorphic rocks; some periglacial mass wasting.
	Piedmont Lowland	Broad, moderately dissected valleys separated by broad, low hills; karstic terrain is common.	Low.	Dominantly carbonate rocks (limestone, dolomite, marble); phyllitic shale and phyllite; some sandstone.	Very complexly folded and faulted.	170	630	Dendritic and karstic.	*South:* Metamorphic rocks of Piedmont Upland section. *North:* Mesozoic red beds.	Fluvial erosion of deeply weathered rocks; solution of carbonate rocks; some periglacial mass wasting.
	Gettysburg-Newark Lowland	Rolling lowlands; isolated hills and highlands.	Low to moderate.	Red and gray shale, siltstone, sandstone, and conglomerate; diabase.	Half-graben structure; low, monoclinal, dominantly northwest-dipping beds.	40	1,355	Dendritic.	Contacts with Paleozoic and Precambrian rocks of South Mountain, Great Valley, Reading Prong, and Piedmont.	Fluvial erosion of moderately resistant and nonresistant beds; minor periglacial mass wasting.
NEW ENGLAND	Reading Prong	Circular to linear, rounded hills or ridges, in some places isolated by limestone valleys.	Moderate.	Granitic gneiss, granodiorite, and quartzite.	Multiple nappes.	140	1,240	Dendritic.	*North:* Great Valley carbonate rocks. *South:* Mesozoic red beds.	Fluvial erosion of deeply weathered rocks; some periglacial mass wasting.
BLUE RIDGE	South Mountain	Pronounced ridges and deep valleys.	Moderate to high.	Metavolcanic rocks, quartzite, and some dolomite.	Major anticlinorium having many second- and third-order folds.	450	2,080	Dendritic.	*North and west:* Great Valley carbonate rocks. *East:* Mesozoic red beds and diabase.	Fluvial erosion of highly variable, metamorphosed extrusive rocks and quartzite; periglacial mass wasting and deposition.
RIDGE AND VALLEY	Great Valley	Very broad, moderately dissected valley having a gently undulating surface; karstic terrain in southern half.	Low to moderate.	Shale and sandstone on northwest side (includes slate belt at east end); limestone and dolomite on southeast side.	Thrust sheets, nappes, overturned folds, and steep faults; many third- and fourth-order folds.	140	1,100	Dendritic and karstic.	*North:* Foot of Blue Mountain. *South:* South Mountain, Mesozoic rocks, and Reading Prong rocks.	Fluvial erosion; some periglacial mass wasting; glacial erosion and deposition in north and east; solution of carbonate rocks.
	Appalachian Mountain	Long, narrow ridges and broad to narrow valleys; some karstic terrain.	Moderate to very high.	Wide variety of sedimentary rocks, including sandstone, siltstone, shale, conglomerate, limestone, dolomite, and others (anthracite in east).	Open and closed plunging folds having narrow hinges and planar limbs; thrust, reverse, and strike-slip faults.	300	3,135	Trellis, angulate, and some karstic.	*Southeast:* Foot of Blue Mountain. *North and west:* Crest of Allegheny Front. *East:* Delaware River escarpment. Arbitrary from Delaware River escarpment to Allegheny Front.	Fluvial erosion; periglacial mass wasting; glacial erosion and deposition in north and east; solution of carbonate rocks.
APPALACHIAN PLATEAUS	Glaciated Pocono Plateau	Broad, undulatory surface having dissected margins.	Low to moderate.	Sandstone, siltstone, and shale; some conglomerate.	Low, north-dipping beds; some small folds.	1,200	2,320	Deranged.	*South and east:* Pocono escarpment. *North:* Maximum slope change. *West:* Arbitrary.	Fluvial and glacial erosion; some glacial deposition.
	Glaciated Low Plateau	Rounded hills and valleys; some buried valleys.	Low to moderate.	Sandstone, siltstone, and shale.	Low-amplitude folds.	440	2,690	Dendritic.	*West and southeast:* Mainly escarpments at adjacent uplands. Arbitrary elsewhere.	Fluvial and glacial erosion; glacial deposition.
	Mountainous High Plateau	Broad, rounded to flat uplands separated by very deep, angular valleys, which follow structural axes to varying degrees.	Moderate to very high.	Sandstone, siltstone, shale, and conglomerate; some coal.	Moderate-amplitude, open folds; a few strike-slip faults near Allegheny Front.	570	2,590	Angulate and dendritic.	*Southeast:* Crest of Allegheny Front. *Northwest:* Arbitrary boundary where pronounced Plateau folds end. *Southwest:* Approximate limit of 1700-foot elevation.	Fluvial erosion; periglacial mass wasting; glacial erosion and deposition in east.
	High Plateau	Broad, rounded to flat uplands having deep, angular valleys.	Moderate to high.	Sandstone, siltstone, shale, conglomerate, and some coal.	Low-amplitude, open folds.	1,080	2,500	Dendritic.	*Northwest:* Glacial border. *Southeast:* Arbitrary boundary where pronounced Plateau folds end. *Southwest:* Approximate limit of 1,700-foot elevation.	Fluvial erosion; periglacial mass wasting; some glacial erosion and deposition in east.
	Allegheny Mountain	Wide ridges separated by broad valleys; ridge elevations decrease to northwest.	Moderate to high.	Sandstone, siltstone, shale, conglomerate, some limestone, and coal.	Large-amplitude, open folds; a few steep thrusts; many strike-slip faults in northeast.	775	3,210	Dendritic.	*East:* Crest of Allegheny Front. *West:* West flank of Chestnut Ridge. *North:* Approximate limit of 1,700-foot elevation.	Fluvial erosion, strongly controlled by major folds; some periglacial mass wasting.
	Pittsburgh Low Plateau	Smooth, undulating surface having numerous narrow, relatively shallow valleys; some high-level terraces.	Low to moderate.	Shale, siltstone, sandstone, limestone, and coal.	Moderate- to low-amplitude, open folds, decreasing in occurrence northwestward.	660	1,700	Dendritic.	*East:* West flank of Chestnut Ridge. *Northwest:* Glacial border. *Northeast:* Approximate limit of 1,700-foot elevation.	Fluvial erosion; some periglacial mass wasting.
	Glaciated Pittsburgh Plateau	Broad, rounded uplands having steep-sided, broad, linear valleys; numerous buried valleys.	Very low to moderate.	Shale, siltstone, and sandstone.	Subhorizontal beds.	900	2,200	Dendritic.	*Northwest:* Escarpment. *South and east:* Glacial border.	Glacial erosion and deposition; some fluvial erosion.
CENTRAL LOWLAND	Eastern Lake	Northwest-sloping, lake-parallel, low-relief ridges.	Very low to low.	Shale and siltstone.	Low, south-dipping to almost horizontal beds.	570	1,000	Parallel.	*Northwest:* Lake Erie. *Southeast:* Escarpment.	Glacial, lake, and fluvial deposition and erosion

[1] Local relief: 0 to 100 feet, very low; 101 to 300 feet, low; 301 to 600 feet, moderate; 601 to 1,000 feet, high; >1,000 feet, very high. (Relief categories listed here for Pennsylvania do not necessarily apply to other states or countries.)

Sciurus carolinensis	Gray Squirrel
Tamiasciurus hudsonicus	Red Squirrel
Glaucomys volans	Southern Flying Squirrel
Castoridae	
Castor canadensis	Beaver
Cricetidae	
Peromyscus maniculatus	Deer Mouse
Peromyscus leucopus	White-footed Mouse
Clethrionomys gapperi	Southern Red-backed Vole
Microtus pennsylvanicus	Meadow Vole
Microtus pinetorum	Woodland Vole
Synaptomys cooperi	Southern Bog Lemming
Muridae	
Rattus norvegicus	Norway Rat
Mus musculus	House Mouse
Zapodidae	
Zapus hudsonius	Meadow Jumping Mouse
Napaeozapus insignis	Woodland Jumping Mouse
Ondatra zibethicus	Muskrat
Carnivora	
Ursidae	
Ursus americanus	Black Bear
Canidae	
Vulpes vulpes	Red Fox
Vulpes cinereoargenteus	Gray Fox
Canis latrans	Coyote
Procyonidae	
Procyon lotor	Raccoon
Mustelidae	
Mustela frenata	Long-tailed Weasel
Mustela vison	Mink
Mephitis mephiti	Striped Skunk

(based on Gifford and Whitebread, 1951)

Certhis americana	Brown Creeper
Troglodytidae	
Thryothorus ludovicianus	Carolina Wren
Troglodytes aedon	House Wren
Troglodytes troglodytes	Winter Wren
Sylviinae	
Polipoptila caerulea	Blue-gray gnatcatcher
Turdinae	
Sialia sialis	Eastern Bluebird
Catharus fuscescens	Veery
Hylocichla mustelina	Wood Thrush
* Turdus migratorius	American Robin
Mimidae	
Dumetella corolinensis	Gray Catbird
* Mimus polyglottos	Northern Mockingbird
Toxostoma rufum	Brown Thrasher
Bombycillidae	
Bombycilla cedrorum	Cedar Waxwing
Sturnidae	
* Sturnus vulgaris	European Starling
Vireonidae	
Vireo griseus	White-eyed Vireo
Vireo solitarius	Solitary Vireo
Vireo flavifrons	Yellow-throated Vireo
Vireo gilvus	Warbling Vireo
Vireo olivaceus	Red-eyed Vireo
Emberizidae	
Vermivora pinus	Blue-winged Warbler
Dendroica petchia	Yellow Warbler
Dendroica pennsylvanica	Chestnut-sided Warbler
Dendroica coronata	Yellow-rumped Warbler
Mniotilta varia	Black-and-white Warbler
Setophaga ruticilla	American Redstart
Parula americana	Northern Parula
Helmitheros vermivorus	Worm-eating Warbler
Seiurus aurocapillus	Ovenbird
Seiurus noveboracensis	Northern Waterthrush
Oporornis formosus	Kentucky Warbler
Geothylpis trichas	Common Yellowthroat
Wilsonia citrina	Hooded Warbler
Icteria virens	Yellow-breasted Chat

Meleagridinae	
Meleagris gallopavo	Eastern Wild Turkey
Odontophorinae	
Colinus virginianus	Northern Bobwhite Quail
Charadriiformes	
Charadriidae	
* Charadrius vociferus	Killdeer
Scolopacidae	
Actitis macularia	Spotted Sandpiper
Scolopax minor	American Woodcock
Laridae	
Sterninae spp.	Terns
Columbiformes	
Colubidae	
* Columa livia	Rock Dove
* Zenaida macroura	Mourning Dove
Cuculiformes	
Cuculidae	
Coccyzus erthropthalmus	Black-billed Cuckoo
Coccyzus americanus	Yellow-billed Cuckoo
Strigiformes	
Strigidae	
Bubo virginianus	Great Horned Owl
Aegolius acadicus	Northern Saw-whet Owl
Otus asio	Northern Screech-Owl
Caprimulgiformes	
Caprimulgidae	
Chordeiles minor	Common Nighthawk
Caprimulgus vociferus	Whip-poor-will
Apodiformes	
Apodidae	
Chaetura pelagica	Chimney Swift

TABLE 8 (Continued)

Summary of Required Forest Habitat Characteristics and Management Recommendations for Forest Interior Breeding Birds

Northern Parula *Parula americana*	canopy	open	canopy	250	retain 60 - 70% canopy closure, increase shrub
Black-and-white Warbler *Mniotilta varia*	ground	open	mid-story	750	maintain early successional forest stage
American Redstart *Setophaga ruticila*	understory	open	mid-story	80	maintain closed canopy; thin competing understory trees
Prothonotary Warbler *Prothonotaria citrea*	snag	cavity	ground	250	maintain old growth stands with dead and decaying trees
Worm-eating Warbler *Helmitheros vermivorus*	ground	open	ground	750	maintain dense understory and low basal area of trees
Louisiana Waterthrush *Seiurus motacilla*	ground	open	ground	250	maintain wooded streambanks and ravines with thick undergrowth
Ovenbird *Seiurus aurocapillus*	ground	open	ground	250	maintain closed canopy and open understory; minimize disturbance
Kentucky Warbler *Oporornis formosus*	understory	open	ground	80	maintain dense understory and well-developed ground cover
Hooded Warbler *Wilsonia citrina*	understory	open	understory	80	maintain canopy closure and dense shrub layer
Scarlet Tanager *Piranga olivacea*	canopy	open	canopy	25	maintain pole stands and well-developed canopy

Observed (‹)
Compiled from Bushman and Therres (1988)

TABLE 7 Continued

LANDSCAPE PLANTINGS FOR URBAN SETTINGS WITH VALUE TO WILDLIFE

Shrubs

Smooth sumac (*Rhus glabra*)
Staghorn sumac (*Rhus typhina*)
Pasture gooseberry (*Ribes cynosbati*)
Meadow rose (*Rosa blanda*)
Pasture rose (*Rosa carolina*)
Rugosa rose (*Rosa rugosa*)
Virginia rose (*Rosa virginiana*)
Coralberry (*Symphoricarpos orbiculatus*)
Lowbush blueberry (*Vaccinium angustifolium*)

Plants That Withstand City Conditions

Trees

Norway maple (*Acer platanoides*)
Common hackberry (*Celtis occidentalis*)
Flowering dogwood (*Cornus florida*)
Hawthorns (*Crataegus* spp.)
American sweetgum (*Liquidambar styraciflua*)
Yellow-poplar (*Liriodendron tulipifera*)
Colorado spruce (*Picea pungens*)
Pin oak (*Quercus palustris*)

Shrubs

Serviceberries (*Amelanchier* spp.)
Devil's walkingstick (*Aralia spinosa*)
Red chokeberry (*Aronia arbutifolia*)
Japanese barberry (*Berberis Thunbergii*)
Gray dogwood (*Cornus racemosa*)
Autumn olive (*Elaeagnus umbellata*)
Witch-hazel (*Hamamelis virginiana*)
Inkberry (*Ilex glabra*)
Common spicebush (*Lindera benzoin*)
Honeysuckles (*Lonicera* spp.)
Scarlet firethorn (*Pyracantha coccinea*)
Common buckthorn (*Rhamnus cathartica*)
Roses (*Rosa* spp.)
American elder (*Sambucus canadensis*)
Common snowberry (*Symphoricarpos albus*)
Coralberry (*Symphoricarpos orbiculatus*)
Japanese yew (*Taxus cuspidata*)
Viburnums (*Viburnum* spp.)

Vines

Heartleaf ampelopsis (*Ampelopsis cordata*)
Common trumpetcreeper (*Campsis radicans*)
American bittersweet (*Celastris scandens*)

Flowering and Fruiting Periods of Medium Shrubs (6–10 feet)[1]

Plant	Flower color	Fruit color	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
American Hazel	i	brown	o	o	•	•			o	o	o	o	o	o
Beaked Filbert	i	brown	o	o		•	•		o	o	o	o	o	o
Speckled Alder	i	brown			•	•	•			o	o	o	o	o
Smooth Alder	i	brown				•	•			o	o	o	o	o
European Barberry	yellow	red	o	o	o	o•	•	•	o	o	o	o	o	o
Allegany Blackberry	white	black					•	•	o	o	o			
Pasture Rose	pink	red						•	o•	o•	o	o	o	o
Swamp Rose	pink	red						•	•	o•	o	o	o	o
Virginia Rose	pink	red						•	o•	o				
Rugosa Rose	pink	red					•	•	o	o•	o			
Red Chokeberry	white	red				•	•	•	•	o	o	o	o	o
Black Chokeberry	white	black	o	o		•	•	•	•	o	o	o	o	o
Bartram Serviceberry	wte/pnk	pur/blk					•	o•	o•	o•	o			
Flameleaf Sumac	i	red	o	o	o				•	o•	o•	o	o	o
Inkberry	i	black	o	o	o•	•	•	•	o	o	o	o	o	o
Devil's Walkingstick	white	black							•	•	o	o		
Silky Dogwood	white	blue						•	•	o	o	o		
Red-osier Dogwood	white	white					•	•	o•	o•	o	o		
Gray Dogwood	white	white					•	•	o•	o	o	o	o	o
Dangleberry	grn/pnk	black					•	o•	o	o	o			
Highbush Blueberry	pink	blue					•	o•	o	o	o			
Common Buttonbush	white	grn/brn	o	o	o			•	•	•	o•	o	o	o
American Elder	white	pur/blk						•	o•	o•	o			
Scarlet Elder	white	red				•	•	o•	o•	o	o			
Glossy Buckthorn	i	black					•	o•	o•	o	o			
Scarlet Firethorn	white	orange	o	o	o	o	•	•			o	o	o	o
Hobblebush	white	purple					•	•	o•	o	o	o		
American Cranberrybush	white	red	o	o	o	o	•	•	•	o	o	o	o	o
Witherod	white	pur/blk	o				•	•	•		o	o	o	o
Tatarian Honeysuckle	pnk/wte	red					•	o•	o	o	o	o	o	
Standish Honeysuckle	white	red				•		o	o	o				
Morrow Honeysuckle	wte/yel	red/yel					•	o•	o	o				
Northern Bayberry	i	gray	o	o	o	o	o•	o•	o•	o	o	o	o	o

[1]fruiting periods indicate when fruits and/or seeds are available for wildlife.
•flower; o, fruit; i, inconspicuous.

TABLE 6 Continued

Flowering and Fruiting Periods of Medium Trees (30–60 feet)[1]

Plant	Flower color	Fruit color	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Eastern Red Cedar	i	blue	o	o	o*	*	*				o	o	o	o
Balsam Fir	i	brown	o	o	o		*	*		o	o	o	o	o
Pitch Pine	i	brown	o	o	o	o*	o*	o	o	o	o	o	o	o
Northern White Cedar	i	brown				*	*			o	o	o		
Bigtooth Aspen	i	brown				*	o*	o						
Quaking Aspen	i	brown				*	o*	o						
Black Willow	i	green		*	*	o*	o*	o*	o					
Butternut	i	green				*	*				o	o	o	o
Mockernut Hickory	i	brown				*	*				o	o	o	o
Sweet Birch	i	brown	o			*	*			o	o	o	o	o
American Hornbeam	i	brown				*	*	*		o	o	o		
Common Hackberry	i	red/pur	o	o		*	*				o	o	o	o
White Mulberry	green	wte/pnk					*		o	o				
Red Mulberry	green	red				*	*	o*	o	o				
Common Sassafras	grn/yel	blue				*	*	*		o	o	o		
American Mountain-ash	white	red/orng	o	o	o		*	*	*	o	o	o	o	o
Siberian Crabapple	white	red/yel	o	o	o		*			o	o	o	o	o
Downy Serviceberry	white	pur			*	*	*	o*	o	o				
Black Tupelo	grn/wte	blu/blk				*	*	*		o	o	o		
Flowering Dogwood	white	red			*	*	*	*		o	o	o	o	
Common Persimmon	white	orng/yel			*	*	*	*			o	o	o	
Green Ash	i	brown	o	o		*	*				o	o	o	o
Black Ash	i	brown	o	o	o	*	*	o	o	o	o	o	o	o

[1]fruiting periods indicate when fruits and/or seeds are available to wildlife.
*flower; o, fruit; i, inconspicuous.

Flowering and Fruiting Periods of Low Shrubs (1–5 feet)[1]

Plant	Flower color	Fruit color	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Canada Yew	i	red				*	*		o	o	o			
Common Juniper	i	blue	o	o	o	o	o*	o	o	o	o	o	o	o
Prairie Willow	i	i			*	o*	o							
Sweetfern	i	i				*	*	*		o	o	o		
Japanese Barberry	yellow	red	o	o	o	*	*	*	o	o	o	o	o	o
Pasture Gooseberry	green	red				*	*	*	o	o	o			
American Black Currant	yel/wte	black				*	*	o*	o	o	o			
Broadleaf Meadowsweet	pnk/wte	brown						*	o*	o*	o*	o	o	
Narrowleaf Meadowsweet	wte/ros	brown						*	*	o*	o*	o	o	
Hardhack	pnk/pur	brown							*	o*	o*	o	o	
Fragrant Thimbleberry	ros/pur	red					*	*	o*	o*	o*			
Northern Dewberry	white	black					*	o*	o	o				
Common Snowberry	white	white	o	o	o	o	o*	*	*	o	o	o	o	o
Meadow Rose	pink	red					*	*	o	o	o	o	o	o
Alderleaf Buckthorn	i	black					*	*	*	o	o	o		
Shrubby St. Johnswort	yellow	brown	o						*	o*	o*	o	o	o
Black Huckleberry	green	black				*	*	o	o	o				
Box Huckleberry	pnk/wte	black					*	*	o	o				
Dwarf Huckleberry	pnk/wte	black					*	o*	o	o	o	o		
Common Bearberry	pnk/wte	red	o	o	o	*	*	*	o*	o	o	o	o	o
Lowbush Blueberry	white	blue				*	*	*	o	o	o			
Mapleleaf Viburnum	white	pur/blk	o				*	*	o*	o*	o	o	o	o
Coralberry	grn/pur	red	o						*	*	o	o	o	o
American Fly Honeysuckle	yel/grn	red				*	*	o*	o	o				
Swamp Fly Honeysuckle	grn/yel	red					*	*	o*	o	o			
Blackcap Raspberry	white	black					*	*	o	o				
Red Raspberry	white	red					*	*	o					

[1]fruiting periods indicate when fruits and/or seeds are available for wildlife.
*flower; o, fruit; i, inconspicuous.

Woody Plants (continued)

Common Name	Scientific Name
Southern Arrowood	*Viburnum dentatum*
Big Tooth Aspen	*Populus grandidentata*
American Holly	*Ilex opaca*
Mulberry	*Morus sp.*
Crepe Myrtle	*Pyrus cornaria*
Crabapple	*Berberis canadensis*
Shagbark Hickory	*Carya ovata*
Silky Dogwood	*Cornus amomum*
Blackberry	*Rubus sp.*
Spice Bush	*Lindera benzoin*
Virginia Creeper	*Parthenocissus cinquefolia*
Mockernut Hickory	*Carya tomentosa*
American Elm	*Ulmus americana*
Tulip Popular	*Liriodendron tulipifera*
Flowering Dogwood	*Cornus florida*
Honey Locust	*Gleditsia tricanthus*
Linden	*Tilia americana*
Sweetgum	*Liquidambar styraciflua*
Sumac	*Rhus sp.*
Box Elder	*Acer negundo*
Norway Maple	*Acer platanoides*

TABLE 2 Continued

SOIL ASSOCIATION SYMBOL AND MAJOR SOILS 1/	DOMINANT SLOPE	PERCENT OF ASSOCIATION 2/	SUITABILITY FOR: 3/ CROPLAND 4/ CORN	ALFALFA	WOODLAND 5/	DEGREE OF LIMITATION AND MAJOR LIMITING FACTORS FOR: 3/ 6/ TOWN AND COUNTRY PLANNING SITE SEWAGE DISPOSAL	HOMESITES WITH BASEMENTS	RECREATION CAMPSITES	PICNIC AND PLAY AREAS
Soils of the Ridge and Valley Province Cont'd.									
Edgemont	3–20	30	Excellent	Excellent	Good	MODERATE - Slope, depth to bedrock	MODERATE - Slope, depth to bedrock	MODERATE - Coarse fragments, slope	MODERATE - Coars fragments, slope
Hazleton	3–20	30	———	———	Good	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
Gilpin	3–20	25	Fair	Fair	Very Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Coarse fragments, slope	MODERATE - Coars fragments, slope
Clymer	0–15	15	Excellent	Excellent	Very Good	MODERATE - Depth to bedrock, slope	MODERATE - Depth to bedrock, slope	MODERATE - Coarse fragments, slope	MODERATE - Coars fragments, slope
Cookport	0–12	10	Good	Fair	Very Good	SEVERE - Seasonal high water table, slow permeability	MODERATE - Seasonal high water table	MODERATE - Slow permeability	SLIGHT
Gilpin	3–20	30	Fair	Fair	Very Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Coarse fragments, slope	MODERATE - Coars fragments, slope
Hazleton	3–20	20	———	———	Good	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
Calvin	3–20	10	Fair	Poor	Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Coarse fragments, slope	MODERATE - Coars fragments, slope
Gilpin	3–20	40	Fair	Fair	Very Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Coarse fragments, slope	MODERATE - Coars fragments, slope
Ernest	0–15	20	Fair	Fair	Very Good	SEVERE - Seasonal high water table, slow permeability	MODERATE - Seasonal high water table, slope	MODERATE - Moderately slow permeability, slope	MODERATE - Slope
Wharton	3–20	5	Fair	Fair	Very Good	SEVERE - Slow permeability	MODERATE - Seasonal high water table, slope	MODERATE - Slow permeability, slope	MODERATE - Slope
Gilpin	3–20	25	Fair	Fair	Very Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Coarse fragments, slope	MODERATE - Coars fragments, slope
Upshur	3–15	25	Fair	Good	Good	SEVERE - Slow permeability	MODERATE - High shrink swell potential, slope, slip hazard	MODERATE - Surface texture, slow permeability	MODERATE - Surface texture, slope
Weikert	3–40	20	———	———	Fair	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
Hazleton	3–20	40	———	———	Good	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
Cookport	0–12	20	Good	Fair	Very Good	SEVERE - Seasonal high water table, slow permeability	MODERATE - Seasonal high water table	MODERATE - Slow permeability	SLIGHT
Hazleton	3–20	25	———	———	Good	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
Gilpin	3–20	25	Fair	Fair	Very Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Coarse fragments, slope	MODERATE - Coars fragments, slope
Ernest	0–15	10	Fair	Fair	Very Good	SEVERE - Seasonal high water table, moderately slow permeability	MODERATE - Seasonal high water table, slope	MODERATE - Moderately slow permeability, slope	MODERATE - Slope
Rayne	3–15	35	Good	Excellent	Very Good	MODERATE - Slope	MODERATE - Slope	MODERATE - Slope	MODERATE - Slope
Wharton	3–20	10	Fair	Fair	Very Good	SEVERE - Slow permeability	MODERATE - Seasonal high water table, slope	MODERATE - Slow permeability, slope	MODERATE - Slope
Ernest	0–15	10	Fair	Fair	Very Good	SEVERE - Seasonal high water table, moderately slow permeability	MODERATE - Seasonal high water table, slope	MODERATE - Moderately slow permeability, slope	MODERATE - Slope

1/ *Soil Names are subject to change pending final correlation.*

2/ *The percentage does not total 100 because of minor soils in each association.*

3/ *The degree of limitation or suitability rating is based on the dominant surface texture and degree of stoniness or rockiness.*

4/ *The ratings given are for bushels per acre of corn and tons per acre of alfalfa hay and are defined as follows: EXCELLENT equals 110 or more for corn and 4.0 or more for alfalfa, GOOD equals 96–110 for corn or 3.6–4.0 for alfalfa, FAIR equals 76–95 for corn or 3.1–3.5 for alfalfa, and POOR equals 75 or less for corn or 3.0 for alfalfa. A dashed line (———) indicates that the soil is generally not suited to corn or alfalfa.*

5/ *The ratings given are for upland oak and are based on the average height obtained by the dominant and codominant trees at age 50 years and are defined as follows: EXCELLENT equals a site index of 85 or more, VERY GOOD equals a site index of 75–84, GOOD equals a site index of 65–74, FAIR equals a site index of 55–64, and POOR equals a site index of less than 54.*

6/ *SLIGHT - These soils have few limitations for the use indicated. MODERATE - These soils have one or more properties that limit their use. Correcting these factors will increase the installation and maintenance costs. SEVERE - These soils have one or more properties that seriously limit their use. Using soils with a severe limitation will increase the probability of failure and add to the cost of installation and maintenance.*

USDA SCS HYATTSVILLE MD 1978

TABLE 2 Continued

IL ASSOCIATION SYMBOL AND AJOR SOILS 1/	DOMI-NANT SLOPE	PERCENT OF ASSOCIATION 2/	SUITABILITY FOR: 3/ CROPLAND 4/ CORN	ALFALFA	WOODLAND 5/	DEGREE OF LIMITATION AND MAJOR LIMITING FACTORS FOR: 3/ 6/ TOWN AND COUNTRY PLANNING ON-SITE SEWAGE DISPOSAL	HOMESITES WITH BASEMENTS	RECREATION CAMPSITES	PICNIC AND PLAY AREA
Soils of the Piedmont Lowlands (Cont'd)									
gorastown	0–12	40	Excellent	Excellent	Excellent	MODERATE - Depth to bedrock, hazard of ground-water contamination	MODERATE - Depth to bedrock, sinkhole hazard	SLIGHT	SLIGHT
lom	3–20	15	Fair	Fair	Very Good	MODERATE - Depth to bedrock, slope	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Slope
rrill	3–15	60	Excellent	Excellent	Good	MODERATE - Slope, hazard of ground-water contamination	MODERATE - Slope	MODERATE - Gravelly, slope	MODERATE - Gravelly, slope
rkesburg	3–20	20	Fair	Fair	Very Good	SEVERE - Seasonal high water table, slow permeability	MODERATE - Seasonal high water table, slope	MODERATE - Seasonal high water table, slow permeability, slope	MODERATE - Seasonal high water table, slope
shington	0–15	50	Excellent	Excellent	Excellent	MODERATE - Slope, hazard of ground-water contamination	MODERATE - Slope	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
ffield	0–12	20	Excellent	Excellent	Excellent	SLIGHT - Hazard of ground-water contamination	SLIGHT	SLIGHT	SLIGHT
ca	3–20	40	Fair	Fair	Very Good	MODERATE - Depth to bedrock, slope	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Slope
kert	3–40	20	———	———	Fair	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
esville	3–35	5	———	———	Fair	SEVERE - Slope, depth to bedrock	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
rnsey	3–30	35	Fair	Poor	Very Good	SEVERE - Slope, instability, seasonal high water table	SEVERE - Slope, instability	SEVERE - Slope	SEVERE - Slope
ooka	3–20	35	Fair	Fair	Very Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Slope
ison	3–20	70	———	———	Good	SEVERE - Hazard of ground-water contamination, slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
derlip	3–20	10	Poor	Poor	Good	MODERATE - Slope	MODERATE - Slope	MODERATE - Surface texture, slope	MODERATE - Surface texture, slope
s	3–20	30	Good	Good	Very Good	MODERATE - Slope, hazard of ground-water contamination	MODERATE - Slope	MODERATE - Cherty, slope	MODERATE - Cherty, slope
ser	3–25	20	Fair	Fair	Very Good	MODERATE - Hazard of ground-water contamination, slope	MODERATE - Slope	SEVERE - Coarse fragments, slope	SEVERE - Coarse fragments, slope
mer	3–15	15	Fair	Fair	Good	SEVERE - Seasonal high water table, slow permeability	MODERATE - Slope, seasonal high water table	MODERATE - Coarse fragments, slow permeability, slope	MODERATE - Coarse fragments, slope
Soils of the Gettysburg-Newark Lowlands									
ottstown	0–5	45	Fair	———	Good	SEVERE - Slow permeability, seasonal high water table	SEVERE - Seasonal high water table	MODERATE - Slow permeability, seasonal high water table	MODERATE - Seasonal high water table
lestown	0–5	15	Poor	———	Fair	SEVERE - High water table	SEVERE - High water table	SEVERE - High water table	SEVERE - High water table
dington	0–8	5	Good	Fair	Good	SEVERE - Moderately slow permeability, seasonal high water table	MODERATE - Seasonal high water table	MODERATE - Moderately slow permeability	SLIGHT
in	3–20	25	Fair	Poor	Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock	MODERATE - Slope	MODERATE - Slope
Hill	3–25	25	Excellent	Excellent	Good	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
esville	3–15	10	Good	Good	Very Good	SEVERE - Moderately slow permeability	MODERATE - Slope	MODERATE - Moderately slow permeability, slope	MODERATE - Slope

FACILITY LOCATION	BUILT	ACRES	BLDGS	FACILITY NAME
Norristown, PA	1956	3.3	2	Ray S. Musselman Reserve Center
Phildelphia	1965	8.7	3	Philadelphia Memorial AFRC
Reading, PA	1987	10.0	2	Reading Reserve Center and AMSA 29
Schuylkill Haven, PA	1960	8.0	2	Robert E. Roeder Reserve Center
Scranton, PA	1951	3.0	2	CSM S.P. Serrenti Memorial Reserve Center
State College, PA	1963	7.0	2	Centre County Memorial Reserve Center
West Hazelton, PA	1958	5.1	2	Lenkalis Reserve Center
Wilkes-Barre, PA (Leased Facility)	1966	5.0	1	AMSA 32 Wilkes-Barre
Wilkes-Barre, PA	1955	6.0	2	Wilkes-Barre Reserve Center
Williamsport, PA	1960	11.0	2	Lycoming Memorial Reserve Center
Willow Grove, PA (On Naval Air Station)	1977	10.0	3	MG John W. Wurts Memorial Reserve Center, HQ 79th ARCOM and AMSA #23
Worcester, PA	1954	31.4	5	North Penn Reserve Center
York, PA	1958	2.0	2	York Memorial Reserve Center

PROGRAMMATIC NATURAL RESOURCE MANAGEMENT PLAN
APPENDIX C
TABLES

TABLE OF CONTENTS

TABLE 1
79TH ARCOM RESERVE FACILITIES IN PENNSYLVANIA

FACILITY LOCATION	BUILT	ACRES	BLDGS	FACILITY NAME
Ashley, PA	1978	22.0	2	CH (CPT) Sabalis Memorial Reserve Center
Bellefonte, PA	1959	3.5	2	SGT Paul Beck AFRC
Bethlehem, PA	1961	7.0	2	Wilson Kramer Reserve Center
Bloomsburg, PA	1965	3.0	2	Bloomsburg Reserve Center
Bristol, PA	1974	27.0	2	Bristol Veterans Reserve Center
Chambersburg, PA	1958	5.0	2	Frank M. Parker Reserve Center
Chester, PA	1958	8.0	2	James W. Reese Reserve Center
Edgemont, PA	1976	44.0	3	AMSA 31 G. Newton Square
Germantown, PA	1955	6.0	2	Germantown Reserve Center
Gettysburg, PA	1962	6.0	1	Adams County Memorial Reserve Center
Greencastle, PA	1953	37.0	3	AMSA 113 Greencastle
Harrisburg, PA	1955	11.0	2	Harrisburg AFRC
Horsham, PA	1960	11.0	2	Horsham Memorial Reserve Center
Lancaster, PA	1957	7.0	2	Lancaster Reserve Center
Lewisburg, PA	1988	10.0	2	Lewisburg Reserve Center
Lewiston, PA	1985	6.1	2	Mifflin County Reserve Center
Lock Haven, PA	1985	19.0	2	AMSA 112 Lock Haven
Marcus Hook, PA	1971	5.0	2	AMSA 84 Marcus Hook
New Cumberland, PA (On DDRE)	1994	3.0	2	New Cumberland Reserve Center

TABLE 2

INTERPRETATIONS FOR THE GENERAL SOIL MAP OF PENNSYLVANIA FOR SELECTED USES

SOIL ASSOCIATION SYMBOL AND MAJOR SOILS 1/	DOMINANT SLOPE	PERCENT OF ASSOCIATION 2/	SUITABILITY FOR: 3/			DEGREE OF LIMITATION AND MAJOR LIMITING FACTORS FOR: 3/ 8/			
			CROPLAND 4/		WOODLAND 5/	TOWN AND COUNTRY PLANNING		RECREATION	
			CORN	ALFALFA		ON-SITE SEWAGE DISPOSAL	HOMESITES WITH BASEMENTS	CAMPSITES	PICNIC AND PLAY AREA
Soils of the Coastal Plain									
Howell	3–8	60	Excellent	Excellent	Very Good	SLIGHT	SLIGHT	MODERATE - Moderately slow permeability	SLIGHT
Fallsington	0–3	5	Excellent	-----	Very Good	SEVERE - High water table	SEVERE - High water table	SEVERE - High water table	SEVERE - High water table
Soils of the Piedmont Uplands									
Chester	3–15	40	Excellent	Excellent	Very Good	MODERATE - Slope	MODERATE - Slope	MODERATE - Slope	MODERATE - Slope
Glenelg	0–20	30	Excellent	Excellent	Very Good	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Slope	MODERATE - Slope
Edgemont	3–20	55	Excellent	Excellent	Good	MODERATE - Slope, depth to bedrock	MODERATE - Slope, depth to bedrock	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
Highfield	3–20	25	Excellent	Excellent	Good	MODERATE - Slope, depth to bedrock	MODERATE - Slope	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
Glenelg	0–20	45	Excellent	Excellent	Very Good	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Slope	MODERATE - Slope
	3–20	25	Fair	Poor	Very Good	MODERATE - Slope, hazard of ground-water contamination	MODERATE - Slope	MODERATE - Channery, slope	MODERATE - Channel slope
ufield	3–20	65	Excellent	Excellent	Good	MODERATE - Slope, depth to bedrock	MODERATE - Slope	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
Arendtsville	5–20	10	Excellent	Excellent	Good	MODERATE - Slope	MODERATE - Slope	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
Myersville	3–20	5	Excellent	Excellent	Excellent	MODERATE - Slope, depth to bedrock	MODERATE - Slope	MODERATE - Slope	MODERATE - Slope
Lehigh	0–8	30	Fair	-----	Good	SEVERE - Moderately slow permeability, seasonal high water table	SEVERE - Seasonal high water table	MODERATE - Seasonal high water table, slow permeability	MODERATE - Seasonal high water table
Brecknock	3–20	20	Fair	Poor	Fair	MODERATE - Slope, depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
Neshaminy	3–25	15	-----	-----	Very Good	SLIGHT	SEVERE - Slope, stony	MODERATE - Stony	SLIGHT
Soils of the Piedmont Lowlands									
Duffield	0–12	50	Excellent	Excellent	Excellent	SLIGHT - Hazard of groundwater contamination	SLIGHT	SLIGHT	SLIGHT
Conestoga	0–15	20	Excellent	Excellent	Excellent	SLIGHT - Hazard of groundwater contamination	SLIGHT	SLIGHT	SLIGHT
Hagerstown	0–12	5	Excellent	Excellent	Excellent	MODERATE - Depth to bedrock, hazard of groundwater contamination	MODERATE - Depth to bedrock, sinkhole hazard	SLIGHT	SLIGHT
Hagerstown	0–12	50	Excellent	Excellent	Excellent	MODERATE - Depth to bedrock, hazard of ground-water contamination	MODERATE - Depth to bedrock, sinkhole hazard	SLIGHT	SLIGHT
Duffield	0–12	25	Excellent	Excellent	Excellent	SLIGHT- Hazard of groundwater contamination	SLIGHT	SLIGHT	SLIGHT

TABLE 2 Continued

SSOCIATION BOL AND MAJOR SOILS 1/	DOMI-NANT SLOPE	PERCENT OF ASSOCIATION 2/	SUITABILITY FOR: 3/ CROPLAND 4/ CORN	CROPLAND 4/ ALFALFA	WOODLAND 5/	DEGREE OF LIMITATION AND MAJOR LIMITING FACTORS FOR: 3/ 6/ TOWN AND COUNTRY PLANNING -SITE SEWAGE DISPOSAL	TOWN AND COUNTRY PLANNING HOMESITES WITH BASEMENTS	RECREATION CAMPSITES	RECREATION PICNIC AND PLAY AREA
Soils of the Gettysburg-Newark Lowlands Contd.									
Lansdale	3–15	30	Good	Excellent	Good	MODERATE - Slope, depth to bedrock	MODERATE - Slope, depth to bedrock	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
Penn	3–15	20	Fair	Poor	Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Slope
Readington	0–8	10	Good	Fair	Good	SEVERE - Moderately slow permeability, seasonal high water table	MODERATE - Seasonal high water table	MODERATE - Moderately slow permeability	SLIGHT
Lewisberry	3–20	45	Fair	Poor	Good	MODERATE - Slope	MODERATE - Slope	MODERATE - Gravelly, slope	MODERATE - Gravelly slope
Penn	3–15	25	Fair	Poor	Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Slope
Meckesville	3–15	40	Good	Good	Very Good	SEVERE - Moderately slow permeability	MODERATE - Slope	MODERATE - Moderately slow permeability, slope	MODERATE - Slope
Albrights	3–15	20	Good	Fair	Good	SEVERE - Moderately slow permeability, seasonal high water table	MODERATE - Seasonal high water table, slope	MODERATE - Slope, moderately slow permeability	MODERATE - Slope
Penn	3–15	35	Fair	Poor	Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Slope
Klinesville	3–35	15	-----	-----	Fair	SEVERE - Depth to bedrock	MODERATE - Slope, depth to bedrock	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
Reaville	0–8	15	Poor	-----	Fair	SEVERE - Depth to bedrock, slow permeability, seasonal high water table	MODERATE - Depth to bedrock, seasonal high water table	MODERATE - Seasonal high water table, coarse fragments	MODERATE - Seasonal high water table, coarse fragments
Soils of the Ridge and Valley Province									
[illegible]	8–30	50	Poor	Poor	Good	SEVERE - Slope, depth to bedrock	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
[illegible]rt	3–40	15	-----	-----	Fair	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
Bedington	3–15	5	Excellent	Excellent	Very Good	MODERATE - Slope, depth to bedrock	MODERATE - Slope	MODERATE - Coarse fragments, slope	MODERATE - Coarse fragments, slope
Cookport	0–12	30	Good	Fair	Very Good	SEVERE - Seasonal high water table, slow permeability	MODERATE - Seasonal high water table	MODERATE - Slow permeability	SLIGHT
Clymer	0–15	15	Excellent	Excellent	Very Good	MODERATE - Depth to bedrock	MODERATE - Depth to bedrock	MODERATE - Coarse fragments	MODERATE - Coarse fragments
Hazleton	3–20	15	-----	-----	Good	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
Cookport	0–12	20	Good	Fair	Very Good	SEVERE - Seasonal high water table, slow permeability	MODERATE - Seasonal high water table	MODERATE - Slow permeability	SLIGHT
Cavode	0–15	20	Fair	-----	Very Good	SEVERE - Seasonal high water table, slow permeability	SEVERE - Seasonal high water table	MODERATE - Seasonal high water table, slow permeability	MODERATE - Seasonal high water table, slope
Wharton	3–20	10	Fair	Fair	Very Good	SEVERE - Slow permeability	MODERATE - Seasonal high water table, slope	MODERATE - Slow permeability, slope	MODERATE - Slope
Culleoka	3–20	60	Fair	Fair	Very Good	SEVERE - Depth to bedrock	MODERATE - Depth to bedrock, slope	MODERATE - Slope	MODERATE - Slope
Weikert	3–40	10	-----	-----	Fair	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope
Dekalb	3–35	40	-----	-----	Fair	SEVERE - Depth to bedrock, slope	SEVERE - Depth to bedrock, slope	SEVERE - Slope	SEVERE - Slope
Laidig	3–20	20	-----	-----	Good	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope	SEVERE - Slope, stony
Buchanan	3–25	5	-----	-----	Good	SEVERE - Seasonal high water table, slope, slow permeability	SEVERE - Slope	MODERATE - Stony, slow permeability, slope	MODERATE - Stony, coarse fragments, slope

TABLE 3
EXISTING VEGETATION MASTER PLANT LIST

Herbaceous Plants

Common Name	Scientific Name
Wintercress	*Barbarea vulgaris*
Teasel	*Dipsacus laciniatus*
Goldenrod	*Solidago sp.*
Broadleaved Cattail	*Typha latifolia*
Sedges	*Carex spp.*
Crown Vetch	*Coronilla varia*
Wool Grass	*Scirpus cyperinus*
Soft Rush	*Juncus effusus*
Blue Flag	*Iris versicolor*
Boneset	*Eupatorium perfoliatum*
Swamp Milkweed	*Asclepias incarnata*
Daisy Fleabane	*Erigeron annuus*
Common Mullein	*Verbascum thapsus*

Woody Plants (Trees, shrubs, and vines)

Black Locust	*Robinia pseudoacacia*
Red Cedar	*Juniperus virginianus*
Black Cherry	*Prunus serotina*
White Pine	*Pinus strobus*
Juniper	*Juniperus communis*
Pacific Yew	*Taxus canadensis*
Sugar Maple	*Acer sacharum*
Douglas Eastern arborvitae	*Thuja occidentalis*
Poison Ivy	*Toxicodendron radicans*
Japanese Honeysuckle	*Lonicera japonica*
Black Willow	*Salix nigra*
Pin Oak	*Quercus palustris*
Black Walnut	*Juglans nigra*
Spruce	*Picea sp.*
Green Ash	*Fraxinus pennsylvanica*
American Sycamore	*Platanus occidentalis*
Northern Red Oak	*Quercus rubra*
Eastern Hemlock	*Tsuga canadensis*
White Birch	*Betula papyrifera*
Red Maple	*Acer rubrum*

TABLE 4
OBSERVED WILDLIFE
MASTER WILDLIFE LIST

Birds

Common Name	Scientific Name
Black Capped Chickadee	*Parus atricapillus*
Tufted Titmouse	*Parus bicolor*
Northern Cardinal	*Cardinalis cardinalis*
American Robin	*Turdus migratorius*
House Sparrow	*Passer domesticus*
Common Grackle	*Quiscalus quiscala*
European Starling	*Sturnus vulgaris*
American Crow	*Corvus brachyrhynchos*
Mallard	*Anas platyrhynchos*
Barn Swallow	*Hirundo rustica*
Killdeer	*Charadrius vociferus*
House Finch	*Carpoclacus mexicanus*
Northern Mockingbird	*Mimus polyglottos*
Red-Winged Blackbird	*Agelaius phoeniceus*
Mourning Dove	*Zenaida macroura*
Canada Goose	*Branta canadensis*
Turkey Vulture	*Cathartes aura*
Pigeon	*Columbia livia*

Mammals

Common Name	Scientific Name
Eastern Cottontail	*Sylvilagus floridanus*
Gray Squirrel	*Sciurus carolinensis*
Groundhog	*Marmota monax*
Virginia Opossum	*Didelphis marsupialis*
White - Tailed Deer	*Odocoileus virginianus*
Eastern Chipmunk	*Tamias striatus*
Raccoon	*Procyon lotor*

TABLE 5

RELATIVE IMPORTANCE OF COMMON PENNSYLVANIA NATIVE PLANTS TO WILDLIFE

The following lists the relative importance of common native plants for use as food and cover for native wildlife. A low numerator (stars) over a large denominator (users) indicates that the plant is used by many wildlife species, but only to a limited extent by each. A higher numerator and small denominator characterizes a plant of great importance to a limited segment of wildlife.

Adapted from Martin, et al., 1951.

Regional Listing of Wildlife Plants

Northeast Region

	Water-birds	Marsh-Shore-birds	Upland Game-birds	Song-birds	Fur & Game Mamm.	Small Mamm.	Browsers
WOODY PLANTS							
Oak (71*/43)	7*/3	0*/1	11*/5	25*/17	21*/14	4*/2	3*/1
Blackberry (50*/56)	—	—	13*/5	27*/34	4*/10	4*/5	2*/2
Wild Cherry (44*/56)	—	—	4*/5	27*/29	9*/13	2*/7	2*/2
Pine (43*/33)	—	—	1*/2	30*/18	8*/10	2*/2	2*/1
Dogwood (42*/47)	3*/2	—	6*/5	25*/28	4*/6	1*/4	3*/2
Grape (37*/53)	1*/1	—	15*/5	14*/37	7*/8	0*/2	—
Maple (36*/27)	—	—	2*/4	13*/7	12*/11	3*/3	6*/2
Beech (34*/31)	1*/1	—	2*/3	8*/12	21*/12	2*/2	0*/1
Blueberry (29*/37)	1*/2	—	3*/2	9*/21	9*/7	5*/3	2*/2
Birch (27*/22)	—	—	6*/3	8*/7	9*/8	0*/2	4*/2
Sumac (23*/28)	—	—	4*/3	10*/19	7*/4	—	2*/2
Aspen (23*/17)	—	—	5*/3	0*/1	12*/10	0*/1	6*/2
Spruce (20*/16)	—	—	—	11*/8	9*/6	0*/1	0*/1
Hickory (17*/19)	—	—	0*/1	6*/6	9*/9	2*/3	—
Fir (16*/13)	—	—	0*/1	6*/4	4*/5	0*/1	6*/2
Alder (14*/11)	—	—	2*/3	7*/3	3*/3	—	2*/2
Poison-ivy (13*/28)	—	—	2*/4	11*/21	0*/3	—	—
Blackgum (13*/27)	0*/1	—	0*/3	9*/18	4*/5	—	—
Mulberry (13*/25)	—	—	—	11*/21	2*/4	—	—
Elm (13*/15)	2*/1	—	0*/3	8*/6	3*/4	—	0*/1
Cedar (13*/8)	—	—	—	13*/7	0*/1	—	—
Serviceberry (12*/39)	—	—	0*/2	6*/25	5*/6	0*/4	1*/2
Hazelnut (12*/16)	—	—	3*/3	0*/1	6*/6	2*/4	1*/2

Northeast Region (cont.)

	Water-birds	Marsh-Shore-birds	Upland Game-birds	Song-birds	Fur & Game Mamm.	Small Mamm.	Browsers
WOODY PLANTS (cont.)							
Willow (12*/13)	—	—	2*/3	—	5*/7	0*/1	5*/2
Hemlock (12*/13)	—	—	0*/1	7*/5	3*/4	0*/2	2*/1
Greenbrier (11*/23)	0*/1	—	4*/3	6*/14	1*/5	—	—
Ash (11*/18)	0*/1	—	1*/2	6*/6	3*/5	0*/2	1*/2
Elderberry (10*/36)	—	—	1*/2	8*/28	1*/3	0*/2	0*/1
Virginia-creeper (10*/22)	—	—	—	10*/19	0*/3	—	—
Tuliptree (10*/14)	—	—	—	7*/7	1*/4	1*/2	1*/1
Mountain-ash (10*/9)	—	—	3*/2	4*/5	—	0*/1	3*/1
Holly (6*/20)	—	—	0*/1	5*/14	0*/2	0*/2	1*/1
Hawthorn (6*/15)	—	—	1*/3	3*/3	2*/6	0*/1	0*/2
Black Walnut (6*/4)	—	—	—	—	6*/4	—	—
UPLAND WEEDS AND HERBS							
Ragweed (67*/49)	—	3*/3	11*/6	53*/37	0*/1	0*/1	0*/1
Bristlegrass (62*/40)	1*/1	0*/4	9*/6	52*/29	—	—	—
Sedge (32*/43)	6*/13	5*/7	2*/5	16*/12	0*/3	0*/1	3*/2
Crabgrass (32*/20)	—	—	3*/4	27*/15	2*/1	—	—
Panicgrass (28*/32)	—	0*/1	0*/4	25*/25	3*/2	—	—
Pigweed (16*/21)	—	—	0*/3	16*/16	0*/1	—	0*/1
Clover (15*/21)	—	0*/1	8*/5	0*/3	7*/7	0*/4	0*/1
Sheepsorrel (12*/23)	—	—	1*/5	9*/14	2*/1	0*/3	—
Goosefoot (12*/18)	—	—	0*/2	11*/15	—	1*/1	—
Dropseedgrass (8*/7)	—	—	—	8*/7	—	—	—
Bluegrass (7*/9)	4*/1	—	1*/2	0*/1	2*/3	0*/1	0*/1
Pokeweed (6*/25)	—	—	2*/1	3*/19	1*/4	0*/1	—
Dandelion (5*/14)	—	—	3*/5	1*/4	1*/3	0*/1	0*/1
Plantain (5*/6)	—	—	0*/1	0*/1	5*/3	—	0*/1
MARSH AND AQUATIC PLANTS							
Smartweed (59*/50)	18*/16	4*/9	3*/2	34*/22	0*/1	—	—
Pondweed (59*/32)	55*/23	4*/9	—	—	—	—	—
Wildrice (48*/25)	32*/16	5*/2	1*/1	10*/6	—	—	—
Bulrush (37*/36)	26*/17	8*/12	—	0*/4	3*/2	0*/1	—
Wildcelery (26*/17)	26*/16	0*/1	—	—	—	—	—
Naiad (21*/17)	21*/17	—	—	—	—	—	—
Cordgrass (17*/8)	9*/5	1*/1	—	7*/2	—	—	—
Widgeongrass (16*/22)	14*/15	2*/7	—	—	—	—	—
Cutgrass (13*/13)	8*/9	1*/1	—	2*/1	2*/2	—	—
Spikerush (12*/14)	8*/8	4*/5	—	—	0*/1	—	—
Eelgrass (12*/12)	12*/11	0*/1	—	—	—	—	—
Burreed (11*/13)	8*/9	0*/3	—	—	3*/1	—	—
Wildmillet (10*/16)	8*/7	1*/2	0*/2	1*/4	0*/1	—	—
Duckweed (10*/9)	10*/7	0*/2	—	—	—	—	—
Algae (9*/10)	9*/9	0*/1	—	—	—	—	—
Arrowhead (7*/6)	4*/4	3*/2	—	—	—	—	—
Muskgrass (6*/16)	6*/14	0*/2	—	—	—	—	—
Arrow-arum (5*/2)	5*/1	0*/1	—	—	—	—	—

TABLE 6

FLOWERING AND FRUITING PERIODS OF NATIVE PLANTS VALUABLE TO WILDLIFE

Adapted from Degraaf and Witman, 1979

Flowering and Fruiting Periods of Tall Trees (60-100+ feet)[1]

Plant	Flower color	Fruit color	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Eastern Hemlock	i	brown	o				•	•			o	o	o	o
Red Spruce	i	brown				•	•				o	o		
White Spruce	i	brown					•			o	o	o	o	
Colorado Spruce	i	brown	o	o		•	•				o	o	o	o
Eastern Larch	i	brown					•			o	o			
White Pine	i	brown				•	•	•		o	o			
Red Pine	i	brown	o	o	o	o•	o•	o•	o	o	o	o	o	o
Scotch Pine	i	brown	o	o	o	o	•	•			o	o	o	o
Eastern Poplar	i	brown		•	•	o•	o•	o						
Eastern Black Walnut	i	green				•	•	•			o	o	o	
Shagbark Hickory	i	brown				•	•				o	o	o	o
Pignut Hickory	i	brown				•	◦	•			o	o	o	o
Yellow Birch	i	brown	o	o		•	•			o	o	o	o	o
Paper Birch	i	brown	o	o		◦	•	•		o	o	o	o	o
American Beech	i	brown				•	•				o	o	o	
White Oak	i	brown			•	•	•				o	o	o	
Northern Red Oak	i	brown				•	•				o	o	o	o
Scarlet Oak	i	brown				•	•				o	o	o	
Pin Oak	i	brown				•	•				o	o	o	
Black Oak	i	brown				•	•				o	o	o	o
American Elm	i	brown		•	•	o•	o•	o						
Yellow-poplar	grn/orng	brown	o			•	•	•			o	o	o	o
American Sweetgum	i	yellow			•	•	•				o	o	o	
Black Cherry	white	pur/blk			•	•	•	o•	o	o	o	o		
Sugar Maple	yellow	brown				•	•	o•	o	o	o	o	o	o
Silver Maple	grn/red	brown		•	•	o•	o•	o						
Norway Maple	yellow	brown				•	•	•			o	o	o	
Boxelder	yel/grn	brown	o	o	o•	•	•			o	o	o	o	o
Red Maple	red	brown		•	o•	o•	o•	o	o					
White Ash	i	brown	o	o		•	•	•			o	o	o	o

[1]fruiting periods indicate when fruits and/or seeds are available for wildlife.
•flower; o, fruit; i, inconspicuous.

Flowering and Fruiting Periods of Low Trees (10–30 feet)[1]

Plant	Flower color	Fruit color	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Gray Birch	i	brown	o	o		•	•				o	o	o	o
American Holly	i	red	o	o	o	o	o•	o•		o	o	o	o	o
American Hop-hornbeam	i	brown				•	•	•		o	o	o	o	o
Bobwhite Crabapple	pnk/wte	yellow	o	o	o	o	•			o	o	o	o	o
Dorothea Crabapple	pnk/wte	yellow	o	o	o		•			o	o	o	o	o
Sargent Crabapple	white	red	o	o	o		•			o	o	o	o	o
Japanese Flowering Crabapple	white	red/yel	o	o	o		•			o	o	o	o	o
Tea Crabapple	white	yel/red	o	o			•			o	o	o	o	o
Common Apple	wte/pnk	red/grn				•	•	•			o	o	o	
Smooth Serviceberry	white	pur/blk			•	•	•	o•	o	o				
Shadblow Serviceberry	white	pur			•	•	•	o•	o	o				
Pin Cherry	white	red			•	•	•	•	o•	o	o	o	o	o
Common Chokecherry	white	pur/blk				•	•	•	o•	o	o	o		

[1]fruiting periods indicate when fruits and/or seeds are available to wildlife.
•flower; o, fruit; i, inconspicuous.

TABLE 6 Continued

Flowering and Fruiting Periods of Tall Shrubs (11–20+ feet)[1]

Plant	Flower color	Fruit color	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Pussy Willow	i	i			•	o•	o							
Purpleosier Willow	i	i				o•	o•							
Allegany Chinkapin	i	brown						•	•	o	o			
Common Spicebush	grn/yel	red			•	•	•		o	o	o	o		
Witch-hazel	yellow	brown	o	o	o	o	o	o	o	o	•	•	•	o
Multiflora Rose	white	red	o	o	o	o		•	o•	o	o	o	o	o
Cockspur Hawthorn	white	red	o	o			•			o	o	o	o	o
Washington Hawthorn	white	orng/red	o					•			o	o	o	o
Paul's Scarlet Hawthorn	pnk/red	red					•				o	o		
Smooth Sumac	green	red	o	o	o			•	•	o•	o	o	o	o
Staghorn Sumac	green	red	o	o	o		•	•	•	o	o	o	o	o
Common Winterberry	grn/wte	red	o	o	o	•	•	•	•	o	o	o	o	o
Smooth Winterberry	i	red					•	•			o	o	o	o
Common Buckthorn	i	black	o			•	•	o•	o•	o	o	o	o	o
Autumn Olive	yellow	red	o				•	•		o	o	o	o	o
Russian Olive	sil/yel	sil/wte	o	o	o	o	•	•	•	o	o	o	o	o
Alternate-leaf Dogwood	white	blu/blk					•	•	o	o	o			
Northern and Southern Arrowwood	white	blue						•	•	o•	o	o	o	
Nannyberry	white	blu/blk			•	•	•		o	o	o			
Amur Honeysuckle	white	red					•	•	o•	o	o	o	o	

[1]fruiting periods indicate when fruits and/or seeds are available for wildlife.
•flower; o, fruit; i, inconspicuous.

Flowering and Fruiting Periods of Vines[1]

Plant	Flower color	Fruit color	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Fox Grape	i	pur/blk					•	•	•	o	o	o		
Riverbank Grape	i	blu/blk					•	•	•	o	o			
Summer Grape	i	black					•	•	•		o	o		
New England Grape	i	black						•	•		o			
Frost Grape	i	black					•	•			o	o		
American Bittersweet	i	yel/orng					•	•		o	o	o	o	o
Common Greenbriar	i	blu/blk	o	o	o	•	•	•	•	•	o	o	o	o
Cat Greenbriar	i	blu/blk	o	o	o		•	•			o	o	o	o
Heartleaf Ampelopsis	i	blue					•	•		o	o	o	o	
Virginia Creeper	i	blue	o	o				•	•	o•	o	o	o	o
Common Trumpetcreeper	orng/red	brown							•	o•	o•	o		
Common Moonseed	i	black					•	•	•	o	o	o		
Poison Ivy	i	white	o	o			•	•	•	o	o	o	o	o

[1]fruiting periods indicate when fruits and/or seeds are available to wildlife.
•flower; o, fruit; i, inconspicuous.

TABLE 7

LANDSCAPE PLANTINGS FOR URBAN SETTINGS WITH VALUE TO WILDLIFE

Adapted from Degraaf and Witman, 1979

Street Trees That Are Valuable for Birds

Shade trees for street planting should show six characteristics:

Hardiness to city conditions
Straightness of growth
Insect resistance
Shade production
Cleanliness—lack of litter
Longevity

Some trees that meet these criteria, and are also valuable to birds in the Northeast are given below:

Wide Streets (more than 50 feet wide)

Sugar maple (*Acer saccharum*)*
Common hackberry (*Celtis occidentalis*)
White ash (*Fraxinus americana*)
Green ash (*Fraxinus pennsylvanica*)
Yellow-poplar (*Liriodendron tulipifera*)
White oak (*Quercus alba*)

Medium Streets (40–50 feet wide)

Norway maple (*Acer platanoides*)
Red maple (*Acer rubrum*)
American sweetgum (*Liquidambar styraciflua*)
Northern red oak (*Quercus rubra*)
Scarlet oak (*Quercus coccinea*)
Pin oak (*Quercus palustris*)

Narrow Streets (less than 40 feet wide)

Flowering dogwood (*Cornus florida*)
Cockspur hawthorn (*Crataegus crus-galli*)
Paul's scarlet hawthorn (*Crataegus oxycantha pauli*)
Washington hawthorn (*Crataegus phaenopyrum*)

*Not recommended for streets salted in winter.

Sources:

Bush-Brown, J. and L. 1965. *America's garden book.* New York: Charles Scribner's Sons.
Fenska, R. R. 1956. *The complete modern tree expert's manual.* New York: Dodd, Mead and Co.

Plants That Will Grow in Dry, Sandy Soils

Trees

EVERGREEN

Eastern red cedar (*Juniperus virginiana*)
White spruce (*Picea glauca*)
Red pine (*Pinus resinosa*)
Pitch pine (*Pinus rigida*)
White pine (*Pinus strobus*)
Scotch pine (*Pinus sylvestris*)

DECIDUOUS

Boxelder (*Acer negundo*)
Gray birch (*Betula populifolia*)
Pignut hickory (*Carya glabra*)
Bigtooth aspen (*Populus grandidentata*)
Quaking aspen (*Populus tremuloides*)
Black cherry (*Prunus serotina*)
Scarlet oak (*Quercus coccinea*)
Common sassafras (*Sassafras albidum*)

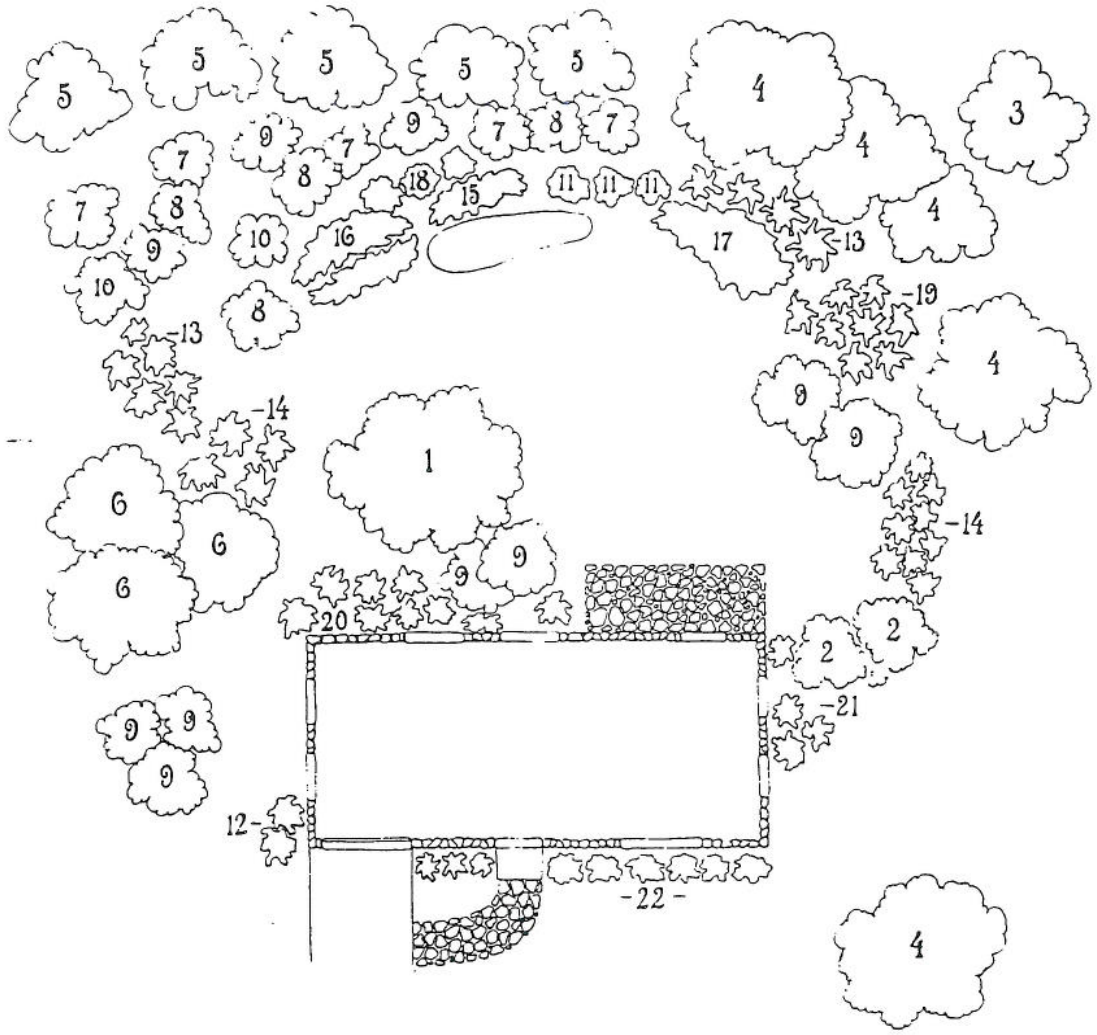
Shrubs

EVERGREEN

Common bearberry (*Arctostaphylos uva-ursi*)
Inkberry (*Ilex glabra*)
Common juniper (*Juniperus communis*)

DECIDUOUS

Japanese barberry (*Berberis Thunbergii*)
European barberry (*Berberis vulgaris*)
Sweetfern (*Comptonia peregrina*)
Russian olive (*Elaeagnus angustifolia*)
Black huckleberry (*Gaylussacia baccata*)
Shrubby St. Johnswort (*Hypericum spathulatum*)
Morrow honeysuckle (*Lonicera Morrowi*)
Northern bayberry (*Myrica pensylvanica*)
Common buckthorn (*Rhamnus cathartica*)
Glossy buckthorn (*Rhamnus frangula*)
Flameleaf sumac (*Rhus copallina*)



LARGE TREES
1. American Beech
2. Northern Red Oak
3. White Oak
4. Sugar Maple
5. Eastern White Pine
6. White Spruce
7. Eastern Hemlock

SMALL TREES
8. American Mountain-ash
9. Flowering Dogwood
10. Washington Hawthorn

LARGE SHRUBS
11. Common Winterberry
12. Amur Honeysuckle
13. Autumn Olive
14. American Cranberrybush
15. American Elder

SMALL SHRUBS
16. American Blackberry
17. Silky Dogwood
18. Red-osier Dogwood
19. Tatarian Honeysuckle
20. Common Snowberry
21. Japanese Barberry
22. Your favorite ornamental—
Pyracantha, Yew, Juniper, etc.

US Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715

Sample Wildlife Habitat
Landscape Planting Plan

TABLE 8

Summary of Required Forest Habitat Characteristics and Management Recommendations for Forest Interior Breeding Birds

Species	Nest Location	Nest Type	Feeding Location	Minimum Forest Size (Acres)	Management Recommendations
Red-Shouldered Hawk * *Buteo lineatus*	canopy	open	open areas	250	maintain mature forest at 148 to 400 trees per acre with few understory trees
Barred Owl *Strix varia*	snag	cavity	open understory	250	retain large hollow cut areas on rotations of 150 years or more
Whip-poor-will *Caprimulgus vociferus*	ground	no nest	open areas	300	maintain pole-size even-age stands
Hairy Woodpecker * *Picoides villosus*	snag	cavity	trunk	10	retain decaying trees and healthy trees during forest management activities
Pileated Woodpecker * *Dryocopus pileatus*	trunk	cavity	trunk	125	retain dead and decaying trees with rotations of 150 years or more
Acadian Flycatcher *Empidonax virescens*	shrub	open	subcanopy	80	maintain tall closed canopy; thin understory trees
Yellow-throated Vireo *Vireo flavifrons*	canopy	open	canopy	250	selective cutting to maintain partially open canopy
Red-eyed Vireo *Vireo olivaceus*	canopy	open	canopy	50	retain at least 70% canopy closure

TABLE 9
REPTILES PRESENT IN EASTERN/CENTRAL PENNSYLVANIA THAT MAY BE FOUND ON THE 79TH ARCOM SITES

TURTLES

Common Name	Scientific Name
Common Snapping	Chelydra s. serpentina
Stinkpot	Sternotherus odoratus
Spotted	Clemmys guttata
Wood	Clemmys insculpta
Bog	Clemmys muhlenbergi (1)
Eastern Box	Terrapene carolina
Map	Graptemys geographica
Midland Painted	Chrysemys picta marginata
Red-bellied	Pseudemys rubriventris (2)

LIZARDS

Common Name	Scientific Name
Northern Fence Lizard	Sceloporus undalatus hyacinthius
Northern Coal Skink	Eumeces anthracinus (3)
Five-lined Skink	Eumeces fasciatus

SNAKES

Common Name	Scientific Name
Northern Water	Nerodia spiedon
Northern Brown	Storeria dekayi
Northern Red-bellied	S. oipitomaculata
Eastern Ribbon	Thamnophis sauritus
Eastern Garter	T. s. sirtalis
Eastern Hognose	Heterodon platyrhinos
Northern Ringneck	Diadophis punctatus edwardsi
Northern Black Racer	Coluber constrictor
Eastern Smooth Green	Opheodrys vernalis
Black Rat	Elaphe obsoleta
Eastern Milk	Lampropeltis triangulum
Northern Copperhead	Agkistrodon contortrix makeson
Timber Rattlesnake	Crotalus horridus

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(1) extreme western edge of range comes into The Great Valley (The Great Valley is in Franklin and Cumberland Counties)

(2) one aount in Franklin county on West Branch of Conocheague Creek in 1968 by PA Fish Commission.

(3) scattered and extremely localized; uncertain locality given by S. F. Baird in 1850 in western Franklin county on eastern most ridge of the Valley and Ridge section.

(McCoy, 1982)

TABLE 10
AMPHIBIANS PRESENT IN EASTERN/CENTRAL PENNSYLVANIA THAT MAY BE FOUND ON 79TH ARCOM SITES

SALAMANDERS

Common Name	Scientific Name
Jefferson	Ambystoma jeffersonianum
Spotted	Ambystoma maculatum
Marbled	Ambystoma opacum
Red-spotted Newt	Notophthalmus viridescens
Northern Dusky	Desmognathus fuscus
Mountain Dusky	Desmognathus ochrophaeus (1)
Redbacked	Plethodon cinereus
Slimy	Plethodon glutinosus
Valley and Ridge	Plethodon hoffmani (2)
Four-toed	Hemidactylium scutatum (3)
Northern Spring	Gyrinophilus porphyriticus
Northern Red	Pseudotriton ruber
Northern Two-lined	Eurycea bislineata
Long-tailed	Eurycea longicauda
Eastern Spadefoot	Scaphiopus holbrooki (4)

TOADS AND FROGS

Common Name	Scientific Name
Eastern American Toad	Bufo a. americanus
Fowler's Toad	B. woodhousei fowleri
Northern Cricket Frog	Acris crepitans
Northern Spring Peeper	Hyla crucifer
Gray Treefrog	Hyla versicolor
Striped Chorus Frog	Pseudacris triseriata
Bullfrog	Rana catesbeiana
Green Frog	Rana clamitans melanota
Pickerel Frog	Rana palustris
Wood Frog	Rana sylvatica

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(1) a few scattered populations in the Valley and Ridge section; absent from southeastern PA
(2) would be restricted to the Valley and Ridge Mountains
(3) special habitat requirements of forest pools and bogs
(4) scattered and extremely localized

(McCoy, 1982)

TABLE 11

A LIST OF BIRDS IN EASTERN AND CENTRAL PENNSYLVANIA THAT MAY BE FOUND ON OR ADJACENT TO 79TH ARCOM SITES

Scientific Name	Common Name
Podicipediformes	
Podicipedidae	
Podilymbus podiceps	Pied-billed Grebe
Ciconiiformes	
Ardeidae	
Ardea horodias	Great Blue Heron
Butorides striatus	Green-backed Heron
Casmerodrus albus	Great Egret
Anseriformes	
Anserinae	
Branta canadensis	Canada Goose
Anatinae	
* Anas platyrhynchos	Mallard
Aix sponsa	Wood Duck
Falconiformes	
Cathartidae	
* Cathartes aura	Turkey Vulture
Accipitrinae	
Accipiter straitus	Sharp-shinned Hawk
Buteo lineatus	Red-shouldered Hawk
Buteo jamaicensis	Red-tailed Hawk
Falconidae	
Falco sparverius	American Kestrel
Galliformes	
Phasianidae	
Phasianus colchius	Ring-necked Pheasant
Tetraoninae	
Bonasa umbellus	Ruffed Grouse

Trochilidae	
Archilochus colubris	Ruby-throated Hummingbird
Coraciiformes	
Alcedinidae	
Ceryle alcyon	Belted Kingfisher
Piciformes	
Picidae	
Melanerpes carolinus	Red-bellied Woodpecker
Picoides pubescens	Downy Woodpecker
Picoides villosus	Hairy Woodpecker
* Calaptes auratus	Northern Flicker
Dryocopus pileatus	Pileated Woodpecker
Passeriformes	
Tyrannidae	
Contopus borealis	Eastern Wood-Pewee
Empidonax virescens	Acadian Flycatcher
Empidonax alnorum	Alder Flycatcher
Empidonax minimum	Least Flycatcher
Sayornis phoebe	Eastern Phoebe
Myiarchus crinitius	Great Crested Flycatcher
Tyrannus tyrannus	Eastern Kingbird
Hirundininae	
Tachycineta bicolor	Tree Swallow
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Riparia riperia	Bank Swallow
Hirundo pyrrhonota	Cliff Swallow
Hirundo rustica	Barn Swallow
Corvidae	
* Cyanocitta cristata	Blue Jay
* Corvus brachyrhynchos	American Crow
Corvus ossifragus	Fish Crow
Corvus corax	Northern Raven
Paridae	
* Parus atricapillus	Black-capped Chickadee
* Parus bicolor	Tufted Titmouse
Sittidae	
Sitta corolinensis	White-breasted Nuthatch
Certhiidae	

Passeridae	
* Passer domesticus	House Sparrow
Thraupinae	
Piranga olivacea	Scarlet Tanager
Emberizinae	
Pipilo erythrophthalmus	Rufous-sided Towhee
Spizella passerina	Chipping Sparrow
Spizella pusilla	Field Sparrow
Pooecetes gramineus	Vesper Sparrow
Ammodramus savannarum	Grasshopper Sparrow
Ammodramus henslowii	Henslow's Sparrow
Melospiza melodia	Song Sparrow
Melospiza geogiana	Swamp Sparrow
Junco hyemalis	Dark-eyed Junco
Icterinae	
* Agelaius phoeniceus	Red-wigned Blackbird
Sturnella magna	Eastern Meadowlark
* Quiscalus quiscula	Common Grackle
Molothrus ater	Brown-headed Cowbird
Icterus galbula	Northern Oriole
Icterus spurius	Orchard Oriole
Fringillidae	
Pheucticus ludovicianus	Rose-breasted Grosbeak
Passerina cyanea	Indigo Bunting
Cardinalis cardinalis	Northern Cardinal
Carpodacus purpureus	Purple Finch
Carpodacus mexicanus	House Finch
Carduelis tristis	American Goldfinch

* Observed at one or more 79th ARCOM facilities.

TABLE 12

MAMMALS OF EASTERN AND CENTRAL PENNSYLVANIA THAT MAY BE FOUND ON 79TH ARCOM SITES

Scientific Name	Common Name
Marsupialia	
Didelphidae	
Didelphis virginiana	Virginia Opossum
Insectivora	
Soricidae	
Sorex cinereus	Masked Shrew
Blarina brevicauda	Short-tailed Shrew
Sorex palustris	Water Shrew
Sorex fumeus	Smokey Shrew
Sorex dispar	Long-tailed Shrew
Sorex hoyi	Pygmy Shrew
Cryptotis parva	Least Shrew
Talpidae	
Scalopus aquaticus	Eastern Mole
Condylura cristata	Star-nosed Mole
Chiroptera	
Vespertilionidae	
Myotis lucifugus	Little Bornw Myotis
Myotis keenii	Keen's Myotis
Myotis leibii	Small-footed Myotis
Pipistrellus subflavus	Eastern Pipistrelle
Eptesicus fuscus	Big Brown Bat
Lagomorpha	
Leporidae	
Sylvilagus floridanus	Eastern Cottontail
Rodentia	
Sciuridae	
Tamias striatus	Eastern Chipmunk
Marmota monax	Woodchuck

TABLE 13
EXISTING COMMUNITY INVOLVEMENT PROGRAMS

INSTALLATION	TYPE OF PROGRAMS HOSTED AT INSTALLATIONS
Bellefonte	Penn DOT
Bethlehem	Pennsylvania State Police Training
Bristol	Vitenam Veterans Cheerleading Groups Civil Air Patrol
Edgemont	Civil Air Patrol Red Cross Blood Drive Pennsylvania State Police use of drill hall Union meetings
Germantown	Community groups
Horsham	Young Marines
Lancaster	Commercial truck drivers license testing Lancaster City Police training
Lewisburg	Scouts Easter Egg Hunt
Lewiston	VFW/American Legion
Lock Haven	Fire Department use of parking lot for demonstrations
Marcus Hook	Boating Rergatta "Bless the Fleet" Fireworks
Norristown	State Police
Reading	Defense Logistics Agency meetings Reserve Officer's Association meetings. Commercial truck drivers license testing
Scranton	Civil Air Patrol Penn DOT classes
State College	Pennsylvania State Police use of buildings Eye testing for the elderly (on and off) IRS help station for elderly on taxes Special Olympics at Penn State University Reserve speaker at scout meetings Provide generators to scouts of prison
Williamsport	Community meetings County Police training courses Special Olympics activities
Woodhaven	Voting center Philadelphia Police Boy Scouts
Worcester	State Police defensive training
York	Mason Drill Team practice in drill hall

A single soil sample obtained from below the former 550-gallon waste oil UST exceeded the Statewide Standard for lead. Based on subsequent delineation sampling for total lead and evaluation presented in our March 29, 2005 report, KVE concluded that an incomplete exposure pathway exists for total lead and a Site Specific Standard for total lead was selected for the subject site. Historic soil sampling analytical results are summarized in Table 2. A soil sampling locations map is provided as Figure 3.

3.3 Groundwater

Groundwater was characterized at the subject site based on the following sources of information:

- Historic sampling of 24 overburden monitoring wells installed at the site by P&A and four overburden wells installed on the adjacent Willow Grove Naval Air Station Joint Reserve Base (WGNAS/JRB) property in 1996;
- Previous environmental reports by P&A, ECI and KVE;
- Drilling, geophysical logging, packer testing and sampling of a bedrock monitoring well pair (MW-25S and MW-25D); and installation of a down gradient bedrock monitoring well (MW-26) in the area of the site by KVE in 2006;
- Sampling data obtained from water supply wells in the site vicinity, and
- Review of hydrologeological studies at various remedial investigation sites at the adjacent WGNAS/JRB.

The subject site is underlain by the middle member of the Stockton Formation consisting of gently dipping interbedded fine to coarse-grained arkosic sandstones, siltstones and shales that form a complex multi-aquifer system with varying hydraulic properties. The depth to the water table generally ranges from 11 to 24 ft bgs and is found within the weathered bedrock zone at the site. The direction of horizontal groundwater flow is northward in both weathered bedrock and underlying shallow to intermediate-depth bedrock zones as the site is situated immediately north of an east-west trending topographic and ground water divide. Based on results of packer testing and subsequent water level measurements of a well pair installed at MW-25, a downward vertical hydraulic gradient is present from the weathered zone to discrete aquifer units in shallow bedrock. Vertical downward gradients to shallow bedrock were likely accentuated in the past when a significant number of pumping wells were located immediately north of the subject facility. With the exception of 1020 Easton Road, these supply wells are no longer active as these residential and commercial properties were connected to a public water system in 1996.

A north-trending diving MTBE plume in groundwater is present at the site. The diving plume has moved downward under relatively low gradient and largely resides in shallow bedrock aquifer units at depths from approximately 25.0 ft to 60.0 ft bgs. The core of the MTBE plume has migrated to the down gradient portion of the plume where it is centered on the shallow supply well at 1020 Easton Road located approximately 750 ft to the north. Currently, the length of the plume in the weathered bedrock zone is less than 600 ft while plume length in the shallow bedrock zone is an estimated 1,500 ft. The down gradient extent

of the MTBE plume is defined by the supply well at Double Visions at 1130 Easton Road and bedrock monitoring well MW-26 located at 1196 Easton Road. Sampling of these two wells in 2006 has shown trace (less than 1.0 ug/l) to not detected concentrations of MTBE. These two wells are located 2,250 ft north and 2,400 ft northeast of the subject property, respectively.

The MTBE plume at the site is in a shrinking condition as evidenced by historic groundwater sampling data of overburden monitoring wells. All other unleaded gasoline constituents have attenuated to a great extent since the December 1995 release as well. Plume attenuation is best demonstrated in the water table aquifer within the weathered bedrock zone of the site. Packer testing and sampling results from MW-25S and MW-25D in 2006 strongly suggest that MTBE and other unleaded gasoline constituents have attenuated to a similar degree within the shallow bedrock zone of the site. The supply well at 1020 Easton Road has been sampled quarterly since September 2, 2004 and results suggest that MTBE concentrations are decreasing in this well. Additional monitoring of this supply well is needed to confirm this trend.

4.0 ADDITIONAL SITE INVESTIGATION ACTIVITIES

4.1 Groundwater and Supply Well Sampling Event – October 31, 2006

The latest quarterly groundwater sampling event was performed on October 31, 2006 when overburden monitoring wells MW-4, MW-6, MW-13, MW-16 and MW-21 and bedrock monitoring wells MW-25S, MW-25I and MW-26 were gauged, evacuated and sampled. On this date, a water sample was also obtained from the supply well at 1020 Easton Road.

The groundwater sampling results are summarized in Table 3. Supply well sampling results are summarized in Table 1. As shown in Table 3, concentrations of MTBE were slightly higher in shallow bedrock monitoring well MW-25S than in nearby overburden well MW-13, which is a similar result as obtained in the previous quarter. MW-25D (intermediate-depth bedrock well) contained an MTBE concentration of less than 1.0 ug/l for the second consecutive quarter. The MTBE concentration obtained in the supply well 1020 Easton Road supply well decreased significantly from the previous quarter and was only moderately higher than results obtained from MW-25S and MW-13. MTBE concentrations decreased in MW-4 and MW-6 from the previous quarter. The laboratory reports are provided in Appendix A.

4.2 Planned Supply Well Sampling & Other Activities

As previously required by PADEP, JOT Fuel will continue to sample the residential supply wells at 522 and 524 W. Moreland Avenue on an annual basis. It is proposed that sampling no longer be required if MTBE and other targeted compounds are not detected at method detection limits by drinking water test methods for two consecutive sampling events conducted at least 30 days apart.

It is recommended that JOT Fuel re-sample the untreated supply well at Double Visions at 1130 Easton Road. This well is located on trend with the MTBE plume to the north of the site. Sampling of this supply well may serve to verify the

Table 3
Groundwater Elevation and Analytical Data
JOT Fuel, Inc.
982 Easton Road
Horsham, PA

Sample or Well ID	Date	Gauging Data			Groundwater Concentrations (in ug/l)						
		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-1	2/22-23/96	99.29	12.36	86.93	62	ND	5	ND	17	NA	NA
	5/14/1996	99.25	12.5	86.75	ND	ND	ND	ND	ND	NA	NA
	8/12/1996		14.44	84.81	ND	ND	ND	ND	ND	NA	NA
	11/14/1996	99.55	14.14	85.41	ND	ND	ND	ND	ND	NA	NA
	2/6/1998		14.95	84.6	ND	ND	ND	ND	ND	NA	NA
	5/7/1998		NR	NR	ND	ND	ND	ND	ND	ND	ND
	8/11/1998		16.88	82.67	ND	ND	ND	ND	ND	ND	ND
	2/25/1999		16.29	83.26	ND	ND	ND	ND	ND	ND	ND
	9/25/2003		14.88	84.67	NA	NA	NA	NA	NA	NA	NA
	12/19/2003		10.15	89.4	NA	NA	NA	NA	NA	NA	NA
	3/23/2004		13.85	85.7	ND	ND	ND	ND	ND	ND	ND
	6/29/2004		16.21	83.34	ND	ND	ND	ND	ND	ND	ND
	9/30/2004		13.56	85.99	ND	ND	ND	ND	ND	ND	ND
	1/4/2005		14.00	85.55	ND	ND	ND	ND	ND	ND	ND
	4/6/2005		10.31	89.24	ND	ND	ND	ND	ND	ND	ND
	7/12/2005		14.86	84.69	ND	ND	ND	ND	ND	ND	ND
MW-2	2/22-23/96	98.82	13.35	85.47	**564**	**187**	**3,080**	147	161	NA	NA
	5/14/1996	98.85	12.92	85.93	**849**	54.6	268	103	26.6	NA	NA
	8/12/1996		15.28	83.57	**3,030**	**81.7**	166	79	21	NA	NA
	11/14/1996	98.23	14.00	84.23	**117,000**	**780**	**7,280**	334	1,700	NA	NA
	2/6/1998		15.26	82.97	245	**124**	483	52.1	105	NA	NA
	5/7/1998		NR	NR	**644**	**66.8**	132	87.6	74.2	152	ND
	8/11/1998		16.82	81.41	248	31.6	29.5	56.9	14.5	124	9.7
	2/25/1999		16.02	82.21	384	**106**	124	112	118	163	11.4 J
	9/25/2003		13.81	84.42	4.99 J	2.1 J	ND	16.6	ND	9.95	ND
	12/19/2003		10.26	87.97	4.11 J	0.92 J	ND	8.1	ND	10.5	ND
	3/23/2004		13.7	84.53	3.99 J	1.96 J	ND	18.9	ND	11.1	ND
	6/29/2004		16.04	82.19	5.78	0.810 J	ND	1.47 J	ND	4.49 J	ND
	9/30/2004		13.86	84.35	3.58 J	0.9 J	ND	1.38 J	ND	2.64 J	ND
	1/4/2005		14.21	84.02	4.05 J	ND	ND	2.56 J	ND	2.52 J	ND
	4/6/2005		10.68	87.55	3.75 J	0.6 J	ND	2.15 J	ND	2.19 J	ND
	7/12/2005		14.97	83.26	3.13 J	1.0 J	ND	2.57 J	ND	ND	ND

ND - Not Detected or below lab reporting limits
J - analyte is estimated value
NA - Not Analyzed
NR - Not Recorded

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		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-3	2/22-23/96	99.09	14.1	84.99	**8,000**	**2,630**	**3,480**	530	2,800	NA	NA
	5/14/1996	98.9	13.35	85.55	**40,800**	**1,170**	**26,600**	182	1,600	NA	NA
	8/6/1996	NA	Abandoned	NA	NA	NA	NA	NA	NA	NA	NA
MW-4	2/22-23/96	98.86	13.24	85.62	**19,700**	**590**	**9,410**	380	1,690	NA	NA
	5/14/1996		13.04	85.82	**76,700**	**992**	**4,150**	140	474	NA	NA
	8/6/1996		15.19	83.67	**55,300**	**1,000**	**4,970**	164	516	NA	NA
	11/18/1996		14.67	84.19	**76,800**	**734**	**3,990**	185	530	NA	NA
	2/6/1998		16.07	82.79	**609**	**138**	550	14.4	71.7	NA	NA
	5/7/1998		NR	NR	**1,650**	**139**	125	140	254	420	20
	8/11/1998		17.53	81.33	**1,210**	**132**	226	198	278	478	25.4
	2/25/1999		16.72	82.14	**3,830**	**303**	178	244	373	711	33.1 J
	9/25/2003		14.46	84.4	NA	NA	NA	NA	NA	NA	NA
	12/19/2003		10.8	88.06	NA	NA	NA	NA	NA	NA	NA
	3/23/2004		14.41	84.45	4.95 J	1.33 J	ND	12	ND	68.2	ND
	6/29/2004		16.72	82.14	11.3	0.98 J	ND	1.79 J	ND	18	ND
	9/30/2004		14.62	84.24	9.19	0.47 J	ND	ND	ND	4.81 J	ND
	1/4/2005		14.96	83.9	5.91	ND	ND	0.63 J	ND	5.49	ND
	4/6/2005		11.4	87.46	4.61 J	0.36 J	ND	0.6 J	ND	5.84	ND
	7/12/2005		15.69	83.17	8.97	0.81 J	ND	0.57 J	ND	4.71 J	ND
	11/17/2005		16.24	82.62	8.3 J	ND	ND	1.75 J	ND	9.4 J	ND
	3/23/2006		14.99	83.87	25.8	ND	ND	0.71 J	ND	4.56	ND
	7/18/2006		13.95	84.91	43.6	ND	ND	0.53 J	ND	3.46	ND
	10/31/2006		13.61	85.25	26.4	ND	ND	1.98	ND	10.9	0.54 J
MW-5	2/22-23/96	98.12	12.99	85.13	**6,200**	**1,770**	470	**18,700**	2,490	NA	NA
	5/14/1996	97.97	12.68	85.29	**62,200**	**1,010**	**4,690**	129	652	NA	NA
	8/6/1996		14.75	83.22	**96,700**	**1,210**	**6,500**	176	834	NA	NA
	11/18/1996		14.33	83.44	**86,700**	**891**	**5,610**	202	970	NA	NA
	2/6/1998		15.39	82.58	**1,370**	**271**	527	83.2	404	NA	NA
	5/7/1998		NR	NR	**2,880**	**136**	60.9	178	331	**1,110**	34
	8/11/1998		16.95	81.02	**7,810**	**161**	71	169	196	838	ND
	2/25/1999		16.18	81.79	**5,080**	**134**	ND	103	104 J	865	ND
	9/25/2003		14.02	83.95	7.51	0.78 J	ND	1.61 J	ND	21	ND
	12/19/2003		10.45	87.52	8.33	0.84 J	ND	2.8 J	3.63 J	31.8	ND
	3/23/2004		13.79	84.18	5.34	0.41 J	ND	ND	ND	5.04	ND
	6/29/2004		16.06	81.91	9.64	0.85 J	ND	0.89 J	ND	11.4	ND

ND - Not Detected or below lab reporting limits
J - analyte is estimated value
NA - Not Analyzed
NR- Not Recorded

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982 Easton Road
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Sample or Well ID	Date	Gauging Data			Groundwater Concentrations (in ug/l)						
		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-5	9/30/2004		14.06	83.91	9.06	ND	ND	ND	ND	1.29 J	ND
	1/4/2005		14.41	83.56	6.67	ND	ND	ND	ND	1.91 J	ND
	4/6/2005		10.84	87.13	4.17 J	0.29 J	ND	ND	ND	3.89 J	ND
	7/12/2005		15.02	82.95	7.06	0.45 J	ND	ND	ND	1.38 J	ND
MW-6	2/22-23/96	98.54	13.35	84.99	**7,200**	**2,110**	**35,800**	566	3,370	NA	NA
	5/14/1996	98.31	13.37	84.93	**40,300**	**1,120**	**15,500**	170	1,320	NA	NA
	8/6/1996	98.31	15.57	82.74	**35,800**	**966**	**3,940**	203	818	NA	NA
	11/18/1996		15.00	83.31	**52,700**	**820**	**5,550**	232	467	NA	NA
	2/6/1998		16.57	81.74	277	46.2	96.3	5.5	24.1	NA	NA
	5/7/1998		NR	NR	**881**	33.8	16.2	28.1	64.7	192	ND
	8/11/1998		17.73	80.58	**1,310**	**65**	38.9	43	53.6	194	ND
	2/25/1999		17.72	80.59	**2,870**	**121**	54.3	59.7	89.2	250	ND
	9/25/2003		14.84	83.47	33.4	0.56 J	14	0.69 J	ND	7.44	ND
	12/19/2003		10.98	87.33	47.2	0.31 J	ND	ND	ND	2.02 J	ND
	3/23/2004		14.69	83.62	45	0.51 J	ND	ND	ND	11.5	ND
	6/29/2004		17.01	81.3	45.7	0.61 J	ND	ND	ND	7.04	ND
	9/30/2004		15.10	83.21	30	ND	ND	ND	ND	2.06 J	ND
	1/4/2005		15.46	82.85	34.8	ND	ND	ND	ND	4.24 J	ND
	4/6/2005		11.51	86.8	12.2	ND	ND	ND	ND	2.8 J	ND
	7/12/2005		16.33	81.98	41	0.64 J	ND	ND	ND	3.54 J	ND
	11/17/2005		16.88	81.43	31.9	ND	ND	ND	ND	2.98 J	ND
	3/23/2006		15.40	82.91	35.4	ND	ND	ND	ND	0.33 J	ND
	7/18/2006		14.53	83.78	44.8	ND	ND	ND	ND	0.82 J	ND
	10/31/2006		15.22	83.09	36.1	ND	ND	ND	ND	1.5	ND
MW-7	2/22-23/96	98.85	14.29	84.56	**5,000**	**1,710**	**36,000**	619	3,920	NA	NA
	5/14/1996	98.9	14.35	84.57	**48,000**	**1,610**	**26,400**	190	1,320	NA	NA
	8/5/1996		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	11/15/1996		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	2/6/1998		16.43 -Dry	82.47	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	8/11/1998		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	9/25/2003		missing	NA	NA	NA	NA	NA	NA	NA	NA
MW-8	2/22-23/96	96.55	12.61	83.94	**11,500**	**2,070**	**22,100**	496	2,700	NA	NA
	5/14/1996		12.5	84.05	**208,000**	**3,210**	**29,100**	160	1,180	NA	NA
	8/5/1996		14.75	81.8	**38,100**	**6,160**	**42,600**	246	1,520	NA	NA
	11/15/1996		14.08	82.47	**240,000**	**4,310**	**32,800**	218	1,360	NA	NA

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JOT Fuel, Inc.
982 Easton Road
Horsham, PA

Sample or Well ID	Date	Gauging Data			Groundwater Concentrations (in ug/l)						
		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylberzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	20	5	1,000	700	10,000	1,100	100
MW-8	2/6/1998		15.9	80.65	**144,000**	**1,029**	**67,500**	664	2,040	NA	NA
	5/7/1998		NR	NR	**76,000**	**4,670**	**60,500**	427	2,440	785	ND
	8/11/1998		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	2/25/1999	96.55	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	9/25/2003		14.6	81.95	**2200**	**139**	**3090**	150	888	ND	31.4
	12/19/2003		10.71	85.84	**1270**	**120 J**	**2230**	150 J	856 J	756	ND
	3/23/2004		14.1	82.45	**1090**	**90.2 J**	949	101	457	598	ND
	6/29/2004		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	9/30/2004		14.71	81.84	**931**	**81**	653	134	572	800	21.4 J
	1/4/2005		14.51	82.04	**992**	**88.2**	249	104	321.1	616	17.4 J
	4/6/2005		11.23	85.32	**934**	**57.9**	108	82.5	208.7	513	13.2 J
	7/12/2005		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	11/17/2005		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	3/23/2006		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	7/18/2006		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	10/31/2006		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW-9	2/22-23/96	98.00	14.24	83.76	**1,780**	**40**	54	ND	83	NA	NA
	5/14/1996		13.17	84.83	**4,860**	**128**	62.2	ND	45.4	NA	NA
	8/5/1996		16.69	81.31	**4,130**	**247**	18.1	ND	52.7	NA	NA
	11/15/1996		16.08	81.92	**14,000**	**301**	26.9	ND	26.5	NA	NA
	2/6/1998		16.27	81.73	**1,554**	**63.7**	37.9	ND	ND	NA	NA
	5/7/1998		NR	NR	**977**	**15**	4.9	ND	7.7	12.8	ND
	8/11/1998		18.68	79.32	**4,770**	**112**	ND	ND	ND	218	ND
	2/25/1999		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	9/25/2003		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	12/19/2003		13.7	84.30	ND	ND	ND	ND	ND	ND	ND
	3/23/2004		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	6/29/2004		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	9/30/2004		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	1/4/2005		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	4/6/2005		13.8	84.20	**90**	ND	ND	ND	ND	ND	ND
	7/12/2005		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	11/17/2005		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	3/23/2006		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	7/18/2006		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	10/31/2006		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

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982 Easton Road
Horsham, PA

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		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-10	2/22-23/96	96.58	13.19	83.39	**740**	15.3	59	ND	17	NA	NA
	5/14/1996		13.15	83.43	**16,800**	14	13.4	ND	ND	NA	NA
	8/5/1996		15.08	81.5	**7,290**	ND	ND	ND	ND	NA	NA
	11/15/1996		14.67	81.91	**2,430**	ND	16.3	ND	ND	NA	NA
	2/6/1998		16.54	80.04	23	ND	ND	ND	ND	NA	NA
	5/7/1998		NR	NR	**881**	ND	22.2	ND	ND	ND	ND
	8/11/1998		16.4	80.18	14.8	ND	928	ND	ND	ND	ND
	2/25/1999		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	9/25/2003		15.15	81.43	5.56 J	ND	261	ND	ND	ND	ND
	12/19/2003		12.06	84.52	6.04 J	ND	234	ND	0.8 J	ND	ND
	3/23/2004		15.45	81.13	3.4 J	ND	396	ND	2.55 J	ND	ND
	6/29/2004		16.65	79.93	2.2 J	3.2 J	389	ND	ND	ND	ND
	9/30/2004		15.65	80.93	2.65 J	ND	447	ND	ND	1.2 J	ND
	1/4/2005		15.1	81.48	ND	ND	252	ND	ND	ND	ND
	4/6/2005		12.9	83.68	3.66 J	ND	150	ND	ND	ND	ND
	7/12/2005		16.53	80.05	1.96 J	ND	168	ND	ND	0.72 J	ND
MW-11	5/14/1996	98.89	13.96	84.93	**33,100**	**1,630**	**35,000**	327	2,510	NA	NA
	8/6/1996		Abandoned	NA	NA	NA	NA	NA	NA	NA	NA
MW-12	5/14/1996	100.89	14.79	86.1	**2,260**	44	716	9.1	75.4	NA	NA
	8/6/1996		17.03	83.86	**1,170**	37	607	9	57	NA	NA
	11/18/1996		16.33	84.56	**21,400**	**121**	**2,530**	101	589	NA	NA
	2/6/1998		16.03	84.86	46.5	8.9	ND	ND	ND	NA	NA
	5/7/1998		NR	NR	171	1.5	1.8	7.3	10.9	81	5.7
	8/11/1998		19.29	81.63	**563**	12.6	35	28.8	26.9	180	8
	2/25/1999		18.38	82.51	190	ND	4.1	13.2	12.6	102	3.6 J
	9/25/2003		16.6	84.29	NA	NA	NA	NA	NA	NA	NA
	12/19/2003		12.98	87.91	NA	NA	NA	NA	NA	NA	NA
	3/23/2004		16.47	84.42	1.91 J	ND	ND	ND	ND	ND	ND
	6/29/2004		18.66	82.23	2.53 J	ND	ND	ND	ND	0.32 J	ND
	9/30/2004		16.62	84.27	1.82 J	ND	ND	ND	ND	ND	ND
	1/4/2005		16.92	83.97	1.79 J	ND	ND	ND	ND	ND	ND
	4/6/2005		13.33	87.56	1.08 J	ND	ND	ND	ND	ND	ND
	7/12/2005		17.68	83.21	1.4 J	ND	ND	ND	ND	ND	ND
	11/17/2005		18.31	82.58	1.2 J	ND	ND	ND	ND	ND	ND
	3/23/2006		17.03	83.86	4.72	ND	ND	ND	ND	0.77 J	ND

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		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-13	8/1/1996	100.36	17.39	82.97	**186,000**	**1,960**	**26,300**	186	314	NA	NA
	11/14/1996		16.75	83.61	**135,000**	**2,180**	**41,300**	339	2,520	NA	NA
	2/6/1998		18.24	82.12	**2,061**	**279**	**1,390**	40	585	NA	NA
	5/7/1998		NR	NR	**6,060**	**186**	**1,350**	90.4	637	417	ND
	8/11/1998		19.46	80.9	**8,340**	**269**	**1,150**	149	838	770	ND
	2/25/1999		19.19	81.17	**6,360**	**247**	**2,190**	193	1,140	867	ND
	9/25/2003	100.36	16.72	83.64	365	1.22 J	ND	ND	ND	14	ND
	12/19/2003		13.01	87.35	87.8	0.39 J	ND	ND	ND	9.86	ND
	3/23/2004		16.6	83.76	331	3.83	1.83 J	14.3	4.92 J	167	1.26 J
	6/29/2004		18.78	81.58	386	6.0 J	2.55 J	21.3 J	12.25 J	246	ND
	9/30/2004		17.23	83.13	180	ND	2.4 J	ND	ND	28.3	ND
	1/4/2005		17.47	82.89	115	ND	1.85 J	14.3 J	1.6 J	175	ND
	4/6/2005		13.42	86.94	83	1.9 J	ND	7.65 J	ND	106	ND
	7/12/2005		18.03	82.33	166	3.75 J	ND	15.8 J	ND	205	ND
	11/17/2005		18.63	81.73	161	2.1 J	ND	8.5 J	ND	123	ND
	3/23/2006		17.11	83.25	110	ND	ND	9.95	2.2 J	146	ND
	7/18/2006		16.31	84.05	50.9	ND	ND	9.25	ND	126	ND
	10/31/2006		16.71	83.65	102	ND	ND	6.4	ND	146	ND
MW-14	8/1/1996	101.25	18.98	82.77	**153,000**	**1,160**	**3,310**	81.4	156	NA	NA
	11/14/1996		18.42	82.83	**146,000**	**1,290**	**1,660**	95.9	757	NA	NA
	2/6/1998		20.01	81.24	**9,980**	**1,130**	**3,000**	ND	ND	NA	NA
	8/11/1998		inaccessible	NA	NA	NA	NA	NA	NA	NA	NA
	9/25/2003		missing	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	8/2/1996	102.4	20.43	81.97	ND	ND	5.6	ND	ND	NA	NA
	11/14/1996		19.83	82.57	**1,720**	ND	ND	ND	ND	NA	NA
	2/6/1998		21.86	80.54	25.7	7.6	5.1	ND	ND	NA	NA
	5/7/1998		NR	NR	4.3	ND	ND	ND	ND	ND	ND
	8/11/1998		22.45	79.95	2.4	ND	ND	ND	ND	ND	ND
	2/25/1999		23.17	79.23	ND	ND	ND	ND	ND	5.6	ND
	9/25/2003		20.45	81.95	ND	ND	ND	ND	ND	ND	ND
	12/19/2003		16.42	85.98	ND	ND	ND	ND	ND	ND	ND
	3/23/2004		20.32	82.08	ND	ND	ND	ND	ND	ND	ND
	6/29/2004		21.96	80.44	ND	ND	ND	ND	ND	ND	ND
	9/30/2004		21.02	81.38	ND	ND	ND	ND	ND	ND	ND
	1/4/2005		21.13	81.27	ND	ND	ND	ND	ND	ND	ND

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		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-15	4/6/2005		17.08	85.32	ND	ND	ND	ND	ND	ND	ND
	7/12/2005		21.51	80.89	ND	ND	ND	ND	ND	ND	ND
MW-16	8/2/1996	100.81	18.87	81.94	**24,900**	**567**	**4,250**	63	509	NA	NA
	11/14/1996		18.33	82.48	**16,000**	**998**	**25,100**	250	1,770	NA	NA
	2/6/1998		20.26	80.55	**4,434**	**209**	819	46.4	882	NA	NA
	5/7/1998		NR	NR	**4,380**	**130**	408	60.3	511	**414**	ND
	8/11/1998		20.95	79.86	**1,060**	8.1	7	ND	19.2	32.9	ND
	2/25/1999	100.81	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	9/25/2003		NR	NR	NA	NA	NA	NA	NA	NA	NA
	12/19/2003		NR	NR	NA	NA	NA	NA	NA	NA	NA
	3/23/2004		18.64	82.17	36	ND	ND	ND	ND	ND	ND
	6/29/2004		20.45- Dry	80.36	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	9/30/2004		19.31	81.5	41.1	ND	ND	ND	ND	ND	ND
	1/4/2005		18.6	82.21	4.34 J	ND	ND	ND	ND	ND	ND
	4/6/2005		15.52	85.29	17.3	ND	ND	ND	ND	ND	ND
	7/12/2005		19.88	80.93	47.1	ND	ND	ND	ND	0.27 J	ND
	11/17/2005		20.41- Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	3/23/2006		18.77	82.04	27.5	ND	ND	ND	ND	ND	ND
	7/18/2006		18.10	82.71	21.1	ND	ND	ND	ND	ND	ND
	10/31/2006		19.50	81.31	12.4	ND	ND	ND	ND	ND	ND
MW-17	8/2/1996	103.39	20.94	82.45	ND	ND	ND	ND	ND	NA	NA
	11/14/1996		20.33	83.06	**1,370**	ND	ND	ND	ND	NA	NA
	2/6/1998		inaccessible	NR	NA	NA	NA	NA	NA	NA	NA
	5/7/1998		NR	NR	3.6	ND	ND	ND	ND	ND	ND
	8/11/1998		22.69	80.7	14.1	ND	ND	ND	ND	ND	ND
	2/25/1999		22.38	81.01	14.0	ND	ND	ND	ND	ND	ND
	9/25/2003		NR	NR	NA	NA	NA	NA	NA	NA	NA
	12/19/2003		NR	NR	NA	NA	NA	NA	NA	NA	NA
	3/23/2004		20.83	82.56	ND	ND	ND	ND	ND	ND	ND
	6/29/2004		22.47	80.92	ND	ND	ND	ND	ND	ND	ND
	9/30/2004		21.48	81.91	ND	ND	ND	ND	ND	ND	ND
	1/4/2005		20.72	82.67	ND	ND	ND	ND	ND	ND	ND
	4/6/2005		17.5	85.89	ND	ND	ND	ND	ND	ND	ND
	7/12/2005		21.95	81.44	ND	ND	ND	ND	ND	ND	ND

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		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-18	9/11/1996	98.16	17.5	80.66	**922**	ND	ND	ND	ND	NA	NA
	11/13/1996		16.92	81.24	**704**	ND	ND	ND	ND	NA	NA
	2/6/1998		18.96	79.2	28.6	6.1	ND	ND	ND	NA	NA
	5/7/1998		NR	NR	26.6	ND	ND	ND	ND	ND	ND
	8/11/1998		19.23	78.93	5.3	ND	ND	ND	1.3	ND	ND
	2/25/1999		21.42	76.74	14.9	ND	ND	ND	ND	ND	ND
	9/25/2003		17.40	80.76	0.66 J	ND	ND	ND	ND	ND	ND
	12/19/2003		14.70	83.46	70.8	ND	ND	ND	ND	ND	ND
	3/23/2004		17.30	80.86	1.67 J	0.33 J	ND	ND	ND	ND	ND
	6/29/2004		18.90	79.26	1.38 J	0.4 J	0.8 J	ND	ND	ND	ND
	9/30/2004		17.77	80.39	11.6	ND	ND	ND	ND	ND	ND
	1/4/2005	98.16	16.91	81.25	20.2	ND	ND	ND	ND	ND	ND
	4/6/2005		14.81	83.35	15.9	0.29 J	0.57 J	ND	ND	ND	ND
	7/12/2005		18.49	79.67	0.73 J	0.38 J	ND	ND	ND	ND	ND
	11/17/2005		19.20	78.96	2.92 J	0.47 J	ND	ND	ND	ND	ND
	3/23/2006		17.40	80.76	8.26	0.75 J	ND	ND	ND	ND	ND
MW-19	9/11/1996	99.91	19.77	80.14	353	ND	ND	ND	ND	NA	NA
	11/13/1996		18.5	81.41	**2,110**	ND	ND	ND	21.6	NA	NA
	2/6/1998		20.61	79.3	27.3	5.6	ND	ND	ND	NA	NA
	5/7/1998		NR	NR	8.8	ND	ND	ND	ND	ND	ND
	8/11/1998		20.93	78.98	6.8	ND	ND	ND	ND	ND	ND
	2/25/1999		23.11	76.8	ND	ND	ND	ND	ND	ND	ND
	9/25/2003		missing	NA	NA	NA	NA	NA	NA	NA	NA
	12/19/2003		missing	NA	NA	NA	NA	NA	NA	NA	NA
	3/23/2004		19	80.91	0.91 J	ND	ND	ND	ND	ND	ND
	6/29/2004		20.6	79.31	ND	ND	ND	ND	ND	ND	ND
	9/30/2004		19.42	80.49	0.79 J	ND	ND	ND	ND	ND	ND
	1/4/2005		18.6	81.31	1.37 J	ND	ND	ND	ND	ND	ND
	4/6/2005		16.17	83.74	ND	ND	ND	ND	ND	ND	ND
	7/12/2005		20.23	79.68	2.72 J	ND	ND	ND	ND	ND	ND

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		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-20	9/11/1996	98.51	18.67	79.84	**699**	20.1	ND	ND	ND	NA	NA
	11/12/1996		17.5	81.01	**4,970**	25.4	ND	ND	ND	NA	NA
	2/6/1998		19.45	79.06	145	11.1	ND	ND	ND	NA	NA
	5/7/1998		NR	NR	**1,520**	16.5	ND	ND	ND	ND	ND
	8/11/1998		19.87	78.64	**833**	7.5	ND	ND	ND	ND	ND
	2/25/1999		21.97	76.54	75.6	ND	ND	ND	ND	ND	ND
	9/25/2003		18.11	80.4	18.3	ND	ND	ND	ND	ND	ND
	12/19/2003		14.72	83.79	ND	ND	ND	ND	ND	ND	ND
	3/23/2004		17.98	80.53	8.23	ND	ND	ND	ND	ND	ND
	6/29/2004		19.47	79.04	8.96	ND	ND	ND	ND	ND	ND
	9/30/2004		18.4	80.11	6.37	ND	ND	ND	ND	ND	ND
	1/4/2005		17.4	81.11	1.36 J	ND	ND	ND	ND	ND	ND
	4/6/2005		15.31	83.2	0.82 J	ND	ND	ND	ND	ND	ND
	7/12/2005		19.15	79.36	2.37 J	ND	ND	ND	ND	ND	ND
MW-21	9/12/1996	98.61	18.83	79.78	**1,130**	ND	ND	ND	ND	NA	NA
	11/12/1996		17.5	81.11	**2,480**	ND	ND	ND	ND	NA	NA
	2/6/1998		19.51	79.1	76.2	8	ND	ND	ND	NA	NA
	5/7/1998		NR	NR	**619**	9.4	9.9	ND	ND	5	ND
	8/11/1998		19.95	78.66	**1,270**	14.2	ND	ND	ND	24.3	ND
	2/25/1999		22.11	76.5	407	ND	ND	ND	ND	ND	ND
	9/25/2003		18.17	80.44	5.73	ND	ND	ND	ND	ND	ND
	12/19/2003		15.81	82.8	ND	ND	ND	ND	ND	ND	ND
	3/23/2004		18.02	80.59	57.2	ND	ND	ND	ND	ND	ND
	6/29/2004		19.55	79.06	42.3	ND	ND	ND	ND	ND	ND
	9/30/2004		18.55	80.06	30	ND	ND	ND	ND	ND	ND
	1/4/2005		17.41	81.2	ND	ND	ND	ND	ND	ND	ND
	4/6/2005		15.31	83.3	ND	ND	ND	ND	ND	ND	ND
	7/12/2005		19.25	79.36	33.7	ND	ND	ND	ND	ND	ND
	11/17/2005		19.79	78.82	5.45	ND	ND	ND	ND	ND	ND
	3/23/2006		18.05	80.56	0.5 J	ND	ND	ND	ND	ND	ND
	7/18/2006		17.70	80.91	ND	ND	ND	ND	ND	ND	ND
	10/31/2006		18.33	80.28	0.4 J	ND	ND	ND	ND	ND	ND

ND - Not Detected or below lab reporting limits
J - analyte is estimated value
NA - Not Analyzed
NR- Not Recorded

Table 3
Groundwater Elevation and Analytical Data
JOT Fuel, Inc.
982 Easton Road
Horsham, PA

Sample or Well ID	Date	Gauging Data			Groundwater Concentrations (in ug/l)						
		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-22	9/12/1996	99.64	19.67	79.97	ND	ND	ND	ND	ND	NA	NA
	11/12/1996		18.17	81.47	ND	ND	ND	ND	ND	NA	NA
	2/6/1998		20.63	79.01	69.1	5.7	ND	ND	ND	NA	NA
	5/7/1998		NR	NR	8.1	ND	ND	ND	ND	ND	ND
	8/11/1998		20.8	78.84	36.7	ND	ND	ND	ND	ND	ND
	2/25/1999		23.29	76.35	9.3	ND	ND	ND	ND	ND	ND
	9/25/2003		19.2	80.44	ND	0.58 J	0.84 J	ND	ND	ND	ND
	12/19/2003		15.31	84.33	ND	ND	ND	ND	ND	ND	ND
	3/23/2004		18.9	80.74	ND	ND	ND	ND	ND	ND	ND
	6/29/2004		20.4	79.24	0.31 J	ND	ND	ND	ND	ND	ND
	9/30/2004		19.75	79.89	0.67 J	ND	ND	ND	ND	ND	ND
	1/4/2005		18.09	81.55	ND	ND	ND	ND	ND	ND	ND
	4/6/2005		15.9	83.74	ND	ND	ND	ND	ND	ND	ND
	7/12/2005		20.21	79.43	0.31 J	ND	ND	ND	ND	ND	ND
MW-23	9/12/1996	101.35	21.13	80.22	48.5	ND	ND	ND	ND	NA	NA
	11/12/1996		19.58	81.77	167	ND	ND	ND	ND	NA	NA
	2/6/1998		21.97	79.38	57.2	8.0	ND	ND	24	NA	NA
	5/7/1998		NR	NR	94.4	ND	ND	ND	ND	3.4	ND
	8/11/1998		22.22	79.13	82.6	ND	ND	ND	ND	1.8	ND
	2/25/1999		NR	NR	NA	NA	NA	NA	NA	NA	NA
	9/25/2003		NR	NR	NA	NA	NA	NA	NA	NA	NA
	12/19/2003		NR	NR	NA	NA	NA	NA	NA	NA	NA
	3/23/2004		20.04	81.31	ND	ND	ND	ND	ND	ND	ND
	6/29/2004		21.77	79.58	2.16 J	ND	ND	ND	ND	ND	ND
	9/30/2004		21.09	80.26	1.64 J	ND	ND	ND	ND	ND	ND
	1/4/2005		19.56	81.79	1.24 J	ND	ND	ND	ND	ND	ND
	4/6/2005		16.92	84.43	0.41 J	ND	ND	ND	ND	ND	ND
	7/12/2005		21.54	79.81	1.2 J	ND	ND	ND	ND	ND	ND
	11/17/2005		22.00	79.35	2.9 J	ND	ND	ND	ND	ND	ND
	3/23/2006		20.06	81.29	1.1	ND	ND	ND	ND	ND	ND
MW-24	8/12/1996	101.76	21.50	80.26	105	ND	ND	ND	ND	NA	NA
	11/12/1996		19.92	81.92	**572**	ND	ND	ND	ND	NA	NA
	2/6/1998		22.42	79.34	23.8	5.1	ND	ND	ND	NA	NA
	5/7/1998		NR	NR	11.0	ND	ND	ND	ND	ND	ND

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Table 3
Groundwater Elevation and Analytical Data
JOT Fuel, Inc.
982 Easton Road
Horsham, PA

Sample or Well ID	Date	Gauging Data			Groundwater Concentrations (in ug/l)						
		Casing Elev. (ft)	DTW (ft)	Water Elev. (ft.)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Cumene	Naphthalene
Standard	-	-	-	-	508	57.9	1,000	700	10,000	1,100	100
MW-24	8/11/1998		22.62	79.14	17.9	ND	ND	ND	ND	ND	ND
	2/25/1999		24.86	76.9	31.9	ND	ND	ND	ND	ND	ND
	9/25/2003		NR	NR	NA	NA	NA	NA	NA	NA	NA
	12/19/2003		NR	NR	NA	NA	NA	NA	NA	NA	NA
	3/23/2004		20.51	81.25	ND	ND	ND	ND	ND	ND	ND
	6/29/2004		22.11	79.65	ND	ND	ND	ND	ND	ND	ND
	9/30/2004		21.53	80.23	ND	ND	ND	ND	ND	ND	ND
	1/4/2005		19.89	81.87	ND	ND	ND	ND	ND	ND	ND
	4/6/2005		17.32	84.44	ND	ND	ND	ND	ND	ND	ND
	7/12/2005		21.91	79.85	ND	ND	ND	ND	ND	ND	ND
	11/17/2005		22.39	79.37	ND	ND	ND	ND	ND	ND	ND
	3/23/2006		20.37	81.39	ND	ND	ND	ND	ND	ND	ND
MW-25											
zone 1: 52- 64'	3/6/2006	packer test	15.77	NR	199	ND	0.32 J	ND	ND	1.28	ND
zone 2: 84- 96'	3/6/2006	packer test	16.12	NR	42.6	ND	0.30 J	ND	ND	0.21 J	ND
zone 3: 107- 119'	3/7/2006	packer test	16.14	NR	39.9	ND	0.55 J	ND	ND	ND	ND
MW-25s	7/18/2006	98.92	16.39	82.53	64.7	ND	ND	ND	ND	ND	ND
screened 54- 64'	10/31/2006		18.11	80.81	121.0	ND	ND	ND	ND	ND	ND
MW-25d	7/18/2006	98.9	17.06	81.84	0.68 J	ND	ND	ND	ND	ND	ND
screened 108- 118'	10/31/2006		19.21	79.69	0.43 J	ND	ND	ND	ND	ND	ND
MW-26	5/18/2006	NR	17.35	NR	0.30 J	ND	12.1	ND	ND	ND	ND
open hole: 30- 150'	7/18/2006		17.77		ND	ND	ND	ND	ND	ND	ND
	10/31/2006		16.8		0.45 J	ND	ND	ND	ND	ND	ND
12MW01	6/30/1997		17.18		**3,700**	**93.0**	ND	ND	ND	ND	ND
(NAS- Willow Grove)	7/26/2004		16.12		2.97 J	ND	ND	ND	ND	ND	ND
	1/5/2006		14.00		5.01	ND	ND	ND	ND	ND	ND
12MW02	6/30/1997		11.89		11	ND	ND	ND	ND	ND	ND
(NAS- Willow Grove)	7/26/2004		8.90		ND	ND	ND	ND	ND	ND	ND
	1/5/2006		8.15		ND	ND	ND	ND	ND	ND	ND
12MW03	6/30/1997		12.52		ND	ND	ND	ND	ND	ND	ND
(NAS- Willow Grove)	7/26/2004		Abandoned		NA	NA	NA	NA	NA	NA	NA
12MW04	6/30/1997		13.28		ND	ND	ND	ND	ND	ND	ND
(NAS- Willow Grove)	7/26/2004		11.31		ND	ND	ND	ND	ND	ND	ND
	1/5/2006		10.26		ND	ND	ND	ND	ND	ND	ND

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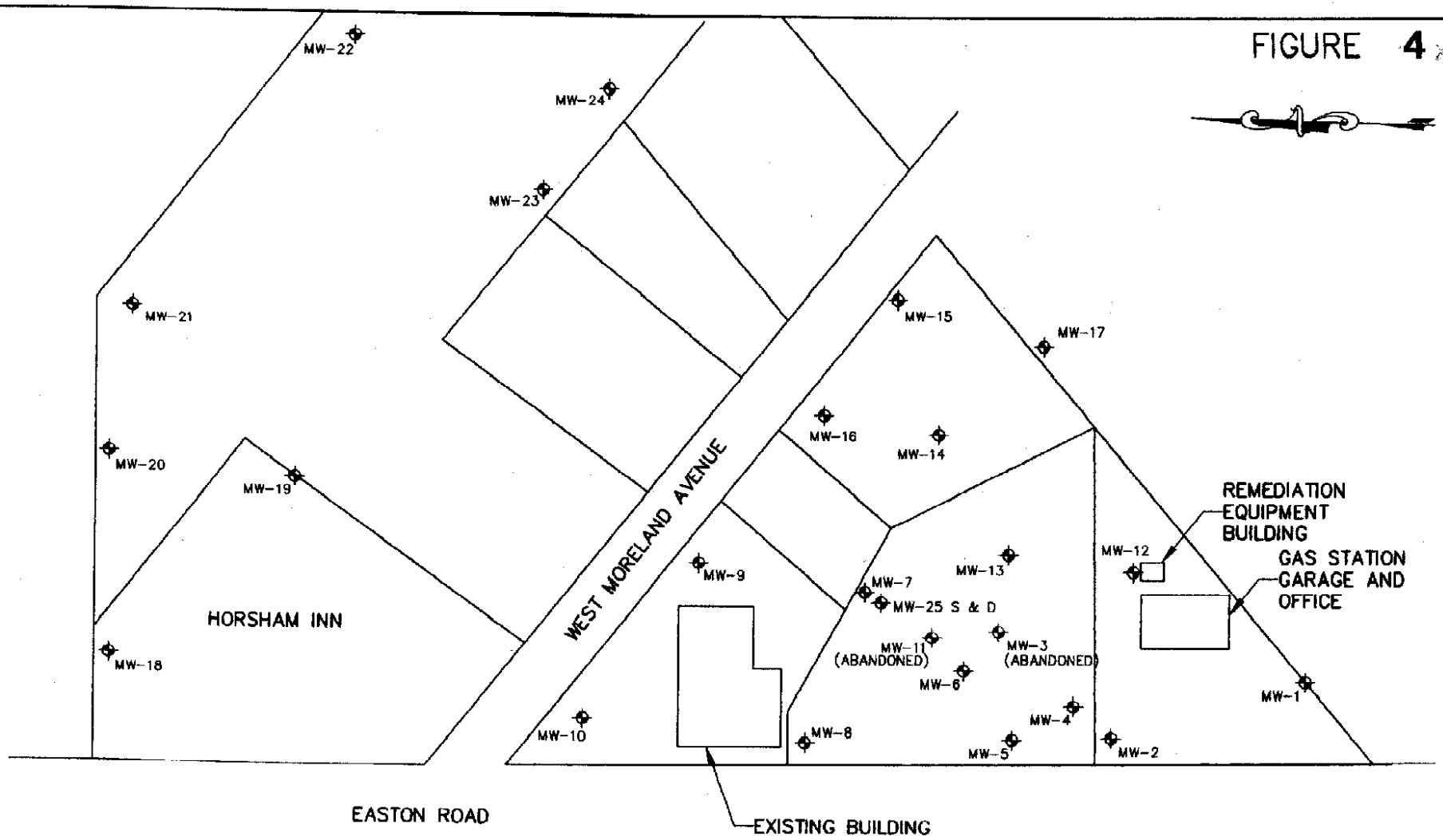
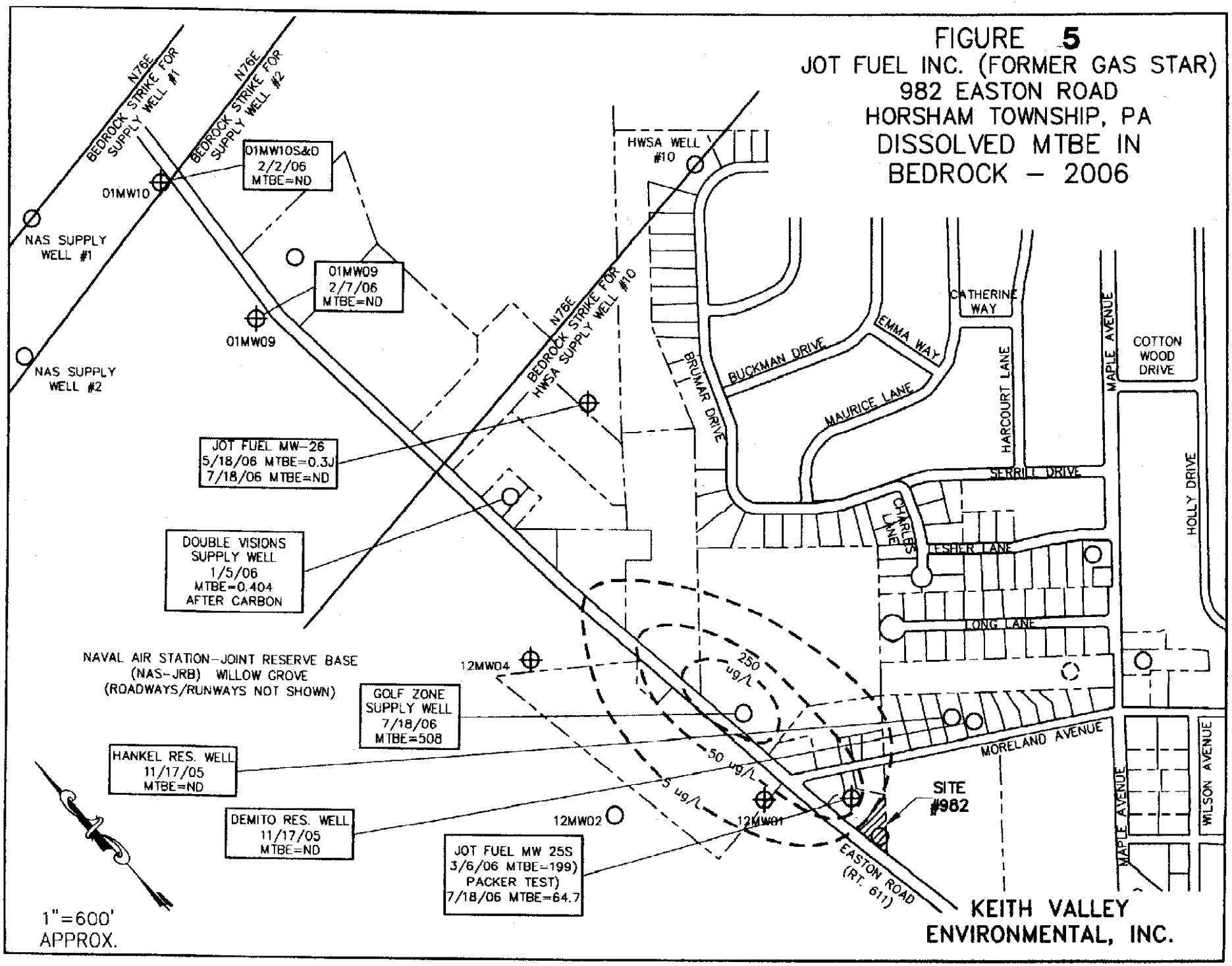
NA - Not Analyzed
NR- Not Recorded

FIGURE 4



JOT FUEL INC. (FORMER GAS STAR)
982 EASTON ROAD
HORSHAM, PA
MONITORING WELL LOCATIONS MAP
1"=80' (APPROX.)

KEITH VALLEY
ENVIRONMENTAL, INC.



Appendix E

Regulatory Database Search Reports

The EDR Radius Map
with GeoCheck®

Horsham Memorial USARC
936 EASTON ROAD
HORSHAM, PA 19044

Inquiry Number: 01714247.230r

July 13, 2006

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

936 EASTON ROAD
HORSHAM, PA 19044

COORDINATES

Latitude (North):	40.194500 - 40° 11' 40.2''
Longitude (West):	75.137400 - 75° 8' 14.6''
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	488304.6
UTM Y (Meters):	4449144.0
Elevation:	367 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	40075-B2 AMBLER, PA
Most Recent Revision:	1983
East Map:	40075-B1 HATBORO, PA
Most Recent Revision:	1983

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following government records. For more information on this property see page 6 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
HORSHAM MEM USARC 936 EASTON RD HORSHAM, PA 19044	RCRA-SQG FINDS	PAR000502534

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

FEDERAL RECORDS

NPL ---------- National Priority List

EXECUTIVE SUMMARY

Proposed NPL Proposed National Priority List Sites
Delisted NPL National Priority List Deletions
NPL RECOVERY Federal Superfund Liens
CERCLIS Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP CERCLIS No Further Remedial Action Planned
CORRACTS Corrective Action Report
RCRA-TSDF Resource Conservation and Recovery Act Information
RCRA-LQG Resource Conservation and Recovery Act Information
ERNS Emergency Response Notification System
HMIRS Hazardous Materials Information Reporting System
US ENG CONTROLS Engineering Controls Sites List
US INST CONTROL Sites with Institutional Controls
FUDS Formerly Used Defense Sites
US BROWNFIELDS A Listing of Brownfields Sites
CONSENT Superfund (CERCLA) Consent Decrees
ROD Records Of Decision
UMTRA Uranium Mill Tailings Sites
ODI Open Dump Inventory
TRIS Toxic Chemical Release Inventory System
TSCA Toxic Substances Control Act
FTTS FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
SSTS Section 7 Tracking Systems
ICIS Integrated Compliance Information System
PADS PCB Activity Database System
MLTS Material Licensing Tracking System
MINES Mines Master Index File
RAATS RCRA Administrative Action Tracking System

STATE AND LOCAL RECORDS

SHWS Hazardous Sites Cleanup Act Site List
HSCA HSCA Remedial Sites Listing
SWF/LF Operating Facilities
HIST LF Abandoned Landfill Inventory
ARCHIVE UST Archived Underground Storage Tank Sites
LAST Storage Tank Release Sites
AST Listing of Pennsylvania Regulated Aboveground Storage Tanks
ARCHIVE AST Archived Aboveground Storage Tank Sites
ACT 2-DEED Act 2-Deed Acknowledgment Sites
ENG CONTROLS Engineering Controls Site Listing
INST CONTROL Institutional Controls Site Listing
VCP Voluntary Cleanup Program Sites
DRYCLEANERS Drycleaner Facility Locations
BROWNFIELDS Brownfields Sites
AIRS Permit and Emissions Inventory Data

TRIBAL RECORDS

INDIAN RESERV Indian Reservations

EDR PROPRIETARY RECORDS

Manufactured Gas Plants EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR Historical Auto Stations EDR Proprietary Historic Gas Stations
EDR Historical Cleaners EDR Proprietary Historic Dry Cleaners

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL RECORDS

RCRAInfo: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System(RCRIS). The database includes selective information on sites which generate, transport, store , treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month Large quantity generators generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRA-SQG list, as provided by EDR, and dated 03/09/2006 has revealed that there are 2 RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
TINIUS OLSEN TESTING MACH CO	***1005 EASTON RD***	***0 - 1/8 S***	***A2***	***6***
Lower Elevation	**Address**	**Dist / Dir**	**Map ID**	**Page**
C & C MOTORS INC	***1100 EASTON ROAD - ROUT***	***1/8 - 1/4 NNW***	***B5***	***10***

DOD: Consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

A review of the DOD list, as provided by EDR, and dated 12/31/2004 has revealed that there is 1 DOD site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
WILLOW GROVE NAVAL AIR STATION		0 - 1/8 WSW	0	6

EXECUTIVE SUMMARY

STATE AND LOCAL RECORDS

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environmental Resources' List of Confirmed Releases.

A review of the LUST list, as provided by EDR, and dated 03/09/2006 has revealed that there are 3 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
JOT FUEL	***982 EASTON RD***	***0 - 1/8 S***	***3***	***9***
Facility Status: Interim Remedial Actions Initiated or Completed				

Lower Elevation	Address	Dist / Dir	Map ID	Page
HATBORO HORSHAM OPR	***224 MAPLE AVE***	***1/8 - 1/4 ESE***	***6***	***13***
Facility Status: Inactive				
HORSHAM GULF	***660 EASTON RD***	***1/4 - 1/2 SSE***	***9***	***14***
Facility Status: Interim Remedial Actions Initiated or Completed				
Facility Status: Cleanup Completed				

UNREG LTANKS: Leaking storage tank cases from unregulated storage tanks.

A review of the UNREG LTANKS list, as provided by EDR, and dated 04/12/2002 has revealed that there are 2 UNREG LTANKS sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
DREXEL IND	331 MAPLE AVE	1/4 - 1/2 S	7	14
Closed: 4/20/1998				
GAFTOMSKI RES	400 WATSON AVE	1/4 - 1/2 SE	8	14

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Resources' Regulated Underground Storage Tank Listing.

A review of the UST list, as provided by EDR, and dated 06/01/2006 has revealed that there are 3 UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
JOT FUEL	***982 EASTON RD***	***0 - 1/8 S***	***3***	***9***

Lower Elevation	Address	Dist / Dir	Map ID	Page
C & C FORD SALES	1100 EASTON RD	1/8 - 1/4 NNW	B4	10
HATBORO HORSHAM OPR	***224 MAPLE AVE***	***1/8 - 1/4 ESE***	***6***	***13***

EXECUTIVE SUMMARY

MANIFEST: Hazardous waste manifest information.

A review of the MANIFEST list, as provided by EDR, and dated 12/31/2005 has revealed that there are 2 MANIFEST sites within approximately 0.25 miles of the target property.

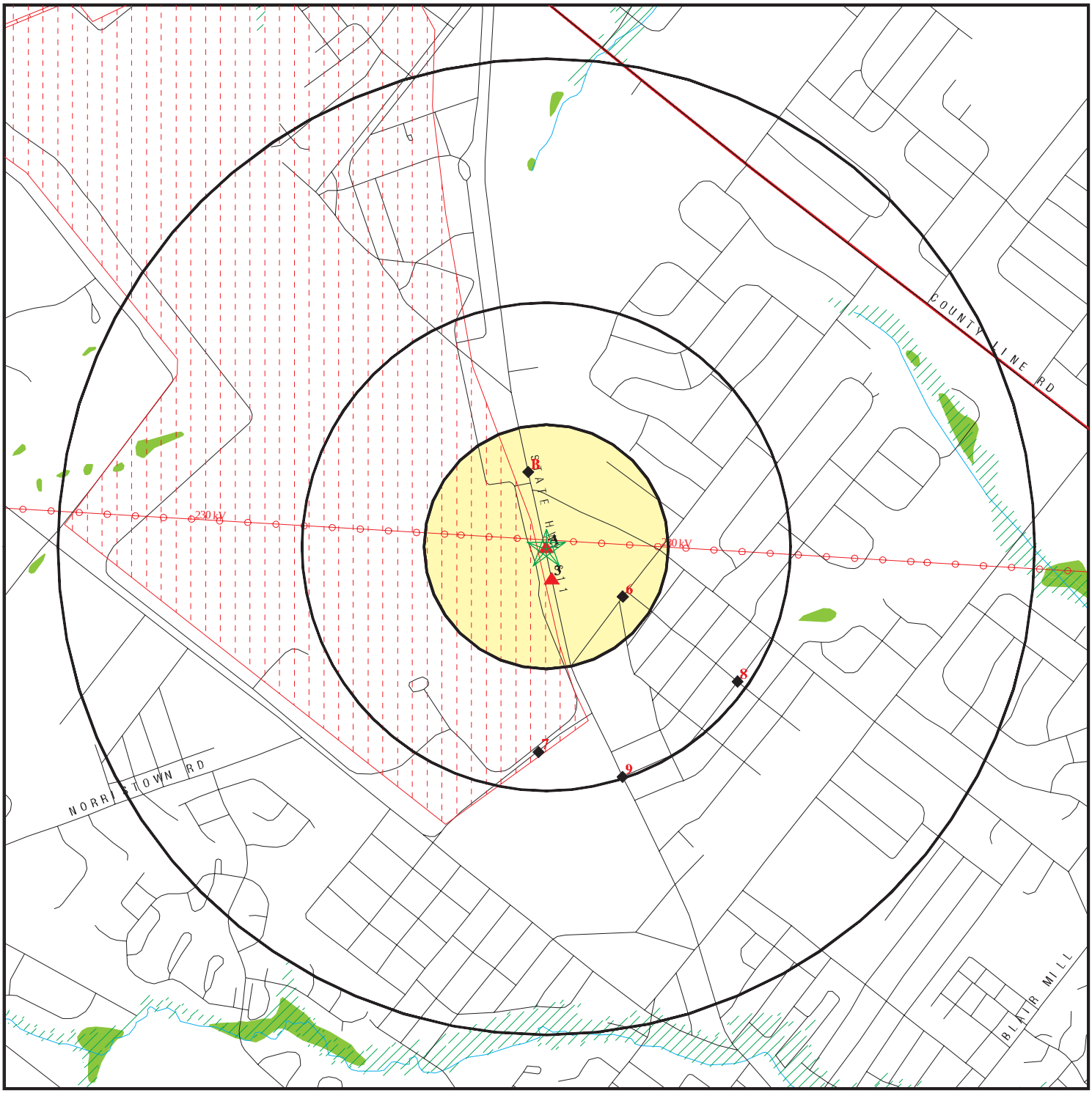
Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
TINIUS OLSEN TESTING MACH CO	*1005 EASTON RD*	*0 - 1/8 S*	*A2*	*6*
Lower Elevation	**Address**	**Dist / Dir**	**Map ID**	**Page**
C & C MOTORS INC	*1100 EASTON ROAD - ROUT*	*1/8 - 1/4 NNW*	*B5*	*10*

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
EXXON RS 2 0493	VCP
GALER & HILLYARD	UNREG LTANKS
MAPLE HILL APT	UNREG LTANKS
EXXON RS 2 0493	LUST
NAVAL FUEL FARM NASJRB	LUST
TAYLOR RENTAL CTR	LUST
HORSHAM TOWNSHIP OF SEWER AUTH	FINDS
HORSHAM TOWNSHIP OF SEWER AUTH	ICIS
OMNIPAC INC/HORSHAM PLT	AIRS
EDON CORP/HORSHAM	AIRS
US CAN CO/HORSHAM	AIRS
HORSHAM VILLAGE MALL	NY MANIFEST

OVERVIEW MAP - 01714247.230r

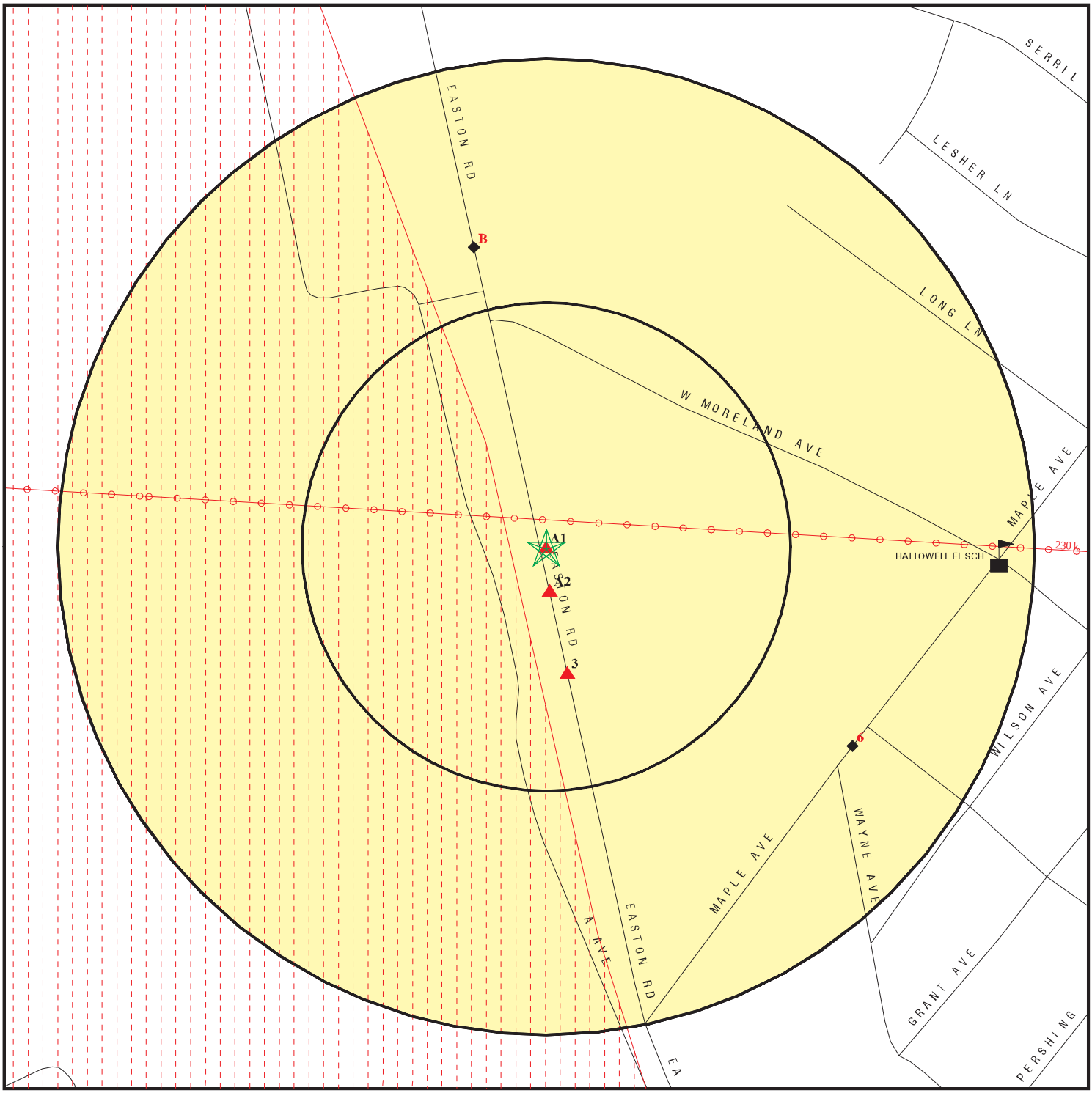


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Horsham Memorial USARC	CLIENT: CH2M Hill
ADDRESS: 936 EASTON ROAD HORSHAM PA 19044	CONTACT: Mary Beth Jacques
LAT/LONG: 40.1945 / 75.1374	INQUIRY #: 01714247.230r DATE: July 13, 2006

DETAIL MAP - 01714247.230r



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Horsham Memorial USARC	CLIENT: CH2M Hill
ADDRESS: 936 EASTON ROAD HORSHAM PA 19044	CONTACT: Mary Beth Jacques INQUIRY #: 01714247.230r
LAT/LONG: 40.1945 / 75.1374	DATE: July 13, 2006

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL RECORDS								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
NPL RECOVERY		TP	NR	NR	NR	NR	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.500	0	0	0	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRA TSD		0.500	0	0	0	NR	NR	0
RCRA Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRA Sm. Quan. Gen.	X	0.250	1	1	NR	NR	NR	2
ERNS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
DOD		1.000	1	0	0	0	NR	1
FUDS		1.000	0	0	0	0	NR	0
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
ODI		0.500	0	0	0	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
ICIS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
FINDS	X	TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
STATE AND LOCAL RECORDS								
State Haz. Waste		1.000	0	0	0	0	NR	0
HSCA		1.000	0	0	0	0	NR	0
SWF/LF		0.500	0	0	0	NR	NR	0
HIST LF		0.500	0	0	0	NR	NR	0
LUST		0.500	1	1	1	NR	NR	3
UNREG LTANKS		0.500	0	0	2	NR	NR	2
UST		0.250	1	2	NR	NR	NR	3
ARCHIVE UST		0.250	0	0	NR	NR	NR	0
LAST		0.500	0	0	0	NR	NR	0
AST		0.250	0	0	NR	NR	NR	0
ARCHIVE AST		TP	NR	NR	NR	NR	NR	0
MANIFEST		0.250	1	1	NR	NR	NR	2
ACT 2-DEED		0.500	0	0	0	NR	NR	0
ENG CONTROLS		0.500	0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INST CONTROL		0.500	0	0	0	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0
DRYCLEANERS		0.250	0	0	NR	NR	NR	0
BROWNFIELDS		0.500	0	0	0	NR	NR	0
AIRS		TP	NR	NR	NR	NR	NR	0
TRIBAL RECORDS								
INDIAN RESERV		1.000	0	0	0	0	NR	0
EDR PROPRIETARY RECORDS								
Manufactured Gas Plants		1.000	0	0	0	0	NR	0
EDR Historical Auto Stations		0.250	0	0	NR	NR	NR	0
EDR Historical Cleaners		0.250	0	0	NR	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1
Target
Property

HORSHAM MEM USARC
936 EASTON RD
HORSHAM, PA 19044

RCRA-SQG
FINDS

1004778436
PAR000502534

Site 1 of 2 in cluster A

Actual:
367 ft.

RCRAInfo:
Owner: 99TH REGIONAL SUPPORT COMMAND
(724) 693-2332
EPA ID: PAR000502534

Contact: KENDRA BORKA
(215) 443-1643

Classification: Conditionally Exempt Small Quantity Generator
TSDF Activities: Not reported

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

DOD
Region
WSW
< 1/8
96 ft.

WILLOW GROVE NAVAL AIR STATION
WILLOW GROVE NAVAL AIR ST (County), PA

DOD

CUSA029251
N/A

FEDERAL LANDS:
Feature 1: Navy DOD
Feature 2: Not reported
Feature 3: Not reported
Agency: DOD
URL: Not reported
Name 1: Willow Grove Naval Air Station
Name 2: Not reported
Name 3: Not reported
State: PA

A2
South
< 1/8
118 ft.

Site 2 of 2 in cluster A

Relative:
Equal

Actual:
367 ft.

TINIUS OLSEN TESTING MACH CO
1005 EASTON RD
HORSHAM, PA 19044

RCRA-SQG
FINDS
MANIFEST
NJ MANIFEST
NY MANIFEST

1004774651
PAD987343928

TINIUS OLSEN TESTING MACH CO (Continued) **1004774651**

RCRAInfo:
Owner: TINIUS OLSEN TESTING MACH CO
(215) 675-7100
EPA ID: PAD987343928

Contact: C_ROBERT TAIT III
(215) 675-7100

Classification: Conditionally Exempt Small Quantity Generator
TSDF Activities: Not reported

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

PA MANIFEST:

Manifest Number:	NJA5107752
Manifest Type:	T
Generator Epa Id:	PAD987343928
Generator Date:	03/23/2005
Mailing Address:	PO BOX 429
Mailing City,St,Zip:	WILLOW GROVE, PA 19090
Contact Name:	ROBERT C TAIT
Contact Phone:	215-675-7100
TSD Epa Id:	NJD002454544
TSD Date:	03/23/2005
TSD Facility Name:	MARISOL INC
TSD Facility Address:	125 FACTORY LN
TSD Facility City:	MIDDLESEX
TSD Facility State:	NJ
Page Number:	1.00000
Line Number:	1.00000
Waste Number:	F003
Container Number:	4.00000
Container Type:	DM
Waste Quantity:	200.00000
Unit:	G
Handling Code:	Not reported
Tsp Epa Id:	NJD002454544
Date Tsp Sig:	03/23/2005

Click this hyperlink while viewing on your computer to access additional PA MANIFEST: detail in the EDR Site Report.

NJ MANIFEST:

Manifest Code:	NJA5034555
EPA ID:	PAD987343928
Date Shipped:	20040519
TSDF EPA ID:	NJD002454544
TSDF Received Date:	040519
Transporter EPA ID:	NJD002454544
Transporer Received Date:	040519

TINIUS OLSEN TESTING MACH CO (Continued) **1004774651**

Waste Code:	F003
Quantity Shipped:	150.00000
Unit of Measure:	G
Method Code:	T04

NY MANIFEST:

Document ID:	NYB8444124
Manifest Status:	Not reported
Trans1 State ID:	NJD986607380
Trans2 State ID:	Not reported
Generator Ship Date:	01/30/1998
Trans1 Recv Date:	01/30/1998
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	02/03/1998
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	PAD987343928
Trans1 EPA ID:	NYD049178296
Trans2 EPA ID:	Not reported
TSDF ID:	NYJA334
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00005
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	98
Facility Type:	Generator
EPA ID:	PAD987343928
Facility Name:	TINIUS OLSEN CO
Facility Address:	EASTON ROAD
Facility City:	WILLOW GROVE
Facility Zip 4:	Not reported
Country:	Not reported
County:	Not reported
Mailing Name:	TINIUS OLSEN CO
Mailing Contact:	MARK FERRY
Mailing Address:	EASTON ROAD
Mailing City:	WILLOW GROVE
Mailing State:	PA
Mailing Zip:	19090
Mailing Zip4:	Not reported
Mailing Country:	Not reported
Mailing Phone:	215-675-7100

Click this hyperlink while viewing on your computer to access additional NY MANIFEST: detail in the EDR Site Report.

3
South
< 1/8
344 ft.

JOT FUEL
982 EASTON RD
HORSHAM, PA 19044

LUST **U003179677**
UST **N/A**

Relative:
Higher

Actual:
369 ft.

LUST:

Facility Id:	46-32134
Facility Type:	Undergroung Storage Tank Containing Petroleum
Facility Status:	**Interim Remedial Actions Initiated or Completed**
Status Date:	Not reported
Release Date:	1995-12-28 00:00:00
Region:	South East
Description:	GAS STAR

UST:

Site ID:	465986
Capacity:	12000
Date Installed:	1996-11-05
Tank Seq No:	007
Substance:	Gasoline
Tank Status:	Currently in Use
Municipality Name :	Horsham
Client Id Number :	184260
Mailing Name :	JOT FUEL INC
Mailing Address:	2328 FERNCROFT CIR
	BOOTHWYN, PA 19061
Other Id :	46-32134
Secondary Facility Address	Not reported
Region Code Name :	EP SE Rgnl Off
Regulated Expiration Dt:	2007-02-04 00:00:00
Tank Code :	UST
Inspection Code :	Facility Operation Inspection
Tank Last Dt Inspected :	Not reported
Region Code :	4100

Site ID:	465986
Capacity:	8000
Date Installed:	1996-11-05
Tank Seq No:	006
Substance:	Gasoline
Tank Status:	Currently in Use
Municipality Name :	Horsham
Client Id Number :	184260
Mailing Name :	JOT FUEL INC
Mailing Address:	2328 FERNCROFT CIR
	BOOTHWYN, PA 19061
Other Id :	46-32134
Secondary Facility Address	Not reported
Region Code Name :	EP SE Rgnl Off
Regulated Expiration Dt:	2007-02-04 00:00:00
Tank Code :	UST
Inspection Code :	Facility Operation Inspection
Tank Last Dt Inspected :	Not reported
Region Code :	4100

B4
NNW
1/8-1/4
833 ft.

Relative:
Lower

Actual:
361 ft.

C & C FORD SALES
1100 EASTON RD
HORSHAM, PA 19044

UST **U003214651**
N/A

Site 1 of 2 in cluster B

UST:

Site ID:	247404
Capacity:	6000
Date Installed:	1989-04-01
Tank Seq No:	001
Substance:	Gasoline
Tank Status:	Currently in Use
Municipality Name :	Horsham
Client Id Number :	51980
Mailing Name :	C & C FORD SALES INC
Mailing Address:	1100 EASTON RD HORSHAM, PA 19044
Other Id :	46-00626
Secondary Facility Address	Not reported
Region Code Name :	EP SE Rgnl Off
Regulated Expiration Dt:	2006-02-04 00:00:00
Tank Code :	UST
Inspection Code :	Facility Operation Inspection
Tank Last Dt Inspected :	2002-01-02 00:00:00
Region Code :	4100

B5
NNW
1/8-1/4
833 ft.

Relative:
Lower

Actual:
361 ft.

C & C MOTORS INC
1100 EASTON ROAD - ROUTE 611
HORSHAM, PA 19044

RCRA-SQG **1000105902**
FINDS **PAD014227524**
MANIFEST
NY MANIFEST

Site 2 of 2 in cluster B

RCRAInfo:

Owner:	OPERNAME
	(215) 555-1212
EPA ID:	PAD014227524
Contact:	Not reported
Classification:	Small Quantity Generator
TSDF Activities:	Not reported

Violation Status: Violations exist

Regulation Violated:	25 pa code 262.11
Area of Violation:	GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined:	12/30/1998
Actual Date Achieved Compliance:	05/18/1999

Regulation Violated:	25 pa code 265.173(a)
Area of Violation:	GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined:	12/30/1998
Actual Date Achieved Compliance:	05/18/1999

Regulation Violated:	25 pa code 262.34(a)(4)
Area of Violation:	GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined:	12/30/1998
Actual Date Achieved Compliance:	05/28/1999

Regulation Violated:	25 pa code 265.201(b)(2)
Area of Violation:	GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined:	12/30/1998
Actual Date Achieved Compliance:	05/28/1999

C & C MOTORS INC (Continued) **1000105902**

Regulation Violated: 25 pa code 265.201(c)(4)
Area of Violation: GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined: 12/30/1998
Actual Date Achieved Compliance: 05/28/1999

Regulation Violated: 25 pa code 265.201(e)(1)(ii)
Area of Violation: GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined: 12/30/1998
Actual Date Achieved Compliance: 05/18/1999

There are 6 violation record(s) reported at this site:

Evaluation	Area of Violation	Date of Compliance
Compliance Evaluation Inspection	GENERATOR-GENERAL REQUIREMENTS	19990518
	GENERATOR-GENERAL REQUIREMENTS	19990528
	GENERATOR-GENERAL REQUIREMENTS	19990528
	GENERATOR-GENERAL REQUIREMENTS	19990528
	GENERATOR-GENERAL REQUIREMENTS	19990518
	GENERATOR-GENERAL REQUIREMENTS	19990518

FINDS:

Other Pertinent Environmental Activity Identified at Site:

PA-EFACTS (Pennsylvania - Environmental Facility Application Compliance Tracking System) is a Department-wide database that provides a holistic view of clients and sites (including facilities) that DEP regulates.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

PA MANIFEST:

Manifest Number: PAG478958
Manifest Type: T
Generator Epa Id: PAD014227524
Generator Date: 02/02/2005
Mailing Address: 1100 EASTON RD
Mailing City,St,Zip: HORSHAM, PA 19044
Contact Name: LUDWIG EICHNER
Contact Phone: 215-674-3600
TSD Epa Id: PAD067098822
TSD Date: 02/11/2005
TSD Facility Name: CYCLE CHEM
TSD Facility Address: 550 INDUSTRIAL DR
TSD Facility City: LEWISBERRY
TSD Facility State: PA
Page Number: 1.00000
Line Number: 1.00000
Waste Number: D001
Container Number: 1.00000
Container Type: DM
Waste Quantity: 200.00000
Unit: P
Handling Code: Not reported
Tsp Epa Id: PAD014146179
Date Tsp Sig: 02/02/2005

C & C MOTORS INC (Continued) **1000105902**

Click this hyperlink while viewing on your computer to access
2 additional PA MANIFEST: record(s) in the EDR Site Report.

NY MANIFEST:

Document ID:	NYA9475367
Manifest Status:	C
Trans1 State ID:	PAYE19054
Trans2 State ID:	Not reported
Generator Ship Date:	890515
Trans1 Recv Date:	890515
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	890519
Part A Recv Date:	890517
Part B Recv Date:	890526
Generator EPA ID:	PAD014227524
Trans1 EPA ID:	ILD051060408
Trans2 EPA ID:	Not reported
TSDF ID:	NYD980753784
Waste Code:	F003 - UNKNOWN
Quantity:	00027
Units:	P - Pounds
Number of Containers:	001
Container Type:	DM - Metal drums, barrels
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	100
Year:	89
Facility Type:	Generator
EPA ID:	PAD014227524
Facility Name:	C & C FORD BODY SHOP
Facility Address:	EASTON ROAD
Facility City:	HORSHAM
Facility Zip 4:	Not reported
Country:	Not reported
County:	Not reported
Mailing Name:	C & C FORD BODY SHOP
Mailing Contact:	Not reported
Mailing Address:	EASTON ROAD
Mailing City:	HORSHAM
Mailing State:	PA
Mailing Zip:	19044
Mailing Zip4:	Not reported
Mailing Country:	Not reported
Mailing Phone:	215-674-3600

Click this hyperlink while viewing on your computer to access
43 additional NY MANIFEST: record(s) in the EDR Site Report.

6
ESE
1/8-1/4
988 ft.

HATBORO HORSHAM OPR
224 MAPLE AVE
HORSHAM, PA 19044

LUST **U003426480**
UST **N/A**

Relative:
Lower

Actual:
344 ft.

LUST:

Facility Id:	46-22595
Facility Type:	Undergroung Storage Tank Containing Petroleum
Facility Status:	**Inactive**
Status Date:	1999-12-31 00:00:00
Release Date:	1990-10-23 00:00:00
Region:	South East
Description:	HATBORO HORSHAM BUS GARAGE

UST:

Site ID:	583652
Capacity:	10000
Date Installed:	1990-10-04
Tank Seq No:	001
Substance:	Diesel Fuel
Tank Status:	Currently in Use
Municipality Name :	Horsham
Client Id Number :	74011
Mailing Name :	HATBORO HORSHAM SCH DIST
Mailing Address:	229 MEETINGHOUSE RD
	HORSHAM, PA 19044
Other Id :	46-22595
Secondary Facility Address	Not reported
Region Code Name :	EP SE Rgnl Off
Regulated Expiration Dt:	2007-02-04 00:00:00
Tank Code :	UST
Inspection Code :	Facility Operation Inspection
Tank Last Dt Inspected :	2002-01-31 00:00:00
Region Code :	4100

Site ID:	583652
Capacity:	6000
Date Installed:	1990-10-04
Tank Seq No:	002
Substance:	Gasoline
Tank Status:	Currently in Use
Municipality Name :	Horsham
Client Id Number :	74011
Mailing Name :	HATBORO HORSHAM SCH DIST
Mailing Address:	229 MEETINGHOUSE RD
	HORSHAM, PA 19044
Other Id :	46-22595
Secondary Facility Address	Not reported
Region Code Name :	EP SE Rgnl Off
Regulated Expiration Dt:	2007-02-04 00:00:00
Tank Code :	UST
Inspection Code :	Facility Operation Inspection
Tank Last Dt Inspected :	2002-01-31 00:00:00
Region Code :	4100

7
South
1/4-1/2
2223 ft.

DREXEL IND — **UNREG LTANKS** — **1006434701**
331 MAPLE AVE — **N/A**
HORSHAM TWP., PA

Relative:
Lower

Actual:
339 ft.

UNREG LTANKS:
Region : South East
Class : Cleanup of Tanks using authorities other than Act 32
Closed : 4/20/1998
Contaminant : FUEL OIL #2

8
SE
1/4-1/2
2530 ft.

GAFTOMSKI RES — **UNREG LTANKS** — **S105919132**
400 WATSON AVE — **N/A**
HORSHAM TWP., PA

Relative:
Lower

Actual:
308 ft.

UNREG LTANKS:
Region : South East
Class : Cleanup of Tanks using authorities other than Act 32
Closed : Not reported
Contaminant : OTHER

9
SSE
1/4-1/2
2623 ft.

HORSHAM GULF — **LUST** — **U001092051**
660 EASTON RD — **ARCHIVE UST** — **N/A**
HORSHAM, PA 19044

Relative:
Lower

Actual:
300 ft.

LUST:
Facility Id: 46-04914
Facility Type: Undergroung Storage Tank Containing Petroleum
Facility Status: Cleanup Completed
Status Date: 2003-09-04 00:00:00
Release Date: 1996-09-20 00:00:00
Region: South East
Description: HORSHAM AUTO SVC

Facility Id: 46-04914
Facility Type: Undergroung Storage Tank Containing Petroleum
Facility Status: Cleanup Completed
Status Date: 2003-07-30 00:00:00
Release Date: 2003-05-01 00:00:00
Region: South East
Description: NOC

Facility Id: 46-04914
Facility Type: Undergroung Storage Tank Containing Petroleum
Facility Status: Interim Remedial Actions Initiated or Completed
Status Date: 2004-02-13 00:00:00
Release Date: 2004-02-13 00:00:00
Region: South East
Description: NOC

PA UST ARCHIVE:
Tank Id Number : Not reported
Tank Sequence # 006
Capacity : 6000
Status : Temporarily Out of use
Owner Name : Not reported
Owner Address :
Owner Phone : Not reported
Facility Id Number : 583338
Installation Date : 09/26/1996
Substance : GAS
Owner Id Number : Not reported
County Code : Not reported

HORSHAM GULF (Continued) **U001092051**

Municipality : Not reported
Resp Party Name Not reported
RP Address :
Other Id : Not reported
Reg Exp Date : Not reported
Inspection Code : Not reported
Status Code End Date : Not reported
Tank Substance End Dt : Not reported
Site ID : Not reported

Client Date : Not reported
Region Code : Not reported

Regn Code Name : Not reported
Tank Code : Not reported
Dt Last Inspection : Not reported

Tank Id Number : Not reported
Tank Sequence # 007
Capacity : 4000
Status : Temporarily Out of use
Owner Name : Not reported
Owner Address :
Owner Phone : Not reported
Municipality : Not reported
Resp Party Name Not reported
RP Address :
Other Id : Not reported
Reg Exp Date : Not reported
Inspection Code : Not reported
Status Code End Date : Not reported
Tank Substance End Dt : Not reported
Site ID : Not reported

Facility Id Number : 583338
Installation Date : 09/26/1996
Substance : GAS
Owner Id Number : Not reported

County Code : Not reported
Client Date : Not reported
Region Code : Not reported

Regn Code Name : Not reported
Tank Code : Not reported
Dt Last Inspection : Not reported

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
HORSHAM	1009246441	HORSHAM VILLAGE MALL	BLAIR MILL RD	19044	NY MANIFEST
HORSHAM	S107692951	OMNIPAC INC/HORSHAM PLT	1196 EASTON RD	19044	AIRS
HORSHAM	S107692483	EDON CORP/HORSHAM	1160 EASTON RD	19044	AIRS
HORSHAM	S105919133	GALER & HILLYARD	1190 EASTON RD		UNREG LTANKS
HORSHAM	S107417649	EXXON RS 2 0493	100 N EASTON RD / BLAIR MILL RD		VCP
HORSHAM	S102606429	EXXON RS 2 0493	100 N EASTON RD		LUST
HORSHAM	S105800475	NAVAL FUEL FARM NASJRB	EASTON RD		LUST
HORSHAM	S105800568	TAYLOR RENTAL CTR	426 EASTON RD		LUST
HORSHAM	1009270419	HORSHAM TOWNSHIP OF SEWER AUTH	617 B HORSHAM RD	19044	ICIS
HORSHAM	1004583768	HORSHAM TOWNSHIP OF SEWER AUTH	617 B HORSHAM RD	19044	FINDS
HORSHAM	S105919234	MAPLE HILL APT	213 MAPLE AVE		UNREG LTANKS
HORSHAM	S107693369	US CAN CO/HORSHAM	431 PRIVET RD	19044	AIRS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

FEDERAL RECORDS

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/19/2006
Date Data Arrived at EDR: 05/05/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 17

Source: EPA
Telephone: N/A
Last EDR Contact: 05/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 8
Telephone: 303-312-6774

EPA Region 4
Telephone 404-562-8033

Proposed NPL: Proposed National Priority List Sites

Date of Government Version: 04/19/2006
Date Data Arrived at EDR: 05/05/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 17

Source: EPA
Telephone: N/A
Last EDR Contact: 05/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/19/2006
Date Data Arrived at EDR: 05/05/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 17

Source: EPA
Telephone: N/A
Last EDR Contact: 05/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

NPL RECOVERY: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 05/23/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 06/22/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 06/23/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/21/2006
Next Scheduled EDR Contact: 09/04/2006
Data Release Frequency: Quarterly

RCRA: Resource Conservation and Recovery Act Information

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/09/2006
Date Data Arrived at EDR: 04/27/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 33

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/28/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Quarterly

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 01/12/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 40

Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/14/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Annually

US ENG CONTROLS: Engineering Controls Sites List
A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/21/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 56

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 07/03/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls
A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/21/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 56

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 07/03/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Varies

DOD: Department of Defense Sites
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/08/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 177

Source: USGS
Telephone: 703-692-8801
Last EDR Contact: 05/12/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 01/19/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 33

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 07/03/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Varies

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 04/26/2006
Date Data Arrived at EDR: 04/27/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/12/2006
Next Scheduled EDR Contact: 09/11/2006
Data Release Frequency: Semi-Annually

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/14/2004
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 04/25/2005
Number of Days to Update: 69

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/13/2006
Date Data Arrived at EDR: 04/28/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 32

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 07/06/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 11/04/2005
Date Data Arrived at EDR: 11/28/2005
Date Made Active in Reports: 01/30/2006
Number of Days to Update: 63

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 06/21/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 07/13/2005
Date Made Active in Reports: 08/17/2005
Number of Days to Update: 35

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 06/22/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 04/12/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/29/2006
Date Data Arrived at EDR: 04/26/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 34

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Date of Government Version: 03/31/2006
Date Data Arrived at EDR: 04/26/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Quarterly

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 05/11/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 11

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 02/13/2006
Date Data Arrived at EDR: 04/21/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 20

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/27/2005
Date Data Arrived at EDR: 02/08/2006
Date Made Active in Reports: 02/27/2006
Number of Days to Update: 19

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 06/28/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/12/2006
Date Data Arrived at EDR: 04/26/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 34

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 07/03/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Quarterly

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/09/2006
Date Data Arrived at EDR: 03/29/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 62

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 06/28/2006
Next Scheduled EDR Contact: 09/25/2006
Data Release Frequency: Semi-Annually

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/27/2006
Date Data Arrived at EDR: 05/02/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 28

Source: EPA
Telephone: N/A
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/05/2006
Next Scheduled EDR Contact: 09/04/2006
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 06/17/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 48

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 06/30/2006
Next Scheduled EDR Contact: 09/11/2006
Data Release Frequency: Biennially

STATE AND LOCAL RECORDS

SHWS: Hazardous Sites Cleanup Act Site List

The Hazardous Sites Cleanup Act Site List includes sites listed on PA Priority List, sites delisted from PA Priority List, Interim Response Completed sites, and Sites Being Studied or Response Being Planned.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 02/17/2006
Date Made Active in Reports: 03/15/2006
Number of Days to Update: 26

Source: Department Environmental Protection
Telephone: 717-783-7816
Last EDR Contact: 06/16/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Semi-Annually

HSCA: HSCA Remedial Sites Listing

A list of remedial sites on the PA Priority List. This is the PA state equivalent of the federal NPL superfund list.

Date of Government Version: 05/05/2004
Date Data Arrived at EDR: 05/26/2004
Date Made Active in Reports: 06/24/2004
Number of Days to Update: 29

Source: Department of Environmental Protection
Telephone: 717-783-7816
Last EDR Contact: 02/17/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Varies

SWF/LF: Operating Facilities

Date of Government Version: 03/15/2006
Date Data Arrived at EDR: 03/31/2006
Date Made Active in Reports: 05/04/2006
Number of Days to Update: 34

Source: Department of Environmental Protection
Telephone: 717-787-7564
Last EDR Contact: 06/22/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Semi-Annually

HIST LF: Abandoned Landfill Inventory

The report provides facility information recorded in the Pennsylvania Department of Environmental Protection ALI database. Some of this information has been abstracted from old records and may not accurately reflect the current conditions and status at these facilities

Date of Government Version: 01/04/2005
Date Data Arrived at EDR: 01/04/2005
Date Made Active in Reports: 02/04/2005
Number of Days to Update: 31

Source: Department of Environmental Protection
Telephone: 717-787-7564
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Varies

HIST LF INACTIVE: Inactive Facilities List

A listing of inactive non-hazardous facilities (10000 & 300000 series). This listing is no longer updated or maintained by the Department of Environmental Protection. At the time the listing was available, the DEP?s name was the Department of Environmental Resources.

Date of Government Version: 12/20/1994
Date Data Arrived at EDR: 07/12/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 30

Source: Department of Environmental Protection
Telephone: 717-787-7381
Last EDR Contact: 06/21/2005
Next Scheduled EDR Contact: 12/19/2005
Data Release Frequency: No Update Planned

HIST LF INVENTORY: Facility Inventory

A listing of solid waste facilities. This listing is no longer updated or maintained by the Department of Environmental Protection. At the time the listing was available, the DEP?s name was the Department of Environmental Resources.

Date of Government Version: 06/02/1999
Date Data Arrived at EDR: 07/12/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 30

Source: Department of Environmental Protection
Telephone: 717-787-7381
Last EDR Contact: 09/19/2005
Next Scheduled EDR Contact: 12/19/2005
Data Release Frequency: No Update Planned

LUST: Storage Tank Release Sites

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 03/09/2006
Date Data Arrived at EDR: 04/11/2006
Date Made Active in Reports: 05/04/2006
Number of Days to Update: 23

Source: Department of Environmental Protection
Telephone: 717-783-7509
Last EDR Contact: 07/12/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Semi-Annually

UNREG LTANKS: Unregulated Tank Cases

Leaking storage tank cases from unregulated storage tanks.

Date of Government Version: 04/12/2002
Date Data Arrived at EDR: 08/14/2003
Date Made Active in Reports: 08/29/2003
Number of Days to Update: 15

Source: Department of Environmental Protection
Telephone: 717-783-7509
Last EDR Contact: 08/14/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST: Listing of Pennsylvania Regulated Underground Storage Tanks

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 06/01/2006
Date Data Arrived at EDR: 06/07/2006
Date Made Active in Reports: 06/30/2006
Number of Days to Update: 23

Source: Department of Environmental Protection
Telephone: 717-772-5599
Last EDR Contact: 07/11/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Varies

ARCHIVE UST: Archived Underground Storage Tank Sites

The list includes tanks storing highly hazardous substances that were removed from the DEP's Storage Tank Information database because of the Department's policy on sensitive information. The list also may include tanks that are removed or permanently closed.

Date of Government Version: 06/01/2006
Date Data Arrived at EDR: 06/07/2006
Date Made Active in Reports: 07/12/2006
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: 717-772-5599
Last EDR Contact: 07/11/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Varies

LAST: Storage Tank Release Sites

Leaking Aboveground Storage Tank Incident Reports.

Date of Government Version: 03/09/2006
Date Data Arrived at EDR: 04/11/2006
Date Made Active in Reports: 05/04/2006
Number of Days to Update: 23

Source: Department of Environmental Protection
Telephone: 717-783-7509
Last EDR Contact: 07/12/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Semi-Annually

AST: Listing of Pennsylvania Regulated Aboveground Storage Tanks

Registered Aboveground Storage Tanks.

Date of Government Version: 06/01/2006
Date Data Arrived at EDR: 06/07/2006
Date Made Active in Reports: 06/30/2006
Number of Days to Update: 23

Source: Department of Environmental Protection
Telephone: 717-772-5599
Last EDR Contact: 07/11/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Varies

ARCHIVE AST: Archived Aboveground Storage Tank Sites

The list includes aboveground tanks with a capacity greater than 21,000 gallons that were removed from the DEP's Storage Tank Information database because of the Department's policy on sensitive information. The list also may include tanks that are removed or permanently closed.

Date of Government Version: 06/01/2006
Date Data Arrived at EDR: 06/07/2006
Date Made Active in Reports: 07/12/2006
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: 717-772-5599
Last EDR Contact: 07/11/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Varies

MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 05/04/2006
Date Made Active in Reports: 06/06/2006
Number of Days to Update: 33

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/12/2006
Next Scheduled EDR Contact: 09/11/2006
Data Release Frequency: Annually

ACT 2-DEED: Act 2-Deed Acknowledgment Sites

This listing pertains to sites where the Department has approved a cleanup requiring a deed acknowledgment under Act 2. This list includes sites remediated to a non-residential Statewide health standard (Section 303(g)); all sites demonstrating attainment of a Site-specific standard (Section 304(m)); and sites being remediated as a special industrial area (Section 305(g)). Persons who remediated a site to a standard that requires a deed acknowledgment shall comply with the requirements of the Solid Waste Management Act or the Hazardous Sites Cleanup Act, as referenced in Act 2. These statutes require a property description section in the deed concerning the hazardous substance disposal on the site. The location of disposed hazardous substances and a description of the type of hazardous substances disposed on the site shall be included in the deed acknowledgment. A deed acknowledgment is required at the time of conveyance of the property.

Date of Government Version: 06/20/2006
Date Data Arrived at EDR: 06/21/2006
Date Made Active in Reports: 07/12/2006
Number of Days to Update: 21

Source: Department of Environmental Protection
Telephone: 717-783-9470
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Varies

ENG CONTROLS: Engineering Controls Site Listing

Under the Land Recycling Act (Act 2) persons who perform a site cleanup using the site-specific standard or the special industrial area standard may use engineering or institutional controls as part of the response action. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/08/2006
Date Data Arrived at EDR: 05/16/2006
Date Made Active in Reports: 06/06/2006
Number of Days to Update: 21

Source: Department of Environmental Protection
Telephone: 717-783-9470
Last EDR Contact: 05/16/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Varies

INST CONTROL: Institutional Controls Site Listing

Under the Land Recycling Act (Act 2) persons who perform a site cleanup using the site-specific standard or the special industrial area standard may use engineering or institutional controls as part of the response action. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/08/2006
Date Data Arrived at EDR: 05/16/2006
Date Made Active in Reports: 06/06/2006
Number of Days to Update: 21

Source: Department of Environmental Protection
Telephone: 717-783-9470
Last EDR Contact: 05/16/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Sites
Sites involved in the Voluntary Cleanup Program

Date of Government Version: 06/20/2006
Date Data Arrived at EDR: 06/21/2006
Date Made Active in Reports: 07/12/2006
Number of Days to Update: 21

Source: Department of Environmental Protection
Telephone: 717-783-2388
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Semi-Annually

DRYCLEANERS: Drycleaner Facility Locations
A listing of drycleaner facility locations.

Date of Government Version: 05/01/2006
Date Data Arrived at EDR: 05/01/2006
Date Made Active in Reports: 06/06/2006
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: 717-787-9702
Last EDR Contact: 04/12/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Varies

BROWNFIELDS: Brownfields Sites

Date of Government Version: 06/20/2006
Date Data Arrived at EDR: 06/21/2006
Date Made Active in Reports: 07/12/2006
Number of Days to Update: 21

Source: Department of Environmental Protection
Telephone: 717-783-7509
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Varies

AIRS: Permit and Emissions Inventory Data
Permit and emissions inventory data.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 05/03/2006
Date Made Active in Reports: 06/06/2006
Number of Days to Update: 34

Source: Department of Environmental Protection
Telephone: 717-787-9702
Last EDR Contact: 04/07/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Annually

TRIBAL RECORDS

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/08/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 177

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 05/12/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Semi-Annually

EDR PROPRIETARY RECORDS

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Historical Auto Stations: EDR Proprietary Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Historical Cleaners: EDR Proprietary Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/17/2006
Date Made Active in Reports: 04/07/2006
Number of Days to Update: 49

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 06/14/2006
Next Scheduled EDR Contact: 09/11/2006
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 04/24/2006
Date Made Active in Reports: 05/02/2006
Number of Days to Update: 8

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/05/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 05/02/2006
Date Data Arrived at EDR: 05/31/2006
Date Made Active in Reports: 06/27/2006
Number of Days to Update: 27

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/31/2006
Next Scheduled EDR Contact: 08/28/2006
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 09/30/2005
Date Data Arrived at EDR: 05/09/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 15

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Annually

VT MANIFEST: Hazardous Waste Manifest Data

Hazardous waste manifest information.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 05/17/2006
Number of Days to Update: 61

Source: Department of Environmental Conservation
Telephone: 802-241-3443
Last EDR Contact: 05/15/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 05/02/2006
Number of Days to Update: 46

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 07/11/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data

Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Child Care Facility List
Source: Department of Public Welfare
Telephone: 717-783-3856

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

HORSHAM MEMORIAL USARC
936 EASTON ROAD
HORSHAM, PA 19044

TARGET PROPERTY COORDINATES

Latitude (North):	40.19450 - 40° 11' 40.2''
Longitude (West):	75.1374 - 75° 8' 14.6''
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	488304.6
UTM Y (Meters):	4449144.0
Elevation:	367 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	40075-B2 AMBLER, PA
Most Recent Revision:	1983
East Map:	40075-B1 HATBORO, PA
Most Recent Revision:	1983

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

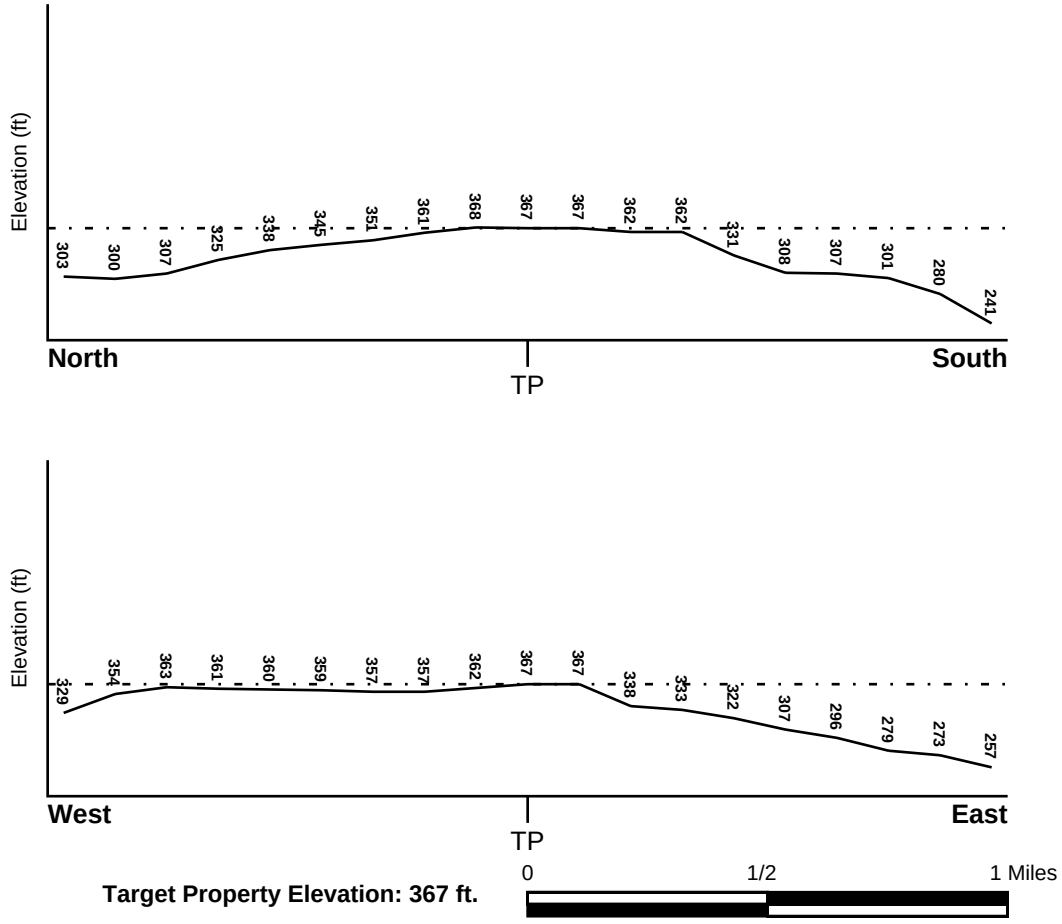
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General East

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
MONTGOMERY, PA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property:	42091C0284E
Additional Panels in search area:	4209900001C 42091C0283E 42091C0303E 42091C0292E 42091C0311E

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
AMBLER	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
C8	1/4 - 1/2 Mile North	N
74	1/2 - 1 Mile NW	NNW
170	1/2 - 1 Mile ENE	E

For additional site information, refer to Physical Setting Source Map Findings.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Mesozoic
System:	Triassic
Series:	Triassic
Code:	Tr *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	LANSDALE
Soil Surface Texture:	loam
Hydrologic Group:	Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.
Soil Drainage Class:	Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: LOW

Depth to Bedrock Min: > 42 inches

Depth to Bedrock Max: > 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	8 inches	loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 2.00 Min: 0.60	Max: 5.00 Min: 4.50
2	8 inches	30 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 0.60	Max: 5.00 Min: 4.50
3	30 inches	45 inches	channery - sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 5.00 Min: 4.50
4	45 inches	49 inches	unweathered bedrock	Not reported	Not reported	Max: 0.60 Min: 0.20	Max: 0.00 Min: 0.00

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: silt loam
channery - silt loam
gravelly - loam

Surficial Soil Types: silt loam
channery - silt loam
gravelly - loam

Shallow Soil Types: silt loam
loam
channery - silt loam

Deeper Soil Types: stratified
silt loam
weathered bedrock
shaly - silt loam

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A3	USGS2165230	1/8 - 1/4 Mile NNW
B4	USGS2165438	1/8 - 1/4 Mile ESE
7	USGS2165381	1/4 - 1/2 Mile SW
D9	USGS2165531	1/4 - 1/2 Mile SW
D10	USGS2165530	1/4 - 1/2 Mile SW
E13	USGS2165494	1/4 - 1/2 Mile SSW
D15	USGS2165515	1/4 - 1/2 Mile SW
F16	USGS2165427	1/2 - 1 Mile WSW
F17	USGS2165409	1/2 - 1 Mile WSW
F18	USGS2165410	1/2 - 1 Mile WSW
G20	USGS2165539	1/2 - 1 Mile SW
F21	USGS2165414	1/2 - 1 Mile WSW
H22	USGS2165399	1/2 - 1 Mile WSW
F23	USGS2165415	1/2 - 1 Mile WSW
F24	USGS2165416	1/2 - 1 Mile WSW
F25	USGS2165411	1/2 - 1 Mile WSW
G26	USGS2165532	1/2 - 1 Mile SW
F28	USGS2165424	1/2 - 1 Mile WSW
H29	USGS2165400	1/2 - 1 Mile WSW
H31	USGS2165382	1/2 - 1 Mile WSW
H33	USGS2165390	1/2 - 1 Mile WSW
H34	USGS2165389	1/2 - 1 Mile WSW
F35	USGS2165428	1/2 - 1 Mile WSW
H36	USGS2165377	1/2 - 1 Mile WSW
H38	USGS2165401	1/2 - 1 Mile WSW
H39	USGS2165402	1/2 - 1 Mile WSW
H40	USGS2165383	1/2 - 1 Mile WSW
I44	USGS2165484	1/2 - 1 Mile SW
H45	USGS2165378	1/2 - 1 Mile WSW
J48	USGS2165425	1/2 - 1 Mile WSW
I49	USGS2165495	1/2 - 1 Mile SW
K51	USGS2165457	1/2 - 1 Mile SSE
H53	USGS2165391	1/2 - 1 Mile WSW
J54	USGS2165403	1/2 - 1 Mile WSW
J55	USGS2165404	1/2 - 1 Mile WSW
L57	USGS2165473	1/2 - 1 Mile SE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
M58	USGS2165368	1/2 - 1 Mile WSW
M59	USGS2165384	1/2 - 1 Mile WSW
M61	USGS2165370	1/2 - 1 Mile WSW
M62	USGS2165369	1/2 - 1 Mile WSW
J63	USGS2165417	1/2 - 1 Mile WSW
J64	USGS2165418	1/2 - 1 Mile WSW
N66	USGS2165522	1/2 - 1 Mile SW
O69	USGS2165483	1/2 - 1 Mile SE
N71	USGS2165527	1/2 - 1 Mile WSW
P73	USGS2165603	1/2 - 1 Mile SSE
Q84	USGS2165287	1/2 - 1 Mile West
Q85	USGS2165308	1/2 - 1 Mile West
Q89	USGS2165291	1/2 - 1 Mile West
Q96	USGS2165309	1/2 - 1 Mile West
Q99	USGS2165274	1/2 - 1 Mile West
V112	USGS2165221	1/2 - 1 Mile WNW
V113	USGS2165222	1/2 - 1 Mile WNW
V115	USGS2165211	1/2 - 1 Mile West
W116	USGS2165319	1/2 - 1 Mile West
W117	USGS2165318	1/2 - 1 Mile West
W118	USGS2165317	1/2 - 1 Mile West
Z130	USGS2165686	1/2 - 1 Mile South
AB138	USGS2165460	1/2 - 1 Mile SW
AC139	USGS2165213	1/2 - 1 Mile West
AC140	USGS2165212	1/2 - 1 Mile West
AD141	USGS2165356	1/2 - 1 Mile WSW
Z145	USGS2165671	1/2 - 1 Mile South
150	USGS2164977	1/2 - 1 Mile NNW
AH151	USGS2165005	1/2 - 1 Mile NE
AD154	USGS2165528	1/2 - 1 Mile WSW
AJ159	USGS2165347	1/2 - 1 Mile West
AJ160	USGS2165346	1/2 - 1 Mile West
AJ161	USGS2165345	1/2 - 1 Mile West
AK162	USGS2164967	1/2 - 1 Mile NW
AE163	USGS2164815	1/2 - 1 Mile NNW
AE164	USGS2164814	1/2 - 1 Mile NNW
AL165	USGS2165667	1/2 - 1 Mile SSW
AE167	USGS2164822	1/2 - 1 Mile NNW
AE168	USGS2164821	1/2 - 1 Mile NNW
AK169	USGS2164978	1/2 - 1 Mile NNW
AN174	USGS2165292	1/2 - 1 Mile West
AK178	USGS2164974	1/2 - 1 Mile NW
AO179	USGS2164830	1/2 - 1 Mile NNW
AO180	USGS2164829	1/2 - 1 Mile NNW
AO183	USGS2164823	1/2 - 1 Mile NNW
AK185	USGS2164975	1/2 - 1 Mile NW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	PA1461069	0 - 1/8 Mile SSE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A2	PA1000000057019	1/8 - 1/4 Mile NNW
B5	PA1000000056388	1/8 - 1/4 Mile ESE
6	PA1000000056662	1/4 - 1/2 Mile ENE
C11	PA1000000057547	1/4 - 1/2 Mile NNW
E12	PA1000000055720	1/4 - 1/2 Mile SSW
D14	PA1000000055797	1/4 - 1/2 Mile SW
G19	PA1000000055931	1/2 - 1 Mile SW
G27	PA1000000055899	1/2 - 1 Mile SW
H30	PA1000000056220	1/2 - 1 Mile WSW
H32	PA1000000056151	1/2 - 1 Mile WSW
H37	PA1000000056105	1/2 - 1 Mile WSW
H41	PA1000000056219	1/2 - 1 Mile WSW
H42	PA1000000056150	1/2 - 1 Mile WSW
I43	PA1000000055685	1/2 - 1 Mile SW
H46	PA1000000056104	1/2 - 1 Mile WSW
J47	PA1000000056312	1/2 - 1 Mile WSW
K50	PA1000000055545	1/2 - 1 Mile SSE
H52	PA1000000056187	1/2 - 1 Mile WSW
L56	PA1000000055650	1/2 - 1 Mile SE
M60	PA1000000056149	1/2 - 1 Mile WSW
65	PA1000000057871	1/2 - 1 Mile NNE
N67	PA1000000055826	1/2 - 1 Mile SW
O68	PA1000000055686	1/2 - 1 Mile SE
N70	PA1000000055858	1/2 - 1 Mile WSW
P72	PA1000000055358	1/2 - 1 Mile SSE
P75	SPAW0121950	1/2 - 1 Mile SSE
P76	PA1000000055359	1/2 - 1 Mile SSE
P77	PA1000000055310	1/2 - 1 Mile SSE
P78	SPAW0121948	1/2 - 1 Mile SSE
79	PA1000000055732	1/2 - 1 Mile SE
P80	SPAW0121949	1/2 - 1 Mile SSE
P81	PA1000000055311	1/2 - 1 Mile SSE
Q82	PA1000000056498	1/2 - 1 Mile West
Q83	PA1000000056569	1/2 - 1 Mile West
R86	SPAW0121925	1/2 - 1 Mile SSE
R87	PA1000000055312	1/2 - 1 Mile SSE
Q88	PA1000000056540	1/2 - 1 Mile West
R90	PA1000000055262	1/2 - 1 Mile SSE
R91	SPAW0121924	1/2 - 1 Mile SSE
R92	PA1000000055208	1/2 - 1 Mile SSE
S93	SPAW0121915	1/2 - 1 Mile SSE
R94	SPAW0121917	1/2 - 1 Mile SSE
S95	PA1000000055160	1/2 - 1 Mile SSE
S97	PA1000000055108	1/2 - 1 Mile SSE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

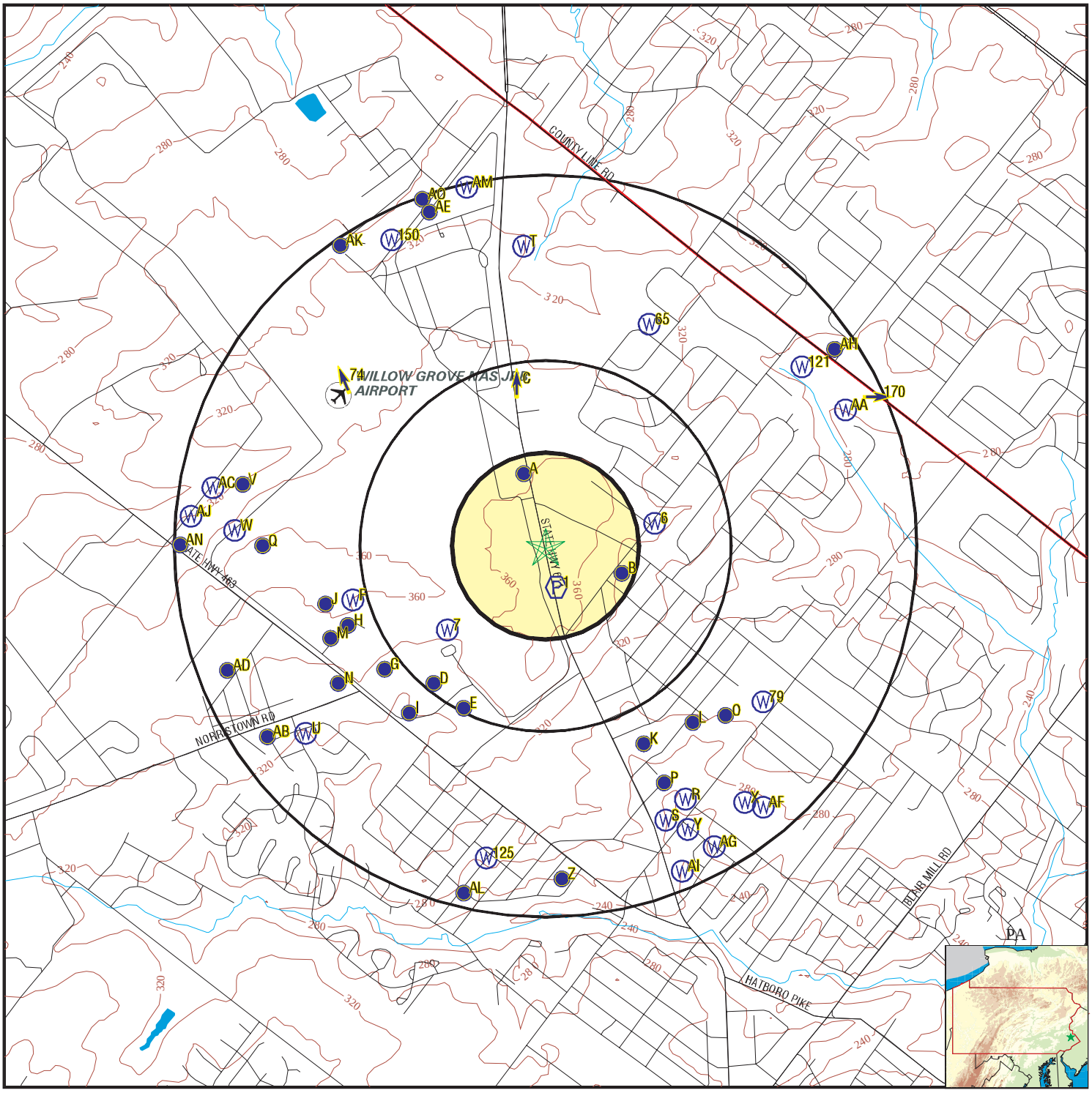
MAP ID	WELL ID	LOCATION FROM TP
S98	SPAW0121914	1/2 - 1 Mile SSE
R100	SPAW0121918	1/2 - 1 Mile SSE
R101	PA1000000055161	1/2 - 1 Mile SSE
R102	SPAW0121923	1/2 - 1 Mile SSE
R103	PA1000000055162	1/2 - 1 Mile SSE
T104	SPAW0121937	1/2 - 1 Mile North
T105	PA1000000058271	1/2 - 1 Mile North
T106	SPAW0121936	1/2 - 1 Mile North
T107	PA1000000058270	1/2 - 1 Mile North
U108	PA1000000055588	1/2 - 1 Mile SW
S109	PA1000000055031	1/2 - 1 Mile SSE
U110	PA1000000055578	1/2 - 1 Mile SW
S111	SPAW0121913	1/2 - 1 Mile SSE
V114	PA1000000056932	1/2 - 1 Mile West
S119	PA1000000055032	1/2 - 1 Mile SSE
S120	SPAW0121916	1/2 - 1 Mile SSE
121	PA1000000057610	1/2 - 1 Mile NE
X122	PA1000000055209	1/2 - 1 Mile SE
X123	SPAW0121988	1/2 - 1 Mile SE
Y124	PA1000000055033	1/2 - 1 Mile SSE
125	PA1000000054757	1/2 - 1 Mile South
Y126	SPAW0121952	1/2 - 1 Mile SSE
X127	PA1000000055263	1/2 - 1 Mile SE
X128	SPAW0121989	1/2 - 1 Mile SE
Z129	PA1000000054703	1/2 - 1 Mile South
AA131	SPAW0121981	1/2 - 1 Mile ENE
AA132	PA1000000057349	1/2 - 1 Mile ENE
X133	SPAW0121991	1/2 - 1 Mile SE
X134	PA1000000055163	1/2 - 1 Mile SE
X135	SPAW0121990	1/2 - 1 Mile SE
X136	PA1000000055164	1/2 - 1 Mile SE
AB137	PA1000000055577	1/2 - 1 Mile SW
AE142	PA1000000058343	1/2 - 1 Mile NNW
AD143	PA1000000055930	1/2 - 1 Mile WSW
AF144	SPAW0121992	1/2 - 1 Mile SE
Z146	PA1000000054610	1/2 - 1 Mile South
AF147	PA1000000055165	1/2 - 1 Mile SE
AG148	SPAW0121954	1/2 - 1 Mile SSE
AG149	PA1000000054883	1/2 - 1 Mile SSE
AG152	SPAW0121953	1/2 - 1 Mile SSE
AG153	PA1000000054836	1/2 - 1 Mile SSE
AE155	PA1000000058401	1/2 - 1 Mile NNW
AH156	PA1000000057744	1/2 - 1 Mile NE
AI157	SPAW0121951	1/2 - 1 Mile SSE
AI158	PA1000000054704	1/2 - 1 Mile SSE
AL166	PA1000000054556	1/2 - 1 Mile SSW
AK171	PA1000000058298	1/2 - 1 Mile NNW
AK172	SPAW0121935	1/2 - 1 Mile NNW
AM173	SPAW0121904	1/2 - 1 Mile NNW
AN175	PA1000000056539	1/2 - 1 Mile West
AM176	PA1000000058546	1/2 - 1 Mile NNW
AM177	PA1000000058524	1/2 - 1 Mile NNW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
AO181	PA1000000058510	1/2 - 1 Mile NNW
AM182	PA1000000058545	1/2 - 1 Mile NNW
AO184	PA1000000058481	1/2 - 1 Mile NNW
AM186	SPAW0121903	1/2 - 1 Mile North
AM187	PA1000000058569	1/2 - 1 Mile North

PHYSICAL SETTING SOURCE MAP - 01714247.230r



- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location

SITE NAME:	Horsham Memorial USARC	CLIENT:	CH2M Hill
ADDRESS:	936 EASTON ROAD HORSHAM PA 19044	CONTACT:	Mary Beth Jacques
LAT/LONG:	40.1945 / 75.1374	INQUIRY #:	01714247.230r
		DATE:	July 13, 2006

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
SSE
0 - 1/8 Mile
Higher | **FRDS PWS** | **PA1461069**

PWS ID:	PA1461069	PWS Status:	Active
Date Initiated:	Not Reported	Date Deactivated:	Not Reported
PWS Name:	LEE'S HOAGIE HOUSE 870-72 EASTON ROAD HORSHAM, PA 190440000		
Addressee / Facility:	Mailing LEE'S HOAGIE HOUSE 870-72 INC 870-72 EASTON RD HORSHAM, PA 190440000		
Facility Latitude:	40 11 34	Facility Longitude:	075 08 14
City Served:	Not Reported		
Treatment Class:	Treated	Population:	00000100

PWS currently has or had major violation(s) or enforcement: Yes

Violations information not reported.

ENFORCEMENT INFORMATION:

System Name:	LEE'S HOAGIE HOUSE		
Violation Type:	MCL, Monthly (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	1999-04-01 - 1999-06-30	Analytical Value:	0000000.000000000
Violation ID:	9923758	Enforcement ID:	99E0001
Enforcement Date:	1999-06-22	Enf. Action:	State Site Visit (enforcement)
System Name:	LEE'S HOAGIE HOUSE		
Violation Type:	MCL, Monthly (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	1999-04-01 - 1999-06-30	Analytical Value:	0000000.000000000
Violation ID:	9923758	Enforcement ID:	99E0003
Enforcement Date:	1999-07-15	Enf. Action:	State Compliance Achieved

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A2
NNW
1/8 - 1/4 Mile
Lower | **PA WELLS** | **PA1000000057019**

WELLID:	401150075082001	LOCALWELLN:	MG 898
COUNTY:	MONTGOMERY		
AAPG:	1		
TOPOGRAPHY:	UNKNOWN		
WELLDEPTH:	126		
ELEVATION:	0		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	10		
HYDROLOGIC:	02040201		

LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19722		
LONGITUDED:	-75.13889		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27916		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	Not Reported
Driller:	1
Source Cons Data:	WELL OWNER
Method Cons:	OTHER/UNKNOWN
Finish:	UNKNOWN

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	Not Reported	Casing Diameter:	8
Casing:	UNKNOWN		

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	INDUSTRIAL

Owner Information:

Owner:	FIRESTONE AIRCRAFT
Date Ownership:	01/01/1947 00:00:00

A3
NNW **FED USGS** **USGS2165230**
1/8 - 1/4 Mile
Lower

Agency cd:	USGS	Site no:	401150075082001
Site name:	MG 898		
Latitude:	401150		
Longitude:	0750820	Dec lat:	40.19733068
Dec lon:	-75.13850605	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	000	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	CrosswicksNeshaminy. New Jersey, Pennsylvania. Area = 521 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	126	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1947-01-01	Ground water data end date:	1947-01-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1947-01-01	14.00	

B4
ESE **FED USGS** **USGS2165438**
1/8 - 1/4 Mile
Lower

Agency cd:	USGS	Site no:	401136075080201
Site name:	MG 502		
Latitude:	401136		
Longitude:	0750802	Dec lat:	40.19344189
Dec lon:	-75.13350598	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	340	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	19570917
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	123	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1957-09-17	Ground water data end date:	1957-09-17
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1957-09-17	45.00	

B5
ESE **PA WELLS** **PA1000000056388**
1/8 - 1/4 Mile
Lower

WELLID:	401136075080201	LOCALWELLN:	MG 502
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	123		
ELEVATION:	340		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	10		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19333		
LONGITUDED:	-75.13389		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27901		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	09/17/1957 00:00:00
Driller:	0260
Source Cons Data:	DRILLER'S RECORD
Method Cons:	CABLE TOOL
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	34	Casing Diameter:	6
Casing:	UNKNOWN		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SANDSTONE AND SHALE		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	DOMESTIC

Owner Information:

Owner:	KOLIN , W
Date Ownership:	01/01/1957 00:00:00

6
ENE **PA WELLS** **PA1000000056662**
1/4 - 1/2 Mile
Lower

WELLID:	401143075075601	LOCALWELLN:	MG 275
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	354		
ELEVATION:	345		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	5		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	WELL OWNER		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19528		
LONGITUDED:	-75.13222		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27907		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	04/19/1955 00:00:00
Driller:	0226
Source Cons Data:	WELL OWNER
Method Cons:	CABLE TOOL
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	40	Casing Diameter:	10
Casing:	STEEL		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	PUBLIC SUPPLY

Owner Information:

Owner:	HORSHAM BORO AUTH
Date Ownership:	04/19/1955 00:00:00

Other ID Information:

Other Identifier:	1	Other I D Assignor:	OWNER PA
Other Identifier:	MG- 36	Other I D Assignor:	DRBC-PA
Other Identifier:	D-65-170 CP	Other I D Assignor:	DRBC

7
SW
1/4 - 1/2 Mile
Lower

FED USGS **USGS2165381**

Agency cd:	USGS	Site no:	401128075083401
Site name:	MG 1851		
Latitude:	401128		
Longitude:	0750834	Dec lat:	40.19121968
Dec lon:	-75.14239517	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	345	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	25	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		336.22

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

			Database	EDR ID Number
C8 **North** **1/4 - 1/2 Mile** **Lower**	Site ID:	46-06835	**AQUIFLOW**	**61623**
	Groundwater Flow:	N		
	Shallowest Water Table Depth:	7.5		
	Deepest Water Table Depth:	12.5		
	Average Water Table Depth:	Not Reported		
	Date:	08/1991		

D9
SW
1/4 - 1/2 Mile
Lower

FED USGS **USGS2165531**

Agency cd:	USGS	Site no:	401122075083702
Site name:	MG 1878		
Latitude:	401122		
Longitude:	0750837	Dec lat:	40.18955304
Dec lon:	-75.14322856	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	329	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	20	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

D10
SW
1/4 - 1/2 Mile
Lower

FED USGS **USGS2165530**

Agency cd:	USGS	Site no:	401122075083701
Site name:	MG 1852		
Latitude:	401122		
Longitude:	0750837	Dec lat:	40.18955304
Dec lon:	-75.14322856	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	329	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	19970612
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	55	Hole depth:	150
Source of depth data:	geologist	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		322.51

C11
NNW
1/4 - 1/2 Mile
Lower

PA WELLS **PA1000000057547**

WELLID:	Not Reported	LOCALWELLN:	Not Reported
COUNTY:	MONTGOMERY		
AAPG:	1		
TOPOGRAPHY:	Not Reported		
WELLDEPTH:	120		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	Not Reported		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	Not Reported		
SOURCE DEPTH DATA:	Not Reported		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.2011		
LONGITUDED:	-75.1397		

DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 215320

Construction Information:
Construction Date: Not Reported
Driller: Not Reported
Source Cons Data: WELL OWNER
Method Cons: Not Reported
Finish: Not Reported

Casing Information:
Top Of Casing: 0
Bottom Of Casing: Not Reported
Casing: STEEL
Casing Wall Thickness: Not Reported
Casing Diameter: 8

Water Use Information:
Site Use: WITHDRAWAL
Water Use: COMMERCIAL

Owner Information:
Owner: TINIUS OLSEN TESTING MACH. CO.
Date Ownership: Not Reported

Remarks Information:
Remark: Population Served = 130
Remark Date: Not Reported

Other ID Information:
Other Identifier: 1460848
Other I D Assignor: PA DEP PWSID

E12
SSW **PA WELLS** **PA1000000055720**
1/4 - 1/2 Mile
Lower

WELLID: 401117075083101
LOCALWELLN: MG 208
COUNTY: MONTGOMERY
AAPG: 231SCKN
TOPOGRAPHY: FLAT SURFACE
WELLDEPTH: 82
ELEVATION: 330
ELEVMETHOD: INTERPOLATED FROM TOPOGRAPHIC MAP
ACCURACYOF: 10
HYDROLOGIC: 02040202
LATLONGACCURACY: ACCURATE TO +1 SECOND
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported
DATEUPDATE: Not Reported
DATARELIABILITY: NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)
SOURCE DEPTH DATA: OTHER/UNKNOWN/UNSPECIFIED
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.18806
LONGITUDED: -75.14194

DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 27872

Agency Use Section:
Agency Use of Site: OBSERVATION
Agency Use Date: Not Reported

Construction Information:
Construction Date: Not Reported
Driller: 1
Source Cons Data: WELL OWNER
Method Cons: CABLE TOOL
Finish: OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	Not Reported	Casing Diameter:	6
Casing:	UNKNOWN		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:
Site Use: UNUSED
Water Use: UNUSED

Owner Information:
Owner: U S NAVAL AIR STATION
Date Ownership: 08/11/1955 00:00:00

E13
SSW **FED USGS** **USGS2165494**
1/4 - 1/2 Mile
Lower

Agency cd:	USGS	Site no:	401117075083101
Site name:	MG 208		
Latitude:	401117		
Longitude:	0750831	Dec lat:	40.18816419
Dec lon:	-75.14156188	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	330	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	82	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count: 0
Water quality data begin date: 0000-00-00
Water quality data end date: 0000-00-00
Water quality data count: 0
Ground water data begin date: 1955-08-11
Ground water data end date: 1955-08-11
Ground water data count: 1

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1955-08-11	10.80	

D14
SW **PA WELLS** **PA1000000055797**
1/4 - 1/2 Mile
Lower

WELLID: 401119075083601
LOCALWELLN: MG 1628
COUNTY: MONTGOMERY
AAPG: 231SCKN
TOPOGRAPHY: FLAT SURFACE
WELLDEPTH: 0
ELEVATION: 338
ELEVMETHOD: Not Reported
ACCURACYOF: 10
HYDROLOGIC: 02040203
LATLONGACCURACY: Not Reported
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported
DATEUPDATE: Not Reported
DATARELIABILITY: FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)
SOURCE DEPTH DATA: USGS OR PAGS
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.18861
LONGITUDED: -75.14333
DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 43916

Agency Use Section:
Agency Use of Site: I
Agency Use Date: 04/29/1997 00:00:00

Construction Information:
Construction Date: 04/29/1997 00:00:00
Driller: 1
Source Cons Data: DRILLER'S RECORD
Method Cons: AIR ROTARY
Finish: Not Reported

Casing Information:
Top Of Casing: 0
Casing Wall Thickness: Not Reported
Bottom Of Casing: 12.5
Casing Diameter: 6
Casing: STEEL

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	148	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/29/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	05/15/1997 00:00:00

D15
SW
1/4 - 1/2 Mile
Lower

FED USGS **USGS2165515**

Agency cd:	USGS	Site no:	401119075083601
Site name:	MG 1628		
Latitude:	401119		
Longitude:	0750836	Dec lat:	40.18871973
Dec lon:	-75.14295079	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	338	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970429
Date inventoried:	19970429	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	148
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-05-15	Ground water data end date:	1997-05-15
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-05-15	14.44	

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

F16
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165427**

Agency cd:	USGS	Site no:	401134075085001
Site name:	MG 1865		
Latitude:	401134		
Longitude:	0750850	Dec lat:	40.1928863
Dec lon:	-75.14683971	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	361	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	30	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		340.29

F17
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165409**

Agency cd:	USGS	Site no:	401131075084901
Site name:	MG 1870		
Latitude:	401131		
Longitude:	0750849	Dec lat:	40.19205298
Dec lon:	-75.14656194	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000

Altitude:	308	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991017	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	84	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		338.10

F18
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165410**

Agency cd:	USGS	Site no:	401131075084902
Site name:	MG 1869		
Latitude:	401131		
Longitude:	0750849	Dec lat:	40.19205298
Dec lon:	-75.14656194	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	308	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	37.5	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		339.23

G19
SW **PA WELLS** **PA1000000055931**
1/2 - 1 Mile
Lower

WELLID:	401123075084501	LOCALWELLN:	MG 1594
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	339		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18972		
LONGITUDED:	-75.14583		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43918		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/16/1997 00:00:00

Construction Information:

Construction Date:	04/16/1997 00:00:00		
Driller:	1		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	AIR ROTARY		
Finish:	Not Reported		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	25	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	149	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/16/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/29/1997 00:00:00

G20
SW
1/2 - 1 Mile
Lower

FED USGS **USGS2165539**

Agency cd:	USGS	Site no:	401123075084501
Site name:	MG 1594		
Latitude:	401123		
Longitude:	0750845	Dec lat:	40.18983081
Dec lon:	-75.14545084	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	339	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970416
Date inventoried:	19970416	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	149
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-29	Ground water data end date:	1997-04-29
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-29	26.54	

F21
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165414**

Agency cd:	USGS	Site no:	401132075085101
Site name:	MG 1760		
Latitude:	401132		
Longitude:	0750851	Dec lat:	40.19233075
Dec lon:	-75.14711751	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	40.5	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

H22
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165399**

Agency cd:	USGS	Site no:	401130075085101
Site name:	MG 1873		
Latitude:	401130		
Longitude:	0750851	Dec lat:	40.19177521
Dec lon:	-75.14711752	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	19970502
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	65	Hole depth:	75
Source of depth data:	geologist	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		338.00

F23
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165415**

Agency cd:	USGS	Site no:	401132075085201
Site name:	MG 1864		
Latitude:	401132		
Longitude:	0750852	Dec lat:	40.19233075
Dec lon:	-75.1473953	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	84.5	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

F24
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165416**

Agency cd:	USGS	Site no:	401132075085202
Site name:	MG 1898		
Latitude:	401132		
Longitude:	0750852	Dec lat:	40.19233075
Dec lon:	-75.1473953	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	32	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

F25
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165411**

Agency cd:	USGS	Site no:	401131075085201
Site name:	MG 1874		
Latitude:	401131		
Longitude:	0750852	Dec lat:	40.19205298
Dec lon:	-75.1473953	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	361	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	19970502
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	74	Hole depth:	74.5
Source of depth data:	geologist	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		338.13

G26
SW
1/2 - 1 Mile
Lower

FED USGS **USGS2165532**

Agency cd:	USGS	Site no:	401122075084601
Site name:	MG 1593		
Latitude:	401122		
Longitude:	0750846	Dec lat:	40.18955304
Dec lon:	-75.14572864	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	339	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970417
Date inventoried:	19970417	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	74.7
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-29	Ground water data end date:	1997-04-29
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-29	29.08	

G27
SW
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055899**

WELLID:	401122075084601	LOCALWELLN:	MG 1593
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	339		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18944		
LONGITUDED:	-75.14611		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43917		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/17/1997 00:00:00

Construction Information:

Construction Date:	04/17/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	30	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	74.6999969482422	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/17/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/29/1997 00:00:00

F28
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165424**

Agency cd:	USGS	Site no:	401133075085301
Site name:	MG 1759		
Latitude:	401133		
Longitude:	0750853	Dec lat:	40.19260852
Dec lon:	-75.14767308	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	362	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	20000724
Date inventoried:	20000810	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	113.5	Hole depth:	151
Source of depth data:	geologist	Project number:	444226200
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

H29
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165400**

Agency cd:	USGS	Site no:	401130075085201
Site name:	MG 1599		
Latitude:	401130		
Longitude:	0750852	Dec lat:	40.19177521
Dec lon:	-75.14739531	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	363	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970508
Date inventoried:	19970508	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	149
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count: 0
Water quality data begin date: 0000-00-00
Water quality data end date: 0000-00-00
Water quality data count: 0
Ground water data begin date: 1997-05-15
Ground water data end date: 1997-05-15
Ground water data count: 1

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-05-15	22.91	

H30
WSW **PA WELLS** **PA1000000056220**
1/2 - 1 Mile
Lower

WELLID: 401130075085201
LOCALWELLN: MG 1599
COUNTY: MONTGOMERY
AAPG: 231SCKN
TOPOGRAPHY: FLAT SURFACE
WELLDEPTH: 0
ELEVATION: 363
ELEVMETHOD: Not Reported
ACCURACYOF: 10
HYDROLOGIC: 02040203
LATLONGACCURACY: Not Reported
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported
DATEUPDATE: Not Reported
DATARELIABILITY: FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)
SOURCE DEPTH DATA: USGS OR PAGS
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.19167
LONGITUDED: -75.14778
DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 43931

Agency Use Section:
Agency Use of Site: I
Agency Use Date: 05/08/1997 00:00:00

Construction Information:
Construction Date: 05/08/1997 00:00:00
Driller: 1
Source Cons Data: DRILLER'S RECORD
Method Cons: AIR ROTARY
Finish: Not Reported

Casing Information:
Top Of Casing: 0
Casing Wall Thickness: Not Reported
Bottom Of Casing: 24.5
Casing Diameter: 6
Casing: STEEL

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	149	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	05/08/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	05/15/1997 00:00:00

H31
WSW **FED USGS** **USGS2165382**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401128075085101
Site name:	MG 1585		
Latitude:	401128		
Longitude:	0750851	Dec lat:	40.19121966
Dec lon:	-75.14711753	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	352	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970403
Date inventoried:	19970403	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	73.6
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-14	Ground water data end date:	1997-04-14
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-14	19.67	

Map ID Direction Distance Elevation		Database	EDR ID Number
H32 WSW 1/2 - 1 Mile Lower		**PA WELLS**	**PA1000000056151**

WELLID:	401128075085101	LOCALWELLN:	MG 1585
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	352		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19111		
LONGITUDED:	-75.1475		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43925		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/03/1997 00:00:00

Construction Information:

Construction Date:	04/03/1997 00:00:00		
Driller:	1		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	AIR ROTARY		
Finish:	Not Reported		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	18	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	73.5999984741211	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/03/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/14/1997 00:00:00

H33
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165390**

Agency cd:	USGS	Site no:	401129075085202
Site name:	MG 1872		
Latitude:	401129		
Longitude:	0750852	Dec lat:	40.19149744
Dec lon:	-75.14739531	Coor meth:	L
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	358	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	84	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		337.26

H34
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165389**

Agency cd:	USGS	Site no:	401129075085201
Site name:	MG 1871		
Latitude:	401129		
Longitude:	0750852	Dec lat:	40.19149744
Dec lon:	-75.14739531	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	358	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	26	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		338.55

F35
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165428**

Agency cd:	USGS	Site no:	401134075085401
Site name:	MG 1866		
Latitude:	401134		
Longitude:	0750854	Dec lat:	40.19288629
Dec lon:	-75.14795086	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	366	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	31	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		345.03

H36
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165377**

Agency cd:	USGS	Site no:	401127075085101
Site name:	MG 1586		
Latitude:	401127		
Longitude:	0750851	Dec lat:	40.19094189
Dec lon:	-75.14711754	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	352	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970404
Date inventoried:	19970404	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	149
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-14	Ground water data end date:	1997-04-14
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-14	18.02	

H37
WSW **PA WELLS** **PA1000000056105**
1/2 - 1 Mile
Lower

WELLID:	401127075085101	LOCALWELLN:	MG 1586
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	352		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19083		
LONGITUDED:	-75.1475		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43923		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/04/1997 00:00:00

Construction Information:

Construction Date:	04/14/1997 00:00:00		
Driller:	1		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	AIR ROTARY		
Finish:	Not Reported		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	18	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	149	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/04/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/14/1997 00:00:00

H38
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165401**

Agency cd:	USGS	Site no:	401130075085301
Site name:	MG 1590		
Latitude:	401130		
Longitude:	0750853	Dec lat:	40.19177521
Dec lon:	-75.14767309	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	361	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970403
Date inventoried:	19970403	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	84
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-15	Ground water data end date:	1997-04-15
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-15	22.23	

H39
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165402**

Agency cd:	USGS	Site no:	401130075085302
Site name:	MG 1875		
Latitude:	401130		
Longitude:	0750853	Dec lat:	40.19177521
Dec lon:	-75.14767309	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	19970506
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	94	Hole depth:	94.5
Source of depth data:	geologist	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		338.09

H40
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165383**

Agency cd:	USGS	Site no:	401128075085201
Site name:	MG 1588		
Latitude:	401128		
Longitude:	0750852	Dec lat:	40.19121966
Dec lon:	-75.14739532	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	355	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970407
Date inventoried:	19970407	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	73
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-15	Ground water data end date:	1997-04-15
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-15	20.22	

H41
WSW **PA WELLS** **PA1000000056219**
1/2 - 1 Mile
Lower

WELLID:	401130075085301	LOCALWELLN:	MG 1590
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	361		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19167		
LONGITUDED:	-75.14806		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43932		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/03/1997 00:00:00

Construction Information:

Construction Date:	04/03/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	25	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	84	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/03/1997 00:00:00

H42
WSW **PA WELLS** **PA1000000056150**
1/2 - 1 Mile
Lower

WELLID:	401128075085201	LOCALWELLN:	MG 1588
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	355		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19111		
LONGITUDED:	-75.14778		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43926		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/07/1997 00:00:00

Construction Information:

Construction Date:	04/07/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	24	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	73	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/07/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/15/1997 00:00:00

I43
SW **PA WELLS** **PA1000000055685**
1/2 - 1 Mile
Lower

WELLID:	401116075084001	LOCALWELLN:	MG 1598
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	332		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040201		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18778		
LONGITUDED:	-75.14444		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43914		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/28/1997 00:00:00

Construction Information:

Construction Date:	04/28/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	13	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	104.599998474121	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/28/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/30/1997 00:00:00

I44
SW **FED USGS** **USGS2165484**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401116075084001
Site name:	MG 1598		
Latitude:	401116		
Longitude:	0750840	Dec lat:	40.18788641
Dec lon:	-75.14406195	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	332	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	CrosswicksNeshaminy. New Jersey, Pennsylvania. Area = 521 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970428
Date inventoried:	19970428	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	104.6
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-30	Ground water data end date:	1997-04-30
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-30	39.00	

H45
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165378**

Agency cd:	USGS	Site no:	401127075085201
Site name:	MG 1587		
Latitude:	401127		
Longitude:	0750852	Dec lat:	40.19094189
Dec lon:	-75.14739532	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	353	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970408
Date inventoried:	19970408	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	148.6
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-14	Ground water data end date:	1997-04-14
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-14	20.91	

H46
WSW
1/2 - 1 Mile
Lower

PA WELLS **PA1000000056104**

WELLID:	401127075085201	LOCALWELLN:	MG 1587
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	353		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		

LATLONGACCURACY: Not Reported
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported DATEUPDATE: Not Reported
DATARELIABILITY: FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)
SOURCE DEPTH DATA: USGS OR PAGS
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.19083
LONGITUDED: -75.14778
DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 43924

Agency Use Section:
Agency Use of Site: I
Agency Use Date: 04/08/1997 00:00:00

Construction Information:
Construction Date: 04/08/1997 00:00:00
Driller: 1
Source Cons Data: DRILLER'S RECORD
Method Cons: AIR ROTARY
Finish: Not Reported

Casing Information:
Top Of Casing: 0 Casing Wall Thickness: Not Reported
Bottom Of Casing: 24 Casing Diameter: 6
Casing: STEEL

Hole Information:
Top Of Hole: 0
Bottom Of Hole: 148.600006103516 Hole Diameter: 0

Water Use Information:
Site Use: OBSERVATION
Water Use: UNUSED

Owner Information:
Owner: U.S. NAVAL AIR STATION
Date Ownership: 04/08/1997 00:00:00

Remarks Information:
Remark: OTHER LOG - BOREHOLE VIDEO
Remark Date: 04/14/1997 00:00:00

J47
WSW **PA WELLS** **PA1000000056312**
1/2 - 1 Mile
Lower

WELLID: 401133075085501 LOCALWELLN: MG 1589
COUNTY: MONTGOMERY
AAPG: 231SCKN
TOPOGRAPHY: FLAT SURFACE
WELLDEPTH: 0
ELEVATION: 365
ELEVMETHOD: Not Reported
ACCURACYOF: 10
HYDROLOGIC: 02040203

LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.1925		
LONGITUDED:	-75.14861		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43933		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/11/1997 00:00:00

Construction Information:

Construction Date:	04/11/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	29	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	168	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/11/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/15/1997 00:00:00

J48
WSW **FED USGS** **USGS2165425**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401133075085501
Site name:	MG 1589		
Latitude:	401133		
Longitude:	0750855	Dec lat:	40.19260852
Dec lon:	-75.14822865	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	365	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970411
Date inventoried:	19970411	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	168
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-15	Ground water data end date:	1997-04-15
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-15	25.42	

I49
SW
1/2 - 1 Mile
Lower

FED USGS **USGS2165495**

Agency cd:	USGS	Site no:	401117075084301
Site name:	MG 1850		
Latitude:	401117		
Longitude:	0750843	Dec lat:	40.18816418
Dec lon:	-75.14489531	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	320	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Upland draw		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	20	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		305.42

K50
SSE **PA WELLS** **PA1000000055545**
1/2 - 1 Mile
Lower

WELLID:	401112075075801	LOCALWELLN:	MG 963
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	400		
ELEVATION:	280		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	10		
HYDROLOGIC:	02040201		
LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18667		
LONGITUDED:	-75.13278		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27854		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	10/11/1973 00:00:00
Driller:	0514
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	OPEN HOLE

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	400	Hole Diameter:	6

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	HORSHAM AUTH
Date Ownership:	10/11/1973 00:00:00

Other ID Information:

Other Identifier:	22	Other I D Assignor:	OWNER PA

K51
SSE **FED USGS** **USGS2165457**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401112075075801
Site name:	MG 963		
Latitude:	401112		
Longitude:	0750758	Dec lat:	40.18677536
Dec lon:	-75.13239497	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	280	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	CrosswicksNeshaminy. New Jersey, Pennsylvania. Area = 521 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	19731011
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	400	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	444209300
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1973-10-11	Ground water data end date:	1973-10-11
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1973-10-11	11.00	

H52
WSW **PA WELLS** **PA1000000056187**
1/2 - 1 Mile
Lower

WELLID:	401129075085501	LOCALWELLN:	MG 1591
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	360		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19139		
LONGITUDED:	-75.14861		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43928		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/10/1997 00:00:00

Construction Information:

Construction Date:	04/10/1997 00:00:00		
Driller:	1		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	AIR ROTARY		
Finish:	Not Reported		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	19	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	93.5999984741211	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/10/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/15/1997 00:00:00

H53
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165391**

Agency cd:	USGS	Site no:	401129075085501
Site name:	MG 1591		
Latitude:	401129		
Longitude:	0750855	Dec lat:	40.19149743
Dec lon:	-75.14822867	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970410
Date inventoried:	19970410	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	93.6
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-15	Ground water data end date:	1997-04-15
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-15	20.88	

J54
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165403**

Agency cd:	USGS	Site no:	401130075085601
Site name:	MG 1758		
Latitude:	401130		
Longitude:	0750856	Dec lat:	40.1917752
Dec lon:	-75.14850645	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	20000727
Date inventoried:	20000810	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	209.5	Hole depth:	261
Source of depth data:	geologist	Project number:	444226200
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

J55
WSW **FED USGS** **USGS2165404**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401130075085602
Site name:	MG 1868		
Latitude:	401130		
Longitude:	0750856	Dec lat:	40.1917752
Dec lon:	-75.14850645	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	40	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count: 0
Water quality data begin date: 0000-00-00
Water quality data end date: 0000-00-00
Water quality data count: 0
Ground water data begin date: 1999-10-07
Ground water data end date: 1999-10-07
Ground water data count: 1

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		338.21

L56
SE **PA WELLS** **PA1000000055650**
1/2 - 1 Mile
Lower

WELLID: 401115075074901 LOCALWELLN: MG 511
COUNTY: MONTGOMERY
AAPG: 231SCKN
TOPOGRAPHY: HILLSIDE
WELLDEPTH: 85
ELEVATION: 290
ELEVMETHOD: INTERPOLATED FROM TOPOGRAPHIC MAP
ACCURACYOF: 5
HYDROLOGIC: 02040202
LATLONGACCURACY: ACCURATE TO +1 SECOND
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported DATEUPDATE: Not Reported
DATARELIABILITY: NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)
SOURCE DEPTH DATA: OTHER/UNKNOWN/UNSPECIFIED
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.1875
LONGITUDED: -75.13028
DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 27864

Agency Use Section:
Agency Use of Site: OBSERVATION
Agency Use Date: Not Reported

Construction Information:
Construction Date: 09/13/1957 00:00:00
Driller: 0155
Source Cons Data: DRILLER'S RECORD
Method Cons: CABLE TOOL
Finish: OPEN HOLE

Casing Information:
Top Of Casing: 0
Casing Wall Thickness: Not Reported
Bottom Of Casing: Not Reported
Casing Diameter: 6
Casing: UNKNOWN

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	DOMESTIC

Owner Information:

Owner:	HUGHES , MARY
Date Ownership:	01/01/1957 00:00:00

L57
SE
1/2 - 1 Mile
Lower

FED USGS **USGS2165473**

Agency cd:	USGS	Site no:	401115075074901
Site name:	MG 511		
Latitude:	401115		
Longitude:	0750749	Dec lat:	40.18760868
Dec lon:	-75.12989488	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	290	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	19570913
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	85	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1957-09-13	Ground water data end date:	1957-09-13
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1957-09-13	25.00	

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

M58
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165368**

Agency cd:	USGS	Site no:	401126075085501
Site name:	MG 1634		
Latitude:	401126.21		
Longitude:	0750855	Dec lat:	40.19072245
Dec lon:	-75.14822869	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	350	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	25	Hole depth:	67
Source of depth data:	logs	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		337.75

M59
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165384**

Agency cd:	USGS	Site no:	401128075085601
Site name:	MG 1592		
Latitude:	401128		
Longitude:	0750856	Dec lat:	40.19121966
Dec lon:	-75.14850646	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000

Altitude:	359	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970409
Date inventoried:	19970409	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	128
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-16	Ground water data end date:	1997-04-16
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-16	21.34	

M60
WSW **PA WELLS** **PA1000000056149**
1/2 - 1 Mile
Lower

WELLID:	401128075085601	LOCALWELLN:	MG 1592
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	359		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19111		
LONGITUDED:	-75.14889		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43927		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/09/1997 00:00:00

Construction Information:

Construction Date:	04/09/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	19	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	128	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/09/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/16/1997 00:00:00

M61
WSW **FED USGS** **USGS2165370**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401126075085503
Site name:	MG 1876		
Latitude:	401126		
Longitude:	0750855	Dec lat:	40.19066412
Dec lon:	-75.14822869	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	350	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	50	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		337.72

M62
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165369**

Agency cd:	USGS	Site no:	401126075085502
Site name:	MG 1635		
Latitude:	401126		
Longitude:	0750855	Dec lat:	40.19066412
Dec lon:	-75.14822869	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	350	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	149	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		318.22

J63
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165417**

Agency cd:	USGS	Site no:	401132075085801
Site name:	MG 1757		
Latitude:	401132		
Longitude:	0750858	Dec lat:	40.19233075
Dec lon:	-75.14906201	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	362	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	20000725
Date inventoried:	20000810	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	84.5	Hole depth:	150
Source of depth data:	geologist	Project number:	444226200
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

J64
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165418**

Agency cd:	USGS	Site no:	401132075085802
Site name:	MG 1867		
Latitude:	401132		
Longitude:	0750858	Dec lat:	40.19233075
Dec lon:	-75.14906201	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	362	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	30	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count: 0
Water quality data begin date: 0000-00-00
Water quality data end date: 0000-00-00
Water quality data count: 0
Ground water data begin date: 1999-10-07
Ground water data end date: 1999-10-07
Ground water data count: 1

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		342.31

65
NNE **PA WELLS** **PA1000000057871**
1/2 - 1 Mile
Lower

WELLID: 401211075075701 LOCALWELLN: MG 958
COUNTY: MONTGOMERY
AAPG: 231SCKN
TOPOGRAPHY: HILLTOP
WELLDEPTH: 271
ELEVATION: 320
ELEVMETHOD: INTERPOLATED FROM TOPOGRAPHIC MAP
ACCURACYOF: 5
HYDROLOGIC: 02040202
LATLONGACCURACY: ACCURATE TO +1 SECOND
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported DATEUPDATE: Not Reported
DATARELIABILITY: FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)
SOURCE DEPTH DATA: OTHER/UNKNOWN/UNSPECIFIED
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.20306
LONGITUDED: -75.1325
DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 27934

Agency Use Section:
Agency Use of Site: OBSERVATION
Agency Use Date: Not Reported

Construction Information:
Construction Date: 04/05/1968 00:00:00
Driller: 0226
Source Cons Data: AGENCY OTHER THAN USGS OR PAGS
Method Cons: OTHER/UNKNOWN
Finish: UNKNOWN

Casing Information:
Top Of Casing: 0 Casing Wall Thickness: Not Reported
Bottom Of Casing: 50 Casing Diameter: 10
Casing: STEEL

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	31	Casing Diameter:	14
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	271	Hole Diameter:	10

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	PUBLIC SUPPLY

Owner Information:

Owner:	HORSHAM AUTH
Date Ownership:	04/05/1968 00:00:00

Other ID Information:

Other Identifier:	10	Other I D Assignor:	OWNER PA
Other Identifier:	D-68- 91 CP	Other I D Assignor:	DRBC
Other Identifier:	MG- 44	Other I D Assignor:	DRBC-PA

N66
SW
1/2 - 1 Mile
Lower

FED USGS **USGS2165522**

Agency cd:	USGS	Site no:	401120075085301
Site name:	MG 383		
Latitude:	401120		
Longitude:	0750853	Dec lat:	40.18899749
Dec lon:	-75.14767315	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	340	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19510101
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	80	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count: 0
Water quality data begin date: 0000-00-00
Water quality data end date: 0000-00-00
Water quality data count: 0
Ground water data begin date: 1956-07-25
Ground water data end date: 1956-07-25
Ground water data count: 1

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1956-07-25	21.00	

N67
SW
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055826**

WELLID: 401120075085301
LOCALWELLN: MG 383
COUNTY: MONTGOMERY
AAPG: 231SCKN
TOPOGRAPHY: FLAT SURFACE
WELLDEPTH: 80
ELEVATION: 340
ELEVMETHOD: INTERPOLATED FROM TOPOGRAPHIC MAP
ACCURACYOF: 10
HYDROLOGIC: 02040202
LATLONGACCURACY: ACCURATE TO +1 SECOND
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported
DATEUPDATE: Not Reported
DATARELIABILITY: NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)
SOURCE DEPTH DATA: OTHER/UNKNOWN/UNSPECIFIED
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.18889
LONGITUDED: -75.14806
DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 27881

Agency Use Section:
Agency Use of Site: OBSERVATION
Agency Use Date: Not Reported

Construction Information:
Construction Date: 01/01/1951 00:00:00
Driller: 1
Source Cons Data: WELL OWNER
Method Cons: CABLE TOOL
Finish: OPEN HOLE

Casing Information:
Top Of Casing: 0
Casing Wall Thickness: Not Reported
Bottom Of Casing: Not Reported
Casing Diameter: 6
Casing: UNKNOWN

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	AIR CONDITIONING

Owner Information:

Owner:	PRYCE , J
Date Ownership:	01/01/1951 00:00:00

O68
SE **PA WELLS** **PA1000000055686**
1/2 - 1 Mile
Lower

WELLID:	401116075074301	LOCALWELLN:	MG 276
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	342		
ELEVATION:	300		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	5		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	AGENCY OTHER THAN USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18778		
LONGITUDED:	-75.12861		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27868		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	10/12/1955 00:00:00
Driller:	0226
Source Cons Data:	WELL OWNER
Method Cons:	CABLE TOOL
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	46	Casing Diameter:	10
Casing:	STEEL		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	UNUSED
Water Use:	UNUSED

Owner Information:

Owner:	HORSHAM AUTH
Date Ownership:	01/01/1955 00:00:00

Other ID Information:

Other Identifier:	2	Other I D Assignor:	OWNER PA
Other Identifier:	MG- 37	Other I D Assignor:	DRBC-PA
Other Identifier:	D-65-170 CP	Other I D Assignor:	DRBC

O69
SE **FED USGS** **USGS2165483**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401116075074301
Site name:	MG 276		
Latitude:	401116		
Longitude:	0750743	Dec lat:	40.18788646
Dec lon:	-75.12822816	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	300	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19551012
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	342	Hole depth:	Not Reported
Source of depth data:	other government (other than USGS)	Project number:	444209300
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1955-10-12	Ground water data end date:	1955-10-12
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1955-10-12	27.00	

N70
WSW **PA WELLS** **PA1000000055858**
1/2 - 1 Mile
Lower

WELLID:	401121075085501	LOCALWELLN:	MG 384
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLTOP		
WELLDEPTH:	0		
ELEVATION:	340		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	10		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18917		
LONGITUDED:	-75.14861		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27884		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	01/01/1951 00:00:00
Driller:	1
Source Cons Data:	WELL OWNER
Method Cons:	CABLE TOOL
Finish:	OPEN HOLE

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	DOMESTIC

Owner Information:

Owner:	PRICE , J
Date Ownership:	01/01/1951 00:00:00

N71
WSW **FED USGS** **USGS2165527**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401121075085501
Site name:	MG 384		
Latitude:	401121		
Longitude:	0750855	Dec lat:	40.18927526
Dec lon:	-75.14822871	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	340	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	19510101
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

P72
SSE **PA WELLS** **PA1000000055358**
1/2 - 1 Mile
Lower

WELLID:	401107075075501	LOCALWELLN:	MG 501
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	100		
ELEVATION:	275		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	5		
HYDROLOGIC:	02040202		

LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18528		
LONGITUDED:	-75.13194		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27840		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	08/01/1957 00:00:00
Driller:	0260
Source Cons Data:	DRILLER'S RECORD
Method Cons:	CABLE TOOL
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	39	Casing Diameter:	6
Casing:	UNKNOWN		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SANDSTONE AND SHALE		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	DOMESTIC

Owner Information:

Owner:	ZEITTER , L
Date Ownership:	01/01/1957 00:00:00

P73
SSE **FED USGS** **USGS2165603**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401107075075501
Site name:	MG 501		
Latitude:	401107		
Longitude:	0750755	Dec lat:	40.1853865
Dec lon:	-75.13156164	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000

Altitude:	275	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	19570801
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	100	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1957-08-23	Ground water data end date:	1957-08-23
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1957-08-23	11.00	

74
NW
1/2 - 1 Mile
Lower

AQUIFLOW **41090**

Site ID:	46-25723
Groundwater Flow:	NNW
Shallowest Water Table Depth:	1.85
Deepest Water Table Depth:	22.88
Average Water Table Depth:	Not Reported
Date:	n Modifica

P75
SSE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121950**

Well ID:	4070N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401107	Longitude:	750753
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	MONITORING
Well Depth:	20	Finish:	OPEN HOLE
Casing 1:	15	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	2-91
Static Water Level:	18	Production WL:	20
Yield (gpm):	1	Yield Measurement Method:	V
Drawdown:	2	Test Time:	0.5
Bedrock:	8	Driller:	188
Water Bearing Zone 1:	7	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	OTHER
Municipality:	HORSHAM	Remark:	ROCK TYPE: TRAPROCK
Aquifer:	STOCKTON FORMATION		

Map ID Direction Distance Elevation		Database	EDR ID Number
P76 **SSE** **1/2 - 1 Mile** **Lower**		**PA WELLS**	**PA1000000055359**

WELLID:	Not Reported	LOCALWELLN:	4070N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	20		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18528		
LONGITUDED:	-75.13139		
DEPTHTOBED:	8		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166481		

Construction Information:

Construction Date:	02/01/1991 00:00:00		
Driller:	188		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	15	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	O		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	MINE
Water Use:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

P77
SSE **PA WELLS** **PA1000000055310**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4068N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	20		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.185		
LONGITUDED:	-75.13194		
DEPTHTOBED:	9		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166479		

Construction Information:

Construction Date:	02/01/1991 00:00:00
Driller:	188
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	15	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	O		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	MINE
Water Use:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

P78
SSE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121948**

Well ID:	4068N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401106	Longitude:	750755
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	MONITORING
Well Depth:	20	Finish:	OPEN HOLE
Casing 1:	15	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	2-91
Static Water Level:	6	Production WL:	20
Yield (gpm):	6	Yield Measurement Method:	V
Drawdown:	14	Test Time:	0.5
Bedrock:	9	Driller:	188
Water Bearing Zone 1:	9	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	OTHER
Municipality:	HORSHAM	Remark:	ROCK TYPE: TRAPROCK
Aquifer:	STOCKTON FORMATION		

79
SE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055732**

WELLID:	Not Reported	LOCALWELLN:	Not Reported
COUNTY:	MONTGOMERY		
AAPG:	1		
TOPOGRAPHY:	Not Reported		
WELLDEPTH:	340		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	Not Reported		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	Not Reported		
SOURCE DEPTH DATA:	Not Reported		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.1883		
LONGITUDED:	-75.1267		

DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 215231

Construction Information:
Construction Date: Not Reported
Driller: Not Reported
Source Cons Data: WELL OWNER
Method Cons: Not Reported
Finish: Not Reported

Casing Information:
Top Of Casing: 0
Bottom Of Casing: Not Reported
Casing: STEEL
Casing Wall Thickness: Not Reported
Casing Diameter: Not Reported

Water Use Information:
Site Use: WITHDRAWAL
Water Use: PUBLIC SUPPLY

Owner Information:
Owner: HORSHAM WATER AUTHORITY
Date Ownership: Not Reported

Remarks Information:
Remark: Population Served = 15768
Remark Date: Not Reported

Other ID Information:
Other Identifier: 1460033
Other I D Assignor: PA DEP PWSID

P80
SSE **PA WELLS** **SPAW0121949**
1/2 - 1 Mile
Lower

Well ID: 4069N
Owner's Name: MOBIL
Latitude: 401106
Quadrangle: AMBLER
Hydrologic Unit: 02040202
Water Usage: Not Reported
Well Depth: 20
Casing 1: 15
Casing2: Not Reported
Grouted: Not Reported
Static Water Level: 18
Yield (gpm): 1
Drawdown: 2
Bedrock: 7
Water Bearing Zone 1: 17
Water Bearing Zone 3: Not Reported
Municipality: HORSHAM
Aquifer: STOCKTON FORMATION
County MONTGOMERY
Longitude: 750754
Lat/Long Accuracy: ACCURATE TO +1 MINUTE
Topographic Setting: HILLSIDE
Site Usage: MONITORING
Finish: OPEN HOLE
Casing1 Diameter(inches): 5
Casing2 Diameter(inches): Not Reported
Date Drilled: 2-91
Production WL: 20
Yield Measurement Method: V
Test Time: 0.5
Driller: 188
Water Bearing Zone 2: Not Reported
Lithology: OTHER
Remark: ROCK TYPE: TRAPROCK

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

P81
SSE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055311**

WELLID:	Not Reported	LOCALWELLN:	4069N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	20		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.185		
LONGITUDED:	-75.13167		
DEPTHTOBED:	7		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166480		

Construction Information:

Construction Date:	02/01/1991 00:00:00		
Driller:	188		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	15	Casing Diameter:	5
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	O		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	MINE
Water Use:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

Q82
West
1/2 - 1 Mile
Lower

PA WELLS **PA1000000056498**

WELLID:	401139075090701	LOCALWELLN:	MG 1597
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	363		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19417		
LONGITUDED:	-75.15194		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43937		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/21/1997 00:00:00

Construction Information:

Construction Date:	04/21/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	20	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	149	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/21/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/30/1997 00:00:00

Q83
West **PA WELLS** **PA1000000056569**
1/2 - 1 Mile
Lower

WELLID:	401141075090701	LOCALWELLN:	MG 1595
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	360		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19472		
LONGITUDED:	-75.15194		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43940		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/23/1997 00:00:00

Construction Information:

Construction Date:	04/23/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	Not Reported	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	0	Hole Diameter:	0

Water Use Information:
Site Use: OBSERVATION
Water Use: UNUSED

Owner Information:
Owner: U.S. NAVAL AIR STATION
Date Ownership: 04/23/1997 00:00:00

Remarks Information:
Remark: CONGER
Remark Date: 04/29/1997 00:00:00

Q84
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165287**

Agency cd:	USGS	Site no:	401139075090701
Site name:	MG 1597		
Latitude:	401139		
Longitude:	0750907	Dec lat:	40.19427514
Dec lon:	-75.15156204	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	363	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970421
Date inventoried:	19970421	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	149
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-30	Ground water data end date:	1997-04-30
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-30	31.20	

Q85
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165308**

Agency cd:	USGS	Site no:	401141075090701
Site name:	MG 1595		
Latitude:	401141		
Longitude:	0750907	Dec lat:	40.19483069
Dec lon:	-75.15156203	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970423
Date inventoried:	19970423	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	149.4
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-29	Ground water data end date:	1997-04-29
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-29	26.70	

R86
SSE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121925**

Well ID:	4045N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401106	Longitude:	750749
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	16	Finish:	OPEN HOLE
Casing 1:	12	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	4-92
Static Water Level:	Not Reported	Production WL:	16
Yield (gpm):	Not Reported	Yield Measurement Method:	Not Reported
Drawdown:	Not Reported	Test Time:	Not Reported
Bedrock:	7	Driller:	188
Water Bearing Zone 1:	Not Reported	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	OTHER
Municipality:	HORSHAM	Remark:	ROCK TYPE: TRAPROCK
Aquifer:	STOCKTON FORMATION		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

R87
SSE | **PA WELLS** | **PA1000000055312**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4045N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	16		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.185		
LONGITUDED:	-75.13028		
DEPTHTOBED:	7		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166456		

Construction Information:

Construction Date:	04/01/1992 00:00:00		
Driller:	188		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	12	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	O		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

Map ID Direction Distance Elevation		Database	EDR ID Number
Q88 **West** **1/2 - 1 Mile** **Lower**		**PA WELLS**	**PA1000000056540**

WELLID:	401140075090801	LOCALWELLN:	MG 1596
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	362		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19444		
LONGITUDED:	-75.15222		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43938		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	04/22/1997 00:00:00

Construction Information:

Construction Date:	04/22/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	25	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	84.5999984741211	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	04/22/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	04/30/1997 00:00:00

Q89
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165291**

Agency cd:	USGS	Site no:	401140075090801
Site name:	MG 1596		
Latitude:	401140		
Longitude:	0750908	Dec lat:	40.19455291
Dec lon:	-75.15183982	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	362	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970422
Date inventoried:	19970422	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	84.6
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-04-30	Ground water data end date:	1997-04-30
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-04-30	30.54	

R90
SSE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055262**

WELLID:	Not Reported	LOCALWELLN:	4044N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	16		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		

LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18472		
LONGITUDED:	-75.13056		
DEPTHTOBED:	5		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166455		

Construction Information:

Construction Date:	04/01/1992 00:00:00		
Driller:	188		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	12	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SS		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

R91
SSE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121924**

Well ID:	4044N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401105	Longitude:	750750
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	16	Finish:	OPEN HOLE
Casing 1:	12	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	4-92
Static Water Level:	10	Production WL:	16
Yield (gpm):	3	Yield Measurement Method:	E
Drawdown:	6	Test Time:	Not Reported
Bedrock:	5	Driller:	188
Water Bearing Zone 1:	13	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	SANDSTONE
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

R92
SSE **PA WELLS** **PA1000000055208**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4037N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	14		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18444		
LONGITUDED:	-75.13111		
DEPTHTOBED:	5		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166448		

Construction Information:

Construction Date:	06/01/1992 00:00:00		
Driller:	188		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	9	Casing Diameter:	3
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SS		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

S93
SSE **PA WELLS** **SPAW0121915**
1/2 - 1 Mile
Lower

Well ID:	4035N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401103	Longitude:	750754
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	12	Finish:	OPEN HOLE
Casing 1:	8	Casing1 Diameter(inches):	3
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	6-92
Static Water Level:	Not Reported	Production WL:	12
Yield (gpm):	Not Reported	Yield Measurement Method:	Not Reported
Drawdown:	Not Reported	Test Time:	Not Reported
Bedrock:	4	Driller:	188
Water Bearing Zone 1:	Not Reported	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	Not Reported
Municipality:	HORSHAM	Remark:	ROCK TYPE: TRAPROCK
Aquifer:	STOCKTON FORMATION		

R94
SSE **PA WELLS** **SPAW0121917**
1/2 - 1 Mile
Lower

Well ID:	4037N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401104	Longitude:	750752
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	14	Finish:	OPEN HOLE
Casing 1:	9	Casing1 Diameter(inches):	3
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	6-92
Static Water Level:	10	Production WL:	14
Yield (gpm):	1	Yield Measurement Method:	E
Drawdown:	4	Test Time:	Not Reported
Bedrock:	5	Driller:	188
Water Bearing Zone 1:	10	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	SANDSTONE
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

S95
SSE **PA WELLS** **PA1000000055160**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4035N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	12		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		

LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18417		
LONGITUDED:	-75.13167		
DEPTHTOBED:	4		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166446		

Construction Information:

Construction Date:	06/01/1992 00:00:00		
Driller:	188		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	8	Casing Diameter:	3
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	Not Reported		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

Q96
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165309**

Agency cd:	USGS	Site no:	401141075090901
Site name:	MG 1863		
Latitude:	401141		
Longitude:	0750909	Dec lat:	40.19483068
Dec lon:	-75.1521176	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	360	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	37	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		336.03

S97
SSE **PA WELLS** **PA1000000055108**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4034N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	9		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18389		
LONGITUDED:	-75.13194		
DEPTHTOBED:	3		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166445		

Construction Information:

Construction Date:	06/01/1992 00:00:00
Driller:	188
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	5	Casing Diameter:	3
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	Not Reported		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

S98
SSE **PA WELLS** **SPAW0121914**
1/2 - 1 Mile
Lower

Well ID:	4034N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401102	Longitude:	750755
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	9	Finish:	OPEN HOLE
Casing 1:	5	Casing1 Diameter(inches):	3
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	6-92
Static Water Level:	Not Reported	Production WL:	9
Yield (gpm):	Not Reported	Yield Measurement Method:	Not Reported
Drawdown:	Not Reported	Test Time:	Not Reported
Bedrock:	3	Driller:	188
Water Bearing Zone 1:	Not Reported	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	Not Reported
Municipality:	HORSHAM	Remark:	ROCK TYPE: TRAPROCK
Aquifer:	STOCKTON FORMATION		

Q99
West **FED USGS** **USGS2165274**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401138075091001
Site name:	MG 1877		
Latitude:	401138		
Longitude:	0750910	Dec lat:	40.19399737
Dec lon:	-75.15239541	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	365	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	19970522
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	85	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		337.65

R100
SSE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121918**

Well ID:	4038N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401103	Longitude:	750751
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	13	Finish:	OPEN HOLE
Casing 1:	9	Casing1 Diameter(inches):	3
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	6-92
Static Water Level:	10	Production WL:	13
Yield (gpm):	1	Yield Measurement Method:	E
Drawdown:	2	Test Time:	Not Reported
Bedrock:	11	Driller:	188
Water Bearing Zone 1:	9	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	SANDSTONE
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

R101
SSE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055161**

WELLID:	Not Reported	LOCALWELLN:	4038N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	13		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18417		
LONGITUDED:	-75.13083		
DEPTHTOBED:	11		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166449		

Construction Information:

Construction Date:	06/01/1992 00:00:00		
Driller:	188		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	9	Casing Diameter:	3
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SS		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

R102
SSE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121923**

Well ID:	4043N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401103	Longitude:	750750
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	45	Finish:	OPEN HOLE
Casing 1:	40	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	4-92
Static Water Level:	10	Production WL:	45
Yield (gpm):	10	Yield Measurement Method:	E
Drawdown:	35	Test Time:	Not Reported
Bedrock:	20	Driller:	188
Water Bearing Zone 1:	21	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	OTHER
Municipality:	HORSHAM	Remark:	ROCK TYPE: TRAPROCK
Aquifer:	STOCKTON FORMATION		

R103
SSE **PA WELLS** **PA1000000055162**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4043N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	45		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18417		
LONGITUDED:	-75.13056		
DEPTHTOBED:	20		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166454		

Construction Information:

Construction Date:	04/01/1992 00:00:00
Driller:	188
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	40	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	O		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

T104
North
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121937**

Well ID:	4057N		
Owner's Name:	WILLOWGROVE	County	MONTGOMERY
Latitude:	401222	Longitude:	750819
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	MONITORING
Well Depth:	11	Finish:	OPEN HOLE
Casing 1:	5	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	2-6-92
Static Water Level:	3	Production WL:	Not Reported
Yield (gpm):	4	Yield Measurement Method:	V
Drawdown:	Not Reported	Test Time:	1
Bedrock:	Not Reported	Driller:	1863
Water Bearing Zone 1:	3	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	SAND
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

T105
North
1/2 - 1 Mile
Lower

PA WELLS **PA1000000058271**

WELLID:	Not Reported	LOCALWELLN:	4057N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	11		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		

LATLONGACCURACY: ACCURATE TO +1 MINUTE
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported DATEUPDATE: Not Reported
DATARELIABILITY: LOCATION MAY NOT BE ACCURATE (WWI paper)
SOURCE DEPTH DATA: DRILLER'S RECORD
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.20611
LONGITUDED: -75.13861
DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 166468

Construction Information:
Construction Date: 02/06/1992 00:00:00
Driller: 1863
Source Cons Data: DRILLER'S RECORD
Method Cons: Not Reported
Finish: OPEN HOLE

Casing Information:
Top Of Casing: 0 Casing Wall Thickness: Not Reported
Bottom Of Casing: 5 Casing Diameter: 4
Casing: Not Reported

Geohydrologic Information:
A A P G: 231SCKN
Lithology: S
Contributing Unit: PRIMARY
Top Of Interval: Not Reported Bottom Of Interval: Not Reported

Water Use Information:
Site Use: MINE
Water Use: Not Reported

Owner Information:
Owner: WILLOWGROVE AIRRESER
Date Ownership: Not Reported

T106
North
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121936**

Well ID: 4056N
Owner's Name: WILLOWGROVE County MONTGOMERY
Latitude: 401222 Longitude: 750821
Quadrangle: AMBLER Lat/Long Accuracy: ACCURATE TO +1 MINUTE
Hydrologic Unit: 02040202 Topographic Setting: HILLSIDE
Water Usage: Not Reported Site Usage: MONITORING
Well Depth: 16 Finish: OPEN HOLE
Casing 1: 8 Casing1 Diameter(inches): 4
Casing2: Not Reported Casing2 Diameter(inches): Not Reported

Grouted:	Not Reported	Date Drilled:	2-7-92
Static Water Level:	8	Production WL:	Not Reported
Yield (gpm):	4	Yield Measurement Method:	V
Drawdown:	Not Reported	Test Time:	1
Bedrock:	Not Reported	Driller:	1863
Water Bearing Zone 1:	12	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	SHALE
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

T107
North **PA WELLS** **PA1000000058270**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4056N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	16		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.20611		
LONGITUDED:	-75.13917		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166467		

Construction Information:

Construction Date:	02/07/1992 00:00:00
Driller:	1863
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	8	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SH		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:
Site Use: MINE
Water Use: Not Reported

Owner Information:
Owner: WILLOWGROVE AIRRESER
Date Ownership: Not Reported

U108
SW **PA WELLS** **PA1000000055588**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	Not Reported
COUNTY:	MONTGOMERY		
AAPG:	1		
TOPOGRAPHY:	Not Reported		
WELLDEPTH:	400		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	Not Reported		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	Not Reported		
SOURCE DEPTH DATA:	Not Reported		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.1872		
LONGITUDED:	-75.15		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	215228		

Construction Information:
Construction Date: Not Reported
Driller: Not Reported
Source Cons Data: WELL OWNER
Method Cons: Not Reported
Finish: Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	Not Reported	Casing Diameter:	Not Reported
Casing:	STEEL		

Water Use Information:
Site Use: WITHDRAWAL
Water Use: PUBLIC SUPPLY

Owner Information:
Owner: HORSHAM WATER AUTHORITY
Date Ownership: Not Reported

Remarks Information:

Remark:	Population Served = 15768
Remark Date:	Not Reported

Other ID Information:

Other Identifier:	1460033	Other I D Assignor:	PA DEP PWSID

S109 **PA WELLS** **PA1000000055031**
SSE
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4033N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	40		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18333		
LONGITUDED:	-75.13194		
DEPTHTOBED:	20		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166444		

Construction Information:

Construction Date:	06/01/1992 00:00:00
Driller:	188
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	35	Casing Diameter:	5
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	Not Reported		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

U110
SW **PA WELLS** **PA1000000055578**
1/2 - 1 Mile
Lower

WELLID:	401113075090001	LOCALWELLN:	MG 962
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	VALLEY FLAT		
WELLDEPTH:	400		
ELEVATION:	320		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	5		
HYDROLOGIC:	02040201		
LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18694		
LONGITUDED:	-75.15		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27857		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	Not Reported
Driller:	1
Source Cons Data:	OTHER/UNKNOWN/UNSPECIFIED
Method Cons:	OTHER/UNKNOWN
Finish:	UNKNOWN

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	16	Casing Diameter:	22
Casing:	STEEL		
Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	12	Casing Diameter:	42
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	400	Hole Diameter:	12

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	PUBLIC SUPPLY

Owner Information:

Owner:	HORSHAM AUTH
Date Ownership:	01/01/1978 00:00:00

Other ID Information:

Other Identifier:	26	Other I D Assignor:	OWNER PA
Other Identifier:	D-79- 30 CP	Other I D Assignor:	DRBC
Other Identifier:	MG- 48	Other I D Assignor:	DRBC-PA

S111
SSE **PA WELLS** **SPAW0121913**
1/2 - 1 Mile
Lower

Well ID:	4033N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401100	Longitude:	750755
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	40	Finish:	OPEN HOLE
Casing 1:	35	Casing1 Diameter(inches):	5
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	6-92
Static Water Level:	10	Production WL:	40
Yield (gpm):	5	Yield Measurement Method:	E
Drawdown:	30	Test Time:	Not Reported
Bedrock:	20	Driller:	188
Water Bearing Zone 1:	22	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	Not Reported
Municipality:	HORSHAM	Remark:	ROCK TYPE: TRAPROCK
Aquifer:	STOCKTON FORMATION		

V112
WNW **FED USGS** **USGS2165221**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401149075091101
Site name:	MG 1856		
Latitude:	401149		
Longitude:	0750911	Dec lat:	40.19705286
Dec lon:	-75.15267313	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	321	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Upland draw		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	22.5	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		315.14

V113
WNW
1/2 - 1 Mile
Lower

FED USGS **USGS2165222**

Agency cd:	USGS	Site no:	401149075091102
Site name:	MG 1857		
Latitude:	401149		
Longitude:	0750911	Dec lat:	40.19705286
Dec lon:	-75.15267313	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	321	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Upland draw		
Site type:	Ground-water other than Spring	Date construction:	19970417
Date inventoried:	Not Reported	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	65	Hole depth:	144
Source of depth data:	geologist	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		314.44

V114
West
1/2 - 1 Mile
Lower

PA WELLS **PA1000000056932**

WELLID:	401148075091201	LOCALWELLN:	MG 1629
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	320		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19667		
LONGITUDED:	-75.15333		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43947		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	05/07/1997 00:00:00

Construction Information:

Construction Date:	05/07/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	13	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	143.800003051758	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	05/07/1997 00:00:00

Remarks Information:

Remark:	OTHER LOG - BOREHOLE VIDEO
Remark Date:	05/15/1997 00:00:00

V115
West **FED USGS** **USGS2165211**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	401148075091201
Site name:	MG 1629		
Latitude:	401148		
Longitude:	0750912	Dec lat:	40.19677509
Dec lon:	-75.15295092	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	320	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970507
Date inventoried:	19970507	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	143.8
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-05-15	Ground water data end date:	1997-05-15
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-05-15	10.62	

W116
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165319**

Agency cd:	USGS	Site no:	401142075091303
Site name:	MG 1855		
Latitude:	401142		
Longitude:	0750913	Dec lat:	40.19510845
Dec lon:	-75.15322874	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	349	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	179	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		336.42

W117
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165318**

Agency cd:	USGS	Site no:	401142075091302
Site name:	MG 1854		
Latitude:	401142		
Longitude:	0750913	Dec lat:	40.19510845
Dec lon:	-75.15322874	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	349	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	80	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		323.17

W118
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165317**

Agency cd:	USGS	Site no:	401142075091301
Site name:	MG 1853		
Latitude:	401142		
Longitude:	0750913	Dec lat:	40.19510845
Dec lon:	-75.15322874	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	349	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	32	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		324.85

S119
SSE **PA WELLS** **PA1000000055032**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4036N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	13		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18333		
LONGITUDED:	-75.13111		
DEPTHTOBED:	3		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166447		

Construction Information:

Construction Date:	06/01/1992 00:00:00
Driller:	188
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	8	Casing Diameter:	3
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	Not Reported		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

S120
SSE **PA WELLS** **SPAW0121916**
1/2 - 1 Mile
Lower

Well ID:	4036N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401100	Longitude:	750752
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	13	Finish:	OPEN HOLE
Casing 1:	8	Casing1 Diameter(inches):	3
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	6-92
Static Water Level:	11	Production WL:	13
Yield (gpm):	0.5	Yield Measurement Method:	E
Drawdown:	2	Test Time:	Not Reported
Bedrock:	3	Driller:	188
Water Bearing Zone 1:	9	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	Not Reported
Municipality:	HORSHAM	Remark:	ROCK TYPE: TRAPROCK
Aquifer:	STOCKTON FORMATION		

121
NE **PA WELLS** **PA1000000057610**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	Not Reported
COUNTY:	MONTGOMERY		
AAPG:	1		
TOPOGRAPHY:	Not Reported		
WELLDEPTH:	0		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	Not Reported		

LATLONGACCURACY:	Not Reported		
QUAD:	HATBORO		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	Not Reported		
SOURCE DEPTH DATA:	Not Reported		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.20139		
LONGITUDED:	-75.12472		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	219732		

Construction Information:

Construction Date:	Not Reported
Driller:	Not Reported
Source Cons Data:	Not Reported
Method Cons:	Not Reported
Finish:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	COMMERCIAL

Owner Information:

Owner:	RICHIE'S BAR AND GRILL
Date Ownership:	Not Reported

Remarks Information:

Remark:	Population Served = 100
Remark Date:	Not Reported

Other ID Information:

Other Identifier:	1461186	Other I D Assignor:	PA DEP PWSID

X122
SE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055209**

WELLID:	Not Reported	LOCALWELLN:	4108N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	22		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18444		
LONGITUDED:	-75.12833		

DEPTHTOBED: 15
DATEDRILLE: Not Reported
PAGWIS ID: 166519

Construction Information:
Construction Date: 04/01/1992 00:00:00
Driller: 188
Source Cons Data: DRILLER'S RECORD
Method Cons: Not Reported
Finish: OPEN HOLE

Casing Information:
Top Of Casing: 0
Bottom Of Casing: 17
Casing: Not Reported
Casing Wall Thickness: Not Reported
Casing Diameter: 5

Geohydrologic Information:
A A P G: 231SCKN
Lithology: SS
Contributing Unit: PRIMARY
Top Of Interval: Not Reported
Bottom Of Interval: Not Reported

Water Use Information:
Site Use: MINE
Water Use: Not Reported

Owner Information:
Owner: MOBIL
Date Ownership: Not Reported

X123
SE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121988**

Well ID: 4108N
Owner's Name: MOBIL
Latitude: 401104
Quadrangle: AMBLER
Hydrologic Unit: 02040202
Water Usage: Not Reported
Well Depth: 22
Casing 1: 17
Casing2: Not Reported
Grouted: Not Reported
Static Water Level: 10
Yield (gpm): 4
Drawdown: 12
Bedrock: 15
Water Bearing Zone 1: 21
Water Bearing Zone 3: Not Reported
Municipality: HORSHAM
Aquifer: STOCKTON FORMATION
County MONTGOMERY
Longitude: 750742
Lat/Long Accuracy: ACCURATE TO +1 MINUTE
Topographic Setting: HILLSIDE
Site Usage: MONITORING
Finish: OPEN HOLE
Casing1 Diameter(inches): 5
Casing2 Diameter(inches): Not Reported
Date Drilled: 4-92
Production WL: 22
Yield Measurement Method: E
Test Time: Not Reported
Driller: 188
Water Bearing Zone 2: Not Reported
Lithology: SANDSTONE
Remark: Not Reported

Map ID Direction Distance Elevation		Database	EDR ID Number
Y124 **SSE** **1/2 - 1 Mile** **Lower**		**PA WELLS**	**PA1000000055033**

WELLID:	Not Reported	LOCALWELLN:	4072N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	13		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18333		
LONGITUDED:	-75.13056		
DEPTHTOBED:	9.5		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166483		

Construction Information:

Construction Date:	10/01/1989 00:00:00		
Driller:	1625		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	3	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	Not Reported		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

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125 **South** **1/2 - 1 Mile** **Lower**	**PA WELLS**	**PA1000000054757**

WELLID:	Not Reported	LOCALWELLN:	Not Reported
COUNTY:	MONTGOMERY		
AAPG:	1		
TOPOGRAPHY:	Not Reported		
WELLDEPTH:	625		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	Not Reported		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	Not Reported		
SOURCE DEPTH DATA:	Not Reported		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.1822		
LONGITUDED:	-75.1408		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	215229		

Construction Information:

Construction Date:	Not Reported
Driller:	Not Reported
Source Cons Data:	WELL OWNER
Method Cons:	Not Reported
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	Not Reported	Casing Diameter:	Not Reported
Casing:	STEEL		

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	PUBLIC SUPPLY

Owner Information:

Owner:	HORSHAM WATER AUTHORITY
Date Ownership:	Not Reported

Remarks Information:

Remark:	Population Served = 15768
Remark Date:	Not Reported

Other ID Information:

Other Identifier:	1460033	Other I D Assignor:	PA DEP PWSID

Y126
SSE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121952**

Well ID:	4072N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401100	Longitude:	750750
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	13	Finish:	OPEN HOLE
Casing 1:	3	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	10-89
Static Water Level:	7.5	Production WL:	7.5
Yield (gpm):	2	Yield Measurement Method:	B
Drawdown:	Not Reported	Test Time:	1
Bedrock:	9.5	Driller:	1625
Water Bearing Zone 1:	9	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	Not Reported
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

X127
SE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055263**

WELLID:	Not Reported	LOCALWELLN:	4109N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	20		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18472		
LONGITUDED:	-75.1275		
DEPTHTOBED:	14		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166520		

Construction Information:

Construction Date:	04/01/1992 00:00:00
Driller:	188
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	16	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SS		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	MINE
Water Use:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

X128
SE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121989**

Well ID:	4109N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401105	Longitude:	750739
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	MONITORING
Well Depth:	20	Finish:	OPEN HOLE
Casing 1:	16	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	4-92
Static Water Level:	10	Production WL:	20
Yield (gpm):	2	Yield Measurement Method:	E
Drawdown:	10	Test Time:	Not Reported
Bedrock:	14	Driller:	188
Water Bearing Zone 1:	8	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	SANDSTONE
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

Z129
South
1/2 - 1 Mile
Lower

PA WELLS **PA1000000054703**

WELLID:	401054075081301	LOCALWELLN:	MG 518
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	75		
ELEVATION:	270		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	10		
HYDROLOGIC:	02040202		

LATLONGACCURACY: ACCURATE TO +1 SECOND
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported DATEUPDATE: Not Reported
DATARELIABILITY: NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)
SOURCE DEPTH DATA:OTHER/UNKNOWN/UNSPECIFIED
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.18167
LONGITUDED: -75.13694
DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 27811

Agency Use Section:
Agency Use of Site: OBSERVATION
Agency Use Date: Not Reported

Construction Information:
Construction Date: 11/08/1957 00:00:00
Driller: 0260
Source Cons Data: DRILLER'S RECORD
Method Cons: CABLE TOOL
Finish: OPEN HOLE

Casing Information:
Top Of Casing: 0 Casing Wall Thickness: Not Reported
Bottom Of Casing: 40 Casing Diameter: 6
Casing: UNKNOWN

Geohydrologic Information:
A A P G: 231SCKN
Lithology: UNKNOWN
Contributing Unit: PRIMARY
Top Of Interval: Not Reported Bottom Of Interval: Not Reported

Water Use Information:
Site Use: WITHDRAWAL
Water Use: DOMESTIC

Owner Information:
Owner: KILEY , M
Date Ownership: 01/01/1957 00:00:00

Z130
South **FED USGS** **USGS2165686**
1/2 - 1 Mile
Lower

Agency cd: USGS Site no: 401054075081301
Site name: MG 518
Latitude: 401054
Longitude: 0750813 Dec lat: 40.18177545
Dec lon: -75.13656185 Coor meth: M
Coor accr: S Latlong datum: NAD27
Dec latlong datum: NAD83 District: 42
State: 42 County: 091
Country: US Land net: Not Reported
Location map: AMBLER Map scale: 24000

Altitude:	265	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	19571108
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	75	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1957-11-08	Ground water data end date:	1957-11-08
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1957-11-08	38.00	

AA131
ENE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121981**

Well ID:	4101N		
Owner's Name:	APPLIANCE WORLD	County	MONTGOMERY
Latitude:	401159	Longitude:	750721
Quadrangle:	HATBORO	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	DOMESTIC	Site Usage:	WITHDRAWAL
Well Depth:	150	Finish:	OPEN HOLE
Casing 1:	40	Casing1 Diameter(inches):	6
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	8-87
Static Water Level:	Not Reported	Production WL:	Not Reported
Yield (gpm):	20	Yield Measurement Method:	E
Drawdown:	Not Reported	Test Time:	Not Reported
Bedrock:	5	Driller:	514
Water Bearing Zone 1:	85	Water Bearing Zone 2:	140
Water Bearing Zone 3:	Not Reported	Lithology:	SANDSTONE
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

AA132
ENE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000057349**

WELLID:	Not Reported	LOCALWELLN:	4101N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	150		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	HATBORO		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19972		
LONGITUDED:	-75.1225		
DEPTHTOBED:	5		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166512		

Construction Information:

Construction Date:	08/01/1987 00:00:00		
Driller:	514		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	40	Casing Diameter:	6
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SS		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	DOMESTIC

Owner Information:

Owner:	APPLIANCE WORLD INC
Date Ownership:	Not Reported

X133
SE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121991**

Well ID:	4111N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401103	Longitude:	750739
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	MONITORING
Well Depth:	22	Finish:	OPEN HOLE
Casing 1:	17	Casing1 Diameter(inches):	5
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	4-92
Static Water Level:	10	Production WL:	22
Yield (gpm):	0.5	Yield Measurement Method:	E
Drawdown:	12	Test Time:	Not Reported
Bedrock:	12	Driller:	188
Water Bearing Zone 1:	19	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	SANDSTONE
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

X134
SE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055163**

WELLID:	Not Reported	LOCALWELLN:	4111N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	22		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18417		
LONGITUDED:	-75.1275		
DEPTHTOBED:	12		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166522		

Construction Information:

Construction Date:	04/01/1992 00:00:00
Driller:	188
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	17	Casing Diameter:	5
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SS		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	MINE
Water Use:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

X135
SE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121990**

Well ID:	4110N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401103	Longitude:	750738
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	MONITORING
Well Depth:	20	Finish:	OPEN HOLE
Casing 1:	16	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	4-92
Static Water Level:	10	Production WL:	20
Yield (gpm):	0.5	Yield Measurement Method:	E
Drawdown:	10	Test Time:	Not Reported
Bedrock:	13	Driller:	188
Water Bearing Zone 1:	7	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	SANDSTONE
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

X136
SE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055164**

WELLID:	Not Reported	LOCALWELLN:	4110N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	20		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		

LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18417		
LONGITUDED:	-75.12722		
DEPTHTOBED:	13		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166521		

Construction Information:

Construction Date:	04/01/1992 00:00:00		
Driller:	188		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	16	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SS		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	MINE
Water Use:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

AB137
SW
1/2 - 1 Mile
Lower

PA WELLS **PA1000000055577**

WELLID:	401113075090701	LOCALWELLN:	MG 385
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	65		
ELEVATION:	330		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	10		
HYDROLOGIC:	02040202		

LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18694		
LONGITUDED:	-75.15194		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27858		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	01/01/1949 00:00:00
Driller:	1
Source Cons Data:	WELL OWNER
Method Cons:	CABLE TOOL
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	40	Casing Diameter:	6
Casing:	UNKNOWN		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	DOMESTIC

Owner Information:

Owner:	LAUER , S
Date Ownership:	01/01/1949 00:00:00

AB138
SW
1/2 - 1 Mile
Lower

FED USGS **USGS2165460**

Agency cd:	USGS	Site no:	401113075090701
Site name:	MG 385		
Latitude:	401113		
Longitude:	0750907	Dec lat:	40.18705307
Dec lon:	-75.15156219	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000

Altitude:	333	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	19490101
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	65	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1956-07-25	Ground water data end date:	1956-07-25
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1956-07-25	12.00	

AC139
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165213**

Agency cd:	USGS	Site no:	401148075091702
Site name:	MG 1859		
Latitude:	401148		
Longitude:	0750917	Dec lat:	40.19677508
Dec lon:	-75.15433985	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	310	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Upland draw		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	168.5	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		321.46

AC140
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165212**

Agency cd:	USGS	Site no:	401148075091701
Site name:	MG 1858		
Latitude:	401148		
Longitude:	0750917	Dec lat:	40.19677508
Dec lon:	-75.15433985	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	310	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Upland draw		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	20	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		308.14

AD141
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165356**

Agency cd:	USGS	Site no:	401123075091401
Site name:	MG 503		
Latitude:	401123		
Longitude:	0750914	Dec lat:	40.18983078
Dec lon:	-75.15350664	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	350	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19570822
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	77	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1957-08-22	Ground water data end date:	1957-08-22
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1957-08-22	18.00	

AE142
NNW
1/2 - 1 Mile
Lower

PA WELLS **PA1000000058343**

WELLID:	Not Reported	LOCALWELLN:	Not Reported
COUNTY:	MONTGOMERY		
AAPG:	1		
TOPOGRAPHY:	Not Reported		
WELLDEPTH:	352		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	Not Reported		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	Not Reported		
SOURCE DEPTH DATA:	Not Reported		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.2069		
LONGITUDED:	-75.1433		

DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 215241

Construction Information:
Construction Date: Not Reported
Driller: Not Reported
Source Cons Data: WELL OWNER
Method Cons: Not Reported
Finish: POROUS CONCRETE

Casing Information:
Top Of Casing: 0
Bottom Of Casing: 18
Casing: STEEL
Casing Wall Thickness: Not Reported
Casing Diameter: 10

Water Use Information:
Site Use: WITHDRAWAL
Water Use: PUBLIC SUPPLY

Owner Information:
Owner: NAVAL AIR JOINT RESERVE BASE
Date Ownership: Not Reported

Remarks Information:
Remark: Population Served = 6000
Remark Date: Not Reported

Other ID Information:
Other Identifier: 1460045
Other I D Assignor: PA DEP PWSID

AD143
WSW **PA WELLS** **PA1000000055930**
1/2 - 1 Mile
Lower

WELLID: 401123075091401
LOCALWELLN: MG 503
COUNTY: MONTGOMERY
AAPG: 231SCKN
TOPOGRAPHY: FLAT SURFACE
WELLDEPTH: 77
ELEVATION: 350
ELEVMETHOD: INTERPOLATED FROM TOPOGRAPHIC MAP
ACCURACYOF: 10
HYDROLOGIC: 02040202
LATLONGACCURACY: ACCURATE TO +1 SECOND
QUAD: AMBLER
TYPEOFSITE: WELL
DATECREATE: Not Reported
DATEUPDATE: Not Reported
DATARELIABILITY: NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)
SOURCE DEPTH DATA: OTHER/UNKNOWN/UNSPECIFIED
MUNICIPALITY: HORSHAM TWP.
LATITUDEDD: 40.18972
LONGITUDED: -75.15389

DEPTHTOBED: 0
DATEDRILLE: Not Reported
PAGWIS ID: 27886

Agency Use Section:
Agency Use of Site: OBSERVATION
Agency Use Date: Not Reported

Construction Information:
Construction Date: 08/22/1957 00:00:00
Driller: 0260
Source Cons Data: DRILLER'S RECORD
Method Cons: CABLE TOOL
Finish: OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	30	Casing Diameter:	6
Casing:	UNKNOWN		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SANDSTONE AND SHALE		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:
Site Use: WITHDRAWAL
Water Use: DOMESTIC

Owner Information:
Owner: TEDESCO , D
Date Ownership: 01/01/1957 00:00:00

AF144
SE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121992**

Well ID:	4112N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401103	Longitude:	750736
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	MONITORING
Well Depth:	22	Finish:	OPEN HOLE
Casing 1:	17	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	4-92
Static Water Level:	10	Production WL:	22
Yield (gpm):	2	Yield Measurement Method:	E
Drawdown:	12	Test Time:	Not Reported
Bedrock:	11	Driller:	188
Water Bearing Zone 1:	21	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	OTHER
Municipality:	HORSHAM	Remark:	ROCK TYPE: TRAPROCK
Aquifer:	STOCKTON FORMATION		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

Z145
South
1/2 - 1 Mile
Lower

FED USGS **USGS2165671**

Agency cd:	USGS	Site no:	401052075081301
Site name:	MG 514		
Latitude:	401052		
Longitude:	0750813	Dec lat:	40.1812199
Dec lon:	-75.13656186	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	290	Altitude method:	M
Altitude accuracy:	20	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	19570927
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	53	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1957-09-27	Ground water data end date:	1957-09-27
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1957-09-27	38.00	

Z146
South
1/2 - 1 Mile
Lower

PA WELLS **PA1000000054610**

WELLID:	401052075081301	LOCALWELLN:	MG 514
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	53		
ELEVATION:	300		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	20		
HYDROLOGIC:	02040202		

LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18111		
LONGITUDED:	-75.13694		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27805		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	09/27/1957 00:00:00
Driller:	0432
Source Cons Data:	DRILLER'S RECORD
Method Cons:	CABLE TOOL
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	30	Casing Diameter:	6
Casing:	UNKNOWN		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	DOMESTIC

Owner Information:

Owner:	TROUTMAN , F
Date Ownership:	01/01/1957 00:00:00

AF147
SE **PA WELLS** **PA1000000055165**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4112N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	22		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		

LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18417		
LONGITUDED:	-75.12667		
DEPTHTOBED:	11		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166523		

Construction Information:

Construction Date:	04/01/1992 00:00:00		
Driller:	188		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	17	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	O		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	MINE
Water Use:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: TRAPROCK
Remark Date:	Not Reported

AG148
SSE **PA WELLS** **SPAW0121954**
1/2 - 1 Mile
Lower

Well ID:	4074N		
Owner's Name:	MOBIL OIL CORP	County	MONTGOMERY
Latitude:	401058	Longitude:	750745
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	13	Finish:	OPEN HOLE
Casing 1:	3	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported

Grouted:	Not Reported	Date Drilled:	10-89
Static Water Level:	9	Production WL:	9
Yield (gpm):	2	Yield Measurement Method:	B
Drawdown:	Not Reported	Test Time:	1
Bedrock:	9.5	Driller:	1625
Water Bearing Zone 1:	9	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	OTHER
Municipality:	HORSHAM	Remark:	ROCK TYPE: SILTSTONE
Aquifer:	STOCKTON FORMATION		

AG149
SSE **PA WELLS** **PA1000000054883**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	4074N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	13		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18278		
LONGITUDED:	-75.12917		
DEPTHTOBED:	9.5		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166485		

Construction Information:

Construction Date:	10/01/1989 00:00:00
Driller:	1625
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	3	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	O		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:
Owner: MOBIL OIL CORP
Date Ownership: Not Reported

Remarks Information:
Remark: ROCK TYPE: SILTSTONE
Remark Date: Not Reported

150
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS2164977**

Agency cd:	USGS	Site no:	401223075084301
Site name:	MG 1949		
Latitude:	401223.25		
Longitude:	0750842.84	Dec lat:	40.20645833
Dec lon:	-75.14523333	Coor meth:	G
Coor accr:	1	Latlong datum:	NAD83
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	310	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	200305
Date inventoried:	20030506	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION,UPPER MEMBER		
Well depth:	120	Hole depth:	120
Source of depth data:	logs	Project number:	24769UX00
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	2003-05-06	Ground water data end date:	2003-05-06
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
2003-05-06	17.3	

AH151
NE
1/2 - 1 Mile
Lower

FED USGS **USGS2165005**

Agency cd:	USGS	Site no:	401207075072301
Site name:	BK 1013		
Latitude:	401207		
Longitude:	0750723	Dec lat:	40.20205286
Dec lon:	-75.12267218	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	HATBORO	Map scale:	24000
Altitude:	300	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	CrosswicksNeshaminy. New Jersey, Pennsylvania. Area = 521 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	444209300
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

AG152
SSE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121953**

Well ID:	4073N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401057	Longitude:	750745
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	13	Finish:	OPEN HOLE
Casing 1:	3	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	10-89
Static Water Level:	9	Production WL:	9
Yield (gpm):	2	Yield Measurement Method:	B
Drawdown:	Not Reported	Test Time:	1
Bedrock:	9.5	Driller:	1625
Water Bearing Zone 1:	9	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	OTHER
Municipality:	HORSHAM	Remark:	ROCK TYPE: SILTSTONE
Aquifer:	STOCKTON FORMATION		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

AG153
SSE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000054836**

WELLID:	Not Reported	LOCALWELLN:	4073N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	13		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.1825		
LONGITUDED:	-75.12917		
DEPTHTOBED:	9.5		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166484		

Construction Information:

Construction Date:	10/01/1989 00:00:00		
Driller:	1625		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	3	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	O		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Owner Information:

Owner:	MOBIL
Date Ownership:	Not Reported

Remarks Information:

Remark:	ROCK TYPE: SILTSTONE
Remark Date:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

AD154
WSW
1/2 - 1 Mile
Lower | **FED USGS** | **USGS2165528**

Agency cd:	USGS	Site no:	401121075091501
Site name:	MG 1740		
Latitude:	401121		
Longitude:	0750915	Dec lat:	40.18927524
Dec lon:	-75.15378443	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	346	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	CrosswicksNeshaminy. New Jersey, Pennsylvania. Area = 521 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-09-14	Ground water data end date:	1999-10-07
Ground water data count:	2		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1999-10-07	11.27		1999-09-14	15.75	

AE155
NNW
1/2 - 1 Mile
Lower | **PA WELLS** | **PA1000000058401**

WELLID:	401226075083801	LOCALWELLN:	MG 210
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	351		
ELEVATION:	310		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	5		
HYDROLOGIC:	02040201		

LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	WELL OWNER		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.20722		
LONGITUDED:	-75.14389		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27956		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	06/04/1942 00:00:00
Driller:	0541
Source Cons Data:	WELL OWNER
Method Cons:	CABLE TOOL
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	18	Casing Diameter:	16
Casing:	UNKNOWN		
Top Of Casing:	-12	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	43	Casing Diameter:	10
Casing:	UNKNOWN		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	18	Hole Diameter:	16
Top Of Hole:	18		
Bottom Of Hole:	351	Hole Diameter:	10

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SANDSTONE AND SHALE		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	PUBLIC SUPPLY

Owner Information:

Owner:	U S NAVAL AIR STATION
Date Ownership:	06/04/1942 00:00:00

Other ID Information:

Other Identifier:	2	Other I D Assignor:	OWNER PA

AH156
NE **PA WELLS** **PA1000000057744**
1/2 - 1 Mile
Lower

WELLID:	401207075072301	LOCALWELLN:	BK 1013
COUNTY:	BUCKS		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLTOP		
WELLDEPTH:	0		
ELEVATION:	300		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	5		
HYDROLOGIC:	02040201		
LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	HATBORO		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	WARMINSTER TWP.		
LATITUDEDD:	40.20222		
LONGITUDED:	-75.12306		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	5031		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	18	Casing Diameter:	16
Casing:	UNKNOWN		
Top Of Casing:	-12	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	43	Casing Diameter:	10
Casing:	UNKNOWN		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	18	Hole Diameter:	16
Top Of Hole:	18		
Bottom Of Hole:	351	Hole Diameter:	10

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	DOMESTIC

Owner Information:

Owner:	SERRILL
Date Ownership:	01/01/1941 00:00:00

AI157
SSE
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121951**

Well ID:	4071N		
Owner's Name:	MOBIL	County	MONTGOMERY
Latitude:	401054	Longitude:	750751
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	Not Reported
Well Depth:	13	Finish:	OPEN HOLE
Casing 1:	3	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Not Reported	Date Drilled:	10-89
Static Water Level:	9	Production WL:	9
Yield (gpm):	2	Yield Measurement Method:	B
Drawdown:	Not Reported	Test Time:	1
Bedrock:	95	Driller:	1625
Water Bearing Zone 1:	9	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	OTHER
Municipality:	HORSHAM	Remark:	ROCK TYPE: SILTSTONE
Aquifer:	STOCKTON FORMATION		

AI158
SSE
1/2 - 1 Mile
Lower

PA WELLS **PA1000000054704**

WELLID:	Not Reported	LOCALWELLN:	4071N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	13		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18167		
LONGITUDED:	-75.13083		

DEPTHTOBED: 95
DATEDRILLE: Not Reported
PAGWIS ID: 166482

Construction Information:
Construction Date: 10/01/1989 00:00:00
Driller: 1625
Source Cons Data: DRILLER'S RECORD
Method Cons: Not Reported
Finish: OPEN HOLE

Casing Information:
Top Of Casing: 0
Bottom Of Casing: 3
Casing: Not Reported
Casing Wall Thickness: Not Reported
Casing Diameter: 4

Geohydrologic Information:
A A P G: 231SCKN
Lithology: O
Contributing Unit: PRIMARY
Top Of Interval: Not Reported
Bottom Of Interval: Not Reported

Owner Information:
Owner: MOBIL
Date Ownership: Not Reported

Remarks Information:
Remark: ROCK TYPE: SILTSTONE
Remark Date: Not Reported

AJ159
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165347**

Agency cd: USGS
Site no: 401144075092103
Site name: MG 1862
Latitude: 401144
Longitude: 0750921
Dec lat: 40.19566399
Dec lon: -75.15545101
Coor meth: M
Coor accr: S
Latlong datum: NAD27
Dec latlong datum: NAD83
District: 42
State: 42
County: 017
Country: US
Land net: Not Reported
Location map: AMBLER
Map scale: 24000
Altitude: 323
Altitude method: L
Altitude accuracy: 1
Altitude datum: NGVD29
Hydrologic: Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.
Topographic: Hillside (slope)
Site type: Ground-water other than Spring
Date construction: Not Reported
Date inventoried: 19991007
Mean greenwich time offset: EST
Local standard time flag: Y
Type of ground water site: Single well, other than collector or Ranney type
Aquifer Type: Unconfined single aquifer
Aquifer: STOCKTON FORMATION
Well depth: 168
Hole depth: Not Reported
Source of depth data: reporting agency (generally USGS)
Project number: 444226200
Real time data flag: 0
Daily flow data begin date: 0000-00-00
Daily flow data end date: 0000-00-00
Daily flow data count: 0
Peak flow data begin date: 0000-00-00
Peak flow data end date: 0000-00-00

Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-01	Ground water data end date:	1999-10-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-01		331.93

AJ160
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165346**

Agency cd:	USGS	Site no:	401144075092102
Site name:	MG 1861		
Latitude:	401144		
Longitude:	0750921	Dec lat:	40.19566399
Dec lon:	-75.15545101	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	323	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	80	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		311.15

AJ161
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165345**

Agency cd:	USGS	Site no:	401144075092101
Site name:	MG 1860		
Latitude:	401144		
Longitude:	0750921	Dec lat:	40.19566399
Dec lon:	-75.15545101	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	323	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	35	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		321.74

AK162
NW
1/2 - 1 Mile
Lower

FED USGS **USGS2164967**

Agency cd:	USGS	Site no:	401221075085201
Site name:	MG 1950		
Latitude:	401221.02		
Longitude:	0750852.44	Dec lat:	40.20583889
Dec lon:	-75.1479	Coor meth:	G
Coor accr:	1	Latlong datum:	NAD83
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	315	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	200305
Date inventoried:	20030507	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION,UPPER MEMBER		
Well depth:	121	Hole depth:	121
Source of depth data:	logs	Project number:	24769UX00
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	2003-05-07	Ground water data end date:	2003-05-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
2003-05-07	25.7	

AE163
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS2164815**

Agency cd:	USGS	Site no:	401227075083802
Site name:	MG 1887		
Latitude:	401227		
Longitude:	0750838	Dec lat:	40.20760823
Dec lon:	-75.14350599	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	308.	Altitude method:	L
Altitude accuracy:	1.	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	85.	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

AE164
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS2164814**

Agency cd:	USGS	Site no:	401227075083801
Site name:	MG 1886		
Latitude:	401227		
Longitude:	0750838	Dec lat:	40.20760823
Dec lon:	-75.14350599	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	308.	Altitude method:	L
Altitude accuracy:	1.	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	38.5	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		291.73

AL165
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS2165667**

Agency cd:	USGS	Site no:	401051075083101
Site name:	MG 516		
Latitude:	401051		
Longitude:	0750831	Dec lat:	40.18094211
Dec lon:	-75.14156202	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000

Altitude:	275	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	19570830
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	84	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1957-08-30	Ground water data end date:	1957-08-30
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1957-08-30	20.00	

AL166
SSW **PA WELLS** **PA1000000054556**
1/2 - 1 Mile
Lower

WELLID:	401051075083101	LOCALWELLN:	MG 516
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	84		
ELEVATION:	275		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	5		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.18083		
LONGITUDED:	-75.14194		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	27803		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	08/30/1957 00:00:00
Driller:	0155
Source Cons Data:	DRILLER'S RECORD
Method Cons:	CABLE TOOL
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	42	Casing Diameter:	6
Casing:	UNKNOWN		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	UNKNOWN		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	DOMESTIC

Owner Information:

Owner:	MURPHY , F
Date Ownership:	01/01/1957 00:00:00

AE167
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS2164822**

Agency cd:	USGS	Site no:	401228075083702
Site name:	MG 1885		
Latitude:	401228		
Longitude:	0750837	Dec lat:	40.207886
Dec lon:	-75.1432282	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	307	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	90	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		294.39

AE168
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS2164821**

Agency cd:	USGS	Site no:	401228075083701
Site name:	MG 1884		
Latitude:	401228		
Longitude:	0750837	Dec lat:	40.207886
Dec lon:	-75.1432282	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	307	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19991007	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	35	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		291.82

AK169
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS2164978**

Agency cd:	USGS	Site no:	401223075085001
Site name:	MG 1948		
Latitude:	401223.45		
Longitude:	0750850.32	Dec lat:	40.20651389
Dec lon:	-75.14731111	Coor meth:	G
Coor accr:	1	Latlong datum:	NAD83
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	300	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	200305
Date inventoried:	20030506	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION,UPPER MEMBER		
Well depth:	70	Hole depth:	70
Source of depth data:	logs	Project number:	24769UX00
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	2003-05-06	Ground water data end date:	2003-05-06
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
2003-05-06	11.3	

170
ENE
1/2 - 1 Mile
Lower

AQUIFLOW **41243**

Site ID:	46-30724
Groundwater Flow:	E
Shallowest Water Table Depth:	6.82
Deepest Water Table Depth:	9.73
Average Water Table Depth:	Not Reported
Date:	ort

AK171
NNW
1/2 - 1 Mile
Lower

PA WELLS **PA1000000058298**

WELLID:	Not Reported	LOCALWELLN:	4055N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	HILLSIDE		
WELLDEPTH:	35		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		

LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.20639		
LONGITUDED:	-75.14778		
DEPTHTOBED:	34		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166466		

Construction Information:

Construction Date:	02/03/1992 00:00:00		
Driller:	1863		
Source Cons Data:	DRILLER'S RECORD		
Method Cons:	Not Reported		
Finish:	OPEN HOLE		

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	18	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SS		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	MINE
Water Use:	Not Reported

Owner Information:

Owner:	WILLOWGROVE AIRRESER
Date Ownership:	Not Reported

AK172
NNW
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121935**

Well ID:	4055N		
Owner's Name:	WILLOWGROVE	County	MONTGOMERY
Latitude:	401223	Longitude:	750852
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	HILLSIDE
Water Usage:	Not Reported	Site Usage:	MONITORING
Well Depth:	35	Finish:	OPEN HOLE
Casing 1:	18	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported

Grouted:	Not Reported	Date Drilled:	2-3-92
Static Water Level:	14	Production WL:	Not Reported
Yield (gpm):	4	Yield Measurement Method:	V
Drawdown:	Not Reported	Test Time:	1
Bedrock:	34	Driller:	1863
Water Bearing Zone 1:	32	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	SANDSTONE
Municipality:	HORSHAM	Remark:	Not Reported
Aquifer:	STOCKTON FORMATION		

AM173
NNW
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121904**

Well ID:	3301N		
Owner's Name:	EARTH DATA INC	County	MONTGOMERY
Latitude:	401230	Longitude:	750831
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	FLAT SURFACE
Water Usage:	INDUSTRIAL	Site Usage:	MONITORING
Well Depth:	31.6	Finish:	OPEN HOLE
Casing 1:	30	Casing1 Diameter(inches):	4
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Yes	Date Drilled:	10-84
Static Water Level:	Not Reported	Production WL:	Not Reported
Yield (gpm):	Not Reported	Yield Measurement Method:	Not Reported
Drawdown:	Not Reported	Test Time:	Not Reported
Bedrock:	Not Reported	Driller:	512
Water Bearing Zone 1:	Not Reported	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	Not Reported
Municipality:	HORSHAM	Remark:	CAS.MAT=PLAST;20FT=DIRT;31.
Aquifer:	STOCKTON FORMATION		

AN174
West
1/2 - 1 Mile
Lower

FED USGS **USGS2165292**

Agency cd:	USGS	Site no:	401140075092301
Site name:	MG 1630		
Latitude:	401140		
Longitude:	0750923	Dec lat:	40.1945529
Dec lon:	-75.15600661	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	319	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970530
Date inventoried:	19970530	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	74
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-06-05	Ground water data end date:	1997-06-05
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-06-05	13.17	

AN175
West
1/2 - 1 Mile
Lower

PA WELLS **PA1000000056539**

WELLID:	401140075092301	LOCALWELLN:	MG 1630
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	319		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.19444		
LONGITUDED:	-75.15639		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43939		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	05/30/1997 00:00:00

Construction Information:

Construction Date:	05/30/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	13	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	74	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	05/30/1997 00:00:00

AM176
NNW **PA WELLS** **PA1000000058546**
1/2 - 1 Mile
Lower

WELLID:	Not Reported	LOCALWELLN:	3301N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	31.6		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.20833		
LONGITUDED:	-75.14194		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	166435		

Construction Information:

Construction Date:	10/01/1984 00:00:00
Driller:	512
Source Cons Data:	DRILLER'S RECORD
Method Cons:	Not Reported
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	30	Casing Diameter:	4
Casing:	Not Reported		

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	Not Reported		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	MINE
Water Use:	INDUSTRIAL

Owner Information:

Owner:	EARTH DATA INC
Date Ownership:	Not Reported

Remarks Information:

Remark:	CAS.MAT=PLAST;20FT=DIRT;31.5FT=SANDSTONE
Remark Date:	Not Reported

AM177
NNW
1/2 - 1 Mile
Lower

PA WELLS **PA1000000058524**

WELLID:	Not Reported	LOCALWELLN:	Not Reported
COUNTY:	MONTGOMERY		
AAPG:	1		
TOPOGRAPHY:	Not Reported		
WELLDEPTH:	398		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	Not Reported		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	Not Reported		
SOURCE DEPTH DATA:	Not Reported		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.2083		
LONGITUDED:	-75.1422		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	215242		

Construction Information:

Construction Date:	Not Reported
Driller:	Not Reported
Source Cons Data:	WELL OWNER
Method Cons:	Not Reported
Finish:	POROUS CONCRETE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	26	Casing Diameter:	10
Casing:	STEEL		

Water Use Information:
Site Use: WITHDRAWAL
Water Use: PUBLIC SUPPLY

Owner Information:
Owner: NAVAL AIR JOINT RESERVE BASE
Date Ownership: Not Reported

Remarks Information:
Remark: Population Served = 6000
Remark Date: Not Reported

Other ID Information:
Other Identifier: 1460045 Other I D Assignor: PA DEP PWSID

AK178
NW
1/2 - 1 Mile
Lower

FED USGS **USGS2164974**

Agency cd:	USGS	Site no:	401222075085501
Site name:	MG 1951		
Latitude:	401221.85		
Longitude:	0750854.51	Dec lat:	40.20606944
Dec lon:	-75.148475	Coor meth:	G
Coor accr:	1	Latlong datum:	NAD83
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	315	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	200305
Date inventoried:	20030508	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION,UPPER MEMBER		
Well depth:	70	Hole depth:	70
Source of depth data:	logs	Project number:	24769UX00
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	2003-05-08	Ground water data end date:	2003-05-08
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
2003-05-08	12.2	

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

AO179
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS2164830**

Agency cd:	USGS	Site no:	401229075083702
Site name:	MG 1892		
Latitude:	401229		
Longitude:	0750837	Dec lat:	40.20816378
Dec lon:	-75.14322819	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	017
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	306	Altitude method:	L
Altitude accuracy:	1	Altitude datum:	NGVD29
Hydrologic:	Lower Delaware. New Jersey, Pennsylvania. Area = 1050 sq.mi.		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	19970520
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Unconfined single aquifer		
Aquifer:	STOCKTON FORMATION		
Well depth:	34	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)	Project number:	444226200
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1999-10-07	Ground water data end date:	1999-10-07
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1999-10-07		291.76

AO180
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS2164829**

Agency cd:	USGS	Site no:	401229075083701
Site name:	MG 1633		
Latitude:	401229		
Longitude:	0750837	Dec lat:	40.20816378
Dec lon:	-75.14322819	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000

Altitude:	308	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970519
Date inventoried:	19970519	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	99
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-06-05	Ground water data end date:	1997-06-05
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-06-05	13.58	

AO181
NNW **PA WELLS** **PA1000000058510**
1/2 - 1 Mile
Lower

WELLID:	401229075083701	LOCALWELLN:	MG 1633
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	308		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.20806		
LONGITUDED:	-75.14361		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43962		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	05/19/1997 00:00:00

Construction Information:

Construction Date:	05/19/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	25	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	99	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	05/19/1997 00:00:00

AM182
NNW **PA WELLS** **PA1000000058545**
1/2 - 1 Mile
Lower

WELLID:	401230075083301	LOCALWELLN:	MG 209
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	397		
ELEVATION:	310		
ELEVMETHOD:	INTERPOLATED FROM TOPOGRAPHIC MAP		
ACCURACYOF:	5		
HYDROLOGIC:	02040201		
LATLONGACCURACY:	ACCURATE TO +1 SECOND		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	OTHER/UNKNOWN/UNSPECIFIED		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.20833		
LONGITUDED:	-75.1425		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	28610		

Agency Use Section:

Agency Use of Site:	OBSERVATION
Agency Use Date:	Not Reported

Construction Information:

Construction Date:	01/01/1942 00:00:00
Driller:	0514
Source Cons Data:	WELL OWNER
Method Cons:	OTHER/UNKNOWN
Finish:	OPEN HOLE

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	26	Casing Diameter:	16
Casing:	UNKNOWN		
Top Of Casing:	-18	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	52	Casing Diameter:	10
Casing:	UNKNOWN		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	26	Hole Diameter:	16
Top Of Hole:	26		
Bottom Of Hole:	52	Hole Diameter:	15
Top Of Hole:	52		
Bottom Of Hole:	397	Hole Diameter:	10

Geohydrologic Information:

A A P G:	231SCKN		
Lithology:	SANDSTONE AND SHALE		
Contributing Unit:	PRIMARY		
Top Of Interval:	Not Reported	Bottom Of Interval:	Not Reported

Water Use Information:

Site Use:	WITHDRAWAL
Water Use:	PUBLIC SUPPLY

Owner Information:

Owner:	U S NAVAL AIR STATION
Date Ownership:	01/01/1942 00:00:00

Other ID Information:

Other Identifier:	1	Other I D Assignor:	OWNER PA

AO183
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS2164823**

Agency cd:	USGS	Site no:	401228075084101
Site name:	MG 1631		
Latitude:	401228		
Longitude:	0750841	Dec lat:	40.207886
Dec lon:	-75.14433934	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000

Altitude:	302	Altitude method:	M
Altitude accuracy:	10	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19970516
Date inventoried:	19970516	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION		
Well depth:	Not Reported	Hole depth:	99
Source of depth data:	reporting agency (generally USGS)	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1997-06-05	Ground water data end date:	1997-06-05
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1997-06-05	11.66	

AO184
NNW **PA WELLS** **PA1000000058481**
1/2 - 1 Mile
Lower

WELLID:	401228075084101	LOCALWELLN:	MG 1631
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	0		
ELEVATION:	302		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	10		
HYDROLOGIC:	02040203		
LATLONGACCURACY:	Not Reported		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	FIELD CHECKED BY REPORTING AGENCY (PaDAg pest. survey)		
SOURCE DEPTH DATA:	USGS OR PAGS		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.20778		
LONGITUDED:	-75.14472		
DEPTHTOBED:	0		
DATEDRILLE:	Not Reported		
PAGWIS ID:	43961		

Agency Use Section:

Agency Use of Site:	I
Agency Use Date:	05/16/1997 00:00:00

Construction Information:

Construction Date:	05/16/1997 00:00:00
Driller:	1
Source Cons Data:	DRILLER'S RECORD
Method Cons:	AIR ROTARY
Finish:	Not Reported

Casing Information:

Top Of Casing:	0	Casing Wall Thickness:	Not Reported
Bottom Of Casing:	19	Casing Diameter:	6
Casing:	STEEL		

Hole Information:

Top Of Hole:	0		
Bottom Of Hole:	99	Hole Diameter:	0

Water Use Information:

Site Use:	OBSERVATION
Water Use:	UNUSED

Owner Information:

Owner:	U.S. NAVAL AIR STATION
Date Ownership:	05/16/1997 00:00:00

AK185
NW
1/2 - 1 Mile
Lower

FED USGS **USGS2164975**

Agency cd:	USGS	Site no:	401222075085502
Site name:	MG 1952		
Latitude:	401221.87		
Longitude:	0750854.93	Dec lat:	40.206075
Dec lon:	-75.14859167	Coor meth:	G
Coor accr:	1	Latlong datum:	NAD83
Dec latlong datum:	NAD83	District:	42
State:	42	County:	091
Country:	US	Land net:	Not Reported
Location map:	AMBLER	Map scale:	24000
Altitude:	320	Altitude method:	M
Altitude accuracy:	5	Altitude datum:	NGVD29
Hydrologic:	Schuylkill. Pennsylvania. Area = 1900 sq.mi.		
Topographic:	Hillside (slope)		
Site type:	Ground-water other than Spring	Date construction:	200305
Date inventoried:	20030508	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STOCKTON FORMATION,UPPER MEMBER		
Well depth:	46	Hole depth:	Not Reported
Source of depth data:	logs	Project number:	24769UX00
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	2003-05-08	Ground water data end date:	2003-05-08
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
2003-05-08	39.9	

AM186
North
1/2 - 1 Mile
Lower

PA WELLS **SPAW0121903**

Well ID:	3300N		
Owner's Name:	EARTH DATA INC	County	MONTGOMERY
Latitude:	401231	Longitude:	750828
Quadrangle:	AMBLER	Lat/Long Accuracy:	ACCURATE TO +1 MINUTE
Hydrologic Unit:	02040202	Topographic Setting:	FLAT SURFACE
Water Usage:	INDUSTRIAL	Site Usage:	MONITORING
Well Depth:	200	Finish:	OPEN HOLE
Casing 1:	50	Casing1 Diameter(inches):	6
Casing2:	Not Reported	Casing2 Diameter(inches):	Not Reported
Grouted:	Yes	Date Drilled:	10-84
Static Water Level:	Not Reported	Production WL:	Not Reported
Yield (gpm):	30	Yield Measurement Method:	Not Reported
Drawdown:	Not Reported	Test Time:	Not Reported
Bedrock:	30	Driller:	512
Water Bearing Zone 1:	Not Reported	Water Bearing Zone 2:	Not Reported
Water Bearing Zone 3:	Not Reported	Lithology:	Not Reported
Municipality:	HORSHAM	Remark:	CAS.MAT=STEEL;15FT=DIRT;200
Aquifer:	STOCKTON FORMATION		

AM187
North
1/2 - 1 Mile
Lower

PA WELLS **PA1000000058569**

WELLID:	Not Reported	LOCALWELLN:	3300N
COUNTY:	MONTGOMERY		
AAPG:	231SCKN		
TOPOGRAPHY:	FLAT SURFACE		
WELLDEPTH:	200		
ELEVATION:	0		
ELEVMETHOD:	Not Reported		
ACCURACYOF:	Not Reported		
HYDROLOGIC:	02040202		
LATLONGACCURACY:	ACCURATE TO +1 MINUTE		
QUAD:	AMBLER		
TYPEOFSITE:	WELL		
DATECREATE:	Not Reported	DATEUPDATE:	Not Reported
DATARELIABILITY:	LOCATION MAY NOT BE ACCURATE (WWI paper)		
SOURCE DEPTH DATA:	DRILLER'S RECORD		
MUNICIPALITY:	HORSHAM TWP.		
LATITUDEDD:	40.20861		
LONGITUDED:	-75.14111		

DEPTHTOBED: 30
DATEDRILLE: Not Reported
PAGWIS ID: 166434

Construction Information:
Construction Date: 10/01/1984 00:00:00
Driller: 512
Source Cons Data: DRILLER'S RECORD
Method Cons: Not Reported
Finish: OPEN HOLE

Casing Information:
Top Of Casing: 0
Bottom Of Casing: 50
Casing: Not Reported
Casing Wall Thickness: Not Reported
Casing Diameter: 6

Geohydrologic Information:
A A P G: 231SCKN
Lithology: Not Reported
Contributing Unit: PRIMARY
Top Of Interval: Not Reported
Bottom Of Interval: Not Reported

Water Use Information:
Site Use: MINE
Water Use: INDUSTRIAL

Owner Information:
Owner: EARTH DATA INC
Date Ownership: Not Reported

Remarks Information:
Remark: CAS.MAT=STEEL;15FT=DIRT;200FT=SANDSTONE
Remark Date: Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: PA Radon

Test Result Statistics

Zip	Total Sites	Min pCi/L	Max pCi/L	Avg pCi/L
19044	850	0	89.7	4.1

EPA Region 3 Statistical Summary Readings for Zip Code: 19044

Number of sites tested: 515.

Maximum Radon Level: 126.0 pCi/L.
Minimum Radon Level: 0.1 pCi/L.

pCi/L <4	pCi/L 4-10	pCi/L 10-20	pCi/L 20-50	pCi/L 50-100	pCi/L >100
381 (73.98%)	93 (18.06%)	28 (5.44%)	10 (1.94%)	1 (0.19%)	2 (0.39%)

Federal EPA Radon Zone for MONTGOMERY County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Pennsylvania Public Water Supply Wells
Source: Pennsylvania Department of Environmental Resources Bureau of Water Supply
Telephone: 717-787-5017

Pennsylvania Groundwater Information System
Source: Department of Conservation and Natural Resources
Telephone: 717-783-7258

OTHER STATE DATABASE INFORMATION

RADON

State Database: PA Radon
Source: Department of Environmental Protection
Telephone: 717-783-3594
Radon Test Results Statistics by Zip Code

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

EPA Region 3 Statistical Summary Readings
Source: Region 3 EPA
Telephone: 215-814-2082
Radon readings for Delaware, D.C., Maryland, Pennsylvania, Virginia and West Virginia.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

STREET AND ADDRESS INFORMATION

Fax To: CH2M Hill
Contact: Mary Beth Jacques
Fax : 404-229-9152
Date: 07/13/2006

Fax From: Bart Sobieralski
EDR
Phone: 1-800-352-0050

EDR PUR-IQ® Report

"the intelligent way to conduct historical research"

for
Horsham Memorial USARC
936 EASTON ROAD
HORSHAM, PA 19044
Lat./Long. 40.19450 / 75.13740
EDR Inquiry # 01714247.230r

The EDR PUR-IQ report facilitates historical research planning required to complete the Phase I ESA process. The report identifies the *likelihood* of prior use coverage by searching proprietary EDR-Prior Use Reports® comprising nationwide information on: city directories, fire insurance maps, aerial photographs, historical topographic maps, flood maps and National Wetland Inventory maps.

Potential for EDR Historical (Prior Use) Coverage - Coverage in the following historical information sources may be used as a guide to develop your historical research strategy:

1. City Directory:	Coverage may exist for portions of Montgomery County, PA.
2. Fire Insurance Map:	When you order online any EDR Package or the EDR Radius Map with EDR Sanborn Map Search/Print, you receive site specific Sanborn Map coverage information at no charge.
3. Aerial Photograph:	Coverage exists for portions of Montgomery County for 1942, 1958, 1969, 1971, 1987, 1992 Shipping time 3-5 business days.
4. Topographic Map:	The USGS 7.5 min. quad topo sheet(s) associated with this site:

Historical: Coverage exists for Montgomery County

Current:	Target Property:	TP | 1983 | 40075-B2 Ambler, PA
	Additional required for 1 Mile radius:	E | 1983 | 40075-B1 Hatboro, PA

EDR's network of professional researchers, located throughout the United States, accesses the most extensive national collections of city directory, fire insurance maps, aerial photographs and historical topographic map resources available for HORSHAM, PA. These collections may be located in multiple libraries throughout the country. To ensure maximum coverage, EDR will often assign researchers at these multiple locations on your behalf. Please call or fax your EDR representative to authorize a search.

EDR - HISTORICAL SOURCE(S) ORDER FORM

CH2M Hill
Mary Beth Jacques
Account # 1592163

Horsham Memorial USARC
936 EASTON ROAD
HORSHAM, PA 19044
Montgomery County
Lat./Long. 40.19450 / 75.13740
EDR Inquiry # 01714247.230r

Should you wish to change or add to your order, fax this form to your EDR account executive:

Bart Sobieralski
Ph: 1-800-352-0050 Fax: 1-800-231-6802

Reports

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___ EDR Multi-Tenant Retail Facility® Report

___ EDR City Directory Abstract

___ EDR Aerial Photo Decade Package

___ USGS Aerial 5 Package

___ USGS Aerial 3 Package

___ EDR Historical Topographic Maps

___ Paper Current USGS Topo (7.5 min.)

___ Environmental Lien Search

___ Chain of Title Search

___ NJ MacRaes Industrial Directory Report

___ EDR Telephone Interview

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Thank you