INSTALLATION RESTORATION PROGRAM

INDIANA AIR NATIONAL GUARD
122nd TACTICAL FIGHTER WING
FORT WAYNE, INDIANA

SITE INSPECTION REPORT

FINAL

AIR NATIONAL GUARD

HAZWRAP SUPPORT CONTRACTOR OFFICE
Oak Ridge, Tennessee 37831
Operated by MARTIN MARIETTA ENERGY SYSTEMS, INC.
For the U.S. DEPARTMENT OF ENERGY under contract DE-AC05-840R21400

AIR NATIONAL GUARD
INSTALLATION RESTORATION PROGRAM
INDIANA AIR NATIONAL GUARD
122nd TACTICAL FIGHTER WING
FORT WAYNE, INDIANA

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SITE INSPECTION REPORT
FINAL

Submitted to:

Air National Guard Readiness Center
Andrews Air Force Base, Maryland

Submitted by:

Hazardous Waste Remedial Actions Program
Martin Marietta Energy Systems, Inc.
Oak Ridge, Tennessee

For the:

U.S. Department of Energy
Under Contract No. DE-AC05-840R21400
General Order No. 89B-99790C, Task Y-01

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01-0827-03-0349-009

January 1994

TABLE OF CONTENTS

Table of Contents
(Continued)

Table of Contents
(Continued)

Table of Contents
(Continued)

APPENDICES

Appendix A - Soil Gas Survey

Appendix B - Borehole Logs & Monitoring Well As-Builts

Appendix C - Sample Location Survey Coordinates

Appendix D - Aquifer Test Procedures and Results and Water Level Measurement Results

Appendix E - Laboratory Analytical Results Data Presentation

Appendix F - Data Quality Assessment

Appendix G - Risk Assessment Procedures

Appendix H - Geotechnical Analytical Results

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES
(continued)

LIST OF TABLES
(continued)

LIST OF ACRONYMS AND ABBREVIATIONS

ADI	Average Daily Intake
ANGB	Air National Guard Base
ANGRC	Air National Guard Readiness Center
ARAR	Applicable or Relevant and Appropriate Requirement
ASTM	American Society for Testing and Materials
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CLP	Contract Laboratory Program
CRDL	Contract Required Detection Limit
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DQO	Data Quality Objective
EIS	Environmental Impact Statement
Energy Systems	Martin Marietta Energy Systems, Inc.
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FFS	Focused Feasibility Study
FID	Flame Ionization Detector
FS	Feasibility Study
FTA	Fire Training Area
GC/MS	Gas Chromatography/Mass Spectrometry
HAZWRAP	Hazardous Waste Remedial Actions Program
HEAST	Hazard Evaluation Assessment Summary Table
HI	Hazard Index
HMTC	Hazardous Materials Technical Center
HQ	Hazard Quotient
HWCA	Hazardous Waste Collection Area
ID	Inside Diameter

List of Acronyms and Abbreviations (Continued)

IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
LCS	Laboratory Control Sample
LOAEL	Lowest-Observable-Adverse-Effect Level
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MSL	Mean Sea Level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NCP	National Contingency Plan
NGB	National Guard Bureau
NIST	National Institute of Science and Technology
NOAA	National Oceanographic and Atmospheric Administration
NOAEL	No-Observable-Adverse-Effect Level
OD	Outside Diameter
OER	Office of Environmental Response
PA	Preliminary Assessment
PAH	Polynuclear Aromatic Hydrocarbon
PARCC	Precision, Accuracy, Representativeness, Comparability, and Completeness
PCB	Polychlorinated Biphenyl
PDF	Probability Density Function
PMCL	Proposed Maximum Contaminant Level
PMCLG	Proposed Maximum Contaminant Level Goal
POL	Petroleum, Oil, and Lubricants
PRP	Potentially Responsible Party
QA/QC	Quality Assurance/Quality Control
RD	Remedial Design
RfC	Reference Concentration

List of Acronyms and Abbreviations (Continued)

RfD	Reference Dose
RI	Remedial Investigation
RM	Remedial Measure
RME	Reasonable Maximum Exposure
RPD	Relative Percent Difference
SAIC	Science Applications International Corporation
SI	Site Inspection
SOP	Standard Operating Procedure
SOW	Statement of Work
SVOC	Semivolatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TIC	Tentatively Identified Compound
TPH	Total Petroleum Hydrocarbon
TRC	Tracer Research Corporation
USGS	U.S. Geodetic Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

This Site Inspection (SI) Report presents the findings of an SI conducted under the U.S. Department of Defense (DOD) Installation Restoration Program (IRP) at three sites at the 122nd Tactical Fighter Wing, Indiana Air National Guard Base (ANGB), Fort Wayne, Indiana. The SI was conducted in two phases; the first phase was planned and conducted to obtain data to confirm the presence or absence of suspected environmental contamination at the three sites. The Phase I activities were conducted during August and September 1990. During Phase . activities, contamination in site soils was found. It also was determined that additional data were needed to fill in data gaps that were identified during the evaluation of field and laboratory data. Accordingly, Phase II activities were planned to obtain data to:

- Confirm the presence of contaminants detected during Phase I
- Delineate the extent of contamination found
- Evaluate the risk posed by any verified contamination to human health and the environment.

Phase II activities were conducted during October and November 1991. This report presents the findings and conclusions from the overall SI activities and presents recommendations for the three s: :s investigated.

Site 1 - Former Fire Training Area (FTA) was in operation from the late 1950s to 1972. An estimated 9,500 gallons of jet fuel and some waste oil and gasoline were used at this site during the period of operation. Site 3 - Hazardous Waste Collection Area (HWCA) is a 40-foot square gravel area enclosed by a fence. Since 1954, waste oils, solvents, paints, and thinners from various shops were collected and stored in drums at this location. Site 4 - POL Spill Area was the location of a 5,000- to 5,300-gallon jet fuel spill in 1968. The fuel was flushed from the immediate area and into the surface drainage system with approximately 200,000 gallons of water.

Phase I of the SI program included drilling and sampling soil borings, installing and sampling monitoring wells and piezometers, sediment sampling, soil gas testing, static water level measuring, and aquifer testing. Phase II of the SI included additional drilling and sampling of soil borings, sampling of existing monitoring wells and piezometers, static water level measuring, and sediment sampling. U.S. Environmental Protection Agency (EPA) protocols established for sampling, chain of custody, and quality assurance/quality control (QA/QC) were followed during the SI program. Results from the 1991 SI activities confirmed the overall results of the 1990 program and provided additional information concerning the extent of contamination at the sites.

In evaluating the significance of contamination detected at Site 1, it should be noted that the former FTA surface where the actual burning occurred is located approximately 10 to 12 feet below current ground surface under a layer of clay-rich fill. Contaminants related to fire training activities conducted at this site are believed to be at the former surface or below the former surface.

Contaminants were detected in the fill layer, but are not considered to be related to fire training activities that occurred at the site. The significance of the presence of these contaminants was evaluated through the performance of a preliminary risk evaluation.

Contamination at Site 1 resulting from fire training activities appears to be present at and below the old surface in an area immediately downslope from the former FTA, extending 60 to 80 feet west of the burn area. The western extent of contamination is estimated to be less than 85 feet from the burn area. Contaminants were not detected in subsurface soils at depths greater than 5 feet below the former FTA surface. The contamination consists of benzene, toluene, ethylbenzene and xylenes (BTEX) compounds that are major components of aviation fuel, and semivolatile organic compounds (SVOCs) that includes a list of several polynuclear aromatic hydrocarbons (PAHs). PAHs are products of combustion and typically are found in burn areas.

No contaminants were detected in the groundwater at Site 1. This is consistent with the soil sampling results, which indicate that contaminants have not migrated beyond 5 feet below the former FTA surface. The thick clay layer that exists throughout the subsurface at the site appears to confine vertical migration of contaminants within close proximity of the former FTA surface.

The risk evaluation conducted for exposure to contaminants at the site showed that carcinogenic and noncarcinogenic risks to public health are within the acceptable range for current and future use scenarios. Based on the evaluation of analytical results, site geology, and risks to human health and the environment, it appears that the overall significance of the observed nature and extent of contamination is minimal.

At Site 3 - HWCA, the contamination in soils consists primarily of oil and grease. Contamination at this site is within the fence that encloses the drum storage area. The contamination is predominantly in the top 4 feet of soils, which also coincides with the thickness of a sand and gravel layer in place within the fenced area. The results of the groundwater analyses show that the underlying aquifer has not been impacted. This is consistent with the conclusion that contamination (consisting of mostly oils and grease) is predominantly in the top 4 feet of soils and has not migrated toward the groundwater table.

The results of the preliminary risk evaluation conducted for Site 3 show that current carcinogenic and noncarcinogenic risks to Base personnel and future risks to onsite construction workers are within the acceptable range.

At Site 4 - POL Spill Area, the analytical results of soil, groundwater, and sediment samples collected show that there is minimal residual contamination at the site resulting from the spill that occurred in 1968. Groundwater at the site has not been impacted; in addition, potential for contaminants to migrate to groundwater is minimal because of the dense clay layer that comprises the subsurface geology.

Other factors that reduce the significance of the low contamination detected at Site 4 include limited access to the site; absence of threatened or endangered species or critical habitats; and no residences, groundwater wells, or surface water resources within 1/4 mile of the site. In addition, the former underground storage tank (UST) system was replaced with an aboveground system built in accordance with regulatory requirements.

A preliminary qualitative evaluation of impacts to the ecology shows that no threatened or endangered species are on Base, and no critical habitats that could be impacted by the contaminants observed at the sites. Therefore, no further data collection or remedial actions are required for these three sites under the IRP. It is recommended, however, that appropriate operating procedures for Site 3 are instituted and followed to minimize the potential for future spills to impact the site. A concrete pad with a surrounding berm or other containment procedure should be considered.

1. INTRODUCTION

This report documents the Site Inspection (SI) activities that Science Applications International Corporation (SAIC) conducted at the 122nd Tactical Fighter Wing, Indiana Air National Guard Base (ANGB), Fort Wayne, Indiana (hereinafter referred to as Indiana ANGB or the Base). The SI was performed under the U.S. Department of Defense (DOD) Installation Restoration Program (IRP). As part of the IRP, the Air Force has entered into an interagency agreement with the U.S. Department of Energy (DOE) under which DOE provides technical assistance in implementing the IRP. Martin Marietta Energy Systems, Inc. (Energy Systems), under contract with DOE, is responsible for managing this effort under the interagency agreement through its Hazardous Waste Remedial Actions Program (HAZWRAP) Division. SAIC provides support for this investigation through an existing general order agreement with HAZWRAP.

1.1 INSTALLATION RESTORATION PROGRAM OBJECTIVES AND SEQUENCE

The objectives of the IRP are to identify, quantify, and evaluate feasible remedies for environmental problems caused by hazardous materials used or disposed of at DOD installations. The five phases that constitute the IRP process and the purpose and activities associated with each phase are presented below:

- *Preliminary Assessment* - A Preliminary Assessment (PA) is performed to identify and evaluate the type and location of suspected problems associated with past hazardous waste handling procedures, disposal sites, and spill sites. This is accomplished through interviews with past and present Base employees, historical records searches, and visual site inspections. In addition, detailed geologic, hydrologic, meteorologic, land use, and environmental data for the study area are gathered. A detailed analysis of all information obtained identifies sites of concern. The PA for Indiana ANGB was completed by the Hazardous Materials Technical Center (HMTC) in April 1988.
- *Site Inspection* - The purpose of an SI is to acquire the necessary data to either confirm the presence or absence of suspected environmental contamination at each identified site of concern and to assess the potential risks to human health, welfare, and the environment. The SI includes identification of specific chemical contaminants and their concentrations in environmental media and evaluates the potential for contaminant migration through site-specific hydrogeologic determinations. SAIC performed Phase I of the SI for Indiana ANGB in 1990 and Phase II in 1991.

- ***Remedial Investigation*** - A Remedial Investigation (RI) is conducted to acquire the necessary data to define the extent of confirmed environmental contamination and to assess further the associated potential risks to human health, welfare, and the environment. The RI quantifies the magnitude and extent of contamination at the sites under investigation and identifies the specific chemical contaminants present and their concentrations in environmental media. A determination also is made as to the potential for contaminant migration by assessing site-specific hydrogeologic and contaminant characteristics.
- ***Feasibility Study*** - The objective of a Feasibility Study (FS) is to develop the remedial action alternative that mitigates confirmed environmental contamination at each site and meets the applicable or relevant and appropriate requirements (ARARs). The FS considers risk assessments and cost benefit analyses in providing the necessary data, direction, and documented supportive rationale to acquire regulatory concurrence (Federal, state, and local) with the recommended remedial alternative. The FS evaluates, develops, and provides recommendations for remedial actions at each site where remediation is required.
- ***Remedial Design*** - The Remedial Design (RD) phase provides engineering design drawings and construction specifications required to implement the recommended remedial action selected through the FS process. Implementation of the remediation plan requires appropriate regulatory acceptance.

1.2 PROJECT BACKGROUND AND PURPOSE

As part of the IRP, HMTC completed a PA of Indiana ANGB for the Air National Guard Readiness Center (ANGRC) in April 1988. The PA identified and evaluated the type and location of potential problem areas through interviews with past and present Base employees, historical records searches, and visual site inspections. In addition, environmental and land use data were collected for the area of study and reported in the PA. The PA indicated that the potential for contamination of surface water, soils, and groundwater existed at the following four sites and recommended further investigation:

- Site 1 - Former Fire Training Area
- Site 2 - Old Motor Pool Area
- Site 3 - Hazardous Waste Collection Area
- Site 4 - POL Spill Area.

The ANGRC specifically requested the support of DOE in assessing the extent of possible contamination at Site 1 - Former Fire Training Area, Site 3 - Hazardous Waste Collection Area, and Site 4 - POL Spill Area. The lead agency for investigation of Site 2 - Old Motor Pool Area is the U.S. Army Corps of Engineers (USACOE). Site 2 was not investigated under the IRP as part of this SI because DOD may be a potentially responsible party (PRP). Therefore, Site 2 was investigated under a project managed by the USACOE following the guidelines of state and Federal regulatory agencies. As a result of this investigation, the USACOE has taken corrective measures to remove an abandoned UST at Site 2 and address potential petroleum contamination at the site. In addition, ANGRC has begun activities to investigate a potential PCB spill area and assess the potential presence of other USTs at the site.

Following the PA, the first phase of the SI was planned to collect data that would confirm the presence or absence of suspected environmental contamination at the three sites (i.e., Sites 1, 3, and 4). Phase I activities began August 13, 1990 and ended September 10, 1990. During Phase I, soil contamination was detected at the three sites. However, it was determined that additional investigations were needed to fill in data gaps. Phase II was planned to collect additional data to:

- Confirm the presence of contaminants detected during Phase I
- Delineate the extent of contamination found
- Evaluate the risk posed by any confirmed contamination to human health and the environment.

Phase II activities began October 28, 1991 and ended November 7, 1991. This report summarizes the results from both phases of field activities. The evaluation of the significance of field and analytical results has been consolidated using the results obtained during Phases I and II of the SI.

1.3 REPORT ORGANIZATION

This SI Report contains the following sections:

- ***Section 1. Introduction*** -- The remainder of this section summarizes the history of Indiana ANGB, the specifics of each individual site, and the previous studies conducted at Indiana ANGB.

- *Section 2. Field Program* -- The activities, methods, and procedures used to determine the hydrogeologic conditions, contaminant characteristics, and extent of contamination at the sites under investigation at Indiana ANGB are described in this section. Background sampling and the disposal of wastes generated during the SI field program also are addressed.
- *Section 3. Results and Significance of Findings* -- This section provides the geologic, hydrogeologic, and analytical results obtained from both phases of the SI program along with the significance of these results.
- *Section 4. Preliminary Risk Evaluation* -- In this section, the results of the sampling and analysis are evaluated, a conceptual model for each site is prepared, and potential receptors are identified. In addition, the sampling results are compared to ARARs and potential risks to human health are quantified.
- *Section 5. Conclusions and Recommendations* -- This section summarizes the results, conclusions based on the SI results, and recommendations for any future IRP activities at each site.

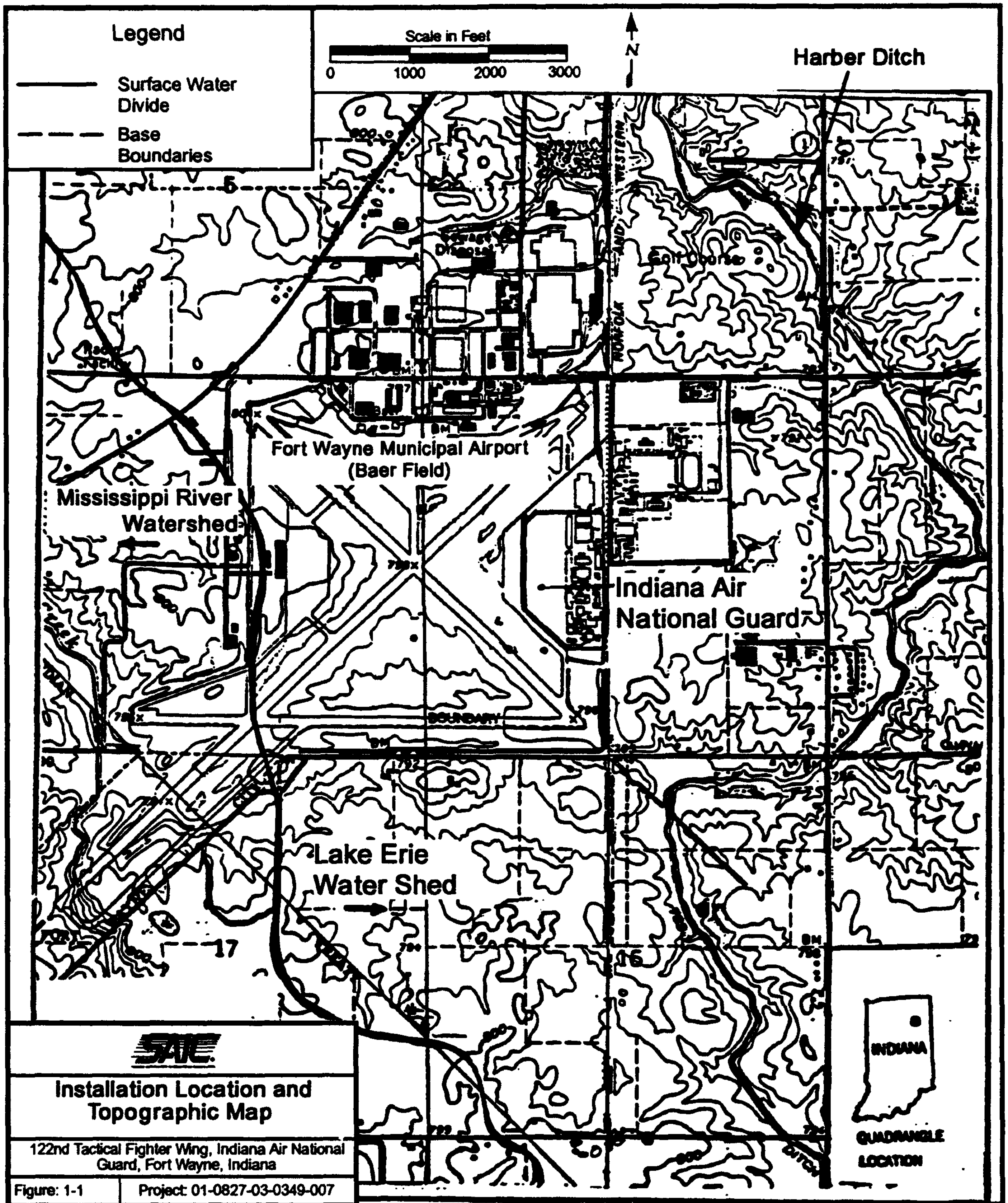
A reference list and a list of acronyms and abbreviations are included in this report. In addition, appendices are provided, which include a summary of analytical results, aquifer test methods and results, monitoring well and soil boring completion logs, survey data, chemical results, a complete quality assurance/quality control (QA/QC) evaluation, risk evaluation methods, and a summary of the site characterization data for Phases I and II.

1.4 FACILITY BACKGROUND

The history of the Indiana ANGB and the sites that were investigated as part of this SI are described in the following sections.

1.4.1 Facility History

The 122nd Tactical Fighter Wing, Indiana Air National Guard, is located in Allen County, Indiana on the southwest side of the city of Fort Wayne. As shown in Figure 1-1, Fort Wayne Municipal Airport (formerly Baer Field) is located immediately west of the Base. South and east of the Base, the land is mostly agricultural, and commercial property lies to the north. The Base currently occupies approximately 90 acres of land with plans to expand to 160 acres.



Installation Location and Topographic Map

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure: 1-1	Project: 01-0827-03-0349-007

The 122nd Tactical Fighter Wing was established at Fort Wayne in 1954. Past Base operations that generated potentially hazardous materials include aircraft maintenance, weapons maintenance, liquid fuels management, fire fighting training, and vehicle maintenance. Waste oils, fuels, cleaners, solvents, and strippers were generated by these Base activities.

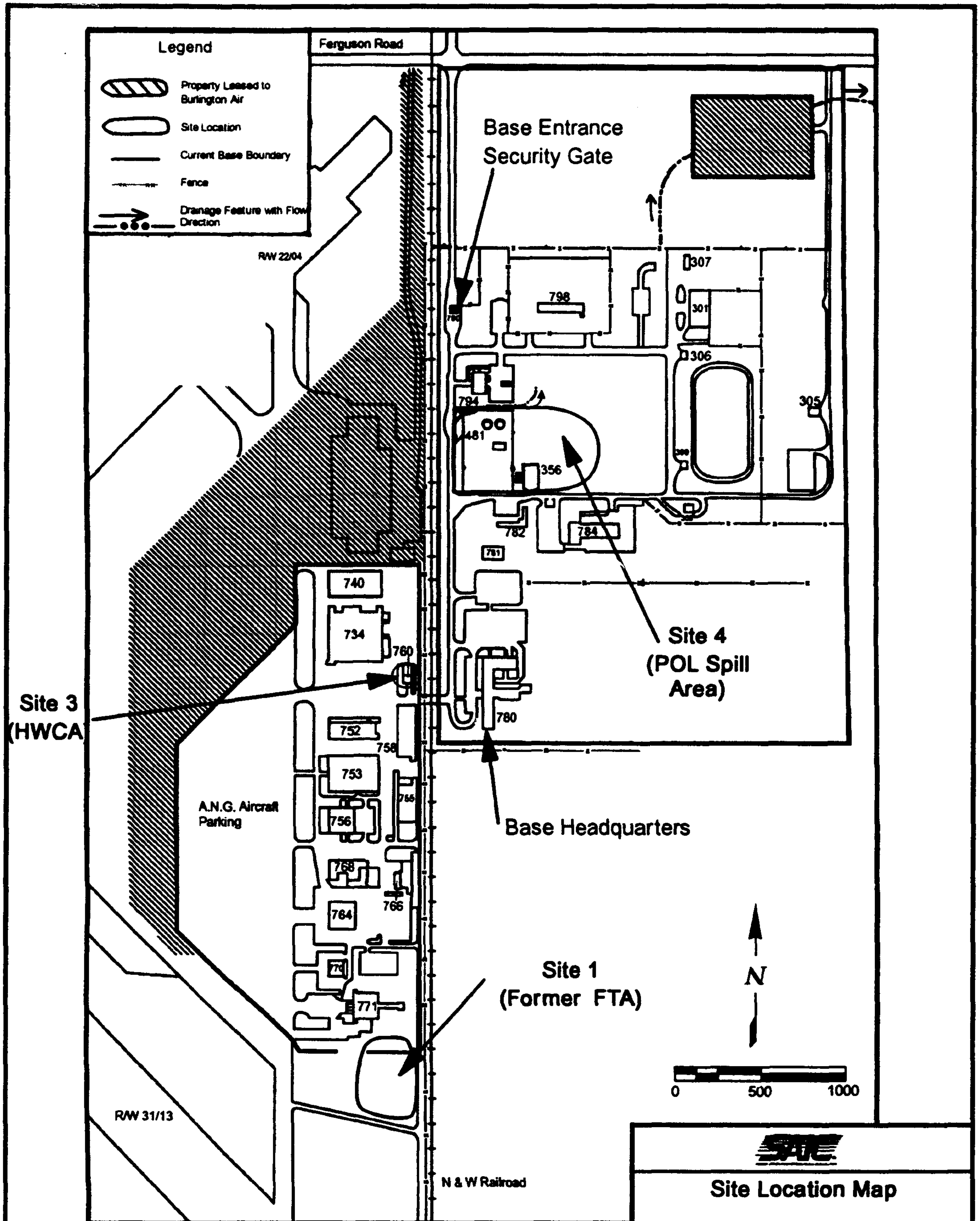
1.4.2 Site Descriptions

This section briefly describes the three sites under investigation (i.e., Site 1 -Former Fire Training Area, Site 3 - Hazardous Waste Collection Area, and Site 4 - POL Spill Area).

Site 1 - Former Fire Training Area -- The Former Fire Training Area (FTA) is located in the extreme southern portion of the Base, south of Building 771 (the Hush House), as shown in Figure 1-2. The location of the former FTA was determined from field observations, interviews with Base personnel (including the former Base Fire Chief), and aerial photographs. The source of contamination at the former FTA is a burn area approximately 15 by 90 feet. The burn area was designed to contain fuel and waste oils used during fire fighting exercises with the construction of a berm on the western (downslope) side of the burn area. The berm was approximately 2 feet wide at its base, 1 foot high and rounded at the top, and extended the entire length of the burn area. The burn area was unlined. Prior to the commencement of each fire fighting exercise, the burn area was soaked with water. The water-soaked ground helped to reduce the extent of fuel migration into the ground.

The former FTA was used from 1963 to 1972 approximately 10 times a year. During each fire training exercise, approximately 50 to 60 gallons of fuel were used for a total of 500 to 600 gallons per year. Most of the fuel used was JP-4; a minimal amount of motor oil and aviation gasoline also was used.

After each fire training session, the burning fuel was extinguished by teams of personnel using a spray of water and foaming agent, which was directed to the northwest or southwest. Occasionally, this stream washed some of the fuel over the berm and downslope from the burn area.



Sources: HMTC 1988, Base Map, and Base Photograph, 1972

Site Location Map

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure: 1-2 | Project: 01-0827-03-0349-007

After 1972, the ANGRC began dumping fill material (primarily native clay soils and some construction debris) over and around the former FTA. The area was continually filled and graded, eventually burying the former FTA under approximately 10 to 12 feet of fill.

Site 3 - Hazardous Waste Collection Area -- The Hazardous Waste Collection Area (HWCA), located behind Building 760, is a 50-foot square gravel area enclosed by a wooden fence. The site location is provided in Figure 1-2. The HWCA currently is used as a temporary storage area. Since 1954, waste oils, solvents, paints, and thinners from various shops have been collected and stored in drums at this location. Initially, the area was grassy; it was later graveled and fenced. Drums of waste oil, hydraulic oil, PD-680 solvent, paints, and thinners are stored on pallets on the gravel. A site visit during the Phase I SI kick-off meeting revealed that funnels were in the top of each drum, the gravel was stained, and there was a noticeable odor of oils and solvents. Prior to the start of Phase II, Base personnel moved most of the drums from the area to a central staging area at the Base. The drums were removed from the staging area by the Defense Reclamation and Maintenance Organization for appropriate disposal at an off-Base location.

Site 4 - POL Spill Area -- The POL Spill Area is located in the northern portion of the Base, east of Building 356 as shown in Figure 1-2. In 1968, a malfunction in the POL system at Building 352 and the nearby pump house resulted in a spill of 5,000 to 5,300 gallons of JP-4 fuel. The spill flowed from the POL facility and ran eastward into the woods and into an open storm drainage ditch. Approximately 200,000 gallons of water were used to flush the JP-4 from the immediate POL area. According to the Preliminary Assessment Report (HMTC 1988), the water and fuel washed eastward into the surface drainage system and eventually into Harber Ditch, which is approximately 3,000 feet east of the Base. Although surface drainage at Site 4 is generally toward Harber Ditch, it is unknown what quantity of the spill actually migrated to any one drainage feature. ANGB personnel noted no vegetative damage in the woods after the spill (HMTC 1988).

1.5 REGIONAL SETTING

The following sections describe the regional environmental setting of the Indiana ANGB, including regional land use, geology, hydrogeology, climate, and surface drainage.

1.5.1 Regional Land Use

Regional land use, prior to the construction of the Base, was primarily agricultural. Residue from agricultural use of fertilizers and pesticides may persist in the form of elevated levels of certain contaminants. These contaminants may include arsenic (from arsenic-based pesticides).

Land is used for a municipal airport adjacent to the Base to the west. This includes the airport terminal, aircraft maintenance warehouses, and light industrial land uses. Other land use adjacent to the Base is primarily agricultural.

1.5.2 Geology

Fort Wayne, Indiana is located within the Central Lowland physiographic province of the Great Plains. The Central Lowlands are characterized by level to gently undulating uplands that are dissected by steep drainageways. The topography of the Base is nearly level, at elevations ranging from 785 feet above mean sea level (MSL) in the eastern portion of the Base to approximately 700 feet above MSL in the southern portion (HMTC 1988).

The uplands in the vicinity of the Base are part of the Tipton Till Plain, formed of unconsolidated glacial till that was deposited during the Pleistocene epoch. From the surface to approximately 20 feet below ground surface (BGS), the New Holland Till Member of the Lagro Formation is present, which is composed predominantly of silt and clay. Underlying the Lagro Formation from approximately 20 to 70 feet BGS is older Pleistocene till known as the Trafalgar Formation. The Trafalgar Formation is an unconsolidated clay-rich till containing scattered thin beds of sand, silt, and gravel (Bleuer and Moore 1978). Immediately underlying the Trafalgar Formation are the Traverse and Detroit River Formations, which are Devonian in age and consist of up to 145 feet of limestones and dolomites. The top of the bedrock below the Base is reported to be at 720 feet above MSL, or approximately 70 feet BGS (Bleuer and Moore 1978).

Soil borings drilled at the Base show that soil in the upper 60 feet consists primarily of stiff clay, with occasional thin lenses of silt, sand, and gravel. A brown clay typically was encountered lying stratigraphically over a thicker gray clay.

1.5.3 Regional and Local Hydrogeology

Groundwater in Allen County is derived from two aquifer types: glacial drift and carbonate bedrock. The glacial aquifers consist of silt, sand, and gravel lenses within unconsolidated clay. The carbonate bedrock aquifers occur where sufficient cracks and voids are present in the bedrock to hold and conduct water (Bleuer and Moore 1978). The glacial aquifers are unconfined water-table aquifers. The majority of the bedrock aquifer is interconnected by overlying sand and gravel units; however, it may be locally confined in some areas (Bleuer and Moore 1978).

Groundwater production wells tap both aquifer types within the county. Because the bedrock surface is shallower and the thin cover of the overlying glacial deposits generally contain a very small percentage of sand and gravel in the vicinity of the Base, nearly all of the production wells are completed in the carbonate bedrock aquifer (Bleuer and Moore, 1978). In a 1-mile radius of the Base, there are a few private production wells that tap into the bedrock and glacial aquifers. The nearest well is located 1,300 feet south of the Base (HTMC April 1988).

The general groundwater flow within the aquifers of Allen County converges on the valleys of the Little River, St. Marys River, St. Joseph River, and Maumee River. This regional flow pattern indicates that groundwater flow beneath the Base moves in an east to northeast direction toward the St. Marys River (HMTC 1988).

1.5.4 Climate and Surface Drainage

The climate of Allen County is mid-continental, characterized by wide variations in temperature from winter to summer and a fairly uniform distribution of precipitation throughout the year. Mean yearly temperature is approximately 50°F; average minimum temperature in the winter is 22°F and average maximum temperature in the summer is 81°F. Precipitation averages 35.3 inches per year (NOAA 1986) and the net precipitation is +3.3 inches per year (HMTC 1988).

According to the Federal Emergency Management Agency (FEMA), the Base is not within a 100-year floodplain. The surface water divide between the Lake Erie watershed and the Mississippi River watershed passes through Allen County just west of the Base (approximate location shown in Figure 1-1). Water from most of Allen County drains into the Maumee River, which is part of the Lake Erie watershed. The far western one-fourth of the county is drained by the Little River and the Eel River, both of which are part of the Mississippi River watershed. Water to supply the city of Fort Wayne is obtained from the St. Joseph River.

The Base is located within the Lake Erie watershed. Surface runoff from the Base flows through a drainageway (shown in Figure 1-2 originating at the northeast portion of the Base) into Harber Ditch, which is approximately 2,000 to 5,000 feet east of the Base. From Harber Ditch, surface water flows north through the city of Fort Wayne and into the St. Marys River. Other surface features include a swampy area located approximately 1,500 feet east of the Base, and a public golf course located adjacent to the northern boundary of the Base. A 1986 aerial photograph shows that the closest residences to the Base are located approximately 1,400 feet south of the Base's southern boundary. Discussions with Base personnel and Allen County officials have established that the closest residence is still located 1,400 feet from the Base boundary.

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2. FIELD PROGRAM

The field activities conducted during the Site Inspection (SI) at the Indiana Air National Guard Base (ANGB) are described in this section. These activities were conducted in accordance with the project work plans (SAIC 1990a, 1991). The procedures used in the field are described in detail in the Field Sampling Plan (SAIC 1990b) and are summarized below.

2.1 FIELD PROGRAM SUMMARY AND RATIONALE

The SI field activities were conducted in two phases: Phase I in August and September 1990 and Phase II in October and November 1991. The Phase II field investigation was a continuation of the Phase I study and was conducted to fill the data gaps discovered during the initial study. Data collected during Phase I were used to plan and develop the technical approach for Phase II activities.

Nine piezometers were installed throughout the Base. The piezometers were positioned on Base property at locations best suited for determining the groundwater elevations and flow direction, but were not placed in areas suspected of being contaminated. Water level elevation data measured from the piezometers were plotted as groundwater contours and provided an initial evaluation of the gradient and flow direction for subsequent placement of monitoring wells. All soil borings, monitoring wells, and piezometers were surveyed using the Indiana State Plane Coordinate system. Table 2-1 summarizes the Phase I and Phase II field activities. The specific field activities conducted at each site are summarized in Sections 2.1.1 through 2.1.4.

2.1.1 Site 1 - Former Fire Training Area (FTA)

The site history and the present topography and subsurface conditions at Site 1 - Former FTA indicate that the former FTA surface is located approximately 10 to 12 feet below current ground surface, and any contamination related to fire training activities conducted at this site would be expected to be found at the former surface or below the former surface. However, the focus of the SI was not only to determine the presence of site-related contamination at the former FTA surface and below, but also at the current ground surface. This was because the

Table 2-1. Summary of Site Inspection Program Activities
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

	Site 1 Former Fire Training Area		Site 3 Hazardous Waste Collection Area		Site 4 POL Spill Area		Background		Total
	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	
Soil and Water Organic Vapor Sample Points	0	0	0	0	30	0	0	0	30
Soil Borings	4	6	4	2	5	3	1	2	27
Total Soil Samples per Site*	12	28	6	5	10	8	0	6	75
Monitoring Wells	2	0	1	0	2	0	0	0	5
Piezometers	5	0	2	0	2	0	0	0	9
Groundwater Samples from Monitoring Wells and Piezometers	3	3	1	1	2	3	0	0	13
Sediment Samples	0	0	0	0	2	2	0	0	4
Aquifer Tests	1	0	1	0	1	0	0	0	3
Water Level Measurements (Monitoring Wells and Piezometers)	7	7	3	3	4	4	0	0	28

* Includes Field Duplicates.

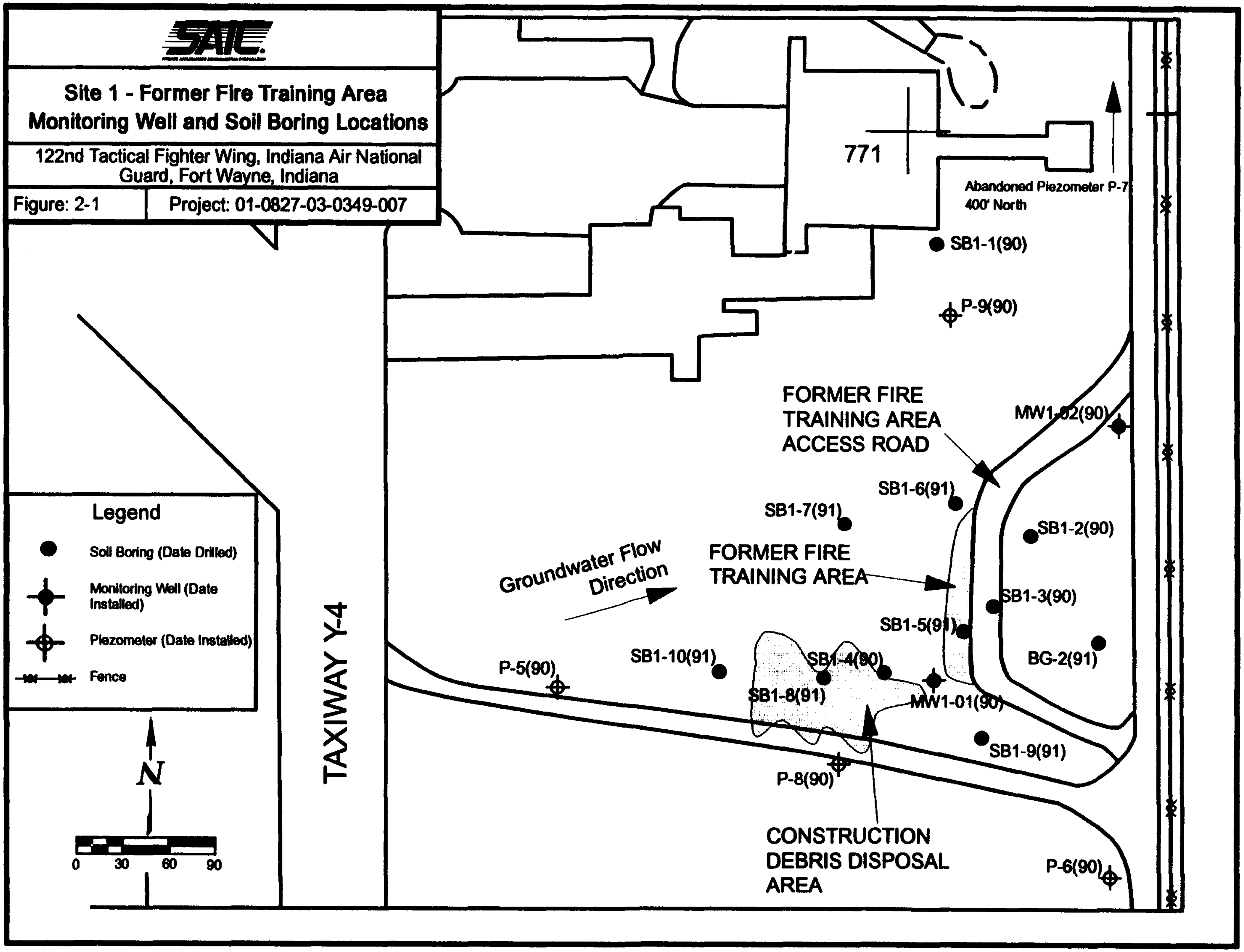
significance of any contamination detected above the former FTA surface, although not related to fire training activities, would still need to be evaluated. Specific field activities conducted at Site 1 during Phases I and II are summarized below. The locations of soil borings, piezometers, and monitoring wells installed during activities conducted during Phases I and II are shown in Figure 2-1.

Phase I Field Activities

- The former FTA location was estimated from aerial photographs and interviews with Base personnel. This was necessary because the former FTA was covered with several feet of fill material after being closed and field inspection of the area was difficult.
- Three soil borings were drilled to the water table in the area thought to be the former FTA. Soil samples were collected from the borings at 5-foot intervals and one sample at each boring was collected at the groundwater interface. Two soil samples from each boring were selected and submitted for laboratory analyses based on field screening results for volatile organics.
- Five piezometers were originally drilled and installed in the vicinity of Site 1 to determine groundwater flow direction and help locate the placement of monitoring wells at Site 1. Piezometer 7 was abandoned at a later date.
- Two monitoring wells were installed at Site 1 and groundwater samples were collected from these wells to determine if contaminants were present in the groundwater. The wells were installed at presumed upgradient and downgradient locations.
- Because subsurface soil contamination was detected during the installation of the presumed upgradient well, an additional soil boring was drilled and sampled near this planned well location to a depth of approximately 15 feet below ground surface (BGS).
- Because contaminants were detected at the original location of the upgradient well, piezometer P-8 was sampled to determine upgradient water quality. The piezometers were constructed similar to the monitoring wells, and therefore, a representative groundwater sample could be collected. The principal objective of the piezometer, however, was to determine groundwater elevations and help locate monitoring wells.

Phase II Field Activities

- Licensed surveyors delineated the location of the former FTA from aerial photographs using control points and benchmarks that have not changed since the FTA was active. This activity was conducted because uncertainty existed during Phase I investigations as to whether the former FTA had been encountered. The delineation of the former FTA boundary has been certified by the surveyor to be



SAIC

Site 1 - Former Fire Training Area
Monitoring Well and Soil Boring Locations

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure: 2-1 | Project: 01-0827-03-0349-007

within 6 feet. In addition, the delineated former FTA boundary was confirmed by the former Base Fire Chief.

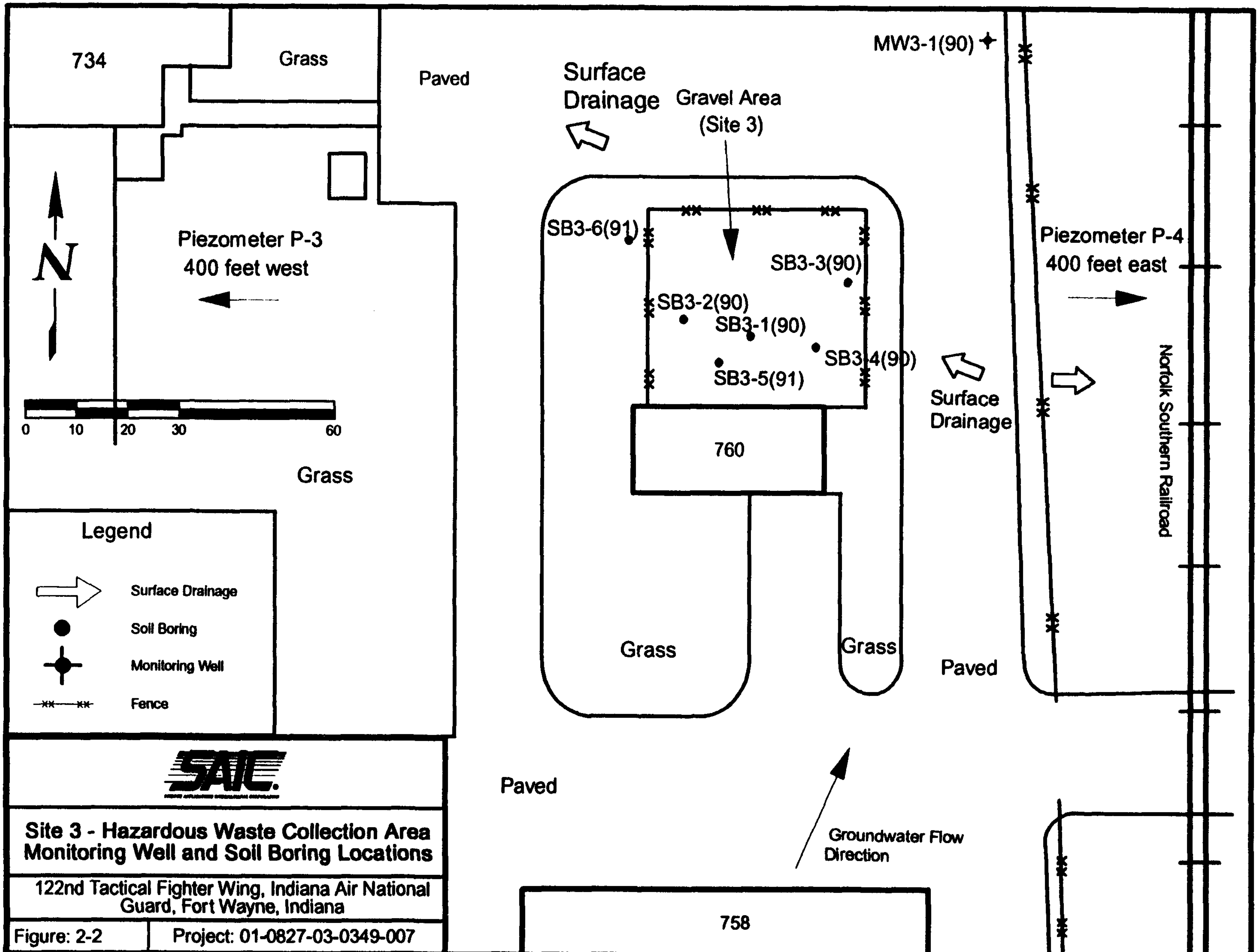
- Six soil borings were drilled and sampled. Soil samples collected from the current land surface and from just below the fill layer were submitted for laboratory analysis. Additional samples from each borehole were selected for laboratory analysis based on field screening results.
- A second round of groundwater samples was collected from the same two monitoring wells and piezometer that were sampled during Phase I. This sampling was conducted to confirm initial results and to provide a comparison of the Phase I groundwater monitoring results.
- Groundwater was collected from an open soil boring that was drilled to the water table in the center of the former FTA. The groundwater was analyzed to determine if contaminants had migrated to the water table at the site. A monitoring well was not installed at this location because of an ANGRC policy concerning areas of known contamination. According to ANGRC policy, monitoring well installation is restricted where it is possible for the well structure or installation procedure to provide a contaminant migration pathway.

2.1.2 Site 3 - Hazardous Waste Collection Area (HWCA)

The specific field activities conducted at Site 3 - HWCA during Phases I and II of the SI are summarized below. The locations of soil borings and monitoring wells installed at this site are shown in Figure 2-2.

Phase I Field Activities

- Four soil borings were drilled within the fenced area at Site 3. One boring was completed at the water table (approximately 40 feet BGS). Soil samples collected from this boring at the surface (0 to 2 feet BGS), 2 to 4 feet BGS, and the groundwater interface were selected for laboratory analysis. Three borings were drilled to 2 feet BGS and one sample from each boring was collected and sent for laboratory analyses. The deep boring was drilled to provide information on the vertical extent of contamination and the shallow borings (0 to 2 feet BGS) were drilled to provide information on the presence of contamination in the surface soils.
- Two piezometers (P-3 and P-4, 400 feet west and 400 feet east of the site, respectively) were installed in the vicinity of Site 3 to assist in determining groundwater flow direction and help place the monitoring wells at the site.
- One monitoring well was installed downgradient from the site and sampled to determine if contaminants were present in the groundwater.



SAIC

Site 3 - Hazardous Waste Collection Area Monitoring Well and Soil Boring Locations

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure: 2-2	Project: 01-0827-03-0349-007

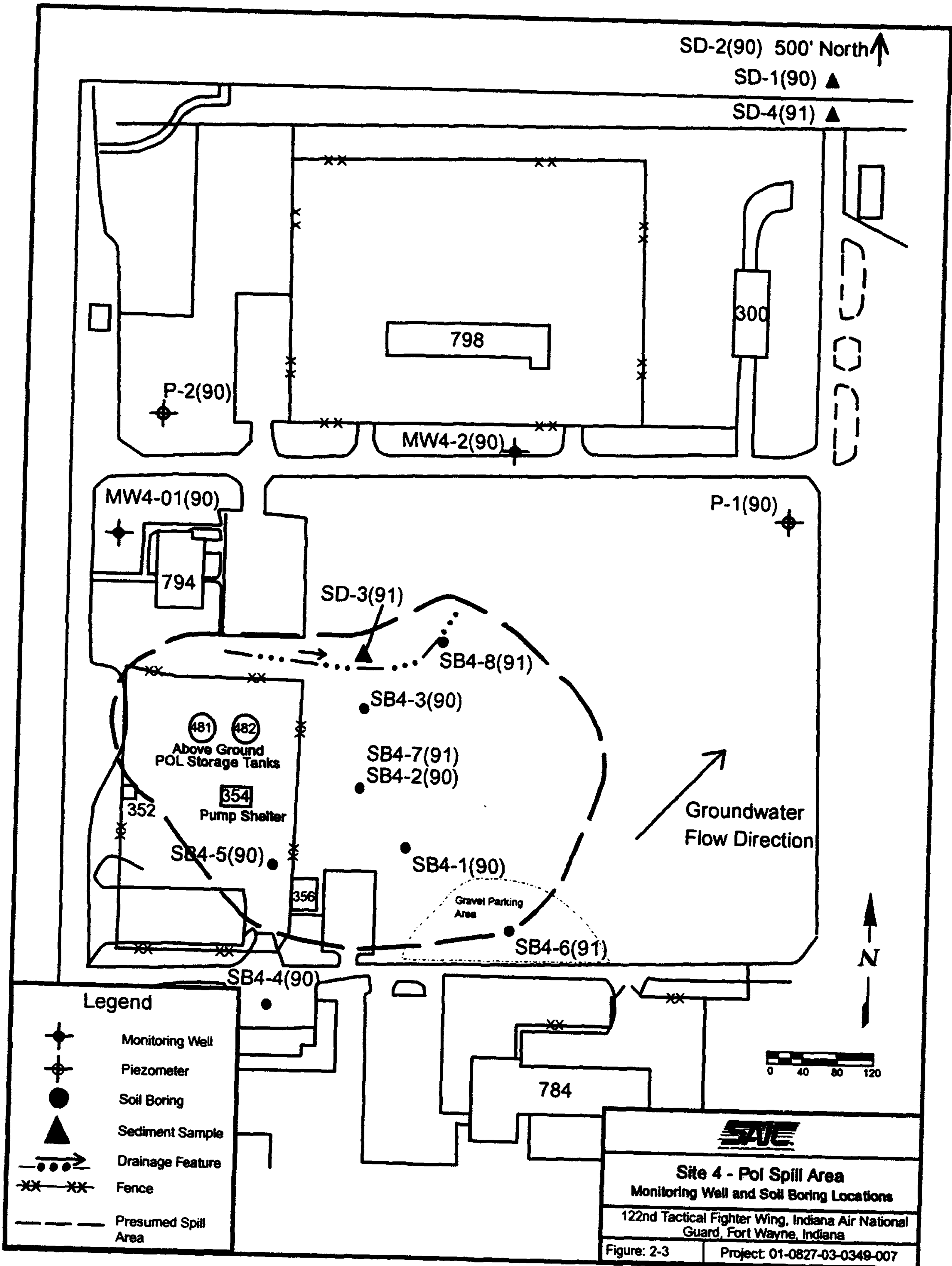
Phase II Field Activities

- One soil boring was drilled within the fenced area and sampled at 5-foot intervals to the groundwater interface. The sample collected at the surface (0 to 2 feet BGS) was forwarded to the laboratory for analyses. Two other samples collected at different depths were submitted for laboratory analyses based on field screening results. The deep boring was drilled to confirm the vertical extent of contamination that had been observed during Phase I activities. In addition, a second boring was drilled approximately 5 feet outside the fenced area to determine if the contaminants had migrated offsite. Two samples, one from the surface (0 to 2 feet BGS) and one at 4 to 5.5 feet BGS, were sent for laboratory analyses.
- The downgradient monitoring well installed and sampled in 1990 was resampled in 1991 to provide comparative data.

2.1.3 Site 4 - POL Spill Area

The focus of investigations at Site 4 was principally to determine the presence of any residual contamination remaining from the 1968 spill. Because any contamination at the site resulted from a spill of an UST system, the response to the release follows the guidelines established under 40 CFR 280.63; accordingly, information on the size and nature of the release must be assembled. To determine the nature of contamination at the site, laboratory analyses were aimed at detecting the presence of any TPH, or benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds. Other investigations were aimed at assembling information pertaining to the land use and environmental receptors in the vicinity of the site. Evaluation of data focused on presenting details of the site investigation work, sampling and analytical methods, and laboratory analytical results, to comply with the requirements of the Indiana Department of Environmental Management (IDEM), Office of Emergency Response (OER).

Specific field activities conducted at Site 4 - POL Spill Area during Phases I and II of the SI are summarized below. The locations of soil borings, monitoring wells, and sediment sampling points are shown in Figure 2-3.

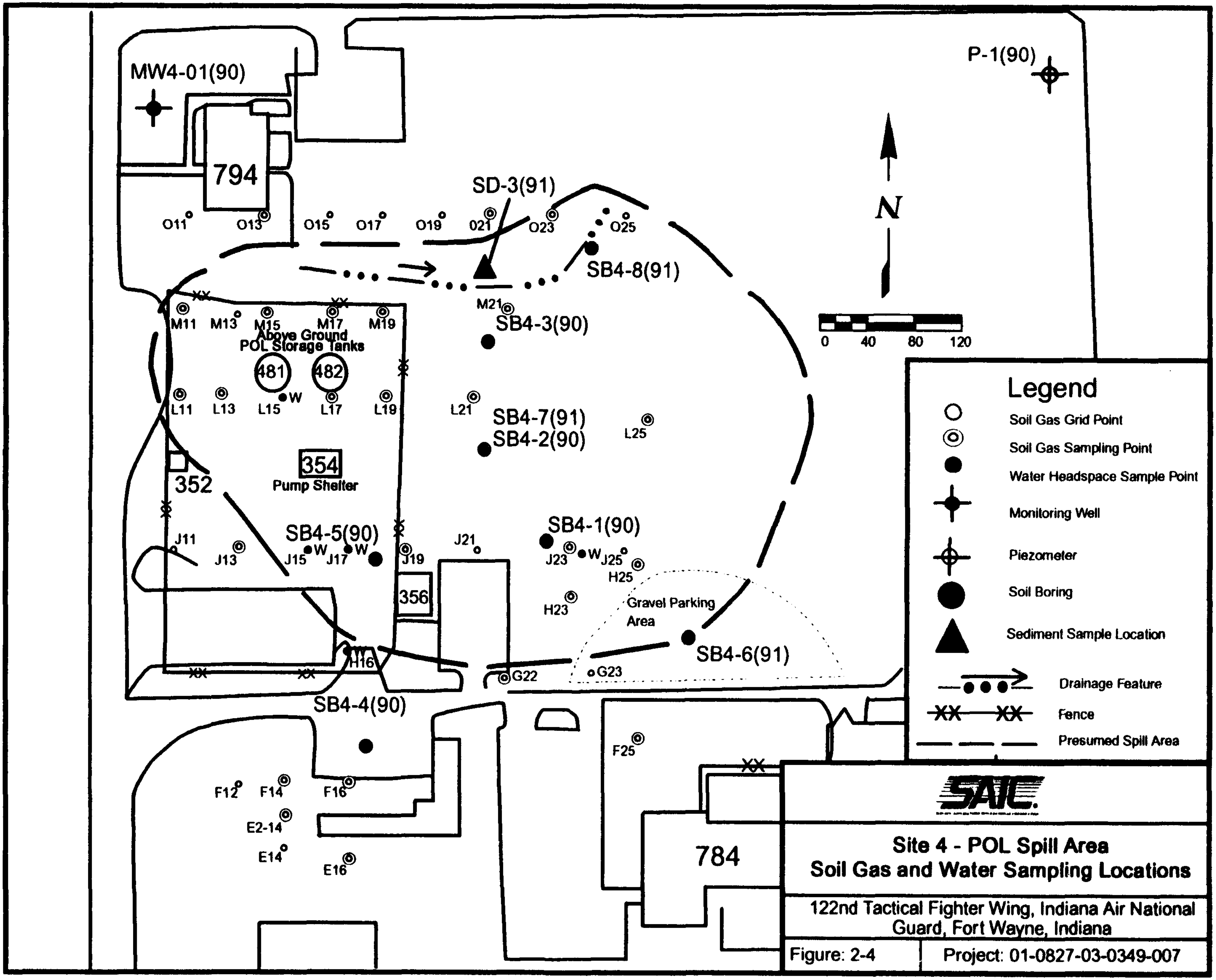

SD-2(90) 500' North
SD-1(90)
SD-4(91)
798
300
P-2(90)
MW4-2(90)
MW4-01(90)
P-1(90)
794
SD-3(91)
SB4-8(91)
SB4-3(90)
481
482
Above Ground POL Storage Tanks
SB4-7(91)
SB4-2(90)
354
Pump Shelter
352
Groundwater Flow Direction
SB4-5(90)
SB4-1(90)
356
Gravel Parking Area
SB4-6(91)
SB4-4(90)
N
0 40 80 120
784
Legend
Monitoring Well
Piezometer
Soil Boring
Sediment Sample
Drainage Feature
Fence
Presumed Spill Area
SAIC
Site 4 - Pol Spill Area
Monitoring Well and Soil Boring Locations
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 2-3
Project: 01-0827-03-0349-007

Phase I Field Activities

- A soil gas survey was first conducted at this site as a screening tool to determine soil sampling locations. Soil vapor and water samples were collected at strategic locations to provide initial information on the area of potential contamination. Figure 2-4 shows the location of the soil gas and water sampling points.
- Five shallow soil borings were drilled to 5 feet BGS to determine the presence of residual contamination from the spill that occurred in 1968. The location of these borings were based on a combination of the soil gas survey results and a knowledge of the presumed extent of the spill. Two samples were collected from each boring, one at 0 to 2 feet BGS and the other at 3 to 5 feet BGS, and forwarded to the laboratory for analyses.
- Two piezometers were drilled and installed in the vicinity of the spill area to assist in determining groundwater flow direction and help place the monitoring wells at this site.
- Two monitoring wells were installed at this site. A groundwater sample was collected from the well located immediately downgradient from the site. However, despite several attempts to collect a sample from the other well at Site 4, it was impossible because of the slow recovery of water in the well. Therefore, piezometer P-2 was sampled instead. The piezometers were constructed similar to the monitoring wells, and therefore, a representative groundwater sample could be collected. The principal objective of the piezometer, however, was to assist in the determination of groundwater elevations and help locate monitoring wells.
- Two sediment samples were collected from the drainage ditch located east and downslope from the site, where runoff from the spill might have accumulated. The sediment sampling locations are shown in Figure 2-5.

Phase II Field Activities

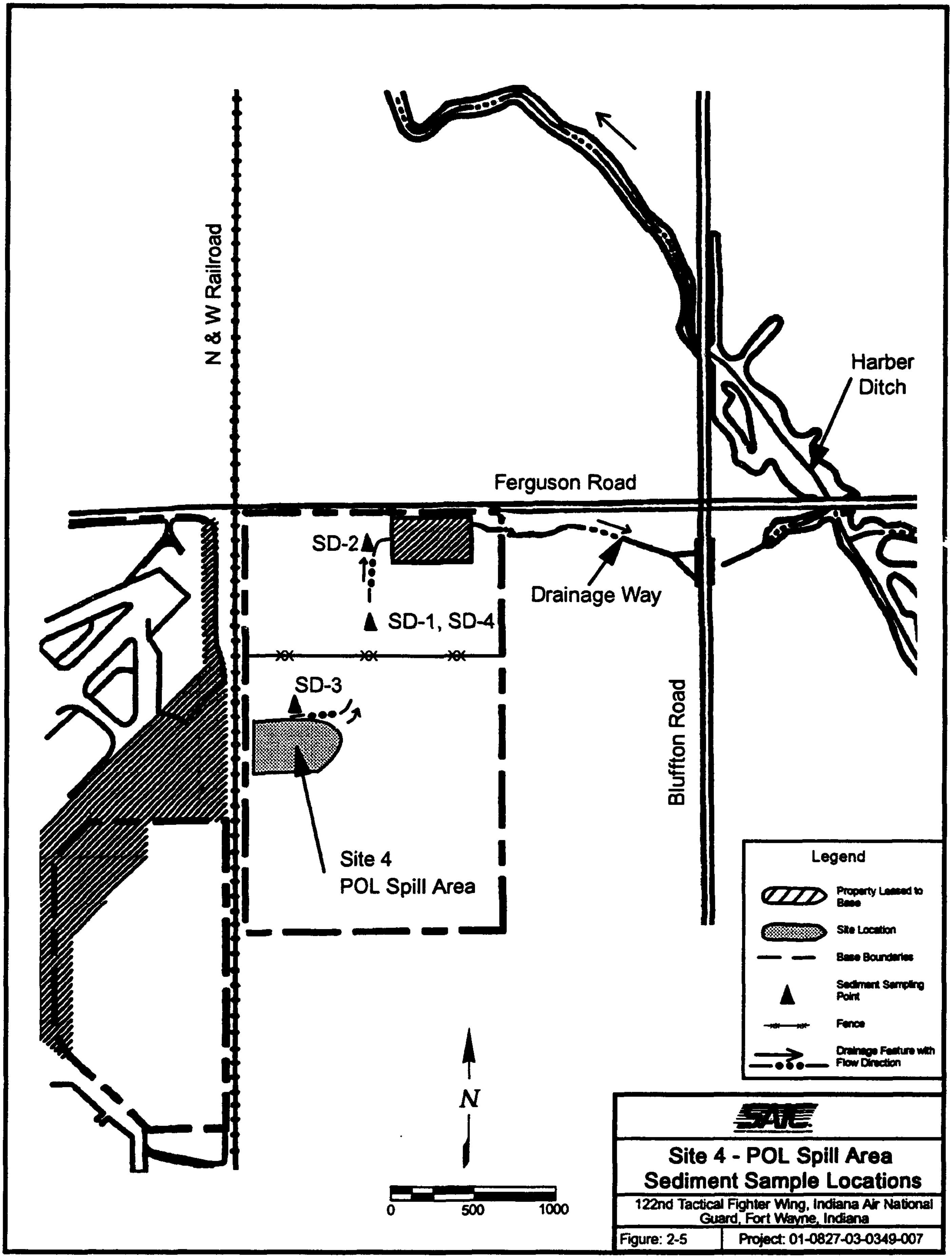
- Three soil borings were drilled and sampled: one at the point of highest contamination detected during Phase I to determine the vertical extent of contamination, and two near the presumed extent of the spill to delineate the spill boundaries. Samples were selected for analysis based on the field screening results.
- The two monitoring wells installed during Phase I were resampled to confirm the initial results and provide comparative data. A piezometer located downgradient from the site also was sampled to provide additional information on the contamination in groundwater.
- Two sediment samples were collected downslope from the spill. One sample was collected from the storm drainage ditch where samples were collected during Phase I. The other sediment sample was collected in a drainage pathway immediately downslope from the spill area.



Site 4 - POL Spill Area
Soil Gas and Water Sampling Locations

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure: 2-4 | Project: 01-0827-03-0349-007


N & W Railroad
Harber Ditch
Ferguson Road
SD-2
Drainage Way
SD-1, SD-4
SD-3
Bluffton Road
Site 4
POL Spill Area
Legend
Property Leased to Base
Site Location
Base Boundaries
Sediment Sampling Point
Fence
Drainage Feature with Flow Direction
N
0
500
1000
SAIC
Site 4 - POL Spill Area
Sediment Sample Locations
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 2-5
Project: 01-0827-03-0349-007

2.1.4 Background Sampling

Three background borings were drilled during Phase I and Phase II activities, as explained below. These background borings were drilled to determine ambient conditions outside areas of suspected site influence. The locations of the background borings are shown in Figure 2-6.

Phase I Field Activities

- One background soil boring was drilled just east of the Base entrance Guard House, at a location considered to be isolated and not impacted by site activities. The boring was drilled to a depth of 10 feet BGS and two samples were collected, one at 0 to 2 feet BGS and the other at 3 to 5 feet BGS.

Phase II Field Activities

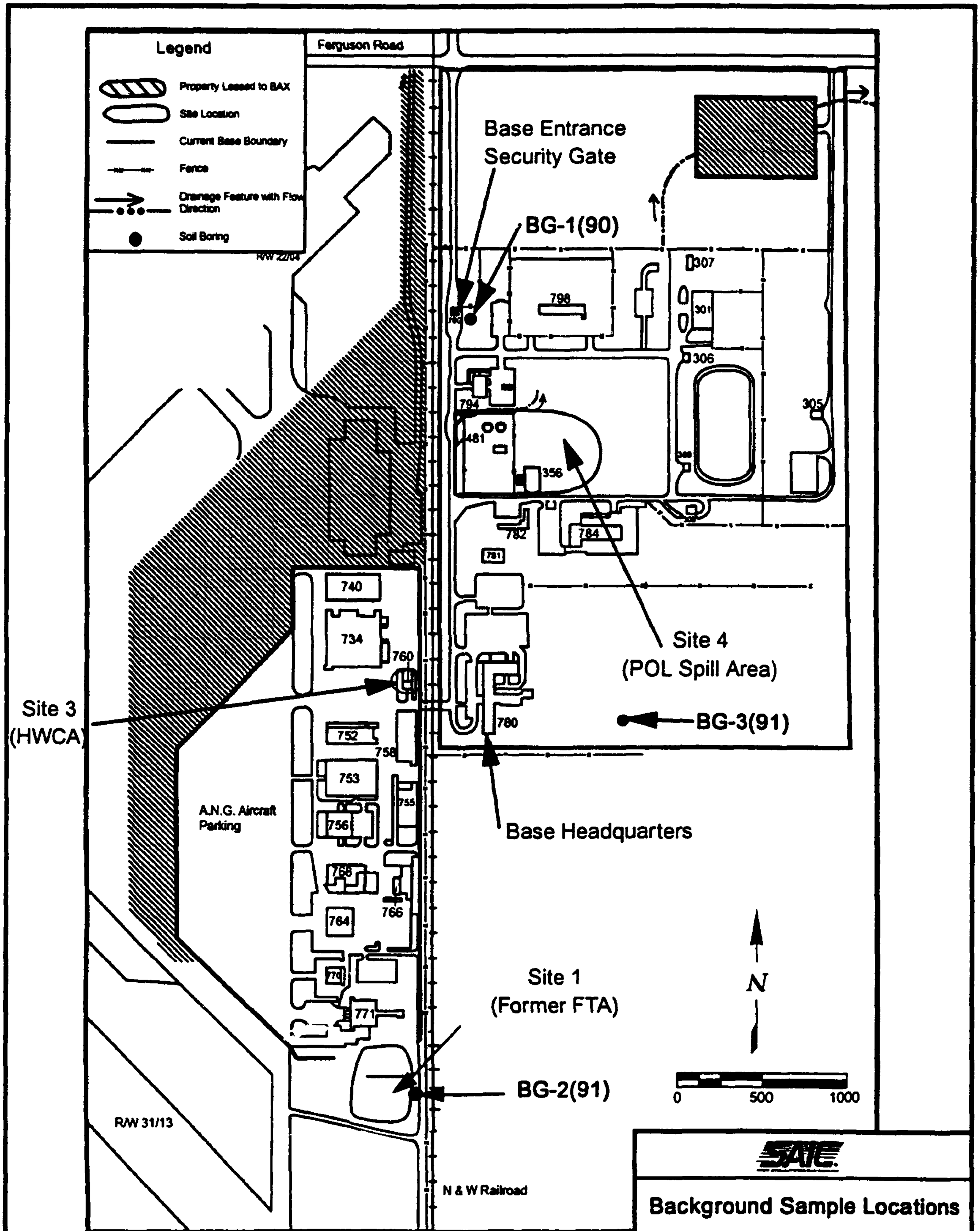
- Two background soil borings were drilled at locations considered to be representative of background conditions. One boring was located upslope from the former FTA specifically for comparison to Site 1 because of the potential for Site 1 to be impacted by airport activities. The second background boring drilled during Phase II was drilled east of the Base Headquarters (Building 780) in a field recently acquired by the Base. Samples were analyzed from the surface, at the water table, and at a depth half the distance to the water table.

2.2 GEOLOGIC AND HYDROGEOLOGIC INVESTIGATION

Geologic and hydrogeologic data for the sites at Indiana ANGB were obtained from lithology encountered during drilling of soil borings and monitoring wells, measurement of groundwater elevations, and rising head permeability tests. These activities are described below.

2.2.1 Static Groundwater Measurements

Monitoring well and piezometer water levels at the Base were measured during each phase of the SI. The water level measurements were used to determine groundwater flow direction and to help calculate groundwater flow rate. Water levels were measured with an electric water level indicator, which emits an audible tone when the water surface is contacted. The level indicator, which was decontaminated after each use following the procedures described in Section 2.8, was lowered into the well until the audible tone was heard. The measurement



Sources: HMTC 1988, Base Map, and Base Photograph, 1972

Background Sample Locations

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure: 2-6 | Project: 01-0827-03-0349-007

was made at a surveyed notch on the top of the monitoring well or piezometer casing, and was recorded to the nearest 0.01 foot. Water levels were referenced to the U.S. Geodetic Survey (USGS) datum (mean sea level).

2.2.2 Aquifer Testing

Rising head permeability aquifer tests were performed in three monitoring wells during Phase I to determine the hydraulic conductivity of formations surrounding the well. These single-well tests were conducted by removing a volume of water from a well using a bailer, then recording the water level in the well at timed intervals as it recovered to static conditions.

Water level measurements recorded during well recovery were made automatically by a Hermit Environmental Data Logger Model SE1000B manufactured by In-Situ, Incorporated. Parameters, including the timed interval for water level measurements, internal clock, test number, and initial static recorder reading, were set at the site by the field scientist. The test was stopped after the water level had recovered to at least 95 percent of the initial drawdown. The test data were downloaded directly to a field computer for review and analysis.

The data collected during the aquifer tests were analyzed using the computer program AQTESOLV™, developed by Geraghty & Miller, Inc. (1989). AQTESOLV™ used analytical solutions developed by Bouwer and Rice (1976) for unconfined, partially penetrating wells to provide values for hydraulic conductivity and best-fit, time-drawdown curves. Darcy flow velocities were calculated using the calculated hydraulic conductivity and hydraulic gradient.

2.3 SOIL GAS SURVEY

A soil gas survey was performed at Site 4 - POL Spill Area during Phase I of the SI. The survey, conducted by Tracer Research Corporation (TRC), was designed to determine the presence of volatile organic contaminants in the soils or groundwater at the site. A grid was established over the site and steel probes were inserted into the soil at specific grid locations to extract a sample for analysis with an onsite gas chromatograph (GC). This process was repeated at various nodes of the grid to determine the potential areal extent of volatile organic contamination. Procedures used to perform the soil gas survey are described in Appendix A.

2.4 DRILLING SUMMARY AND PROCEDURES

Soil borings were drilled at the Base during both phases of the SI to collect soil samples for laboratory analysis primarily to confirm the presence or absence of soil contamination. These data also were used to identify the chemical nature, and to define the magnitude and extent of both vertical and horizontal contamination. In addition, soil borings were used to provide descriptions of the soil column at each boring location. Twenty-seven soil borings were drilled at Indiana ANGB during the SI (14 borings drilled during Phase I and 13 drilled in Phase II). Three of the borings were located in areas considered to represent background conditions. The procedures for installing the soil borings are described below.

All boreholes were drilled using 6 ¼-inch outside diameter (O.D.) hollow-stem augers. The stem opening was 4.5 inches, which allowed soil sampling using a 3-inch inside diameter (I.D.) stainless steel split spoon sampler. All soil samples forwarded to the laboratory for analyses were collected using brass (for organic, petroleum hydrocarbons, and oil and grease analyses), and stainless steel (for priority pollutant metals analyses) liners. After the split spoon was retrieved from the borehole, these liners were capped and labeled. The augers were advanced to the sampling depth with the auger plugged. When the desired depth was reached, the plug was removed and the soil sample was collected by driving the split spoon sampler with a 140-pound drive hammer into the undisturbed material below the lead auger. Blows of the hammer for each 6 inches of sampler advancement were recorded. Once the sampler was driven to the desired depth, it was removed from the hole and the material in the sampler was transferred to the appropriate sampling containers following the procedures detailed in Section 6 of the Field Sampling Plan (SAIC 1990b). Abandonment of each soil boring was completed following the procedures detailed in Appendix A of the Field Sampling Plan. Borehole logs are provided in Appendix B of this report.

2.5 MONITORING WELL AND PIEZOMETER INSTALLATION

Five monitoring wells and nine piezometers were installed during Phase I of the SI to determine if contaminants were present in the groundwater and to determine aquifer characteristics. Monitoring wells and piezometers were installed by drilling a borehole as described above and then installing a monitoring well or piezometer following the procedures described in Appendix A of the Field Sampling Plan (SAIC 1990b). Monitoring well boreholes were drilled to a depth approximately 15 feet below the water table to allow for proper screen placement in accordance with the procedures detailed in the Field Sampling Plan (SAIC 1990b). The water table was located by measuring the water level inside the hollow-stem auger following the first sign of wet drill cuttings or soil samples. A typical well construction diagram for wells installed at the Base is presented in Figure 2-7. At the Indiana ANGB, the monitoring wells and piezometers were constructed in a similar manner. However, piezometers were installed first to estimate the groundwater flow direction and determine the appropriate location of the monitoring wells. Well construction diagrams providing details on each well and piezometer are presented in Appendix B. Monitoring well and piezometer locations at Sites 1, 3, and 4 are presented in Figures 2-1, 2-2, 2-3, and 2-4, respectively.

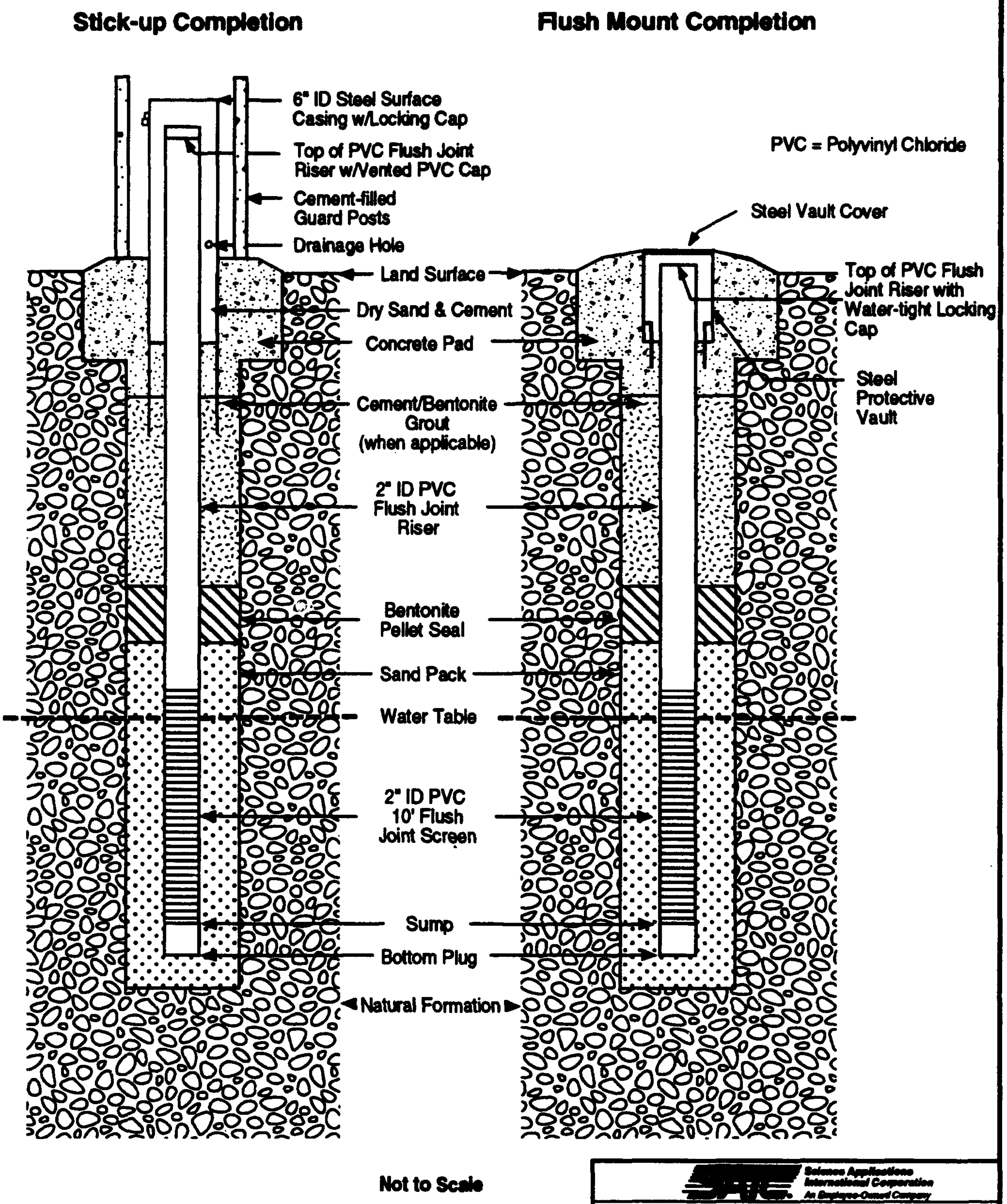
2.6 SURVEYING

Sampling locations, including boreholes, wells, piezometers, and sediment sample areas, were surveyed during each phase of the SI. Surveys were subcontracted to local surveyors licensed in the State of Indiana. After the wells, piezometers, and soil borings were completed at each site, they were surveyed for horizontal location and elevation. The surveys were completed to a vertical accuracy of 0.01 feet and a horizontal accuracy of 1 foot. All surveys were referenced to USGS elevation datum and the Indiana State Coordinate System. The horizontal coordinates and elevation data of the soil borings and monitoring wells installed at Indiana ANGB are summarized in Appendix C.

During Phase II, surveyors also determined the location of the former FTA from aerial photographs taken in 1963 and 1972. Using control points (such as buildings and railroad tracks) that have been undisturbed and unchanged throughout the period from 1963 to the present, surveyors were able to locate the former FTA within 6 feet.

2.7 FID SCREENING

During Phase I drilling of the soil borings, samples were collected at 5-foot intervals and screened with a portable flame ionization detector (FID). The screening was conducted to provide field data on the levels of volatile organic compound (VOC) contamination and select



Science Applications International Corporation
An Employee-Owned Company

Typical Monitoring Well and Piezometer Construction

122nd Tactical Fighter Wing
Indiana Air National Guard, Fort Wayne, Indiana

Figure: 2-7	Project: 1-827-03-349-007

soil samples for laboratory analysis. During Phase II, samples were collected using the following field screening strategy: Samples were collected from each borehole from the surface (0 to 2 feet BGS) and to total depth at 5-foot intervals. All surface samples were submitted for laboratory analysis. All samples were screened using the FID, including the surface sample. The boring was considered complete when two consecutive samples (including the surface sample) contained no volatile organic vapors according to the FID. If no two consecutive samples were free of organic vapors, the borehole was completed when groundwater was encountered during drilling. In addition to the surface soil sample, the second consecutive clean sample and the sample with the highest FID reading were submitted for laboratory analysis. Where two consecutive clean samples were not encountered, the sample with the highest FID reading and the sample closest to the water table were submitted for laboratory analysis. In addition, during Phase II, the decontaminated soil sampling equipment was screened with the FID to establish an equipment and ambient air background FID reading. The results of field screening for VOCs are presented in Table 2-2.

2.8 DECONTAMINATION PROCEDURES

Before sampling activities began, between sampling intervals, and after sampling activities at a location were completed, all sampling equipment (e.g., split spoon samplers, bailers, and sediment sampling equipment) was decontaminated. During the first part of the soil boring and sampling activities, the sampling equipment was decontaminated as specified in the Field Sampling Plan (SAIC 1990b). This procedure included an initial scrubbing with Alconox® detergent, rinsing with potable water, rinsing with American Society for Testing and Materials (ASTM) Type II water, rinsing with pesticide-grade methanol, and finally rinsing with pesticide-grade hexane and allowing the equipment to completely air dry before use. The cold weather prevented the equipment from drying quickly and the hexane from volatilizing easily, which caused interference with the field screening for volatile organic vapors.

During the field visit by HAZWRAP representatives on October 30, 1991, the decontamination procedure was modified slightly to eliminate the hexane rinse and add two final ASTM water rinses. The equipment was then allowed to air dry before use. This procedure removed the remaining residual organic solvent vapors. Lines used to lower bailers into the

Table 2-2. Summary of Field Screening Results During Site Inspection Activities, 122nd Tactical Fighter Wing Indiana Air National Guard, Fort Wayne, Indiana

Sample No.	Date	Interval (feet)	Sample Screening Results	Background Results (ppm)[1]	Rationale for Lab Analysis
SB1-5-1	11/1/91	0 - 1.5	BG	1 - 2	Current SFC
SB1-5-2	11/1/91	10 - 11.5	100 - 200 ppm	1 - 2	Former SFC
SB1-5-3	11/1/91	13.5 - 15	150 - 250 ppm	1	Highest
SB1-5-7	11/2/91	35 - 36.5	2 ppm	1	WT
SB1-6-1	11/2/91	0 - 1.5	30 ppm	0	Current SFC
SB1-6-2	11/2/91	10 - 11.5	50 - 70 ppm	0	Former SFC
SB1-6-3	11/2/91	13.5 - 15	50 - 80 ppm	0	Highest
SB1-6-5	11/2/91	25 - 26.5	10 ppm	2 - 3	Apparent WT
SB1-6-5R	11/2/91	25 - 26.5	10 ppm	2 - 3	Duplicate
SB1-6-7	11/2/91	35 - 36.5	BG	0	2nd Clean (WT)
SB1-7-1	11/5/91	0 - 1.5	BG	0	Current SFC
SB1-7-2	11/5/91	8.5 - 10	BG	0	BG Former SFC
SB1-7-3	11/5/91	15 - 16.5	BG	0	2nd Clean
SB1-8-1	11/4/91	0 - 1.5	BG	1	Current SFC
SB1-8-2	11/4/91	6.4 - 8.5	BG	1	Former SFC
SB1-8-3	11/4/91	11.5 - 13	1 - 2 ppm	1	Highest
SB1-8-5	11/4/91	20 - 21.5	0	0 - 10[2]	2nd Clean
SB1-9-1	11/4/91	0 - 1.5	BG	0	Current SFC
SB1-9-2	11/4/91	5 - 6.5	BG	0	Former SFC
SB1-9-3	11/4/91	10 - 11.5	BG	1	2nd Clean
SB1-10-1	11/4/91	0 - 1.5	BG	0	Current SFC
SB1-10-2	11/4/91	5 - 6.5	5 - 7 ppm	0	Former SFC
SB1-10-3	11/4/91	10 - 11.5	10 - 20 ppm	0	Highest
SB1-10-4	11/5/91	15 - 16.5	BG	0	1st Clean
SB1-10-4R	11/5/91	15 - 16.5	BG	0	Duplicate
SB1-10-5	11/5/91	20 - 21.5	BG	0	2nd Clean
SB3-5-1	10/30/91	0 - 1.5	20 ppm	0	SFC

Table 2-2. Summary of Field Screening Results During Site Inspection Activities, 122nd Tactical Fighter Wing Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	Date	Interval (feet)	Sample Screening Results	Background Results (ppm)[1]	Rationale for Lab Analysis
SB3-5-6	10/31/91	24.5 - 26	500 - 700 ppm	3	Highest
SB3-5-9	10/31/91	39.5 - 40	25 ppm	0	Water Table
SB3-6-1	10/31/91	0 - 1.5	BG	0	SFC
SB3-6-2	10/31/91	4 - 5.5	BG	0	2nd Clean
SB4-6-1	10/30/91	0 - 2	BG	1	SFC
SB4-6-2	10/30/91	4.5 - 6.5	8 ppm	1	Highest
SB4-6-6	10/30/91	24 - 25.5	BG	2	2nd Clean
SB4-7-1	10/31/91	0 - 2	BG	0	SFC
SB4-7-2	10/31/91	4 - 5	BG	0	2nd Clean
SB4-8-1	11/1/91	0 - 1.5	BG	3 - 5	SFC
SB4-8-2	11/1/91	4.5 - 6	10 - 20 ppm	3 - 5	Highest
SB4-8-4	11/1/91	14.5 - 16	BG	3 - 5	2nd Clean
BG2-1	11/3/91	0 - 1.5	BG	0.5 - 1	Current SFC
BG2-2	11/3/91	3 - 4.5	BG	0.5 - 1	Former SFC
BG2-3	11/3/91	20 - 21.5	BG	0.3	Midway to WT
BG2-4	11/3/91	37 - 39	BG	0	WT
BG3-1	11/3/91	0 - 1.5	BG	0.2	SFC
BG3-2	11/3/91	15 - 16.5	BG	0.2	Midway to WT
BG3-3	11/3/91	29 - 30.5	BG	0	WT

WT - Water table
SFC - Surface
Clean - No organic vapors indicated with FID
BG - FID reading on sample was equal to background FID reading
NR - Not Recorded

[1]FID screening results of ambient air plus decontaminated equipment.
[2]Jets operating upwind, sample checked in closed space to avoid interference.

wells were replaced between wells. Water level monitoring devices and measuring tapes were scrubbed with laboratory-grade Alconox® detergent and rinsed with distilled water between uses. Drilling equipment (including rods, bits, and tools) were cleaned at the decontamination area with a steam cleaner, laboratory-grade Alconox® detergent, and a potable water rinse before, between, and after each drilling location. The decontamination area was cleaned after each use.

2.9 SAMPLING PROGRAM AND PROCEDURES

Soil, sediment, and groundwater samples were collected during the SI at Indiana ANGB. The following sections summarize the sampling program and procedures. Table 2-3 shows the site-specific analyses conducted by the laboratory. The laboratory methods used for samples from each site are presented in Table 2-4.

2.9.1 Soil Sampling

Twenty-eight soil samples collected during Phase I and 47 soil samples collected during Phase II were selected for laboratory analysis during the SI. The soil samples sent to the laboratory were analyzed for the parameters identified during the planning phase of the SI. These parameters were selected based on site history and use, previously detected contaminants, and discussions with ANGRC and Hazardous Waste Remedial Actions Program (HAZWRAP) personnel.

2.9.2 Geotechnical Sampling and Analysis

During Phase II activities, soil samples were collected and sent to a geotechnical testing laboratory to obtain analytical data on the physical characteristics of the soil above the aquifer and to confirm the field geologic descriptions. Geotechnical samples were collected from each of the three sites and one background location using split spoons and the procedures described in Section 2.4. Soil was collected close to the water table but above the aquifer material to estimate permeability and the rate of vertical migration of site-related contaminants to the water table. Grain size, textural analyses, pH, organic matter content, and moisture content were conducted on five samples from the sites. These data were important in determining how long it would take contamination to migrate through the clay layer to the underlying aquifers.

Table 2-3. Site-Specific Sample Analysis Summary for Site Inspection at 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Site/Sample	Volatile Organic Compounds[1]	Semivolatile Organic Compounds	Petroleum Hydrocarbons	Metals[2]	Lead[3]	BTEX[4]	Pesticides/ PCBs	Oil and Grease
SITE 1 - Former FTA								
PHASE I								
SB1-1, SB1-2, SB1-3		X	X		X			
SB1-4	X	X	X	X	X			
MW1-1, MW1-2, P-8	X	X	X	X	X			
PHASE II								
SB1-5 through SB1-10	X	X	X	X				
MW1-1, MW1-2, P-8	X	X	X	X				
GW1-1	X	X						
SITE 3 - HWCA								
PHASE I								
SB3-1, SB3-2, SB3-3, SB3-4	X	X	X	X			X	
MW2-1	X	X	X	X				
PHASE II								
SB3-5, SB3-6	X	X	X	X				X
MW2-1	X	X	X	X				X

Table 2-3. Site-Specific Sample Analysis Summary for Site Inspection at 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Site/Sample	Volatile Organic Compounds[1]	Semivolatile Organic Compounds	Petroleum Hydrocarbons	Metals[2]	Lead[3]	BTEX[4]	Pesticides/ PCBs	Oil and Grease
SITE 4 - POL Spill Area								
PHASE I								
SB4-1, SB4-2, SB4-3, SB4-4, SB4-5	X	X	X	X				
SD1, SD2		X	X	X				
MW4-1, MW4-2	X	X	X	X				
PHASE 2								
SB4-6, SB4-7, SB4-8			X		X	X		
SD3, SD4	X		X		X			
MW4-1, MW4-2, P-1			X		X	X		
BACKGROUND								
PHASE I								
BG-1	X	X	X	X			X	
BG-2	X	X	X	X				
BG-3	X	X	X	X				

[1]During the scoping of Phase I activities, it was decided that the earth moving activities that occurred at the former FTA after fire training operations had been terminated would have resulted in the volatilization of any remaining VOCs. Therefore, VOC analyses were not performed on soil samples collected from the former FTA during Phase I. This strategy was, however, changed for the Phase II stage.

[2]Metals: As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Sb, Se, Ag, Tl, Zn.

[3]Lead: The focus of investigations at Site 4 during Phase II was to comply with the Federal and State of Indiana UST regulations pertaining to spill response requirements in soil and groundwater samples.

[4]BTEX: Benzene, toluene, ethylbenzene, and xylenes.

Table 2-4. Summary of Analytical Methods and Parameters for Phases I and II of the Site Inspection at 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

PHASE I		
Media	Parameter	Method
Water	Petroleum Hydrocarbons	E418.1
	Volatile Organics	SW 5030/8240
	Priority Pollutant Metals (Be, Cd, Cr, Cu, Ni, Ag, Zn)	SW 3005/6010
	Antimony	SW 3005/7041
	Lead	SW 3020/7421
	Arsenic	SW 7060
	Mercury	SW 7470
	Selenium	SW 7740
	Thallium	SW 3020/7841
	Semivolatile Organics	SW 3510/8270
	Pesticides/PCBs	SW 3510/8080
Soil	Petroleum Hydrocarbons	SW 3550/E418.1
	Volatile Organics	SW 5030/8240
	Priority Pollutant Metals (BE, Cd, Cr, Cu, Ni, Ag, Zn)	SW 3050/6010
	Antimony	SW 3005/7041
	Lead	SW 3050/7421
	Arsenic	SW 3050/7060
	Mercury	SW 7471
	Selenium	SW 3050/7740
	Thallium	SW 3050/7841
	Semivolatile Organics	SW 3550/8270
	Pesticides/PCBs	SW 3530/3550/8080

Table 2-4. Summary of Analytical Methods and Parameters for Phases I and II of the Site Inspection at 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

PHASE II		
Media	Parameter	Method
Water	Petroleum Hydrocarbons	E418.1[1]
	Oil and Grease	E413.2
	Volatile Organics	CLP SOW 3/90
	BTEX	SW 5030/8020
	Priority Pollutant Metals (Be, Cd, Cr, Cu, Ni, Ag, Zn)	SW 3005/6010
	Antimony	SW 3005/7041
	Lead	SW 3020/7421
	Arsenic	SW 7060
	Mercury	SW 7470
	Selenium	SW 7740
	Thallium	SW 3020/7841
	Semivolatile Organics	CLP SOW 3/90
Soil	Petroleum Hydrocarbons	SW 3550/E418.1[1]
	Oil and Grease	SW 3550/E413.2
	Volatile Organics	CLP SOW 3/90
	BTEX	SW 5030/8020
	Priority Pollutant Metals (Be, Cd, Cr, Cu, Ni, Ag, Zn)	SW 3050/6010
	Antimony	SW 3005/7041
	Lead	SW 3050/7421
	Arsenic	SW 3050/7060
	Mercury	SW 7471
	Selenium	SW 3050/7741
	Thallium	SW 3050/7841
	Semivolatile Organics	CLP SOW 3/90

[1]E418.1 was used for Sites 1 and 3; modified SW 8015 was used at Site 4 because of UST requirements.

2.9.3 Sediment Sampling

Four sediment samples were collected from drainage features downslope from Site 4 - POL Spill Area during the SI. The samples were collected using a stainless steel scoop and stainless steel bowl. Samples for VOC analyses were collected directly into sample containers. Samples for other analyses were first composited in the stainless steel bowl and then transferred to clean sample containers. The sediment samples were submitted to the laboratory for the analyses listed in Table 2-3.

2.9.4 Groundwater Sampling

Thirteen groundwater samples were collected during the SI to determine if contaminants were present in the groundwater. Six samples were collected during Phase I and seven samples were collected from existing monitoring wells and piezometers during Phase II. The wells were purged and sampled following the procedures detailed in the Field Sampling Plan (SAIC 1990b). The following describes the general approach to purging, sampling, and equipment decontamination procedures used during the SI.

Prior to purging and sample collection, static water level measurements were taken in each well. Depths to groundwater were used to calculate the volume of standing water in each well to determine the volume of water to be purged from each well prior to sampling.

Three to five well volumes of water were purged from each well prior to collection of samples using a bailer. Purging ensured that a representative sample of the aquifer (i.e., not stagnant water) had been collected. Prior to commencement of well purging operations, between wells, and after purging was completed, the equipment was washed with a laboratory-grade detergent and rinsed with potable water (HAZWRAP 1990).

Groundwater samples were collected within 3 hours of purging each well. Samples were retrieved with a Teflon® bailer and dispensed directly into an appropriate sample bottle containing the required preservative (if any was required) for the parameter to be tested. Sample containers were wrapped in packing material and placed in coolers containing ice to maintain a maximum temperature of 4°C. Sample coolers were then shipped to laboratories by overnight carrier.

2.10 DISPOSAL OF WASTES FROM FIELD ACTIVITIES

The soil cuttings that were generated during the drilling of soil borings were containerized in 55-gallon drums during both phases of the SI. All drums were sealed and labeled. Soil that was not contaminated based on field screening for VOCs or laboratory analyses was disposed of onsite. Analytical results for the remaining soil waste were submitted to Chemical Waste Management of Allen County in an application for disposal of the soil waste at the Adams Center landfill. It is expected that the analytical results will be accepted by Chemical Waste Management and Allen County and that the soils can be disposed of at the Adams Center Landfill.

Wastewater was generated during well development and purging during both phases of the SI. The wastewater was containerized in a 1,000-gallon polyethylene tank. The results from groundwater analyses were submitted to the State of Indiana Department of Environmental Management for evaluation. Permission was granted by the Indiana Department of Environmental Management to dispose of the water into the Base storm drain system because the groundwater contained no significant contaminants (IDEM 1991).

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3. RESULTS AND SIGNIFICANCE OF FINDINGS

This section presents the results of the Site Inspection (SI) conducted at the three sites at the 122nd Tactical Fighter Wing, Indiana Air National Guard Base (ANGB), Fort Wayne, Indiana. A discussion of the general geologic/hydrogeologic characteristics of the Base are presented in Section 3.1. Section 3.2 summarizes the quality assurance/quality control (QA/QC) results for the SI program. Section 3.3 discusses background sampling results. Sections 3.4 through 3.6 provide site-specific information on the analytical results of samples collected and the significance of the results. Figures and tables specific to Sections 3.4 through 3.6 follow the text of the individual sections.

3.1 BASE GEOLOGY AND HYDROGEOLOGY

The following two sections describe the geology and hydrogeology at Indiana ANGB. In general, the soil and groundwater characteristics were consistent throughout the three sites studied on Base. Minor deviations from the following descriptions are presented in the site-specific discussions.

3.1.1 Base Geology

The surface soils in the region of Fort Wayne and the Indiana ANGB are composed of unconsolidated glacial sediments. The regional unconsolidated glacial sediments are predominantly of the New Holland Till Member of the Lagro Formation and Trafalgar Formation, deposited during the Pleistocene epoch. In the vicinity of the Base, these formations are composed of till deposited directly from ice with some local meltwater outwash deposits.

The broad spectrum of glacial deposit sediments as it relates to the geology of the base is subdivided into two major categories: glacial till and outwash. Glacial till is unsorted and unstratified glacial drift that typically contains a significant amount of fine-size particles. Sorted and stratified outwash deposits are dominated by sand and gravel. Associated with glacial activities are lake deposits consisting of silts and clays.

All boreholes drilled during the SI were completed within 60 feet of the ground surface and within the unconsolidated glacial drift. The top 10 to 25 feet of sediment corresponding to the Lagro Formation is clay in varying shades of brown. Below the brown clay is the Trafalgar Formation, which consists of a thicker layer of dark gray clay. Water was encountered during drilling at 35 to 45 feet below ground surface (BGS) in gravel, sand, or silt lenses. Beneath these water-bearing units, the unconsolidated clay layer continues to 60 feet and reportedly continues to the top of bedrock at approximately 70 feet BGS (Bleuer and Moore 1978).

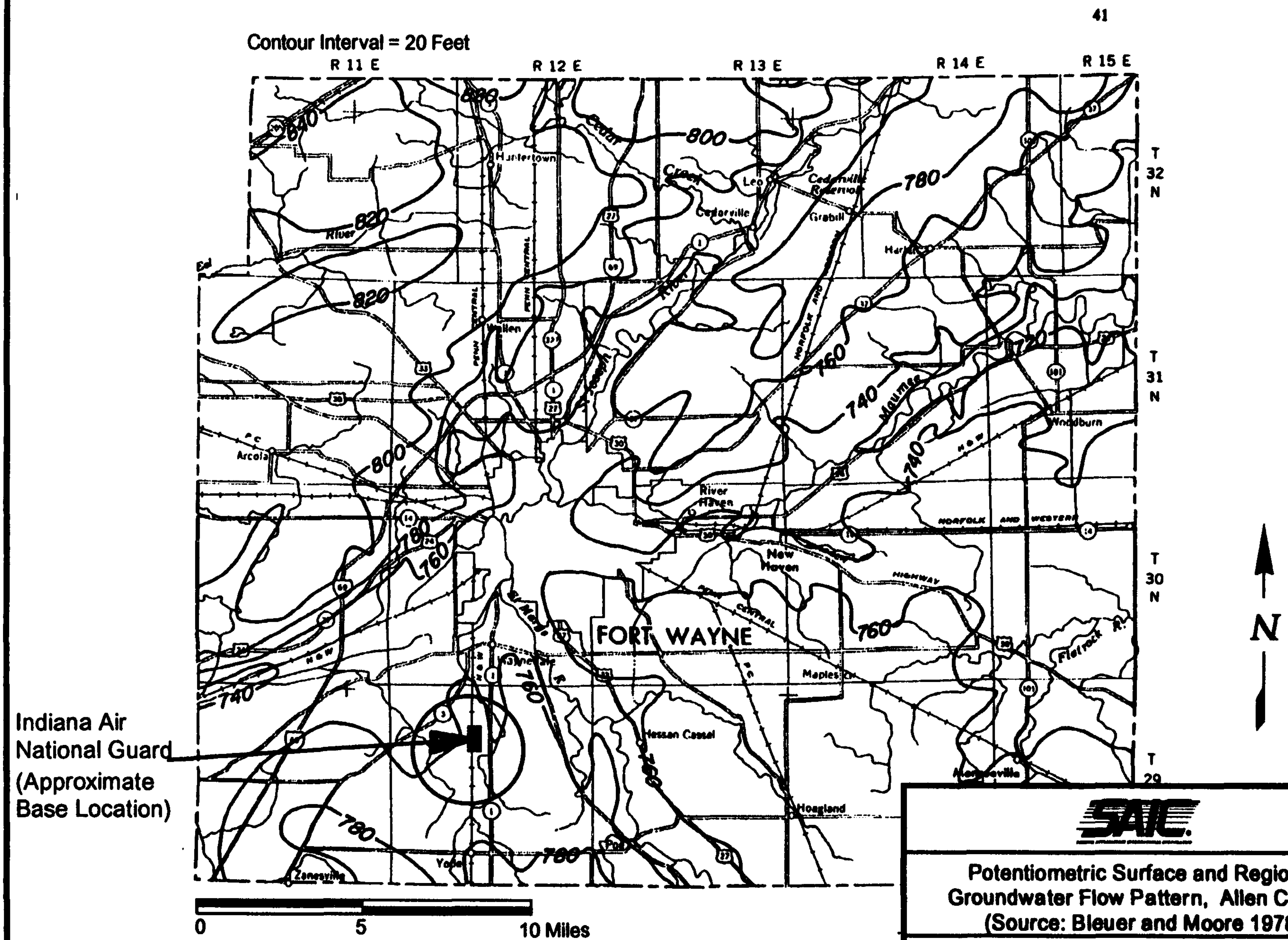
3.1.2 Base Hydrogeology

The hydrogeologic characterization of Indiana ANGB is based on lithology encountered during drilling, static water level measurements of wells and piezometers, and aquifer tests.

During the SI, groundwater was encountered in glacial drift aquifers. Water-bearing units were encountered between 767 and 755 feet above mean sea level (MSL) (typically 35 to 45 feet BGS). Deeper bedrock aquifers underlie the clay layer; however, the shallow glacial aquifer is more significant to the SI, since it is more likely to be affected by past disposal practices. The glacial aquifers are unconfined.

Regional groundwater flow patterns indicate that groundwater beneath the Base flows in an east to northeast direction, as shown in Figure 3-1 (Bleuer and Moore 1978). Local groundwater flow direction at the Base also was determined to be east to northeast based on static water levels measured in wells and piezometers during Phase I. This finding was confirmed by additional static water level measurements recorded during Phase II. Figure 3-2 presents groundwater elevation contours and the groundwater flow direction at the Base.

Rising head permeability tests were conducted on three monitoring wells during Phase I of the SI. These tests measured recovery rates of groundwater in the wells. The recovery rates were used to calculate hydraulic conductivity and groundwater flow rates at the Base. Static water level measurement results, permeability test data, graphs of well recovery rates, and the methods used are presented in Appendix D. The range of hydraulic conductivity determined for the three sites was from 2.29×10^{-5} to 2.96×10^{-4} cm/sec.

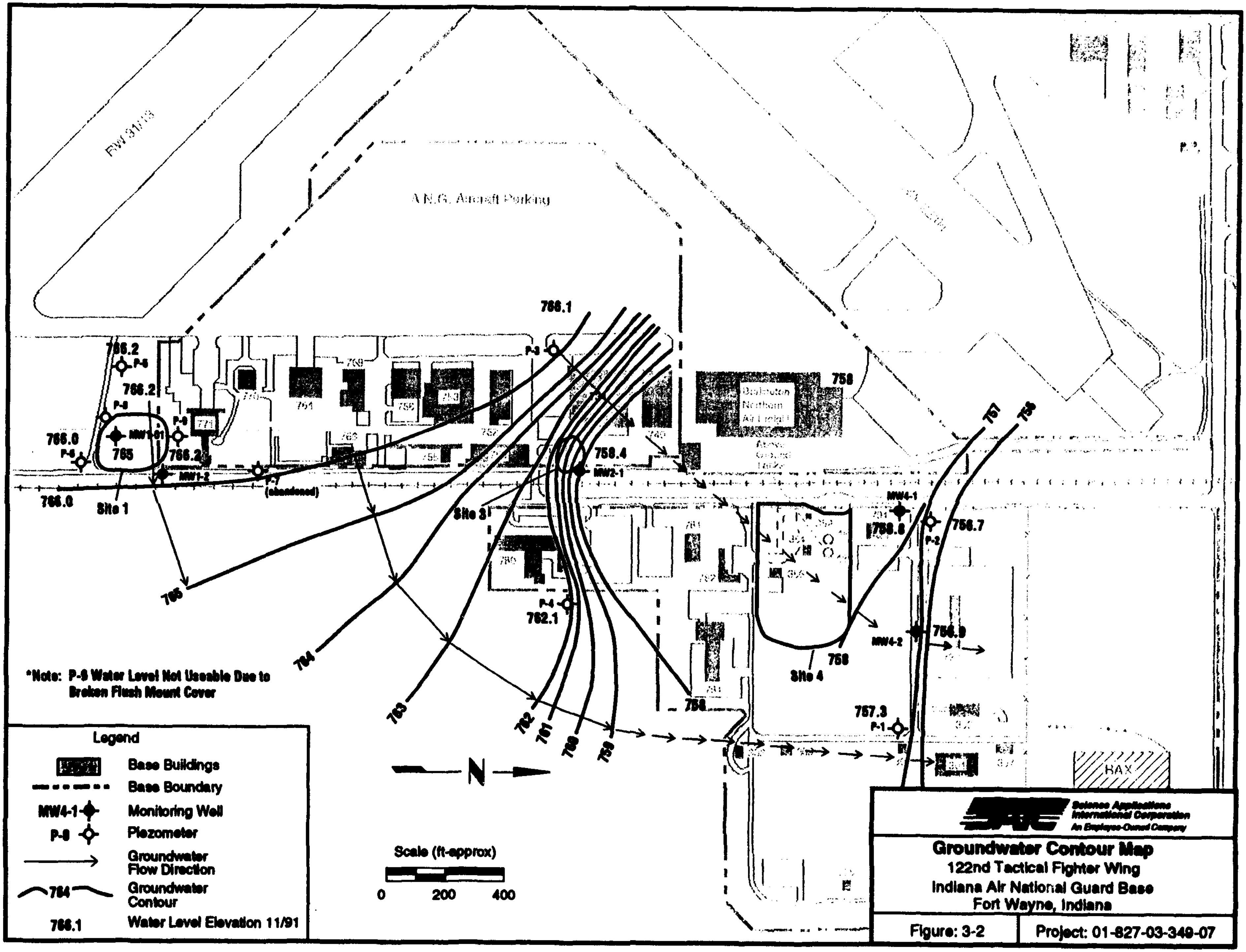


SAIC

Potentiometric Surface and Regional Groundwater Flow Pattern, Allen County (Source: Bleuer and Moore 1978)

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure: 3-1	Project: 01-0827-03-0349-007


RW 31/13
A.N.G. Aircraft Parking
Burlington Northern Air Freight
Site 1
Site 3
Site 4
MW1-2
MW2-1
MW4-1
MW4-2
P-1
P-2
P-3
P-4
P-5
P-6
P-7
(abandoned)
P-8
765
766.1
758.4
762.1
757.3
756.7
757
756
758
759
760
761
762
763
764
*Note: P-8 Water Level Not Useable Due to Broken Flush Mount Cover
Legend
Base Buildings
Base Boundary
MW4-1 Monitoring Well
P-8 Piezometer
Groundwater Flow Direction
784 Groundwater Contour
766.1 Water Level Elevation 11/91
N
Scale (ft-approx)
0
200
400
Science Applications International Corporation
An Employee-Owned Company
Groundwater Contour Map
122nd Tactical Fighter Wing
Indiana Air National Guard Base
Fort Wayne, Indiana
Figure: 3-2
Project: 01-827-03-349-07

To calculate groundwater flow rates, an average hydraulic gradient was determined, and the porosity of the soils at the Base was assumed. Hydraulic gradient (I) is the change in hydraulic head per unit horizontal distance measured along the slope of the water table. A value of 0.005 was calculated as the average for the Base. The method used for calculating hydraulic gradients and the results are presented in Appendix B. A range of porosity values of 10 to 25 percent for glacial till (Driscoll 1986) was used to calculate the flow rate of the aquifer. The groundwater flow rate was calculated to be 3.8×10^{-6} cm/sec using a porosity of 10 percent, and 1.52×10^{-7} cm/sec using a porosity value of 25 percent. This was determined using the following equation:

$$\text{Darcy Flow } V = KI/n$$

where:

K = Hydraulic conductivity

I = Hydraulic gradient

n = Porosity.

Cross sections developed from geologic data collected during the field effort indicate that the aquifer is composed of a 10-foot thick zone of silt, sand, and gravel lenses, each ranging in thickness from 1 to 10 feet. The lenses are believed to be hydraulically connected in this region (Bleuer and Moore 1978).

Hydraulic conductivity of the clay layer was not calculated, although it can be assumed to be lower than the aquifer material conductivity of 7.6×10^{-5} cm/sec. Based on grain size analyses of soil collected just above the sandy gravel aquifer, the soil above the aquifer is classified as clay. The conductivity of water through unconsolidated clay ranges from 10^{-9} to 10^{-6} cm/sec (Fetter 1980). The results of grain size and textural analyses at each site is presented in Appendix H.

3.2 DATA QUALITY ASSESSMENT

A standardized QA/QC program was followed during the SI conducted at the Indiana ANGB to ensure that analytical results and the decisions based on these results were representative of the environmental condition at the sites. The objective of the SI was to confirm the presence of contamination, collect and analyze sufficient numbers of samples to determine the lateral and vertical extent of contamination detected during the Phase I field effort, and present recommendations on further actions. The SI was conducted using the Hazardous Waste Remedial Actions Program (HAZWRAP) Levels B and C (i.e., U.S. Environmental Protection Agency [EPA] Levels II and III) QC requirements described in *Requirements For Quality Control Of Analytical Data* (DOE/HWP-65/R1, July 1990). The results of validated laboratory analyses of soil, sediment, and groundwater samples are presented in Appendix E. The numbers of soil and sediment samples and groundwater samples collected during the SI, in addition to the numbers of field QC samples collected and selected laboratory QC (i.e., matrix spikes and duplicates) samples analyzed, are summarized in Appendix F. The data validation worksheets are referenced within the subsection describing the applicable analysis. The QC checks and results applicable to the Phases I and II field efforts are summarized below.

3.2.1 Data Quality Objectives

The following sections summarize the data quality objectives (DQOs) for precision, accuracy, representativeness, comparability, and completeness (PARCC) obtained during the SI.

3.2.1.1 Precision

Precision was defined as the reproducibility, or degree of agreement, among replicate measurements of the same quantity. The closer the numerical values of the measurements are to each other, the more precise the measurement is. Analytical precision was expressed as the percentage of the difference between results of duplicate samples for a given compound or element. Relative percent difference (RPD) was calculated using the equation given in Appendix F.

Precision was determined using matrix spike/matrix spike duplicate (MS/MSD) and duplicate sample analyses conducted on samples collected for volatile organic compound (VOC), semivolatile organic compound (SVOC), pesticide/polychlorinated biphenyl (PCB) analyses and total petroleum hydrocarbon (TPH), oil and grease, priority pollutant metals, and total dissolved solids (TDS) analyses during the SI. The laboratory selected 1 sample in 20 and split the sample into 2 additional aliquots. MS/MSD samples were prepared by routinely analyzing the first aliquot for the parameters of interest, while the remaining two aliquots were spiked with known quantities of the parameters of interest before analysis. The RPD between the spike results was calculated and used as an indication of the analytical precision for the VOC and SVOC analyses performed. Duplicate samples (i.e., for priority pollutant metals, oil and grease, TPH, and TDS analyses) were prepared by subdividing 1 sample of every 20 samples received and analyzing both samples of the duplicate pair. The RPD between the spike results was calculated and used as an indication of the analytical precision for VOC, SVOC, and pesticide/PCB analyses performed. The RPD between two detected concentrations was calculated and used as an indication of the analytical precision for the analyses performed.

All RPD values calculated from the VOC analyses were within the EPA Contract Laboratory Program (CLP) advisory control limits for analytical precision. Thirteen RPD values (of 55 total values) calculated from the SVOC analyses and 1 RPD value (of 6 total values) calculated from the pesticide/PCB analyses were outside the EPA CLP advisory control limits for analytical precision. Since each analysis was evaluated according to the required QC criteria described in Section F.3 and all of these criteria were met for the environmental samples analyzed, these RPD values are considered to be a more representative reflection of the variability characteristic of the environmental conditions at the Base, and as a result, the analytical DQO for VOC, SVOC, and pesticide/PCB (for soils only) precision is considered to have been met. The analytical precision DQO for pesticides/PCBs in groundwater could not be evaluated, since the MS/MSD analyses for that matrix was conducted using a field QC blank rather than an environmental sample.

All priority pollutant metals RPD values were within the control limits, except aluminum, arsenic, chromium, copper, lead, manganese, and zinc. As a result, data validation qualifiers were applied to these elements in numerous soil samples associated with those samples analyzed in duplicate. These results are considered to have little impact on the environmental data quality and considered more likely to be a result of the regional matrix variability, since all other analytical QC criteria were met. Therefore, the analytical precision DQO for these metals analyses is considered to have been met. Four RPD values calculated from TPH analysis, one

RPD value calculated from oil and grease analysis, and one RPD value calculated from TDS analysis were within the appropriate limit; therefore, the analytical precision DQO for these analyses is considered to have been met. The analytical QC evaluation criteria used to evaluate precision and all MS/MSD results are discussed in Section F.3.

Sample collection reproducibility and media variability were measured in the laboratory by the analysis of field replicates. Field replicates were collected using the same techniques as those used to collect the environmental samples. One in 10 similar matrices was collected, and sample collection reproducibility and media variability were evaluated based on the RPD values between two duplicate samples. No corrective action was taken based on RPD values.

All soil samples to be analyzed by the laboratory were collected using brass (i.e., for VOC, SVOC, TPH, and oil and grease analyses) and stainless steel (i.e., for priority pollutant metals analyses) liners. Each split spoon was filled with sufficient liners such that replicate samples could be collected at any sample collection interval. After the split spoon sampler was retrieved from the borehole, these liners were capped and labeled and each sample was shipped to the laboratory in the liner. Therefore, the replicate concentrations measured by the laboratory reflect the natural matrix variability inherent in the soil at the Base. Field RPD values were calculated only for compounds and elements detected above the contract required detection limits (CRDLs) in both replicate pair samples and only for those compounds and elements not considered to be common laboratory contaminants (e.g., methylene chloride and zinc). Toluene was detected in one soil replicate pair (i.e., SB1A-3-4 and SB1A-3-4R). The RPD value was calculated at 141 percent. All other VOC, SVOC, and TPH RPD values met the acceptance criteria. Priority pollutant metals replicate RPD values met the evaluation criteria, except for lead in one soil replicate pair (i.e., SB1-3-3 and SB1-3-3R). Based on these RPD results and the acceptable QC results, the sample collection DQO for reproducibility is considered to have been met. A comprehensive discussion of all replicate sample results is presented in Appendix F (Section F.2.4).

3.2.1.2 Accuracy

Accuracy was defined as the degree of difference between measured or calculated values and the true value. The closer the numerical value of the measurement approaches the true value, or actual concentration, the more accurate the measurement is. Analytical accuracy is expressed as the percent recovery of a compound or element that has been added to the environmental sample at a known concentration before analysis. The percent recovery values were determined using the equation given in Appendix F.

Laboratory accuracy was qualitatively assessed by evaluating sample holding times, method blank, tuning and mass calibration (gas chromatography/mass spectrometry [GC/MS] only), system performance compound and surrogate recovery (GC/MS and GC, respectively, only), internal standard (GC/MS only), laboratory control sample (LCS) and method blank spike recovery, and initial and continuing calibration results calculated from all analyses conducted on environmental samples.

Seven (of 150 values), three (of 110 values), and one (of 18 values) percent recovery values were outside the required control limits. All supporting VOC, SVOC, and pesticide/PCB information cited above was qualitatively evaluated with respect to the analytical accuracy. Selected data validation qualifiers were applied to the VOC environmental sample results due to method blank interference (i.e., methylene chloride), internal standard performance, and poor surrogate recoveries. Selected data validation qualifiers were applied to the SVOC environmental sample results due to the exceeded holding times, internal standard performance, and poor surrogate recoveries. Undetected compounds in three soil samples and two groundwater samples were rejected due to the exceeded holding times. In addition, two soil samples and three groundwater samples were rejected due to poor surrogate recoveries. Of the qualified SVOC data points, these values have the greatest adverse impact on the environmental data quality. 4,4′-DDT in one water sample was rejected due to matrix spike recovery. Selected data validation qualifiers were applied to the pesticide/PCB environmental samples due to poor surrogate recoveries.

Data validation qualifiers were applied to 17 antimony, 6 arsenic, and 10 lead concentrations to indicate that these values were rejected due to unacceptable (i.e., less than 30 percent recovery) matrix spike recoveries. Mercury in one groundwater sample was rejected due to the exceeded holding time. In addition, data validation qualifiers were applied to numerous other priority pollutant metals concentrations to indicate that the matrix spike recoveries were outside the applicable control limits. Despite these values, no systematic laboratory error was detected, since all LCS criteria for soil and water samples were met. As a result, all associated soil and groundwater samples data were qualified for data validation purposes, as required by EPA validation quidelines; however, the results are considered to have little impact on the overall data quality. All supporting priority pollutant metals QC information cited above also was qualitatively evaluated with respect to the analytical accuracy DQO. Of this information, numerous data points in selected environmental samples were estimated due to method blank interference and mercury in selected samples was estimated due to the exceeded holding time. Based on the evaluation of the MS/MSD results and the associated QC results summarized in Section F.3, the overall laboratory accuracy is acceptable, and as such, the analytical DQO for accuracy was met, except where noted.

Sampling accuracy was maximized by adherence to the strict QA program presented in DOE/HWP-69/R1. All procedures (i.e., soil boring and monitoring well installation, soil and groundwater collection, equipment decontamination, and health monitoring equipment calibration and operation) used during the Indiana ANGRC SI were documented as standard operating procedures (SOPs). Field QC blanks (i.e., trip blanks, field blanks, and equipment blanks) were prepared to ensure that all samples represent the particular site from which they were collected, assess any cross contamination that may have occurred, and qualify the associated analytical results accordingly.

Data validation qualifiers (e.g., U[FB]) were applied to the methylene chloride, toluene, and acetone in 10 selected environmental samples (i.e., 3 groundwater and 7 soil samples) to indicate that these compounds were considered not detected due to associated field QC blank interference. These samples were validated using the highest concentration of the applicable interferent detected in the associated field QC blank. Data validation qualifiers were applied to selected priority pollutant metals (i.e., predominantly cadmium, copper, lead, sodium, and zinc) and TDS detected in soil and groundwater samples to indicate that these concentrations are considered estimated, since the concentrations detected in the environmental samples did not exceed five times that detected in the associated field QC blank. Despite the data validation qualifiers, these field QC blanks are not considered to have adversely impacted the soil sample data quality, since metals are relatively nonvolatile and the possibility of cross contamination between field QC blanks and soil samples is remote. Therefore, it is unlikely that the water used to prepare the field QC blanks was a source of those elements and TDS detected in the associated groundwater samples, since the bailer was effectively rinsed numerous times with the sample media during the well preparation activities. Based on an evaluation of the compounds and elements detected in the field QC blanks, the overall field accuracy is acceptable, except where noted. As a result, the field DQO for accuracy is considered to have been met. A comprehensive discussion of the field QC results is presented in Section F.2.

3.2.1.3 Representativeness

Representativeness was defined as the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling location, a process condition, or an environmental condition. Sample representativeness was ensured during the SI by collecting sufficient samples of a population medium, properly distributed with respect to location and time. Representativeness was assessed by reviewing the drilling techniques and equipment; well installation procedures and materials; and sample collection methods, equipment, and sample containers used during the SI, in addition to the onsite GC analysis results and evaluating the RPD values calculated from the duplicate samples and the concentrations of interferents detected in the field and laboratory QC blanks. The reproducibility of a representative set of samples reflects the degree of heterogeneity of the sampled medium, as well as the effectiveness of the sample collection techniques.

All monitoring wells were installed using hollow stem auger drilling techniques. This method is commonly used to install monitoring wells to depths less than 100 feet. All samples were collected using the split spoon driven in front of the auger. As originally specified in the project Work Plan, California ring samplers (i.e., brass or stainless steel liners inserted into a split spoon sampler) were to be used to collect all soil samples. All other data are considered to be representative.

Based on the evaluation of the factors described above and summarized in Section F.3, the samples collected during the SI are considered representative of the environmental condition at Indiana ANGB.

3.2.1.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another and is limited to the other PARCC parameters, because only when precision and accuracy are known can one data set be compared to another. To optimize comparability, only the specific methods and protocols that were required by DOE/HWP-65/R1 were used to collect and analyze samples during the SI conducted at the Base. By using consistent sampling and analysis procedures, all data sets were comparable within the sites at Indiana ANGB, between sites at the installation, or among ANGB facilities nationwide, to ensure that remedial action decisions and priorities were based on a consistent data base. Comparability also was ensured by the analysis of EPA reference materials, establishing that the analytical procedures used were generating valid data.

All samples collected for VOC and SVOC analysis were analyzed using EPA methods and the March 1990 EPA CLP Statement of Work (SOW). Table 2-4 contains a list of EPA methods used. Samples collected for pesticides/PCBs, priority pollutant metals, TPH, oil and grease, and TDS analyses were analyzed using EPA methods. A summary of analytical methods and parameters is provided in Table 2-4.

Based on the precision and accuracy assessment presented above, the data collected during the SI at Indiana ANGB are considered to be comparable with the data collected during previous investigations.

3.2.1.5 Completeness

Completeness was defined as the percentage of valid data obtained from a measurement system. For data to be considered valid, they must have met all acceptance criteria, including accuracy and precision, as well as any other criteria specified by the analytical methods used. Based on the evaluation of the field and laboratory QC results presented in Sections F.2 and F.3, 99.4 percent of the sample data collected for VOCs; 91 percent of the sample data collected for SVOCs; 99.7 percent of the sample data collected for pesticides/PCBs; 98.5 percent of the sample data collected for priority pollutant metals; and 100 percent of the sample data collected for benzene, toluene, ethylbenzene, and xylenes (BTEX), TPH, and TDS during the SI were used as the basis for recommendations presented in this report.

Furthermore, project completeness was defined as the percentage of data used to prepare a preliminary risk evaluation and upon which recommendations for site remediation are based. For analytical data to be considered usable for risk evaluation and remediation recommendations, they must be satisfactorily validated. Rejected (i.e., due to holding time, surrogate, and matrix spike recoveries) values and concentrations reported for all analyses were not used in the risk estimates or for remediation recommendations due to the increased potential of using the concentrations of false positive compounds and elements or omitting compounds or elements (i.e., false negatives) that may have an adverse impact on human health. As a result, 564 SVOC, 1 pesticide/PCB, and 35 priority pollutant metals data points were rejected, and as a result, were not included in the preliminary risk evaluation. A complete list of these data points is presented in Appendix F.

3.2.2 Tentatively Identified Compounds

As required by the March 1990 EPA CLP SOW for organics analyses, those compounds (up to a maximum of 10 compounds) detected that cannot be identified as a CLP target volatile compounds were reported with the sample results (i.e., Form I) as tentatively identified compounds (TICs) on Form I VOA-TIC. A maximum of 20 semivolatile compounds were reported as TICs on Form I SVO-TIC. TICs were defined as compounds for which standard reference material was not used (or not available) to calibrate the GC/MS or to produce a daily reference mass spectrum that is unique for that compound. The exact identification is uncertain, since the compound is identified by comparing the mass spectrum with those (i.e., the mass spectra of more than 50,000 compounds) in the National Institute of Science and Technology (NIST) library of mass spectra contained in the GC/MS data system, as required by the EPA CLP, and not with that of a standard. The concentration of each compound detected was calculated by using a response factor of one compared to the nearest internal standard. All TICs are reported as estimated (i.e., "J") concentrations, since the response factor also is estimated.

The VOC and SVOC TIC data were used to recommend additional remedial measures (or to develop no further action Decision Documents at sites where VOC and SVOC TICs were not detected), since the hydrocarbons that make up the JP-4 fuel mixture are not CLP target compounds, except benzene, toluene, ethylbenzene, p-xylene, o-xylene, naphthalene, and 2-methyl-naphthalene. As a result, most petroleum fuel hydrocarbons that make up JP-4 are reported as VOC and SVOC TICs, if detected in a soil or water sample. Furthermore, the TICs potentially might be the only indicator of contamination at some sites where fuel spills occurred or fire training activities were conducted in decades past, since the VOCs are volatile and would likely not be detected and the SVOCs make up less than 0.5 percent (by weight) of any given JP-4 mixture. For the purposes of the SI, VOC and SVOC TICs that could not be directly attributed to laboratory method blank or field QC blank interference were used to indicate contamination resulting from past JP-4 use at the applicable site. All TIC concentrations were summed and reported in the Appendix E data presentation tables as a single estimated value. The number of individual compounds reported was presented in parentheses adjacent to the cumulative concentration.

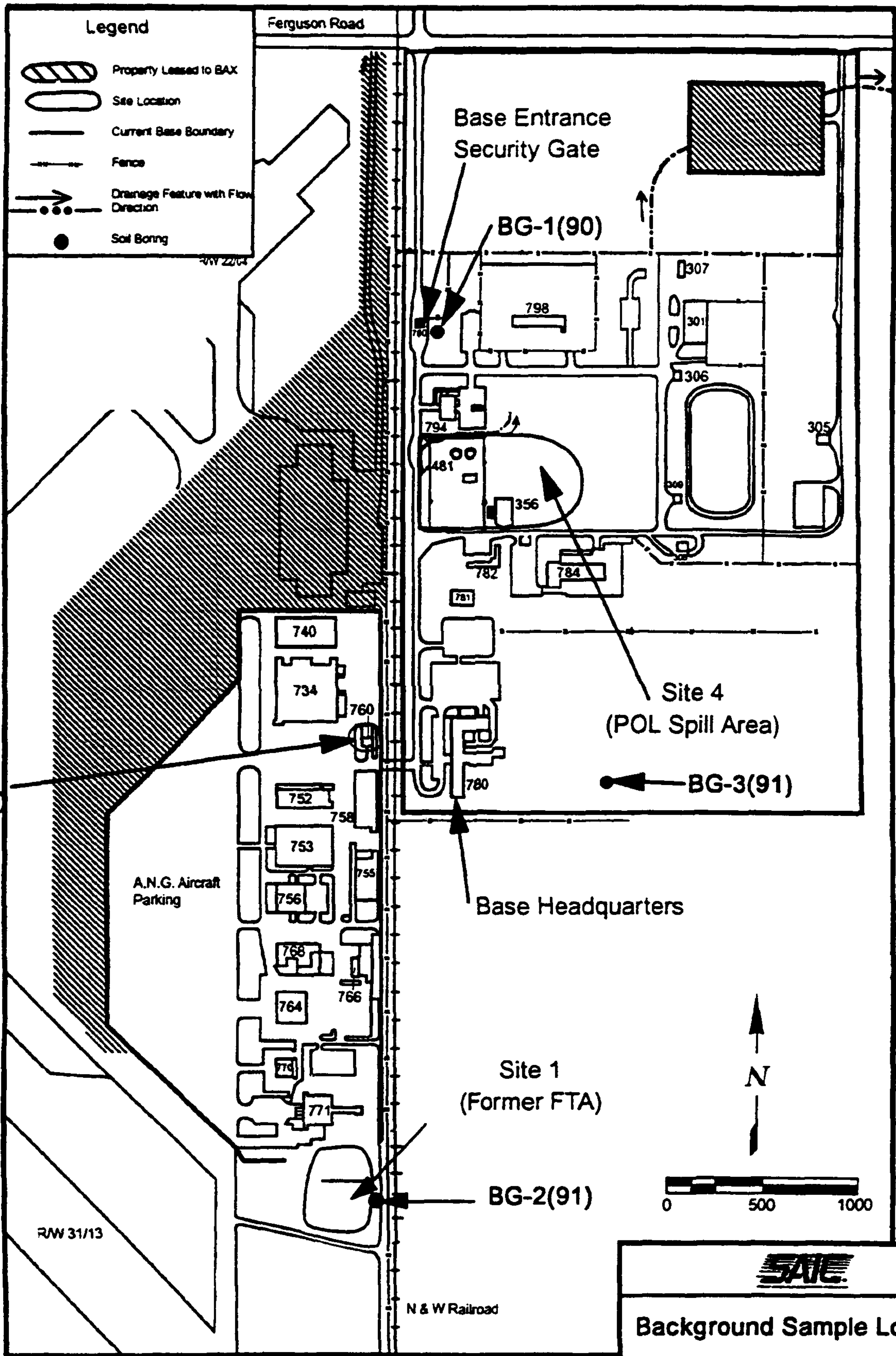
3.3 BACKGROUND SAMPLING

Three background borings were drilled and sampled during the SI program. One boring (BG1) was drilled during Phase I and two samples were collected, one at 0 to 2 feet BGS and the other at 3 to 5 feet BGS. Two additional borings (BG2 and BG3) were drilled during Phase II activities. Three samples were collected from each of the two borings: one at the surface (0 to 2 feet BGS), one at the water table interface, and one at a depth half the distance to the water table. The intent of the background samples was to establish a baseline for contaminant concentrations for comparison to site-related contaminant concentrations. The locations of the borings are shown in Figure 3-3. The analytical results for soil samples collected from the background borings are presented in Table 3-1.

As shown in Table 3-1, TPHs were detected at 670 mg/Kg in the surficial background sample collected from BG1. In boring BG2 drilled during Phase II, TPH were detected at 220 mg/Kg in the surficial sample (0 to 1.5 feet BGS), and at 100 mg/Kg in the sample collected at 3 to 4.5 feet BGS. Toluene was detected in samples collected from all borings (BG1, BG2 and BG3) drilled during the SI (Table 3-1). Some SVOCs were detected in the surficial sample (0 to 2 feet BGS) from boring BG1, and in samples collected from boring BG2. Boring BG1 was drilled just east of the Base entrance Guard House in an area not impacted by any of the three sites. Potential sources of petroleum hydrocarbons in boring BG1 surface soil include analytical interferences from naturally occurring organic material in the soil or hydrocarbons exhausted from the numerous vehicles entering and exiting the Base. The analytical method used for TPH during Phase I (EPA 418.1) was changed to EPA SW Method 8015 during Phase II in order to detect only anthropogenic petroleum contaminants. PAHs are products of incomplete combustion and also may have occurred in BG1 surface soil as a result of vehicle exhaust.

At boring BG2 drilled during Phase II, contaminants detected in the soil samples are most likely from a source not related to Site 1 activities. This boring was drilled upslope from Site 1 -Former Fire Training Area (FTA) as confirmed by surveying activities and is outside of Site 1 boundaries. As explained in Section 3.4, contamination that might result from fire training activities at Site 1 would most likely be detected at the former FTA surface, which is downslope from BG2 and approximately 10 to 12 feet BGS.

Background analytical results represent conditions not associated with site activities. Petroleum hydrocarbons and PAHs observed in some background surface samples are most likely from operations that are routinely conducted at the Base. Operations such as aircraft maintenance and flight testing are routinely conducted and will continue to be conducted in the future. Therefore, background data obtained for the Base were used in evaluating the significance of site-specific field and laboratory results.



Sources: HMTC 1988, Base Map, and Base Photograph, 1972

SAIC

Background Sample Locations

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure 3-3	Project: 01-0827-03-0349-007

Table 3-1. Summary of Analytical Results for Background Samples, 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Sample No.	BG1-1	BG1-2	BG2-1	BG2-2	BG2-3	BG2-4
Depth (ft. BLS)	0 - 2	3 - 5	0 - 1.5	3 - 4.5	20 - 21.5	37 - 39
Sample Date	8/90	8/90	11/91	11/91	11/91	11/91
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Parameter						
Metals (mg/Kg)						
Antimony	NT	NT	ND	ND	3.5J(NB)	ND
Arsenic	NT	NT	8.5	9.3	7.6	7.1
Beryllium	1	2.8	0.69J(B)	0.6J(B)	0.5J(B)	.6J(B)
Cadmium	0.34J(MB,B)	0.49J(MB,B)	0.67J(MB,B)	0.34(B)	0.71J(MB,B)	0.6J(MB,B)
Chromium	15.5	34	22.2	21.1	16.7	19.1
Copper	13J(FB)	29.3	30.2J(N*)	28.6J(N*)	24.8J(N*)	23J(N*)
Lead	NT	NT	30.6	14.1	9.1	10.3
Nickel	11J(MB)	28.3	26.3	34.7	27.9	37.4
Thallium	NT	NT	0.28J(B)	0.4J(B)	0.4J(B)	0.5J(B)
Zinc	41.9J(FB)	71.9J(FB)	75.9	93	72.3	76.1
Total Petroleum Hydrocarbons (mg/Kg)	670	ND	220	100	ND	ND
Volatile Organics (μg/Kg)						
Toluene	NT	180J(SSR,IS)	2(J)	31	41	ND
Semivolatile Organics (μg/Kg)		ND			ND	ND
2,4-Dinitrotoluene	ND	ND	3,400	ND	ND	ND
Benzo(a)anthracene	ND	ND	1,000	ND	ND	ND
Benzo(a)pyrene	210(J)	ND	1,100	ND	ND	ND
Benzo(b)fluoranthene	170(J)	ND	2,200	1,000	ND	ND
Benzo(k)fluoranthene	320(J)	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	ND	ND	ND	370	ND	ND
Chrysene	ND	ND	ND	490	ND	ND
Fluoranthene	ND	ND	1,500	920	ND	ND
Fluorene	220(J)	ND	ND	ND	ND	ND
N-Nitrosodiphenyl-amine	ND	ND	800	ND	ND	ND
Phenanthrene	ND	ND	600	420	ND	ND
Pyrene	190(J)	ND	1,600	880	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT - Not Tested
J - Concentration should be considered as an estimate
U - Compound/element was not detected, but is presented with accompanying data validation qualifier
R - Data rejected
Note: A list of relevant data validation qualifiers is included at the end of Table 3-1.

Table 3-1. Summary of Analytical Results for Background Samples, 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (continued)

Sample No.	BG3-1	BG3-2	BG3-3
Depth (ft. BLS)	0 - 1.5	15 - 16.5	29 - 30.5
Sample Date	11/91	11/91	11/91
Matrix	Soil	Soil	Soil
Parameter			
Metals (mg/Kg)			
Antimony	ND	ND	ND
Arsenic	7.8	7.3	1.21J(MB,B)
Beryllium	0.75J(B)	0.53J(B)	ND
Cadmium	ND	0.48J(MB,B)	ND
Chromium	16.3	17.9	3.9
Copper	46.2J(N*)	21.9J(N*)	7.9J(N*)
Lead	20.6	9.3	2J(FB)
Nickel	19	30.9	6J(MB,B)
Thallium	ND	0.43J(B)	ND
Zinc	85.9	63.8	16.1J(MB)
Total Petroleum Hydrocarbons (mg/Kg)	ND	ND	ND
Volatile Organics (μg/Kg)			
Toluene	110J(IS)	110	ND
Semivolatile Organics (μg/Kg)	ND	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT - Not Tested
J - Concentration should be considered as an estimate
U - Compound/element was not detected, but is presented with accompanying data validation qualifier
R - Data rejected
Note: A list of relevant data validation qualifiers is included at the end of Table 3-1.

List of Data Validation Qualifiers Applicable to Table 3-1

J(B)[metals]	- the reported value is estimated because it is greater than the instrument detection limit (IDL), but less than the contract required detected limit (CRDL).
J(MB)	- the reported value is estimated because the element also was detected in the associated laboratory method blank.
J(FB)[metals]	- the reported value is estimated because the element also was detected in the associated field blank.
J(N)[metals]	- the reported value was estimated because spike recovery is outside the control limits.
J(*)[metals]	- the reported value was estimated because duplicate sample analysis is outside the control limits.
J(IS), UJ(IS)	- the reported value was estimated because internal standard area is outside the control limits.
J(SSR)	- the reported value was estimated because surrogate recovery is outside the required control limits.

3.4 SITE 1 - FORMER FIRE TRAINING AREA

Site 1 - Former Fire Training Area (FTA) was used from the late 1950's until 1972 when fire training activities were terminated at this location. The location of this site is shown in Figure 1-2. During the time the former FTA was used, approximately 500 gallons of aviation fuel were burned per year for a total of 9,500 gallons during the time the former FTA was in operation. After fire training operations ceased, the area was filled primarily with native clay and some construction debris, and graded to form the current topography at the site. The former FTA surface is approximately 10 to 12 feet below the current ground surface. The intervening surface consists of backfill material, which is mostly clay and silty sand.

The site history and the present topography and subsurface conditions should be kept in perspective when evaluating the nature and extent of contamination at Site 1. Since the former FTA surface is located approximately 10 to 12 feet BGS, any contamination that is related to fire training activities conducted at the site would be expected to be detected at or below the former surface. The focus of the SI, however, was not only to determine the presence of site-related contamination within the former FTA surface, but also at the current ground surface. This was because the significance of any contamination present above the former FTA surface, although not related to fire training activities, should be evaluated. Accordingly, soil samples were collected above, at, and below the former FTA surface.

Ten soil borings were drilled at the site. Four borings were drilled during Phase I activities in August 1990, and six borings were drilled during Phase II activities in October and November 1991. Groundwater samples were collected from two downgradient monitoring wells and one piezometer installed upgradient from the FTA site, and from an open soil boring drilled in the center of the former FTA. The following sections present the findings of the SI field investigations conducted at Site 1. A presentation and discussion of the laboratory results of soil and groundwater samples collected at the site is included. A brief discussion on the subsurface geologic profile, information on groundwater flow direction, and conclusions drawn concerning the nature and extent of contamination also are presented.

3.4.1 Site-specific Geologic Discussions

The geologic and hydrogeologic characteristics are similar to the description of Base characteristics discussed in Section 3.1 except for the presence of fill material overlying the former ground surface and a more easterly groundwater flow direction. Groundwater flow at Site 1 was determined from static water level measurements of five piezometers installed around the site, and two monitoring wells installed at the site. In the area of the former FTA, groundwater flows east-northeast; groundwater flow under the Base-is generally northeast. The location and depiction of a cross section showing the general geology at Site 1 are shown in Figures 3-4 and 3-5, respectively.

A layer of fill material composed primarily of native clay and reportedly some construction debris (HMTC 1988) was deposited over the Site 1 area (Figure 3-4); however, during drilling activities at Site 1, no significant areas of construction debris were encountered. The clay forming the fill layer appeared to have the same characteristics as the native clay found throughout the Base. The fill layer ranges in depth from approximately 5 to 13 feet above the former ground surface. In the area of the former FTA, the fill layer is 10 to 12 feet BGS. The fill material covers an area approximately 255 by 300 feet. Based on the results of the surveying conducted to delineate the former FTA boring and discussions with the former Base Fire Chief, the FTA comprises an area approximately 15 by 90 feet.

3.4.2 Soil Sampling Results

An evaluation of analytical results for soil samples collected from the 10 borings at Site 1 - Former FTA are presented below. The borings drilled at the site are designated SB1-1 through SB1-10. The locations of these borings are shown in Figure 3-6. The analytical results for the soil samples collected from the former FTA are shown in Table 3-2; profiles depicting the concentrations of contaminants detected in the soil samples are shown in Figure 3-7.

The analytical results for the soil samples from the former FTA have been divided into two groups to effectively evaluate the data: 1) results of samples collected above the former FTA surface (5 to 12 feet BGS), and 2) results from soils at and below the former FTA surface (from 5 feet below current ground surface to the water table).

3.4.2.1 Analytical Results of Samples Collected Above the Former FTA Surface

The following briefly summarizes the analytical results for samples collected above the former FTA surface (Table 3-2):

- TPH were detected in samples SB1-4-1 (collected in the surficial 0- to 2-foot layer) at 2,400 mg/Kg and SB1-10-2 (collected at 5 to 6.5 feet BGS) at 1,900 mg/Kg.
- Organics detected in samples collected above the former FTA surface were toluene at 80 μg/Kg in sample SB1-4-1; four PAHs (i.e., benzo(a)pyrene, benzo(b)fluoranthene, fluoranthene, and pyrene) in sample SB1-7-1 (however, only fluoranthene levels should be considered for evaluation, as concentrations of the other three compounds are only estimates); toluene and several PAHs in sample SB1-9-1; acetone, toluene, and the same four PAHs listed above in sample SB1-10-1; and acetone, methylene chloride, and toluene in sample SB1-10-2.
- Several metals were detected in all samples collected above the former FTA surface, including antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, thallium, and zinc. Not all of the metals were detected in all samples; as evidenced from Table 3-2, the average concentrations of most of the metals detected are below background concentrations. Only arsenic and nickel in the top 2 feet of soils were slightly above background concentrations in the same depth interval.

3.4.2.2 Analytical Results of Soil Samples Collected Below the Former FTA Surface

In soil samples collected at and below the former FTA surface, site-related contaminants were predominantly detected in SB1-5 (which was drilled in the center of the former FTA), SB1-4, and SB1-7. Contaminants were detected in samples from borings SB1-2, SB1-8, SB1-9, and SB1-10, but these contaminants are either not considered to be related to the fire training activities or are otherwise not considered to be significant, as explained later in this section. The following summarizes the analytical results for samples collected below the former FTA surface from borings SB1-4, SB1-5, and SB1-7:

- In samples from boring SB1-4, TPH were detected at 1,500 mg/Kg at the former FTA surface, and at 1,400 and 1,100 mg/Kg in two samples collected below the surface. Benzene, toluene, ethylbenzene, and SVOCs, including several PAHs, also were detected in these samples.
- In samples from boring SB1-5, benzene, toluene, and 4-methylphenol were detected at the former FTA surface (10 to 11.5 feet BGS).

- Samples collected from boring SB1-7 showed the presence of TPH at 200 mg/Kg, and acetone, methylene chloride, toluene, and SVOCs, including several PAHs, in the sample collected at the former FTA surface (8.5 to 10 feet BGS).
- The same VOCs also were detected in the sample collected 5 feet below the former FTA surface (15 to 16.5 feet BGS) in boring SB1-7; however, no SVOCs were detected in this sample.

The following briefly summarizes additional analytical results from samples collected at and below the former FTA surface:

- TPH were found at 630 mg/Kg in sample SB1-2-3 collected at 14 to 18 feet BGS; no SVOCs were detected in this sample.
- No TPH or SVOCs were detected in boring SB1-3.
- Only methylene chloride at 56 μg/Kg was detected in boring SB1-6; methylene chloride was detected in sample SB1-6-5 collected at 25 to 26.5 feet BGS.
- Acetone, toluene, and methylene chloride were detected in samples from SB1-8.
- VOCs, such as acetone, methylene chloride, and toluene, were detected in samples from boring SB1-9; however, several of the VOC concentrations are considered to be estimates (Table 3-2).
- The contamination distribution scenario observed in boring SB1-10 was similar to that in boring SB1-9.
- Metals detected in all samples are considered to be within background levels; the significance of these levels will be evaluated through a preliminary risk evaluation.

3.4.2.3 Evaluation of Soil Sampling Results

Based on physical inspection (visual appearance and prevalence of odor) of soil samples collected during the drilling of boring SB1-5, it appeared that the former FTA had been encountered. The field screening equipment used during field activities also detected the presence of organic vapors. However, the only contaminants detected in this boring were BTEX compounds found at the former FTA surface. A review of the actual operation of the fire training activities revealed that some unburned fuel remained at the end of each fire training event. At that time, the terrain at the fire training area sloped downward from east to west uniformly across the length (the long axis) of the burn area. Unburned flammable liquids possibly were carried westward from the burn area. This is evidenced from the results of the samples collected from borings SB1-4 and SB1-7.

Soil boring SB1-4 was completed at approximately 50 feet west and downslope from the former FTA, due west of the southern extent of the FTA. Samples from this boring near the former FTA surface showed the presence of PAHs and TPH. Soil boring SB1-7 was completed approximately 75 feet west and downslope from the former FTA, due west of the northern extent of the FTA. Samples at the former FTA surface from this boring contained 13 PAHs ranging from 71 to 1,700 μg/Kg and TPH at 200 mg/Kg. It appears that some of the unburned fuel from the FTA also reached this location.

In boring SB1-4, TPH were detected at the current land surface, 8 to 10 feet, 10 to 12 feet, and 12 to 14 feet BGS in decreasing concentrations from the current land surface. The presence of the high TPH in the surficial samples from the current land surface is not related to the fire training activities and is probably from another source originating at the current land surface. Therefore, the high levels of TPH and PAHs observed at the former FTA surface and below might partially be from this unknown source in addition to contaminants that may have migrated from the former FTA itself. In boring SB1-7, the four PAHs detected in the surficial samples are not considered to be related to the fire training activities and could possibly be a result of jet exhaust or recent burning at other locations.

Contaminants were not detected in soil boring SB1-6. This boring is located just north of the northern extent of the burn area. The absence of contaminants in SB1-6 indicates that contaminants primarily migrated downslope to the west and not to the north of the burn area.

Contaminants were not detected at the former FTA surface in soil boring SB1-9. This boring is located approximately 35 feet south of the southern end of the burn area. The absence of contaminants in SB1-9 indicates that the contaminant migration to the south was limited and confirms that the principal direction of contaminant migration was downslope to the west. The PAHs detected at the current land surface in this boring are not site-related, since they most likely did not originate at the former FTA surface. The contamination may be due to aircraft exhaust or recent burning at other locations.

Contaminants were detected at the former FTA surface in boring SB1-10. this boring is located approximately 80 feet west of what is most likely the western extent of site-related contamination. The high occurrence of TPH in boring SB1-10 from 5 to 6.5 feet BLS is similar in concentration to TPH detected in boring SB1-4 and is not related to former FTA activities. Boring SB1-10 is beyond the extent of contamination delineated by the other borings and probably originates from a source closer to the airport runways west of Site 1.

3.4.3 Groundwater Sampling Results

Groundwater samples were collected during both phases of the field activities from monitoring wells MW1-1 and MW1-2, which are located downgradient from the former FTA (Figure 3-6). A sample also was collected from piezometer P-8, which is located upgradient from the site.

During each phase, the groundwater samples were analyzed for metals, TPH, VOCs, and SVOCs. The results of groundwater analyses for both Phases I and II are summarized in Table 3-3. In addition, one water sample was collected from boring SB1-5; this sample was collected when the water table interface was encountered and was analyzed only for organics (VOCs and SVOCs).

As shown in Table 3-3, no organics were detected in any of the groundwater samples. In addition, no organics were detected in sample GW1-1 collected from boring SB1-5. Several metals were detected in the groundwater samples. In particular, among the metals of concern (based on effects to public health and the environment), arsenic, chromium, lead, and nickel were detected during Phase II sampling; however, only arsenic and lead were detected during Phase I sampling. Only copper, lead, and zinc were detected in all samples collected during both phases (Table 3-3). Chromium and beryllium were detected in three of the six samples collected, arsenic in five samples, and nickel in four samples.

As mentioned in Section 3.4.2, except for arsenic and nickel in the top 2 feet of soils, the concentrations of all other metals detected in site soils are within background levels for the entire Base. The concentrations of metals detected in groundwater at the site are not considered to be entirely site related. Metals tend to be adsorbed easily to soils and are not easily transported by infiltrating water. Solubility of metals in water is mainly a function of oxidation state and pH. In a reducing environment or at a low pH, the solubility of metals increases; with increasing pH or oxidation, metals species are less soluble and precipitate out of the solution. Based on geotechnical tests conducted, pH of the site soils is between 7.7 and 8.2. At these pH levels, solubility of metals will be low. In addition, metals in the soil environment are relatively stable due to high sorption properties (high octanol/water partitioning coefficient). Therefore, metals mobility is limited in the soil environment at Site 1.

Based on site history, volatile organics would more likely be found in the soils, especially fuel-related compounds and compounds that are a result of combustion operations (e.g., PAHs). This is because, in comparison to metals, some halogenated organics would more easily tend to be transported through the soil matrix. However, no VOCs were detected in groundwater and only some VOCs were detected in the site soils at low concentrations. The metals concentration detected in site groundwater can be considered to consist of the following three groups:

- Fraction that is naturally occurring in groundwater
- Fraction that is site related
- Fraction that is due to contributions from other sources.

Based on an evaluation of the analytical results and review of the site geology, the fraction that is due to site-related contamination is considered to be minimal. It is difficult to estimate the fraction of metals concentration in groundwater that is actually from the site. However, it appears certain that the concentration of metals detected in groundwater is not entirely related to site activities. The significance of the concentration of metals detected in groundwater will be measured by comparison of the concentrations against applicable or relevant and appropriate requirements (ARARs).

3.4.4 Summary and Extent of Soil and Groundwater Contamination

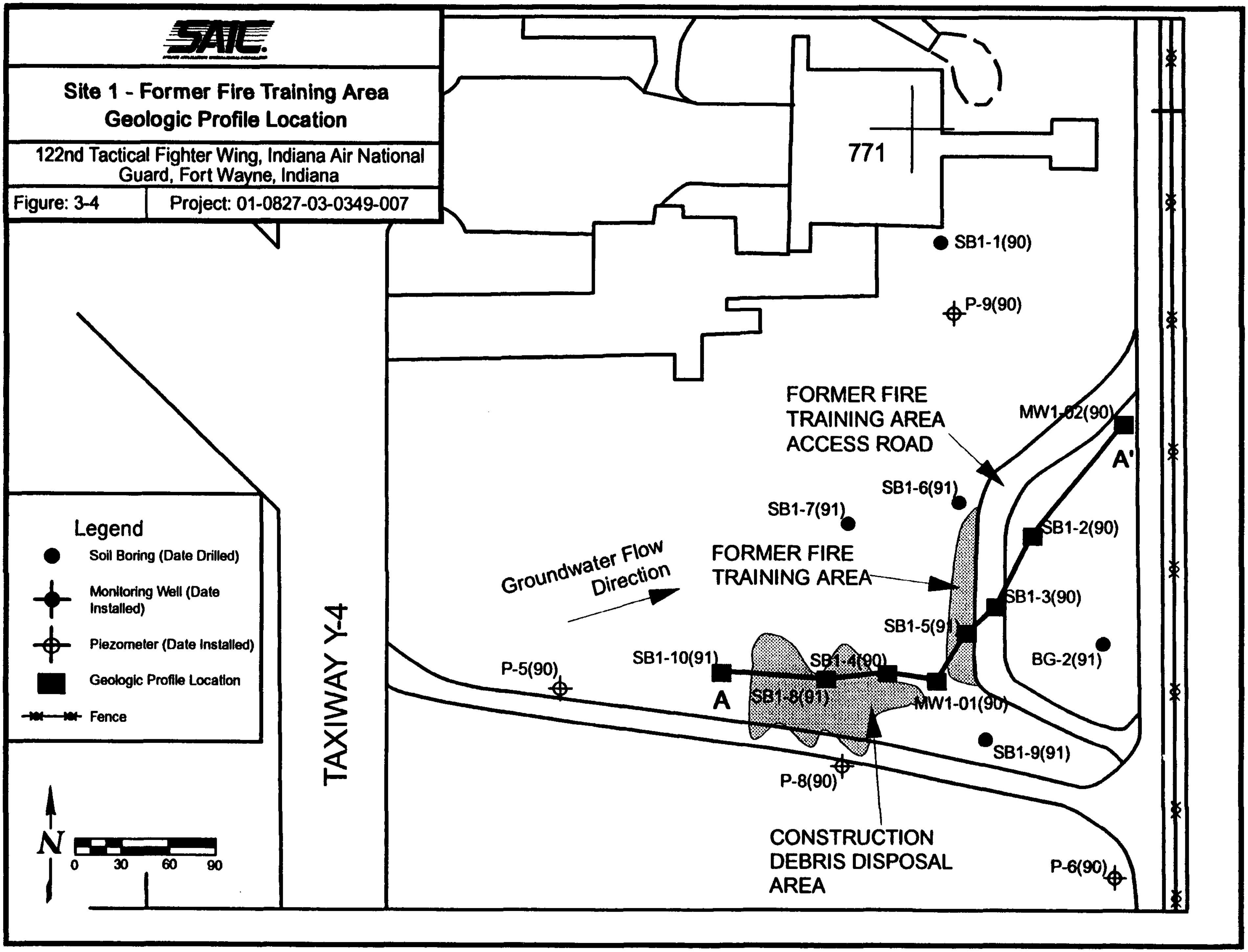
Contamination at Site 1 - Former FTA resulting from fire training activities appears to be present in soil only in an area immediately downslope from the former FTA. The area of contamination extends 60 to 80 feet west of the burn area and approximately 5 feet below the surface of the former FTA. The predominantly downslope migration of contaminants to the west is indicated by the presence of site-related contaminants in the soils west of the burn area and the absence of contaminants to the north (SB1-6), south (SB1-8 and SB1-9), or east (SB1-3). The western limit of contamination is presumed to be less than 85 feet from the burn area because no contaminants were detected in boring SB1-8 (located approximately 85 feet west of the southern extent of the burn area). The absence of contaminants at SB1-8 indicates that contaminants have not migrated south or west of this sampling point. The former terrain at Site 1 sloped downward from east to west uniformly across the length of the burn area; therefore, it is assumed that the contaminants from the burn area were likely to migrate uniformly downslope with surface flow.

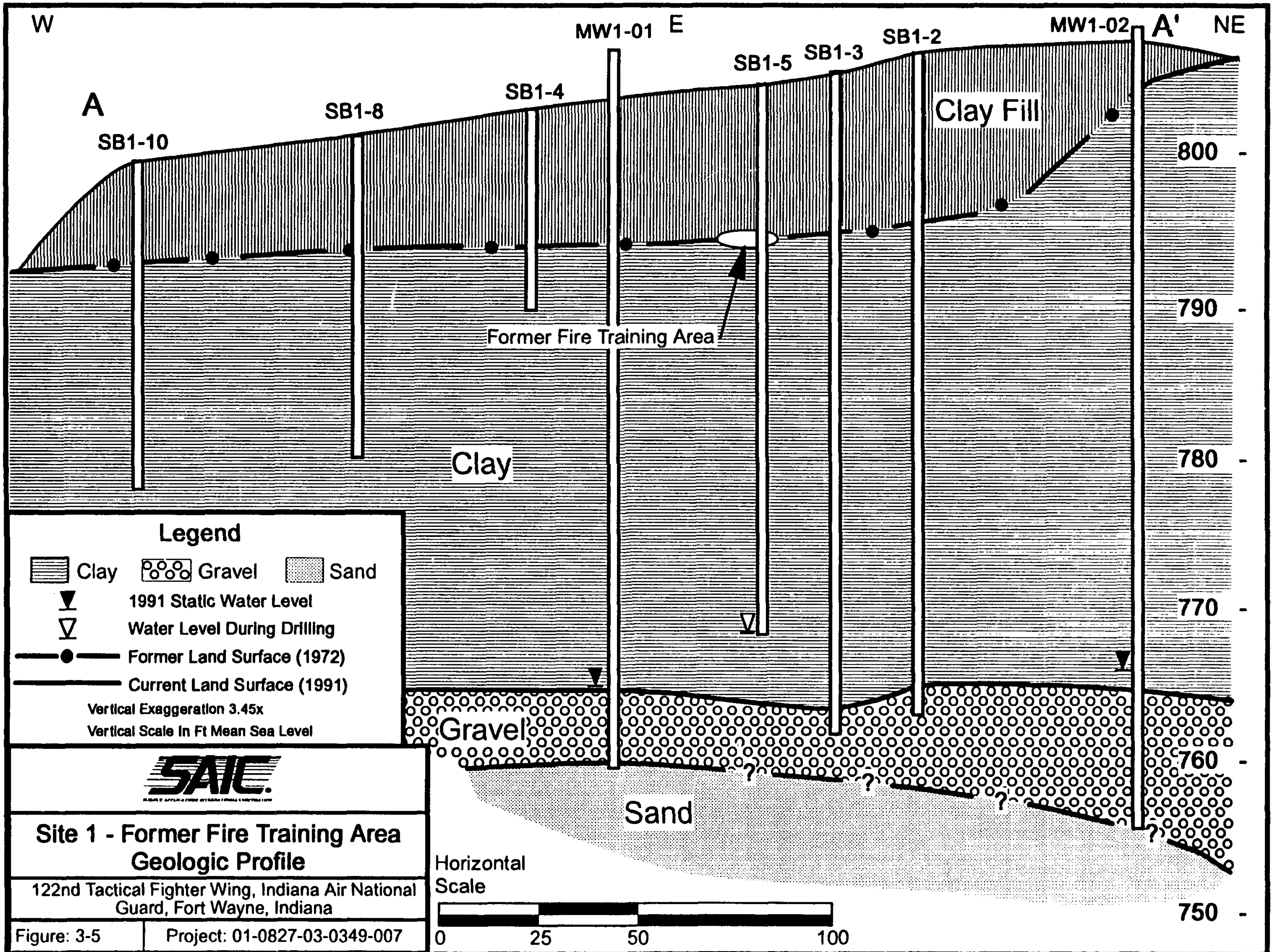
Another significant finding is that contaminants were not detected in subsurface soil at depths greater than 5 feet below the former FTA surface. Therefore, the vertical extent of soil contamination related to the former FTA does not exceed 17 feet BGS. The clay layer below the former FTA surface has apparently limited the vertical migration of contaminants.

The site-related contamination consists of BTEX compounds that are major components of aviation fuel, and SVOCs, which include several PAHs. PAHs are products of combustion and typically are found in areas where combustion has occurred.

No contaminants were detected in the groundwater. This is consistent with the soil sampling results, which indicate that contaminants have not migrated beyond 5 feet below the former FTA surface. The former FTA surface is capped by a layer of clay, which retards surface water infiltration. The thick clay layer that exists throughout the subsurface at the site appears to have contained the vertical migration of any contaminants in the vicinity of the former FTA surface and will continue to do so in the future.

Based on an evaluation of analytical results and a review of the site geology, it appears that the overall significance of the observed nature and extent of contamination is minimal. In addition, a preliminary risk evaluation was conducted to determine risks to public health and the environment due to the presence of observed contamination at the site. The results of this assessment are presented in Section 4.


SAIC
Site 1 - Former Fire Training Area
Geologic Profile Location
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 3-4
Project: 01-0827-03-0349-007
771
SB1-1(90)
P-9(90)
FORMER FIRE TRAINING AREA ACCESS ROAD
MW1-02(90)
A'
SB1-6(91)
SB1-7(91)
SB1-2(90)
FORMER FIRE TRAINING AREA
Groundwater Flow Direction
SB1-3(90)
SB1-5(91)
BG-2(91)
SB1-10(91)
SB1-4(90)
P-5(90)
A
SB1-8(91)
MW1-01(90)
SB1-9(91)
P-8(90)
TAXIWAY Y-4
CONSTRUCTION DEBRIS DISPOSAL AREA
P-6(90)
Legend
Soil Boring (Date Drilled)
Monitoring Well (Date Installed)
Piezometer (Date Installed)
Geologic Profile Location
Fence
N
0
30
60
90


W
E
NE
A
A'
SB1-10
SB1-8
SB1-4
MW1-01
SB1-5
SB1-3
SB1-2
MW1-02
Clay Fill
Clay
Gravel
Sand
Former Fire Training Area
800
790
780
770
760
750
Legend
Clay
Gravel
Sand
1991 Static Water Level
Water Level During Drilling
Former Land Surface (1972)
Current Land Surface (1991)
Vertical Exaggeration 3.45x
Vertical Scale In Ft Mean Sea Level
Horizontal Scale
0
25
50
100
SAIC.
Site 1 - Former Fire Training Area Geologic Profile
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 3-5
Project: 01-0827-03-0349-007

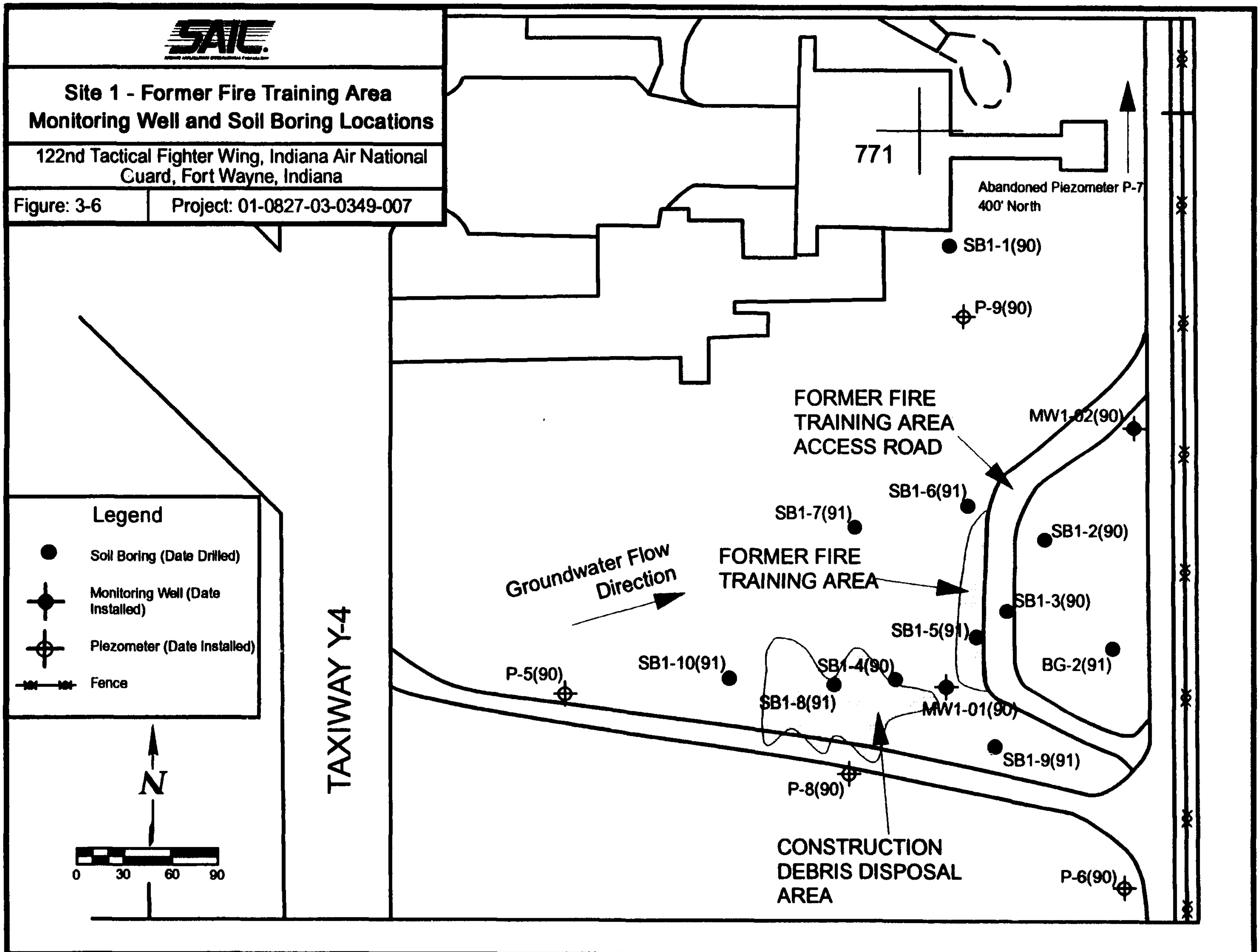

SAIC
Site 1 - Former Fire Training Area
Monitoring Well and Soil Boring Locations
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 3-6
Project: 01-0827-03-0349-007
771
Abandoned Piezometer P-7
400' North
SB1-1(90)
P-9(90)
FORMER FIRE
TRAINING AREA
ACCESS ROAD
MW1-02(90)
SB1-6(91)
SB1-7(91)
SB1-2(90)
FORMER FIRE
TRAINING AREA
Groundwater Flow
Direction
SB1-3(90)
SB1-5(91)
BG-2(91)
SB1-10(91)
SB1-4(90)
P-5(90)
SB1-8(91)
MW1-01(90)
SB1-9(91)
P-8(90)
CONSTRUCTION
DEBRIS DISPOSAL
AREA
P-6(90)
TAXIWAY Y-4
Legend
Soil Boring (Date Drilled)
Monitoring Well (Date Installed)
Piezometer (Date Installed)
Fence
N
0
30
60
90

Table 3-2. Summary of Analytical Results for Soil Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Sample No.	SB1-1-11	SB1-1-12	SB1-2-3	SB1-2-16
Depth (ft. BLS)	30-32	31-33	14-18	42-44
Sample Date	8/90	8/90	8/90	8/90
Matrix	Soil	Soil	Soil	Soil
Parameter				
Metals (mg/Kg)				
Beryllium	1.3	0.74	1.4	0.93
Cadmium	0.22J(MB,B)	ND	0.24J(MB,B)	ND
Chromium	11.1	7.9	24.6	18.3
Copper	29.2	24.6	19.7	27
Lead	12.8	7.0	14	17.9
Nickel	16.9J(MB)	17	23.3	22.2
Zinc	29.6J(FB)	172	62.3J(FB)	42.3J(FB)
Total Petroleum Hydrocarbons (mg/Kg)	ND	ND	630	ND
Volatile Organics (μg/Kg)	NT	NT	NT	NT
Semivolatile Organics (μg/Kg)	ND	ND	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-2.

Table 3-2. Summary of Analytical Results for Soil Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	SB1-3-2	SB1-3-5	SB1-3-17
Depth (ft. BLS)	12-14	18-20	42-44
Sample Date	8/90	8/90	8/90
Matrix	Soil	Soil	Soil
Parameter			
Metals (mg/Kg)			
Beryllium	2.0	1.7	0.94
Cadmium	0.6J(MB)	0.34J(MB,B)	0.21J(MB,B)
Chromium	27.0	20.6	9.6
Copper	19.3	27.8	34.7
Lead	13.7	10	7.5
Nickel	29.7	26.2	23.8
Zinc	66.0J(FB)	54.4J(FB)	33.2J(FB)
Total Petroleum Hydrocarbons (mg/Kg)	ND	ND	ND
Volatile Organics (μg/Kg)	NT	NT	NT
Semivolatile Organics (μg/Kg)	ND	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detted, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-2.

Table 3-2. Summary of Analytical Results for Soil Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	SB1-4-1	SB1-4-2	SB1-4-3	SB1-4-4
Depth (ft. BLS)	0-2	8-10	10-12	12-14
Sample Date	8/90	8/90	8/90	8/90
Matrix	Soil	Soil	Soil	Soil
Parameter				
Metals (mg/Kg)				
Beryllium	1.7	1.3	1.7	1.6
Cadmium	0.66J(MB)	0.49J(MB)	0.79J(MB)	0.37J(MB,B)
Chromium	19.4	16.6	20.5	19.5
Copper	24.8	29.2	30.3	34.2
Lead	23.0	12.2	15.5	13.9
Nickel	24.8	22.3	29.1	31.4
Zinc	64.8	55.8	76.2	67.7
Total Petroleum Hydrocarbons (mg/Kg)	2,400	1,500	1,400	1,100
Volatile Organics (µg/Kg)				
Benzene	ND	ND	10	ND
Ethylbenzene	ND	ND	ND	93
Toluene	80	270J(SSR,IS)	67	350
Semivolatile Organics (µg/Kg)				
Anthracene	ND	ND	ND	280(J)
Phenanthrene	ND	ND	360(J)	1,100
Fluoranthene	ND	ND	730	1,100
Pyrene	ND	ND	730	1,000
Benzo(a)anthracene	ND	ND	560	530
Chrysene	ND	ND	620	560
Benzo(b)fluoranthene	ND	ND	720	530
Benzo(k)fluoranthene	ND	ND	800	580
Benzo(a)pyrene	ND	ND	790	540
Indeno(1,2,3-cd)pyrene	ND	ND	610	330(J)
Dibenzo(a,h)anthracene	ND	ND	260(J)	ND
Benzo(g,h,i)perylene	ND	ND	760	370(J)

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-2.

Table 3-2. Summary of Analytical Results for Soil Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	SB1-5-1	SB1-5-2	SB1-5-3	SB1-5-7
Depth (ft. BLS)	0-1.5	10-11.5	13.5-15	35-36.5
Sample Date	11/91	11/91	11/91	11/91
Matrix	Soil	Soil	Soil	Soil
Parameter				
Metals (mg/Kg)				
Arsenic	9.5	9.8	9.8	8J(*)
Beryllium	0.33J(B)	0.8J(B)	0.56J(B)	0.40J(B)
Cadmium	ND	0.74J(MB,B)	0.83J(B)	0.33J(MB,B)
Chromium	8.5	18.6	19	17.3
Copper	22.4J(N*)	27.4J(N*)	39.0J(N*)	23.6
Lead	15.7	13.6	16.2	11.4
Nickel	20.2	28.3	39.8	28.9
Thallium	0.39J(B)	ND	0.33J(B)	0.35J(MB,B)
Zinc	59.3	83.5	80.4	63.9
Total Petroleum Hydrocarbons (mg/Kg)	ND	ND	ND	ND
Volatile Organics (µg/Kg)				
Benzene	ND	90	ND	ND
Toluene	ND	150	ND	ND
Semivolatile Organics (µg/Kg)				
4-Methylphenol	ND	1,900	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-2.

Table 3-2. Summary of Analytical Results for Soil Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	SB1-6-1	SB1-6-2	SB1-6-3	SB1-6-5	SB1-6-7
Depth (ft. BLS)	0-1.5	10-11.5	13.5-15	25-26.5	35-36.5
Sample Date	11/91	11/91	11/91	11/91	11/91
Matrix	Soil	Soil	Soil	Soil	Soil
Parameter					
Metals (mg/Kg)					
Antimony	ND	ND	ND	3.3 BN	ND
Arsenic	9.7	5.5	8.2	R(N)	6.7
Beryllium	0.67J(B)	0.73J(B)	0.76J(B)	0.42J(B)	0.5J(B)
Cadmium	0.72J(MB,B)	ND	2.6	0.45J(B)	0.53J(MB,B)
Chromium	20.3	17.8	26.5	16.1	17.3
Copper	20.1J(N*)	18.8J(N*)	29.8J(N*)	28.2	29.1J(N*)
Lead	16.9	18.2	14.5	10.9	9.7
Nickel	27	21.8	94.7	29.3	33.3
Thallium	0.31J(B)	0.28J(B)	0.4J(B)	0.26J(MB,B)	0.37J(B)
Zinc	69	70	111	77.2	69.6
Total Petroleum Hydrocarbons (mg/Kg)	ND	ND	ND	21	ND
Volatile Organics (μg/Kg)					
Methylene Chloride	ND	ND	ND	56	ND
Semivolatile Organics (μg/Kg)	ND	ND	ND	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-2.

Table 3-2. Summary of Analytical Results for Soil Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	SB1-7-1	SB1-7-2	SB1-7-3
Depth (ft. BLS)	0-1.5	8.5-10	15-16.5
Sample Date	11/91	11/91	11/91
Matrix	Soil	Soil	Soil
Parameter			
Metals (mg/Kg)			
Arsenic	8.3J(*)	9.7J(*)	3.9J(*)
Beryllium	0.61J(B)	0.44J(B)	0.48J(B)
Cadmium	0.68J(MB,B)	0.79J(MB,B)	0.79J(MB,B)
Chromium	18.3	14.8	14.8
Copper	25.5	19.6	23.1
Lead	16.6	34.1	26.4
Nickel	28.1	22.9	23.6
Thallium	0.3J(MB,B)	0.26J(MB,B)	ND
Zinc	87.5	58.7	60
Total Petroleum Hydrocarbons (mg/Kg)	ND	200	ND
Volatile Organics (μg/Kg)			
Acetone	120U(EB)	160	220
Methylene Chloride	67U(FB)	76U(FB)	80U(FB)
Toluene	61	140	480
Semivolatile Organics (μg/Kg)			
Acenaphthene	ND	180(J)	ND
Anthracene	ND	220(J)	ND
Benzo(a)anthracene	ND	740	ND
Benzo(a)pyrene	160(J)	540	ND
Benzo(b)fluoranthene	390(J)	1,300	ND
Carbazole	ND	230(J)	ND
Chrysene	ND	730	ND
Dibenzofuran	ND	71(J)	ND
Fluoranthene	400	1,500	ND
Fluorene	ND	140(J)	ND
Indeno(1,2,3-cd)pyrene	ND	370(J)	ND
Phenanthrene	ND	1,400	ND
Pyrene	390(J)	1,700	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-2.

Table 3-2. Summary of Analytical Results for Soil Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	SB1-8-1	SB1-8-2	SB1-8-3	SB1-8-5
Depth (ft. BLS)	0-1.5	6.5-8.5	11.5-13	20-21.5
Sample Date	11/91	11/91	11/91	11/91
Matrix	Soil	Soil	Soil	Soil
Parameter				
Metals (mg/Kg)				
Arsenic	8.1	6.4	5.1	R(N)
Beryllium	0.51J(B)	0.61J(B)	0.43J(B)	0.6J(B)
Cadmium	1.2J(MB)	2.9	0.85J(B)	ND
Chromium	15.2	16	15.9	19.5
Copper	17.1J(N*)	19.7J(N*)	24.2J(N*)	42.6
Lead	33.9	31.3	11	11.4
Nickel	20.4	23.7	28.1	30.4
Selenium	ND	ND	0.98J(MB,B)	ND
Thallium	0.29J(B)	0.27J(B)	0.52J(B)	ND
Zinc	62.5	69.6	71.6	108*
Total Petroleum Hydrocarbons (mg/Kg)	ND	ND	ND	ND
Volatile Organics (μg/Kg)				
Acetone	ND	ND	ND	58(J)
Methylene Chloride	ND	ND	ND	36
Toluene	26(J)	36	190	670
Semivolatile Organics (μg/Kg)				
Fluoranthene	ND	100J	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-2.

Table 3-2. Summary of Analytical Results for Soil Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	SB1-9-1	SB1-9-2	SB1-9-3
Depth (ft. BLS)	0-1.5	5-6.5	10-11.5
Sample Date	11/91	11/91	11/91
Matrix	Soil	Soil	Soil
Parameter			
Metals (mg/Kg)			
Arsenic	12.6	4.5	5.3J(*)
Beryllium	0.68J(B)	0.47J(B)	0.8J(B)
Cadmium	0.44J(MB,B)	0.74J(MB,B)	0.5J(MB,B)
Chromium	15.3	15.9	19
Copper	34.6J(N*)	20.7J(N*)	20.8
Lead	21.6	9	11.9
Nickel	36.5	25.5	29.9
Thallium	0.55J(B)	0.31J(B)	ND
Zinc	116	58.3	74.5
Total Petroleum Hydrocarbons (mg/Kg)	ND	ND	ND
Volatile Organics (µg/Kg)			
Acetone	ND	120	55(J)
Methylene Chloride	ND	32U(FB)	31U(FB)
Toluene	250	170	1,000
Semivolatile Organics (µg/Kg)			
Benzo(a)pyrene	660	ND	ND
Benzo(b)fluoranthene	1,300	ND	ND
Fluoranthene	610	ND	ND
Indeno(1,2,3-cd)pyrene	500	ND	ND
Pyrene	620J(RPD)	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-2.

Table 3-2. Summary of Analytical Results for Soil Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	SB1-10-1	SB1-10-2	SB1-10-3	SB1-10-4	SB1-10-5
Depth (ft. BLS)	0-1.5	5-6.5	10-11.5	15-16.5	20-21.5
Sample Date	11/91	11/91	11/91	11/91	11/91
Matrix	Soil	Soil	Soil	Soil	Soil
Parameter					
Metals (mg/Kg)					
Antimony	4.9J(N,B)	5.2J(N,B)	ND	ND	ND
Arsenic	4.8J(*)	7J(*)	7J(*)	R(N)	7.5J(*)
Beryllium	ND	0.27J(B)	0.47J(B)	0.45J(B)	0.48J(B)
Cadmium	0.51J(MB,B)	ND	0.23J(MB,B)	0.71J(B)	1.3J(B)
Chromium	8.4	9.5	17.9	19.3	17.1
Copper	12.9	20.6	23.2	43.7	23.1
Lead	9.3	14.4	10.7	11.8	10.7
Nickel	14.4	14.9	25.5	30.4	33.3
Selenium	ND	ND	ND	0.42J(B)	ND
Thallium	ND	0.26J(MB,B)	ND	1.1J(MB,B)	0.38J(MB,B)
Zinc	36	55.8	62.8	95.3J(*)	61.6
Total Petroleum Hydrocarbons (mg/Kg)	ND	1,900	ND	ND	ND
Volatile Organics (μg/Kg)					
Acetone	70	190	75	190	130
1,2-Dichloroethene	ND	ND	49	ND	ND
Methylene Chloride	ND	69U(FB)	60U(FB)	66	ND
Toluene	160	160	99	640	370
Semvolatile Organics (μg/Kg)					
Benzo(a)pyrene	300(J)	ND	ND	ND	ND
Benzo(b)fluoranthene	660	ND	ND	ND	ND
Fluoranthene	710	ND	81(J)	ND	ND
Pentachlorophenol	ND	13,000(D)	ND	ND	ND
Pyrene	700	ND	94(J)	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

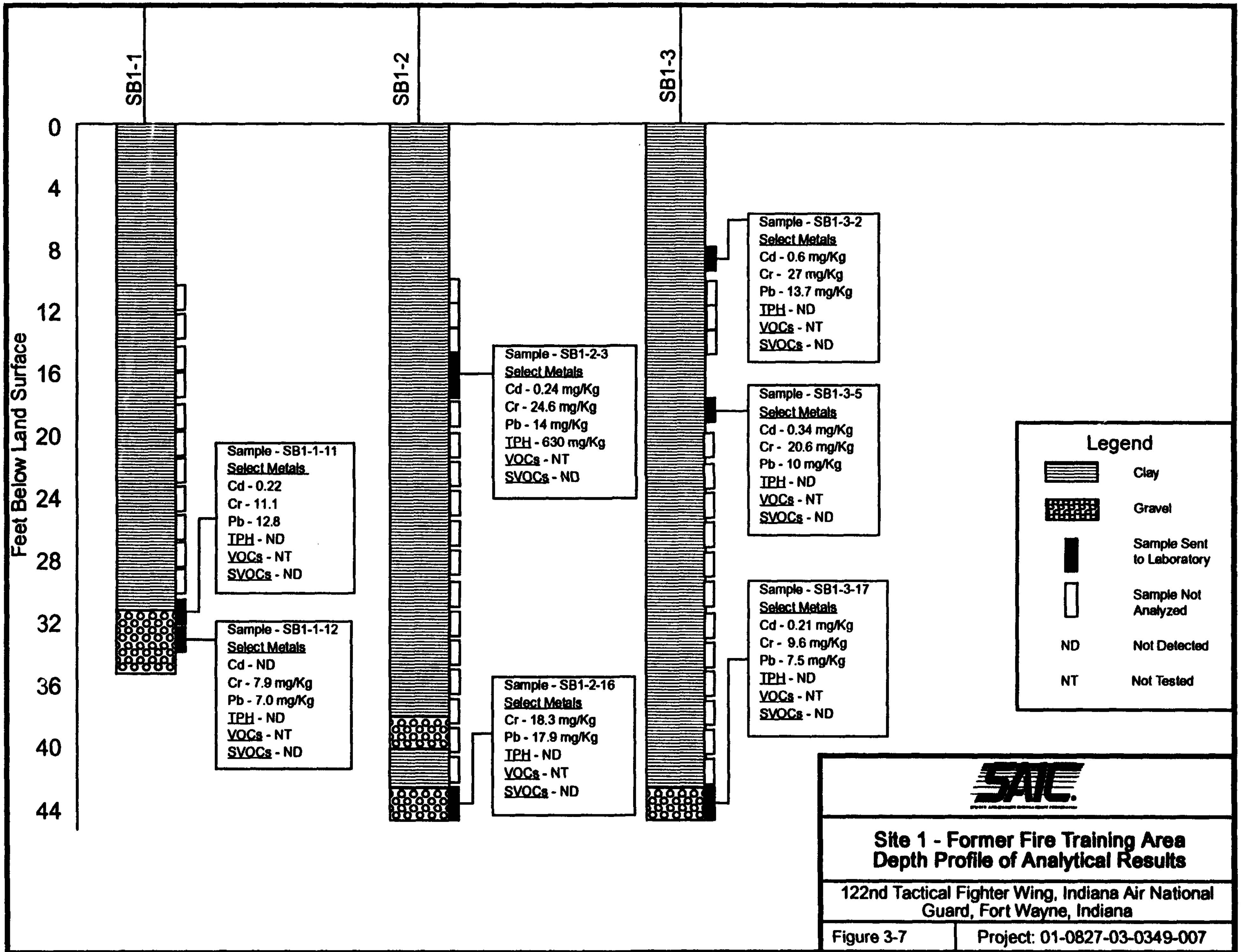
U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

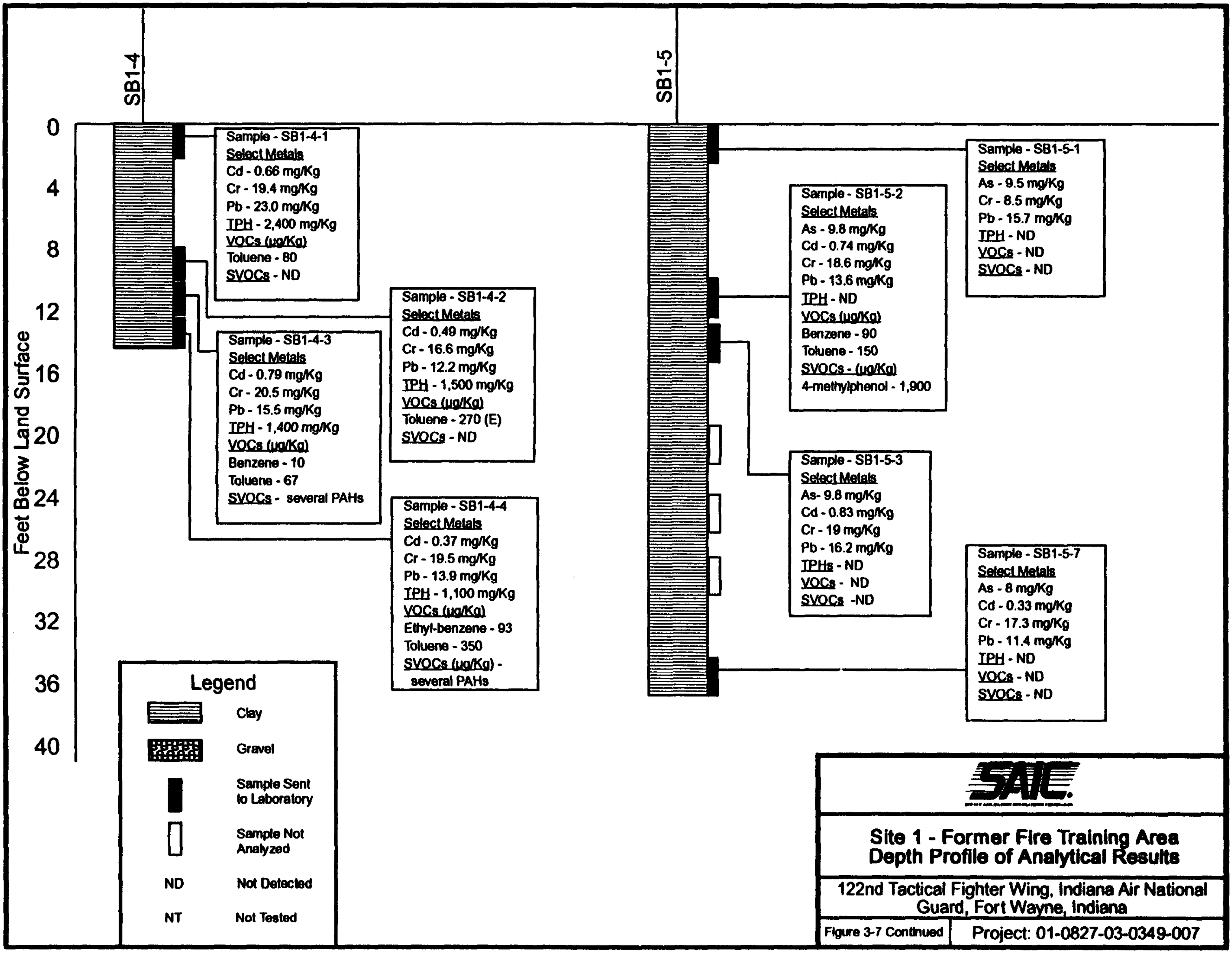
R - Data rejected.

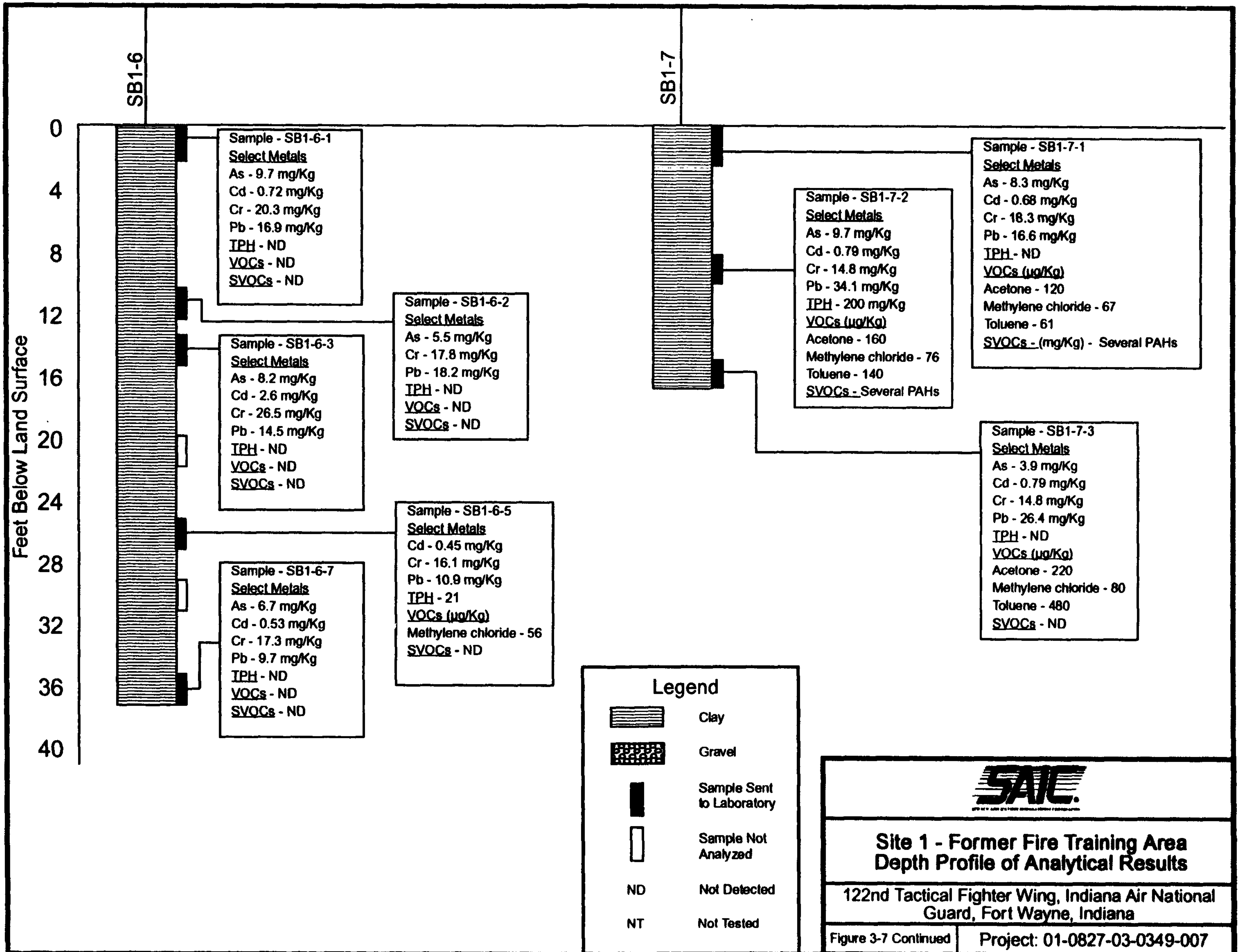
Note: A list of relevant data validation qualifiers is included at the end of Table 3-2.

List of Data Validation Qualifiers Applicable to Table 3-2

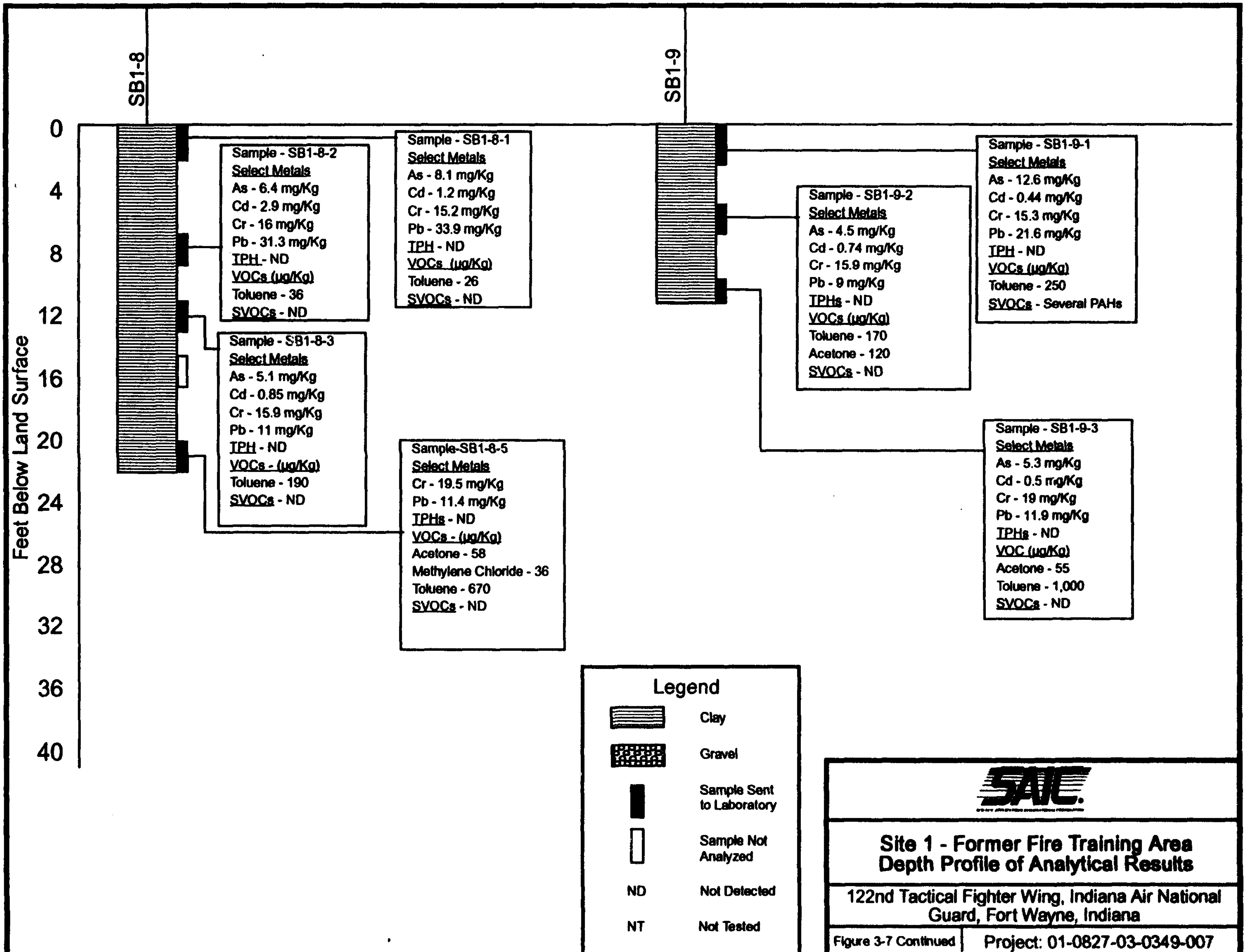
J(B)[metals] -	the reported value is estimated because it is greater than the instrument detection limit (IDL), but less than the contract required detection limit (CRDL).
J(MB) -	the reported value is estimated because the element also was detected in the associated laboratory method blank.
J(FB) [metals] -	the reported value is estimated because the element also was detected in the associated field blank.
J(N) [metals] -	the reported value was estimated because spike recovery is outside the control limits.
J(*) [metals] -	the reported value was estimated because duplicate sample analysis is outside the control limits.
J(IS), UJ(IS) -	the reported value was estimated because internal standard area is outside the control limits.
J(SSR) -	the reported value was estimated because surrogate recovery is outside the required control limits.
U(EB) -	the reported value is cosidered as nondetected because the compound also was detected in the associated equipment blank.
U(FB) -	the reported value is considered as nondetected because the compound also was detected in the associated field blank.
R(N) [metals] -	the reported value was rejected because spike recovery is outside the control limits.


SB1-1
SB1-2
SB1-3
Feet Below Land Surface
0
4
8
12
16
20
24
28
32
36
40
44
Sample - SB1-1-11
Select Metals
Cd - 0.22
Cr - 11.1
Pb - 12.8
TPH - ND
VOCs - NT
SVOCs - ND
Sample - SB1-1-12
Select Metals
Cd - ND
Cr - 7.9 mg/Kg
Pb - 7.0 mg/Kg
TPH - ND
VOCs - NT
SVOCs - ND
Sample - SB1-2-3
Select Metals
Cd - 0.24 mg/Kg
Cr - 24.6 mg/Kg
Pb - 14 mg/Kg
TPH - 630 mg/Kg
VOCs - NT
SVOCs - ND
Sample - SB1-2-16
Select Metals
Cr - 18.3 mg/Kg
Pb - 17.9 mg/Kg
TPH - ND
VOCs - NT
SVOCs - ND
Sample - SB1-3-2
Select Metals
Cd - 0.6 mg/Kg
Cr - 27 mg/Kg
Pb - 13.7 mg/Kg
TPH - ND
VOCs - NT
SVOCs - ND
Sample - SB1-3-5
Select Metals
Cd - 0.34 mg/Kg
Cr - 20.6 mg/Kg
Pb - 10 mg/Kg
TPH - ND
VOCs - NT
SVOCs - ND
Sample - SB1-3-17
Select Metals
Cd - 0.21 mg/Kg
Cr - 9.6 mg/Kg
Pb - 7.5 mg/Kg
TPH - ND
VOCs - NT
SVOCs - ND
Legend
Clay
Gravel
Sample Sent to Laboratory
Sample Not Analyzed
ND Not Detected
NT Not Tested
SAIC
Site 1 - Former Fire Training Area
Depth Profile of Analytical Results
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure 3-7
Project: 01-0827-03-0349-007


SB1-4
SB1-5
Feet Below Land Surface
0
4
8
12
16
20
24
28
32
36
40
Sample - SB1-4-1
Select Metals
Cd - 0.66 mg/Kg
Cr - 19.4 mg/Kg
Pb - 23.0 mg/Kg
TPH - 2,400 mg/Kg
VOCs (ug/Kg)
Toluene - 80
SVOCs - ND
Sample - SB1-4-2
Select Metals
Cd - 0.49 mg/Kg
Cr - 16.6 mg/Kg
Pb - 12.2 mg/Kg
TPH - 1,500 mg/Kg
VOCs (ug/Kg)
Toluene - 270 (E)
SVOCs - ND
Sample - SB1-4-3
Select Metals
Cd - 0.79 mg/Kg
Cr - 20.5 mg/Kg
Pb - 15.5 mg/Kg
TPH - 1,400 mg/Kg
VOCs (ug/Kg)
Benzene - 10
Toluene - 67
SVOCs - several PAHs
Sample - SB1-4-4
Select Metals
Cd - 0.37 mg/Kg
Cr - 19.5 mg/Kg
Pb - 13.9 mg/Kg
TPH - 1,100 mg/Kg
VOCs (ug/Kg)
Ethyl-benzene - 93
Toluene - 350
SVOCs (ug/Kg) - several PAHs
Sample - SB1-5-1
Select Metals
As - 9.5 mg/Kg
Cr - 8.5 mg/Kg
Pb - 15.7 mg/Kg
TPH - ND
VOCs - ND
SVOCs - ND
Sample - SB1-5-2
Select Metals
As - 9.8 mg/Kg
Cd - 0.74 mg/Kg
Cr - 18.6 mg/Kg
Pb - 13.6 mg/Kg
TPH - ND
VOCs (ug/Kg)
Benzene - 90
Toluene - 150
SVOCs - (ug/Kg)
4-methylphenol - 1,900
Sample - SB1-5-3
Select Metals
As- 9.8 mg/Kg
Cd - 0.83 mg/Kg
Cr - 19 mg/Kg
Pb - 16.2 mg/Kg
TPHs - ND
VOCs - ND
SVOCs -ND
Sample - SB1-5-7
Select Metals
As - 8 mg/Kg
Cd - 0.33 mg/Kg
Cr - 17.3 mg/Kg
Pb - 11.4 mg/Kg
TPH - ND
VOCs - ND
SVOCs - ND
Legend
Clay
Gravel
Sample Sent to Laboratory
Sample Not Analyzed
ND Not Detected
NT Not Tested
SAIC
Site 1 - Former Fire Training Area
Depth Profile of Analytical Results
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure 3-7 Continued
Project: 01-0827-03-0349-007



SB1-6
SB1-7
Feet Below Land Surface
0
4
8
12
16
20
24
28
32
36
40
Sample - SB1-6-1
Select Metals
As - 9.7 mg/Kg
Cd - 0.72 mg/Kg
Cr - 20.3 mg/Kg
Pb - 16.9 mg/Kg
TPH - ND
VOCs - ND
SVOCs - ND
Sample - SB1-6-2
Select Metals
As - 5.5 mg/Kg
Cr - 17.8 mg/Kg
Pb - 18.2 mg/Kg
TPH - ND
VOCs - ND
SVOCs - ND
Sample - SB1-6-3
Select Metals
As - 8.2 mg/Kg
Cd - 2.6 mg/Kg
Cr - 26.5 mg/Kg
Pb - 14.5 mg/Kg
TPH - ND
VOCs - ND
SVOCs - ND
Sample - SB1-6-5
Select Metals
Cd - 0.45 mg/Kg
Cr - 16.1 mg/Kg
Pb - 10.9 mg/Kg
TPH - 21
VOCs (µg/Kg)
Methylene chloride - 56
SVOCs - ND
Sample - SB1-6-7
Select Metals
As - 6.7 mg/Kg
Cd - 0.53 mg/Kg
Cr - 17.3 mg/Kg
Pb - 9.7 mg/Kg
TPH - ND
VOCs - ND
SVOCs - ND
Sample - SB1-7-1
Select Metals
As - 8.3 mg/Kg
Cd - 0.68 mg/Kg
Cr - 18.3 mg/Kg
Pb - 16.6 mg/Kg
TPH - ND
VOCs (µg/Kg)
Acetone - 120
Methylene chloride - 67
Toluene - 61
SVOCs - (mg/Kg) - Several PAHs
Sample - SB1-7-2
Select Metals
As - 9.7 mg/Kg
Cd - 0.79 mg/Kg
Cr - 14.8 mg/Kg
Pb - 34.1 mg/Kg
TPH - 200 mg/Kg
VOCs (µg/Kg)
Acetone - 160
Methylene chloride - 76
Toluene - 140
SVOCs - Several PAHs
Sample - SB1-7-3
Select Metals
As - 3.9 mg/Kg
Cd - 0.79 mg/Kg
Cr - 14.8 mg/Kg
Pb - 26.4 mg/Kg
TPH - ND
VOCs (µg/Kg)
Acetone - 220
Methylene chloride - 80
Toluene - 480
SVOCs - ND
Legend
Clay
Gravel
Sample Sent to Laboratory
Sample Not Analyzed
ND Not Detected
NT Not Tested
SAIC
Site 1 - Former Fire Training Area
Depth Profile of Analytical Results
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure 3-7 Continued
Project: 01-0827-03-0349-007

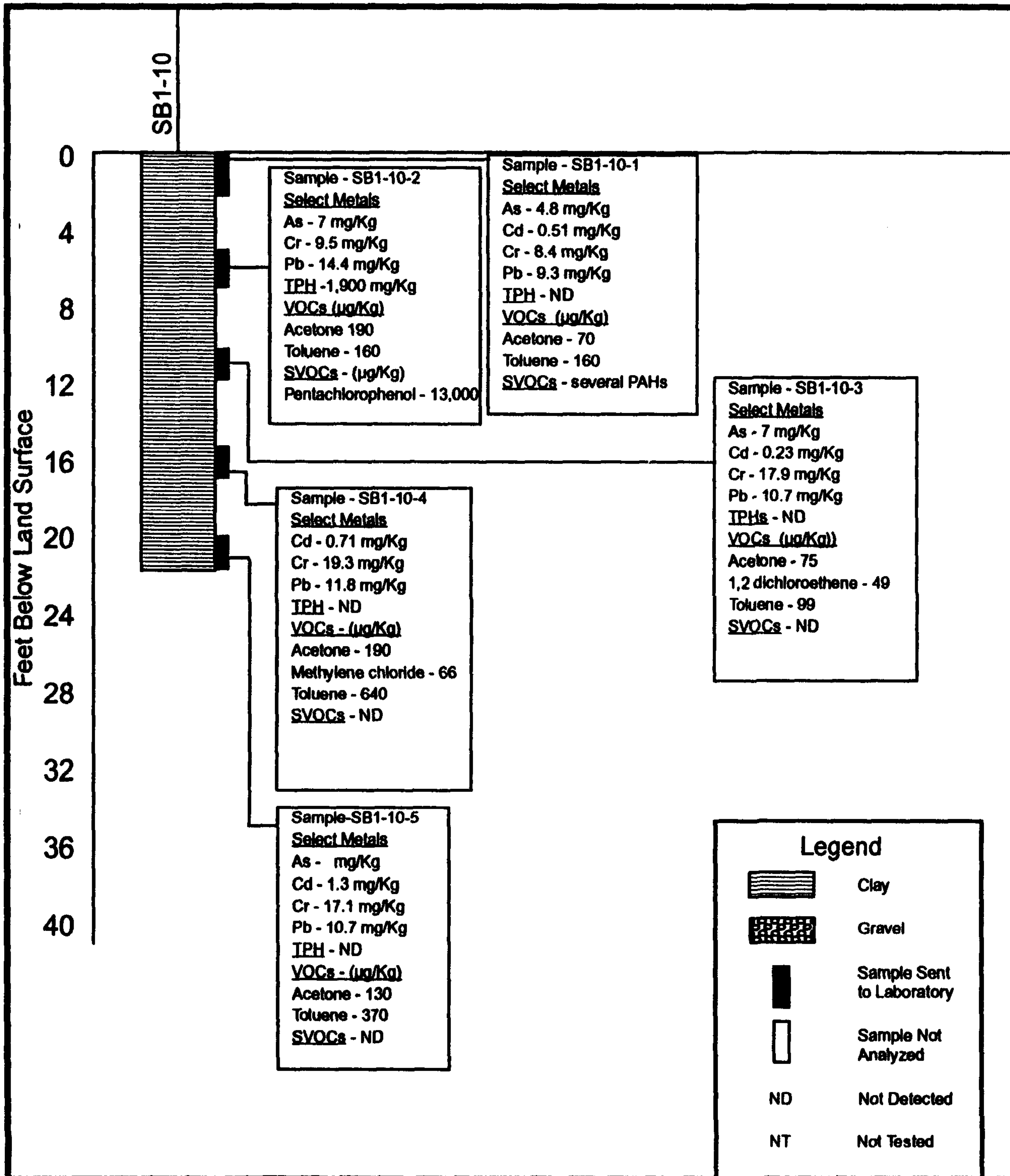


SAIC

Site 1 - Former Fire Training Area Depth Profile of Analytical Results

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure 3-7 Continued | Project: 01-0827-03-0349-007



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Site 1 - Former Fire Training Area Depth Profile of Analytical Results

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure 3-7 Continued | Project: 01-0827-03-0349-007

Table 3-3. Summary of Analytical Results for Groundwater Samples from Site 1 - Former Fire Training Area 122nd Tactical Fighter Wing, Indiana Air National Guard Fort Wayne, Indiana

Sample No.	MW1-1	MW1-2	P-8	MW1-1	MW1-2	P-8
Depth (ft. BLS)	--	--	--	--	--	--
Sample Date	8/90	8/90	8/90	11/91	11/91	11/91
Matrix	Ground-water	Ground-water	Ground-water	Ground-water	Ground-water	Ground-water
Parameter						
Metals (mg/L)						
Antimony	NT	NT	NT	14.2J(N,B)	ND	14.6J(N,B)
Arsenic	5.8J(B)	5.4J(B)	ND	92.4	7.4J(MB,B)	24.4
Beryllium	ND	ND	ND	1.8J(B)	1.11J(MB,B)	2.21J(B)
Cadmium	ND	ND	ND	ND	1.7J(B)	ND
Chromium	ND	ND	ND	60.9	21.2	71.8
Copper	11J(FB,B)	32J(FB)	37J(FB)	79.6	30.2J(B)	75.7
Lead	4.8J(FB,B)	14.3J(FB)	6.9J(FB)	49	15	38.1
Nickel	14J(MB,B)	ND	ND	74.1	30.2J(B)	84.6
Zinc	15J(FB,B)	51J(FB)	24J(FB)	221	96.4	212
Total Petroleum Hydrocarbons(mg/L)	ND	ND	ND	ND	ND	3U(MB)
Volatile Organics (ug/L)	ND	ND	ND	ND	ND	ND
Semvolatile Organics (ug/L)	ND	ND	ND	ND	ND	ND

Sample No.	GW1-1
Depth (ft. BLS)	--
Sample Date	11/91
Matrix	G'water
Parameter	
Volatile Organics (ug/L)	ND
Semivolatile Organics (ug/L)	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-3.

List of Data Validation Qualifiers Applicable to Table 3-3

J(B)[metals] - the reported value is estimated because it is greater than the instrument detection limit (IDL), but less than the contract required detection limit (CRDL).

J(MB) - the reported value is estimated because the element also was detected in the associated laboratory method blank.

J(FB) [metals] - the reported value is estimated because the element also was detected in the associated field blank.

J(N) [metals] - the reported value was estimated because spike recovery is outside the control limits.

J(*) [metals] - the reported value was estimated because duplicate sample analysis is outside the control limits.

U(MB) - the reported value is cosidered as nondetected because the compound also was detected in the associated method blank.

3.5 SITE 3 - HAZARDOUS WASTE COLLECTION AREA

Site 3 - Hazardous Waste Collection Area (HWCA) is a 50-foot square gravel area enclosed by a wooden fence. The site is used as a temporary storage area for waste oils, solvents, paints, and thinners from various shops at the Base.

Six soil borings were installed at Site 3 to determine if contamination is present in the surface and subsurface soils and whether contamination extends beyond the fenced area that constitutes the storage area. Of the six borings, two were drilled to the water table to determine if contaminants had migrated vertically toward the groundwater aquifer. Of the remaining four borings, three were drilled to a depth of 2 feet BGS and one boring outside the fence was drilled to a maximum depth of 5.5 feet BGS to determine if contaminants were present in the surface soils.

The boring outside the fenced area was drilled to determine if contaminants had migrated offsite in a direction that surface runoff would most likely carry the contamination at the site. This boring was drilled at the only accessible downslope location. Further downslope from this location, underground and overhead utility lines are present, making soil sampling at the site inaccessible. In addition to soil borings, one monitoring well was installed downgradient from the site to determine if site-related contaminants were present in the groundwater.

The following sections present the findings of the SI field investigation conducted at Site 3 - HWCA. A presentation and discussion of the site-specific geology and hydrogeology, laboratory results of soil and groundwater samples collected from the site, and conclusions that were drawn from evaluating the data are included.

3.5.1 Site-specific Geologic and Hydrogeologic Discussions

The geology at Site 3 was altered slightly by the addition of a gravel layer within the fenced area. The engineered gravel layer is located from the surface to approximately 1 to 3 feet BGS and is confined to the fenced area. Except for this feature, the site geology and hydrogeology is similar to the Base characteristics discussed in Section 3.1. The location and depiction of a cross section showing the general geology at Site 3 is shown in Figures 3-8 and

3-9, respectively. Groundwater flow at Site 3 appears to be in a northeasterly direction, which is consistent with the flow direction for the entire Base.

3.5.2 Soil Sampling Results

The evaluation of analytical results for the soil samples collected from the soil borings at Site 3 - HWCA are presented below. The six borings drilled at the site are designated as SB3-1 through SB3-6. The locations of these six borings are shown in Figure 3-10. As evidenced from this figure, boring SB3-6 was drilled outside the fenced area. The analytical results for soil samples collected from Site 3 are shown in Table 3-4; profiles depicting the concentrations of contaminants detected in the soil samples are shown in Figure 3-11.

3.5.2.1 Analytical Results for Soil Samples

The analytical results for the soil samples from Site 3 have been divided into the following two groups to effectively evaluate the data:

- The top 1 to 4 feet of soil comprising the sand and gravel layer.
- From 4 feet BGS to the groundwater table comprising the silty clay layer. Additional information on the site geology is presented in Sections 3.1 and 3.6.1.

As shown in Table 3-4, TPH were detected in samples collected from 0 to 2 feet BGS from borings SB3-1, SB3-3, and SB3-4. TPH were not detected in the surficial sample from boring SB3-2 (SB3-2-1) and sample SB3-1-2 (2 to 4 feet BGS in the sand and gravel layer). These borings were completed during Phase I activities. TPH were detected at a concentration of 1,500 mg/Kg in sample SB3-3-1; 3,000 mg/Kg in sample SB3-4-1; and 5,900 mg/Kg in sample SB3-1-1. SVOCs were not detected in any of the surficial samples from the four borings drilled during Phase I, and only some halogenated organic compounds, such as toluene, acetone, and xylenes, were detected in the same surficial samples.

TPH and oil and grease were detected in the surficial samples collected from 0 to 1.5 feet BGS within the sand and gravel layer from borings SB3-5 and SB3-6 drilled during Phase II. In boring SB3-5, TPH were detected at 7,700 mg/Kg and oil and grease at 7,300 mg/Kg; only

TPH were detected at 98 mg/Kg in SB3-6-1. In the same borings, SVOCs were detected in two samples (SB3-5-1 and SB3-6-1) collected within the sand and gravel layer. These SVOCs consist of bis(2-ethylhexyl)phthalate in sample SB3-5-1 and several PAHs in sample SB3-6-1.

Volatile organic compounds, such as BTEX, acetone, and 2-hexanone, were detected in samples collected within the sand and gravel layer from borings SB3-2, SB3-3, and SB3-4 drilled during Phase I activities. In boring SB3-5, which was drilled during Phase II activities in the immediate vicinity of borings SB3-1 through SB3-4, no VOCs were detected, although TPH concentrations were similar in the samples collected. This indicates that the volatile organic contaminants detected during Phase I may have dissipated to the extent that they were not detected during Phase II. Natural attenuation through biodegradation and volatilization may have contributed to the reduction in volatile organic contamination.

Several metals were detected in soil samples from the sand and gravel layer, including arsenic, cadmium, chromium, lead, and nickel. Except for arsenic in samples SB3-3-1 and SB3-4-1, the concentration of almost all metals in onsite soil samples were within background concentrations. Because land use at the site was previously agricultural, the presence of elevated concentrations of arsenic may be due to past practices using arsenic-based pesticides.

3.5.2.2 Evaluation of Results

The contaminants in the sand and gravel layer comprising the top 4 feet of soil at Site 3 predominantly consist of oil and grease. As mentioned earlier, relatively high concentration of TPH (1,500 to 5,900 mg/Kg) were observed in samples collected during Phase I. However, the concentrations of VOCs and SVOCs in the same samples were not proportionate to the high concentrations of TPH detected in the samples. To reconcile this inconsistency, it was proposed that the TPH fraction may be oil and grease, which was not analyzed during Phase I activities.

Accordingly, samples collected during Phase II activities (SB3-5-1 and SB3-6-1) were analyzed for oil and grease in addition to TPH. The high concentration of oil and grease (7,300 mg/Kg) detected in the onsite soil sample (SB3-5-1) corresponds to the TPH concentration of

7,700 mg/Kg in that sample which confirms that the TPH fraction predominantly consists of oil and grease. The fraction of organic contamination (VOCs and SVOCs) is minimal compared to the oil and grease levels. Volatile organics detected during Phase I sampling were not observed in samples collected during Phase II. Natural attenuation processes, such as volatilization and biodegradation, may be partially responsible for the reduction in VOCs concentration. Volatilization, in particular, could easily occur through the loose sand and gravel layer.

Bis(2-ethylhexyl)phthalate was detected in sample SB3-5-1; however, it does not follow the trend of SVOC contamination observed in other soil samples and may not be significant. The significance of the concentration as it relates to risks to public health and the environment is evaluated in the preliminary risk evaluation conducted for this site.

The soil boring drilled 5 feet west and outside the fenced area (SB3-6) was located in a downslope direction from Site 3. Because of the topography of the area, which includes a gentle westward slope, soil boring SB3-6 is positioned to intercept contaminants that might have migrated offsite through surface runoff. PAHs, TPH, and bis(2-ethylhexyl)phthalate were detected in surface soil at SB3-6. PAHs were not detected in any soil samples collected from within the fenced area. Soil in the vicinity of SB3-6 was excavated in 1988 to install a 36-inch diameter storm drain pipe at approximately 10 feet BGS. Leaks from equipment used for excavation may have contributed to the contamination detected in SB3-6. During installation of the storm drain pipe, soils were excavated and replaced with clean engineered fill. Therefore, any contamination that might have been transported by surface runoff from Site 3 has now been removed. Contamination in the sand and gravel layer at Site 3 most likely has been confined to the fenced area and has not migrated outside the borders of the fenced area. This is consistent with the site history, wherein all storage activities were contained within the fenced area, and therefore, any contamination present would be expected to be detected predominantly within the boundaries of the storage area.

In the deeper silty clay layer (deeper than 5 feet BGS), three samples were collected: one from boring SB3-1 drilled during Phase I and two from boring SB3-5 drilled during Phase II. During Phase I sampling, toluene was detected in the soil sample collected from boring SB3-1 at the groundwater interface; this concentration should be considered as an estimate due to internal standards and surrogate recovery results, as shown in Table 3-4. The presence of toluene at the groundwater interface indicated that contamination may have migrated to the groundwater table. In the deep boring (SB3-5) drilled during Phase II activities to confirm the vertical extent of contamination, soil samples collected at 26 feet BGS and at the water table interface showed no evidence of organic contamination, even though the highest concentration of oil and grease and TPH were detected in the surface sample from this boring. This indicates that contamination has not migrated to the groundwater interface, because toluene, reported during Phase I, was not confirmed in the Phase II investigation.

Based on the analytical results from soil samples collected from the silty clay layer at Site 3, the contaminants are confined from the ground surface to 24.5 feet BGS. However, it appears that contamination resulting from activities at this site are predominantly in the top 4 feet of soil and coincide with the thickness of the sand and gravel layer. The contamination is mainly oil and grease, which tends to adsorb to the soil particles and is not easily transported by infiltering water. In addition, the aquifer at this site is overlain by 30 to 35 feet of dense clays, thus minimizing the potential for vertical migration of contamination. The dense clay layer begins from the end of the sand and gravel layer (i.e., from 5 feet BGS) and is present down to the groundwater table.

3.5.3 Groundwater Sampling Results

One groundwater monitoring well was installed downgradient from Site 3 during Phase I activities. A groundwater sample from this well was collected in August 1990 and analyzed for metals, TPH, VOCs, and SVOCs. The same well was resampled during Phase II and analyzed for the same parameters; in addition, the sample was analyzed for oil and grease. A replicate sample was collected during the Phase II sampling. The analytical results of the groundwater samples collected during Phases I and II are presented in Table 3-5.

Methylene chloride (at 5 μg/L) was the only organic compound detected in the groundwater sample collected during Phase I at a concentration equal to the detection limit. The detected concentration should be considered as an estimate, and is insignificant because methylene chloride also was detected in the associated trip blank sample. During the Phase II sampling, methylene chloride was again detected at 5 μg/L, equal to the detection limit, but it also was detected in the method blank for that sample. Therefore, this concentration is not considered to be significant. Oil and grease were detected in the replicate sample at a low concentration (3 mg/L). Several metals were detected in the groundwater; arsenic, chromium, lead, and nickel were detected during the Phase II sampling, but only arsenic and lead were detected during the Phase I sampling.

As mentioned earlier, the concentrations of metals in site soils are below background levels. The same scenario presented earlier for Site 1 groundwater is applicable for Site 3 groundwater. The metals detected in the groundwater at the site at the detected levels are not considered to be entirely site related. Metals and inorganics detected in groundwater may have resulted from past agricultural practices (such as arsenic-based pesticide use) or the placement of fill material over the site containing metals and inorganics at concentrations great than local parent material. Metals tend to be adsorbed easily to soils and are not easily transported by infiltrating water. Based on site history, organics would more likely be detected in the soils, and in comparison to metals, some halogenated organics would more easily tend to be transported through the soil matrix. No organics were found in the water and only some organics at low concentrations were found in the site soils.

Based on an evaluation of the analytical results and a review of the site geology, the fraction of metals concentration that is due to site-related activities is considered minimal. The significance of the concentrations of metals detected in groundwater will be measured by comparison of the levels against ARARs.

3.5.4 Summary and Extent of Soil and Groundwater Contamination

The following summarizes the nature and extent of contamination in soils and groundwater at Site 3:

- Several metals were detected in soil samples collected from the sand/gravel layer (top 5 feet of soil); except for arsenic detected in two samples, all metals were below background concentrations. Arsenic concentrations may have resulted from past agricultural practices such as the use of arsenic-based pesticides.

- TPH were detected at concentrations ranging from 1,500 to 7,700 mg/Kg in soil samples from the sand and gravel layer. Oil and grease was detected at similar concentrations, indicating that the TPH fraction was composed mainly of oil and grease.

- SVOCs were not detected in any soil samples collected during Phase I sampling. Bis(2-ethylhexyl)phthalate was the only SVOC detected in the sand and gravel layer during the Phase I sampling. However, this concentration is a one-time and one-sample occurrence, does not follow the general trend of SVOC contamination in site soils, and is not considered to be site related. SVOCs observed in offsite soils are not considered to be from contamination at the storage area.

- Some VOCs, were detected in soil samples from the sand and gravel layer during Phase I sampling. These compounds were not detected in samples collected during Phase II. The concentrations of VOCs have been significantly reduced through natural attenuation processes, such as biodegradation and volatilization.

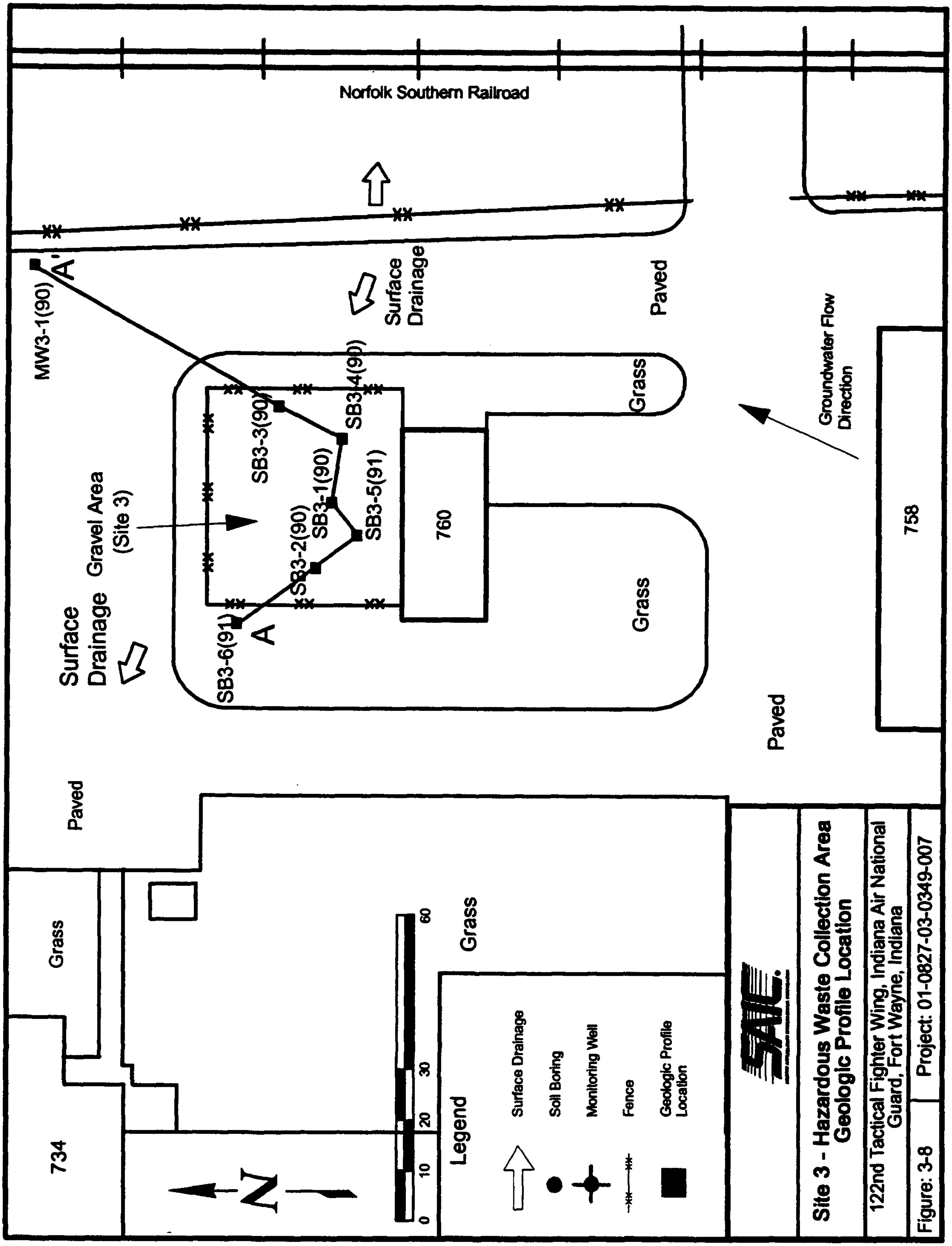
- In the deeper soil samples collected from the silty clay layer, toluene was detected in one sample at the groundwater interface; however, VOC analyses for this sample was impacted due to interference in internal standards and surrogate recoveries. To confirm the presence of contamination at the groundwater interface, another deep boring was drilled during Phase II in the immediate vicinity of the deep boring installed during Phase I. No organics were detected in samples collected 26.5 feet BGS and at the groundwater interface.

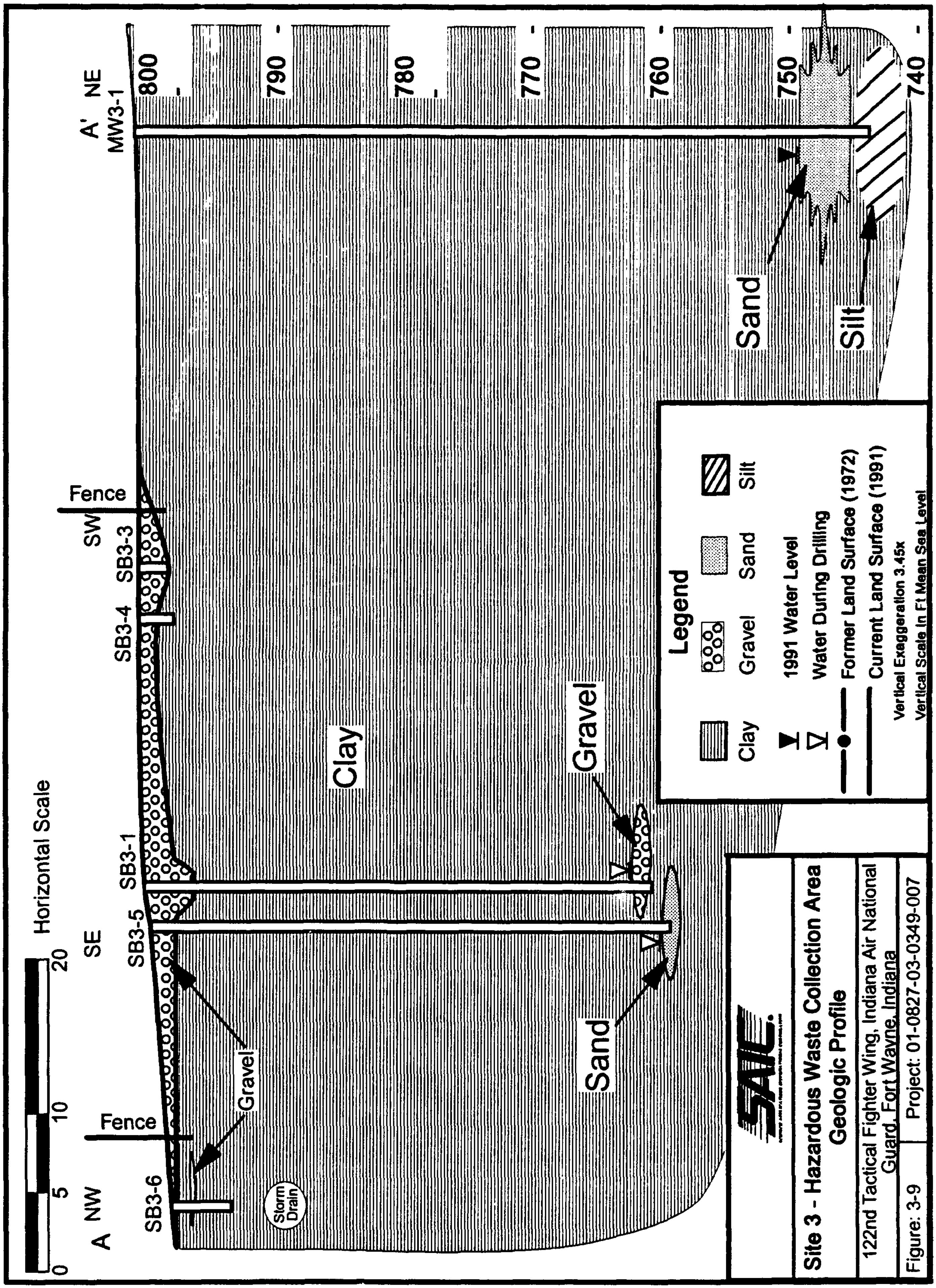
- Soil contamination at Site 3 primarily consists of oil and grease. No organic contaminants were detected in soil samples from the sand and gravel layer and metals are present at background concentrations.

- Soil contamination at this site is confined to the fenced area that surrounds the location where drums and other items are stored. The contamination also is predominantly in the top 4 feet of soils, which coincides with the thickness of the sand and gravel layer.

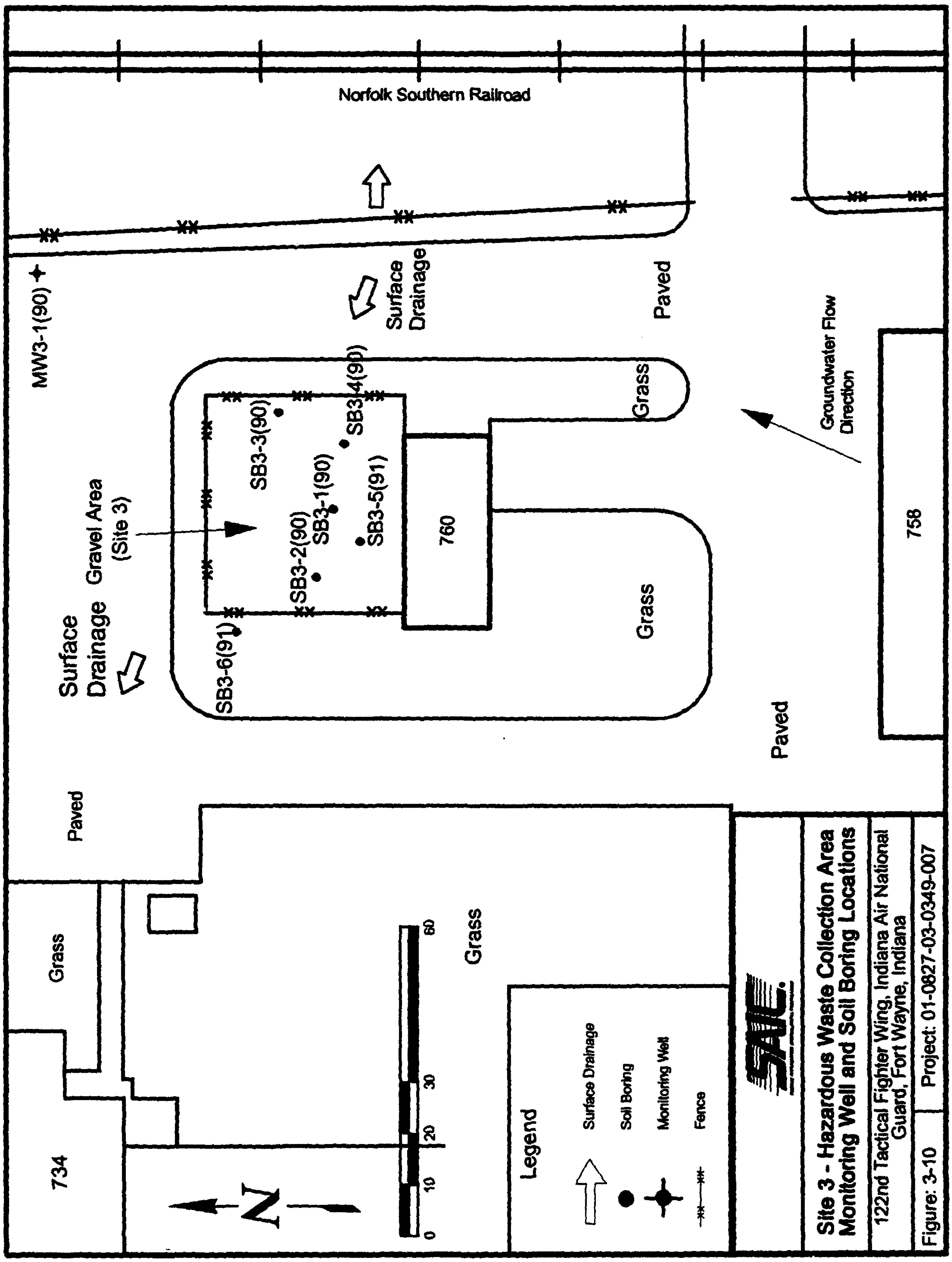
- The overall significance of contamination at the site is minimal. However, the significance of soil contamination will be determined after a preliminary risk evaluation is conducted and impacts to public health and the environment are evaluated.

- No contaminants were detected in the groundwater, which indicates that even after years of storage use, contaminants have not migrated to groundwater. This is consistent with the conclusion made after Phase I that contamination is predominantly in the top 5 feet of soils and the clay layer greatly reduces vertical contaminant migration.


Norfolk Southern Railroad
Surface Drainage
Surface Drainage
Paved
Paved
Paved
Groundwater Flow Direction
MW3-1(90)
A'
A
SB3-4(90)
SB3-3(90)
SB3-1(90)
SB3-5(91)
SB3-2(90)
SB3-6(91)
Gravel Area (Site 3)
760
758
734
Grass
Grass
Grass
Grass
N
0 10 20 30 60
Legend
Surface Drainage
Soil Boring
Monitoring Well
Fence
Geologic Profile Location
SAIC
Site 3 - Hazardous Waste Collection Area Geologic Profile Location
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 3-8
Project: 01-0827-03-0349-007



Horizontal Scale
0
5
10
20
A NW
SB3-6
Storm Drain
Fence
Gravel
SE
SB3-5
SB3-1
Sand
Gravel
Clay
SB3-4
SB3-3
SW
Fence
A' NE
MW3-1
800
790
780
770
760
750
740
Sand
Silt
Legend
Clay
Gravel
Sand
Silt
1991 Water Level
Water During Drilling
Former Land Surface (1972)
Current Land Surface (1991)
Vertical Exaggeration 3.45x
Vertical Scale In Ft Mean Sea Level
SAIC
Site 3 - Hazardous Waste Collection Area
Geologic Profile
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 3-9
Project: 01-0827-03-0349-007



Norfolk Southern Railroad
MW3-1(90)
Surface Drainage
Paved
SB3-4(90)
SB3-3(90)
SB3-1(90)
SB3-5(91)
SB3-2(90)
SB3-6(91)
Gravel Area (Site 3)
Surface Drainage
760
Grass
Grass
Groundwater Flow Direction
758
Paved
Paved
Grass
734
Grass
N
0 10 20 30 60
Legend
Surface Drainage
Soil Boring
Monitoring Well
Fence
SAIC
Site 3 - Hazardous Waste Collection Area Monitoring Well and Soil Boring Locations
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 3-10
Project: 01-0827-03-0349-007

Table 3-4. Summary of Analytical Results for Soil Samples from Site 3 - Hazardous Waste Collection Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Sample No.	SB3-1-1	SB3-1-2	SB3-1-19	SB3-2-1	SB3-3-1	SB3-4-1
Depth (ft. BLS)	0-2	2-4	36-38	0-2	0-2	0-2
Sample Date	8/90	8/90	8/90	8/90	8/90	8/90
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Parameter						
Metals (mg/Kg)		NT				
Antimony	ND		ND	ND	ND	ND
Arsenic	1.3J(MB,N)		14.3J(N)	1.7J(N,MB)	20.7J(N)	11.5J(N)
Beryllium	ND		0.73	ND	0.98	0.91
Cadmium	ND		0.31J(MB,B)	ND	0.65J(MB)	0.23J(MB,B)
Chromium	2		8.6	2.8	11.7	10
Copper	19.3		24.1	17.4	26.5	31.4
Lead	6.2J(EB)		7.6J(EB)	3.7J(EB)	16.3	15.6
Mercury	0.02		ND	ND	0.03	ND
Nickel	1.7J(MB,B)		15.6J(MB)	1.6J(MB,B)	19.5	18.7
Thallium	ND		0.3J(B)	ND	0.37J(B)	0.58J(B)
Zinc	33.2J(FB)		208	4.6J(FB)	66.9J(FB)	64.5J(FB)
Total Petroleum Hydrocarbons (mg/Kg)	5,900J(HT)	ND	ND	ND	1,500J(HT)	3,000J(HT)
Volatile Organics (μg/Kg)						
Methylene Chloride	ND	ND	ND	14U(FB)	16U(TB)	84
Benzene	ND	6U(FB)	ND	ND	ND	ND
Toluene	38U(FB)	45U(FB)	100J(SSR,IS,FR)	ND	15U(FB)	91
Ethylbenzene	ND	16	ND	ND	ND	ND
Xylenes	ND	190	ND	ND	ND	140
4-methyl-2-pentanone	ND	34	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	70	820
2-Hexanone	ND	ND	ND	ND	ND	1,100
Semivolatile Organics (μg/Kg)	ND	ND		ND	ND	ND
Bis(2-ethylhexyl)phthalate			400J			

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-4.

Table 3-4. Summary of Analytical Results for Soil Samples from Site 3 - Hazardous Waste Collection Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana (Continued)

Sample No.	SB3-5-1	SB3-5-6	SB3-5-9	SB3-6-1	SB3-6-2
Depth (ft. BLS)	0-1.5	24.5-26	39.5-40	0-1.5	4-5.5
Sample Date	11/91	11/91	11/91	11/91	11/91
Matrix	Soil	Soil	Soil	Soil	Soil
Parameter					
Metals (mg/Kg)					
Arsenic	12.8J(N)	5.1J(N)	5.9J(N)	4.8J(N)	3.9J(N)
Beryllium	0.34J(B)	0.56J(B)	0.24J(B)	0.58J(B)	0.81J(B)
Cadmium	1.8J(FB)	2J(FB)	1.5J(FB)	2J(FB)	2.7
Chromium	9.4	18.3	6.5	15.3	23.1
Copper	26.2	23.9	18J(FB)	18.1	24.3
Lead	R(N)	R(N)	R(N)	R(N)	R(N)
Nickel	24.1	31.9	14.7	21.9	36.4
Selenium	ND	0.23	ND	ND	ND
Silver	ND	0.52	ND	ND	ND
Thallium	ND	ND	ND	ND	ND
Zinc	75.7	63.1	47.3	61.4	64.2
Total Petroleum Hydrocarbons (mg/Kg)	7,700	ND	ND	98	ND
Oil & Grease (mg/Kg)	7,300	ND	ND	ND	ND
Volatile Organics (µg/Kg)	ND	ND	ND	ND	ND
Semivolatile Organics (µg/Kg)					
Benzo(b)fluoranthene	ND	ND	ND	650	ND
Bis(2-ethylhexyl) phthalate	2,400	ND	ND	240(J)	ND
Fluoranthene	ND	ND	ND	660	ND
Phenanthrene	ND	ND	ND	350	ND
Pyrene	ND	ND	ND	560	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-4.

List of Data Validation Qualifiers Applicable to Table 3-4

J(B)[metals] - the reported value is estimated because it is greater than the instrument detection limit (IDL), but less than the contract required detection limit (CRDL).

J(MB) - the reported value is estimated because the element also was detected in the associated laboratory method blank.

J(FB) [metals] - the reported value is estimated because the element also was detected in the associated field blank.

J(EB) [metals] - the reported value is estimated because the element also was detected in the associated equipment blank.

J(N) [metals] - the reported value was estimated because spike recovery is outside the control limits.

J(*) [metals] - the reported value was estimated because duplicate sample analysis is outside the control limits.

J(HT) - concentration is estimated because the holding time was exceeded.

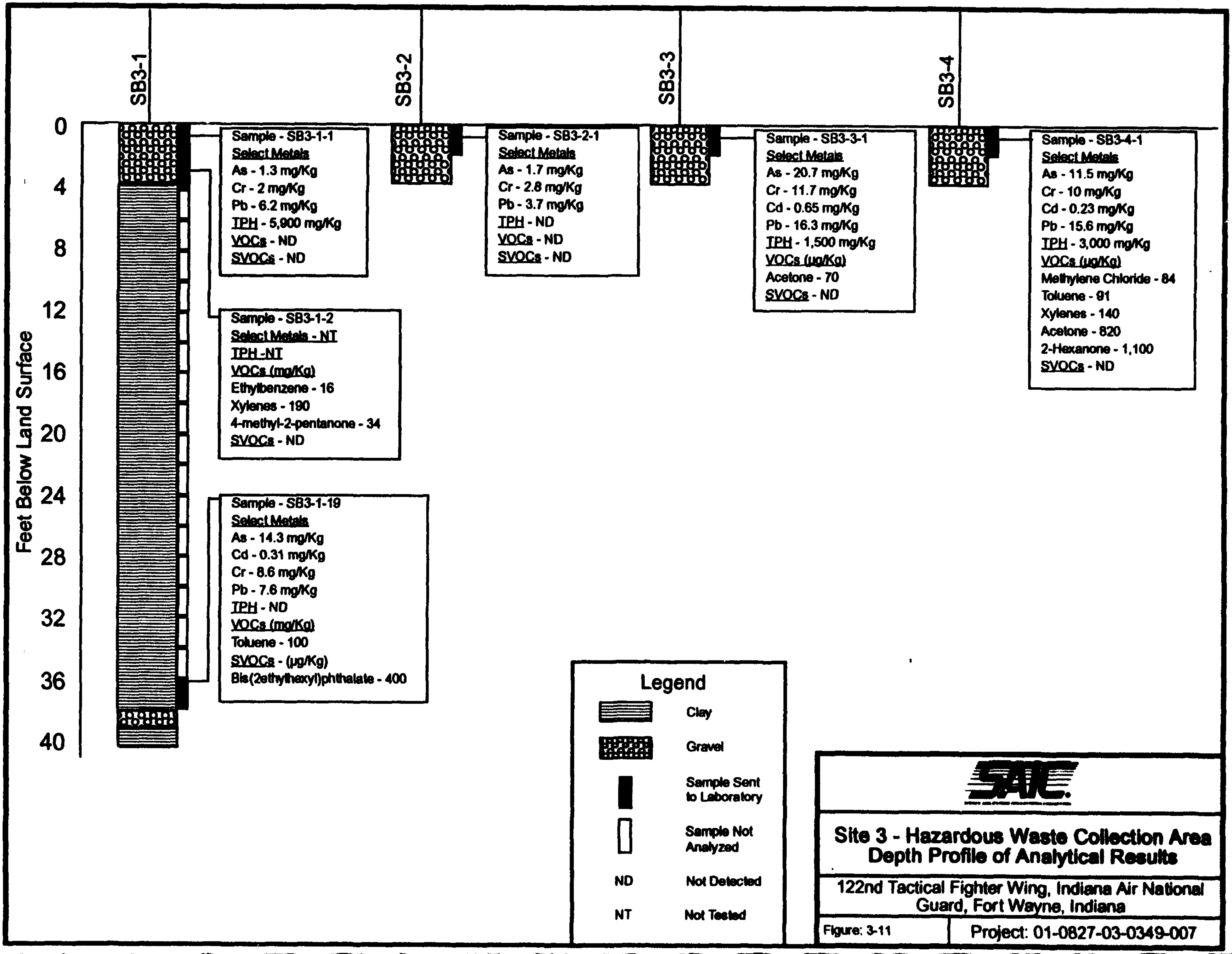
U(FB) - the reported value is considered as nondetected because the compound also was detected in the associated field blank.

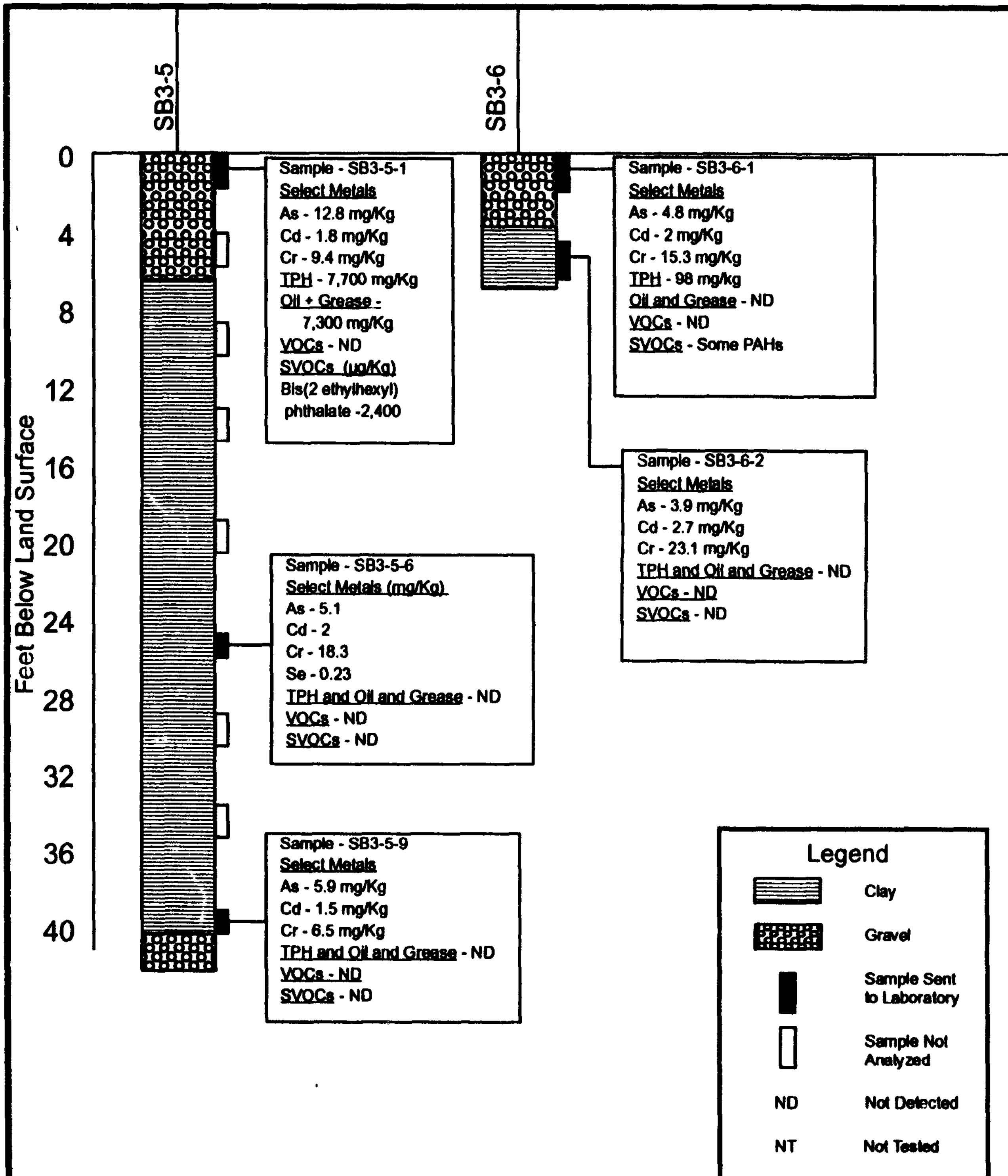
U(TB) - the reported value is considered as nondetected because the compound also was detected in the associated trip blank.

J(IS) - the reported value was estimated because internal standard area is outside the control limits.

J(SSR) - the reported value was estimated because surrogate recovery is outside the required control limits.

R(N) [metal] - the reported value was rejected because spike recovery is outside the control limits.


SB3-1
SB3-2
SB3-3
SB3-4
Feet Below Land Surface
0
4
8
12
16
20
24
28
32
36
40
Sample - SB3-1-1
Select Metals
As - 1.3 mg/Kg
Cr - 2 mg/Kg
Pb - 6.2 mg/Kg
TPH - 5,900 mg/Kg
VOCs - ND
SVOCs - ND
Sample - SB3-1-2
Select Metals - NT
TPH -NT
VOCs (mg/Kg)
Ethylbenzene - 16
Xylenes - 190
4-methyl-2-pentanone - 34
SVOCs - ND
Sample - SB3-1-19
Select Metals
As - 14.3 mg/Kg
Cd - 0.31 mg/Kg
Cr - 8.6 mg/Kg
Pb - 7.6 mg/Kg
TPH - ND
VOCs (mg/Kg)
Toluene - 100
SVOCs - (µg/Kg)
Bis(2ethylhexyl)phthalate - 400
Sample - SB3-2-1
Select Metals
As - 1.7 mg/Kg
Cr - 2.8 mg/Kg
Pb - 3.7 mg/Kg
TPH - ND
VOCs - ND
SVOCs - ND
Sample - SB3-3-1
Select Metals
As - 20.7 mg/Kg
Cr - 11.7 mg/Kg
Cd - 0.65 mg/Kg
Pb - 16.3 mg/Kg
TPH - 1,500 mg/Kg
VOCs (µg/Kg)
Acetone - 70
SVOCs - ND
Sample - SB3-4-1
Select Metals
As - 11.5 mg/Kg
Cr - 10 mg/Kg
Cd - 0.23 mg/Kg
Pb - 15.6 mg/Kg
TPH - 3,000 mg/Kg
VOCs (µg/Kg)
Methylene Chloride - 84
Toluene - 91
Xylenes - 140
Acetone - 820
2-Hexanone - 1,100
SVOCs - ND
Legend
Clay
Gravel
Sample Sent to Laboratory
Sample Not Analyzed
ND Not Detected
NT Not Tested
SAIC
Site 3 - Hazardous Waste Collection Area
Depth Profile of Analytical Results
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 3-11
Project: 01-0827-03-0349-007



Site 3 - Hazardous Waste Collection Area Depth Profile of Analytical Results

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure 3-11 Continued | Project: 01-0827-03-0349-007

Table 3-5. Summary of Analytical Results for Groundwater Samples for Site 3 - Hazardous Waste Collection Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne Indiana

Sample No.	MW2-1	MW2-1	MW2-1R
Depth (ft. BLS)	--	--	--
Sample Date	8/90	11/91	11/91
Matrix	Groundwater	Groundwater	Groundwater
Parameter			
Metals (mg/L)			
Arsenic	6.3J(B)	24.8	23.3
Beryllium	ND	1.8J(B)	1.5J(B)
Chromium	ND	69.1	60.2
Copper	22J(B)	82.3	74.9
Lead	27.9	43.4	39
Nickel	ND	76.8	68.4
Zinc	26J(FB)	179	165
Total Petroleum Hydrocarbons (mg/L)	ND	ND	ND
Oil & Grease (mg/L)	NT	ND	3
Volatile Organics (μg/L)			
Methylene Chloride	5U(TB)	ND	5U(MB)
Semivolatile Organics (μg/L)	ND	ND	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-5.

List of Data Validation Qualifiers Applicable to Table 3-5

J(B)[metals] - the reported value is estimated because it is greater than the instrument detection limit (IDL), but less than the contract required detection limit (CRDL).

J(FB) [metals] - the reported value is estimated because the element also was detected in the associated field blank.

U(MB) - the reported value is considered as nondetected because the compound also was detected in the associated method blank.

U(TB) - the reported value is considered as nondetected because the compound also was detected in the associated trip blank.

3.6 SITE 4 - POL SPILL AREA

Site 4 - POL Spill Area is located in the northern portion of the Base (Figure 1-1). The POL system consisted of an underground storage tank (UST) system, including two USTs and associated pumps and piping. In 1968, a malfunction in the POL system resulted in a spill of 5,000 to 5,300 gallons of JP-4. From the POL facility, the spill ran into the woods and into an open storm drainage ditch. Approximately 200,000 gallons of water were used to flush the spilled JP-4 from the immediate POL area.

The focus of the Phase I and Phase II investigation at Site 4 was to determine the presence of any residual contamination remaining from the 1968 spill. Because any contamination results from a spill from an UST system, the response to the release will follows the guidelines established under 40 CFR Part 280.63; accordingly, information on the size and nature of the release must be assembled. The objective of the site assessment work at Site 4 was to comply with the Indiana Department of Environmental Management (IDEM), Office of Environmental Response (OER) UST regulations for response to a spill. The evaluation of data for Site 4 focused on presenting details of the site assessment work, sampling and analytical methods, and laboratory analytical results to comply with IDEM, OER requirements for UST system spills. This site characterization must be submitted to the IDEM, OER. The initial site characterization should contain the following items, at a minimum:

1. Data on the nature and estimated quantity of release.
2. Data from available sources or site investigations concerning the following factors:
    - Surrounding population and land use
    - Location and use of all groundwater wells within 1/4 mile
    - Subsurface soil characteristics
    - Location of nearby subsurface sewers
    - Location of surface water and drainage ditches within 1/4 mile
    - Depth to groundwater.
3. A short narrative of any sampling/cleanup work conducted at the site, which includes:
    - Results of all site soil and/or groundwater sampling and site assessment work
    - Description of sampling and analytical methods
    - Description of disposal methods for contaminated soil and/or groundwater.

4. Results of an investigation to determine the possible presence of free product and a description of measures taken to begin free product removal if free product is detected.

With respect to Item 1, an estimated 5,000 to 5,300 gallons of JP-4 fuel reportedly spilled from the UST system. Pertinent information required to comply with Item 2 is presented in Section 3.6.5.

The presentation of soil and groundwater sampling results for Site 4 follows the requirements of Item 3. Soil and groundwater sampling has been conducted at the site to determine the presence of residual contamination from the spill. The results and evaluation of the sampling effort is presented in the following sections. The residual contamination at the site is minimal and no cleanup actions are warranted based on available data. The only cleanup work that has been conducted in the past is the flushing that was performed with 200,000 gallons of water immediately after the spill occurred. In addition, the tanks were removed in 1981 and replaced with an aboveground system that complies with all regulations.

With respect to Item 4, no free product is present at the site. Almost all of the spilled JP-4 was flushed away with 200,000 gallons of water. Therefore, no free product investigation was conducted.

At Site 4, a till composed of clays and silts dominates the area from land surface to an approximate depth of 25 feet BGS. Sample SB4-1-4 (14.5 to 16.0 feet BGS), considered representative of Site 4 lithology, was collected for grain size analysis. Data results indicate the composition to be 51 percent clay, 31 percent silt, and 19 percent sand, as shown in Appendix H. The till is probably part of the Lagro Formation, which dominates the area where the Base is located. Tills in this formation are considered to have a low permeability, due to a clay content of 40 to 50 percent (Bleuer and Moore 1978).

3.6.1 Soil Gas Survey Results

A soil gas survey was conducted at Site 4 to help place the soil borings and monitoring wells. Twenty-five soil vapor samples and five water samples (isolated perched water pockets existed at these sampling locations at the time of sampling) were collected and analyzed. Figure 3-12 presents the locations of the soil gas sampling points. Soil gas sample results are presented in Appendix A. Target compounds include BTEX and TPH, which were chosen because they are indicators of petroleum contamination.

In general, the highest concentrations of organic vapors were detected at stations L15, J15, and H16 in water extracted from 2 to 5 feet BGS and in soil vapor extracted at station J13. These locations correspond to the immediate vicinity of the pump shelter and the oil/water separator system. The results are probably due to current fueling operations within the POL facility and do not appear to represent the area that would have been impacted by the spill pathway. The remaining soil gas sample analyses did not detect the presence of the target compounds or indicated concentrations two to five orders of magnitude lower than those detected at stations L15, J15, J13, and J16. One exception is water sample J23, which is located downslope from the spill. Because organic vapors detected in this location may represent residual spill contaminants, a soil boring was drilled at this location during Phase I.

3.6.2 Soil Sampling Results

Eight soil borings were drilled at the spill site at the locations shown in Figure 3-13. Six of these borings were completed to a depth of 5 feet BGS. One boring (SB4-6) was drilled to 25.5 feet BGS and one boring (SB4-8) was drilled to 16 feet BGS. Soil borings SB4-1 through SB4-5 were drilled during Phase I and borings SB4-6 through SB4-8 were drilled during Phase II activities. Soil samples collected during Phase I were analyzed for metals, TPH, and SVOCs. Samples collected during Phase II at Site 4 were analyzed for TPH (as motor oil and diesel fuel), total lead, and BTEX compounds in accordance with the requirements of IDEM, UST Division. The analytical results for soil samples collected from Site 4 are presented in Table 3-6.

As shown in Table 3-6, TPH were detected in surficial samples (0 to 2 feet BGS) from borings SB4-2, SB4-3, and SB4-5; the deeper sample (3 to 5 feet BGS) from boring SB4-5 also contained TPH at a concentration of 64 mg/Kg. All of these samples were collected during Phase I of the SI. The concentrations of TPH in samples from soil collected during the Phase I activities are greater than the TPH concentrations detected during the Phase II activities, as discussed in the remainder of this section.

During Phase II of the SI, TPH were detected in surficial samples from boring SB4-7 at a concentration of 52 mg/Kg (40 mg/Kg as motor oil and 12 mg/Kg as diesel fuel). TPH were not detected in the deeper sample collected at 4 to 5 feet BGS from the same boring. Boring SB4-7 was drilled immediately next to boring SB4-2 and a comparison of results for TPH analyses indicates that natural attenuation processes may have reduced the concentration of TPH in the site soils observed in the Phase I samples.

Another possible reason for the lower TPH concentration observed during Phase II sampling is the change in analytical method used to measure TPH in the soil samples. Phase I samples were analyzed using Method E 418.1, while samples collected during Phase II were analyzed using Method 8015 (modified). In accordance with IDEM requirements, soil samples from an UST site should be analyzed for TPH using Method 8015. Analytical Method E 418.1 not only measures hydrocarbons related to petroleum hydrocarbons, but also hydrocarbons from all organic matter present in the samples. Therefore, vegetative matter (such as decaying leaves and twigs), which is abundantly present, harmless and easily biodegradable, would be measured using Method E 418.1. Because of this, TPH concentrations measured by Method E 418.1 are relatively higher than those concentrations measured by Method 8015. The latter method specifically measures petroleum hydrocarbons and, as indicated in Table 3-6, can differentiate between the motor oil and the diesel fuel fraction in petroleum hydrocarbons.

In boring SB4-6, drilled at the edge of the spill boundary and near a vehicle parking area, TPH were detected at low concentrations in surficial samples. The sample collected at 4 to 5.5 feet BGS did not show the presence of any TPH, but TPH were detected in the deeper sample collected at 24 to 25.5 feet BGS at a concentration of 248 mg/Kg. The results from the deeper sample are not consistent with what would be expected at a site contaminated with fuel-related products. The surface sample showed TPH contamination, but at 5 feet BGS these TPH were not detected. It seems likely that TPH observed in the deep sample are not site related. This is strengthened by the fact that the clay layer present from 5 feet BGS is sufficiently dense to retard vertical migration of contaminants (hydraulic conductivity of the clay is low: -10^{-5} to 10^{-9} cm/sec). TPH contamination in samples collected from boring SB4-8 follows the same scenario. No TPH were detected in the surficial sample and in the sample collected at 4.5 to 6 feet BGS, yet the deeper sample from 14.5 to 16 feet BGS showed TPH at 43 mg/Kg. However, this concentration is still less than the IDEM guideline of 100 mg/Kg TPH. (Remediation of a site contaminated with fuel products is dictated in a general case by the concentrations of TPH detected in the contaminated media. If TPH are above 100 mg/Kg, remediation could be warranted. However, actual concentrations and the decision to remediate are based on a site-specific basis.)

Some SVOCs, principally PAHs, were detected in samples from borings SB4-1, SB4-2, and SB4-5. All three of these borings are located in close proximity to Building 356, where a large coal storage pile once existed. Burlington Northern used the coal from the storage pile in their rail cars. Therefore, the presence of PAHs in the vicinity of the coal pile would be expected given that PAHs are products of combustion and typically are found in this type of area.

Ethylbenzene, xylenes, styrene and toluene were detected in soil samples from boring SB4-6. The surficial sample (0 to 2 feet BGS) had the highest concentration of BTEX compounds as shown in Table 3-6. The topography of the area at the time of the spill was such that any surface runoff from Building 354 would most likely flow northeast toward the wooded area and beyond into drainage ditches. The presence of BTEX compounds in the surficial sample is most likely from vehicle emissions in the parking area located adjacent to boring SB4-6.

3.6.3 Sediment Sampling Results

The analytical results for sediment samples from Site 4 are shown in Table 3-7. Two sediment samples (SD4-1 and SD4-2) were collected during Phase I from a drainage ditch well beyond the spill site. Runoff from the western portion of the Base, including Buildings 300, 301, 307, and 798, also flow down into the same drainage ditch from where the samples were collected. TPH were detected in both sediment samples collected during Phase I (1,400 mg/Kg in SD4-1 and 880 mg/Kg in SD4-2). No SVOCs were detected in the sediment samples and metals concentrations were within background levels. During Phase II, two additional sediment samples were collected, one in the immediate vicinity of the site (SD4-3) and one further downgradient (SD4-4) where the Phase I sediment samples were collected. The TPH (as motor oil) concentration in both the samples was 17 mg/Kg. Only acetone was detected among the VOCs in both sediment samples.

The results of the Phase II sampling show that TPH are present at low concentrations (17 mg/Kg) in the immediate vicinity of the site, and further downgradient the concentrations of TPH are well below the TPH guideline of 100 mg/Kg. The high concentration of TPH observed during Phase I in the same drainage area has either dissipated to the low levels observed during Phase II activities, or was from a one-time occurrence in surface runoff from other buildings and areas that flow into the same drainage path. The use of Method 8015 for analysis of TPH for Phase II samples as opposed to E 418.1 for Phase I samples could be another reason for the reduction in TPH concentration.

3.6.4 Groundwater Sampling Results

To determine if contamination from the fuel spill had migrated vertically and impacted the groundwater resource, two monitoring wells and one piezometer installed at the site were sampled and analyzed for appropriate parameters. The locations of the monitoring wells and piezometers at Site 4 are shown in Figure 3-13. Monitoring well MW4-2 and piezometer P-1 are immediately downgradient from the spill site. The results of groundwater analyses are presented in Table 3-8. The sample collected during Phase I was analyzed for metals, TPH, VOC, and SVOCs. The sample collected during Phase II was analyzed for total lead, TPH (as motor oil and diesel fuel), and VOCs.

Monitoring wells MW4-1 and MW4-2 and piezometer P-1 were sampled during Phase II. During Phase I activities, MW4-1 could not be sampled because the water level in the well was not recovering sufficiently for samples to be collected. Several attempts were made before a decision was made to abandon sampling of the well. Therefore, piezometer P-2, located approximately 130 feet downgradient from MW4-1, was sampled instead.

As Table 3-8 shows, no contaminants were detected in groundwater samples. In the samples collected during Phase I, no TPH, VOCs, or SVOCs were detected in groundwater; some metals were detected, but they are not considered to be significant because they are below the maximum contaminant level (MCL) for the respective metals. Samples collected during Phase II did not show any BTEX compounds, and only TPH (as diesel fuel) at 0.52 mg/L was detected in the sample from piezometer P-1.

Lead was detected at 229 μg/L in sample MW4-1 collected during Phase II, but was detected at only 10.2 μg/L in sample MW4-2. Although not directly upgradient from the spill site, MW4-1 is located laterally northwest of the site. The groundwater flow direction at the site is in a northeasterly direction. Although some impacts of the spill could be expected in MW4-1, they would be less than the impacts detected in the downgradient wells. The conclusion that lead detected in well MW4-1 is from a source not related to the spill at Site 4 is based on the following:

- Wells MW4-2 and P-1 are located directly downgradient and downslope from the Site 4 spill and are better positioned to detect the site-related groundwater contaminants than MW4-1 (which is nearly upgradient of the spill). However, lead was detected at only 10.2 μg/L in MW4-2 and not detected in P-1.
- Other sources for lead contamination in groundwater from MW4-1 may include runoff from the adjacent asphalt-paved road, exhaust from vehicle or aircraft traffic, or a small unreported fuel spill on the road.

The concentration in monitoring well MW4-2 is consistent with the levels observed in other groundwater samples collected during Phases I and II. The results of the groundwater analyses clearly show that groundwater has not been impacted; this evaluation and conclusion is also consistent with what has been observed in the site soils (Section 3.6).

3.6.5 Pertinent Information Required for UST System Release Response

The following summarizes pertinent information required to be assembled for site characterization in response to a leak from an UST system, as mandated under 40 CFR Part 280.63:

- ***Surrounding population and land use:*** No permanent residence is located within 1,400 feet of the site. South of the Base, the land use is mostly agricultural; north and east of the Base the use is predominantly commercial. The Fort Wayne Municipal Airport is located immediately west of the Base. Therefore, within a 1-mile radius of the Base, land use is mostly commercial and agricultural.

- ***Locations and use of all groundwater wells within 1/4 mile:*** No groundwater wells are located within 1/4 mile of any of the sites. The nearest well from Site 4 is 3,500 feet from the site (HMTC 1988).
- ***Subsurface soil characteristics:*** From land surface to approximately 30 feet BGS, the soils are mostly clay; typically, the soils are composed of 50 percent clay, 30 percent silt, and 20 percent fine sands. Few small sand and gravel lenses are present near the water table. The estimated permeability of the soils at this site is 1.4×10^{-4} to 5.6×10^{-4} cm/sec.
- ***Locations of nearby subsurface sewers:*** A storm drain is located approximately 200 feet south of Site 4.
- ***Locations of surface water and drainage ditches within 1/4 mile:*** No surface water resource is located within ¼-mile of the site. The nearest surface water body is Harber Ditch, located approximately 2,000 to 5,000 feet east of the Base from Site 4.
- ***Depth to groundwater:*** Groundwater is 45 to 50 feet BGS at Site 4.

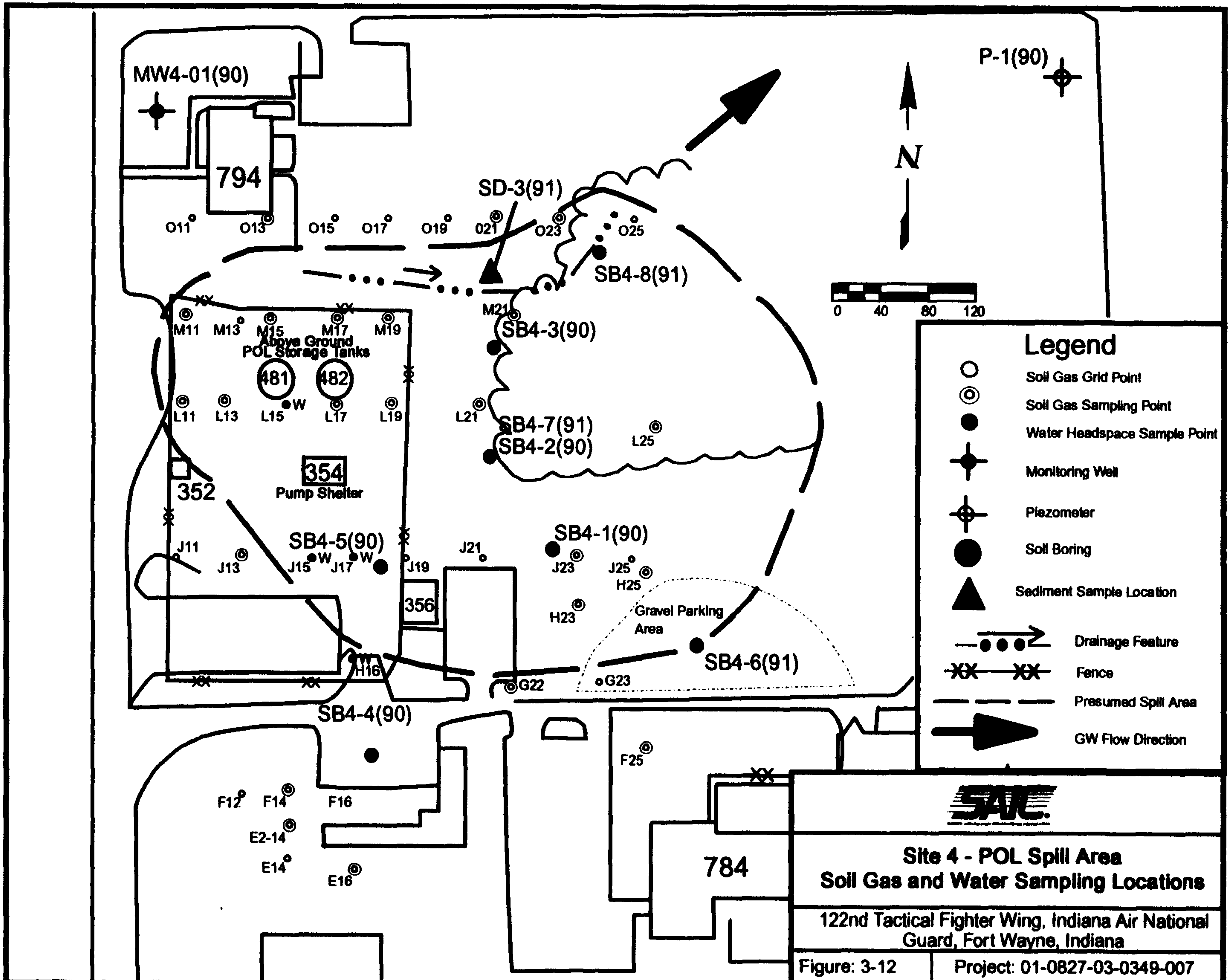
3.6.6 Summary and Extent of Contamination

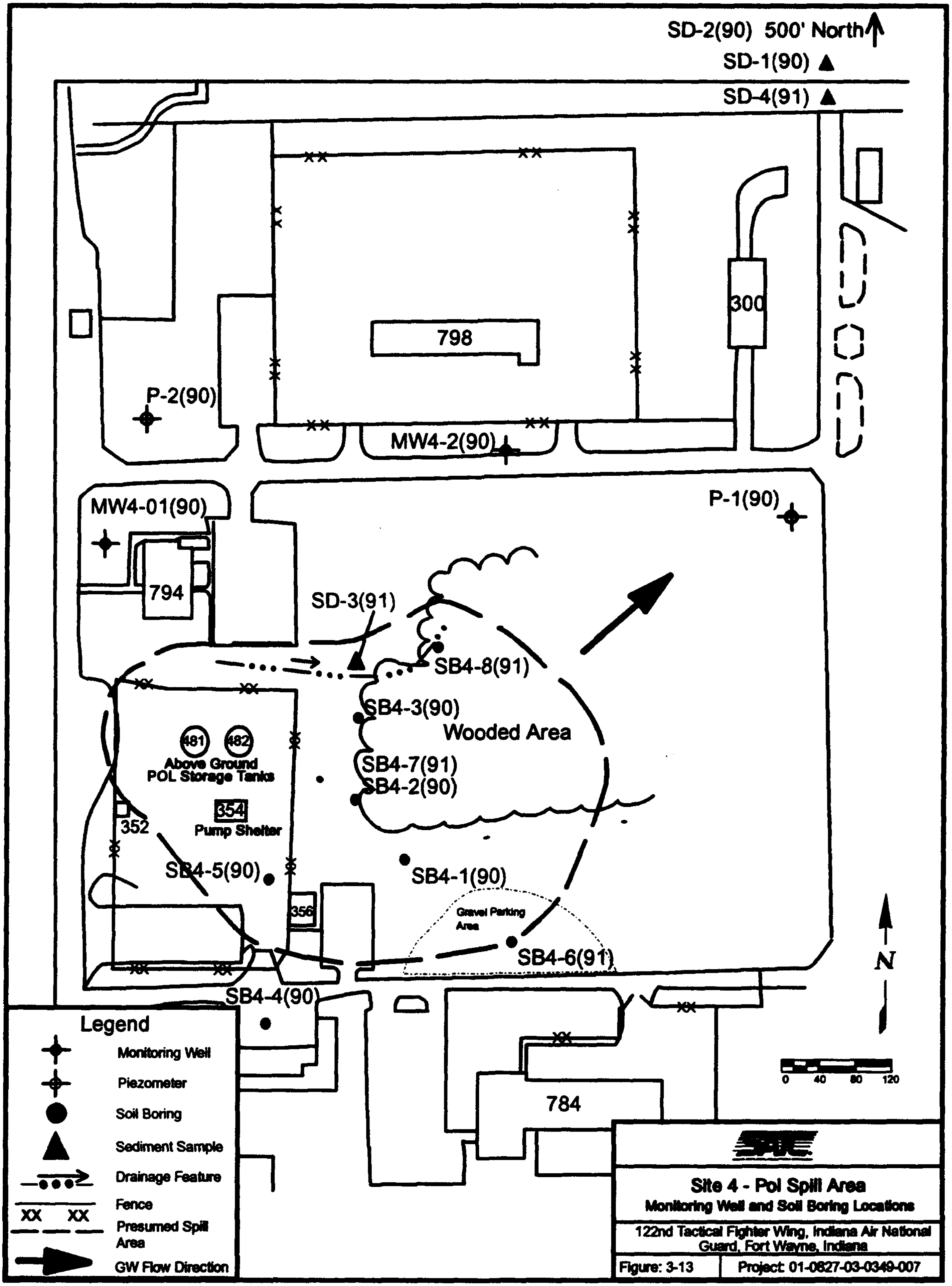
The analytical results of soil samples collected from Site 4 show that minimal residual contamination remains from the 1968 spill. Some areas of contamination exist that could be attributed to other sources, such as the former coal pile, the oil/water separator, and the vehicle parking area located close to boring SB4-6. In other areas, the concentration of TPH were found to be less than 100 mg/kg (the guideline that is typically used by the IDEM to justify cleanup actions). Actual concentration of TPH and the decision to remediate are, however, typically based on a site-specific basis. Sediment samples collected from drainage pathways in the immediate vicinity of the site and further downgradient showed that concentration of TPH are below 100 mg/kg. Groundwater samples collected from the site showed that there are no site-related contaminants present in the groundwater; this is also consistent with what has been observed in the site soils. In general, TPH concentration in samples collected during Phase II activities were found to be lower than those collected during Phase I activities. One reason for this discrepancy may be the different method used to detect TPH. During Phase I activities, Method E418.1 was used while Method 8015 was used to detect TPH during Phase II activities. As explained earlier, Method E418.1 measures all hydrocarbons from all organic matter present in the samples. The hydrocarbons related to petroleum products constitute a portion of the total hydrocarbons. Therefore, TPH results from Method E418.1 tend to be slightly higher than that measured by Method 8015 which detects only those hydrocarbons that constitute the fraction related to petroleum products. The overall significance of the detected contamination at this site can be considered minimal for the following reasons:

- The aquifer at this site, as at other sites, is overlain by 30 to 35 feet of dense clays, minimizing the potential for vertical migration of contaminants.

- Access to the site is limited; therefore, exposure for the general public to any surficial contaminants would be minimal. Base personnel working in the area follow appropriate procedures required for conducting operations at a fuel storage site. These procedures also would prevent exposure to site surface soils.

- Based on available information, the contamination at this site is the result of a spill that occurred in 1968. Remedial actions that were implemented at that time consisted of flushing the spill with 200,000 gallons of water. Since that spill, the former UST system has been replaced by an aboveground system designed in accordance with regulatory requirements.


MW4-01(90)
794
P-1(90)
N
0 40 80 120
SD-3(91)
O11
O13
O15
O17
O19
O21
O23
O25
SB4-8(91)
M21
SB4-3(90)
M11
M13
M15
M17
M19
Above Ground POL Storage Tanks
481
482
W
L11
L13
L15
L17
L19
L21
SB4-7(91)
SB4-2(90)
L25
354
Pump Shelter
352
SB4-5(90)
J11
J13
J15
J17
J19
J21
SB4-1(90)
J23
J25
H25
H23
356
Gravel Parking Area
SB4-6(91)
G22
G23
H16
SB4-4(90)
F12
F14
F16
E2-14
E14
E16
F25
784
Legend
Soil Gas Grid Point
Soil Gas Sampling Point
Water Headspace Sample Point
Monitoring Well
Piezometer
Soil Boring
Sediment Sample Location
Drainage Feature
Fence
Presumed Spill Area
GW Flow Direction
SAIC
Site 4 - POL Spill Area
Soil Gas and Water Sampling Locations
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 3-12
Project: 01-0827-03-0349-007



SD-2(90) 500' North
SD-1(90)
SD-4(91)
300
798
P-2(90)
MW4-2(90)
MW4-01(90)
P-1(90)
794
SD-3(91)
SB4-8(91)
SB4-3(90)
Wooded Area
481
482
Above Ground
POL Storage Tanks
SB4-7(91)
SB4-2(90)
354
Pump Shelter
352
SB4-5(90)
SB4-1(90)
356
Gravel Parking Area
SB4-6(91)
SB4-4(90)
N
0 40 80 120
784
Legend
Monitoring Well
Piezometer
Soil Boring
Sediment Sample
Drainage Feature
Fence
XX XX
Presumed Spill Area
GW Flow Direction
Site 4 - Pol Spill Area
Monitoring Well and Soil Boring Locations
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana
Figure: 3-13
Project: 01-0827-03-0349-007

Table 3-6. Summary of Analytical Results for Soil Samples from Site 4 - POL Spill Area 122nd Tactical Fighter Wing, Indiana Air National Guard Fort Wayne, Indiana

Sample No.	SB4-1-1	SB4-1-2	SB4-2-1	SB4-2-2	SB4-3-1
Depth (ft. BLS)	0-2	3-5	0-2	3-5	0-2
Sample Date	8/90	8/90	8/90	8/90	8/90
Matrix	Soil	Soil	Soil	Soil	Soil
Parameter					
Metals (mg/Kg)					
Arsenic	8.4J(N)	11.1J(N)	10.9J(N)	9.8J(N)	9.7J(N)
Beryllium	1.2	2.1	1.7	1.9	1.9
Cadmium	0.36J(MB,B)	ND	0.36J(MB,B)	0.24J(MB,B)	0.45J(MB,B)
Chromium	7.7	29.6	21.6	22.3	25.3
Copper	54.8	22.6	28.8	29.6	16.7
Lead	14.1	9.4	11.7	10.5	13.6
Mercury	0.04	0.03	0.09	0.03	0.04
Nickel	11.2J(MB)	21.3	23.4	32.3	24.9
Selenium	0.39J(B)	0.33J(B)	ND	ND	0.38(B)
Thallium	0.49J(B)	0.47J(B)	0.28J(B)	ND	ND
Zinc	22.0J(FB)	66.7J(FB)	66.0J(FB)	66.8J(FB)	77.1J(FB)
Total Petroleum Hydrocarbons (mg/Kg, Using Method E418.1)	ND	ND	1,500J(HT)	ND	520J(HT)
Volatile Organics (µg/Kg)	NT	NT	NT	NT	NT
Semivolatile Organics (µg/Kg)		ND			ND
Naphthalene	290(J)	ND	ND	ND	ND
2-methylnaphthalene	360(J)	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	380(J)	ND
Benzo(a)pyrene	240(J)	ND	280(J)	590	ND
Benzo(b)fluoranthene	370(J)	ND	280(J)	520	ND
Benzo(k)fluoranthene	350(J)	ND	360(J)	830	ND
Benzo(g,h,i)perylene	ND	ND	230(J)	540	ND
Chrysene	380(J)	ND	ND	400	ND
Fluoranthene	660	ND	ND	520	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	410	ND
Phenanthrene	720	ND	ND	300(J)	ND
Pyrene	600	ND	ND	480	ND

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-6.

Table 3-6. Summary of Analytical Results for Soil Samples from Site 4 - POL Spill Area 122nd Tactical Fighter Wing, Indiana Air National Guard Fort Wayne, Indiana (Continued)

Sample No.	SB4-3-2	SB4-4-1	SB4-4-2	SB4-5-1	SB4-5-2
Depth (ft. BLS)	3-5	0-2	3-5	0-2	3-5
Sample Date	8/90	8/90	8/90	8/90	8/90
Matrix	Soil	Soil	Soil	Soil	Soil
Parameter					
Metals (mg/Kg)					
Arsenic	11.4J(N)	10.8J(N)	8.2J(N)	2.8J(N)	7.0J(N)
Beryllium	1.9	1.1	1.4	0.25J(B)	1.6
Cadmium	ND	0.21J(MB,B)	0.49J(MB)	ND	0.28J(MB,B)
Chromium	28.3	13.1	16.9	5.4	21.2
Copper	28	16.9	31.3	16.1	27.4
Lead	14.5	25.6	10.4	11	10.8
Mercury	0.04	0.02	ND	0.03	ND
Nickel	36.9	14.5J(MB)	31.5	9.2J(MB)	28.6
Selenium	ND	0.45J(B)	0.52J(B)	0.36J(B)	ND
Thallium	0.38J(B)	ND	ND	ND	ND
Zinc	87J(FB)	51.2J(FB)	66.7J(FB)	13.8J(FB)	55.3J(FB)
Total Petroleum Hydrocarbons(mg/Kg, Using Method E418.1)	ND	ND	ND	180J(HT)	64J(HT)
Volatile Organics (µg/Kg)	NT	NT	NT	NT	NT
Semivolatile Organics (µg/Kg)	ND	ND	ND		ND
Naphthalene				1,800	
Dibenzofuran				280(J)	

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested
J - Concentration should be considered as an estimate.
U - Compound/element was not detected, but is presented with accompanying data validation qualifier.
R - Data rejected.
Note: A list of relevant data validation qualifiers is included at the end of Table 3-6.

Table 3-6. Summary of Analytical Results for Soil Samples from Site 4 - POL Spill Area 122nd Tactical Fighter Wing, Indiana Air National Guard Fort Wayne, Indiana (Continued)

Sample No.	SB4-6-1	SB4-6-2	SB4-6-6	SB4-7-1	SB4-7-2
Depth (ft. BLS)	0-2	4-5.5	24-25.5	0-2	4-5
Sample Date	11/91	11/91	11/91	11/91	11/91
Matrix	Soil	Soil	Soil	Soil	Soil
Parameter					
Metals (mg/Kg)					
Arsenic	3.6J(N)	7.1J(N)	4.6J(N)	6.5J(N)	6.3J(N)
Lead	R(N)	R(N)	R(N)	R(N)	R(N)
Total Petroleum Hydrocarbons (mg/Kg, Using Method 8015)	15.9	ND	248	52	ND
	11	ND	150	40	ND
As Motor Oil	4.9	ND	98	12	ND
As Diesel					
Volatile Organics ($\mu g/Kg$)					
Ethylbenzene	210	ND	ND	ND	ND
m-p-xylenes	110	ND	ND	ND	ND
Styrene	84	ND	ND	ND	ND
Toluene	ND	0.7	1.6	ND	3.5
Semivolatile Organics ($\mu g/Kg$)	NT	NT	NT	NT	NT

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-6.

Table 3-6. Summary of Analytical Results for Soil Samples from Site 4 - POL Spill Area 122nd Tactical Fighter Wing, Indiana Air National Guard Fort Wayne, Indiana (Continued)

Sample No.	SB4-8-1	SB4-8-2	SB4-8-4
Depth (ft. BLS)	0-1.5	4.5-6	14.5-16
Sample Date	11/91	11/91	11/91
Matrix	Soil	Soil	Soil
Parameter			
Metals (mg/Kg)			
Lead	19.3J(*)	11.7J(*)	10.1J(*)
Total Petroleum Hydrocarbons (mg/Kg, Using Method 8015)	ND	ND	43
As Motor Oil	ND	ND	27
As Diesel	ND	ND	16
Volatile Organics (μg/Kg)			
Toluene	ND	0.98	ND
Semivolatile Organics (μg/Kg)	NT	NT	NT

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-6.

List of Data Validation Qualifiers Applicable to Table 3-6

J(B)[metals] - the reported value is estimated because it is greater than the instrument detection limit (IDL), but less than the contract required detection limit (CRDL).

J(MB) - the reported value is estimated because the element also was detected in the associated laboratory method blank.

J(FB) [metals] - the reported value is estimated because the element also was detected in the associated field blank.

J(EB) [metals] - the reported value is estimated because the element also was detected in the associated equipment blank.

J(N) [metals] - the reported value was estimated because spike recovery is outside the control limits.

J(*) [metals] - the reported value was estimated because duplicate sample analysis is outside the control limits.

J(HT) - concentration is estimated because the holding time was exceeded.

R(N) [metal] - the reported value was rejected because spike recovery is outside the control limits.

Table 3-7. Summary of Analytical Results for Sediment Samples from Site 4 - POL Spill Area 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Sample No.	SD4-1	SD4-2	SD4-3	SD4-4
Depth (ft. BLS)	Surficial	Surficial	Surficial	Surficial
Sample Date	8/90	8/90	11/91	11/91
Matrix	Sediment	Sediment	Sediment	Sediment
Parameter				
Metals (mg/Kg)				
Arsenic	11.0J(N)	9.6J(N)		
Beryllium	1.7	2.0		
Cadmium	0.22J(MB,B)	0.35J(MB,B)		
Chromium	20.9	19.3		
Copper	31.1	28.1		
Lead	13.8	20.4	39.3J(*)	7.4J(*)
Mercury	ND	0.04		
Nickel	33.7	26.1		
Thallium	0.27J(B)	0.3J(B)		
Zinc	73.9	71.3		
Total Petroleum Hydrocarbons (mg/Kg)*	1,400J(HT)	880J(HT)	17	17
As Motor Oil			17	17
As Diesel			ND	ND
Volatile Organics (μg/Kg)	NT	NT		
Acetone			290	280
Semivolatile Organics (μg/Kg)	ND	ND	NT	NT

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested

J - Concentration should be considered as an estimate.

U - Compound/element was not detected, but is presented with accompanying data validation qualifier.

R - Data rejected.

Note: A list of relevant data validation qualifiers is included at the end of Table 3-7.

* - TPH were detected using Method E418.1 for samples SD4-1 and SD4-2, and Method 8015 for samples SD4-3 and SD4-4

List of Data Validation Qualifiers Applicable to Table 3-7

J(B)[metals] - the reported value is estimated because it is greater than the instrument detection limit (IDL), but less than the contract required detection limit (CRDL).

J(MB) - the reported value is estimated because the element also was detected in the associated laboratory method blank.

J(N) [metals] - the reported value was estimated because spike recovery is outside the control limits.

J(*) [metals] - the reported value was estimated because duplicate sample analysis is outside the control limits.

J(HT) - concentration is estimated because the holding time was exceeded.

Table 3-8. Summary of Analytical Results for Groundwater Samples from Site 4 - POL Spill Area
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne Indiana

Sample No.	P-2	MW4-2	MW4-1	MW4-2	P-1
Depth (ft. BLS)	--	--	--	--	--
Sample Date	8/90	8/90	11/91	11/91	11/91
Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Parameter					
Metals (mg/L)					
Arsenic	3J(B)	3.3J(MB,B)	NT	NT	NT
Copper	43	27	NT	NT	NT
Lead	10.5J(EB)	29.4J(EB)	229	10.2	10.6
Nickel	32J(MB,B)	16J(MB,B)	NT	NT	NT
Zinc	25J(FB)	32J(FB)	NT	NT	NT
Total Petroleum Hydrocarbons (mg/L)*	ND	ND	ND	ND	0.52
As Motor Oil			ND	ND	ND
As Diesel			ND	ND	0.52
Volatile Organics (µg/L)			ND	ND	ND
Methylene Chloride	5U(TB)	5U(TB)			
Semivolatile Organics (µg/L)	ND	ND	NT	NT	NT

ND - Not Detected (with no accompanying data validation qualifiers); NT- Not Tested
J - Concentration should be considered as an estimate.
U - Compound/element was not detected, but is presented with accompanying data validation qualifier.
R - Data rejected.
Note: A list of relevant data validation qualifiers is included at the end of Table 3-8.
* - TPH were detected using Method E 418.1 for samples collected in 8/90, and Method 8015 for samples collected in 11/91

List of Data Validation Qualifiers Applicable to Table 3-8

J(B)[metals] - the reported value is estimated because it is greater than the instrument detection limit (IDL), but less than the contract required detection limit (CRDL).

J(MB) - the reported value is estimated because the element also was detected in the associated laboratory method blank.

J(FB) [metals] - the reported value is estimated because the element also was detected in the associated field blank.

J(EB) [metals] - the reported value is estimated because the element also was detected in the associated equipment blank.

U(TB) - the reported value is considered as nondetected because the compound also was detected in the associated trip blank.

4. PUBLIC HEALTH RISK EVALUATION

4.1 INTRODUCTION

As part of the Site Inspection (SI) at Indiana Air National Guard Base (ANGB), a preliminary human health risk evaluation was conducted to evaluate risks of exposure to chemicals present at, or released from, the waste sites at the Base. A risk evaluation was performed for contaminants at the following sites:

- Site 1 - Former Fire Training Area (FTA)
- Site 3 - Hazardous Waste Collection Area (HWCA).

A preliminary risk evaluation has not been performed for Site 4. Because contamination at this site is a result of residue from a fuel spill, the response to the release will follow IDEM, OER UST System guidelines. Accordingly, investigations have been performed to develop data on environmental receptors and the potential exposure pathways of concern. This information was presented earlier in Section 3 and complies with IDEM, OER requirements.

An examination of potential human health risks due to exposure to site-related contaminants conducted during the SI process helped to determine the need for further investigations at the sites. This evaluation assesses the potential for adverse noncarcinogenic and carcinogenic effects following long-term or chronic exposure to site-related contaminants. The risk evaluation also incorporates comparison of sampling data with applicable or relevant and appropriate Federal and state requirements (ARARs). This evaluation, conducted as part of the SI at Indiana ANGB, is a preliminary evaluation and as such is not designed to be as comprehensive as that required for remedial investigation (i.e., baseline risk assessment). A brief discussion of ecological risks (i.e., nonhuman receptors) also has been included.

A risk evaluation is used as a decisionmaking tool for selecting appropriate remedial alternatives. Although exposure to humans may be negligible or even nonexistent, risk evaluation based on current and future land use activities, and other site-specific information, may still be warranted to project potential risks to human health and to provide a useful measure of the magnitude or significance of site contamination.

4.2 DATA COLLECTION AND EVALUATION

This section evaluates the results of sampling and analysis of environmental media conducted at Site 1 - Former FTA and Site 3 - HWCA at Indiana ANGB for use in the preliminary public health risk evaluation. Analytical data from Phases I and II of the SI were validated using quality assurance/quality control (QA/QC) protocols and used to prepare summary statistics of the results. The summary tables provide information on frequency of detection; the minimum, maximum, and arithmetic mean concentrations of chemicals in environmental media at each site; and background concentrations.

4.2.1 Chemicals in Soil

The results of sampling activities and chemical analysis of soil samples obtained from Sites 1 and 3 have been described in detail in Section 3. Section 3 presents characteristics of the nature and extent of contamination, and compares chemical concentrations to background concentrations. A statistical analysis was performed to determine whether contaminant concentrations in site samples exceeded levels expected in the background soils. Site-related contamination may exist if chemical concentrations exceed levels expected in the background. Background levels are defined as chemical concentrations that would be expected in the absence of site-related disposal activities. A statistical approach for determining evidence of site-related contamination is to define background Upper Tolerance Limits (Tu) for each contaminant of potential concern, and to compare the Tu to chemical concentrations found at the site.

The Tu is an estimate of the proportion of background samples for each chemical that would be expected to be below an upper 95 percentile value 95 percent of the time if the Tu were repeatedly estimated. The selected comparison means, therefore, that there is a 95 percent probability (5 percent chance of false positive estimates) that the site sample data are less than the 95 percentile background Tu estimates.

The sample data for both chemicals of potential concern were assumed to be lognormally distributed, so to maintain comparability both background and site sample data were lognormally transformed. Upper Tolerance Limits were compared to the maximum sample result for each chemical of potential concern within each respective sampled area at Sites 1, 3, and 4. The results of this comparability exercise are shown in Table 4-1. In each case, the maximum detected site sample concentration fell below the background Tu, indicating that there is no statistical evidence of site-related contamination for these substances.

Based on the available information, the observed levels of metals in soils do not appear to be entirely site related, and could be partially from other sources at the Base. The presence of organic chemicals, however, can be attributed to activities at the sites.

During Phases I and II of the SI at Site 1, seven samples were collected from surficial soils (i.e., 0 to 2 feet below ground surface [BGS]). In addition, 35 subsurface soil samples were collected from Site 1. At Site 3, 11 soil samples were collected during the two phases of the investigation, including 6 surface samples from 0 to 2 feet BGS, 2 samples from 2 to 6 feet BGS, and 3 samples at varying depths from 6 to 40 feet BGS.

All chemicals positively identified in soil samples at Sites 1 and 3 have been included in the preliminary risk evaluation. Indicator chemicals were not used in the risk evaluation. The U.S. Environmental Protection Agency (EPA) notes that the use of indicator chemicals may facilitate the risk assessment process when dozens of compounds have been identified at a waste site, and time and resources prohibit the evaluation of the full (and often complex) data set (EPA 1989a). However, there is nothing inherent in the indicator selection process that improves the characterization of risk to human health or the environment. EPA does not recommend eliminating chemicals from the risk assessment based upon their presence in background samples (EPA 1989a).

Formally promulgated Federal and state ARARs for soil are not currently available. Therefore, ARAR comparison for soil has not been included in the preliminary evaluation of Indiana ANGB sites.

Table 4-1. Comparison of Background Soils and Site-Specific Soil Concentrations for Selected Chemical of Potential Concern
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

ANALYTE	NUMBER OF SITE SAMPLES	BACKGROUND SAMPLES (Base lognormal) (ln)			LOGNORMAL TRANSFORMED MAXIMUM SITE CONCENTRATION	COMPARISON	CONCLUSION
		NUMBER OF BACKGROUND SAMPLES	X	Tu=X+Ks			
SITE 1							
Arsenic	22	7	1.799	4.23	2.5	2.5<4.23	-maximum site concentrations are less than background no statistical evidence of site related contamination
Benzo-(a)pyrene	36	9	5.47	7.259	6.685	6.685<7.259	-maximum site concentrations are less than background no statistical evidence of site related contamination
SITE 3							
Arsenic	10	7	1.799	4.23	3.03	3.03<4.23	-maximum site concentrations are less than background no statistical evidence of site related contamination
Benzo-(a)pyrene	10	9	5.47	7.259	None Detected	NA	NA
SITE 4							
Arsenic	12	7	1.799	4.23	2.43	2.43<4.23	-maximum site concentrations are less than background no statistical evidence of site related contamination
Benzo-(a)pyrene	12	9	5.47	7.259	6.38	6.38<7.259	-maximum site concentrations are less than background no statistical evidence of site related contamination

X - Mean Concentration
Tu - Upper Tolerance Limit
s - Relative Standard Deviation
K - Constant from Table A.3 "Methods for Evaluating the Attainment of Cleanup Standards - Volume 1 Soils and Solid Media".

4.2.2 Chemicals in Groundwater

Sections 1 and 3 of this report discussed the groundwater sampling conducted at Sites 1 and 3. Details on the locations of monitoring wells also are presented in Section 3.

The results of sampling and analysis of groundwater from Sites 1 and 3 indicate that site-related chemicals are not being transported to the groundwater. This may partially be attributed to the presence of relatively impermeable subsurface soils (clay material) at the site. The groundwater resource at the site is not a source of potable water for the Base or the city municipal water supply. As such, there is no exposure of Base personnel or the surrounding community to site-related chemicals by the groundwater pathway. In addition, the groundwater quality at the site is not suitable for potable water, and future use of groundwater from the site as a source of drinking water for the Base is not anticipated. Given the above information, a quantitative characterization of risks of hypothetical exposure to groundwater will not be presented in this evaluation. However, chemicals in groundwater are evaluated by comparison with ARARs.

Analytical results of groundwater samples were compared to concentrations in upgradient samples from the sites under investigation. All results were of the same order of magnitude as background concentrations. Section 3 provides additional details on concentration of metals in groundwater. Table 4-1a lists the ARARs for the groundwater contaminants detected at the site including maximum contaminant levels (MCLs), maximum contaminant level goals (MCLGs), proposed maximum contaminant levels (PMCLs), proposed maximum contaminant level goals (PMCLGs), and State of Indiana water quality standards. The results of groundwater samples from both phases of the SI are compared to the above guidelines in Tables 4-2 and 4-3. As shown in Tables 4-2 and 4-3, the mean and maximum concentrations of the observed chemicals were compared to the relevant Federal ARARs. The frequency of detection of the chemicals in groundwater is also shown in Tables 4-2 and 4-3.

Table 4–1a. Applicable or Relevant and Appropriate Requirements for Groundwater: 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

PARAMETER	MCL (a)	PMCL (a,b)	MCLG (a)	PMCLG (a,b)	INDIANA MCL (e)
METALS					
Antimony		10/5 (c,d)		3 (d)	
Arsenic	50				50
Beryllium		1 (d)		0 (d)	
Cadmium	10	5		5	10
Chromium	50	100		100	50
Copper	1,000 *	1,300		1,300	1,000 *
Lead	50	5		0	50
Nickel		100 (d)		100 (d)	
Zinc	5,000 *				5,000 *
ORGANICS					
Methylene Chloride		5 (d)		0 (d)	

All units are $\mu g/L$ for aqueous samples unless noted.

* – Secondary MCL, not an ARAR

(a) MCLs, MCLGs, proposed MCLs, proposed MCLGs. *Drinking Water Regulations and Health Advisories.* Office of Water, USEPA, November 1991.

(b) Proposed MCLs and proposed MCLGs. *Federal Register: Rules and Regulations*, Vol. 56, No. 20, Wednesday, January 30, 1991, Tables 1 and 2.

(c) Two MCLs are proposed based on sample detection limits 5 or 10 times the contract required detection limit

(d) Proposed MCLs and MCLGs, July 25, 1990

(e) State MCLs have not been promulgated for Indiana, Federal MCLs are used instead

Table 4-2. Comparison of Groundwater Concentrations with ARARs at Site 1 – Former Fire Training Area – 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Parameter	FREQUENCY OF DETECTION	MEAN CONCENTRATION IN GROUNDWATER (μg/L)	COMPARISON: MEAN CONCENTRATION vs. ARARs	MAXIMUM CONCENTRATION IN GROUNDWATER (μg/L)	COMPARISON: MAXIMUM CONCENTRATION vs. ARARs
Total Petroleum Hydrocarbons	1/6	0.58	– –	1.00	– –
INORGANICS					
Antimony	2/6	6.22	– –	14.60	> PMCL
Arsenic	5/6	22.73	– –	92.40	> MCL
Beryllium	3/6	1.35	> PMCL	2.21	> PMCL
Cadmium	1/6	0.95	– –	1.70	– –
Chromium	3/6	28.90	– –	71.80	> MCL
Copper	6/6	44.25	– –	79.60	– –
Lead	6/6	21.35	– –	49.00	– –
Nickel	4/6	35.82	– –	84.60	– –
Zinc	6/6	103.23	– –	221.00	– –
VOLATILE ORGANICS	0/6	ND	– –	ND	– –
SEMIVOLATILE ORGANICS	0/6	ND	– –	ND	– –

– – ARARs not exceeded
MCL – Maximum Contaminant Level
PMCL – Proposed Maximum Contaminant Level

Table 4–3. Comparison of Groundwater Concentrations with ARARs at Site 3 – Hazardous Waste Collection Area – 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Parameter	FREQUENCY OF DETECTION	MEAN CONCENTRATION IN GROUNDWATER (μg/L)	COMPARISON: MEAN CONCENTRATION vs. ARARs	MAXIMUM CONCENTRATION IN GROUNDWATER (μg/L)	COMPARISON: MAXIMUM CONCENTRATION vs. ARARs
Total Petroleum Hydrocarbons	0/2	ND	– –	ND	– –
INORGANICS					
Arsenic	2/2	15.55	– –	24.80	– –
Beryllium	1/2	1.40	> PMCL	1.80	> PMCL
Chromium	1/2	37.80	– –	69.10	> MCL
Copper	2/2	52.15	– –	82.30	– –
Lead	2/2	35.65	– –	43.40	– –
Nickel	1/2	41.40	– –	76.80	– –
Zinc	2/2	102.50	– –	179.00	– –
VOLATILE ORGANICS					
Methylene Chloride	1/2	3.75	– –	5.00	> PMCL
SEMIVOLATILE ORGANICS	0/2	ND	– –	ND	– –

– – ARAR not exceeded
MCL – Maximum Contaminant Level
PMCL – Proposed Maximum Contaminant Level

The following summarizes the results of the comparison of groundwater concentrations with relevant Federal and state ARARs:

- The mean and maximum concentrations of beryllium in groundwater at Sites 1 and 3 are above the PMCL of 1 μg/L for the chemical. The source of beryllium cannot be attributed to the site.
- The mean concentration of all other chemicals in groundwater samples from Sites 1 and 3 are below relevant ARARs.
- In groundwater samples from Site 1, the maximum concentration of arsenic and chromium were above the MCLs for the respective compounds, and the maximum concentration of antimony was above the PMCL for the compound.
- In Site 3 groundwater samples, the maximum concentration of chromium exceeded the MCL and the maximum concentration of methylene chloride exceeded the PMCL for the respective compounds.

As discussed in Section 3, the metals in groundwater at the site at the detected concentrations are not considered to be entirely site related. Metals tend to be adsorbed easily to soils and are not easily transported by infiltrating water. Solubility of metals in water is mainly a function of oxidation state and pH. In a reducing environment or at a low pH, the solubility of metals increases; with increasing pH or oxidation, metals species are less soluble and precipitate out of the solution. Based on geotechnical tests conducted, pH of the site soils is between 7.7 and 8.2. At these pH levels, solubility of metals will be low. In addition, metals in the soil environment are relatively stable due to high sorption properties (high octanol/water partitioning coefficient). Therefore, metals mobility is limited in the soil environment at Site 1.

Based on site history, volatile organics would more likely be detected in the soils, especially fuel-related compounds and compounds that are a result of combustion operations (e.g., PAHs). This is because, in comparison to metals, some halogenated organics would more easily tend to be transported through the soil matrix. However, no VOCs were detected in the groundwater and only some VOCs were detected in the site soils at low concentrations. The metals concentration detected in site groundwater can be considered to consist of the following three groups:

- Fraction that is naturally occurring in groundwater
- Fraction that is site related
- Fraction that is due to contributions from other sources.

Based on an evaluation of the analytical results and a review of the site geology, the fraction that is due to site-related contamination is considered to be minimal. It is difficult to estimate the fraction of metals concentration in groundwater that is actually from the site. However, it appears certain that the concentration of metals detected in groundwater is not entirely related to site activities.

4.3 EXPOSURE ASSESSMENT

4.3.1 Overview and Objectives

This section evaluates the potential for human exposure to contaminants present at, or released from, Sites 1 and 3 at Indiana ANGB. The results of exposure assessment in conjunction with the toxicity assessment are used in the characterization of potential risks to human health. The principal components adopted in the exposure assessment for Sites 1 and 3 at the Base are as follows:

- Evaluation of contaminant transport
- Identification and characterization of exposure pathways
- Identification of populations at risk of exposure
- Discussion of all assumptions used in deriving estimates of intake and dose.

The conceptual site model for Sites 1 and 3 and exposure assumptions or scenarios described in this section are the basis for exposure evaluation. It is important to recognize that the assumptions used in this section may contribute significantly to uncertainty in the results of the risk evaluation. The evaluation presented in this section follows the most current versions of EPA guidance on exposure and risk evaluation (EPA 1988, 1989a,b).

As specified by EPA, both current and future land uses need to be considered in evaluation of potential human health risks. The Base is located in the southwest side of the city of Fort Wayne, Indiana. Base property is guarded and secured, and the general public does not have direct access to this property. The use of this property is projected to remain under the control of the National Guard. Although the Indiana ANG property is surrounded by agricultural and commercial activities, there are currently no plans to return the land for use by the general public. For the purposes of risk evaluation, however, current and future land uses scenarios have been assumed to evaluate potential occupational exposure to Base personnel currently, and to onsite workers during construction, and receptors under a commercial exposure scenario in the future.

4.3.2 Characterization of Exposure Setting: Conceptual Site Models

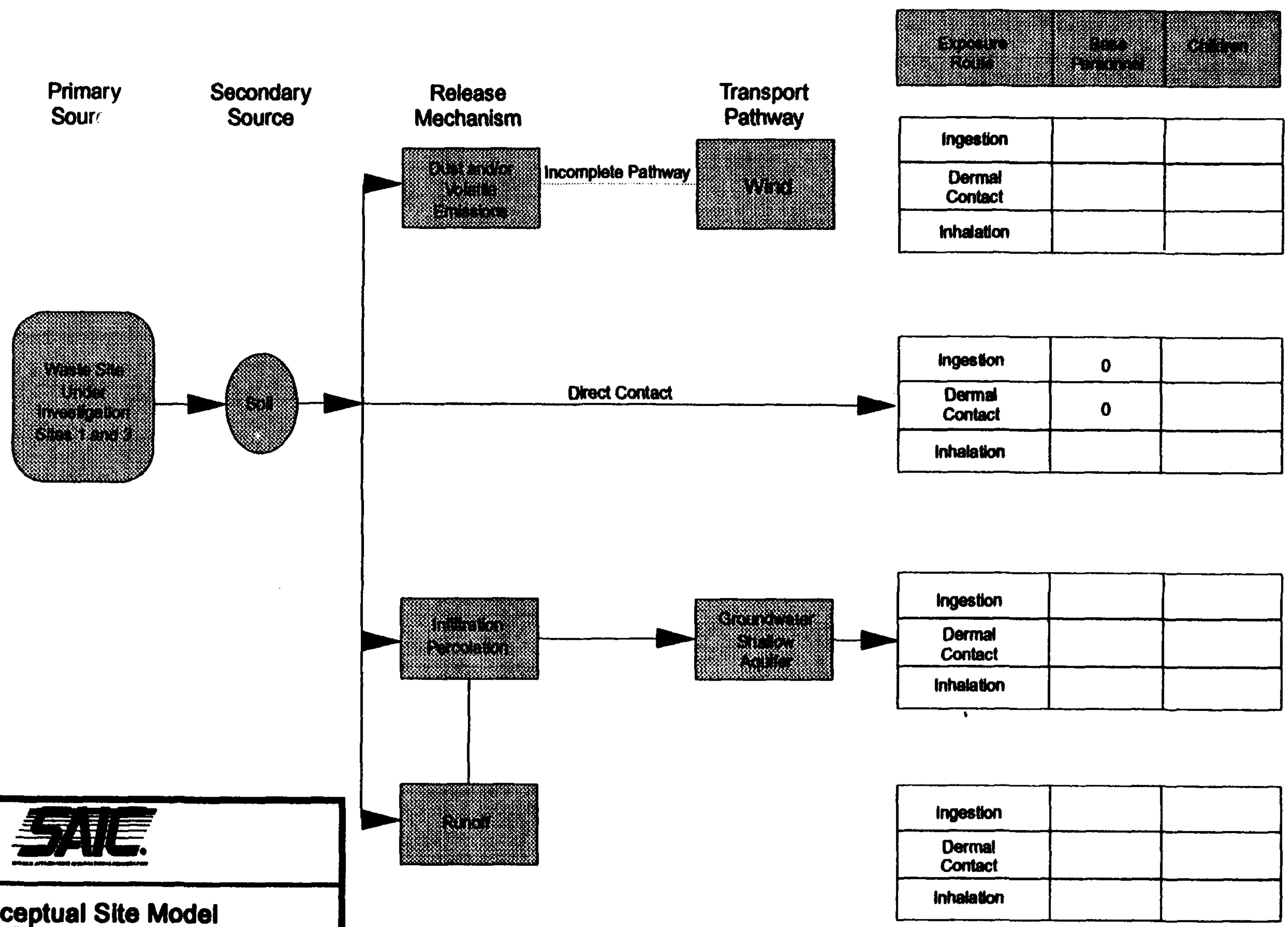
In order to characterize the transport of chemicals from the source of release to potential receptors at risk, conceptual models of the waste sites under investigation at the Base have been prepared. Conceptual site models identify the sources and types of environmental release and link these with receptor locations and activity patterns to determine the principal exposure pathways of concern (EPA 1989a).

The conceptual exposure model for Sites 1 and 3 at the Base is presented in Figure 4-1. Based on the available background data, and discussions with Base personnel, it was determined that environmental transport and exposure pathways for Sites 1 and 3 are sufficiently similar as to be adequately characterized by a single model.

Soils at and 5 feet below the former FTA surface and the 4 feet of sand and gravel layer at Site 3 act as a primary source of chemicals released to soils beneath the sites. Once in soils, chemicals may be transported through runoff, infiltration or percolation to the subsurface soils, or to the atmosphere (via entrainment of particulates or volatile emissions).

Prior to construction of the Base, the lands were primarily used for agriculture. As a result, elevated levels of fertilizer and pesticide residues (particularly, antimony and arsenic-based pesticides) are expected to persist in the environmental media. Contribution of inorganic

Conceptual Site Model: Sites 1 and 3



SAIC

Conceptual Site Model
Sites 1 and 3

122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Figure: 4-1 | Project: 01-0827-03-0349-007

contaminants arising due to earlier land use activities to the overall risks is an important factor in the evaluation of the public health and environmental impacts due to the activities at the ANG Base.

At present, land is used for a municipal airport adjacent to the Base to the west. This includes the airport terminal, aircraft maintenance warehouses, and light industrial land uses. Other land use adjacent to the Base is agricultural. Future increases in the ongoing industrial activities at the vicinity of the Base could enhance the hazard of commercial/industrial exposures to the onsite contaminants.

Base personnel are the potential receptor group of concern. In this preliminary evaluation, the exposure pathways of importance at Sites 1 and 3 are inadvertent ingestion and dermal exposure to contaminated surficial soils (i.e., direct contact). Based on a limited future land-use scenario at Site 3, commercial exposure, and exposure of construction workers to contaminated subsurface soils also are evaluated.

It is likely that wildlife would avoid paved and open areas (such as at Sites 1 and 3) used routinely by Base personnel, or characterized by soils or vegetation of unpleasant taste or odor. Because these sites do not provide wildlife habitats, bioaccumulation in wildlife is not a likely human exposure route.

Although contaminants may be released from the soil to air, inhalation exposure to suspended particulates and volatile organics from the sites is not anticipated be a significant exposure pathway of concern for the Base personnel or the general public.

The former FTA is covered with 5 to 12 feet of native fill that consists mostly of clay and relatively small amounts of construction debris. Therefore, direct exposure to site-related soil contaminants does not occur. Site 3 currently is being used as a storage area for a variety of oils and organic solvents. Activities records indicate that Site 1 is not used by the Base and as such exposure of the Base personnel are nonexistent. For the purpose of this risk evaluation, it is assumed that the Base personnel are exposed to chemicals at these sites 1 day a week

(1 hour per day), 52 weeks per year (a conservative estimate based on personal conversations with the Indiana ANGB officials, 1992). Risk evaluation for Sites 1 and 3 will be conducted for potential exposure to soils by the onsite workers.

Based on the geological characteristics of the region and the clayey nature of the subsurface soil, Sites 1 and 3 may be classified as low risk for direct exposure to contaminants in groundwater. As noted previously, groundwater is not a source of drinking water for Base personnel. The Base uses municipal water supply as the source of drinking water for military personnel. The municipal water supply originates from three river systems, including the St. Joseph River. Therefore, there is no exposure of Base personnel or the surrounding community to site-related chemicals by the groundwater pathway.

4.3.3 Exposure Assumptions

This section presents the equation and assumptions used in deriving intake estimates for potential receptors. Two exposure pathways are considered for current land use and two pathways are considered for the future construction scenario at Sites 1 and 3:

- Exposure through incidental ingestion of contaminated surficial soils by Base personnel for the current land use scenario
- Exposure through dermal contact to contaminated surficial soils by Base personnel for the current land use scenario
- Potential future exposure by ingestion of subsurface soils by onsite construction workers for the future land use scenario
- Potential future exposure through dermal contact with subsurface soils by onsite construction workers for the future land use scenario.

The land is usually paved during commercial developments of a site. Concrete pavement almost completely eliminates the risks of direct exposure to top soil contaminants. For the purposes of this risk evaluation, however, it is assumed that the lands used for commercial activities are not completely paved and that nonpaved areas within the commercial properties pose a potential risk of direct exposure to the presence of onsite soil. For this commercial exposure scenario, two soil exposure pathways have been considered:

- Potential future commercial exposure by ingestion of subsurface soils under the future land use scenario
- Potential future commercial exposure through dermal contact with subsurface soils under the future land use scenario.

The exposure assumptions and factors that were selected to generate upper-bound conservative estimates of potential health risks are discussed below. These estimates should be regarded as preliminary screening-level characterizations and not absolute projections of the likelihood of adverse effects in humans.

Base personnel indicated that worker activity at Sites 1 and 3 is very limited (Indiana ANGB 1992). Site 1 is closed (no fire training activity), and as such, no Base personnel work in the immediate area. Further, the site is covered with 5 to 12 feet of native fill material; as a consequence, inadvertent exposure to site-related contaminants does not occur. Site 3 is being used as a storage space. Worker exposure frequency at this site is not anticipated to exceed three times a week. Incidental ingestion exposure of Base personnel to soils is projected to occur during maintenance and inspection activities at the sites under investigation.

In general, under current land-use conditions, there is no potential for direct exposure to chemicals in soils at a depth greater than 6 to 24 inches. However, during construction activities (e.g., excavation and construction of foundations or basements), it is assumed that workers may be exposed to soils to a depth of approximately 10 feet. In order to develop a measure of the significance of the observed levels of contamination at Indiana ANGB, the preliminary risk evaluation will evaluate hypothetical exposure of Base personnel to the mean and maximum concentrations of chemicals in the soil column to a depth of 10 feet. Contamination below this depth will not be evaluated for soil exposure pathways.

The exposure concentrations that form the basis of risk estimates are typically the arithmetic averages of the environmental concentration that the receptor is projected to experience over the exposure period (EPA 1989a). Because of the uncertainty associated with any estimate of exposure concentration, the upper confidence limit (i.e., the 95 percent confidence limit) on the arithmetic average is recommended by EPA for use in risk assessment (EPA 1989a).

The 95th percent upper-bound risk estimate based on the arithmetic mean would fall between the arithmetic average and the maximum observed value at the site. Risk estimates based upon these "reasonable maximum exposure" (RME) concentrations provide a basis for characterizing the upper-bound risks to human health. It should be noted, however, that if the sample set is very small, or if there is considerable variability in measured concentrations, the RME estimate of the arithmetic mean may exceed the maximum value observed at the site. Under these circumstances, EPA recommends adopting the maximum observed concentration as the basis of the risk assessment.

For the screening-level evaluation, risk estimates will be derived using both the arithmetic mean and the maximum observed concentrations in soils. RME concentrations calculated using the available data sets typically were above the maximum observed concentrations. Use of the arithmetic mean and the maximum concentrations have bounded the estimates of potential risks to human health. The mean concentrations used in the exposure assessment were calculated as the weighted arithmetic mean of the data sets obtained during both phases of the SI.

4.3.4 Intake Estimates for Current Land Use

For a current land-use scenario, two exposure pathways are used as the basis for estimating risks of exposure to soil for Base personnel: ingestion and dermal exposure to contaminants detected in samples collected from 0 to 2 feet BGS.

4.3.4.1 Ingestion Exposure of Base Personnel

Based on the current activities at the sites, intake estimates for ingestion exposure of Base personnel to soils in the vicinity of the former FTA and HWCA are determined as follows:

where:

C = Arithmetic mean or maximum chemical concentration in soils. Not detected values treated as one-half the limit of detection.

CR = Contact rate: 0.1 gram/day projected as conservative exposure in the absence of site-specific information (EPA default value: Exposure Factors Handbook, EPA 1989b).

CF = Conversion factor to intake in units of mg/day: 10^{-6} Kg/mg.

EF = Exposure frequency: 1 day every week (52 days per year). Conservative exposure frequency estimate for Base personnel (Indiana ANGB 1992).

ED = Exposure duration: 30 years. Upper-bound estimate of period of employment or service at the Base.

BW = Average body weight for adults: 70 Kg.

AT = Averaging time for noncarcinogenic effects, chronic exposure: 30 years x 365 days/year. Averaging time for cancer risk estimates: 70 years x 365 days/year.

All chemicals are assumed to be conservative in the environment (i.e., they do not transform or degrade over the period of exposure) and 100 percent bioavailable for uptake and absorption. The use of equation (1) above is in accordance with methods proposed by EPA in the Risk Assessment Guidance for Superfund (EPA 1989a).

4.3.4.2 Dermal Exposure of Base Personnel

Dermal exposure is assumed to occur simultaneously with inadvertent ingestion exposure during maintenance or inspection activities. The skin surface area of arms and hands are assumed to be available for contact with soil.

Dose estimates for dermal exposure of Base personnel to soils in the vicinity of the former FTA and the HWCA are determined as follows:

where:

C = Arithmetic mean or maximum chemical concentration in surface soils or sediments. Not detected values treated as one-half the limit of detection.

CF = Conversion factor to intake in units of mg/day: 10^{-6} Kg/mg.

SA = Skin surface area available for contact: hands and arms 3,120 cm^2 (EPA 1989b).

AF = Soil to skin adherence factor: 1.45 mg/cm^2 (EPA 1989a). Average of EPA value for potting soil used as default in the absence of site-specific information.

ABS = Relative absorption factor: 1 percent (0.01) for metals and inorganics, and 25 percent (0.25) for organics (Ryan et al. 1987).

EF = Exposure frequency: One day every week (52 days per year). Conservative exposure frequency estimate for Base personnel (Indiana ANGB 1992).

ED = Exposure duration: 30 years. Upper-bound estimate of period of employment or service at the Base.

BW = Average body weight for adults: 70 Kg.

AT = Averaging time for noncarcinogenic effects, chronic exposure: 30 years x 365 days/year. Averaging time for cancer risk estimates: 70 years x 365 days/year.

All chemicals are assumed to be conservative in the environment (i.e., they do not transform or degrade over the period of exposure). The use of equation (2) above is in accordance with methods presented by EPA in the Risk Assessment Guidance for Superfund (EPA 1989a).

4.3.5 Intake Estimates For Future Land-use Scenario

Similar to the current land use scenario, two exposure pathways were used as the basis for estimating risks for exposure to onsite construction workers and receptors under the commercial exposure scenario: ingestion and dermal exposure to contaminants detected in soil samples collected from 0 to 10 feet BGS.

4.3.5.1 Limited Ingestion Exposure of Onsite Construction Workers

Construction or repair work is anticipated as plausible future activities at Site 3. Although there are no plans for construction activities at Site 1, these pathways were applied to this site to address the future land-uses scenario in a consistent manner. Exposure estimates are derived for limited exposure of onsite construction workers to subsurface soil contaminants during digging and excavation at the sites under evaluation. For the purposes of quantifying the dose, contaminant concentrations of soil samples collected from 0 to 10 feet BGS. The exposure equation used for inadvertent soil ingestion by onsite workers is as follows:

where:

C = Arithmetic mean or maximum chemical concentration in soil samples from 0 to 10 feet BGS. Not detected values treated as one-half the limit of detection.

CR = Contact rate: 0.1 gram/day projected as conservative exposure in the absence of site-specific information (EPA default value: Exposure Factors Handbook, EPA 1989b).

CF = Conversion factor to intake in units of mg/day: 10^{-6} Kg/mg.

EF = Exposure frequency: 5 days per week for 1 year (250 days/year).

ED = Exposure duration: One year. Upper-bound estimate of period of construction or repair works at the site.

BW = Average body weight for adults: 70 Kg.

AT = Averaging time for noncarcinogenic effects, chronic exposure: 1 year x 365 days/year. Averaging time for cancer risk estimates: 70 years x 365 days/year.

All chemicals are assumed to be conservative in the environment (i.e., they do not transform or degrade over the period of exposure) and 100 percent bioavailable for uptake and absorption. The use of equation (3) above is in accordance with methods proposed by EPA in the Risk Assessment Guidance for Superfund (EPA 1989a).

4.3.5.2 Limited Dermal Exposure of Onsite Construction Workers

For the dermal exposure pathway, the preliminary risk evaluation will evaluate exposure of construction workers to the mean and maximum concentrations of chemicals in the soil column to a depth of 10 feet.

Dose estimates for dermal exposure for construction workers are as follows:

where:

C	=	Arithmetic mean or maximum chemical concentration in soil column of 0 to 10 feet in depth. Not detected values treated as one-half the limit of detection.
CF	=	Conversion factor 10^{-6} Kg/mg.
SA	=	Skin surface area available for contact: hands and arms 3,120 cm^2 (EPA 1989b).
AF	=	Soil to skin adherence factor: 1.45 mg/cm^2 (EPA 1989a). Average of EPA value for potting soil used as default in the absence of site-specific information.
ABS	=	Absorption factor: 1 percent (0.01) for metals and inorganics, and 25 percent (0.25) for organics (Ryan et al. 1987).
EF	=	Exposure frequency: 5 days per week for 1 year (250 days/year).
ED	=	Exposure duration: 1 year. Upper-bound estimate of period for construction or repair work at the site.
BW	=	Average body weight for adults: 70 Kg.
AT	=	Averaging time for noncarcinogenic effects, chronic exposure: 1 year x 365 days/year. Averaging time for cancer risk estimates: 70 years x 365 days/year.

All chemicals are assumed to be conservative in the environment (i.e., they do not transform or degrade over the period of exposure). The use of equation (4) above is in accordance with methods presented by EPA in the Risk Assessment Guidance for Superfund (EPA 1989a).

4.3.5.3 Commercial Exposures by Ingestion of Onsite Soil

Exposure estimates are derived for limited commercial exposures to onsite soil present in unpaved areas. For the purposes of quantifying the dose, contaminant concentrations of soil samples collected from 0 to 10 feet BGS have been used. The exposure equation used for inadvertent soil ingestion is as follows:

where:

C = Arithmetic mean or maximum chemical concentration in soil samples from 0 to 10 feet BGS. Not detected values treated as one-half the limit of detection.

CR = Contact rate: 0.05 gram/day projected as conservative exposure in the absence of site-specific information (EPA default value: Exposure Factors Handbook, EPA 1989b).

CF = Conversion factor to intake in units of mg/day: 10^{-6} Kg/mg.

EF = Exposure frequency: 5 days per week for 1 year (250 days/year).

ED = Exposure duration: 25 years. Upper-bound estimate for commercial/industrial activities.

BW = Average body weight for adults: 70 Kg.

AT = Averaging time for noncarcinogenic effects, chronic exposure: 25 years x 365 days/year. Averaging time for cancer risk estimates: 70 years x 365 days/year.

All chemicals are assumed to be conservative in the environment (i.e., they do not transform or degrade over the period of exposure) and 100 percent bioavailable for uptake and absorption. The use of equation (3) above is in accordance with methods proposed by EPA in the Risk Assessment Guidance for Superfund (EPA 1989a).

4.3.5.4 Commercial Exposure by Dermal Route to Onsite Soil

For the dermal exposure pathway, the preliminary risk evaluation will evaluate commercial exposure to the mean and maximum concentrations of chemicals in the soil column to a depth of 10 feet.

Dose estimates for dermal exposure for construction workers are as follows:

where:

- C = Arithmetic mean or maximum chemical concentration in soil column of 0 to 10 feet in depth. Not detected values treated as one-half the limit of detection.
- CF = Conversion factor 10^{-6} Kg/mg.
- SA = Skin surface area available for contact: hands and arms 3,120 cm^2 (EPA 1989b).
- AF = Soil to skin adherence factor: 1 mg/cm^2 (EPA 1989a). Average of EPA value for potting soil used as default in the absence of site-specific information.
- ABS = Absorption factor: 1 percent (0.01) for metals and inorganics, and 25 percent (0.25) for organics (Ryan et al. 1987).
- EF = Exposure frequency: 5 days per week for 1 year (250 days/year).
- ED = Exposure duration: 25 years. Upper-bound estimate of period for construction or repair work at the site.
- BW = Average body weight for adults: 70 Kg.
- AT = Averaging time for noncarcinogenic effects, chronic exposure: 25 years x 365 days/year. Averaging time for cancer risk estimates: 70 years x 365 days/year.

All chemicals are assumed to be conservative in the environment (i.e., they do not transform or degrade over the period of exposure). The use of equation (4) above is in accordance with methods presented by EPA in the Risk Assessment Guidance for Superfund (EPA 1989a).

4.4 TOXICITY ASSESSMENT

Identification of toxicological measures for the contaminants of concern is a critical step in the health risk evaluation process. The objectives of toxicity assessment are to evaluate the inherent toxicity of the compounds under investigation and to identify and quantify toxicological measures of potential concern.

EPA has provided guidelines for quantitative estimation of carcinogenic and noncarcinogenic risks for virtually all hazardous chemicals detected at Superfund sites. Toxicity-based health risk evaluation requires quantitative measures of critical toxicologic endpoints of health relevance.

In order to evaluate noncarcinogenic and carcinogenic health risks, EPA has adopted two basic approaches for toxicity assessment based on the proposed mechanisms of induction of toxic effects. In assessing the noncarcinogenic or systemic effects, EPA assumes the existence of a threshold dose below which no adverse health effects would be manifested in an exposed receptor. The threshold assumption in the dose-response relationship for systemic effects assumes that adaptive or compensating processes that normally operate in living systems must be overcome before adverse effects become manifest in the exposed organism. In contrast, however, EPA assumes a "nonthreshold" mechanism of action for carcinogenic effects. Here, it is believed that any exposure to a carcinogen carries a risk of adverse effect; for example, that a limited number of molecular events can result in permanent chromosomal changes leading to uncontrolled cellular proliferation leading to neoplastic development.

EPA derives reference doses (RfDs) and reference concentrations (RfCs) for use in evaluating the potential for adverse noncarcinogenic effects. RfDs and RfCs are defined as dose estimates (with uncertainty spanning one order of magnitude or greater) expressed as daily exposure levels for the human population, including sensitive subpopulations, that are likely to be without an appreciable risk of deleterious effects during a lifetime (EPA 1989a). RfDs are toxicity measures used in evaluating risks of exposure via the oral route, whereas RfCs are used in evaluating risks via the inhalation exposure.

The chemical-specific reference doses for chronic adverse effects in humans or experimental animals are based on the no-observable-adverse-effect level (NOAEL) or lowest-observable-adverse-effect level (LOAEL) in a dose-response curve from a chronic human or animal bioassay. The RfD for oral exposure is derived as follows:

where:

NOAEL = No-observable-adverse-effect level (mg/Kg body weight/day)

UF = Uncertainty factor (unitless)

MF = Modifying factor (unitless).

The inhalation RfC is derived as follows:

where:

$NOAEL_{[HEC]}$ = No-observable-adverse-effect level (mg/Kg body weight/day) adjusted to human equivalent concentration

UF = Uncertainty factor (unitless)

MF = Modifying factor (unitless).

A brief description of the principal study and the uncertainty factors used in the derivation of the RfD for various chemicals of concern at this site are described in Appendix G.

For the purposes of evaluating carcinogenic effects, EPA has adopted a two-step approach in which the carcinogenic chemical is first assigned a weight-of-evidence classification based on the evidence of carcinogenicity in human and experimental data, and then a cancer potency factor (slope factor) for a specific data set on tumor induction (see Appendix G for details). The cancer slope factors for oral exposure or inhalation routes is an indicator of the cancer causing potency of the chemical. The cancer potency factor is a plausible upper-bound estimate of the slope of the dose-response curve in the low dose range. It is denoted as the probability of a cancer response per unit intake of a chemical over a lifetime. In risk assessment, the cancer slope (potency) factor is used to estimate the excess lifetime probability of a carcinogenic effect occurring in exposed receptors.

In conducting an evaluation of risk of exposure to chemicals at the Base, two toxicity measures of principal importance may be identified:

- RfDs for oral exposure - acceptable intake values for subchronic and chronic exposure (noncarcinogenic effects)
- Cancer slope factors for oral exposure.

The primary source of toxicologic information used for risk characterization at the Base is the EPA Integrated Risk Information System (IRIS) data base. IRIS is a on-line data base for risk assessment and risk management information for chemical substances. Data in the IRIS system are regularly reviewed and updated monthly. If toxicity measures are not available on IRIS, EPA recommends use of the EPA ORD Health Effects Assessment Summary Tables (HEAST FY 1991: EPA 1991) as the second current source of information. Table 4-4 summarizes the toxicity measures used in the public health risk evaluation at the Base.

Note that RfDs or slope factors have not been developed by EPA for the dermal exposure route. In the absence of these factors, the common practice has been to use the available toxicity measures for the oral route of exposure. This approach has been adopted in the preliminary risk evaluation of the Indiana ANG sites under investigation. Note, however, that there is considerable uncertainty in the use of oral measures for the dermal exposure pathway. The results of risk evaluation that incorporate these measures should not be interpreted as characterizing actual risks to human health via the dermal exposure pathway. The risk measures derived for this pathway should be considered only a screening-level tool for evaluating the relative significance of the observed levels of contamination in environmental media.

In evaluating the dermal pathway, EPA recommends expressing chemical intake as absorbed dose and adjusting the oral toxicity measures also to reflect absorbed dose (EPA 1989a). The adjustment of the oral toxicity measure can be accomplished only if sufficient data are available in the principal laboratory studies on oral absorption efficiency in the species on which the toxicity measures are based. EPA notes that exposure estimates for absorption efficiency should not be adjusted if the toxicity values are based on administered doses (EPA 1989a).

Table 4–4. Toxicity Measures for Waste Site Evaluation: Ingestion and Dermal Exposure Pathways *
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical Classes of Concern	Oral RfD (mg/kg/day)	Inhalation RfD (mg/kg/day)	Cancer Slope Factor Oral Route (mg/kg/day)–1		Cancer Slope Factor Inhalation Route (mg/kg/day)–1	Reference
INORGANICS						
Antimony	4.0E–04	NA	NA		NA	a
Arsenic	1.0E–03	NA	1.75E+00	[A]	5.00E+01 [A]	a
Beryllium	5.0E–03	NA	4.30E+00	[B2]	8.40E+00 [B2]	a
Cadmium	5.0E–04	5.0E–04	NA		6.10E+00 [B1]	a
Chromium (III)	1.0E+01	5.0E–07	NA		NA	a
Chromium (VI)	5.0E–03	NA	NA	-	4.10E+01 [A]	a, i
Copper	3.7E–02	NA	NA		NA	b, k
Lead	1.4E–03	1.4E–03	NA		NA	b, j
Mercury	3.0E–04	8.6E–05	NA		NA	b
Nickel	2.0E–02	NA	NA		NA	a, b
Thallium	7.0E–05	NA	NA		NA	b
Zinc	2.0E–01	NA	NA		NA	b
VOLATILE ORGANICS						
Acetone	1.0E–01	NA	NA		NA	a, b
Benzene	NA	NA	2.90E–02	[A]	2.90E–02 [A]	a, b
Ethylbenzene	1.0E–01	NA	NA		NA	a
2–Hexanone	NA	NA	NA		NA	a, c
4–Methyl–2–pentanone	5.0E–02	2.3E–02	NA		NA	a
Toluene	2.0E–01	5.7E–01	NA		NA	a
Xylene (total)	2.0E+00	7.0E–01	NA		NA	a, d
SEMIVOLATILE ORGANICS						
Bis(2–ethylhexyl)phthalate	2.0E–02	2.0E–02	1.40E–02	[B2]	1.40E–02 [B2]	a, b
Acenaphthene	4.0E–03	NA	NA		NA	a, b
Anthracene	4.0E–03	NA	1.00E+00	[B2]	1.00E+00 [B2]	a, e
Benz[a]anthracene	4.0E–03	NA	1.67E+00	[B2]	NA [B2]	f, g
Benzo[b]fluoranthene	4.0E–03	NA	1.61E+00	[D]	NA [B2]	f, g
Benzo[k]fluoranthene	4.0E–03	NA	7.59E–01	[B2]	NA [B2]	f, g
Benzo[a]pyrene	4.0E–03	NA	1.15E+01	[B2]	6.10E+00 [B2]	f, g
Chrysene	4.0E–03	NA	5.06E–02	[B2]	1.40E–02 [C]	f, g
Dibenzofuran	1.0E–03	NA	NA		NA	f, g
Fluoranthene	4.0E–02	NA	NA		NA	f, g
Indeno[1,2,3–cd]pyrene	4.0E–03	NA	2.67E+01	[C]	NA [B2]	f, g
Phenanthrene	4.0E–03	NA	NA		NA	f, g
Pyrene	3.0E–02	NA	9.30E–01	[D]	9.30E–01 [D]	f, g

NA = Not available; [P] = Proposed
* Quantitative toxicity parameters were obtained from published studies and IRIS data base
(a) Integrated Risk Information System (IRIS) data base (as of October 1991).
(b) EPA Health Effects Assessment Summary Tables (HEAST) FY 1991, or Superfund Public Health Evaluation Manual (1986).
(c) Hazardous Substances Data Bank (HSDB) on–line data base (as of January 1992).
(d) Toxicity measures presented are for mixed xylenes.
(e) Unit risk estimate based on use of toxicity equivalence factors and revised ingestion unit risk for B[a]P from (e) 2–stage and (f) linearized multistage model (Clements Associates 1988).
(g) In the absence of chemical–specific quantitative toxicity parameters, the RfD for naphthalene was adopted for this PAH.
(i) Reference doses for hexavalent chromium oral route.
(j) RfD for Pb is under evaluation by EPA; an earlier RfD (from HEAST 1989) for lead is listed in this table.
(k) RfD derived from the EPA drinking water standard as listed in EPA 1989 HEAST 2nd Quarter Report.

4.5 RISK CHARACTERIZATION

4.5.1 Overview

The principal aim of the human health risk evaluation is to determine if exposure to chemicals present at, or released from, the sites under investigation pose an unacceptable level of risk to human health. Risk characterization brings together the results of the exposure and toxicity assessments to derive a quantitative measure of risk. The risk estimates obtained in this manner serve in the decisionmaking process for site remediation.

Noncancer risk estimates for individual chemicals are a measure of the potential for adverse systemic effects for that chemical and termed Hazard Quotient (HQ) whereas Hazard Index (HI) is the indicator of noncancer risks for combined exposure to all chemicals of concern for an exposure pathway. The HQ is the ratio of intake or dose divided by the EPA RfD or RfC. Cancer risks are probabilistic estimates of the additional or excess incidence of cancer in an individual attributable to exposure to site-related chemicals. Excess lifetime cancer risks are determined by multiplying the estimated route-specific intake or average daily intake (ADI) with cancer potency factors (or cancer slope factors) (see Appendix G for a more detailed discussion).

Cancer risk estimates are commonly based on prolonged periods of exposure involving decades of periodic contact with contaminated environmental media. Since EPA has adopted a non-threshold mechanism for the process carcinogenesis, any exposure to carcinogens is assumed to contribute an incremental level of increased cancer risks. It is important to note, however, that exposure duration adopted for cancer risk characterization in future land-use scenarios at the Indiana ANGB are very short, and as such, these scenarios and risk estimates have to be viewed as screening-level estimates.

4.5.2 Guidelines for Risk Characterization

EPA guidelines for evaluating noncarcinogenic effects specify determination of an HQ for a given chemical in a contaminated medium. If the HQ for a contaminant (HQ: ratio of daily intake or dose and the chemical-specific RfD) is > 1, it is concluded that there may be potential for adverse noncarcinogenic effects at the given exposure/dose level. In evaluating exposure to multiple chemicals (noncarcinogens), the HQs are summed for all chemicals under evaluation. If the sum of these ratios, the HI is > 1, the potential for adverse noncarcinogenic effects exists. Under these circumstances, EPA recommends segregating the compounds into chemical groups with similar toxicological effects, and re-evaluating the combined potential of segregated groups of chemicals for adverse health effects.

Carcinogenic risk estimates are probabilistic measures of the excess lifetime cancer risks to the individual above the background levels (i.e., due to exposure to contaminants from the site). For carcinogenic effects, the total excess lifetime cancer risk to all contaminants should fall within the acceptable range of 10^{-4} to 10^{-6}. Although the 10^{-6} risk level is identified by EPA as a "point of departure" in evaluating the results of risk evaluation, the revised National Contingency Plan (NCP) indicates that the 10^{-4} level is the upper bound of the acceptable range (55 FR 8666).

The EPA guidelines for noncarcinogenic and carcinogenic risk characterization have been adopted in the evaluation and interpretation of risks at Indiana ANG sites.

4.5.3 Risk Characterization for Current Land-use Scenario

The results of risk characterization for current land-use scenarios at Sites 1 and 3 are shown in Tables 4-5 through 4-8. Each table presents: 1) the contaminant chemicals under evaluation, 2) the weighted arithmetic mean and maximum concentrations, 3) the HQs and HIs for assessing the potential for adverse noncarcinogenic effects, and 4) estimates of excess lifetime cancer risk for each chemical and total risks combined across chemicals (Appendix G provides additional discussion of risk assessment methods). In order to bound the potential risks to human health, cancer risk estimates and estimates of the potential for noncarcinogenic effects are derived based on mean and maximum soil concentrations.

Tables 4-5 and 4-7 and Tables 4-6 and 4-8 summarize the risk estimates for current land-use conditions at Sites 1 and 3 for ingestion exposure and dermal contact, respectively. As indicated in Tables 4-5 and 4-8, both noncancer and cancer risk estimates for Site 1 fall within the acceptable range established by EPA for waste site remediation. This applies to the risk estimates derived for both weighted arithmetic mean and maximum concentrations of

Table 4-5. Risk Characterization for Site 1 – Former Fire Training Area
Ingestion Exposure of Base Personnel to Surficial Soil Contaminants
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Surface Soil (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (b) Concentrations in Surface Soil (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Antimony	2.16	1.08E−03		4.9	2.45E−03	
Arsenic	8.83	1.77E−03	1.34E−06	12.6	2.52E−03	1.92E−06
Beryllium	0.66	2.64E−05	2.47E−07	1.7	6.80E−05	6.36E−07
Cadmium	0.62	2.48E−04		1.2	4.80E−04	
Chromium	15.06	6.02E−04		20.3	8.12E−04	
Copper	22.49	1.22E−04		34.6	1.87E−04	
Lead	19.57	2.80E−03		33.9	4.84E−03	
Nickel	24.49	2.45E−04		36.5	3.65E−04	
Thallium	0.33	9.43E−06		0.55	1.57E−05	
Zinc	70.73	7.07E−05		116	1.16E−04	
VOLATILE ORGANICS						
Acetone	0.03	6.00E−08		0.07	1.40E−07	
Toluene	0.083	8.30E−08		0.25	2.50E−07	
SEMIVOLATILE ORGANICS						
Benzo[a]pyrene	0.269	1.35E−05	2.69E−07	0.66	3.30E−05	6.60E−07
Benzo[b]fluoranthene	0.444	2.22E−05	6.22E−08	1.3	6.50E−05	1.82E−07
Fluoranthene	0.354	1.77E−06		0.71	3.55E−06	
Pyrene	0.353	1.77E−05	8.20E−09	0.7	3.50E−05	1.63E−08
Indeno[1,2,3−cd]pyrene	0.236	1.57E−06	5.34E−09	0.5	3.33E−06	1.13E−08

	Results based on mean values		Results based on maximum values	
Hazard Index (HI): (Combined Exposure) (d)	7.02E−03		1.20E−02	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)		1.94E−06		3.42E−06

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).

(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 sampling data sets for top 2 feet of soil.

(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for top 2 feet of soil.

(c) Average daily intake calculated assuming exposure to mean and maximum concentrations of chemicals in surface soil through ingestion.
Exposure Assumptions: Inadvertent ingestion by Base personnel of 0.1 gms of soil/day, 1 day/week, 52 days/year, for 30 years of a 70−year lifetime.
All ingested chemicals are assumed to be 100% bioavailable.

(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for lead is based on an earlier EPA reference dose of 0.0014 mg/kg/day (SPHEM 1986).

Table 4-6. Risk Characterization for Site 1 – Former Fire Training Area
Dermal Exposure of Base Personnel to Surficial Soil Contaminants
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Surface Soil (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (b) Concentrations in Surface Soil (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Antimony	2.16	4.97E-04		4.9	1.13E-03	
Arsenic	8.83	8.13E-04	6.10E-07	12.6	1.16E-03	8.71E-07
Beryllium	0.66	1.22E-05	1.12E-07	1.7	3.13E-05	2.89E-07
Cadmium	0.62	1.14E-04		1.2	2.21E-04	
Chromium	15.06	2.77E-04		20.3	3.74E-04	
Copper	22.49	5.60E-05		34.6	8.61E-05	
Lead	19.57	1.29E-03		33.9	2.23E-03	
Nickel	24.49	1.13E-04		36.5	1.68E-04	
Thallium	0.33	4.34E-06		0.55	7.24E-06	
Zinc	70.73	3.26E-05		116	5.34E-05	
VOLATILE ORGANICS						
Acetone	0.03	6.90E-07		0.07	1.61E-06	
Toluene	0.083	9.54E-07		0.25	2.88E-06	
SEMIVOLATILE ORGANICS						
Benzo[a]pyrene	0.269	1.55E-04	2.78E-06	0.66	3.80E-04	6.83E-06
Benzo[b]fluoranthene	0.444	2.55E-04	6.43E-07	1.3	7.48E-04	1.88E-06
Fluoranthene	0.354	2.04E-05		0.71	4.08E-05	
Pyrene	0.353	2.03E-04	8.48E-08	0.7	4.03E-04	1.68E-07
Indeno[1,2,3-cd]pyrene	0.236	1.81E-05	5.52E-08	0.5	3.83E-05	1.17E-07

	Results based on mean values		Results based on maximum values	
Hazard Index (HI): (Combined Exposure) (d)	3.86E-03		7.07E-03	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)		4.29E-06		1.02E-05

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).
(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 sampling data sets for top 2 feet of soil.
(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for top 2 feet of soil.
(c) Average daily intake calculated assuming exposure to mean and maximum concentrations of chemicals in surface soil through ingestion.
Exposure Assumptions: Incidental dermal exposure by Base personnel of 0.1 gms of soil/day for 1 day/week, 52 days/year, for 30 years of a 70-year lifetime. Surface area of arms and hands, and soil adherence factor were adopted from RAGS 1989. Availability of organic and metallic compounds were approximated at 25% and 1% of the organic and metal concentrations, respectively.
(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for dermal exposure to lead is based on an earlier EPA oral reference dose of 0.0014 mg/kg/day (SPHEM 1986).

Table 4–7. Risk Characterization for Site 3 – Hazardous Waste Collection Area Ingestion Exposure of Base Personnel to Surficial Soil Contaminants 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Surface Soil (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (b) Concentrations in Surface Soil (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Arsenic	9.60	8.64E–03	6.72E–06	20.70	1.86E–02	1.45E–05
Beryllium	0.49	8.82E–05	8.43E–07	0.98	1.76E–04	1.69E–06
Cadmium	0.58	1.04E–03		1.80	3.24E–03	
Chromium	7.18	1.29E–03		11.70	2.11E–03	
Copper	24.16	5.88E–04		31.40	7.64E–04	
Lead	10.62	6.83E–03		16.30	1.05E–02	
Mercury	0.02	6.00E–05		0.03	9.00E–05	
Nickel	13.12	5.90E–04		24.10	1.08E–03	
Thallium	0.26	3.34E–03		0.58	7.46E–03	
Zinc	48.98	2.20E–04		75.70	3.41E–04	
VOLATILE ORGANICS						
Acetone	0.18	1.63E–06		0.82	7.38E–06	
2–Hexanone	0.22			1.10		
Methylene Chloride	0.02	4.32E–07	7.20E–11	0.08	1.51E–06	2.52E–10
Toluene	0.03	1.35E–07		0.09	4.10E–07	
Xylenes	0.03	1.35E–08		0.14	6.30E–08	
SEMIVOLATILE ORGANICS						
Bis(2–ethylhexyl)phthalate	0.63	2.81E–05	3.50E–09	2.40	1.08E–04	1.34E–08

	Results based on mean values		Results based on maximum values	
Hazard Index (HI): (Combined Exposure) (d)	2.27E–02		4.45E–02	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)		7.57E–06		1.62E–05

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).
(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 sampling data sets for top 2 feet of soil.
(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for top 2 feet of soil.
(c) Average daily intake calculated assuming exposure to mean and maximum concentrations of chemicals in surface soil through ingestion.
Exposure Assumptions: Inadvertent ingestion by Base personnel of 0.1 gms of soil/day, 1 day/week, 52 days/year, for 30 years of a 70–year lifetime.
All ingested chemicals are assumed to be 100% bioavailable.
(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for lead is based on an earlier EPA reference dose of 0.0014 mg/kg/day (SPHEM 1986).

Table 4–8. Risk Characterization for Site 3 – Hazardous Waste Collection Area
Dermal Exposure of Base Personnel to Surficial Soil Contaminants
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Surface Soil (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (b) Concentrations in Surface Soil (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Arsenic	9.60	3.84E–03	1.68E–06	20.70	8.28E–03	3.62E–06
Beryllium	0.49	3.92E–05	2.11E–07	0.98	7.84E–05	4.21E–07
Cadmium	0.58	4.64E–04		1.80	1.44E–03	
Chromium	7.18	5.74E–04		11.70	9.36E–04	
Copper	24.16	2.61E–04		31.40	3.39E–04	
Lead	10.62	3.03E–03		16.30	4.66E–03	
Mercury	0.02	2.67E–05		0.03	4.00E–05	
Nickel	13.12	2.62E–04		24.10	4.82E–04	
Thallium	0.26	1.49E–03		0.58	3.31E–03	
Zinc	48.98	9.80E–05		75.70	1.51E–04	
VOLATILE ORGANICS						
Acetone	0.18	1.99E–05		0.82	9.02E–05	
2–Hexanone	0.22			1.10		
Methylene Chloride	0.02	5.28E–06	8.46E–10	0.08	1.85E–05	6.35E–08
Toluene	0.03	1.65E–06		0.09	5.01E–06	
Xylenes	0.03	1.65E–07		0.14	7.70E–07	
SEMIVOLATILE ORGANICS						
Bis(2–ethylhexyl)phthalate	0.63	3.44E–04	4.11E–08	2.40	1.32E–03	3.82E–08

	Results based on mean values		Results based on maximum values	
Hazard Index (HI): (Combined Exposure) (d)	1.05E–02		2.12E–02	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)		1.93E–06		4.15E–06

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).
(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 sampling data sets for top 2 feet of soil.
(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for top 2 feet of soil.
(c) Dermal exposure dose was calculated assuming exposure to mean and maximum concentrations of chemicals in surface soil.
Exposure Assumptions: Incidental dermal exposure by Base personnel of 0.1 gms of soil for 1 day/week, 52 days/year, for 30 years of a 70–year lifetime. Surface area of arms and hands, and soil adherence factor were adopted from RAGS 1989. Availability of organic and metallic compounds were approximated at 25% and 1% of the organic and metal concentrations, respectively.
(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for dermal exposure to lead is based on an earlier EPA oral reference dose of 0.0014 mg/kg/day (SPHEM 1986).

contaminant chemicals detected at the site. Cancer and noncancer risk estimates for combined exposure to all of the chemicals for a single pathway in the soil (i.e., ingestion <u>or</u> dermal contact) and combined across pathways (i.e., for simultaneous ingestion <u>and</u> dermal exposure) are within the acceptable range.

Based on estimated HIs for combined exposure to all of the contaminants at the site, no adverse noncarcinogenic effects would be anticipated for exposure of onsite workers and personnel to chemicals in the top 0 to 2 feet of soil at Sites 1 and 3. Combined estimates of excess lifetime cancer risk for ingestion and dermal exposure are within the acceptable range of 10^{-6} to 10^{-5}. It is important to recognize the relative nature of risk estimate as a function of the assumptions adopted in the exposure assessment.

4.5.4 Risk Characterization for Future Land Use Scenarios

Public health risks based on future land-uses at this site consider (a) limited occupational exposures of construction workers (Section 4.5.4.1), and (b) future commercial exposures to the onsite soil (Section 4.5.4.2).

4.5.4.1 Risk Characterization for Construction Scenario

Tables 4-9 and 4-11 and Tables 4-10 and 4-12 summarize the potential risks to construction workers for ingestion exposure and dermal contact, respectively. Results of risk characterization presented in Tables 4-9 through 4-12 indicate that both noncancer and cancer risk estimates fall within EPA's acceptable range for waste site remediation. This is true for risk estimates derived for both weighted arithmetic mean and maximum concentrations of contaminant chemicals detected in the soil. Similarly, cancer and noncancer risks for combined exposure to all of the chemicals for a single pathway in the soil (i.e., ingestion <u>or</u> dermal contact) and combined across pathways (i.e., for simultaneous ingestion <u>and</u> dermal exposure) are within the acceptable range.

Based on estimated HIs for combined exposure to all of the contaminants at the site, it is anticipated that no adverse noncarcinogenic effects would result from limited exposure of construction workers to chemicals in the 0- to 10-foot soil column at Sites 1 and 3. Likewise,

Table 4-9. Risk Characterization for Site 1 – Former Fire Training Area
Ingestion Exposure of Onsite Construction Workers to Subsurface Soil Contaminants
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Antimony	2.31	5.20E-03		5.20	1.17E-02	
Arsenic	8.06	7.25E-03	1.97E-07	12.60	1.13E-02	3.09E-07
Beryllium	0.64	1.15E-04	3.85E-08	1.70	3.06E-04	1.02E-07
Cadmium	0.64	1.15E-03		1.20	2.16E-03	
Chromium	14.85	2.67E-03		20.30	3.65E-03	
Copper	22.27	5.42E-04		34.60	8.42E-04	
Lead	19.83	1.27E-02		34.10	2.19E-02	
Nickel	23.39	1.05E-03		36.50	1.64E-03	
Thallium	0.31	3.99E-05		0.55	7.07E-05	
Zinc	64.46	2.90E-04		116.00	5.22E-04	
VOLATILE ORGANICS						
Acetone	0.06	5.40E-07		0.19	1.71E-06	
Toluene	0.113	5.09E-07		0.27	1.22E-06	
SEMIVOLATILE ORGANICS						
Acenaphthene	0.308	4.62E-06		1.15	1.73E-05	
Anthracene	0.271	8.13E-07		1.15	3.45E-06	
Carbazole	0.281			1.15		
Chrysene	0.285	6.41E-05	2.02E-10	1.15	2.59E-04	8.15E-10
Benzo[a]anthracene	0.392	8.82E-05	9.16E-09	1.40	3.15E-04	3.27E-08
Benzo[a]pyrene	0.504	1.13E-04	8.11E-08	1.50	3.38E-04	2.42E-07
Benzo[b]fluoranthene	0.277	6.23E-05	6.24E-09	1.15	2.59E-04	2.59E-08
Dibenzofuran	0.521	4.69E-04		1.70	1.53E-03	
Fluoranthene	0.332	7.47E-06		1.15	2.59E-05	
Fluorene	0.331	7.45E-05		1.15	2.59E-04	
Pentachlorophenol	2.150	7.01E-05	3.61E-09	13.00	4.24E-04	2.18E-08
Phenanthrene	0.543	1.22E-04		1.30	2.93E-04	
Pyrene	0.362	8.15E-05	4.71E-09	1.15	2.59E-04	1.50E-08
Indeno[1,2,3-cd]pyrene	0.326	9.78E-06	1.19E-09	1.15	3.45E-05	4.19E-09

	Results based on mean values		Results based on maximum values	
Hazard Index (HI): (Combined Exposure) (d)	3.22E-02		5.82E-02	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)		1.06E-07		3.42E-07

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).
(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 subsurface soil sampling data sets for 0-10 feet soil bore samples.
(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for 0-10 feet soil bore samples.
(c) Average daily intake calculated assuming exposure to mean and maximum concentrations of chemicals in subsurface soil through ingestion.
Exposure Assumptions: Accidental ingestion by onsite workers of 0.1 gms of soil for 5 days/week, 250 days/year, for 1 year of a 70-year lifetime.
All ingested chemicals are assumed to be 100% bioavailable.
(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for lead is based on an earlier EPA reference dose of 0.0014 mg/kg/day (SPHEM 1986).

Table 4–10. Risk Characterization for Site 1 – Former Fire Training Area
Dermal Exposure of Onsite Construction Workers to Subsurface Soil Contaminants
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Subsurface Soil (0–10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (a) Concentrations in Subsurface Soil (0–10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Antimony	2.31	2.31E–03		5.2	5.20E–03	
Arsenic	8.06	3.22E–03	8.89E–08	12.6	5.04E–03	1.39E–07
Beryllium	0.64	5.12E–05	1.73E–08	1.7	1.36E–04	4.61E–08
Cadmium	0.64	5.12E–04		1.2	9.60E–04	
Chromium	14.85	1.19E–03		20.3	1.62E–03	
Copper	22.27	2.41E–04		34.6	3.74E–04	
Lead	19.83	5.67E–03		34.1	9.74E–03	
Nickel	23.39	4.68E–04		36.5	7.30E–04	
Thallium	0.31	1.77E–05		0.55	3.14E–05	
Zinc	64.46	1.29E–04		116	2.32E–04	
VOLATILE ORGANICS						
Acetone	0.06	6.60E–06		0.19	2.09E–05	
Toluene	0.113	6.22E–06		0.27	1.49E–05	
SEMIVOLATILE ORGANICS						
Acenaphthene	0.308	5.65E–05		1.15	2.11E–04	
Anthracene	0.271	9.94E–06		1.15	4.22E–05	
Carbazole	0.281			1.15		
Chrysene	0.285	7.84E–04	1.44E–09	1.15	3.16E–03	5.82E–09
Benzo[a]anthracene	0.392	1.08E–03	6.55E–08	1.40	3.85E–03	2.34E–07
Benzo[a]pyrene	0.504	1.39E–03	5.80E–07	1.50	4.13E–03	1.73E–06
Benzo[b]fluoranthene	0.277	7.62E–04	4.46E–08	1.15	3.16E–03	1.85E–07
Dibenzofuran	0.521	5.73E–03		1.70	.87E–02	
Fluoranthene	0.332	9.13E–05		1.15	3.16E–04	
Fluorene	0.331	9.10E–04		1.15	3.16E–03	
Pentachlorophenol	2.150	7.93E–04	4.08E–08	13.00	4.80E–03	2.47E–07
Phenanthrene	0.543	1.49E–03		1.30	3.58E–03	
Pyrene	0.362	9.96E–04	3.37E–08	1.15	3.16E–03	1.07E–07
Indeno[1,2,3–cd]pyrene	0.326	1.20E–04	8.48E–09	1.15	4.22E–04	2.99E–08

	Results based on mean values		Results based on maximum values	
Hazard Index (HI): (Combined Exposure) (d)	2.80E–02		7.28E–02	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)		7.74E–07		2.53E–06

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).
(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 subsurface soil sampling data sets for 0–10 feet soil bore samples.
(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for 0–10 feet soil bore samples.
(c) Dermal exposure dose was calculated assuming exposure to mean and maximum concentrations of chemicals in subsurface soil through ingestion. Exposure Assumptions: Incidental dermal exposure by onsite workers of 0.1 gms of soil for 5 days/week, 250 days/year, for 1 year of a 70–year lifetime. Surface area of arms and hands, and soil adherence factor were adopted from RAGS 1989. Availability of organic and metallic compounds were approximated at 25% and 1% of the organic and metal concentrations, respectively.
(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for dermal exposure to lead is based on an earlier EPA oral reference dose of 0.0014 mg/kg/day (SPHEM 1986).

Table 4-11. Risk Characterization for Site 3 – Hazardous Waste Collection Area Ingestion Exposure of Onsite Construction Workers to Subsurface Soil Contaminants 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Subsurface Soil (0–10 feet) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (b) Concentrations in Subsurface Soil (0–10 feet) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Arsenic	9.60	8.64E–03	2.35E–07	20.70	1.86E–02	5.07E–07
Beryllium	0.49	8.82E–05	2.95E–08	0.98	1.76E–04	5.90E–08
Cadmium	0.58	1.04E–03		1.80	3.24E–03	
Chromium	7.18	1.29E–03		11.70	2.11E–03	
Copper	24.16	5.88E–04		31.40	7.64E–04	
Lead	10.62	6.83E–03		16.30	1.05E–02	
Mercury	0.02	6.00E–05		0.03	9.00E–05	
Nickel	13.12	5.90E–04		24.10	1.08E–03	
Thallium	0.26	3.34E–03		0.58	7.46E–03	
Zinc	48.98	2.20E–04		75.70	3.41E–04	
VOLATILE ORGANICS						
Acetone	0.15	1.37E–06		0.82	7.38E–06	
Benzene	0.00		1.62E–12	0.01		3.65E–12
Ethylbenzene	0.01	6.30E–08		0.02		
2–Hexanone	0.19			1.10		
Methylene Chloride	0.02	3.60E–07	2.10E–12	0.08	1.51E–06	8.82E–12
4–Methyl–2–pentanone	0.01	2.52E–07		0.03		
Toluene	0.03	1.44E–07		0.09	4.10E–07	
Xylenes	0.06	2.57E–08		0.19	8.55E–08	
SEMIVOLATILE ORGANICS						
Bis(2–ethylhexyl)phthalate	0.56	2.50E–05	1.09E–10	2.40	1.08E–04	4.70E–10

	Results based on mean values		Results based on maximum values	
Hazard Index (HI): (Combined Exposure) (d)	2.27E–02		4.45E–02	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)		1.13E–10		4.83E–10

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).
(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 subsurface soil sampling data sets for 0–10 feet soil bore samples.
(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for 0–10 feet soil bore samples.
(c) Average daily intake calculated assuming exposure to mean and maximum concentrations of chemicals in subsurface soil through ingestion. Exposure Assumptions: Accidental ingestion by onsite workers of 0.1 gms of soil for 5 days/week, 250 days/year, for 1 year of a 70–year lifetime. All ingested chemicals are assumed to be 100% bioavailable.
(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for lead is based on an earlier EPA reference dose of 0.0014 mg/kg/day (SPHEM 1986).

Table 4-12. Risk Characterization for Site 3 – Hazardous Waste Collection Area Dermal Exposure of Onsite Construction Workers to Subsurface Soil Contaminants 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Subsurface Soil (0–10 feet) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (b) Concentrations in Subsurface Soil (0–10 feet) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Arsenic	9.60	3.84E–03	1.06E–07	20.70	8.28E–03	2.28E–07
Beryllium	0.49	3.92E–05	1.33E–08	0.98	7.84E–05	2.65E–08
Cadmium	0.58	4.64E–04		1.80	1.44E–03	
Chromium	7.18	5.74E–04		11.70	9.36E–04	
Copper	24.16	2.61E–04		31.40	3.39E–04	
Lead	10.62	3.03E–03		16.30	4.66E–03	
Mercury	0.02	2.67E–05		0.03	4.00E–05	
Nickel	13.12	2.62E–04		24.10	4.82E–04	
Thallium	0.26	1.49E–03		0.58	3.31E–03	
Zinc	48.98	9.80E–05		75.70	1.51E–04	
VOLATILE ORGANICS						
Acetone	0.15	1.67E–05		0.82	9.02E–05	
Benzene	0.00		1.16E–11	0.01		2.61E–11
Ethylbenzene	0.01	7.70E–07		0.02		
2–Hexanone	0.19			1.10		
Methylene Chloride	0.02	4.40E–06	1.50E–11	0.08	1.85E–05	6.30E–11
4–Methyl–2–pentanone	0.01	3.08E–06		0.03		
Toluene	0.03	1.76E–06		0.09	5.01E–06	
Xylenes	0.06	3.14E–07		0.19	1.05E–06	
SEMIVOLATILE ORGANICS						
Bis(2–ethylhexyl)phthalate	0.56	3.05E–04	7.77E–10	2.40	1.32E–03	3.36E–09

	Results based on mean values		Results based on maximum values	
Hazard Index (HI): (Combined Exposure) (d)	1.04E–02		2.12E–02	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)		8.0[illegible]E–10		3.45E–09

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).
(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 subsurface soil sampling data sets for 0–10 feet soil bore samples.
(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for 0–10 feet soil bore samples.
(c) Dermal exposure dose was calculated assuming exposure to mean and maximum concentrations of chemicals in subsurface soil through ingestion. Exposure Assumptions: Incidental dermal exposure by onsite workers of 0.1 gms of soil for 5 days/week, 250 days/year, for 1 year of a 70–year lifetime. Surface area of arms and hands, and soil adhearence factor were adopted from RAGS 1989. Availability of organic and metallic compounds were approximated at 25% and 1% of the organic and metal concentrations, respectively.
(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for dermal exposure to lead is based on an earlier EPA oral reference dose of 0.0014 mg/kg/day (SPHEM 1986).

combined estimates of excess lifetime cancer risk for ingestion and dermal exposure are within the acceptable range of 10^{-6} to 10^{-5}. Since there are no definitive future land-use plans at Sites 1 and 3, the estimated risks for the construction workers exposure scenario is only for illustrative purposes to assess potential future human health risks.

4.5.4.2 Risk Characterization for Commercial Exposures

Tables 4-13 and 4-14 and Tables 4-15 and 4-16 summarize the potential risks to commercial exposures for soil ingestion and dermal contact, respectively. Results of risk characterization presented in Tables 4-13 through 4-16 indicate that both noncancer and cancer risk estimates fall within EPA's acceptable range for waste site remediation. This is true for risk estimates derived for both weighted arithmetic mean and maximum concentrations of contaminant chemicals detected in the soil. Similarly, cancer and noncancer risks for combined exposure to all of the chemicals for a single pathway in the soil (i.e., ingestion or dermal contact) and combined across pathways (i.e., for simultaneous ingestion and dermal exposure) are within the acceptable range.

Based on estimated HIs for combined exposure to all of the contaminants at the site, it is anticipated that no adverse noncarcinogenic effects would result from limited exposure to chemicals in the 0- to 10-foot soil column at Sites 1 and 3. Likewise, combined estimates of excess lifetime cancer risk for ingestion and dermal exposure are within the acceptable range of 10^{-6} to 10^{-4}. Since there are no definitive future land-use plans at Sites 1 and 3, public health risk evaluation for commercial exposure scenarios are based solely on projected future land uses.

4.6 UNCERTAINTY EVALUATION

It is essential to recognize the uncertainties inherent in quantitative health risk evaluation. This section on uncertainty evaluation briefly describes the sources of uncertainty in the preliminary public health risk evaluation of the Indiana ANG waste sites, and the relative influence of these sources on the overall health risk evaluation.

The quantitative risk evaluation process introduces uncertainties in the selection or derivation of key input parameters in the hazard assessment, exposure evaluation, and toxicity

Table 4—13. Risk Characterization for Site 1 - Former Fire Training Area
Ingestion Exposure of Commercial Community to Subsurface Soil Contaminants
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Antimony	2.31	2.8E-03		5.20	6.37E-03	
Arsenic	8.06	3.9E-03	2.4E-06	12.60	6.17E-03	3.75E-06
Beryllium	0.64	6.3E-05	4.7E-07	1.70	1.67E-04	1.24E-06
Cadmium	0.64	6.3E-04		1.20	1.18E-03	
Chromium	14.85	1.5E-03		20.30	1.99E-03	
Copper	22.27	2.9E-04		34.60	4.58E-04	
Lead	19.83	6.9E-03		34.10	1.19E-02	
Nickel	23.39	5.7E-04		36.50	8.94E-04	
Thallium	0.31	2.2E-05		0.55	3.85E-05	
Zinc	64.46	1.6E-04		116.00	2.84E-04	
VOLATILE ORGANICS						
Acetone	0.06	2.9E-07		0.19	9.31E-07	
Toluene	0.113	2.8E-07		0.27	6.61E-07	
SEMIVOLATILE ORGANICS						
Acenaphthene	0.308	2.5E-06		1.15	9.39E-06	
Anthracene	0.271	4.4E-07		1.15	1.88E-06	
Carbazole	0.281	NA		1.15	NA	
Chrysene	0.285	3.5E-05	2.5E-09	1.15	1.41E-04	9.89E-09
Benzo[a]anthracene	0.392	4.8E-05	1.1E-07	1.40	1.71E-04	3.97E-07
Benzo[a]pyrene	0.504	6.2E-05	9.9E-07	1.50	1.84E-04	2.93E-06
Benzo[b]fluoranthene	0.277	3.4E-05	7.6E-08	1.15	1.41E-04	3.15E-07
Dibenzofuran	0.521	2.6E-04		1.70	8.33E-04	
Fluoranthene	0.332	4.1E-06		1.15	1.41E-05	
Fluorrene	0.331	4.1E-05		1.15	1.41E-04	
Pentachlorophenol	2.150	3.5E-05	4.4E-08	13.00	2.12E-04	2.65E-07
Phenanthrene	0.543	6.7E-05		1.30	1.59E-04	
Pyrene	0.362	4.4E-05	5.7E-08	1.15	1.41E-04	1.82E-07
Indeno[1,2,3-cd]pyrene	0.326	5.3E-06	1.4E-08	1.15	1.88E-05	5.08E-08
Hazard Index (HI): (Combined Exposure)(d)		1.75E-02			3.17E-02	
Excess Lifetime Cancer Risk: (Combined Exposure)(d)			4.16E-06			9.14E-06

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).
(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 subsurface soil sampling data sets for for 1 - 10 feet soil bore samples.
(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for 0-10 feet soil bore samples.
(c) Dermal exposure dose was calculated assuming exposure to mean and maximum concentrations of chemical in subsurface soil by ingestion. Exposure assumptions Exposure assumptions for commercial scenarios: Public and onsite workers exposures via incidental ingestion of 50 mg/day, for 250 days/year, for 25 years of a 70-year lifetime.
(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for dermal exposure to lead is based on an earlier EPA oral reference dose of 0.0014 mg/kg/day (SPHEM, 1986).

Table 4—14. Risk Characterization for Site 1 - Former Fire Training Area
Dermal Exposure of Commercial Community to Subsurface Soil Contaminants
122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Antimony	2.31	1.8E-03		5.20	4.0E-03	
Arsenic	8.06	2.5E-03	1.6E-06	12.60	3.9E-03	2.4E-06
Beryllium	0.64	4.0E-05	3.0E-07	1.70	1.1E-04	8.0E-07
Cadmium	0.64	4.0E-04		1.20	7.4E-04	
Chromium	14.85	9.2E-04		20.30	1.3E-03	
Copper	22.27	1.9E-04		34.60	2.9E-04	
Lead	19.83	4.4E-03		34.10	7.6E-03	
Nickel	23.39	3.6E-04		36.50	5.7E-04	
Thallium	0.31	1.4E-05		0.55	2.4E-05	
Zinc	64.46	1.0E-04		116.00	1.8E-04	
VOLATILE ORGANICS						
Acetone	0.06	4.6E-06		0.19	1.4E-05	
Toluene	0.113	4.3E-06		0.27	1.0E-05	
SEMIVOLATILE ORGANICS						
Acenaphthene	0.308	3.9E-05		1.15	1.5E-04	
Anthracene	0.271	6.9E-06		1.15	2.9E-05	
Carbazole	0.281	NA		1.15	NA	
Chrysene	0.285	5.4E-04	3.9E-08	1.15	2.2E-03	1.6E-07
Benzo[a]anthracene	0.392	7.4E-04	1.8E-06	1.40	2.7E-03	6.3E-06
Benzo[a]pyrene	0.504	9.6E-04	1.6E-05	1.50	2.9E-03	4.7E-05
Benzo[b]fluoranthene	0.277	5.3E-04	1.2E-06	1.15	2.2E-03	5.0E-06
Dibenzofuran	0.521	4.0E-03		1.70	1.3E-02	
Fluoranthene	0.332	6.3E-05		1.15	2.2E-04	
Fluorrene	0.331	6.3E-04		1.15	2.2E-03	
Pentachlorophenol	2.150	5.4E-04	7.0E-07	13.00	3.3E-03	4.2E-06
Phenanthrene	0.543	1.0E-03		1.30	2.5E-03	
Pyrene	0.362	6.9E-04	9.1E-07	1.15	2.2E-03	2.9E-06
Indeno[1,2,3-cd]pyrene	0.326	8.3E-05	2.3E-07	1.15	2.9E-04	8.1E-07
Hazard Index (HI): (Combined Exposure)(d)		2.05E-02			5.23E-02	
Excess Lifetime Cancer Risk: (Combined Exposure)(d)			2.23E-05			6.92E-05

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*). Since reference doses and cancer slope factors for dermal exposure are not available, oral reference dose and cancer potency factors were used in risk calculations.

(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 subsurface soil sampling data sets for 1-10 feet soil bore samples. bore samples.

(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling dat ets for 0-10 feet soil bore samples.

(c) Dermal exposure dose was calculated assuming exposure to mean and maximum ncentrations of chemical in subsurface soil. Exposure assumptions for commercial scenarios: Public and onsite workers exposures via incidental dermal contact to 1 mg/cm2 of soil for 250 days/yr, for 25 yrs of a 70-yr lifetime. Surface area of arms and hands, and soil adherence factors were obtained from RAGS 1989. Availability of organic and d metallic compounds were approximated at 25% and 1% of the concentrations for the organic and metallic coumpounds, respectively.

(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for dermal exposure to lead is based on an earlier EPA oral reference dose of 0.0014 mg/kg/day (SPHEM, 1986).

Table 4—15. Risk Characterization for Site 3 - Hazardous Waste Collection Area Ingestion Exposure of Onsite Construction Workers to Subsurface Soil Contaminants 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Arsenic	9.60	4.7E-03	2.9E-06	20.70	1.0E-02	6.2E-06
Beryllium	0.49	4.8E-05	3.6E-07	0.98	9.6E-05	7.2E-07
Cadmium	0.58	5.7E-04		1.80	1.8E-03	
Chromium	7.18	7.0E-04		11.70	1.1E-03	
Copper	24.16	3.2E-04		31.40	4.2E-04	
Lead	10.62	3.7E-03		16.30	5.7E-03	
Mercury	0.02	3.3E-05		0.03	4.9E-05	
Nickel	13.12	3.2E-04		24.10	5.9E-04	
Thallium	0.26	1.8E-03		0.58	4.1E-03	
Zinc	48.98	1.2E-04		75.70	1.9E-04	
VOLATILE ORGANICS						
Acetone	0.15	7.3E-07		0.82	4.0E-06	
Benzene	0.00			0.01		4.9E-11
Ethylbenzene	0.01	4.9E-08		0.02	9.8E-08	
2-Hexanone	0.19			1.10		
Methylene Chloride	0.02	1.6E-07	2.5E-11	0.08	6.9E-07	1.1E-10
4-Methyl-2-pentanone	0.01	9.8E-08		0.03	2.9E-07	
Toluene	0.03	7.3E-08		0.09	2.2E-07	
Xylenes	0.06	1.5E-08		0.19	4.7E-08	
SEMIVOLATILE ORGANICS						
Bis(2-ethylhexyl)phthalate	0.56	1.4E-05	1.3E-09	2.40	5.9E-05	5.7E-09
	Results based on mean values			Results based on maximum values		
Hazard Index (HI): (Combined Exposure) (d)		1.24E-02			2.42E-02	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)			1.36E-09			5.87E-09

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*).

(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 subsurface soil sampling data sets for 1-10 feet soil bore samples.

(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for 0-10 feet soil bore samples.

(c) Dermal exposure dose was calculated assuming exposure to mean and maximum concentrations of chemical in subsurface soil by ingestion. Exposure assumptions for commercial scenarios: Public and onsite workers exposures via incidental ingestion of 50 mg/day, for for 250 days/year, for 25 years of a 70-year lifetime.

(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for dermal exposure to lead is based on an earlier EPA oral reference dose of 0.0014 mg/kg/day (SPHEM, 1986).

Table 4--16. Risk Characterization for Site 3 - Hazardous Waste Collection Area Dermal Exposure of Onsite Construction Workers to Subsurface Soil Contaminants 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Chemical	Mean (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)	Maximum (a) Concentrations in Subsurface Soil (0-10 ft) (mg/kg)	Hazard Quotient Noncarcinogenic Effects (c) (Intake/RfD)	Excess Lifetime Carcinogenic Risks (c) (Intake x q1*)
INORGANICS						
Arsenic	9.60	3.0E-03	1.8E-06	20.70	6.4E-03	4.0E-06
Beryllium	0.49	3.0E-05	2.3E-07	0.98	6.1E-05	4.6E-07
Cadmium	0.58	3.6E-04		1.80	1.1E-03	
Chromium	7.18	4.5E-04		11.70	7.3E-04	
Copper	24.16	2.0E-04		31.40	2.6E-04	
Lead	10.62	2.4E-03		16.30	3.6E-03	
Mercury	0.02	2.1E-05		0.03	3.1E-05	
Nickel	13.12	2.0E-04		24.10	3.7E-04	
Thallium	0.26	1.2E-03		0.58	2.6E-03	
Zinc	48.98	7.6E-05		75.70	1.2E-04	
VOLATILE ORGANICS						
Acetone	0.15	1.1E-05		0.82	6.2E-05	
Benzene	0.00			0.01		7.8E-10
Ethylbenzene	0.01	7.6E-07		0.02	1.5E-06	
2-Hexanone	0.19			1.10		
Methylene Chloride	0.02	2.5E-06	4.0E-10	0.08	1.1E-05	1.7E-09
4-Methyl-2-pentanone	0.01	1.5E-06		0.03	4.6E-06	
Toluene	0.03	1.1E-06		0.09	3.5E-06	
Xylenes	0.06	2.3E-07		0.19	7.2E-07	
SEMIVOLATILE ORGANICS						
Bis(2-ethylhexyl)phthalate	0.56	2.1E-04	2.1E-08	2.40	9.1E-04	9.1E-08

	Results based on mean values		Results based on maximum values	
Hazard Index (HI): (Combined Exposure) (d)	8.05E-03		1.63E-02	
Excess Lifetime Cancer Risk: (Combined Exposure) (d)		2.10E-06		4.54E-06

RfD = Reference Dose; Cancer Slope Factor = Cancer Potency Factor (q1*). Since reference doses and cancer slope factors for dermal exposure are not available, oral reference dose and cancer potency factors were used in risk calculations.

(a) Arithmetic mean of the surface soil concentrations obtained from 1990 and 1991 subsurface soil sampling data sets for 1-10 feet soil bore samples.

(b) Maximum surface soil concentrations obtained from 1990 and 1991 sampling data sets for 0-10 feet soil bore samples.

(c) Dermal exposure dose was calculated assuming exposure to mean and maximum concentrations of chemical in subsurface soil. Exposure assumptions for commercial scenarios: Public and onsite workers exposures via incidental dermal contact to 1 mg/cm2 of soil for 250 days/yr, for 25 yrs of a 70-yr lifetime. Surface area of arms and hands, and soil adherence factors were obtained from RAGS 1989. Availability of organic and d metallic compounds were approximated at 25% and 1% of the concentrations for the organic and metallic compounds, respectively.

(d) Risk estimates for combined exposure to maximum concentrations are for illustrative purposes only. Risk characterization for dermal exposure to lead is based on an earlier EPA oral reference dose of 0.0014 mg/kg/day (SPHEM, 1986).

characterization steps. Propagation of uncertainties at various steps may introduce considerable uncertainty in the final risk estimates. Therefore, the point estimates of risk obtained in preliminary evaluation of waste sites must be viewed with caution. A more realistic estimate of risk would be derived using a range of values for each input parameter corresponding to the range of projected uncertainty.

Given that the verified toxicity measures (i.e., RfDs and cancer slope factors) used in risk assessment are established by EPA, the greatest sources of uncertainty are the determination of exposure point concentrations, the development of exposure scenarios, and the derivation of long-term intake or dose estimates for the human receptors that are at greatest risk.

Input parameters used in the derivation of intake and dose estimates may introduce considerable uncertainty in the risk evaluation process. Variations in human activity patterns, physico-chemical considerations in the estimation of exposed dose, and bioavailability assumptions are critical in exposure assessment. It is here that the professional judgment of the risk assessor becomes particularly important. The risk assessor must examine and interpret a diversity of information, including:

- The nature, extent, and magnitude of contamination
- Transport of chemicals in the environment
- Identification of exposure routes
- Identification of receptor groups currently at risk, and potentially at risk in the future
- Activity patterns of receptors and receptor groups.

Based on this information, the risk assessor must develop exposure scenarios and quantify all parameters needed in the equations to estimate intake or dose (EPA 1989a).

The general form of the intake or dose equation used in risk evaluation is presented and discussed in Appendix G. The equation used will vary depending upon the exposure route under consideration (e.g., ingestion exposure, dermal exposure). Although inaccurate, for the purposes of quantifying intake or dose, exposure variables, including chemical concentration, are commonly taken as point estimates. In actuality, each of these variables is characterized by a distribution of possible values; a probability distribution, or more accurately, a probability density function (PDF).

Depending upon the characteristics of the data set, the PDF may be represented by a variety of distributions: uniform, normal, lognormal, exponential, and beta. As a continuous function of distribution, height of the curve at any given point in PDF is proportional to the relative likelihood of the uncertainty in quantity having that value. Ideally, dose estimates for risk assessment should be developed by combining PDFs for all input variables. The resultant PDF for dose would then be used in the risk characterization step to generate a probability distribution of potential risk estimates.

A quantitative uncertainty analysis of this type is beyond the scope of the present evaluation. The existing EPA guidance does not yet recommend the use of these methods given the lack of information on the shape of these probability distributions, and the need to consider correlation between input variables. However, it is important to understand this approach, and the limitations of risk evaluation that do not use these methods.

Table 4-17 summarizes the principal sources of uncertainty in the preliminary human health risk evaluation of chemicals present at, or released from, the Indiana ANGB sites. In keeping with EPA guidance (EPA 1989a), a qualitative (order of magnitude) evaluation is made of the relative influence of each principal source of uncertainty on the overall results of risk evaluation.

4.7 ECOLOGICAL EVALUATION

This section presents an evaluation of the potential for ecologically significant effects associated with the presence of contaminants at the three sites at the Base.

4.7.1 Overview

Ecological (or environmental) assessment is conducted as a parallel process to the human health risk evaluation. The principal purpose of ecological assessment within the context of the

Table 4-17. Summary of Uncertainty in Health Risk Assessment 122 Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Assumptions in Risk Assessment	Overall Effect on Risk Estimates*		
	Potential for Overestimation	Potential for Underestimation	Potential for Over or Underestimation
Data Collection and Evaluation			
Number of samples			L to M
Precision and accuracy of chemical analysis			L to M
Exposure Assessment			
Use of maximum parameter concentrations	M		
Conservative uptake and bioavailability information	M to H		
Assumptions that chemicals persist for extended periods	L to M		
Exclusion of exposure pathways		L	
Contaminant detected is ubiquitous		L to M	
Use of limited information on contaminant levels for chronic effects assessment			L to M
Future exposure to groundwater	M		
Toxicity Assessment			
Use of EPA-derived RfDs and SFs		L to M	
Use of oral RfD for dermal risk estimation	M		
Dose estimates based on administered versus absorbed dose	M		
Assumption of additivity of toxic effects		M	
Risk Characterization			
Likelihood that receptors under evaluation are actually at risk	M		
Uniform distribution of risks for age and sex categories		L to M	

* L = Low (effects on risk estimate < one order of magnitude)
M = Moderate (effect on estimate by one or two orders of magnitude)
H = High (effects on risk estimate > two orders of magnitude)

Installation Restoration Program (IRP) waste site evaluation program is to provide information on threats to the natural environment associated with contaminants present at, or released from, a waste site. This information is used in determining the need for further site assessment and results in one of the following:

- A recommendation of no further action
- The need for immediate response (imminent threat)
- A recommendation for a Focused Feasibility Study/Remedial Measures (FFS/RM)
- A recommendation for a Remedial Investigation/Feasibility Study (RI/FS).

The preliminary ecological evaluation presented in this report is a supplement to the SI and preliminary human health risk evaluation conducted by SAIC. The ecological evaluation should be viewed as a screening-level assessment and decisionmaking tool. This evaluation is not designed to be as comprehensive as that prepared for an RI (i.e., baseline ecological risk assessment).

The ecological evaluation for the three sites at the Indiana ANGB has been conducted to provide preliminary information on potential impacts to plant and animal species. This qualitative evaluation focuses principally on three component analyses:

- Determine the presence of threatened or endangered species
- Determine the presence of critical habitats
- Examine the potential for disruption of critical habitats (if present) and impacts to threatened or endangered species.

A qualitative assessment also was made of potential impacts to wetlands and wilderness areas, and natural, historic, and archaeological preservation areas.

This evaluation is based on information obtained on the ecological conditions in the vicinity of Indiana ANGB and should not be considered a risk assessment. This evaluation is qualitative in nature and does not quantify potential adverse effects in plant or animal species, in populations, or in the ecosystem as a whole. However, given the minimal levels of contamination observed at the sites at the Base, and the absence of any unique habitats, the qualitative assessment provided herein is considered to be adequate for the purposes of an SI.

4.7.2 Current Ecological Setting

The current ecological setting in the vicinity of the Base is briefly summarized below. Much of this information has been extracted from the Environmental Impact Statement (EIS) prepared for the proposed construction of a major highway in the vicinity of the Base.

Wetlands -- Robinson Creek, located more than 1 mile to the north/northeast of the Base, is a riverine, lower perennial, unconsolidated bottom wetland. Harber Ditch is a drainage way located in the vicinity of the Base, and is a riverine, intermittent, streambed wetland. The Fogwell Natural Forest Preserve, located more than 3 miles from the Base, is a 28-acre palustrine, forested, broad-leaved, deciduous wetland, privately owned by Acres, Inc.

Terrestrial and Aquatic Ecology -- In the vicinity of the Base, the land is used mostly for agriculture. A small percentage of the area that is wooded is characterized by small tracts of generally 10 to 20 acres. Most farm woodlots are characterized by upland hardwoods. Vegetation within the area near the Base varies from roadside grasses and grassy lawns to a variety of tree species, including sugar maple, beech, oak, ash, hickory, dogwood, and viburnums.

To the northeast and southeast of the Base are the St. Marys and St. Joseph Rivers, which converge to form the Maumee River further east of the Base (Figure 1-1). The woody cover along the river banks and adjacent woodlands provides good wildlife habitat. Within the Maumee River basin, the St. Joseph watershed is characterized by the best terrestrial and aquatic habitat because of less intensive farming, abandoned fields, large bottomland woods, and better water quality. The St. Marys watershed is intensively farmed, with a narrow band of trees and scattered woods along the river. Better habitat is found along the river downstream from Decatur, Indiana. Forty-four species of mammals are found in the Maumee River basin, including deer, squirrel, raccoon, opossum, skunk, fox, coyote, rabbit, other small mammals, reptiles, and amphibians. A variety of songbirds, scavenger birds, and predatory birds also may be present.

The poor water quality of the St. Marys River is responsible for the presence and dominance of such undesirable aquatic species as gizzard shad, quillback carpsucker, green sunfish, and carp. No rare or endangered aquatic species are known or anticipated to exist in other surface waterways.

Rare and Endangered Species -- The only species of rare or endangered wildlife thought to exist in the area surrounding the Base is the Indiana bat (Myotis Sodalis). This mammal makes its primary summer habitat under the loose bark of medium to large trees.

4.7.3 Evaluation

The focus of the preliminary ecological evaluation of the three sites on Base is a limited examination of endangerment to threatened and endangered species, and the potential for disruption of critical habitats. Because no ecological survey has been conducted for the Indiana ANGB, the assessment if based largely on data from the surrounding area. As mentioned earlier, much of this information has been extracted from the EIS prepared for the proposed construction of a major highway traversing approximately 2 to 3 miles from the Base.

Based on available information and discussions with personnel from the Indiana Department of Natural Resources (IDNR), no threatened or endangered species of flora or fauna are located within a 1-mile radius of the Base. In the vicinity of the Base, the area is within the range of the Federal endangered Indiana bat (Myotis Sodalis). The EIS prepared for construction of the major highway noted that, although the project was located within the range of the Indiana bat, the U.S. Fish and Wildlife Services had determined that the project would not affect this species. No known or endangered aquatic species are known to exist in the vicinity of the Base. Since there are no major surface water resources on Base, no endangered aquatic species are anticipated to exist on Base.

Based on available information and discussions with IDNR personnel, there are no critical habitats at, or in the vicinity of, the Base. A habitat may be defined as the place where an organism lives in the natural setting or the place where one would expect to find the organism. Habitat also may describe the place occupied by an entire community of organisms, including the abiotic environment (e.g., physical, chemical, or morphological structure of a lake or river system). Critical habitats are unique or unusual natural settings that are necessary for the continued propagation of key species in the ecosystem (i.e., characterized by essential food sources or nesting sites for other species, spawning, and rearing areas). Key species would include organisms essential to the structure and function of the food web, and rare, threatened, or endangered species. Given that a large percentage of the ANGB land area has been paved over or is in an open field, no critical habitats are anticipated to be present on Base property. In particular, the Indiana bat makes its primary summer habitat under the loose bark of medium to large trees. Because of the topography and land use on Base, there would be minimal to no impacts on the Indiana bat even if it were present on Base.

Based on available information, there are no wetlands or wilderness areas on Base or in the immediate vicinity of the Base that could be impacted by the contaminants present at or released from the site. Robinson Creek and the Fogwell Forest Natural Preserve are located more than 1 and 1/2 miles from the Base and are not anticipated to be impacted by contaminants at the Base. From available information, there are no natural, historic, or archaeological preservation sites on Base. There are some prehistoric sites in the vicinity of the Base, but none of these sites appears to be eligible for nomination to the State or National Historic Registers. The Fogwell Forest Natural Preserve and the Fogwell Cemetery are located off Base, but are not expected to be impacted by the contaminants onsite at the Base.

The following additional points should be kept in perspective during the ecological evaluation:

- Principal risks to ecological receptors on Base would be associated with direct contact with contaminated soils.
- Terrestrial species and birds would be the organisms primarily at risk of exposure.
- Most of Indiana ANGB is paved over or characterized by open field. Only the wooded and marshy areas on the southern end of the Base would provide much in the way of habitat.
- Based upon information from IDNR, no critical habitats are anticipated to be present on Base.

- It is likely that terrestrial species would avoid paved and open areas used predominantly by Base personnel, or characterized by soils or vegetation of unpleasant taste or odor.
- No 'keystone species' are present on the Indiana ANGB. Therefore, no irreversible population or ecosystem effects are projected to occur. The scope of the ecological risk assessment for the SI is not sufficiently comprehensive to accurately determine impacts on individual organisms.
- Based on surveys of the area in the vicinity of the Base, the only threatened or endangered species expected to be present is the Indiana bat; however, this species is not expected to be found at the Base. No state-listed threatened or endangered species unique to the area are projected to be found on Base.

Therefore, based on the above points and available information on the ecological setting at the Base, it is concluded that the ANGB sites under investigation do not present an unacceptable risk to the environment. There is no critical habitat, or threatened or endangered species, likely to be present at the ANGB sites under investigation. Chemicals present at the waste sites do not pose an irreversible risk to key species, populations, or ecosystem structure and function.

4.8 SUMMARY AND CONCLUSIONS OF THE PRELIMINARY RISK EVALUATION

A preliminary risk evaluation of Indiana ANGB Sites 1 and 3 was conducted to evaluate risks to human health and to support the determination of the need for site remediation. The risk evaluation performs a comparison of environmental quality data for site-specific chemicals with ARARs. In addition, quantitative risk evaluation was performed to evaluate current and future potential for adverse noncarcinogenic and carcinogenic effects following long-term exposure of Base personnel to site-related contaminants. Based on the preliminary risk characterization, the risks of exposure of Base personnel to the site-related chemicals at Sites 1 and 3 fall within the acceptable range established by EPA. Similarly, the potential future risks for onsite construction workers to site-related chemicals at Sites 1 and 3 are considered acceptable.

The risk estimates were primarily attributable to two chemicals, arsenic and benzo(a)pyrene. An analysis of background concentrations for these two chemicals was performed, whereby background levels were compared to the chemical concentrations detected at the sties. This comparison indicated that the site samples were consistent with background levels for the same substances. This indicates that there is no statistical evidence of site-related contamination, and that the acceptable risk estimates are indistinguishable from those attributable to background.

It is important to re-emphasize that this evaluation was conducted as part of the SI at Indiana ANGB and was not designed to be as comprehensive as that prepared for an RI (i.e., baseline risk assessment). Ecological risk assessment is only preliminary; the actual risks to nonhuman receptors are not quantified.

The following summarizes the preliminary risk evaluation for Indiana ANGB Sites 1 and 3:

- There is no immediate endangerment to human health due to the presence of chemicals in the surficial soils, or subsurface (0 to 10 feet) soil at Indiana ANGB Sites 1 and 3.
- The potential risks (i.e., noncarcinogenic and carcinogenic) to onsite workers of chronic (long-term) ingestion and dermal exposure to chemicals in surficial soils are within the acceptable range established by EPA for waste site remediation. The HQs and HIs are orders of magnitude below the acceptable level of 1. The estimated excess lifetime risk of cancer is within the range of 10^{-6} to 10^{-4}. Risks are within the acceptable range for exposure to both average and maximum concentrations of contaminants in the soil samples.
- Groundwater beneath the waste sites is not used currently or projected to be used in the future as a source of drinking water for Base personnel and the general public. The groundwater quality was determined to be unsuitable as a potable water supply. Therefore, exposure to groundwater is not an exposure pathway of concern.
- For the purposes of the present study, groundwater quality was evaluated by comparison with ARARs. Except for beryllium, the mean concentrations of all metals were below the relevant ARARs. The maximum concentration of certain chemicals exceeded the PMCLs. All metals in groundwater are not considered to be entirely site related.

Considering that the risk estimates are point estimates, it is important to recognize the inherent uncertainties in the calculated risks for the sites under evaluation. Ideally, all risk estimates should encompass the range of possible values for all of the exposure and toxicity components used in the derivation of risks. In the absence of detailed site-specific information, the preliminary risk evaluation of Indiana ANGB sites yield upper-bound estimates of the potential for adverse health effects. Given the conservative nature of the adopted method for the risk evaluation, it is very unlikely that the potential risks to human health have been underestimated.

5. CONCLUSIONS AND RECOMMENDATIONS

A Site Inspection (SI) has been conducted under the U.S. Department of Defense (DOD) Installation Restoration Program (IRP) at three sites at the 122nd Tactical Fighter Wing, Indiana Air National Guard Base (ANGB), Fort Wayne, Indiana. The SI was conducted in two phases; the first phase of the SI was planned and conducted to obtain data to confirm the presence or absence of suspected environmental contamination at the three sites. The Phase I activities were conducted during August and September 1990. During Phase I activities, contamination in site soils was observed. It also was determined that additional data were needed to fill in data gaps that were identified during the evaluation of field and laboratory data. Accordingly, Phase II activities were planned to obtain data to:

- Confirm the presence of contaminants detected during Phase I
- Delineate the extent of contamination found
- Evaluate the risk posed by any verified contamination to human health and the environment.

Phase II activities were conducted during October and November 1991. Conclusions and recommendations from the overall SI activities are presented in this section and discussed separately for each site.

5.1 SITE 1 - FORMER FIRE TRAINING AREA

In evaluating the significance of contamination detected at Site 1 - Former Fire Training Area (FTA), it should be noted that the former FTA surface where the actual burning occurred is located approximately 10 to 12 feet below current ground surface. Therefore, any contamination related to fire training activities conducted at this site would most likely be found at the former surface or below the former surface. The former FTA surface is covered with 5 to 12 feet of fill material, which consists of a large fraction of dense clay. Analytical data were divided into two groups to evaluate effectively the significance of contamination at the site: 1) the fill layer above the former FTA surface (upper 5 to 12 feet), and 2) the former FTA surface and below (from 5 feet below the current ground surface to the water table).

Contaminants were detected in the fill layer, but are not considered to be related to fire training activities that occurred at the site. Except for arsenic, all other metals were detected at concentrations below background levels. Some volatile organic compounds (VOCs), principally toluene, and several polynuclear aromatic hydrocarbons (PAHs) were detected in soil samples collected within the fill layer. The significance of these contaminants was evaluated through a preliminary risk evaluation. The results of the risk evaluation are discussed later in this section.

Contamination at Site 1 resulting from fire training activities appears to be present in an area immediately downslope from the former FTA extending 60 to 80 feet west of the burn area. The western extent of contamination is estimated to be less than 85 feet from the burn area. The contamination consists of benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds that are major components of aviation fuel, and semivolatile organic compounds (SVOCs) that include a list of several PAHs. PAHs are products of combustion and typically are found in burn areas. Contaminants were not detected in subsurface soils at depths greater than 5 feet below the former FTA surface (15 to 16.5 feet below current ground surface).

No contaminants were detected in the groundwater. This is consistent with the soil sampling results, which indicate that contaminants have not migrated beyond 5 feet below the former FTA surface. The thick clay layer that exists throughout the subsurface at the site appears to have contained the vertical migration of any contamination well in the vicinity of the former FTA surface, and will continue to do so in the future.

Based on the evaluation of analytical results and a review of the site geology, the overall significance of the observed nature and extent of contamination appears to be minimal. The risk evaluation conducted for exposure to contaminants at the site showed that carcinogenic and noncarcinogenic risks to public health are within the acceptable range. Current risks to Base personnel were estimated based on ingestion and dermal contact with the soils. Future risks assumed construction at the site, and consequent exposure to onsite workers.

Based on the conclusions presented above, no further actions are required at Site 1. Twenty years have elapsed since fire training activities were terminated at the FTA, and in that time, site-related contaminants have migrated only 5 feet below the former FTA surface. This is evidenced by the fact that groundwater has not been impacted. Therefore, no remedial actions are required at this site.

5.2 SITE 3 - HAZARDOUS WASTE COLLECTION AREA

The contamination in soils at Site 3 - Hazardous Waste Collection Area (HWCA) consists primarily of oils and grease. No organic contaminants were detected in soil samples collected from the sand and gravel layer, and except for arsenic, all other metals detected are considered within background concentrations. Some VOCs, namely halogenated organic compounds, were detected in some soils from the sand and gravel layer during the Phase I sampling event. The same VOCs were not detected in samples collected during Phase II activities. It appears likely that the concentration of VOCs may have been significantly reduced through natural attenuation processes. In particular, volatilization of VOCs would occur easily through the loose sand and gravel layer.

Contamination at this site is confined to the fenced area that surrounds the drum storage area. The contamination is predominantly in the top 4 feet of soils, which also coincides with the thickness of the sand and gravel layer. The results of the groundwater analyses show that the underlying aquifer has not been impacted. This is consistent with the conclusion that contamination (consisting of mostly oils and grease) is predominantly in the top 4 feet of soils and has not migrated toward the groundwater table. Oils and grease are insoluble in water, and are easily adsorbed to the soils; therefore, the potential for oils and grease to migrate vertically is minimal. Oils and grease also are easily biodegradable, and natural attenuation processes will reduce the concentration of these compounds over time.

The results of the preliminary risk evaluation show that current carcinogenic and noncarcinogenic risks to Base personnel from ingestion and dermal contact with the surficial soils are within the acceptable range. For a future exposure scenario assuming construction at the site, risks to onsite workers also was found to be within the acceptable range.

No remedial actions are required at Site 3; however, it is recommended that appropriate operating procedures be employed during storage to ensure that any spills that might occur be effectively captured. A concrete pad with a surrounding berm or other containment procedure is an option that should be considered for this site.

5.3 SITE 4 - POL SPILL SITE

The analytical results of soil, groundwater, and sediment samples collected at Site 4 - POL Spill Site show that there is minimal residual contamination at the site resulting from the spill that occurred in 1968. Spots of contamination are present in soils at the site that are most likely from other sources and not from the spill itself. In sediment samples collected from the drainage ditch in the immediate vicinity of the site, low concentrations of total petroleum hydrocarbons (TPH) (17 mg/Kg) were detected; however, no organics of concern were detected. Groundwater at the site has not been impacted; in addition, potential for contaminants to migrate to groundwater is minimal because of the dense clay layer that comprises the subsurface geology. Lead was detected in one monitoring well sample at a concentration above the maximum contaminant level (MCL) for lead. Although this monitoring well is not located directly upgradient from the site, it is in a lateral direction to groundwater flow. Therefore, concentration of lead in this well may be from some other source at the Base. The average concentration of lead in all groundwater samples is below the MCL.

The overall significance of the detected contamination at this site can be considered minimal for the following reasons:

- The aquifer at this site, as at other sites, is overlain by 30 to 35 feet of dense clays, which minimizes the potential for vertical migration of contaminants.
- Access to the site is limited; therefore, exposure for the general public to any surficial contaminants would be minimal. Base personnel working in the area follow appropriate procedures required for conducting operations at a fuel storage site. These procedures would prevent exposure to site surface soils.
- Based on available information, the contamination at this site is the result of a spill that occurred in 1968. Remedial actions that were implemented at that time consisted of flushing the spill with 200,000 gallons of water. Since that spill, the old underground storage tank (UST) system has been replaced by an aboveground system designed in accordance with regulatory requirements.

No permanent residences are within 1,400 feet of the Base. The land use in the vicinity of the Base is mostly agricultural. The Base itself is securely guarded so that access to the general public is minimal. No groundwater wells or surface water resources are located within 1/4 mile of the site. A storm drain is located approximately 200 feet from the site.

A preliminary qualitative assessment of impacts to the ecology shows that no threatened or endangered species are on Base, and no critical habitats that could be impacted by the contaminants observed onsite. Therefore, given the minimal extent of residual contamination at the site, and the low potential for Base personnel and the general public to be impacted, no further remedial actions are required at Site 4.

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APPENDIX A
SOIL GAS SURVEY

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SHALLOW SOIL GAS AND GROUNDWATER INVESTIGATION INDIANA AIR NATIONAL GUARD FORT WAYNE, INDIANA

AUGUST 1990

SUBMITTED BY:

Tracer Research Corporation

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TABLE OF CONTENTS

INTRODUCTION

A shallow soil gas and groundwater investigation was performed by Tracer Research Corporation (TRC) at the Indiana Air National Guard site located in Fort Wayne, Indiana. The investigation was conducted August 15-16, 1990 under contract to Science Applications International Corporation (SAIC). The purpose of the investigation was to delineate the extent of possible contamination in the subsurface.

During this survey, a total of ~~twenty four~~ twenty five soil gas samples and ~~three~~ five groundwater samples were collected and analyzed. Samples were analyzed for volatile organic compounds from the following suite:

benzene
toluene
ethylbenzene
xylenes
total petroleum hydrocarbons ~~(THC)~~ (TPH)

Xylenes are reported as the total of the three xylene isomers and total hydrocarbons are reported as gasoline range compounds consisting of approximately C_4-C_9 aliphatic, alicyclic, and aromatic compounds.

These compounds were chosen as target compounds because of their suspected presence in the subsurface and amenability to soil gas technology. Soil gas and groundwater samples were screened on a gas chromatograph equipped with a flame ionization detector (FID).

SHALLOW SOIL GAS INVESTIGATION - METHODOLOGY

Shallow soil gas investigation refers to a method developed by TRC for investigating underground contamination from volatile organic chemicals (VOCs) such as industrial solvents, cleaning fluids and petroleum products by looking for their vapors in the shallow soil gas. The method involves pumping a small amount of soil gas out of the ground through a hollow probe driven into the ground and analyzing the gas for the presence of volatile contaminants. The presence of VOCs in shallow soil gas indicates the observed compounds may either be in the vadose zone near the probe or in groundwater below the probe. The soil gas technology is most effective in mapping low molecular weight halogenated solvent chemicals and petroleum hydrocarbons possessing high vapor pressures and low aqueous solubilities. These compounds readily partition out of the groundwater and into the soil gas as a result of their high gas/liquid partitioning coefficients. Once in the soil gas, VOCs diffuse vertically and horizontally through the soil to the ground surface where they dissipate into the atmosphere. The contamination acts as a source and the above ground atmosphere acts as a sink, and typically a concentration gradient develops between the two. The concentration gradient in soil gas between the source and ground surface may be locally distorted by hydrologic and geologic anomalies (e.g. clays, perched water); however, soil gas mapping generally remains effective because distribution of the contamination is usually broader in areal extent than the local geologic barriers and is defined using a large data base. The presence of geologic obstructions on a small scale tends to create anomalies in the soil gas-groundwater correlation, but generally does not obscure the broader areal picture of the contaminant distribution.

Soil gas contaminant mapping helps to reduce the time and cost required to delineate underground contamination by volatile contaminants. The soil gas investigation does this by outlining the general areal extent of contamination. Conventional bore holes or observation wells are used to verify both the presence and extent of the subsurface contamination as indicated in the soil gas survey. In this manner, soil gas contaminant mapping can assist in determining the placement of monitoring wells. Thus, the likelihood of drilling unnecessary monitoring wells is reduced. The soil gas survey is not intended to be a substitute for conventional methodology, but rather to enable conventional methods to be used efficiently.

EQUIPMENT

Tracer Research Corporation utilized a one ton Ford analytical field van that was equipped with one gas chromatograph and two Spectra Physics computing integrators. In addition, the van has two built-in gasoline powered generators that provide the electrical power (110 volts AC) to operate all of the gas chromatographic instruments and field equipment. A specialized hydraulic mechanism consisting of two cylinders and a set of jaws was used to drive and withdraw the sampling probes. A hydraulic hammer was used to assist in driving probes past cobbles and through unusually hard soil.

SOIL GAS SAMPLING PROCEDURES

Sampling probes consist of 7 foot lengths of 3/4 inch diameter hollow steel pipe that are fitted with detachable drive tips. Soil gas probes were advanced to 2-5 feet below grade. Once inserted into the ground, the above-ground end of the sampling probes were fitted with a steel reducer and a length of polyethylene tubing leading to a vacuum pump. Gas flow is monitored by a vacuum gauge to insure that an adequate flow is obtained.

To adequately purge the volume of air within the probe, 2 to 5 liters of gas is evacuated with a vacuum pump. During the soil gas evacuation, samples are collected in a glass syringe by inserting a syringe needle through a silicone rubber segment in the evacuation line and down into the steel probe. Ten milliliters of gas are collected for immediate analysis in the TRC analytical field van. Soil gas is subsampled (duplicate injections) in volumes ranging from 1 uL to 2 mL, depending on the VOC concentration at any particular location.

Sample probe vacuums ranged from three to twelve inches Hg. The maximum pump vacuum was measured at twenty-two inches Hg.

GROUNDWATER SAMPLING PROCEDURES

Groundwater samples were collected by driving the hollow probes with detachable drive points below the water table. Once at the desired depth the probe was withdrawn several inches to permit water inflow into the resulting hole. Groundwater samples were collected depths of 2-3 feet below grade. Once inserted into the ground, the above-ground end of the sampling probes were fitted with a vacuum adaptor (metal reducer) and a length of polyethylene tubing leading to a vacuum pump. A vacuum of up to 24 inches of mercury was applied to the interior of the probe and open hole for 10 to 15 minutes or until the water was drawn up the probe. The water thus accumulated was then removed by drawing a vacuum on a 1/4 inch polyethylene tube inserted down the probe to the bottom of the open hole. Loss of volatile compounds by evaporation is accordingly reduced when water is induced to flow into the very narrow hole, because it can be sampled with little exposure to air. The polyethylene tubing was only used once and then discarded to avoid any cross-contamination problems.

Groundwater samples were collected in 40 mL VOC vials that are filled to exclude any air and then capped with Teflon-lined septa caps. Water samples were analyzed by injecting headspace in the sample container created by decanting off approximately half of the liquid in the bottle. Headspace analysis is the preferred technique when a large number of water samples are to be performed daily. The method is more time efficient for the measurement of volatile organics than direct injection because there is less chance for semi-volatile and non-volatile organics to contaminate the system as there is with direct injection. Depending upon the partitioning coefficient of a given compound, the headspace analysis technique can also yield greater sensitivity than the direct injection technique. Both methods are similar in terms of precision and accuracy.

ANALYTICAL PROCEDURES

A Varian 3300 gas chromatograph, equipped with a flame ionization detector (FID), was used for the soil gas and groundwater analyses. Compounds were separated on 6' by

1/8" OD packed column with OV-101 as the stationary phase in a temperature controlled oven of 100°C. Nitrogen was used as the carrier gas.

Hydrocarbon compounds detected in the soil gas and groundwater were identified by chromatographic retention time. Quantification of compounds was achieved by comparison of the detector response of the sample with the response measured for calibration standards (external standardization). Instrument calibration checks were run periodically throughout the day and system blanks were run at the beginning of the day to check for contamination in the soil gas sampling equipment. Air samples were also routinely analyzed to check for background levels in the atmosphere.

The GC was calibrated for groundwater headspace analysis by decanting 10 to 20 mL off of the known aqueous standard so as to leave approximately the same amount of headspace that was in the groundwater samples. The bottle was then resealed and shaken vigorously for 30 seconds. An analysis of the headspace in the vial determines the Response Factor (RF) which is then used to estimate water concentrations.

Detection limits for the compounds of interest are a function of the injection volume as well as the detector sensitivity for individual compounds. Thus, the detection limit varies with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest must be kept within the linear range of the analytical equipment. If any compound has a high concentration, it is necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may cause decreased detection limits for other compounds in the analyses.

The detection limits for the selected compounds were approximately 0.01 ug/L for hydrocarbons detected in the soil gas samples and 0.1 ug/L for hydrocarbons detected in the groundwater samples, depending on the conditions of the measurement, in particular, the sample size. If any component being analyzed is not detected, the detection limit for that compound in that analysis is given as a "less than" value (e.g. <0.1 ug/L). Detection limits obtained from GC analyses are calculated from the current response factor,the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation's normal quality assurance procedures were followed in order to prevent any cross-contamination of soil gas and groundwater samples.

- Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility of cross-contamination. Enough probes are carried on each van to avoid the need to reuse any during the day.
- Probe adaptors (TRC's patented design) are used to connect the sample probe to the vacuum pump. The adaptor is designed to eliminate the possibility of exposing the sample stream to any part of the adaptor. Associated tubing connecting the adaptor to the vacuum pump is replaced periodically as needed during the job to insure cleanliness and good fit. At the end of each day the adaptor is cleaned with soap and water and baked in the GC oven.
- Silicone tubing (which acts as a septum for the syringe needle) is replaced as needed to insure proper sealing around the syringe needle. This tubing does not directly contact soil gas samples.
- Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.
- Injector port septa through which samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.

- Analytical instruments are calibrated each day by analytical standards from Chem Service, Inc. Calibration checks are also run after approximately every five sampling locations.
- Subsampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph.
- Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10 cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to a concurrently sampled ambient air analysis.
- All sampling and subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.
- Soil gas pumping is monitored by a vacuum gauge to insure that an adequate gas flow from the vadose zone is maintained. A reliable gas sample can be obtained if the sample vacuum gauge reading is at least 2 inches Hg less than the maximum pump vacuum.

APPENDIX A: CONDENSED DATA

NOTE:

1 "Condensed Data" provides results from all samples collected; however, some grid points were labeled in the field and on site diagrams but not sampled.

2 "Air" samples are field blanks of ambient air used for quality control purposes.

SAIC/INDIANA AIR NATIONAL GUARD/FORT WAYNE, INDIANA JOB#1-90-700-S
8/15/90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TPH ~~THC~~ ug/l
AIR	<1	<1	<1	<3	<6
WS-J17-5'	<1	<1	<1	<3	<6
WS-L15-5'	440	<28	<28	3000	28000
AIR	<0.3	<0.4	<0.4	<0.6	<2
L21-4'	2	1	<0.1	0.3	14
M21-4'	0.3	0.2	<0.09	0.1	0.7
O21-3'	<0.03	<0.04	<0.04	<0.05	<0.2
O13-4'	<0.03	<0.04	<0.04	<0.05	<0.2
M11-4'	<0.03	<0.04	<0.04	<0.05	<0.2
M15-2.5'	<0.03	<0.04	<0.04	<0.05	<0.2
M17-3.5'	<0.03	<0.04	<0.04	<0.05	<0.2
L11-3.5'	<0.03	<0.04	<0.04	<0.05	<0.2
L17-5'	<0.03	<0.04	<0.04	<0.05	<0.2
L19-2'	<0.03	<0.04	<0.04	<0.05	<0.2
M19-5'	<0.03	<0.04	<0.04	<0.05	<0.2

Analyzed by: P. Reko
Checked by: J. Cook
Proofed by: K. Suess

Tracer Research Corporation

SAIC/INDIANA AIR NATIONAL GUARD/FORT WAYNE, INDIANA JOB#1-90-700-S
8/16/90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TPH ~~THC~~ ug/l
AIR	<0.03	<0.03	<0.04	<0.04	<0.1
O23-3.5'	<0.03	<0.03	<0.04	<0.04	<0.1
J23-3'	<0.03	0.1	<0.04	<0.04	0.2
L25-2.5'	<0.03	<0.03	<0.04	<0.04	<0.1
J19-2.5'	2	6	<0.2	<0.2	21
H23-5'	<0.03	<0.03	<0.04	<0.04	<0.07
L13-10'	<0.03	<0.03	<0.04	<0.04	<0.1
J13-5'	14	10	<0.2	18	130
F16-4'	<0.03	0.03	<0.04	<0.04	0.3
WS-J23-3'	<0.9	43	<1	<2	110
WS-J15-2.5'	6000	4800	<4	12000	76000
WS-H16-2'	<2	12000	<2	4600	36000
AIR	<0.2	<0.2	<0.2	<0.3	<0.3
F14-4.5'	0.6	0.8	<0.07	0.4	2
B16-2'	<0.03	<0.03	<0.04	<0.04	<0.1
E2-14-1.5'	0.07	0.2	<0.04	0.08	0.4
H25-3'	<0.1	<0.2	<0.2	<0.2	<0.7
G22-2'	<0.03	<0.03	<0.04	<0.04	<0.1
F25-4.5'	<0.03	<0.03	<0.04	<0.04	<0.1

Analyzed by: P. Reko
Checked by: J. Cook
Proofed by: [signature]

Tracer Research Corporation

APPENDIX B
BOREHOLE LOGS & MONITORING WELL AS-BUILTS

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INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 1

SOIL BORING NO.: SB1-1
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 3/30-32
DRILLING STARTED: 8/27/90
BORING COMPLETED: 8/27/90

LAND SURFACE ELEVATION: 796.03 MSL
TOTAL DEPTH DRILLED: 33 BLS
TOTAL DEPTH ELEVATION: 763.03 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	N/A	N/A	N/A	10.0	N/A					
10.0	SB1-1-1	13-25-32	10.0	12.0	1.83	CL		CLAY; TRC TO SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; PLASTIC; SLIGHTLY MOIST.	BKGD	NR
12.0	SB1-1-2	10-19-34	12.0	14.0	1.83	CL		CLAY; TRC TO SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; PLASTIC; SLIGHTLY MOIST.	BKGD	NR
14.0	SB1-1-3	8-14-18	14.0	16.0	1.83	CL		CLAY; TRC TO SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; PLASTIC; MOIST.	BKGD	0
16.0	SB1-1-4	9-16-18	16.0	18.0	1.8	CL		CLAY; TRC TO SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; PLASTIC; MOIST.	BKGD	NR
18.0	SB1-1-5	8-16-24	18.0	20.0	1.83	CL		CLAY; SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; V. PLASTIC; MOIST.	BKGD	1
20.0	SB1-1-6	7-14-20	20.0	22.0	1.83	CL		CLAY; SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; V. PLASTIC; MOIST.	BKGD	2
22.0	SB1-1-7	NR	22.0	24.0	1.83	CL		CLAY; SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; V. PLASTIC; MOIST.	BKGD	0
24.0	SB1-1-8	9-15-25	24.0	26.0	1.83	CL		CLAY; SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; V. PLASTIC; MOIST.	BKGD	0
26.0	SB1-1-9	14-27-31	26.0	28.0	1.83	CL		CLAY; SOME SILT; SOME TO TRC FINE SAND; TRC PEBBLES. 10YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; V. PLASTIC; MOIST.	BKGD	0

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
28.0	SB1-1-10	10-16-25	28.0	30.0	1.83	CL		CLAY; SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; V. PLASTIC; MOIST.	BKGD	0
30.0	SB1-1-11	13-26-30	30.0	32.0	1.83	CL		30-31', CLAY; SOME SILT; TRC PEBBLES. 10 YR 4/1 DARK GRAY; POORLY SORT; PEBBLES RND; V. DENSE; V. PLASTIC; MOIST. 31-32 (SEE SB1-1-12)	BKGD	0
31.0	SB1-1-12	3-12-24	31.0	33.0	1.83	GW		GRAVEL; V. FINE TO COARSE PEBBLES; SOME V. FINE TO COARSE SAND. 10YR 4/1 - 4/2 DARK GRAY TO DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; SAT.	BKGD	0

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 1

SOIL BORING NO.: SB1-2
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/12-18
DRILLING STARTED: 8/29/90
BORING COMPLETED: 8/29/90

LAND SURFACE ELEVATION: 806.70 MSL
TOTAL DEPTH DRILLED: 44 BLS
TOTAL DEPTH ELEVATION: 762.70 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	N/A	N/A	N/A	10.0	N/A					
10.0	SB1-2-1	3-4-7	10.0	12.0	1.0	CL		CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC COARSE TO FINE PEBBLES; TRC ORGANIC MATTER - ASPHALT(FILL MATERIAL). 2.5Y 4/2 DARK GRAYISH BROWN WITH 10YR 5/8 YELLOWISH BROWN STREAKS OF CLAY; POORLY SORT CLASTS; RND TO SUBR; DENSE; PLASTIC; MOIST.	BKGD	0
12.0	SB1-2-2	8-10-14	12.0	14.0	1.8	CL		CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC COARSE TO FINE PEBBLES; TRC ORGANIC MATTER - ASPHALT(FILL MATERIAL). 2.5Y 4/2 DARK GRAYISH BROWN WITH 10YR 5/8 YELLOWISH BROWN STREAKS OF CLAY; POORLY SORT CLASTS; RND TO SUBR; DENSE; PLASTIC; MOIST.	BKGD	0
14.0	SB1-2-3	5-5-6	14.0	16.0	1.83	CL		CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC COARSE TO FINE PEBBLES; TRC ORGANIC MATTER - ASPHALT. 2.5Y 4/2 DARK GRAYISH BROWN WITH 10YR 5/8 YELLOWISH BROWN STREAKS OF CLAY; POORLY SORT; RND TO SUBR; DENSE; PLASTIC; MOIST.	BKGD	40-50
16.0	SB1-2-3R	6-10-15	16.0	18.0	1.83	CL		CLAY; SOME SILT; SOME FINE TO V. FINE SAND. 10YR 4/2 DARK GRAYISH BROWN MOTTLED WITH 10YR 4/6 DARK YELLOWISH BROWN CLAY; POORLY SORT; DENSE; PLASTIC; MOIST. THIN BEDS OF V. FINE TO MED QUARTZ SAND.	BKGD	40-50
18.0	SB1-2-4	14-22-27	18.0	20.0	1.83	CL		CLAY; SOME SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; SLIGHTLY PLASTIC; MOIST TO SLIGHTLY MOIST.	BKGD	0
20.0	SB1-2-5	16-23-30	20.0	22.0	1.83	CL		CLAY; SOME SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 5CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; SLIGHTLY PLASTIC; MOIST TO SLIGHTLY MOIST.	BKGD	40-50
22.0	SB1-2-6	15-25-40	22.0	24.0	1.83	CL		CLAY; SOME SILT; TRC COARSE SAND TO MED PEBBLES. 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; PLASTIC; MOIST TO SLIGHTLY MOIST.	BKGD	0

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
24.0	SB1-2-7	15-20-29	24.0	26.0	1.83	CL		CLAY; SOME SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; SLIGHTLY PLASTIC; MOIST TO SLIGHTLY MOIST.	BKGD	0
26.0	SB1-2-8	11-16-25	26.0	28.0	1.83	CL		CLAY; SOME SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; SLIGHTLY PLASTIC; MOIST TO SLIGHTLY MOIST.	BKGD	0
28.0	SB1-2-9	12-20-30	28.0	30.0	1.83	CL		CLAY; SOME SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; SLIGHTLY PLASTIC; MOIST TO SLIGHTLY MOIST.	BKGD	0
30.0	SB1-2-10	15-23-40	30.0	32.0	1.83	CL		CLAY; SOME SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; SLIGHTLY PLASTIC; MOIST TO SLIGHTLY MOIST.	BKGD	0
32.0	SB1-2-11	11-28-38	32.0	34.0	1.83	CL		CLAY; TRC SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; V. PLASTIC; MOIST TO WET.	BKGD	0
34.0	SB1-2-12	16-25-30	34.0	36.0	1.83	CL		CLAY; TRC SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; V. PLASTIC; MOIST TO WET.	BKGD	0
36.0	SB1-2-13	13-18-28	36.0	38.0	1.83	CL		CLAY; TRC SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; V. PLASTIC; MOIST TO WET.	BKGD	0
38.0	SB1-2-14	15-26-32	38.0	40.0	1.83	CL		CLAY; TRC SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; V. PLASTIC; WET.	BKGD	0
						GC		.5' LENSE OF CLAYEY GRAVEL; V. FINE TO MED PEBBLES; SOME SAND. 10YR 4/1 DARK GRAY; POORLY SORT; RND TO SUBR; DENSE; NON-PLASTIC; WET TO SAT.		
40.0	SB1-2-15	15-26-32	40.0	42.0	1.83	CL		CLAY; TRC SILT; TRC COARSE SAND TO MED PEBBLES (UP TO 2CM). 10YR 4/1 DARK GRAY; POORLY SORT; CLASTS RND; V. DENSE; V. PLASTIC; MOIST TO WET.	BKGD	0
42.0	SB1-2-16	12-20-35	42.0	44.0	1.0	GW		AQUIFER MATERIAL. GRAVEL; V.FINE TO V. COARSE PEBBLES; SOME V. FINE TO COARSE SAND; TRC SILT; TRC CLAY. 10YR 4/1 - 5/1 DARK GRAY TO GRAY; V. POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; SAT.	BKGD	0

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 1

SOIL BORING NO.: SB1-3
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/4-10
DRILLING STARTED: 8/28/90
BORING COMPLETED: 8/28/90

LAND SURFACE ELEVATION: 805.31 MSL
TOTAL DEPTH DRILLED: 44 BLS
TOTAL DEPTH ELEVATION: 761.31 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	N/A	N/A	N/A	10.0	N/A					
10.0	SB1-3-1	9-17-22	10.0	12.0	NR	CL		BROWN CLAY	BKGD	0
12.0	SB1-3-2	6-10-13	12.0	14.0	1.5	CL		CLAY; SOME SILT; SOME FINE TO COARSE SAND. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	4
14.0	SB1-3-3	4-7-14	14.0	16.0	1.83	CL		CLAY; SOME SILT; SOME FINE TO COARSE SAND. 2.5Y 5/4 LIGHT OLIVE BROWN MOTTLED WITH 10YR 6/8 BROWNISH YELLOW; POORLY SORT; RND; DENSE; PLASTIC; MOIST.	BKGD	0
16.0	SB1-3-4	15-24-31	16.0	18.0	1.83	CL		GRADATION FROM BROWN TO BLUE CLAY. NO SAMPLE RECORDED.	BKGD	0
18.0	SB1-3-5	15-21-29	18.0	20.0	1.83	CL		CLAY; SOME SILT; TRC FINE TO COARSE GRAVEL (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE; PLASTIC; SLIGHTLY MOIST.	BKGD	5-10
20.0	SB1-3-6	18-26-30	20.0	22.0	1.83	CL		CLAY; SOME SILT; SOME FINE TO COARSE SAND; POCKETS OF CLAY. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	1-2
22.0	SB1-3-7	15-23-40	22.0	24.0	1.83	CL		CLAY; SOME SILT; SOME FINE TO COARSE SAND; POCKETS OF CLAY. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	1
24.0	SB1-3-8	13-23-34	24.0	26.0	1.83	CL		CLAY, BLUE; SOME COARSE SAND TO FINE GRAVEL. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	.5
26.0	SB1-3-9	14-20-31	26.0	28.0	1.83	CL		CLAY, BLUE; SOME COARSE SAND TO FINE GRAVEL. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	.5

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
28.0	SB1-3-10	13-19-32	28.0	30.0	1.83	CL		CLAY, BLUE; SOME COARSE SAND TO FINE GRAVEL. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0
30.0	SB1-3-11	15-20-30	30.0	32.0	1.83	CL		CLAY, BLUE; SOME COARSE SAND TO FINE GRAVEL. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0
32.0	SB1-3-12	11-28-38	32.0	34.0	1.83	CL		CLAY, BLUE; SOME COARSE SAND TO FINE GRAVEL. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0
34.0	SB1-3-13	10-15-20	34.0	36.0	1.83	CL		CLAY, BLUE; SOME COARSE SAND TO FINE GRAVEL. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0
36.0	SB1-3-14	12-19-25	36.0	38.0	1.83	CL		CLAY, BLUE; SOME COARSE SAND TO FINE GRAVEL. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0
38.0	SB1-3-15	12-19-25	38.0	40.0	1.83	CL		CLAY, BLUE; SOME COARSE SAND TO FINE GRAVEL. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	1
40.0	SB1-3-16	10-16-25	40.0	42.0	1.83	CL		CLAY, BLUE; SOME COARSE SAND TO FINE GRAVEL. 2.5Y 5/4 LIGHT OLIVE BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0
42.0	SB1-3-17	12-20-35	42.0	44.0	1.0	GW		GRAVEL; V. FINE PEBBLES TO SOME GRAVEL; SOME V. FINE TO COARSE SAND; TRC SILT. 10YR 4/1 DARK GRAY; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; SAT.	BKGD	0

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 1

SOIL BORING NO.: SB1-4
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/39-40
DRILLING STARTED: 9/8/90
BORING COMPLETED: 9/8/90

LAND SURFACE ELEVATION: 803.46 MSL
TOTAL DEPTH DRILLED: 14 BLS
TOTAL DEPTH ELEVATION: 789.46 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	SB1-4-1	15-13-19	0.0	2.0	1.2	CL		CLAY; SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC TO SOME V. FINE TO COARSE PEBBLES. 10YR 4/2 - 4/3 DARK GRAYISH BROWN TO BROWN MOTTLED WITH 10YR 4/6 - 3/6 DAR YELLOWISH BROWN; POORLY SORT; RND TO SUBA; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	150
8.0	SB1-4-2	5-9-19	8.0	10.0	1.2	CL		CLAY; SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC TO SOME V. FINE TO COARSE PEBBLES. 10YR 4/2 - 4/3 DARK GRAYISH BROWN TO BROWN MOTTLED WITH 10YR 4/1 DARK GRAY; POORLY SORT; RND TO SUBA; DENSE; PLASTIC; MOIST.	BKGD	NR
10.0	SB1-4-3	6-11-19	10.0	12.0	1.3	CL		CLAY; SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC TO SOME V. FINE TO COARSE PEBBLES. 5Y 4/1 - 5/1 DARK GRAY TO GRAY WITH CHUNKS THAT APPEARS TO BE CHARRED WOOD; POORLY SORT; RND TO SUBA; DENSE; PLASTIC; MOIST.	BKGD	NR
12.0	SB1-4-4	16-24-36	12.0	14.0	1.6	CL		CLAY; SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC TO SOME V. FINE TO COARSE PEBBLES. 10YR 4/3 - 4/4 BROWN TO DARK YELLOWISH BROWN; POORLY SORT; RND TO SUBA; DENSE; PLASTIC; MOIST.	BKGD	NR

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Field Boring Log Page 1 of 1

SBI-5

Site File No. 03-0349-XX County ALLEN Boring No. SBI-11 Monitor Well No N/A

Site File Name FT WAYNE FANGB Surface Elev. 804.6 Completion Depth 40

Fed. ID. No N/A Auger Depth 40 Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 11/1/91 Finish 11/2/91

Boring Location N 1267198.659

E 634544.499

Drilling Equipment CME 75; HSA; 140 lb HAMMER

Personnel:
G - TOM WEATHERLY
D - TIM CRANK
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID Δ (readings ppm)	REMARKS
	(1) [ML] GRAVELLY SILT, SOME CLAY, SOME COBBLES (50 mm) CONSTRUCTION DEBRIS; LOOSELY COMPACTED BUT ROLLS INTO SHORT CORDS OF SILT & CLAY WHICH CRUMBLE EASILY, BROWN 10 YR 3/3.		1	SS	X	Y	2-2-4	BG	SS - SPLIT SPOON BG - BACKGROUND BG = 1-2 PPM (1) LAB ANAL: LEAD 22.4 ppm VOC ND SVOC ND TPH ND
		5.0							
	(2) [CL] CLAY AND SILT, SOME GRAVEL. 10YR 3/1 V. DK GRAY MOTTLED W/ BLACK. REC: 1.2	10.0	2	SS	X	Y	5-8-9	100-200	(2) LAB ANAL: BENZENE 110 ppb TOLUENE 180 ppb SVOC 1900 ppb LEAD 27.4 ppm TPH ND
	(3) [ML] SILT & CLAY, TRC V. CSE SAND. REC: 1.1' 10YR 3/1 V. DK GRAY.		3	SS	X	Y	1-3-5	150-250	(3) LAB ANAL: LEAD 34.0 ppm VOC ND SVOC ND TPH ND
		15.0							
	(4) [ML] SILT AND CLAY, SOME GRAVEL. 10YR 3/1 V. DK GRAY, TRC V. CSE SAND. REC: 1.25'	20.0	4	SS	X	N	5-7-15	250	
	(5) [ML] SILT & CLAY, SOME V. CSE SAND. DENSE & COMPACTED AND CRUMBLES W/ EFFORT. REC: 1.3' 10 YR 3/1 V. DK GRAY.	25.0	5	SS	X	N	9-17-20	10-20	BG = 2-5 PPM
	(6) [ML] SILT & CLAY, GRAVEL, V. CSE SAND. DENSE, COMPACTED POORLY SORTED. REC: 1.2' 10YR 3/1 V. DK GRAY	30.0	6	SS	X	N	6-12-22	100	
	(7) [ML] SILT & CLAY, V. CSE SAND, SOME GRAVEL. 10YR 4/1 DK GRAY.	35.0	7	SS	X	Y	4-7-10	2	(7) LAB ANAL: LEAD 23.6 ppm SVOC ND VOC ND TPH ND

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Field Boring Log Page 1 of 1

Site File No. 03-0346-XX County ALLEN Boring No. SBI-6 (SBI-2) Monitor Well No N/A

Site File Name FT WAYNE I ANGB Surface Elev. 805.71 Completion Depth 36.5

Fed. ID. No. N/A Auger Depth 35' Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 11/2/91 Finish 11/2/91

Boring Location N 1267276.494

E 634536.918

Drilling Equipment CME 75; HSA; 140 lb HAMMER

Personnel:
G - TOM WEATHERLY
D - TIM CRANK
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings (ppm)	REMARKS
	① [ML] SILT & CLAY, SOME PEBBLES (5mm), TRC V. CSE SAND. 10YR 3/3 BROWN; LOOSELY COMPACTED; SOME FINE (GRASS ROOTS).		①	SS	X	Y	3-5-5	30	SS - SPLIT SPOON BG - BACKGROUND ① LAB ANAL LEAD 16.9 ppm TPH ND SVOC ND VOC ND
		5.0							
	② TOP .5' [ML] SILT & CLAY, V. CSE SAND, SMALL GRAVEL (2mm) ABOUT 5%. BROWN; SUBA. REC: 1.0' BOTTOM .5' [ML] SILT & CLAY. 10YR 4/1 GRAY; COMPACTED BUT CRUMBLES EASILY.	10.0	②	SS	X	Y	3-7-10	50-70	② LAB ANAL LEAD 18.2 ppm TPH ND SVOC ND VOC ND
	③ [ML] SILT & CLAY, LARGER GRAVELS, TRC V. CSE SAND SIZE PARTICLES (RND) WHICH ARE VERY DK GRAY. 10YR 3/3 BROWN. DENSLY COMPACTED AND CRUMBLES ONLY AFTER ROLLING FOR ABOUT 15 SECONDS. REC: .9'	15.0	③	SS	X	Y	2-5-5	50-80	③ LAB ANAL LEAD ~~22.6~~ 14.5 ppm TPH ND SVOC ND VOC ND
	④ [ML] SILT & CLAY W/ TRC GRAVELS (2-3mm). 10YR 4/2 BROWN; CRUMBLES EASILY; V. DENSE & COMPACTED. REC: 1.1'	20.0	④	SS	X	N	6-12-18	25	
	⑤ [ML] SILT & CLAY, TRC GRAVEL (2mm). 10YR 3/1 V. DK GRAY; DENSELY COMPACTED - BREAKS W/ PRESSURE; SUBA. REC: 1.1'	25.0	⑤	SS	X	Y	7-9-13	10	BG = 2-3 PPM LAB ANAL LEAD 10.9 ppm TPH ND VOC ND SVOC ND
	⑥ [ML] SILT & CLAY, TRC GRANULES (2mm). 10YR 3/1 V. DK GRAY; SUBR TO SUBA; SL MOIST; PLASTIC. REC 1.35	30.0	⑥	SS	X	N	4-8-8	BG	BG = 1 PPM
	⑦ TOP .2' SAND & SOME GRAVEL. 10YR 3/1 V. DK GRAY. BOTTOM 1.0' [ML] SILT & CLAY. 10YR 3/1 V. DK GRAY; DENSE; PLASTIC; SAT. REC: 1.2	35.0	⑦	SS	X	Y	4-8-10	BG	⑦ LAB ANAL LEAD 9.7 ppm TPH ND SVOC ND VOC ND

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Field Boring Log Page 1 of 1

Site File No. 03-0349-XX County ALLEN Boring No. SB1-7 (SB1-3) Monitor Well No. N/A

Site File Name FT WAYNE "IANGB" Surface Elev. 803.66 Completion Depth 16.5'

Fed. ID. No. N/A Auger Depth 15' Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 11/5/91 Finish 11/5/91

Boring Location N 1267247.629
E 634468.413

Drilling Equipment CME 75; HSA; 140 lb HAMMER

Personnel:
G - TOM WEATHERLY
D - TIM CRANE
H - DAVE SULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings (ppm)	REMARKS
	① [ML] SILT & CLAY, TRC PEBBLES, SOME CSE SAND; FINE ROOTS IN SAMPLE. DK BROWN; SL MOIST; SUBR; SL. COMPACTED. REC: 1.0' (10 YR 4/3)		①	SS		Y	2-3-3	BG	SS - SPLIT SPOON BG - BACKGROUND ① LAB ANAL: LEAD 16.6 ppm PAHs - 160-390 ppb VOC - poss. lab contam TPH ND
		2.5							
		5.0							
		7.5							
	② [ML] SILT & CLAY, SOME GRAVEL, PEBBLES TO 4mm 10YR 3/3 DK BROWN; POOR SORT; DENSE; COMPACTED; NON-PLASTIC; V. SL. MOIST. REC: .75'		②	SS		Y	3-5-7	BG	② LAB ANAL: LEAD 34.1 PAH 71-1100 ppb TPH 200 ppm VOC poss lab contam
		10.0							
		12.5							
	③ TOP .4' [ML] SILT & CLAY, TRC PEBBLES (3mm), 10YR 3/3 DK BROWN; COMPACTED; DENSE; BOTTOM 1.0' [ML] SILT & CLAY, TRC SMALL PEBBLES (2mm), 10YR 4/1 V. DK GRAY; DENSE; COMPACTED; NON-PLASTIC	15.0	③	SS		Y	5-10-4	BG	③ LAB ANAL: LEAD 26.4 VOC poss lab contam TPH ND SVOC ND
		17.5							

SAIC Science Applications International Corporation

Field Boring Log Page 1 of 1

Site File No. 03-0349-XX County ALLEN Boring No. SB1-8 (SB1A-1) Monitor Well No N/A

Site File Name FT WAYNE IANGB Surface Elev. 801.61 Completion Depth 21.5

Fed. ID. No N/A Auger Depth 20.0 Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 11/4/91 Finish 11/4/91

Boring Location N 1267161.329
E 634441.327

Drilling Equipment CME 75; HSA; 140 lb HAMMER

Personnel:
G - TOM WEATHERLY
D - TIM CRANK
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID (ppm)	REMARKS
	① [ML] SILT, CLAY, SOME CSE SAND, TRC PEBBLES. SUBR TO SUBA. REC: .8' 10 YR 4/3 DK BROWN		①	SS	X	Y	3-6-7	BG	SS - SPLIT SPOON; BG - BACKGROUND; DNR - DATA NOT RECORDED; ① LAB ANAL: LEAD 33.9 ppm, VOC - poss. lab contam., SVOC ND, TPH ND
		5.0							
	② [ML] SILT & CLAY, SOME PEBBLES (2mm). 10YR 3/3 BROWN; CRUMBLES EASILY; SUBR TO SUBA. REC: 1.2		②	SS	X	Y	3-5-6	BG	BG = 1 PPM; ② LAB ANAL: LEAD 31.3 ppm, VOC - poss. lab contam., SVOC ND, TPH ND
		10.0							
	③ [ML] SILT & CLAY, SOME PEBBLES (2mm), 10YR 3/3 DK BROWN; DRY; NON-PLASTIC; CRUMBLES EASILY. REC: DNR		③	SS	DNR	Y	7-15-29	?	BG = 1 PPM; ③ LAB ANAL: LEAD 71 ppm, VOC poss. lab contam., TPH, SVOC ND
	④ [ML] SILT & CLAY, SOME SUBA PEBBLES (4mm). 10YR 3/1 V. DK GRAY; DRY; CRUMBLES EASILY; SL. COMPACTED. REC 1.5'	15.0	④	SS	X	N	5-10-15	BG	BG = ± 1 PPM
	⑤ [ML] SILT & CLAY, SOME PEBBLES (3mm). 10YR 3/3 DK GREY; DENSE; COMPACT; V. SL. PLASTIC.	20.0	⑤	SS	X	Y	7-12-19	BG	BG = ± 10 ppm; ⑤ LAB ANAL: LEAD 11.4, VOC poss. lab contam., SVOC ND, TPH ND
		25.0							

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Field Boring Log Page 1 of 1

Site File No. 03-0349-xx County ALLEN Boring No. SB1-9 (SB1A-2) Monitor Well No N/A

Site File Name FT WAYNE - IANGB Surface Elev. 799.51 Completion Depth 11.5'

Fed. ID. No N/A Auger Depth 10.0' Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 11/4/91 Finish 11/4/91

Boring Location N 1267118.218

E 634547.588

Drilling Equipment CME 75; HSA; 140 lb HAMMER

Personnel:
G - ~~TOM~~ WEATHERLY
D - TIM CRANK
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings (PPM)	REMARKS
	① [ML] SILT & CLAY, LARGE COBBLES (9cm), SOME V. CSE SAND. 10YR 3/4 & 3/3. POSSIBLY CONSTRUCTION DEBRIS PRESENT. REC: 1.25'		①	SS		Y	3-5-9	BG	SS - SPLIT SPOON BG - BACKGROUND ① LAB ANAL: LEAD 21.6 ppm TOLUENE: 250 ppb PAH: 500-1300 ppb VOC poss. lab contam.
		2.5							
	② [ML] SILT & CLAY, SOME GRAVEL (6mm), TRC V. CSE SAND, 10YR 3/3 DK BROWN; SL COMPACTED; NON-PLASTIC; POOR SORT. REC: .91'	5.0	②	SS		Y	2-3-7	BG	② LAB ANAL: LEAD 9 ppm TOLUENE: 170 ppb VOC: poss lab contam. SVOC ND
		7.5							
	③ [ML] SILT & CLAY, TRC PEBBLES (2mm), 10YR 3/2.5 DK BROWN; DENSE; SL. COMPACTED; CRUMBLES W/ EFFORT; BREAKS APART; POORLY SORT. REC: 1.0'	10.0	③	SS		Y	5-13-17	BG	BG = 1 PPM ③ LAB ANAL: LEAD 11.9 ppm TOLUENE 1,000 ppb VOC: poss. lab contam. SVOC ND
		12.5							

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Field Boring Log SB1-10 Page 1 of 1

Site File No.: 03-0349-XX County ALLEN Boring No. SB1A-3 Monitor Well No N/A

Site File Name FT WAYNE IANGB Surface Elev. 799.51 Completion Depth 11.5'

Fed. ID. No. N/A Auger Depth 10.0' Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 11/4/91 Finish 11/5/91

Boring Location N ~~126718.218~~ 126769.512
E ~~634547.588~~ 634386.429

Drilling Equipment CME 75; HSA; 140 lb HAMMER

Personnel: G - TOM WEATHERLY; D - TIM CRANK; H - DAVE JULIUS; H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings (PPM)	REMARKS
	(1) [ML] SILT & CLAY, SOME CSE TO V. CSC SAND. 10YR 3/3 DK BROWN, TRC PEBBLES. REC: .65'		1	SS		Y	4-4-4	BG	SS - SPLIT SPOON; BG - BACKGROUND; DNR - DATA NOT RECORDED; (1) LAB ANAL: LEAD 9.3 ppm, TOLUENE 160 ppb, PAH 300-780, POSS LAB VOCS, SVOC NDS
	(2) WOOD IN SAMPLE [ML] SILT & CLAY, SOME CSE SAND, SOME PEBBLES. DK BROWN; MOIST. REC: 1.05' (10YR3/3)	5.0	2	SS		Y	4-6-4	5-7	(2) LAB ANAL: LEAD 14.4 ppm, TPH 1,900 ppb, TOLUENE 160 ppb, POSS LAB VOCS, SVOC ND
	(3) [ML] SILT & CLAY, TRC PEBBLES (2mm). 10YR 3/3 DK. BROWN; DENSE; MOIST; PLASTIC; SUBR.	10.0	3	SS		Y	DNR	10-20	(3) LAB ANAL: LEAD 10.7 ppm, 1,2 DCE 4 ppb, TOLUENE 99 ppb, PAH 81-94 ppb, POSS. LAB VOCS, TPH ND
	(4) TOP .3' 10YR 3/3 DK BROWN. BOTTOM 1.2' [ML] SILT & CLAY, SOME PEBBLES (2mm), 10YR 4/1; V. DENSE; SUBR. DK GRAY REC: 1.5'	15.0	4	SS		Y	5-10-13	BG	(4) LAB ANAL: LEAD 11.8, TOLUENE 640, POSS. LAB VOCS, TPH ND, SVOC ND
	(5) [ML] SILT AND CLAY, TRC PEBBLES (4mm). 10YR4/1 V. DK GRAY; DENSE; V. SL. MOIST; NON-PLASTIC REC: 1.35'	20.0	5	SS		Y	7-10-17	BG	(5) LAB ANAL: LEAD 10.7, TOLUENE 370, POSS. LAB VOCS, TPH ND, SVOC ND
		25.0							

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 2

SOIL BORING NO.: SB2-1
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/18-24
DRILLING STARTED: 8/28/90
BORING COMPLETED: 8/28/90

LAND SURFACE ELEVATION: 800.23 MSL
TOTAL DEPTH DRILLED: 40 BLS
TOTAL DEPTH ELEVATION: 760.23 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	SB2-1-1	18-18-17	0.0	2.0	1.2	GW		GRAVEL; SANDY; FINE SAND TO COARSE PEBBLES; TRC CLASTS (UP TO 5CM). 10YR 5/2 GRAYISH BROWN; POORLY SORT; RND; LOOSE; NON-PLASTIC; SLIGHTLY MOIST.	BKGD	2
2.0	SB2-1-2	5-8-10	2.0	4.0	1.2	GW CL		2-3':GRAVEL; SANDY; FINE SAND TO COARSE PEBBLES; TRC CLASTS (UP TO 5CM). 10YR 5/2 GRAYISH BROWN; POORLY SORT; RND; LOOSE; NON-PLASTIC; SLIGHTLY MOIST. 3-4': GRAVELLY CLAY; SOME SILT; TRC FINE TO COARSE SAND. 2.5Y 5/2 - 5Y 4/1 GRAYISH BROWN TO DARK GRAY; POORLY SORT; CLASTS RND (UP TO 2CM); SLIGHTLY DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST. CLAY; SOME SILT; SOME FINE TO COARSE SAND. 2.5Y 5/4 LIGHT OLIVE BROWN; MOIST.	BKGD	0
4.0	SB2-1-3	6-10-12	4.0	6.0	1.3	CL		GRAVELLY CLAY; SOME SILT; TRC FINE TO COARSE SAND. 2.5Y 5/2 - 5Y 4/1 GRAYISH BROWN TO DARK GRAY; POORLY SORT; CLASTS RND; (UP TO 2CM); SLIGHTLY DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST. CLAY; SOME SILT; SOME FINE TO COARSE SAND. 2.5Y 5/4 LIGHT OLIVE BROWN; MOIST.	BKGD	0
6.0	SB2-1-4	11-13-14	6.0	8.0	1.3	CL		CLAY; TRC TO SOME SILT; SOME COARSE SAND TO FINE TO MED PEBBLES. 5Y 4/3 OLIVE MOTTLED WITH BLACK CLAY 2.5Y 2/0; POORLY SORT; RND TO SUBR (SAND LESS ROUNDED); DENSE; PLASTIC; MOIST	BKGD	0
8.0	SB2-1-5	14-20-23	8.0	10.0	NR	CL		CLAY; TRC TO SOME SILT; SOME COARSE SAND TO FINE TO MED PEBBLES. 10YR 5/4 YELLOWISH BROWN MOTTLED WITH 10YR 5/1 GRAY; POORLY SORT; RND TO SUBR (SAND LESS ROUNDED); DENSE; PLASTIC; MOIST.	BKGD	0
10.0	SB2-1-6	8-16-23	10.0	12.0	1.5	CL		CLAY; TRC TO SOME SILT; SOME COARSE SAND TO FINE TO MED PEBBLES. SALT AND PEPPER COLOR; POORLY SORT POCKETS OF FINE TO COARSE SAND; RND TO SUBR (SAND LESS ROUNDED); DENSE; PLASTIC; MOIST.	BKGD	NR
12.0	SB2-1-7	14-22-37	12.0	14.0	1.5	CL		CLAY; TRC TO SOME SILT; SOME COARSE SAND TO FINE TO MED PEBBLES. SALT AND PEPPER COLOR; POORLY SORT; RND TO SUBR (SAND LESS ROUNDED); DENSE; PLASTIC; MOIST.	BKGD	0

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
14.0	SB2-1-8	24-40-55	14.0	16.0	1.83	CL		CLAY; SOME SILT; SOME FINE TO V. COARSE SAND; TRC FINE PEBBLES. 10YR 4/4 DARK YELLOWISH BROWN MOTTLED WITH 10YR 5/1 GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
16.0	SB2-1-9	20-24-32	16.0	18.0	1.83	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
18.0	SB2-1-10	13-19-25	18.0	20.0	NR	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
20.0	SB2-1-11	11-17-25	20.0	22.0	1.83	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
22.0	SB2-1-12	12-15-27	22.0	24.0	NR	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	NR
24.0	SB2-1-13	10-15-25	24.0	26.0	1.83	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
26.0	SB2-1-14	12-16-29	26.0	28.0	1.83	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0-1
28.0	SB2-1-15	13-17-27	28.0	30.0	1.83	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
30.0	SB2-1-16	11-18-18	30.0	32.0	1.83	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
32.0	SB2-1-17	15-17-22	32.0	34.0	1.83	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
34.0	SB2-1-18	13-17-27	34.0	36.0	1.83	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
36.0	SB2-1-19	6-8-12	36.0	38.0	1.83	CL		CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
38.0	SB2-1-20	14-45-53	38.0	40.0	1.2	CL		0-3" : CLAY; TRC TO SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES (UP TO 1CM). 10YR 4/1 DARK GRAY; POORLY SORT; RND; DENSE, PLASTIC, MOIST.	BKGD	0
						GW		3-9" : AQUIFER MATERIAL. GRAVEL; V. FINE TO COARSE PEBBLES; SOME FINE TO COARSE SAND; TRC SILT. 10YR 5/1 GRAY; POORLY SORT; RND TO SUBR; LOOSE, NON-PLASTIC; SAT.		
						CL		9-15" : CLAY; SOME TO AND V. FINE SAND; SOME SILT; TRC COARSE SAND TO MED PEBBLES. 10YR 4/1 DARK GRAY; POORLY SORT; SUBR TO RND; V. DENSE; NON TO SLIGHTLY PLASTIC; WET.		

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 2

SOIL BORING NO.: SB2-2
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/18-24
DRILLING STARTED: 8/30/90
BORING COMPLETED: 8/30/90

LAND SURFACE ELEVATION: 800.16 MSL
TOTAL DEPTH DRILLED: 2 BLS
TOTAL DEPTH ELEVATION: 798.16 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	SB2-2-1	28-14-12	0.0	2.0	1.2	GM		SANDY GRAVEL; FINE SAND TO V. COARSE PEBBLES (UP TO 5CM). 2.5Y N4/ DARK GRAY; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; MOIST TO WET.	BKGD	NR

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 2

SOIL BORING NO.: SB2-3
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/26
DRILLING STARTED: 8/30/90
BORING COMPLETED: 8/30/90

LAND SURFACE ELEVATION: 805.31 MSL
TOTAL DEPTH DRILLED: 2 BLS
TOTAL DEPTH ELEVATION: 803.31 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	SB2-3-1	20-16-11	0.0	2.0	1.2	GW		0-1' : GRAVEL; COARSE TO FINE PEBBLES (UP TO 2CM); SOME FINE TO COARSE SAND. 2.5Y N4/ DARK GRAY; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; MOIST.	BKGD	0
						CL		1-2' : CLAY-SANDY; SOME V. FINE TO V. COARSE SAND; TRC COARSE TO FINE PEBBLES. 2.5Y 4/2 DARK GRAYISH BROWN; POORLY SORT; RND; SLIGHTLY DENSE; SLIGHTLY PLASTIC; MOIST.		

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 2

SOIL BORING NO.: SB2-4
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/26
DRILLING STARTED: 8/30/90
BORING COMPLETED: 8/30/90

LAND SURFACE ELEVATION: 800.46 MSL
TOTAL DEPTH DRILLED: 2 BLS
TOTAL DEPTH ELEVATION: 798.46 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	SB2-4-1	15-14-10	0.0	2.0	1.2	GW		0-1' : GRAVEL; COARSE TO FINE PEBBLES (UP TO 2CM); SOME FINE TO COARSE SAND. 2.5Y N4/ DARK GRAY; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; MOIST.	BKGD	0
						CL		1-2' : CLAY-SANDY; SOME V. FINE TO V. COARSE SAND; TRC COARSE TO FINE PEBBLES. 2.5Y 4/2 DARK GRAYISH BROWN; POORLY SORT; RND; SLIGHTLY DENSE; SLIGHTLY PLASTIC; MOIST.		

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Field Boring Log Page 1 of 2

Site File No.: 03-0349-XX County ALLEN Boring No SB3-5 (SB3-1) Monitor Well No N/A

Site File Name FT WAYNE IANGB Surface Elev. 799.94 Completion Depth 41.0'

Fed. ID. No N/A Auger Depth 39.5 Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 10/30/91 Finish 10/3 /91

Boring Location N 1268796.426
E 634576.046

Drilling Equipment CME-75; HSA; 140 lb HAMMER

Personnel
G - TOM WEATHERLY
D - TIM CRANK
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings (PPM)	REMARKS
	(1) [GW] SAND AND GRAVEL, CSE SAND, SOME SILT, 10YR 3/3 DK BROWN; GRAVEL WELL SORTED; ANGULAR; NATIVE AND NON-NATIVE PEBBLES SUBR TO 2 mm		(1)	SS	X	Y	5-7-7	20	SS - SPLIT SPOON DNR - DATA NOT RECORDED (1) LAB ANAL: LEAD 11.3 ppm, OIL + GRS 7300 ppm, SVOC 2460 ppb, VOC ND
	(2) TOP .4' SAND AND GRAVEL BOTTOM .5' CLAY AND SILT 2.5YR 3/3 OLIVE GRAY. NON-PLASTIC.	5.0	(2)	SS	X	N	5-7-10	6 20	BG = BACKGROUND WHICH WAS 2 PPM AT THIS SCREENING.
	(3) [CL] CLAY AND SILT; DENSE; MOIST; 2.5Y 5/6	10.0	(3)	SS	X	N	4-6-16	50	BG = 3 PPM
	(4) [ML] SILT AND CLAY; 2.5YR 4/2 OLIVE BROWN; DENSE; MOIST TO WET. REC: 1.5	15.0	(4)	SS	X	N	4-4-6	BG	BG = 3 PPM
	(5) [CL] SILTY CLAY. 2.5YR 4/2 BROWN/OLIVE BROWN; DENSE; MOIST REC: 1.5'	20.0	(5)	SS	X	N	3-8-9	100	
	(6) [ML] SILT & CLAY. 10YR 4/1; DENSE. REC: 1.5'	25.0	(6)	SS	X	Y	3-7-9	500-700	(6) LAB ANAL: LEAD 8.5, SVOC ND, VOC ND, TPH ND
	(7) [CL] SILTY CLAY. 10YR 4/1; DENSE. REC: 1.5'	30.0	(7)	SS	X	N	7-8-10	10	
	(8) [CL] SILTY CLAY, SOME PEBBLES, 10YR 4/1; DENSE	35.0	(8)	SS	X	N	3-4-7	30	

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Field Boring Log Page 2 of 2

Site File No. 03-0349-XX	County ALLEN	Boring No. SB3-5 (SB3-1)	Monitor Well No N/A
Site File Name FT WAYNE TANGB		Surface Elev. 799.94	Completion Depth 41'
Fed. ID. No. N/A		Auger Depth 39.5'	Rotary Depth N/A
Quadrangle OSSIAN, IND	Sec. 9 T. 29 R 12	Date: Start 10/30/91	Finish 10/31/91
Boring Location N 1266796.426 E 634576.046			
Drilling Equipment CME 75; HSA; 140 lb HAMMER			

Personnel:
G - TOM WEATHERLY
D - TIM CRANY
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings (PPM)	REMARKS
									SS - SPLIT SPOON
	9 [SW] SAND; MED SAND, SOME SILT, SOME 2-4 mm PEBBLES (W. RND); WET. REC: 1.5'	40.0	9	SS	X	Y	16-25-28	25	9 LAB ANAL: LEAD 5.8, SVOC ND, VOC ND, TPH ND

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Field Boring Log Page 1 of 1

Site File No. 03-0319-xx County ALLEN Boring No. SB3-2 (SB3-6) Monitor Well No. N/A

Site File Name FT WAYNE - IANGB Surface Elev. 798.45 Completion Depth 5.5

Fed. ID. No. N/A Auger Depth 4 Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 10/31/91 Finish 10/31/91

Boring Location N 1268822.625
E 634558.123

Drilling Equipment CME-75; HSA; 140 lb HAMMER

Personnel:
G - TOM WEATHERLY
D - TIM CRANK
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings	REMARKS
	① TOP .5' [GW] SANDY GRAVEL. 10YR4/1 GRAY. .5'-1.0' [CL] SILTY CLAY. 10YR 4/4 BROWN. 1.0'-1.5' [GW] SANDY GRAVEL. 10YR4/1 GRAY		①	SS		Y	2-2-4	BG	SS - SPLIT SPOON; BG = BACKGROUND; ① LAB ANAL: LEAD 13.5 ppm, Oil+Gr. 98 ppm, PAH 240-660 ppb, VOC ND
		2.5							
	② [CL] SILTY CLAY. 10YR 4/4 BROWN; SOME SAND.	5.0	②	SS		Y	1-2-3	BG	② LAB ANAL: LEAD 3.6 ppm, TPH ND, SVOC ND, VOC ND

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 4

SOIL BORING NO.: SB4-1
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/27
DRILLING STARTED: 8/30/90
BORING COMPLETED: 8/30/90

LAND SURFACE ELEVATION: 793.35 MSL
TOTAL DEPTH DRILLED: 5 BLS
TOTAL DEPTH ELEVATION: 788.35 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	SB4-1-1	6-11-20	0.0	2.0	1.5	SW		SAND; V. COARSE TO FINE GRAIN; SOME FINE TO COARSE SAND. 2.5Y N2/ BLACK WITH SOME 2.5Y 4/2 DARK GRAYISH BROWN PEBBLES; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; MOIST.	BKGD	0
3.0	SB4-1-2	6-12-18	3.0	5.0	1.2	CL		CLAY; TRC SILT; TRC FINE SAND; TRC COARSE PEBBLES. 10YR 4/2 DARK GRAYISH BROWN MOTTLED WITH 2.5Y 5/1 GRAY; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC TO PLASTIC; MOIST.	BKGD	0

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 4

SOIL BORING NO.: SB4-2
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/27
DRILLING STARTED: 8/30/90
BORING COMPLETED: 8/30/90

LAND SURFACE ELEVATION: 792.02 MSL
TOTAL DEPTH DRILLED: 5 BLS
TOTAL DEPTH ELEVATION: 787.02 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	SB4-2-1	13-10-10	0.0	2.0	1.2	CL		CLAY; TRC SILT; TRC FINE TO COARSE PEBBLES. 2.5Y 4/4 OLIVE BROWN; POORLY SORT; RND; DENSE; PLASTIC; MOIST.	BKGD	0
3.0	SB4-2-2	8-12-16	3.0	5.0	1.2	CL		CLAY; TRC SILT; TRC FINE TO COARSE PEBBLES. 2.5Y 5/4 LIGHT OLIVE BROWN MOTTLED WITH 2.5Y 5/1 GRAY; POORLY SORT; RND; DENSE; PLASTIC; MOIST.	BKGD	0

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 4

SOIL BORING NO.: SB4-3
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/28
DRILLING STARTED: 8/30/90
BORING COMPLETED: 8/30/90

LAND SURFACE ELEVATION: 789.18 MSL
TOTAL DEPTH DRILLED: 5 BLS
TOTAL DEPTH ELEVATION: 783.18 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	SB4-3-1	6-10-19	0.0	2.0	1.2	CL		CLAY; TRC SILT; TRC FINE TO COARSE PEBBLES. 10YR 3/2 V. DARK GRAYISH BROWN; POORLY SORT; RND; SLIGHTLY DENSE; PLASTIC; MOIST.	BKGD	NR
3.0	SB4-3-2	7-11-17	3.0	5.0	1.0	CL		CLAY; TRC SILT; TRC FINE TO COARSE PEBBLES. 2.5Y 5/4 LIGHT OLIVE BROWN MOTTLED WITH 2.5Y 5/1 GRAY; POORLY SORT; RND; DENSE; PLASTIC; MOIST.	BKGD	NR

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 4

SOIL BORING NO.: SB4-4
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/29
DRILLING STARTED: 8/30/90
BORING COMPLETED: 8/30/90

LAND SURFACE ELEVATION: 793.34 MSL
TOTAL DEPTH DRILLED: 5 BLS
TOTAL DEPTH ELEVATION: 788.34 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0	SB4-4-1	NR	0.0	2.0	.5	GW		GRAVEL; CLASTS RANGE FORM 5-6CM TO FINE SAND. 10YR 5/1 GRAY; POORLY SORT; SUBR TO SUBA; LOOSE; NON-PLASTIC; SAT.	BKGD	NR
3.0	SB4-4-2	NR	3.0	5.0	1.7	CL		CLAY; TRC SILT; TRC FINE TO COARSE PEBBLES. 2.5Y 5/4 LIGHT OLIVE BROWN MOTTLED WITH 2.5Y 5/1 GRAY; POORLY SORT; RND; DENSE; PLASTIC; MOIST.	BKGD	NR

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
SOIL BORING LOG

SITE 4

SOIL BORING NO.: SB4-5
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/29-30
DRILLING STARTED: 8/30/90
BORING COMPLETED: 8/30/90

LAND SURFACE ELEVATION: 795.44 MSL
TOTAL DEPTH DRILLED: 5 BLS
TOTAL DEPTH ELEVATION: 790.44 MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
1.0	SB4-5-1	40-50-23	1.0	3.0	1.2	CL		SILTY CLAY; SOME TO AND SILT; TRC COARSE TO COARSE PEBBLES; COAL CHUNKS. 2.5Y 5/2 GRAYISH BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	NR
3.0	SB4-5-2	10-18-25	3.0	5.0	1.5	CL		CLAY; TRC SILT; TRC FINE TO COARSE PEBBLES. 2.5Y 5/4 LIGHT OLIVE BROWN MOTTLED WITH 2.5Y 5/1 GRAY; POORLY SORT; RND; DENSE; PLASTIC; MOIST.	BKGD	NR

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Field Boring Log Page 1 of 1

Site File No. 03-0349-XY County ALLEN Boring No ~~SB4-1~~ SB4-6 Monitor Well No N/A

Site File Name FT WAYNE IANGB Surface Elev 787.52 Completion Depth 25.5'

Fed. ID No N/A Auger Depth 24.5' Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 10/30/91 Finish 10/30/91

Boring Location N 1269546.481
E 635213.465

Drilling Equipment CME-75; HSA; 140lb HAMMER

Personnel:
G - TIM WEATHERLY
D - TIM M. CRANK
H - DAVE D. JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	Penetrometer	N Values (Blows)	OVA or HNU readings (PPM)	REMARKS
	(1) ASPHALT, REC: .7' SOME GRAVEL TO 5mm SOME SILT WITH CLAY & SAND BROWN 10YR5/3		(1)	SS	X	Y	5-7-[illegible]	1PPM	SS - SPLIT SPOON BG = 1 PPM BACKGROUND DNR - DATA NOT RECORDED (1) LAB ANAL: LEAD 0.2 ppm, TPH/OIL 11 ppm, TPH/DESL 4.9 ppm, BTEX 84-210 ppb
	[ML] (2) BLACK COARSE MATERIAL W/ V. COURSE SAND. BOTTOM .5' SILT & CLAY; BROWN / GRAY MOTTLED. (10YR4/3 w/ 10YR4/1) REC: 1.3'	5.0	(2)	SS	X	Y	5-9-13	8 PPM	(2) LAB ANAL: LEAD 0.2 ppm, TOLUENE 0.7 ppb, TPH ND
	[ML] DK GRAY (10YR 4/1) (3) CLAY AND SILT. REC: 2.0'	10.0	(3)	SS	X	N	7-13-20	BG	
	[CL] (4) DK GRAY SILTY CLAY; MOIST, PLASTIC; 10YR 4/1.	15.0	(4)	SS	X	N	DNR	2-8	
	[GW] (5) GRAVELLY SAND - POORLY SORTED; PEBBLES TO 10 mm; GRAY - DK GRAY; SALT & PEPPER APPEARANCE; 10YR 3/2. REC: 2.0	20.0	(5)	SS	X	N	6-12-15	BG	
	[CL] (6) CLAY W/SILT, SOME PEBBLES (SUBR TO W. RND); PLASTIC SL. MOIST; 10YR 3/3 DK GREY. REC: DNR	25.0	6	SS	DNR	Y	6-6-10	BG	BG FOR SAMPLE #6 WAS 2PPM - 5PPM (6) LAB ANAL: LEAD 0.2 ppm, TPH/OIL 150 ppm, TPH/Diesel 98 ppm, TOLUENE 1.6 ppb

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Field Boring Log SB9-7 — Page 1 of 1

Site File No. 03-0349-XY — County ALLEN

Boring No. SB4-2 — Monitor Well No N/A

Site File Name FT WAYNE - IANGB

Surface Elev. 791.62 — Completion Depth 6.0'

Fed. ID. No N/A

Auger Depth 4.5 — Rotary Depth N/A

Quadrangle OSSIAN, IND — Sec. 9 — T. 29 — R 12

Date: Start 10/31/91 — Finish 10/31/91

Boring Location N 1269707.137 E 635033.558

Drilling Equipment CME 75; HSA; 140 lb HAMMER

Personnel:
G - TOM WEATHERLY
D - TIM CRANK
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings	REMARKS
	① [ML] SILT w/ CLAY & SOME CSE SAND. 10YR 4/3; DENSE; COMPACTED.		①	SS	X	Y	3-5		SS - SPLIT SPOON BG - BACKGROUND ① LAB ANAL: LEAD 0.2 ppm TPH/OIL 40 ppm TPH/DIESEL 12 ppm BTEX ND
		2.5							
	② [ML] SILT AND CLAY, TRC CSE SAND (~10%); DENSE & COMPACTED	5.0	②	SS	X	Y	7-11-16	BG	② LAB ANAL: LEAD 0.2 ppm TPH ND BTEX (TOLUENE) 3.5 ppb
		7.5							

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Field Boring Log

Page 1 of 1

Site File No. 03-0349-XX County ALLEN

Boring No. SB4-8 (SB4-3) Monitor Well No N/A

Site File Name FT WAYNE IANGB

Surface Elev. 787.67 Completion Depth 16'

Fed. ID. No. N/A

Auger Depth 14.5 Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R. 12

Date: Start 11/1/91 Finish 11/1/91

Boring Location N 1269899.317 E 635128.215

Drilling Equipment CME 75; HSA; 140 lb HAMMER

Personnel
G - TOM WEATHERLY
D - TIM CRANE
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings (ppm)	REMARKS
	① NO DESCRIPTION WAS RECORDED, REC: .9'		1	SS	X	Y	2-5-7	BG	SS - SPLIT SPOON BG - BACKGROUND BG = 3-5 PPM ① LAB ANAL: LEAD 19.3 ppm TPH ND BTEX ND
		2.5							
	② [ML] SILT AND CLAY. 10YR 5/3 BROWN WITH SOME GRAY MOTTLING. TRC CSE SAND; DENSE & COMPACTED. REC: .9'	5.0	2	SS	X	Y	2-4-4	10-20	BG = 3-5 PPM ② LAB ANAL: TPH ND BTEX (TOLUENE) 0.48 ppb LEAD 11.7 ppm
		7.5							
	③ [ML] SILT AND CLAY, SOME CSE SAND. 10YR 3/3; DENSE & COMPACTED; MOIST. REC: 1.5'	10.0	3	SS	X	N	5-7-8	BG	BG = 3-5 PPM
		12.5							
	④ [ML] SILT AND CLAY, 10YR3/1; DENSE & COMPACTED; MOIST. REC: 1.5'	15.0	4	SS	X	Y	5-8-9	BG	④ LAB ANAL: LEAD 10.1 ppm TPH/OIL 27 ppm TPH/Diesel 16 ppm BTEX ND
		17.5							

INDIANA
FT WAYNE, INDIANA
SOIL BORING LOG

SITE BKGD

BG-1

SOIL BORING NO.: (SB-B-1-1)
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/10-11
DRILLING STARTED: 8/28/90
BORING COMPLETED: 8/28/90

LAND SURFACE ELEVATION: MSL
TOTAL DEPTH DRILLED: 5 BLS
TOTAL DEPTH ELEVATION: MSL

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)	LAB ANALYSIS Y/N
0.0	BG-1-1	12-17-23	0.0	2.0	1.0	CL		CLAY; SOME SILT; SOME V. FINE TO V. COARSE PEBBLES; POOR SORT; RND TO SUBR; 10YR 3/3 - 4/3 DK. BROWN TO BROWN; SLIGHTLY DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0	Y
3.0	BG-1-2	NR	3.0	5.0	1.5	CL		CLAY; SOME SILT; SOME V. FINE TO V. COARSE PEBBLES; POOR SORT; RND TO SUBR; 10YR 3/3 - 4/3 DK. BROWN TO BROWN MOTTLED WITH 10YR 4/1 DK. GRAY; SLIGHTLY DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0	Y

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Field Boring Log

Page 1 of 1

Site File No. 03-0349-XX County ALLEN

Boring No. BG-2 (BG1-1) Monitor Well No N/A

Site File Name FT WAYNE IANGB

Surface Elev. 805.51 Completion Depth 39'

Fed. ID. No N/A

Auger Depth 37' Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12

Date: Start 11/3/91 Finish 11/3/91

Boring Location N 1267187.618
E 634626.554

Drilling Equipment CME 75, HSA; 140 lb HAMMER

Personnel:
G - TOM WEATHERLY
D - TIM CRANK
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings (PPM)	REMARKS
	(1) TOP 0.3' SAND, CSE TO V. CSE SAND. REMAINDER IS CONGLOMERATE OF ASPHALT, COBBLES, CONCRETE, SILT & CLAY. ALMOST LIKE GLACIAL TILL IN APPEARANCE. 10YR 4/4; DENSELY COMPACTED AND DRY. REC: 1.1'		(1)	SS		Y	7-15-20	BG	SS - SPLIT SPOON; BG - BACKGROUND; BG = .5-1 PPM
	(2) TOP .3' [SM] SAND, CSE TO V. CSE SAND, SOME SILT, GRANULES TO 2mm. LOOSELY COMPACTED; DRY. BOTTOM .6' [ML] SILT & CLAY, SOME PEBBLES, TRC V. CSE SAND, 10YR 4/3; SUBE TO SUBA. (CRUMBLES WITH EFFORT (SILT & CLAY); BREAKS RATHER THAN CRUMBLES (SAND); V. LITTLE MOISTURE. REC: .9'	5.0	(2)	SS		Y	4-9-9	BG	BG = .5-1 PPM. (1) LAB ANAL: LEAD 30.6 ppm; TPH 220 ppm; TOLUENE 2 ppb; PAH 600 ppb-3400 ppb. (2) LAB ANAL: LEAD 14.1 ppm; TPH 100 ppm; TOLUENE 31 ppb; PAH 370-1000 ppb
		10.0							
		15.0							
	(3) [ML] SILT & CLAY, TRC PEBBLES (2mm). 10YR 3/1 V. DK GRAY; V. DENSE AND COMPACT. REC: 1.35'	20.0	(3)	SS		Y	6-10-13	BG	BG = .3 PPM. (3) LAB ANAL: LEAD 9.1 ppm; TPH ~~41 ppm~~ ND; TOLUENE 41 ppb; PAH ND; SVOC ND
		25.0							
		30.0							(4) LAB ANAL: LEAD 10.3; TPH ND; VOC ND; SVOC ND
	(4) 37-39' [ML] SILT & CLAY. 10YR 3/1 V. DK GRAY; WET TO SAT. REC: 2.0'	35.0	(4)	SS		Y	5-7-8-12	BG	SAMPLE (4) WAS A TWO FOOT SAMPLING INTERVAL.

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Field Boring Log BG-3 Page 1 of 1

Site File No. 03-0349-XX County ALLEN Boring No. (BG 2-1) Monitor Well No N/A

Site File Name FT WAYNE IANGB Surface Elev. 790.90 Completion Depth 30.5

Fed. ID. No N/A Auger Depth 29.0' Rotary Depth N/A

Quadrangle OSSIAN, IND Sec. 9 T. 29 R 12 Date: Start 11/3/91 Finish 11/3/91

Boring Location N 1268664.986
E 635319.343

Drilling Equipment CME 75; HSA; 140 lbs HAMMER

Personnel:
G - TOM WEATHERLY
D - TIM CRANK
H - DAVE JULIUS
H -

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery	LAB ANALYSIS Y/N	N Values (Blows)	FID readings (PPM)	REMARKS
	(1) [ML] ~~SILT~~ CLAY, TRC FINE ROOTS. 10YR 3/3 DK. BROWN; CRUMBLES EASILY - NOT PLASTIC; LOOSELY COMPACTED; SL. MOIST, REC: 1.0'		(1)	SS	X	Y	3-5-6	BG	SS - SPLIT SPOON BG - BACKGROUND BG = .2 PPM (1) LAB ANAL: LEAD 20.6 ppm TOLUENE 110 ppb TPH ND SVOC ND
		5.0							
		10.0							
	(2) [ML] SILT & CLAY, TRC PEBBLES (2mm). 10YR 4/1 DK GRAY; SUBA TO SUBR; CRUMBLES EASILY; DENSE & COMPACTED, NOT PLASTIC; SL MOIST. REC: 1.4'	15.0	(2)	SS	X	Y	4-6-10	BG	BG = .2 PPM (2) LAB ANAL: LEAD 9.3 ppm VOC ~~BTEX~~ ND TPH ND SVOC ND
		20.0							
		25.0							
	(3) [SM] SAND, FINE SAND, SOME SILT. 10YR 4/1; SAT TO V. MOIST.	30.0	(3)	SS	X	Y	21-34-46	BG	(3) LAB ANAL LEAD 2 ppm VOC ~~BTEX~~ ND TPH ND SVOC ND
		35.0							

INDIANA ANG SITE INVESTIGATION FORT WAYNE, INDIANA
WELL BORING LOG

SITE FTA

WELL BORING NO.: MW1-1
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 3/46-47
DRILLING STARTED: 9/6/90
WELL COMPLETED: 9/6/90

LAND SURFACE ELEVATION: 804.37 MSL
TOTAL DEPTH DRILLED: 47.24 BLS
TOTAL DEPTH ELEVATION: 757.13 MSL
COMPLETION DEPTH: 47.24 BLS

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	S C R	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0											
5.0	MW1-1-1	3-5-8-13	5.0	7.0	1.1	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SAND; SOME V. FINE TO V. COARSE PEBBLES. 2.5Y 3/2 V. DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; MED DENSE; SLIGHTLY PLASTIC; MOIST	BKGD	NR
10.0	MW1-1-2	2-4-4-8	10.0	12.0	1.0	CL			CLAY; SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC V. FINE TO V. COARSE PEBBLES. 5Y 3/1 - 3/2 VERY DARK GRAY TO DARK OLIVE GRAY; POORLY SORT; RND TO SUBR; DENSE; PLASTIC; MOIST.	BKGD	NR
15.0	MW1-1-3	6-11-13-17	15.0	17.0	1.0	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SAND; TRC V. FINE TO MED PEBBLES. 2.5Y 3/2 - 4/2 VERY DARK GRAYISH BROWN TO DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; V. DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST TO MOIST.	BKGD	NR

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	SCR	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
20.0	MW1-1-4	3-6-9-15	20.0	22.0	1.2	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SANDS; TRC V. FINE TO MED PEBBLES. 2.5Y 3/2 - 4/2 VERY DARK GRAYISH BROWN TO DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; V. DENSE; PLASTIC; MOIST.	BKGD	NR
25.0	MW1-1-5	3-9-11-18	25.0	27.0	1.5	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SANDS; TRC V. FINE TO MED PEBBLES. 2.5Y 3/2 - 4/2 VERY DARK GRAYISH BROWN TO DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; V. DENSE; PLASTIC; MOIST.	BKGD	NR
30.0	MW1-1-6	3-8-11-16	30.0	32.0	1.2	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SANDS; TRC V. FINE TO MED PEBBLES. 2.5Y 3/2 - 4/2 VERY DARK GRAYISH BROWN TO DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; V. DENSE; PLASTIC; MOIST.	BKGD	NR
35.0	MW1-1-7	5-5-5-7	35.0	37.0	1.45	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SANDS; TRC V. FINE TO MED PEBBLES. 2.5Y 3/2 - 4/2 VERY DARK GRAYISH BROWN TO DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; V. DENSE; VERY PLASTIC; V. MOIST TO WET.	BKGD	NR
40.0	MW1-1-8	2-5-8-13	40.0	42.0	0.9	GW			GRAVEL; V. FINE TO V. COARSE PEBBLES (UP TO 4CM); SOME V. FINE TO COARSE SAND; TRC SILT. 2.5Y 3/2 VERY DARK GRAYISH BROWN TO 4/2 DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; SAT.	BKGD	NR

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	SCR	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
45.0	MW1-1-9	16-38-32-34	45.0	47.0	1.8	SW		-	0-.25', SAND; V.FINE TO V. COARSE; SOME V. FINE TO MED PEBBLES. 2.5Y 3/2 - 4/2 VERY DARK GRAYISH BROWN TO DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; SAT. .25-1.8', CLAY; SOME TO AND SILT; TRC TO SOME V. FINE SAND TO MED PEBBLES. 5Y 4/1 DARK GRAY; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	NR
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.											
50.0											

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
WELL BORING LOG

SITE FTA

WELL BORING NO.: MW1-2
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 3/43-44
DRILLING STARTED: 9/6/90
WELL COMPLETED: 9/6/90

LAND SURFACE ELEVATION: 807.23 MSL
TOTAL DEPTH DRILLED: 52.56 BLS
TOTAL DEPTH ELEVATION: 744.67 MSL
COMPLETION DEPTH: 52.56 BLS

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	S C R	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0											
5.0	MW1-2-1	2-4-4-7	5.0	7.0	1.0	CL			CLAY; TRC TO SOME SILT; TRC FINE TO MED. SAND. 2.5Y 4/2 DARK GRAYISH BROWN MOTTLED WITH 10YR 5/1 GRAY AND 10YR 5/6 - 6/6 YELLOWISH BROWN TO BROWNISH YELLOW; POORLY SORT; DENSE; PLASTIC; MOIST.	BKGD	0
10.0	MW1-2-2	2-2-4-4	10.0	12.0	0.9	CL			CLAY; TRC TO SOME SILT; TRC V. FINE TO MED PEBBLES (3-5MM) AND SANDY LAYERS (SEVERAL GRAINS THICK); V. FINE TO COARSE SAND. 2.5Y 4/2 DARK GRAYISH BROWN MOTTLED WITH 10YR 5/1 GRAY AND 10YR 5/6 - 6/6 YELLOWISH BROWN TO BROWNISH YELLOW; MOD TO WELL SORT; DENSE; PLASTIC; MOIST.	BKGD	0
15.0	MW1-2-3	2-4-6-11	15.0	17.0	1.0	CL			CLAY; SOME SILT; TRC FINE SAND TO MED PEBBLES. 5Y 3/1 - 4/1 V. DARK GRAY TO DARK GRAY; POORLY SORTED; RND; DENSE; SLIGHTLY PLASTIC TO PLASTIC; SLIGHTLY MOIST.	BKGD	0

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	S C R	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
20.0	MW1-2-4	6-10-15-24	20.0	22.0	1.4	CL			CLAY; SOME SILT; TRC TO SOME V. FINE TO COARSE SAND; TRC V. FINE TO COARSE PEBBLES (UP TO 2CM). 5Y 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	0
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25.0	MW1-2-5	4-7-10-19	25.0	27.0	1.8	CL			CLAY; SOME SILT; TRC TO SOME V. FINE TO COARSE SAND; TRC V. FINE TO COARSE PEBBLES (UP TO 2CM). 5Y 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	0
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30.0	MW1-2-6	6-15-20-22	30.0	32.0	1.1	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO COARSE SAND; TRC V. FINE TO COARSE PEBBLES (UP TO 2CM). 5Y 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	NR
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35.0	MW1-2-7	NR	35.0	37.0	1.2	CL			CLAY; SOME SILT; TRC TO SOME V. FINE TO COARSE SAND; TRC V. FINE TO COARSE PEBBLES (UP TO 2CM). 5Y 4/1 -5/1 DARK GRAY TO GRAY; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	NR
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40.0	MW1-2-8	18-30-35-31	40.0	42.0	0.2	CL			CLAY; SOME SILT; TRC TO SOME V. FINE TO COARSE SAND; TRC V. FINE TO COARSE PEBBLES (UP TO 2CM). 5Y 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	NR
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DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	S C R	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
45.0	MW1-2-9	4-12-16-21	45.0	47.0	1.0	GW			GRAVEL; V. FINE TO V. COARSE PEBBLES (UP TO 5CM); SOME V. FINE TO V. COARSE SAND; TRC SILT. 5Y 4/1 DARK GRAY; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; SAT.	BKGD	NR
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50.0	MW1-2-10	7-17-24-38	50.0	52.0	2.0	GW			GRAVEL; V. FINE TO V. COARSE PEBBLES (UP TO 5CM); SOME V. FINE TO V. COARSE SAND; TRC SILT. 5Y 4/1 DARK GRAY; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; SAT.	BKGD	NR
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INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
WELL BORING LOG

SITE HWSA

WELL BORING NO.: MW2-1
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 4/31-35
DRILLING STARTED: 9/7/90
WELL COMPLETED: 9/7/90

LAND SURFACE ELEVATION: 801.17 MSL
TOTAL DEPTH DRILLED: 58.19 BLS
TOTAL DEPTH ELEVATION: 742.88 MSL
COMPLETION DEPTH: 58.19 BLS

DRILLING COMPANY: MATHES ENV. SERV
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	SCR	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0											
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5.0	MW2-1-1	2-3-3-4	5.0	7.0	0.6	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE PEBBLES. 10YR 4/3 - 4/4 DARK BROWN TO DARK YELLOWISH BROWN MOTTLED WITH 10YR 5/1 GRAY; POORLY SORT; RND TO SUBR; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0
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.0.0	MW2-1-2	4-9-14-17	10.0	12.0	1.5	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SAND; TRC MED PEBBLES. 10YR 4/3 - 4/4 DARK BROWN TO DARK YELLOWISH BROWN MOTTLED WITH 10YR 5/1 GRAY; POORLY SORT; RND TO SUBR; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0
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15.0	MW2-1-3	5-13-16-19	15.0	17.0	0.7	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SAND; TRC FINE TO MED PEBBLES. 10YR 4/3 - 4/4 DARK BROWN TO DARK YELLOWISH BROWN MOTTLED WITH 10YR 5/1 GRAY; POORLY SORT; RND TO SUBR; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	0
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DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	SCR	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
20.0	MW2-1-4	4-10-15-22	20.0	22.0	1.7	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SAND; TRC MED PEBBLES. 2.5YR 4/2 DARK GRAYISH BROWN; POORLY SORT; RND TO SUBR; DENSE; SLIGHTLY PLASTIC; MOIST.	BKGD	NR
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25.0	MW2-1-5	4-7-11-17	25.0	27.0	1.5	CL			CLAY; SOME SILT; TRC TO SOME V. FINE TO V. COARSE SAND; TRC V. FINE TO MED GRAVEL. 5Y 4/1 DARK GRAY; POORLY SORT;RND TO SUBR; DENSE; PLASTIC; MOIST.	BKGD	0
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30.0	MW2-1-6	4-8-11-15	30.0	32.0	1.2	CL			CLAY; SOME SILT; SOME V. FINE TO V. COARSE SAND; TRC TO SOME V. FINE TO MED PEBBLES. 5Y 4/1 DARK GRAY; POORLY SORT;RND TO SUBR; DENSE; PLASTIC; MOIST.	BKGD	NR
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35.0	MW2-1-7	4-6-9-14	35.0	37.0	1.4	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO V. COARSE SAND; TRC V. FINE TO MED PEBBLES. 5Y 4/1 DARK GRAY; POORLY SORT; RND TO SUBR; DENSE TO SLIGHTLY DENSE; SLIGHTLY PLASTIC; MOIST TO SLIGHTLY WET.	BKGD	0
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40.0	MW2-1-8	15-27-50	40.0	42.0	1.0	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO MED SAND; TRC V. FINE TO MED PEBBLES. 5Y 4/1 DARK GRAY; WELL SORT; RND TO SUBR; DENSE; SLIGHTLY PLASTIC; MOIST TO WET. THIN LAYERS (1-3 GRAINS THICK) OF WELL SORT FINE TO MED SAND.	BKGD	0
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DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	S C R	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
45.0	MW2-1-9	12-22-30-30	45.0	47.0	1.9	CL			CLAY; SOME TO AND SILT; SOME V. FINE TO MED SAND; TRC V. FINE TO MED PEBBLES. 5Y 4/1 DARK GRAY; WELL SORT; RND TO SUBR; DENSE; SLIGHTLY PLASTIC; MOIST TO WET.	BKGD	NR
50.0	MW2-1-10	4-20-54	50.0	52.0	1.6	SP			SAND; V. FINE TO MED; TRC COARSE SAND; TRC SILT. 5Y 4/1 - 4/2 DARK GRAY TO OLIVE GRAY; WELL SORT; RND TO SUBR; LOOSE; NON-PLASTIC; SAT.	BKGD	NR
55.0	MW2-1-11	26-33	55.0	57.0	0.4	SP			0-.15', SAND; V. FINE TO MED; TRC COARSE; TRC SILT. 5Y 4/1 - 4/2 DARK GRAY TO OLIVE GRAY; WELL SORT; RND TO SUBR; LOOSE; NON- PLASTIC; SAT.	BKGD	NR
						ML			.15-.4', SILT; SOME CLAY; SOME V. FINE TO COARSE SAND; TRC TO SOME V. FINE TO MED PEBBLES. 5Y 3/1 - 4/1 V. DARK GRAY TO DARK GRAY; POORLY SORT; RND TO SUBR; V. DENSE; NON-PLASTIC; SLIGHTLY MOIST TO DRY.		

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
WELL BORING LOG

SITE HWSA

WELL BORING NO.: MW4-1
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 3/34-36
DRILLING STARTED: 8/31/90
WELL COMPLETED: 9/4/90

LAND SURFACE ELEVATION: 796.91 MSL
TOTAL DEPTH DRILLED: 54.01 BLS
TOTAL DEPTH ELEVATION: 742.90 MSL
COMPLETION DEPTH: 53.51 BLS

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	S C R	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0											
-											
-											
-											
-											
5.0	MW4-1-1	12-16-21-34	5.0	7.0	1.5	CL			CLAY; SOME SILT TO FINE SAND; TRC TO SOME COARSE SAND TO MED. PEBBLES. 10YR 4/3 BROWN; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	NR
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10.0	MW4-1-2	6-16-22-32	10.0	12.0	0.9	CL			CLAY; SOME COARSE CLAY TO FINE SAND; TRC TO SOME COARSE SAND TO MED. PEBBLES. 10YR 4/3 BROWN MOTTLED WITH 10 YR 5/1 GRAY; POORLY SORT; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	NR
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15.0	MW4-1-3	6-12-14-22	15.0	17.0	1.8	CL			CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC FINE TO MED. PEBBLES. 10YR 4/1 DARK GRAY MOTTLED WITH 10YR4/3 BROWN; POORLY SORT; RND TO SUBR.; DENSE; PLASTIC; MOIST.	BKGD	NR
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DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	S C R	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
20.0	MW4-1-4	5-8-13-19	20.0	22.0	1.9	CL			CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC FINE TO MED. PEBBLES. 10YR 4/1 DARK GRAY; POORLY SORT.; RND TO SUBR.; DENSE; PLASTIC; MOIST.	BKGD	NR
25.0	MW4-1-5	4-8-14-21	25.0	27.0	1.1	CL			CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC FINE TO MED. PEBBLES. 10YR 4/1 DARK GRAY; POORLY SORT.; RND TO SUBR.; DENSE; PLASTIC; MOIST.	BKGD	NR
30.0	MW4-1-6	5-7-9-14	30.0	32.0	1.9	CL			CLAY; SOME SAND; FINE TO MED. SAND; TRC COARSE SAND; SOME SILT. 10YR 4/1 DARK GRAY; POORLY SORT; RND SUBR; LOOSE; NON-PLASTIC; MOIST TO SLIGHTLY SAT. SAND LENSE FROM 1.3 TO 1.6 FT.	BKGD	NR
35.0	MW4-1-7	60-	35.0	37.0	0.6	CL			SILTY CLAY; SOME TO AND SILT; SOME V. FINE TO FINE SAND; TRC. COARSE SAND TO FINE PEBBLES. 2.5YR 4/2 - 5/2 DARK GRAYISH BROWN TO GRAYISH BROWN; POORLY SORT; RND; DENSE (BREAKS IN .5 - 1CM LAYERS); NON-PLASTIC; DAMP TO SLIGHTLY MOIST.	BKGD	NR
40.0	MW4-1-8	45-30	40.0	42.0	0.9	CL			SILTY CLAY; SOME TO AND SILT; 2.5YR 4/2 - 5/2 DARK GRAYISH BROWN TO GRAYISH BROWN; POORLY SORT; RND; DENSE (BREAKS IN .5 - 1CM LAYERS); NON-PLASTIC; DAMP TO SLIGHTLY MOIST.	BKGD	NR

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	SCR	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
45.0	MW4-1-9	35-50	45.0	47.0	0.8	CL			SILTY CLAY; SOME TO AND SILT; SOME FINE TO COARSE SAND AND PEBBLES (UP TO 1 CM). 2.5YR 4/2 - 5/2 DARK GRAYISH BROWN TO GRAYISH BROWN; POORLY SORT; RND; DENSE (BREAKS IN .5 - 1CM LAYERS); NON-PLASTIC; DAMP TO SLIGHTLY MOIST.	BKGD	NR
48.5	MW4-1-10	100	48.5	50.5	0.5	CL			SILTY CLAY; SOME TO AND SILT; SOME FINE TO COARSE SAND AND PEBBLES (UP TO 1 CM). 2.5YR 4/2 - 5/2 DARK GRAYISH BROWN TO GRAYISH BROWN; POORLY SORT; RND; DENSE (BREAKS IN .5 - 1CM LAYERS); NON-PLASTIC; DAMP TO SLIGHTLY MOIST.	BKGD	NR
50.0											

INDIANA ANG SITE INVESTIGATION, FORT WAYNE, INDIANA
WELL BORING LOG

SITE POL

WELL BORING NO.: MW4-02
SUPERVISORY GEOLOGIST: KATE FOX
LOG BOOK/PG. NO. : 3/39-41
DRILLING STARTED: 9/5/90
WELL COMPLETED: 9/5/90

LAND SURFACE ELEVATION: 790.68 MSL
TOTAL DEPTH DRILLED: 59.38 BLS
TOTAL DEPTH ELEVATION: 731.30 MSL
COMPLETION DEPTH: 59.38 BLS

DRILLING COMPANY: MATHES ENV. SERV.
DRILLER: K. BUNSELMEYER
RIG TYPE: CME - 550

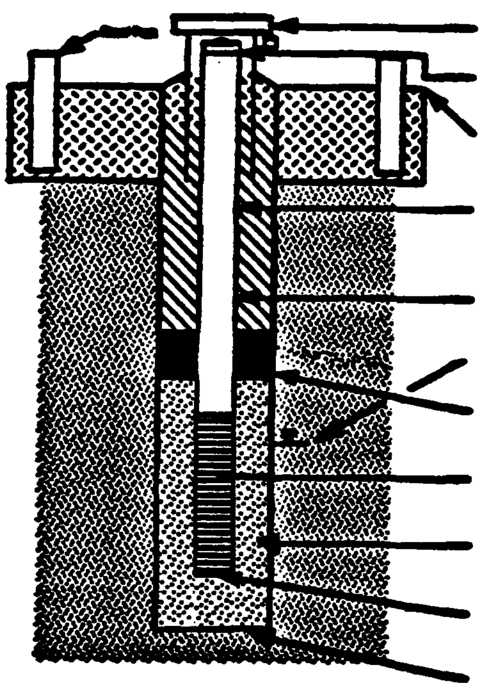
DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	S C R	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
0.0											
5.0	MW4-2-1	4-19-14-19	5.0	7.0	1.4	CL			CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC FINE PEBBLES. 10YR 4/3 - 4/4 BROWN TO DARK YELLOWISH BROWN MOTTLED WITH 5Y 5/2 - 4/2 OLIVE GRAY; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	NR
10.0	MW4-2-2	5-9-15-22	10.0	12.0	1.3	CL			CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC FINE PEBBLES. 10YR 4/3 - 4/4 BROWN TO DARK YELLOWISH BROWN MOTTLED WITH 10YR 5/1 - 4/1 GRAY TO DARK GRAY; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	1
15.0	MW4-2-3	4-9-14-20	15.0	17.0	1.1	CL			CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC FINE PEBBLES. 10YR 4/3 - 4/4 BROWN TO DARK YELLOWISH BROWN MOTTLED WITH 10YR 5/1 - 4/1 GRAY TO DARK GRAY; POORLY SORT; RND; DENSE; SLIGHTLY PLASTIC; SLIGHTLY MOIST.	BKGD	0

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	SCR	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
20.0	MW4-2-4	6-12-14-15	20.0	22.0	1.3	CL			CLAY; SOME SILT; TRC FINE TO COARSE SAND; TRC V. FINE TO COARSE PEBBLES (UP TO 3 CM). 10YR 5/1 - 4/1 GRAY TO DARK GRAY; POORLY SORT; RND TO SUBR; DENSE; PLASTIC; MOIST.	BKGD	NR
-											
-											
-											
-											
25.0	MW4-2-5	2-4-14-45	25.0	27.0	1.4	CL			0.0 - 1.15'; CLAY; SOME SILT; SOME FINE TO COARSE SAND; TRC V. FINE TO COARSE PEBBLES. 10YR 5/1 - 4/1 GRAY TO DARK GRAY; POORLY SORT; RND TO SUBR; PLASTIC; MOIST. 1.15 - 1.4 FT SANDY CLAY; SOME TO AND SAND; SOME V. FINE TO COARSE SILT SAND; TRC TO SOME V. FINE TO COARSE PEBBLES (UP TO 1CM). 10YR 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND TO SUBR; V. DENSE; NON-PLASTIC; SLIGHTLY MOIST TO DRY.	BKGD	NR
-											
-											
-											
-											
30.0	MW4-2-6	40-50	30.0	32.0	1.0	CL			SANDY CLAY; SOME TO AND SAND; SOME V. FINE TO COARSE SILT SAND; TRC TO SOME V. FINE TO COARSE PEBBLES (UP TO 1CM). 10YR 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND TO SUBR; V. DENSE; NON-PLASTIC; SLIGHTLY MOIST TO DRY.	BKGD	0
-											
-											
-											
-											
35.0	MW4-2-7	35-50	35.0	37.0	0.8	CL			SANDY CLAY; SOME TO AND SAND; SOME V. FINE TO COARSE SILT SAND; TRC TO SOME V. FINE TO COARSE PEBBLES UP TO 1CM 10YR 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND TO SUBR; V. DENSE; NON-PLASTIC; MOIST TO SLIGHTLY WET. LAST 1" SILTY SAND; V. FINE TO COARSE SAND; SOME SILT; SOME V. FINE TO COARSE PEBBLES(UP TO .5CM). 5Y 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND TO SUBR; DENSE; NON-PLASTIC; WET.	BKGD	NR
-											
-											
-											
-											
40.0	MW4-2-8	30-50	40.0	42.0	0.8	CL			SANDY CLAY; SOME TO AND SAND; SOME V. FINE TO COARSE SAND; TRC TO SOME V. FINE TO COARSE PEBBLES UP TO 1CM 10YR 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND TO SUBR; V. DENSE; NON-PLASTIC; MOIST TO WET. LAST 1" SILTY SAND; V. FINE TO COARSE SAND; SOME SILT; SOME V. FINE TO COARSE PEBBLES(UP TO .5CM). 5Y 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND TO SUBR; DENSE; NON-PLASTIC; SLIGHTLY SAT.	BKGD	NR
-											
-											
-											
-											

DEPTH (FT BLS)	SAMPLE NUMBER	BLOW COUNT	TOP OF SAMPLE (FT BLS)	BOTTOM SAMPLE (FT BLS)	RECOVERY (FT)	SOIL TYPE (USCS)	LITHOLOGIC SYMBOLS	3 C R	LITHOLOGIC DESCRIPTION	LEL RESULTS %	HNU RESULTS (PPM)
45.0	MW4-2-9	45-50	45.0	47.0	0.7	CL			SANDY CLAY; SOME TO AND SAND; SOME V. FINE TO COARSE SILT SAND; TRC TO SOME V. FINE TO COARSE PEBBLES (UP TO 1CM) 10YR 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND TO SUBR; V. DENSE; NON-PLASTIC; SLIGHTLY SAT. LAST 1" SILTY SAND; V. FINE TO COARSE SAND; SOME SILT; SOME V. FINE TO COARSE PEBBLES(UP TO .5CM). 5Y 4/1 - 5/1 DARK GRAY TO GRAY; POORLY SORT; RND TO SUBR; DENSE; NON-PLASTIC; SLIGHTLY SAT.	BKGD	NR
50.0	MW4-2-10	35-65	50.0	52.0	0.8	CL			SANDY SILT CLAY-CLAY; SOME SILT; SOME FINE TO COARSE SAND, TRC V.FINE TO COARSE (UP TO 1CM) GRAVEL. 5YR 4/1 DARK GRAY; POORLY SORT; RND TO SUBR; DENSE; NON-PLASTIC; SLIGHTLY MOIST.	BKGD	0
55.0	MW4-2-11	27-50	55.0	57.0	0.8	SP			SAND; SOME SILT; TRC CLAY; V. FINE TO V. COARSE SAND; TRC TO SOME FINE TO COARSE PEBBLES (PEBBLES UP TO 2CM). 5YR 4/1 DARK GRAY; POORLY SORT; RND TO SUBR; LOOSE; NON-PLASTIC; SAT.	BKGD	0
60.0											

Well No.	: MW1-01	Drilling Company	: MATHES ENV. SERV.
U.S.G.S. Coordinates	:	Rig Type	: CME - 550
Longtitude	: 0.00	Driller	: K. BUNSELMEYER
Latitude	: 0.00	Drilling Started (Date)	: 9/6/90
State Coordinates	:	Drilling Completed (Date)	: 9/7/90
Northings	: 634,506.42		:
Eastings	: 1,267,167.30	Completion Depth	: 47.24
Reference Point	: TOP OF PVC CASING		:
Reference Point Elev.	: 807.28	Development	:
Type of Security	: LOCKING CAP	Date	: 9/8/90
		Type	: COMPRESSED AIR
Supervisory Geologist	: KATE FOX	Volume Removed	: 110 GAL.
Log Book/Page No.	: 3/46-49		:
		Post Devel. Water Level	: 767.29
		Date	: 9/8/90
			:
		Hydraulic Conductivity	: NR CM/SEC

MONITORING WELL AS-BUILT



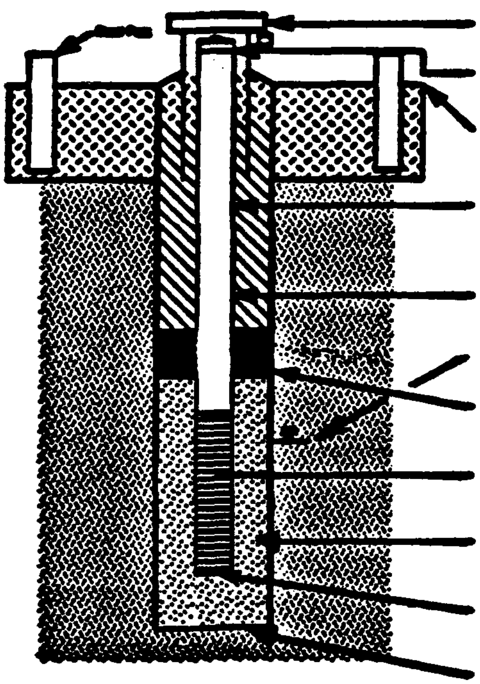
			BLS	MSL
Steel Casing with Cap and lock		+	NR	804.37
Top of Riser w/Vented Cap and Eyebolt		+	2.91	807.28
Land Surface:			0.00	804.37
Cement Bentonite Grout:	Top		0.00	804.37
	Bottom		30.40	773.97
Riser:	Top	+	2.91	807.28
	Bottom		34.45	769.92
Water Level During Drilling:			NR	804.37
Seal:	Top		30.40	773.97
	Bottom		32.50	771.87
Screen:	Top		34.45	769.92
	Bottom		45.13	759.24
Sand Pack:	Top		32.50	771.87
	Bottom		47.24	757.13
Bottom Sump:	Top		45.13	759.24
	Bottom		47.24	757.13
Borehole Total Depth:			47.24	757.13

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	:	MW1-02	Drilling Company	:	MATHES ENV. SERV.
U.S.G.S. Coordinates	:		Rig Type	:	CME - 550
Longtitude	:	0.00	Driller	:	K. BUNSELMEYER
Latitude	:	0.00	Drilling Started (Date)	:	9/6/90
State Coordinates	:		Drilling Completed (Date)	:	9/6/90
Northings	:	634,639.96		:	
Eastings	:	1,267,330.69	Completion Depth	:	52.56
Reference Point	:	TOP OF PVC CASING		:	
Reference Point Elev.	:	810.21	Development	:	
Type of Security	:	LOCKING CAP	Date	:	9/7/90
			Type	:	COMPRESSED AIR
Supervisory Geologist	:	KATE FOX	Volume Removed	:	128.3 GAL
Log Book/Page No.	:	3/43-46		:	
			Post Devel. Water Level	:	769.60
			Date	:	9/7/90
				:	
			Hydraulic Conductivity	:	NR CM/SEC

MONITORING WELL AS-BUILT



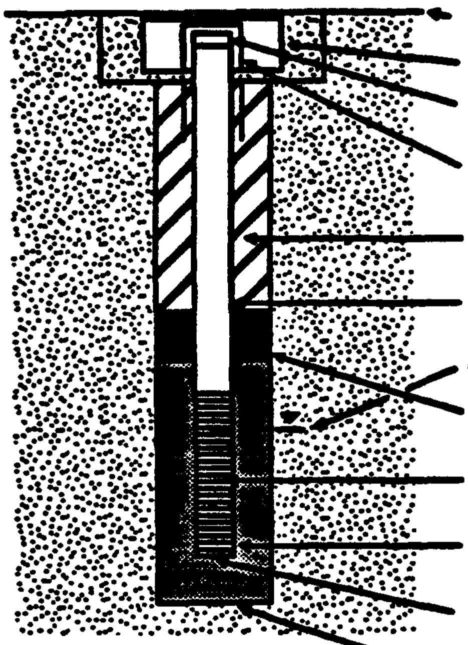
			BLS	MSL
Steel Casing with Cap and lock		+	NR	807.23
Top of Riser w/Vented Cap and Eyebolt		+	2.98	810.21
Land Surface:			0.00	807.23
Cement Bentonite Grout:	Top		0.00	807.23
	Bottom		37.30	769.93
Riser:	Top	+	2.98	810.21
	Bottom		39.78	767.45
Water Level During Drilling:			40.61	766.62
Seal:	Top		34.30	772.93
	Bottom		37.30	769.93
Screen:	Top		39.78	767.45
	Bottom		50.41	756.82
Sand Pack:	Top		37.30	769.93
	Bottom		52.56	754.67
Bottom Sump:	Top		50.41	756.82
	Bottom		52.56	754.67
Borehole Total Depth:			52.56	754.67

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
(+) Signifies Above Land Surface (ALS) measurements

Well No.	:	MW2-01	Drilling Company	:	MATHES ENV. SERV.
USGS Coordinates	:		Rig Type	:	CME - 550
Longitude	:	0.00	Driller	:	K. BUNSELMEYER
Latitude	:	0.00	Drilling Started (Date)	:	9/7/90
State Coordinates	:		Drilling Completed (Date)	:	9/7/90
Northings	:	634,627.69			
Eastings	:	1,268,860.36	Completion Depth	:	58.19
Reference Point	:	TOP OF PVC CASING			
Reference Point Elev.	:	800.72	Developement		
Type of Security	:	LOCKING CAP	Date	:	9/9/90 to 9/10/90
			Type	:	COMPRESSED AIR
Supervisory Geologist	:	KATE FOX	Volume Removed	:	NR
Log Book/Page No.	:	4/31-37			
			Post Devel. Water Level	:	757.81
			Date	:	8/30/90
			Hydraulic Conductivity	:	NR CM/SEC

MONITORING WELL AS-BUILT



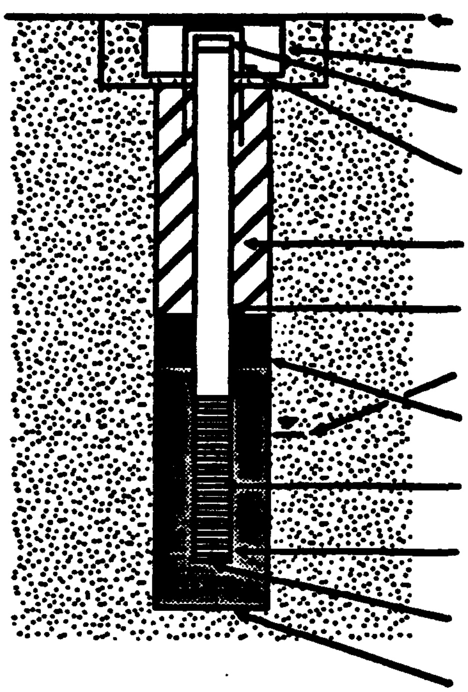
			BLS	MSL
Land Surface			0.00	801.17
Flush Mount Vault (approx.)		+	NR	801.17
Top of Riser w/Water-tight Cap			0.45	800.72
Protective Casing w/ Locking Cap			NR	801.17
Cement/Bentonite Grout:	Top		NR	801.17
	Bottom		41.00	760.17
Riser:	Top		0.45	800.72
	Bottom		45.43	755.74
Water Level During Drilling:			42.91	758.26
Seal:	Top		41.00	760.17
	Bottom		43.00	758.17
Screen:	Top		45.43	755.74
	Bottom		56.06	745.11
Sand Pack:	Top		43.00	758.17
	Bottom		58.19	742.98
Bottom Sump:	Top		56.06	745.11
	Bottom		58.19	742.98
Borehole Total Depth:			58.19	742.98

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	:	MW4-01	Drilling Company	:	MATHES ENV. SERV.
USGS Coordinates	:		Rig Type	:	CME - 550
Longitude	:	0.00	Driller	:	K. BUNSELMEYER
Latitude	:	0.00	Drilling Started (Date)	:	8/31/90
State Coordinates	:		Drilling Completed (Date)	:	9/4/90
Northings	:	634,768.31			
Eastings	:	1,270,008.55	Completion Depth	:	53.51
Reference Point	:	TOP OF PVC CASING			
Reference Point Elev.	:	796.52	Developement		
Type of Security	:	LOCKING CAP	Date	:	9/4/90
			Type	:	COMPRESSED AIR
Supervisory Geologist	:	KATE FOX	Volume Removed	:	9 GAL.
Log Book/Page No.	:	3/35-38			
			Post Devel. Water Level	:	748.48
			Date	:	9/9/90
			Hydraulic Conductivity	:	NR CM/SEC

MONITORING WELL AS-BUILT



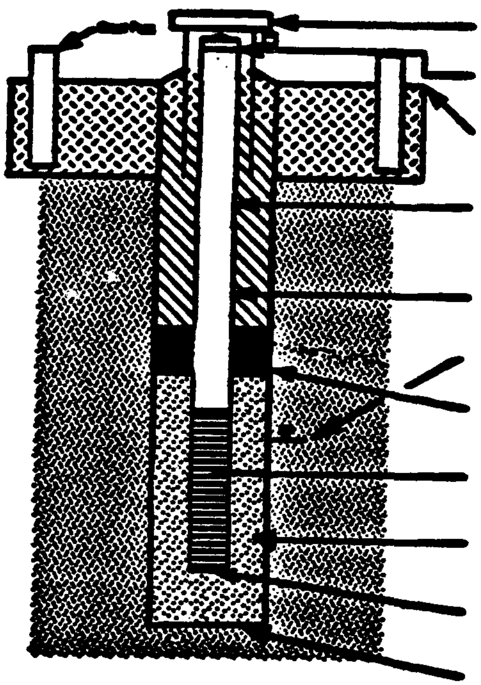
			BLS	MSL
Land Surface			0.00	796.91
Flush Mount Vault (approx.)		+	0.10	797.01
Top of Riser w/Water-tight Cap			0.39	796.52
Protective Casing w/ Locking Cap			NR	796.91
Cement/Bentonite Grout:	Top		NR	796.91
	Bottom		33.50	763.41
Riser:	Top		0.39	796.52
	Bottom		41.03	755.88
Water Level During Drilling:			38.90	758.01
Seal:	Top		33.50	763.41
	Bottom		38.90	758.01
Screen:	Top		41.03	755.88
	Bottom		51.37	745.54
Sand Pack:	Top		38.90	758.01
	Bottom		54.00	742.91
Bottom Sump:	Top		51.37	745.54
	Bottom		53.52	742.91
Borehole Total Depth:			54.01	742.90

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	: MW4-02	Drilling Company	:	MATHES ENV. SERV.
U.S.G.S. Coordinates	:	Rig Type	:	CME - 550
Longtitude	: 0.00	Driller	:	K. BUNSELMEYER
Latitude	: 0.00	Drilling Started (Date)	:	9/5/90
State Coordinates	:	Drilling Completed (Date)	:	9/6/90
Northings	: 635,550.12		:	
Eastings	: 1,270,055.11	Completion Depth	:	59.38
Reference Point	: TOP OF PVC CASING		:	
Reference Point Elev.	: 793.27	Development	:	
Type of Security	: LOCKING CAP	Date	:	9/7/90
		Type	:	COMPRESSED AIR
Supervisory Geologist	: KATE FOX	Volume Removed	:	55 GAL.
Log Book/Page No.	: 3/39-43		:	
		Post Devel. Water Level	:	756.33
		Date	:	9/7/90
			:	
		Hydraulic Conductivity	:	NR CM/SEC

MONITORING WELL AS-BUILT



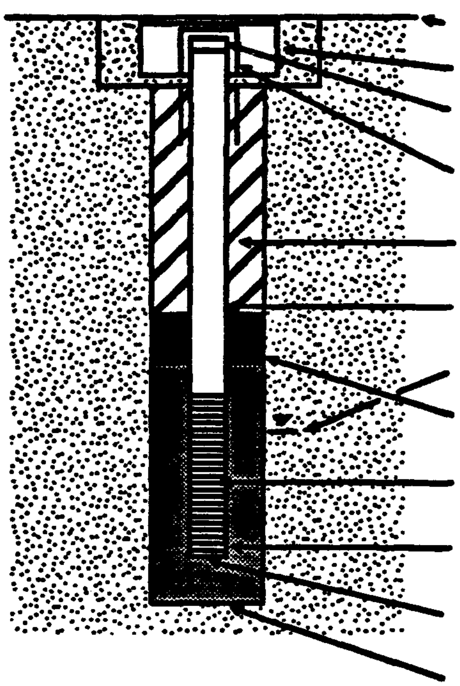
			BLS	MSL
Steel Casing with Cap and lock		+	2.83	793.51
Top of Riser w/Vented Cap and Eyebolt		+	2.59	793.27
Land Surface:			0.00	790.68
Cement Bentonite Grout:	Top		0.00	790.68
	Bottom		41.00	749.68
Riser:	Top	+	2.59	793.27
	Bottom		46.50	744.18
Water Level During Drilling:			34.30	756.38
Seal:	Top		41.00	749.68
	Bottom		45.00	745.68
Screen:	Top		46.50	744.18
	Bottom		57.25	733.43
Sand Pack:	Top		45.00	745.68
	Bottom		59.38	731.30
Bottom Sump:	Top		57.25	733.43
	Bottom		59.38	731.30
Borehole Total Depth:			59.38	731.30

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
(+) Signifies Above Land Surface (ALS) measurements

Well No.	:	P-1	Drilling Company	:	MATHES ENV. SERV.
USGS Coordinates	:		Rig Type	:	CME - 550
Longitude	:	0.00	Driller	:	K. BUNSELMEYER
Latitude	:	0.00	Drilling Started (Date)	:	8/17/90
State Coordinates	:		Drilling Completed (Date)	:	8/18/90
Northings	:	635,550.12			
Eastings	:	1,270,055.11	Completion Depth	:	38.35
Reference Point	:	TOP OF PVC CASING			
Reference Point Elev.	:	786.74	Developement		
Type of Security	:	LOCKING CAP	Date	:	8/20/90
			Type	:	COMPRESSED AIR
Supervisory Geologist	:	KATE FOX	Volume Removed	:	18 GAL. APPROX.
Log Book/Page No.	:	3/8-10			
			Post Devel. Water Level	:	756.93
			Date	:	8/30/90
			Hydraulic Conductivity	:	NR CM/SEC

MONITORING WELL AS-BUILT



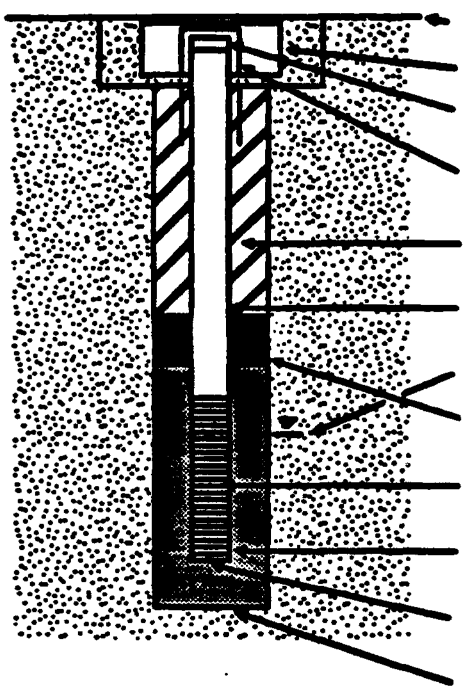
			BLS	MSL
Land Surface			0.00	787.13
Flush Mount Vault (approx.)		+	0.10	787.23
Top of Riser w/Water-tight Cap			0.39	786.74
Protective Casing w/ Locking Cap			NR	787.13
Cement/Bentonite Grout:	Top		NR	787.13
	Bottom		28.50	758.63
Riser:	Top		0.39	786.74
	Bottom		35.00	752.13
Water Level During Drilling:			25.55	761.58
Seal:	Top		28.50	758.63
	Bottom		30.50	756.63
Screen:	Top		35.00	752.13
	Bottom		38.03	749.10
Sand Pack:	Top		30.50	756.63
	Bottom		39.00	748.13
Bottom Sump:	Top		38.03	749.10
	Bottom		38.35	748.13
Borehole Total Depth:			39.00	748.13

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	: P-2	Drilling Company	: MATHES ENV. SERV.
USGS Coordinates	:	Rig Type	: CME - 550
Longitude	: 0.00	Driller	: K. BUNSELMEYER
Latitude	: 0.00	Drilling Started (Date)	: 8/16/90
State Coordinates	:	Drilling Completed (Date)	: 8/17/90
Northings	: 634,813.02		
Eastings	: 1,270,144.40	Completion Depth	: 53.01
Reference Point	: TOP OF PVC CASING		
Reference Point Elev.	: 795.42	Developement	
Type of Security	: LOCKING CAP	Date	: 8/27/90 9/10/90
		Type	: COMPRESSED AIR
Supervisory Geologist	: KATE FOX	Volume Removed	: 55 GAL. APPROX;30
Log Book/Page No.	: 3/5-8		
		Post Devel. Water Level	: 756.70
		Date	: 9/10/90
		Hydraulic Conductivity	: NR CM/SEC

MONITORING WELL AS-BUILT



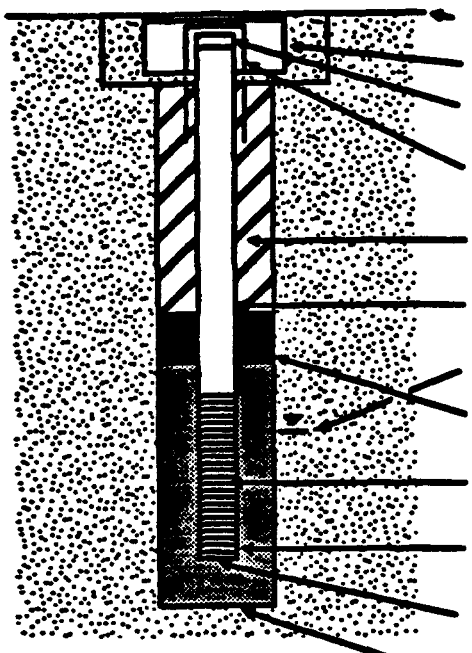
		BLS	MSL
Land Surface		0.00	795.92
Flush Mount Vault (approx.)	+	0.05	795.97
Top of Riser w/Water-tight Cap		0.50	795.42
Protective Casing w/ Locking Cap		NR	795.92
Cement/Bentonite Grout:	Top	NR	795.92
	Bottom	43.00	752.92
Riser:	Top	0.50	795.42
	Bottom	48.00	747.92
Water Level During Drilling:		46.50	749.42
Seal:	Top	43.00	752.92
	Bottom	45.00	750.92
Screen:	Top	48.00	747.92
	Bottom	53.01	742.91
Sand Pack:	Top	45.00	750.92
	Bottom	55.00	740.92
Bottom Sump:	Top	53.01	742.91
	Bottom	53.30	740.92
Borehole Total Depth:		55.00	740.92

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	: P-3		Drilling Company	: MATHES ENV. SERV.
USGS Coordinates	:		Rig Type	: CME - 550
Longitude	: 0.00		Driller	: K. BUNSELMEYER
Latitude	: 0.00		Drilling Started (Date)	: 8/18/90
State Coordinates	:		Drilling Completed (Date)	: 8/19/90
Northings	: 634,212.94			
Eastings	: 1,268,777.79		Completion Depth	: 35.42
Reference Point	: TOP OF PVC CASING			
Reference Point Elev.	: 797.30		Developement	
Type of Security	: LOCKING CAP		Date	: 8/30/90
			Type	: COMPRESSED AIR
Supervisory Geologist	: KATE FOX		Volume Removed	: 30 GAL. APPROX.
Log Book/Page No.	: 3/13-16			
			Post Devel. Water Level	: 766.09
			Date	: 8/30/90
			Hydraulic Conductivity	: NR CM/SEC

MONITORING WELL AS-BUILT



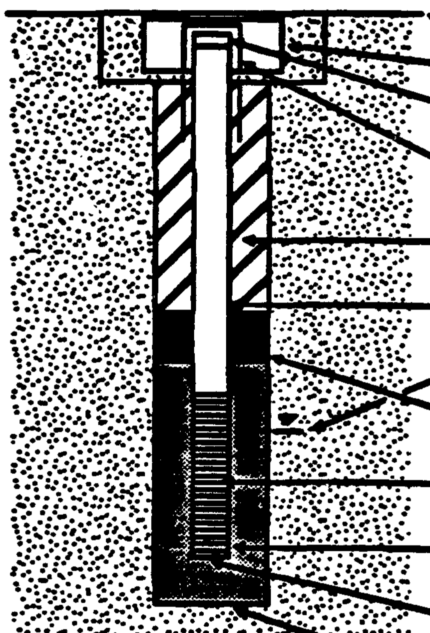
			BLS	MSL
Land Surface			0.00	797.80
Flush Mount Vault (approx.)		+	0.03	797.83
Top of Riser w/Water-tight Cap			0.50	797.30
Protective Casing w/ Locking Cap			NR	797.80
Cement/Bentonite Grout:	Top		NR	797.80
	Bottom		26.00	771.80
Riser:	Top		0.50	797.30
	Bottom		30.08	767.72
Water Level During Drilling:			32.50	765.30
Seal:	Top		26.00	771.80
	Bottom		28.00	769.80
Screen:	Top		30.08	767.72
	Bottom		35.10	762.70
Sand Pack:	Top		28.00	769.80
	Bottom		36.00	761.80
Bottom Sump:	Top		35.10	762.70
	Bottom		35.42	761.80
Borehole Total Depth:			36.00	761.80

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	: P-4	Drilling Company	: MATHES ENV. SERV.
USGS Coordinates	:	Rig Type	: CME - 550
Longitude	: 0.00	Driller	: K. BUNSELMEYER
Latitude	: 0.00	Drilling Started (Date)	: 8/18/90
State Coordinates	:	Drilling Completed (Date)	: 8/18/90
Northings	: 635,098.79		
Eastings	: 1,268,826.73	Completion Depth	: 42.73
Reference Point	: TOP OF PVC CASING		
Reference Point Elev.	: 791.40	Developement	
Type of Security	: LOCKING CAP	Date	: 8/23/90
		Type	: COMPRESSED AIR
Supervisory Geologist	: KATE FOX	Volume Removed	: 55 GAL. APPROX.
Log Book/Page No.	: 3/10-13		
		Post Devel. Water Level	: 760.96
		Date	: 8/30/90
		Hydraulic Conductivity	: NR CM/SEC

MONITORING WELL AS-BUILT



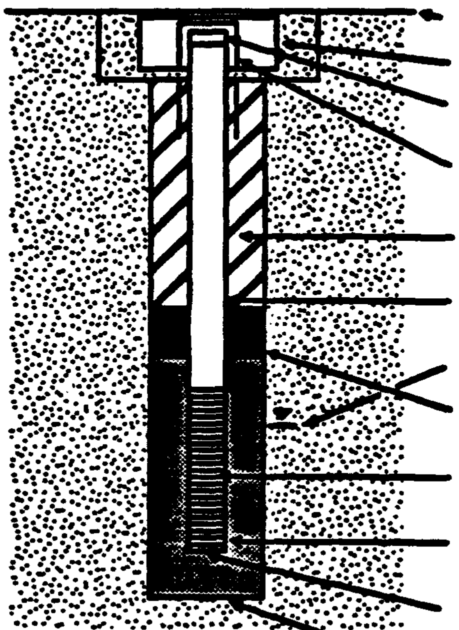
		BLS	MSL
Land Surface		0.00	791.79
Flush Mount Vault (approx.)		+ 0.38	792.17
Top of Riser w/Water-tight Cap		0.39	791.40
Protective Casing w/ Locking Cap		NR	791.79
Cement/Bentonite Grout:	Top	NR	791.79
	Bottom	30.00	761.79
Riser:	Top	0.39	791.40
	Bottom	37.73	754.06
Water Level During Drilling:		38.51	753.28
Seal:	Top	30.00	761.79
	Bottom	35.00	756.79
Screen:	Top	37.73	754.06
	Bottom	42.73	749.06
Sand Pack:	Top	35.00	756.79
	Bottom	43.00	748.79
Bottom Sump:	Top	42.73	749.06
	Bottom	43.00	748.79
Borehole Total Depth:		43.00	748.79

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	:	P-5	Drilling Company	:	MATHES ENV. SERV.
USGS Coordinates	:		Rig Type	:	CME - 550
Longitude	:	0.00	Driller	:	K. BUNSELMEYER
Latitude	:	0.00	Drilling Started (Date)	:	8/22/90
State Coordinates	:		Drilling Completed (Date)	:	8/23/90
Northings	:	634,273.05			
Eastings	:	1,267,157.32	Completion Depth	:	35.00
Reference Point	:	TOP OF PVC CASING			
Reference Point Elev.	:	796.81	Developement		
Type of Security	:	LOCKING CAP	Date	:	8/28/90
			Type	:	COMPRESSED AIR
Supervisory Geologist	:	KATE FOX	Volume Removed	:	17 GAL.
Log Book/Page No.	:	3/26-29			
			Post Devel. Water Level	:	766.20
			Date	:	8/30/90
			Hydraulic Conductivity	:	NR CM/SEC

MONITORING WELL AS-BUILT



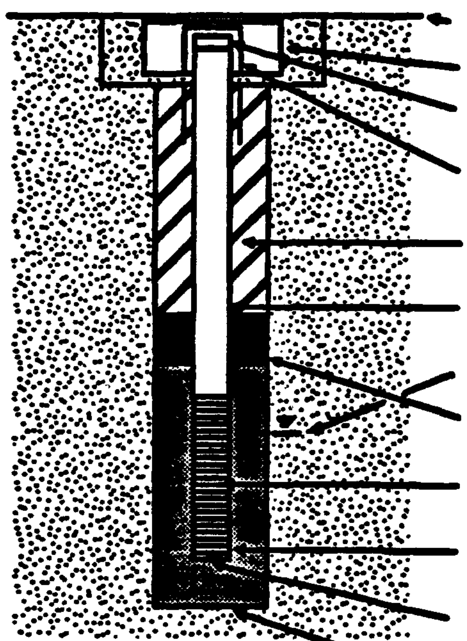
			BLS	MSL
Land Surface			0.00	797.23
Flush Mount Vault (approx.)		+	0.14	797.37
Top of Riser w/Water-tight Cap			0.42	796.81
Protective Casing w/ Locking Cap			NR	797.23
Cement/Bentonite Grout:	Top		NR	797.23
	Bottom		25.50	771.73
Riser:	Top		0.42	796.81
	Bottom		29.64	767.59
Water Level During Drilling:			NR	797.23
Seal:	Top		25.50	771.73
	Bottom		27.50	769.73
Screen:	Top		29.64	767.59
	Bottom		34.65	762.58
Sand Pack:	Top		27.50	769.73
	Bottom		35.00	762.23
Bottom Sump:	Top		34.65	762.58
	Bottom		35.00	762.23
Borehole Total Depth:			35.00	762.23

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	: P-6	Drilling Company	: MATHES ENV. SERV.
USGS Coordinates	:	Rig Type	: CME - 550
Longitude	: 0.00	Driller	: K. BUNSELMEYER
Latitude	: 0.00	Drilling Started (Date)	: 8/21/90
State Coordinates	:	Drilling Completed (Date)	: 8/21/90
Northings	: 634,634.95		
Eastings	: 1,267,032.08	Completion Depth	: 43.35
Reference Point	: TOP OF PVC CASING		
Reference Point Elev.	: 802.86	Developement	
Type of Security	: LOCKING CAP	Date	: 8/28/90
		Type	: COMPRESSED AIR
Supervisory Geologist	: KATE FOX	Volume Removed	: 25 GAL. APPROX.
Log Book/Page No.	: 3/22-24		
		Post Devel. Water Level	: 766.19
		Date	: 8/30/90
		Hydraulic Conductivity	: NR CM/SEC

MONITORING WELL AS-BUILT



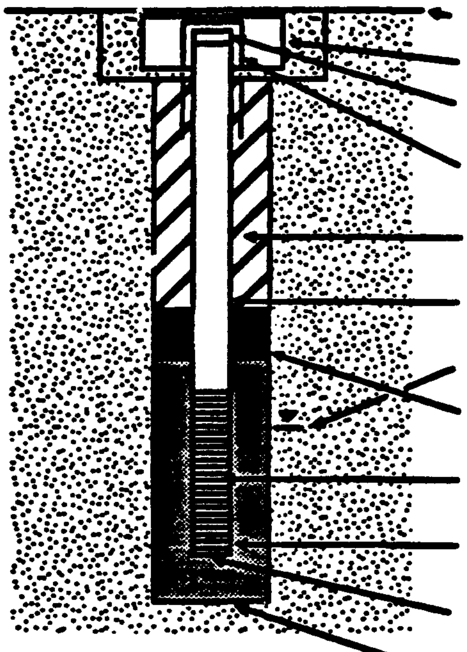
			BLS	MSL
Land Surface			0.00	803.26
Flush Mount Vault (approx.)		+	0.01	803.27
Top of Riser w/Water-tight Cap			0.40	802.86
Protective Casing w/ Locking Cap			NR	803.26
Cement/Bentonite Grout:	Top		NR	803.26
	Bottom		34.00	769.26
Riser:	Top		0.40	802.86
	Bottom		37.98	765.28
Water Level During Drilling:			41.31	761.95
Seal:	Top		34.00	769.26
	Bottom		35.99	767.27
Screen:	Top		37.98	765.28
	Bottom		43.03	760.23
Sand Pack:	Top		35.99	767.27
	Bottom		44.00	759.26
Bottom Sump:	Top		43.03	760.23
	Bottom		43.35	759.26
Borehole Total Depth:			44.00	759.26

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	: P-7		Drilling Company	: MATHES ENV. SERV.
USGS Coordinates	:		Rig Type	: CME - 550
Longitude	: 0.00		Driller	: K. BUNSELMEYER
Latitude	: 0.00		Drilling Started (Date)	: 8/19/90
State Coordinates	:		Drilling Completed (Date)	: 9/4/90
Northings	: 634,640.93			
Eastings	: 1,267,690.04		Completion Depth	: 27.50
Reference Point	: TOP OF PVC CASING			
Reference Point Elev.	: 803.47		Developement	
Type of Security	: LOCKING CAP		Date	: N/A
			Type	: COMPRESSED AIR
Supervisory Geologist	: KATE FOX		Volume Removed	: N/A
Log Book/Page No.	: 3/16-19			
			Post Devel. Water Level	: 803.4/
			Date	: N/A
			Hydraulic Conductivity	: NR CM/SEC

MONITORING WELL AS-BUILT



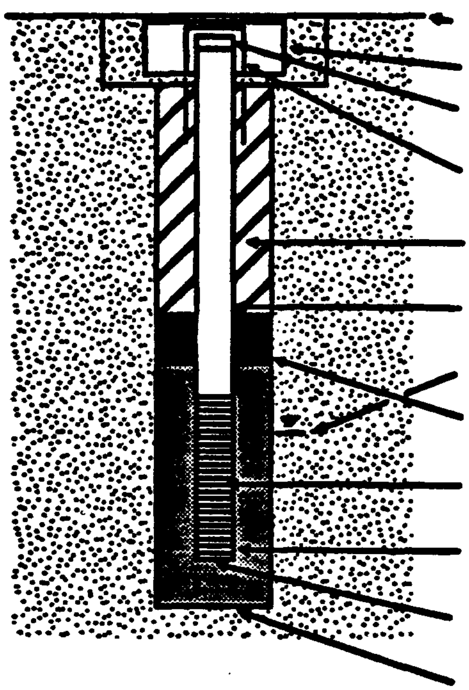
		BLS	MSL
Land Surface		0.00	803.86
Flush Mount Vault (approx.)		+ 0.20	804.06
Top of Riser w/Water-tight Cap		0.39	803.47
Protective Casing w/ Locking Cap		NR	803.86
Cement/Bentonite Grout:	Top	NR	803.86
	Bottom	17.50	786.36
Riser:	Top	0.39	803.47
	Bottom	22.12	781.74
Water Level During Drilling:		17.10	786.76
Seal:	Top	17.50	786.36
	Bottom	20.00	783.86
Screen:	Top	22.12	781.74
	Bottom	27.18	776.68
Sand Pack:	Top	20.00	783.86
	Bottom	27.50	776.36
Bottom Sump:	Top		803.86
	Bottom	N/A	776.36
Borehole Total Depth:		27.50	776.36

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	: P-8	Drilling Company	: MATHES ENV. SERV.
USGS Coordinates	:	Rig Type	: CME - 550
Longitude	: 0.00	Driller	: K. BUNSELMEYER
Latitude	: 0.00	Drilling Started (Date)	: 8/21/90
State Coordinates	:	Drilling Completed (Date)	: 8/21/90
Northings	: 634,462.52		
Eastings	: 1,267,111.25	Completion Depth	: 37.40
Reference Point	: TOP OF PVC CASING		
Reference Point Elev.	: 796.73	Developement	
Type of Security	: LOCKING CAP	Date	: 8/28/90
		Type	: COMPRESSED AIR
Supervisory Geologist	: KATE FOX	Volume Removed	: 25 GAL.
Log Book/Page No.	: 3/24-26		
		Post Devel. Water Level	: 766.15
		Date	: 8/30/90
		Hydraulic Conductivity	: NR CM/SEC

MONITORING WELL AS-BUILT



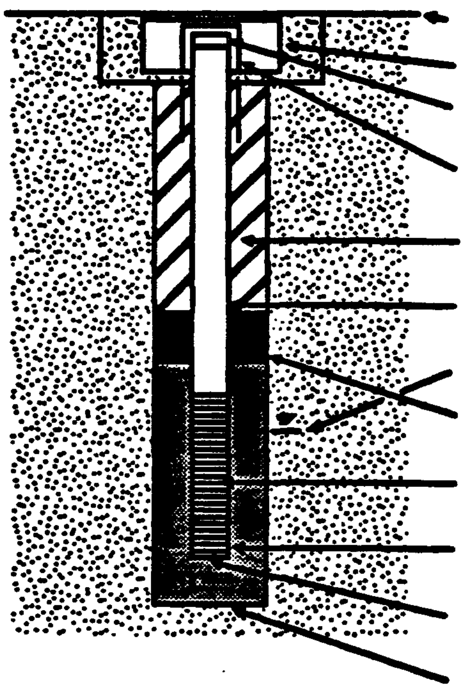
			BLS	MSL
Land Surface			0.00	797.17
Flush Mount Vault (approx.)		+	0.05	797.22
Top of Riser w/Water-tight Cap			0.44	796.73
Protective Casing w/ Locking Cap			NR	797.17
Cement/Bentonite Grout:	Top		NR	797.17
	Bottom		28.00	769.17
Riser:	Top		0.44	796.73
	Bottom		32.02	765.15
Water Level During Drilling:			NR	797.17
Seal:	Top		28.00	769.17
	Bottom		30.00	767.17
Screen:	Top		32.02	765.15
	Bottom		37.09	760.08
Sand Pack:	Top		30.00	767.17
	Bottom		38.00	759.17
Bottom Sump:	Top		37.09	760.08
	Bottom		37.40	759.17
Borehole Total Depth:			38.00	759.17

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

Well No.	: P-9		Drilling Company	: MATHES ENV. SERV.
USGS Coordinates	:		Rig Type	: CME - 550
Longitude	: 0.00		Driller	: K. BUNSELMEYER
Latitude	: 0.00		Drilling Started (Date)	: 8/21/90
State Coordinates	:		Drilling Completed (Date)	: 8/21/90
Northings	: 634,528.55			
Eastings	: 1,267,402.21		Completion Depth	: 36.69
Reference Point	: TOP OF PVC CASING			
Reference Point Elev.	: 795.37		Developement	
Type of Security	: LOCKING CAP		Date	: 8/28/90
			Type	: COMPRESSED AIR
Supervisory Geologist	: KATE FOX		Volume Removed	: 15 GAL.
Log Book/Page No.	: 3/20-21			
			Post Devel. Water Level	: 766.18
			Date	: 8/30/90
			Hydraulic Conductivity	: NR CM/SEC

MONITORING WELL AS-BUILT



			BLS	MSL
Land Surface			0.00	795.78
Flush Mount Vault (approx.)		+	0.06	795.84
Top of Riser w/Water-tight Cap			0.41	795.37
Protective Casing w/ Locking Cap			NR	795.78
Cement/Bentonite Grout:	Top		NR	795.78
	Bottom		27.30	768.48
Riser:	Top		0.41	795.37
	Bottom		30.63	765.15
Water Level During Drilling:			29.00	766.78
Seal:	Top		27.30	768.48
	Bottom		29.30	766.48
Screen:	Top		30.63	765.15
	Bottom		36.69	759.09
Sand Pack:	Top		29.30	766.48
	Bottom		37.00	758.78
Bottom Sump:	Top		36.69	759.09
	Bottom		37.00	758.78
Borehole Total Depth:			37.00	758.78

NOT TO SCALE

All measurements in feet unless otherwise noted
BLS - Below Land Surface
MSL - Mean Sea Level
+ Indicates an Above Land Surface (ALS) measurement

APPENDIX C
SAMPLE LOCATION SURVEY COORDINATES

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Table C-1. Survey Coordinates for Sample Locations at Indiana Air National Guard Base, Fort Wayne, Indiana

Description	Northing	Easting	Land Surface Elevation	Top of Casing Elevation
SB1-1(90)	1267436.590	634522.263	795.61	—
SB1-2(90)	1267259.897	634582.154	806.27	—
SB1-3(90)	1267211.727	634562.6447	805.31	—
SB1-4(90)	1267168.927	634485.128	803.06	—
SB1-5(91)	1267198.659	634544.499	804.66	—
SB1-6(91)	1267276.494	634536.918	805.71	—
SB1-7(91)	1267247.629	634468.413	803.66	—
SB1-8(91)	1267161.329	634441.327	801.61	—
SB1-9(91)	1267118.218	634547.588	799.51	—
SB1-10(91)	1267169.512	634386.429	799.51	—
SB3-1(90)	1268800.085	634579.014	800.23	—
SB3-2(90)	1268804.810	634570.3909	800.16	—
SB3-3(90)	1268812.232	634600.1866	800.43	—
SB3-4(90)	1268800.121	634596.3574	800.46	—
SB3-5(91)	1268796.426	634576.046	799.94	—
SB3-6(91)	1268822.625	634558.123	798.45	—
SB4-1(90)	1269640.032	635086.2888	793.35	—
SB4-2(90)	1269707.225	635033.3853	792.02	—
SB4-3(90)	1269801.851	635034.6490	789.18	—
SB4-4(90)	1269456.359	634948.7862	793.34	—
SB4-5(90)	1269619.631	634955.6724	795.44	—
SB4-6(91)	1269546.481	635213.465	787.52	—
SB4-7(91)	1269707.137	635033.558	791.62	—
SB4-8(91)	1269899.317	635128.215	787.67	—
BG-1(90)	Not surveyed, east of Base entrance security gate			
BG-2(91)	1267187.618	634626.554	805.51	—
BG-3(91)	1268664.986	635319.343	790.90	—

Table C-1. Survey Coordinates for Sample Locations at Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

Description	Northing	Easting	Land Surface Elevation	Top of Casing Elevation
MW1-01(90)	1267167.437	634506.386	804.37	807.28
MW1-02(90)	1267330.799	634639.944	807.23	810.21
MW2-01(90)	1268860.540	634627.760	801.17	800.72
MW4-01(90)	1270008.548	634768.397	796.91	796.52
MW4-02(90)	1270114.322	635224.895	790.68	793.27
P-1(90)	1270055.117	635550.118	787.13	786.74
P-2(90)	1270144.433	634813.033	795.92	795.42
P-3(90)	1268777.986	634213.088	797.80	797.30
P-4(90)	1268826.905	635098.827	791.79	791.40
P-5(90)	1267157.474	634273.071	797.23	796.81
P-6(90)	1267032.216	634634.893	803.26	802.86
P-7	1267690.037	634640.9323	803.86	803.47
P-8(90)	1267111.355	634462.559	797.17	796.73
P-9(90)	1267402.171	634528.468	795.78	795.37
SD-1	Not surveyed, near SD-4			
SD-2	Not surveyed, about 500 feet north of SD-4			
SD-3(91)	Not surveyed, near SB4-8			
SD-4(91)	1270517.653	635551.674	784.798	—

APPENDIX D
AQUIFER TEST PROCEDURES AND RESULTS
AND WATER LEVEL MEASUREMENT RESULTS

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A Q T E S O L V

A Program for Automatic Estimation of Aquifer Coefficients From Aquifer Test Data

By:

Glenn M. Duffield
and
James O. Rumbaugh, III

Geraghty & Miller Modeling Group
1895 Preston White Drive, Suite 301
Reston, VA 22091

(703) 476 - 0335

A Q T E S O L V is a user-friendly program designed to analyze data from aquifer tests automatically. Aquifer coefficients for a variety of aquifer test conditions can be estimated by A Q T E S O L V , including the following:

- confined aquifers, unconfined aquifers, and leaky aquifers
- pumping tests, injection tests, recovery tests, and slug tests

Features:

- Interactive, menu-driven program design
- Nonlinear least-squares estimation of aquifer coefficients
- Statistical analysis of results
- Complete graphical display of results

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A Q T E S O L V   R E S U L T S

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PROBLEM DEFINITION

blem title: MW102A SLUG TEST

wns and Constants:
No. of data points.................. 35
Radius of well casing............... 0.083
Radius of well...................... 0.344
Aquifer saturated thickness......... 8.74
Well screen length.................. 10
Static height of water in well...... 8.74
Log(Re/Rw).......................... 2.459
A, B, C............................. 0.000, 0.000, 1.940

==

ANALYTICAL METHOD

wer and Rice (unconfined aquifer slug test)

==

RESULTS FROM STATISTICAL CURVE MATCHING

TISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	5.5646E-005	+/-	6.8050E-006
y0 =	3.2785E-001	+/-	1.5003E-002

LYSIS OF MODEL RESIDUALS

idual = calculated - observed
ghted residual = residual * weight

ghted Residual Statistics:
Number of residuals............... 35
Number of estimated parameters.... 2
Degrees of freedom................ 33
Residual mean..................... 0.003004
Residual standard deviation....... 0.04141
Residual variance................. 0.001715

el Residuals:

Time	Observed	Calculated	Residual	Weight
1.25	0.34	0.30199	0.038006	1
1.3333	0.34	0.30035	0.039654	1
1.4166	0.34	0.29871	0.041294	1
1.5	0.34	0.29707	0.042926	1
1.5833	0.34	0.29545	0.044548	1
1.6667	0.3	0.29384	0.0061627	1
1.75	0.3	0.29223	0.0077667	1

1.8333	0.3	0.29064	0.0093619	1
1.9167	0.3	0.28905	0.01095	1
2	0.3	0.28747	0.012528	1
2.5	0.3	0.27818	0.02182	1
3	0.26	0.26919	-0.0091891	1
3.5	0.26	0.26049	-0.00048852	1
4	0.22	0.25207	-0.032069	1
4.5	0.18	0.24392	-0.063922	1
5	0.22	0.23604	-0.016038	1
5.5	0.18	0.22841	-0.048409	1
6	0.18	0.22103	-0.041026	1
6.5	0.18	0.21388	-0.033882	1
7	0.15	0.20697	-0.056969	1
7.5	0.15	0.20028	-0.05028	1
8	0.15	0.19381	-0.043807	1
8.5	0.15	0.18754	-0.037542	1
9	0.15	0.18148	-0.031481	1
9.5	0.15	0.17562	-0.025615	1
10	0.15	0.16994	-0.019939	1
12	0.11	0.14901	-0.039011	1
14	0.18	0.13066	0.04934	1
16	0.15	0.11457	0.035431	1
18	0.15	0.10046	0.049541	1
20	0.15	0.088088	0.061912	1
22	0.15	0.07724	0.07276	1
24	0.07	0.067727	0.0022727	1
26	0.15	0.059387	0.090613	1
28	0.07	0.052073	0.017927	1

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	3.3581E-005
y0 =	2.5904E-001

A Q T E S O L V

A Program for Automatic Estimation of Aquifer Coefficients From Aquifer Test Data

By:

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and
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- o confined aquifers, unconfined aquifers, and leaky aquifers
- o pumping tests, injection tests, recovery tests, and slug tests

Features:

- o Interactive, menu-driven program design
- o Nonlinear least-squares estimation of aquifer coefficients
- o Statistical analysis of results
- o Complete graphical display of results

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A Q T E S O L V   R E S U L T S

12/04/90 14:17:41

PROBLEM DEFINITION

Problem title: SLUG TEST FOR MW1021B

Knowns and Constants:
- No. of data points................ 75
- Radius of well casing............ 0.083
- Radius of well.................... 0.344
- Aquifer saturated thickness...... 8.87
- Well screen length................ 10
- Static height of water in well... 8.87
- Log(Re/Rw)........................ 2.468

ESTIMATION RESULTS

Analytical method: Bouwer and Rice (unconfined aquifer slug test)

PARAMETER ESTIMATES

	Estimate		Std. Error
K =	3.7645E-005	+/-	2.6154E-006
y0 =	3.2040E-001	+/-	4.2986E-003

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
- Number of residuals............... 75
- Number of estimated parameters.... 2
- Degrees of freedom................ 73
- Residual mean..................... 0.0007205
- Residual standard deviation....... 0.02886
- Residual variance................. 0.0008327

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.0033	0.37	0.32036	0.049643	1
0.0066	0.37	0.32031	0.04969	1
0.0099	0.37	0.32026	0.049737	1
0.0133	0.37	0.32021	0.049785	1
0.0166	0.37	0.32017	0.049832	1
0.02	0.37	0.32012	0.04988	1
0.0233	0.37	0.32007	0.049927	1
0.0266	0.37	0.32003	0.049974	1
0.03	0.34	0.31998	0.020022	1
0.0333	0.34	0.31993	0.020069	1
0.05	0.34	0.31969	0.020305	1
0.0666	0.34	0.31946	0.02054	1
0.0833	0.34	0.31922	0.020776	1
0.1	0.34	0.31899	0.021012	1

0.1166	0.34	0.31875	0.021247	1
0.1333	0.3	0.31852	-0.018518	1
0.15	0.3	0.31828	-0.018282	1
0.1666	0.3	0.31805	-0.018048	1
0.1833	0.3	0.31781	-0.017813	1
0.2	0.3	0.31758	-0.017578	1
0.2166	0.3	0.31734	-0.017345	1
0.2333	0.3	0.31711	-0.01711	1
0.25	0.3	0.31688	-0.016876	1
0.2666	0.26	0.31664	-0.056643	1
0.2833	0.3	0.31641	-0.016409	1
0.3	0.3	0.31617	-0.016175	1
0.3166	0.3	0.31594	-0.015942	1
0.3333	0.3	0.31571	-0.015709	1
0.4167	0.3	0.31455	-0.014545	1
0.5	0.3	0.31339	-0.013387	1
0.5833	0.3	0.31223	-0.012233	1
0.6667	0.3	0.31108	-0.011082	1
0.75	0.3	0.30994	-0.0099363	1
0.8333	0.3	0.3088	-0.0087951	1
0.9167	0.3	0.30766	-0.0076567	1
1	0.3	0.30652	-0.0065239	1
1.0833	0.3	0.3054	-0.0053952	1
1.1667	0.3	0.30427	-0.0042693	1
1.25	0.3	0.30315	-0.003149	1
1.3333	0.3	0.30203	-0.0020327	1
1.4166	0.3	0.30092	-0.00092059	1
1.5	0.3	0.29981	0.00018878	1
1.5833	0.3	0.29871	0.0012927	1
1.6667	0.3	0.29761	0.0023939	1
1.75	0.3	0.29651	0.0034898	1
1.8333	0.3	0.29542	0.0045816	1
1.9167	0.3	0.29433	0.0056706	1
2	0.3	0.29325	0.0067544	1
2.5	0.26	0.28682	-0.026824	1
3	0.26	0.28054	-0.020542	1
3.5	0.26	0.2744	-0.014399	1
4	0.3	0.26839	0.03161	1
4.5	0.26	0.26251	-0.0025122	1
5	0.22	0.25676	-0.036763	1
5.5	0.22	0.25114	-0.03114	1
6	0.18	0.24564	-0.065641	1
6.5	0.18	0.24026	-0.060261	1
7	0.18	0.235	-0.055	1
7.5	0.18	0.22985	-0.049853	1
8	0.18	0.22482	-0.04482	1
8.5	0.22	0.2199	0.00010358	1
9	0.22	0.21508	0.0049191	1
9.5	0.22	0.21037	0.0096293	1
10	0.18	0.20576	-0.025764	1
12	0.18	0.18832	-0.008323	1
14	0.22	0.17236	0.04764	1
16	0.18	0.15775	0.022249	1
18	0.15	0.14438	0.0056202	1
20	0.15	0.13214	0.017858	1
22	0.11	0.12094	-0.010941	1
24	0.15	0.11069	0.03931	1
26	0.15	0.10131	0.048692	1
28	0.11	0.092721	0.017279	1
30	0.11	0.084862	0.025138	1
32	0.11	0.077669	0.032331	1

A Program for

Automatic Estimation of Aquifer Coefficients

From Aquifer Test Data

By:

Glenn M. Duffield
and
James O. Rumbaugh, III

Geraghty & Miller Modeling Group
1895 Preston White Drive, Suite 301
Reston, VA 22091

(703) 476 - 0335

A Q T E S O L V is a user-friendly program designed to analyze data from aquifer tests automatically. Aquifer coefficients for a variety of aquifer test conditions can be estimated by A Q T E S O L V , including the following:

- o confined aquifers, unconfined aquifers, and leaky aquifers
- o pumping tests, injection tests, recovery tests,

Features:

- o Interactive, menu-driven program design
- o Nonlinear least-squares estimation of aquifer coefficients
- o Statistical analysis of results
- o Complete graphical display of results

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

12/05/90 03:25:45

Problem title: SLUG TEST FOR MW1021C

Knowns and Constants:

Bouwer and Rice (unconfined aquifer slug test)

==================================

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate	Std. Error
K		

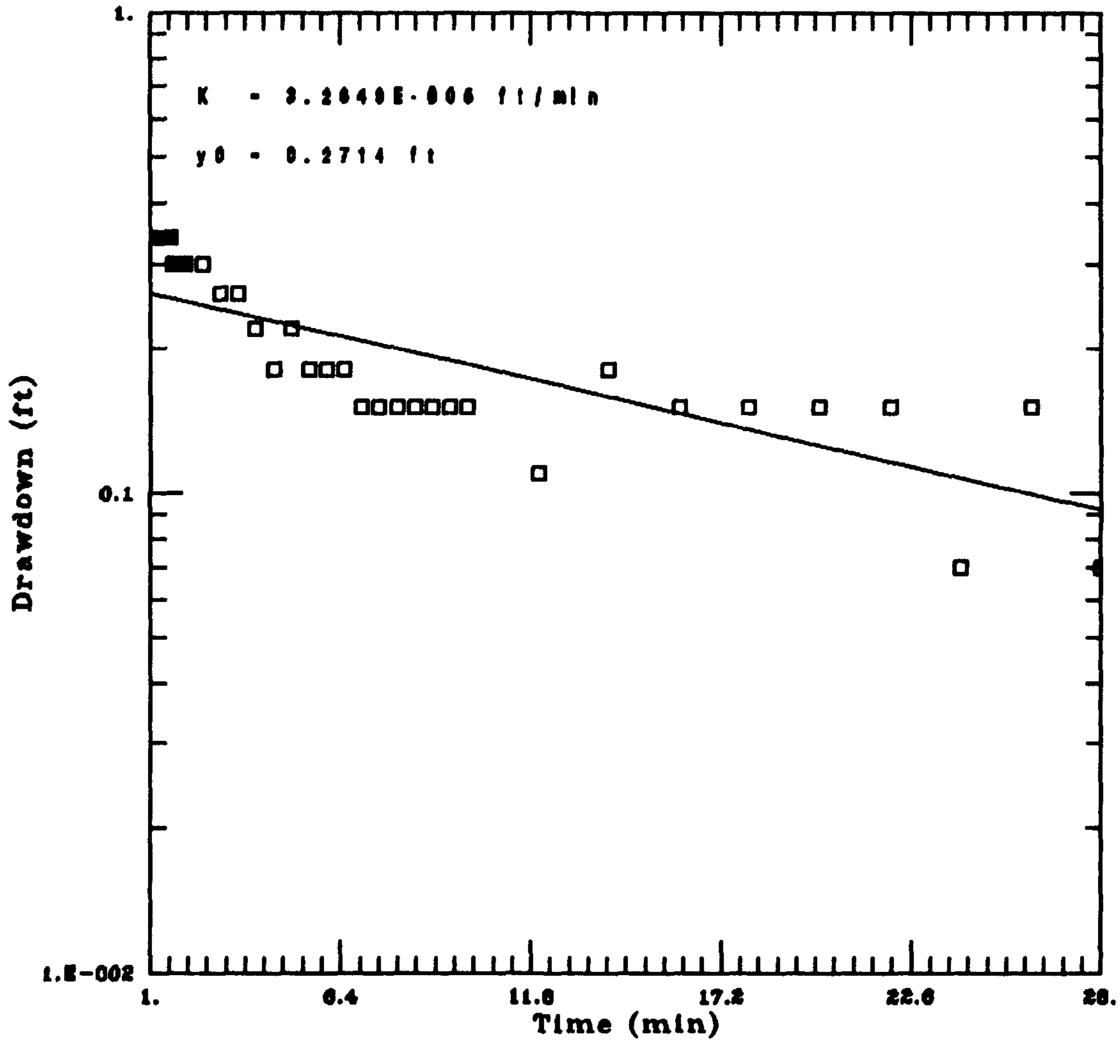
VISUAL MATCH PARAMETER ESTIMATES

Estimate

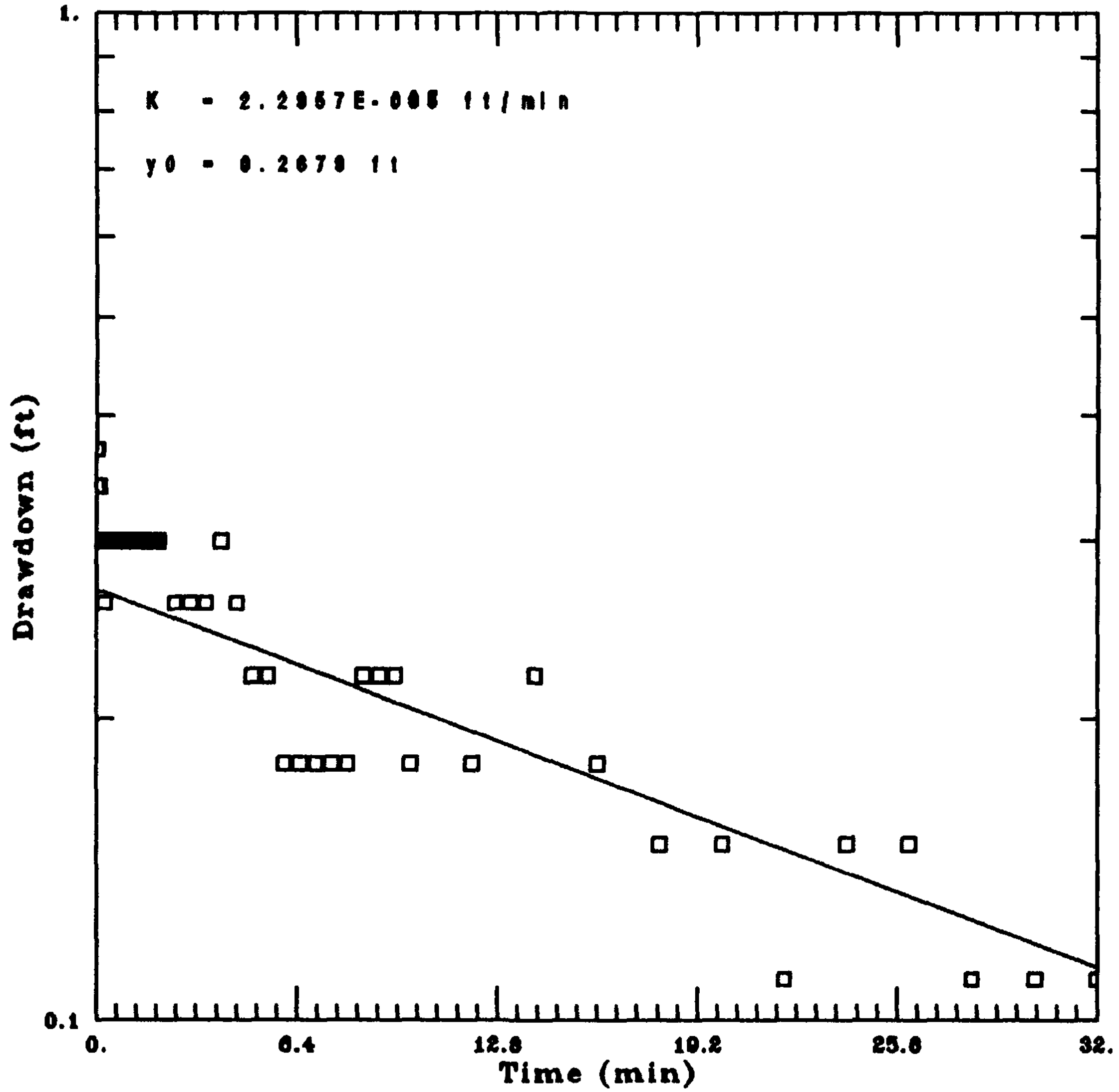
K = 2.9615E-004

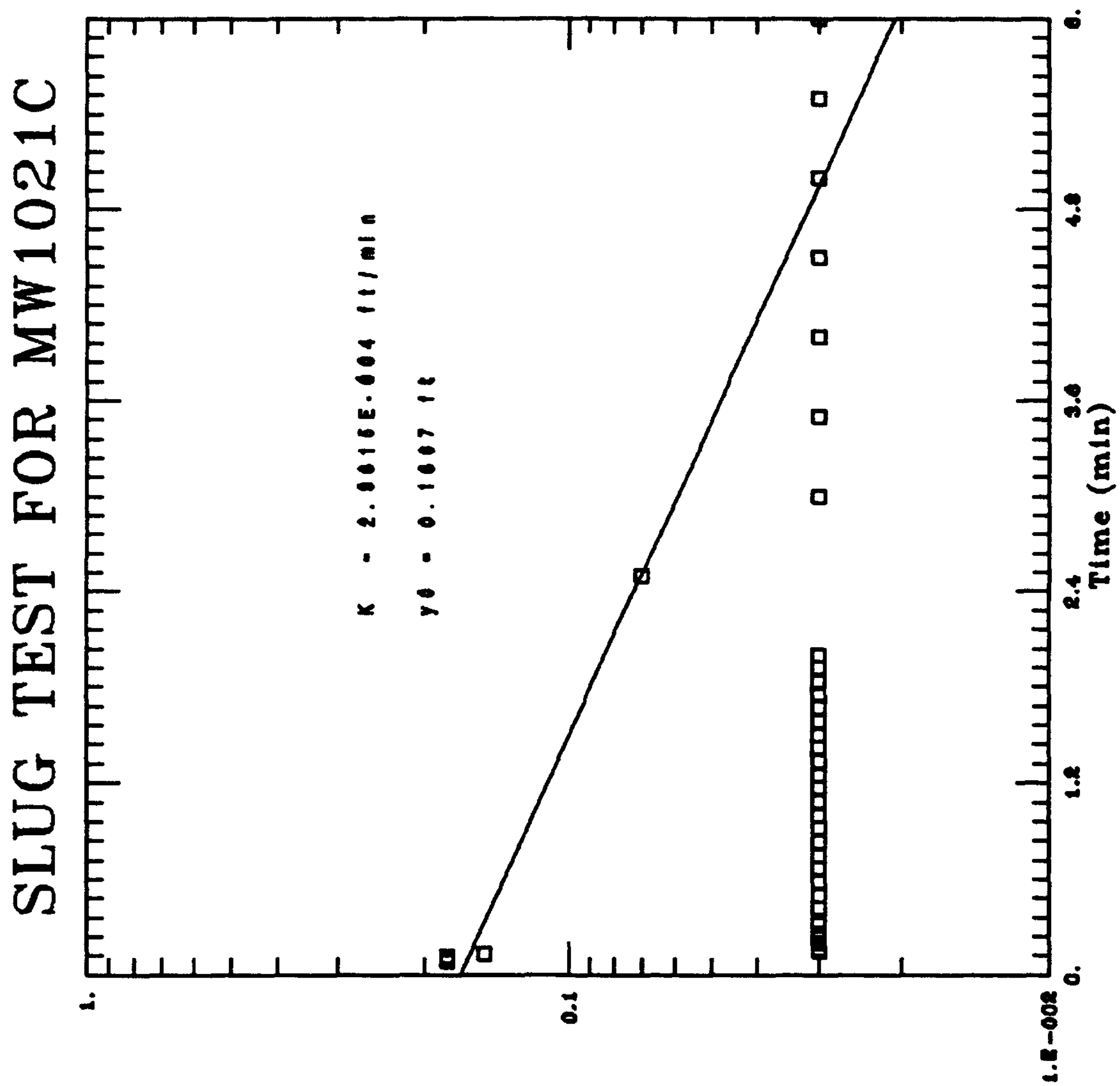
y0 =

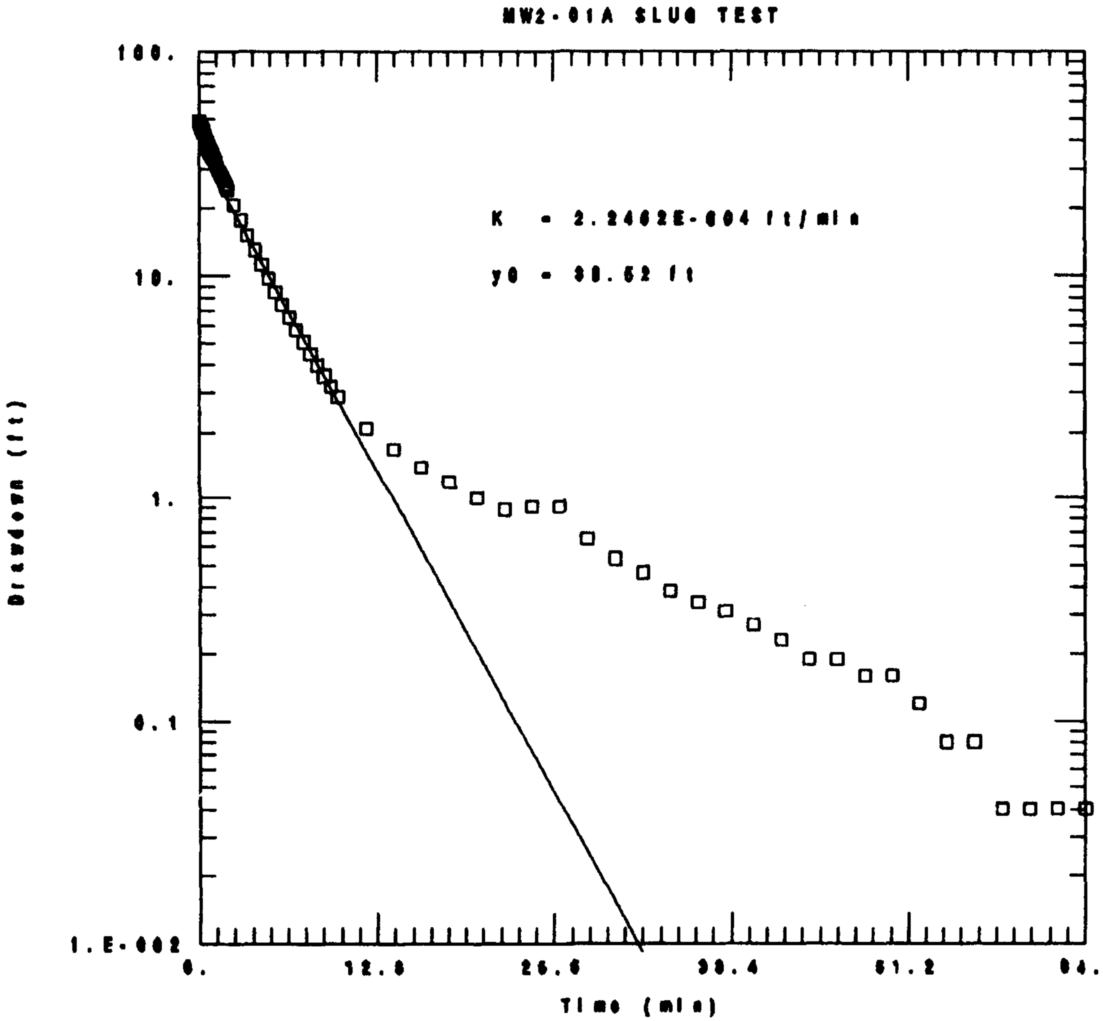
SLUG TEST FOR MW1021A

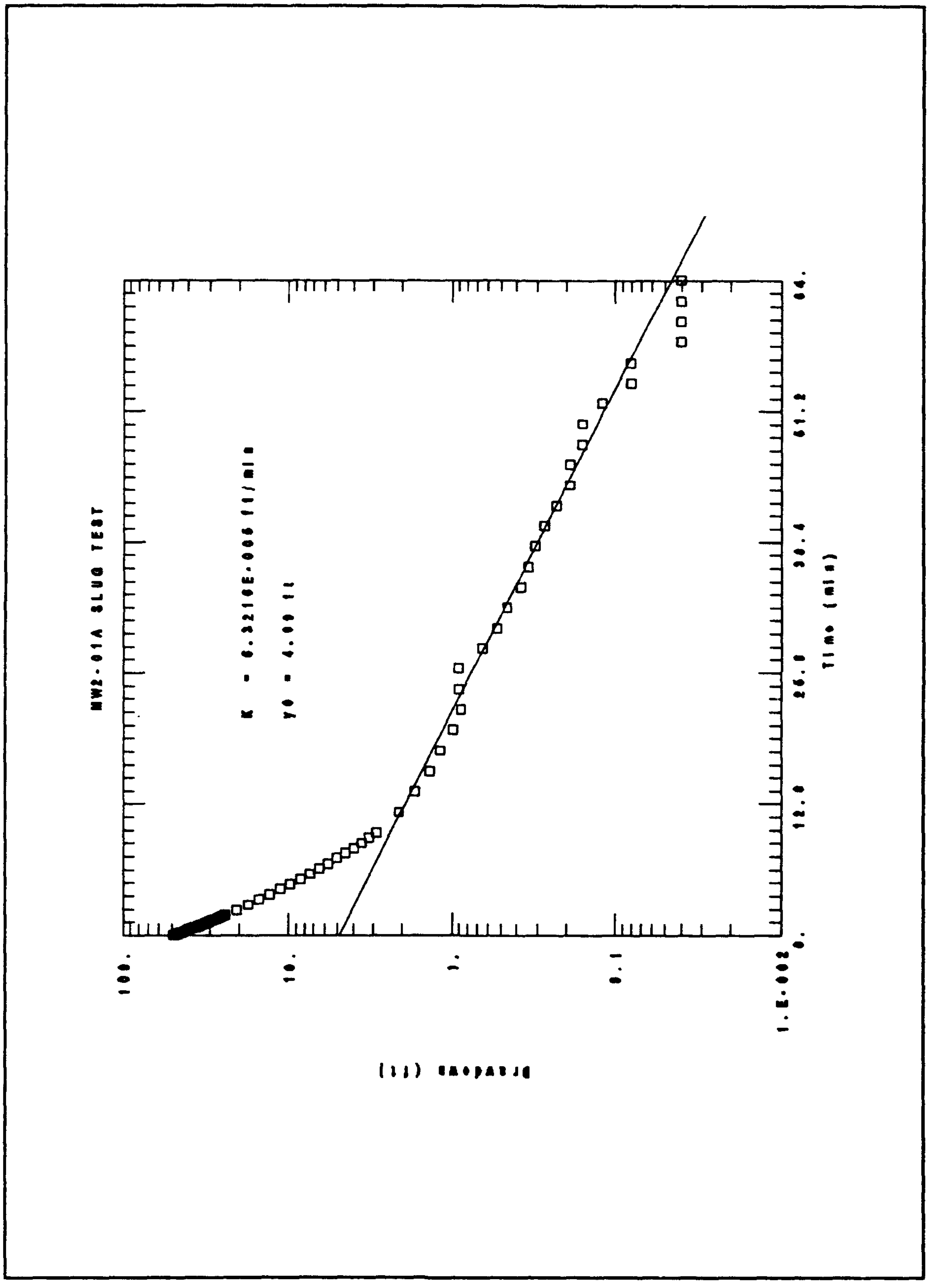


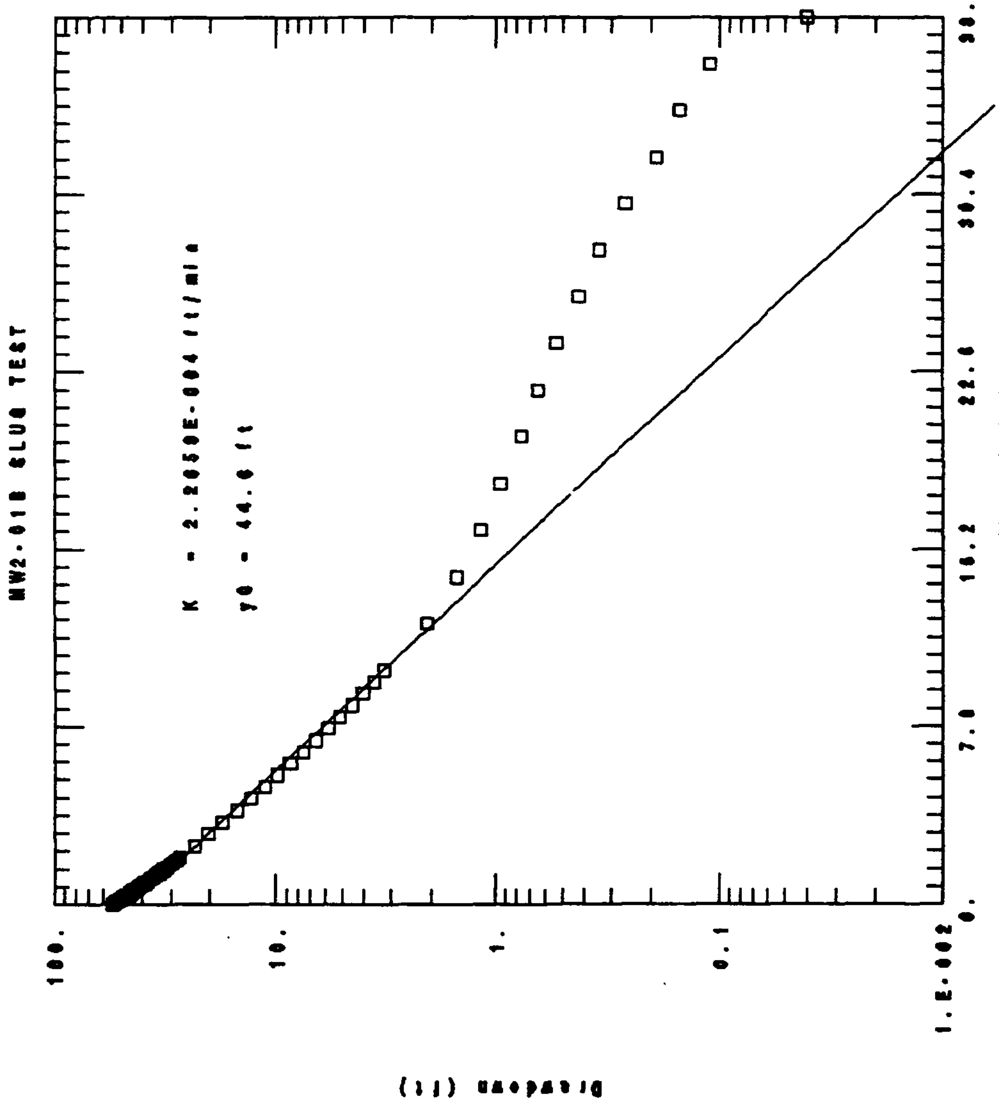
SLUG TEST FOR MW1021B

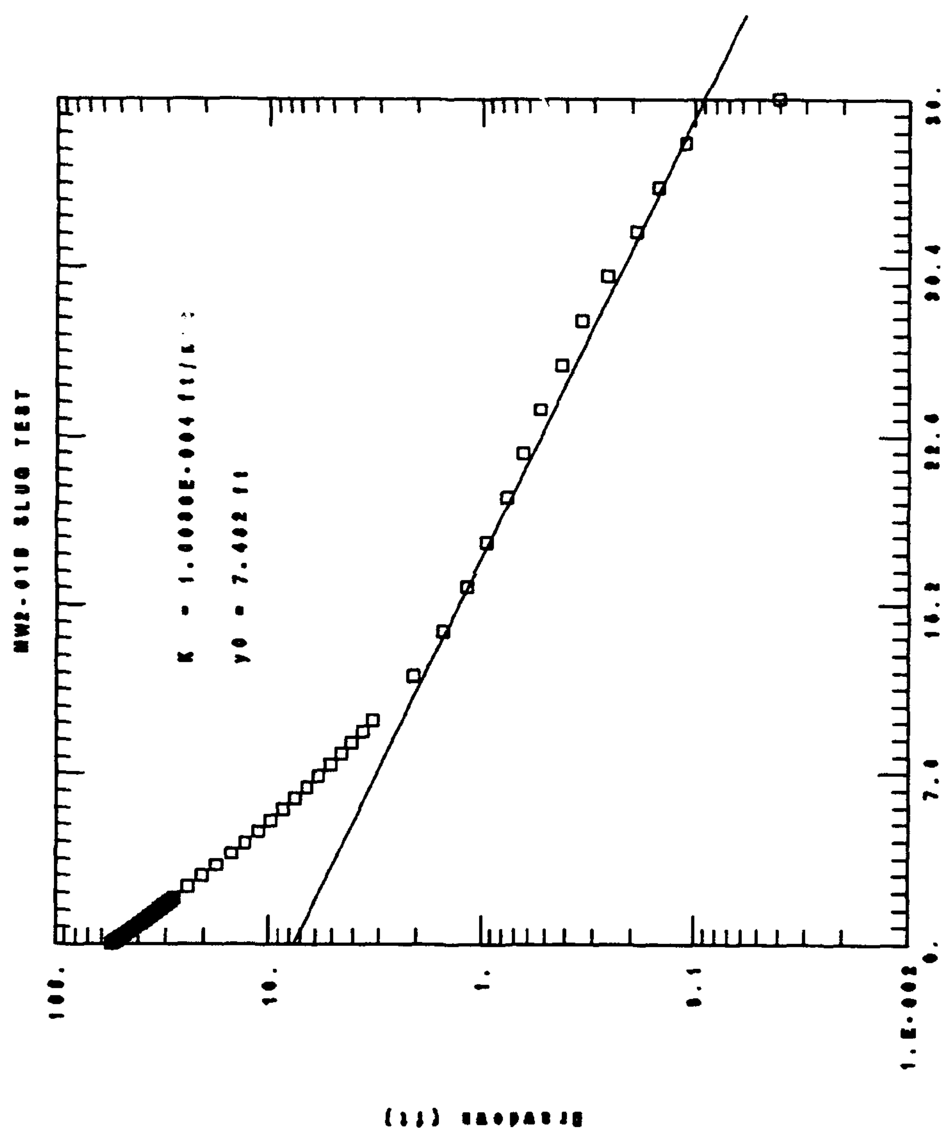



SLUG TEST FOR MW1021C
Drawdown (ft)
Time (min)
1.
0.1
1.E-002
0.
1.2
2.4
3.6
4.8
6.

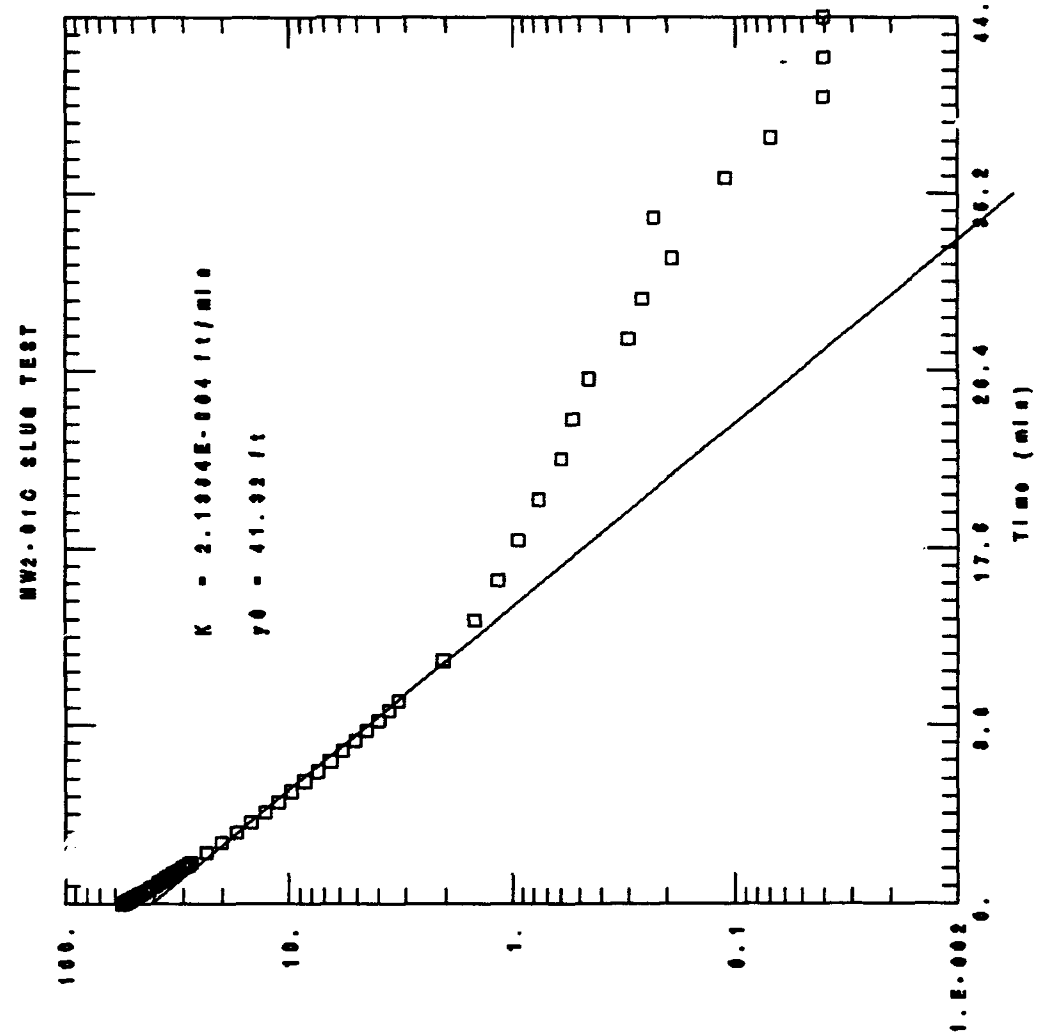

MW2-01A SLUG TEST
K = 2.2462E-004 ft/min
y0 = 30.52 ft
100.
10.
1.
0.1
1.E-002
Drawdown (ft)
0.
12.8
25.6
38.4
51.2
64.
Time (min)

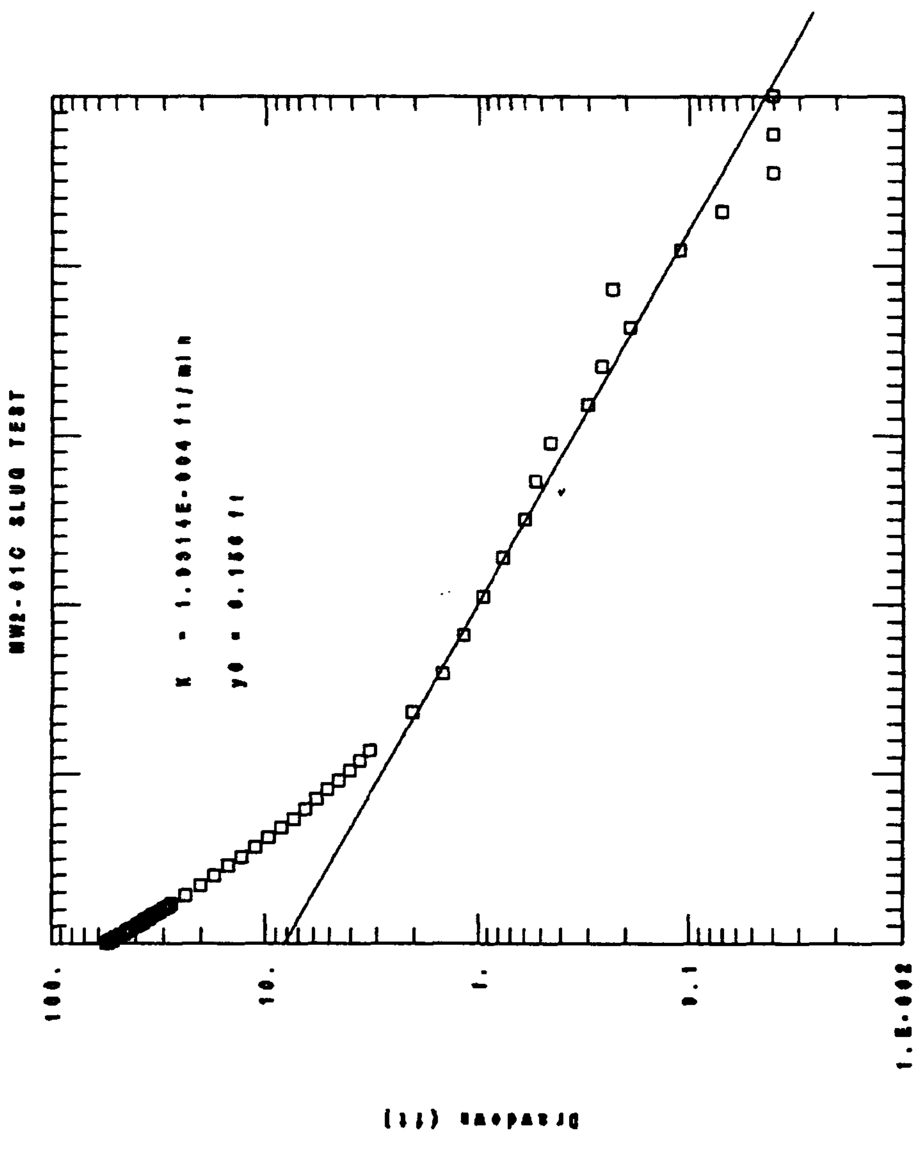

MW2-01A SLUG TEST
K = 6.3216E-005 ft/min
Y0 = 4.00 ft
Drawdown (ft)
100.
10.
1.
0.1
1.E-002
Time (min)
0.
12.8
25.6
38.4
51.2
64.

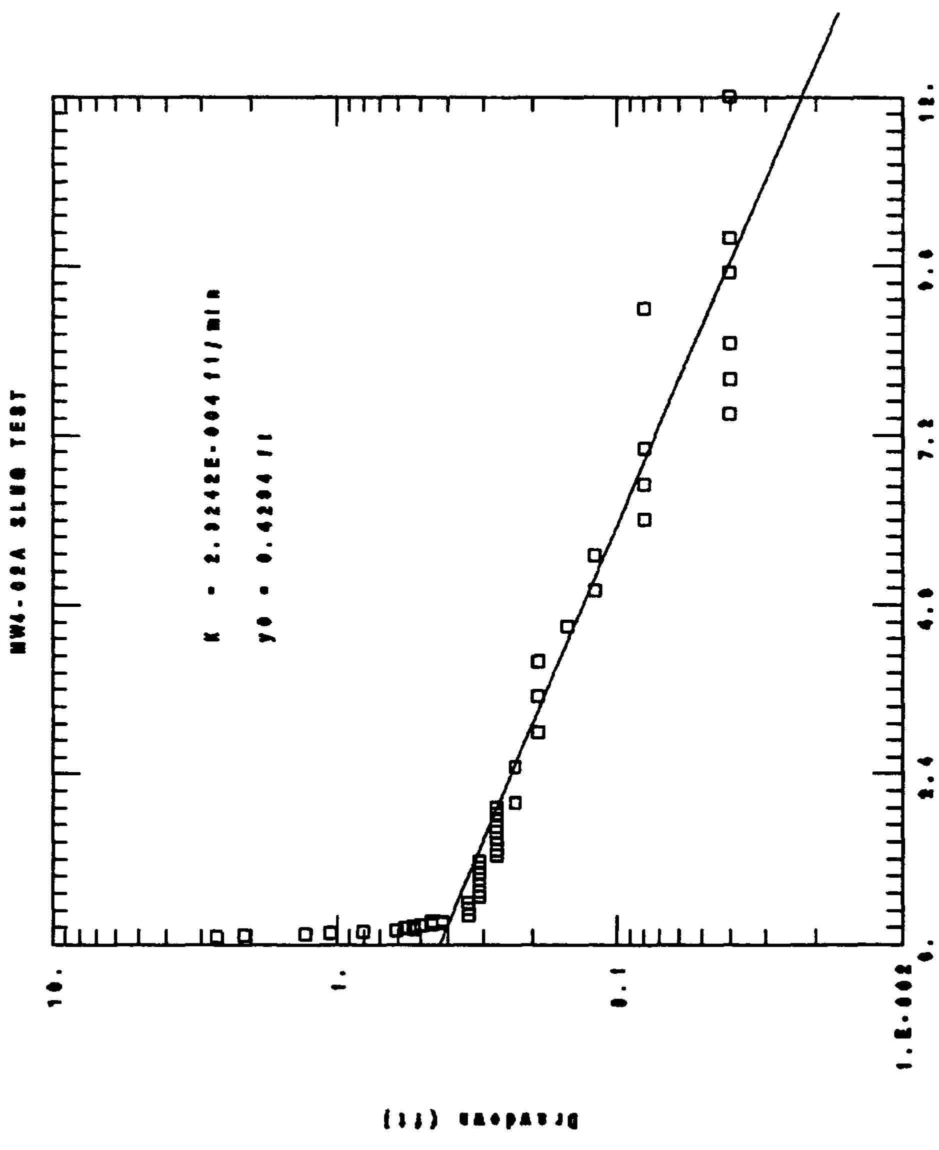

MW2-01B SLUG TEST
K = 2.2050E-004 ft/min
y0 = 44.6 ft
100.
10.
1.
0.1
1.E-002
Drawdown (ft)
0.
7.6
15.2
22.8
30.4
38.
Time (min)



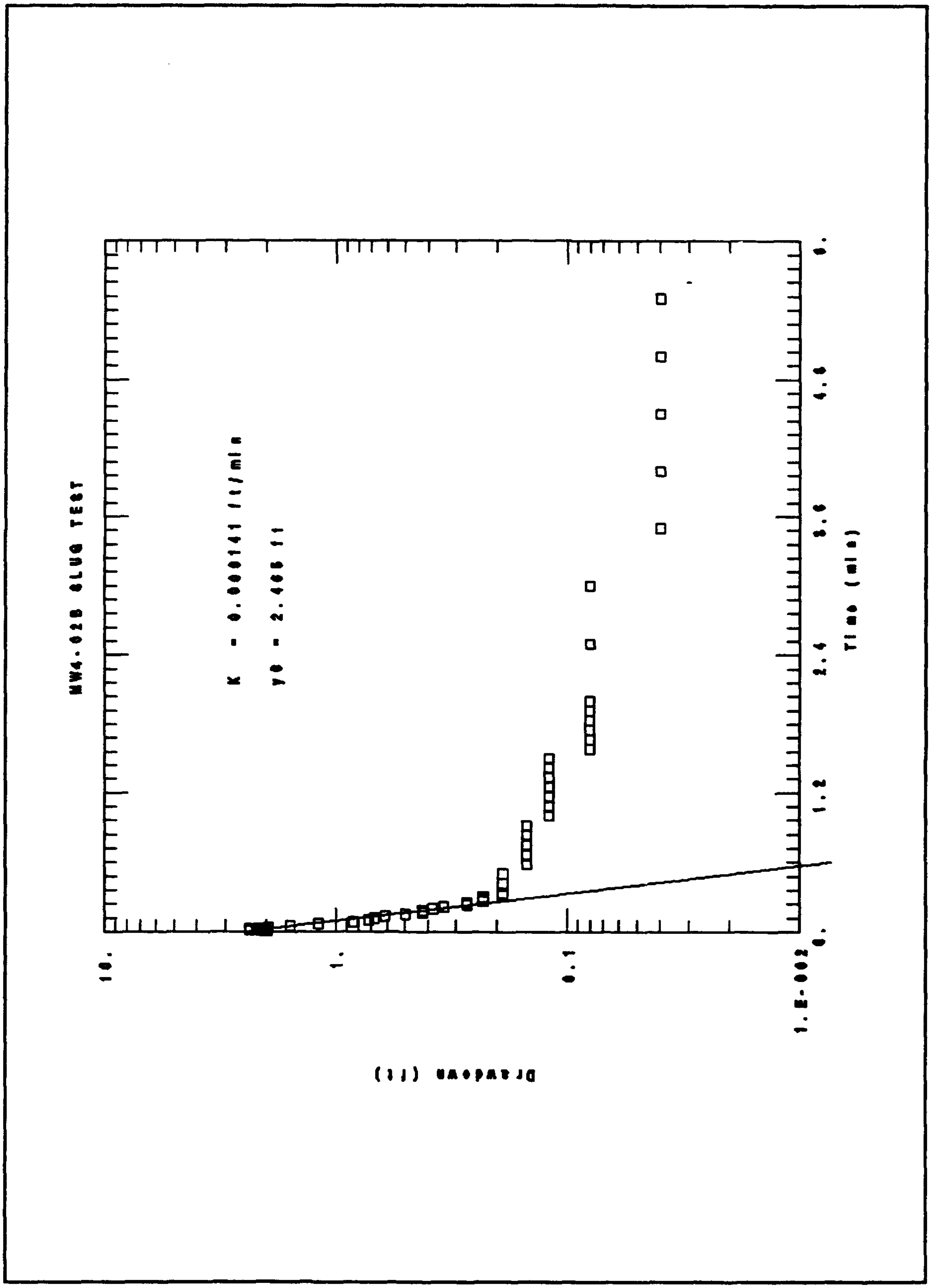
MW2-01D SLUG TEST
K = 1.0000E-004 ft/
y0 = 7.402 ft
Displacement (ft)
Time (min)
100.
10.
1.
0.1
1.E-002
0.
7.6
15.2
22.8
30.4
38.

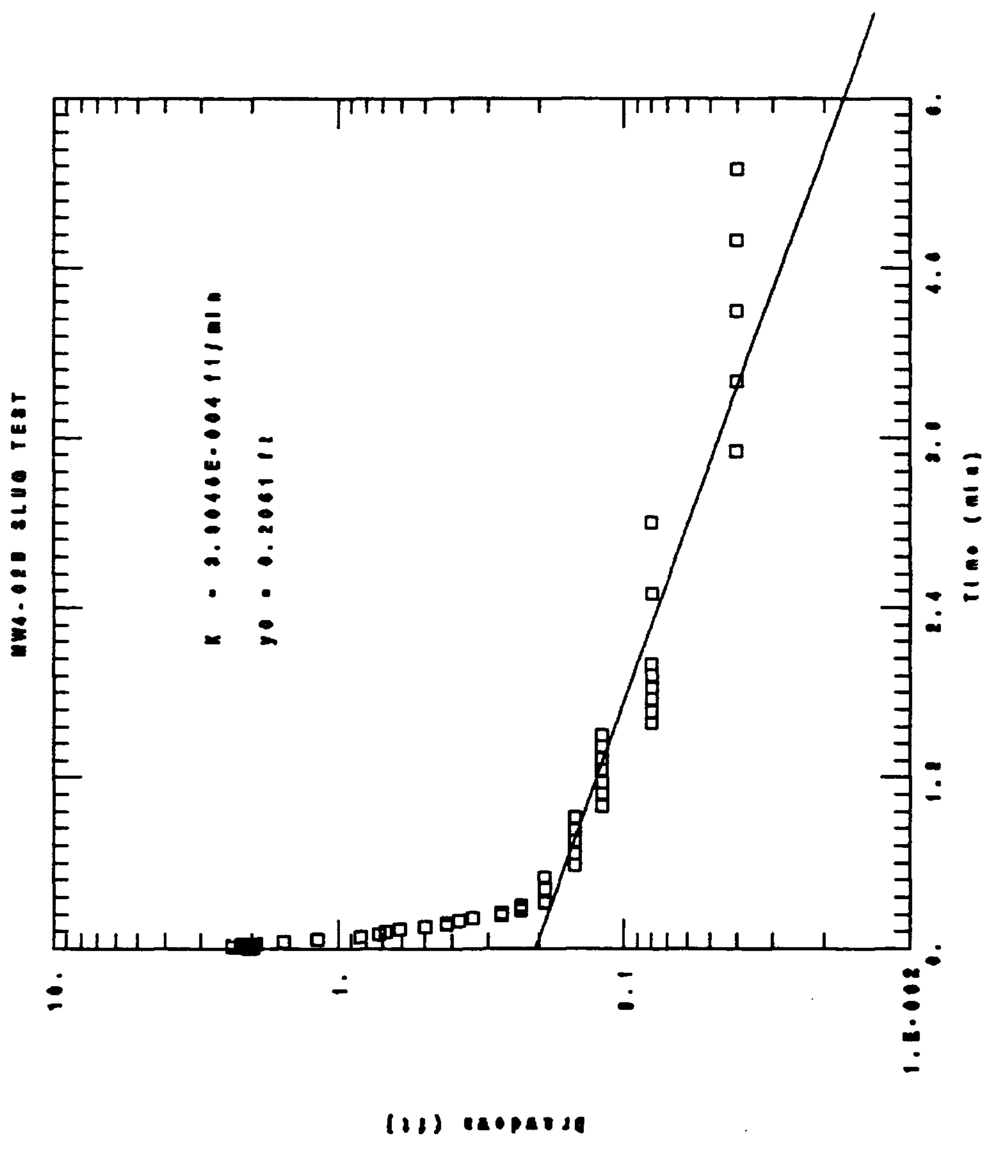

MW2-01C SLUG TEST
K = 2.1864E-004 ft/min
y0 = 41.32 ft
Drawdown (ft)
100.
10.
1.
0.1
1.E-002
Time (min)
0.
8.8
17.6
26.4
35.2
44.


MW2-01C SLUG TEST
Drawdown (ft)
Time (min)
100.
10.
1.
0.1
1.E-002
0.
44.



MW4-02A SLUG TEST
K = 2.9242E-004 ft/min
y0 = 0.4294 ft
Drawdown (ft)
Time (min)
10.
1.
0.1
1.E-002
0.
2.4
4.8
7.2
9.6
12.


MW4-02B SLUG TEST
K = 0.000141 ft/min
y0 = 2.465 ft
Drawdown (ft)
10.
1.
0.1
1.E-002
Time (min)
0.
1.2
2.4
3.6
4.8
6.



MW4-02D SLUG TEST
K = 3.0046E-004 ft/min
y0 = 0.2061 ft
Drawdown (ft)
10.
1.
0.1
1.E-002
Time (min)
0.
1.2
2.4
3.6
4.8
6.

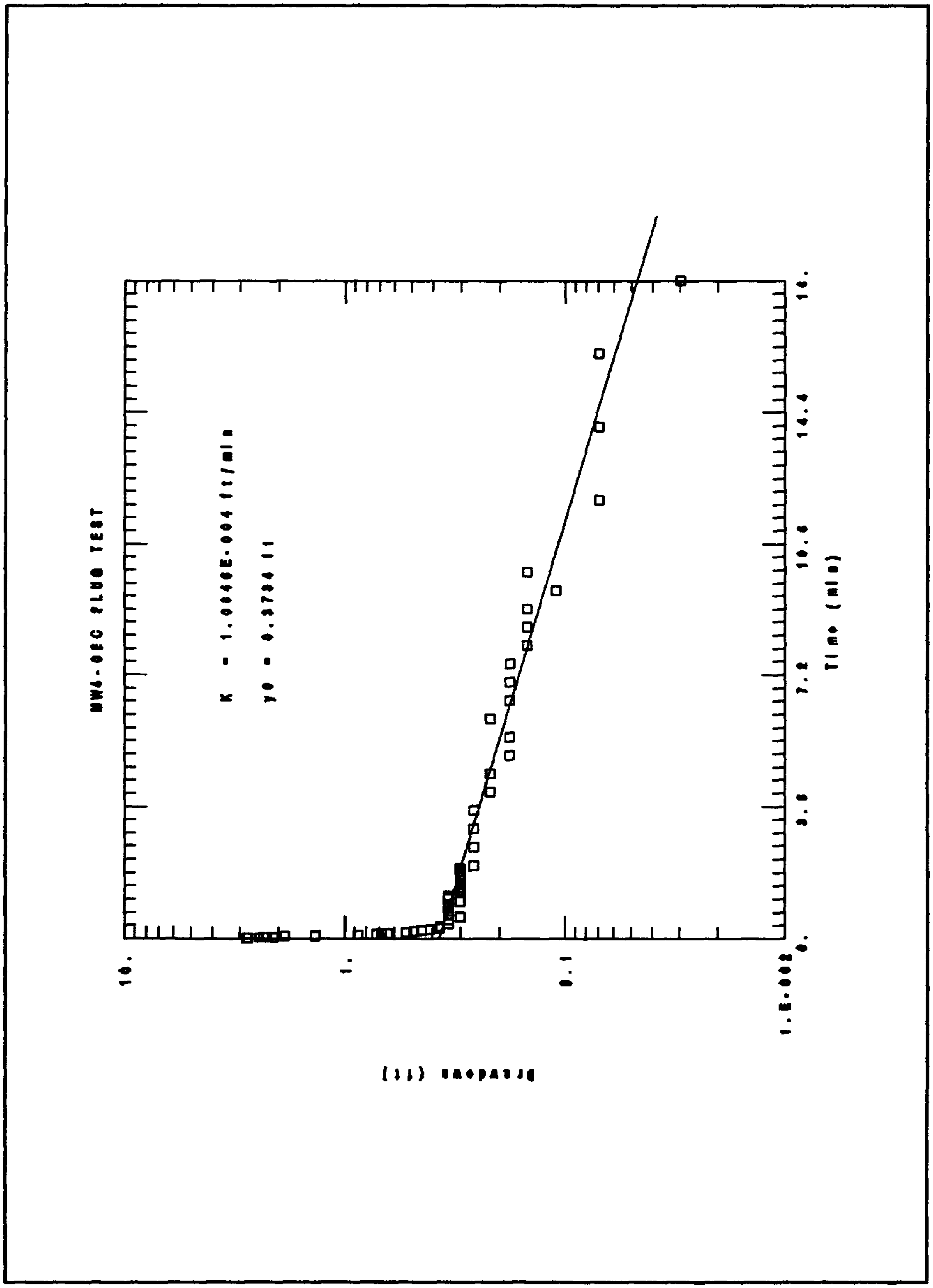

MW4-03C SLUG TEST
K = 1.0046E-004 ft/min
y0 = 0.3734 ft
Drawdown (ft)
10.
1.
0.1
1.E-002
0.
3.6
7.2
10.8
14.4
18.
Time (min)

Table D-1. Water Level Measurements
Indiana Air National Guard Base
Fort Wayne, Indiana

Well ID	Land Surface Elevation	Elevation Top of Casing	Water Elevation 1990	Date Measured	Water Elevation 1991	Date Measured	Change in Elevation 1991 - 1990 (feet)
MW1-01	804.37	807.28	766.30	9-10-90	765.61	11-5-91	-0.69
MW1-02	807.23	810.21	766.40	9-10-90	766.21	11-4-91	-0.19
MW2-01	801.17*	800.72	757.92	9-10-90	758.36	11-5-91	+0.44
MW4-01	796.91*	796.52	757.81	9-10-90	758.77	11-5-91	+0.96
MW4-02	790.68	793.27	756.65	9-10-90	756.90	11-6-91	+0.25
P-1	787.13*	786.74	756.93	9-10-90	757.34	11-6-91	+0.41
P-2	795.92*	795.42	756.70	9-10-90	756.67	11-7-91	-0.03
P-3	797.80*	797.30	766.14	9-10-90	766.16	11-7-91	+0.02
P-4	791.79*	791.40	762.31	9-10-90	762.16	11-3-91	-0.15
P-5	797.23*	796.81	766.23	9-10-90	766.27	11-7-91	+0.04
P-6	803.26*	802.86	766.22	9-10-90	766.08	11-7-91	-0.14
P-7	803.86*	803.47	Abandoned		---	---	
P-8	791.17*	796.73	766.21	9-10-90	766.26	11-7-91	+0.05
P-9	795.78*	795.37	766.24	9-10-90	767.57**	11-7-91	+1.33

NOTE: All measurements are in feet above mean sea level (MSL)
* Indicates monitoring well/piezometer is flush mount
** Cover broken, rainwater in flush mount cavity. Not used to determne groundwater flow direction.

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APPENDIX E
LABORATORY ANALYTICAL RESULTS
DATA PRESENTATION

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Table E-1. 1990 to 1991 Sample Cross-Reference

WATER SAMPLES (1990)

Former SAIC Sample ID	Laboratory Sample ID	Current SAIC Sample ID
EW-01	90021710	EW-01
EW-02	90021711	EW-02
EW-03	90021808	EW-03
EW-04	90022314	EW-04
EW-05	90022401	EW-05
EW-06	90023605	EW-06
EW-07	90024901	EW-07
EW-08	90025103	EW-08
EW-09	90025104	EW-09
FB-01	90021708	FB-01
FB-02	90021709	FB-02
FB-03	90023606	FB-03
HT-01	90025106	HT-01
MW1-01	90025102	MW1-1
MW1-02	90025101	MW1-2
MW2-01	90024902	MW3-1
MW4-02	90023901	MW4-2
P-2	90024801	P-2
P-8	90025105	P-8
TB-01	90021712	TB-01
TB-02	90021713	TB-02
TB-03	90021714	TB-03
TB-04	90021807	TB-04
TB-05	90022315	TB-05
TB-06	900224TB	TB-06
TB-07	900236TB	TB-07
TB-08	90023902	TB-08
TB-09	90024802	TB-09
TB-10	90024903	TB-10
TB-11	90024904	TB-11
TB-12	90025107	TB-12

SOIL SAMPLES (1990)

Former SAIC Sample ID	Laboratory Sample ID	Current SAIC Sample ID
SB1-01-11	90021702	SB1-1-11
SB1-01-12	90021701	SB1-1-12
SB1-02-03	90021801	SB1-2-3
SB1-02-03R	90021802	SB1-2-3R
SB1-02-16	90021803	SB1-2-16
SB1-03-02	90021703	SB1-3-2
SB1-03-05	90021704	SB1-3-5
SB1-03-18	90021705	SB1-3-18
SB1-04-01	90023601	SB1-4-1
SB1-04-02	90023602	SB1-4-2
SB1-04-03	90023603	SB1-4-3
SB1-04-04	90023604	SB1-4-4
SB2-01-01	90021804	SB3-1-1
SB2-01-02	90021805	SB3-1-2
SB2-01-19	90021806	SB3-1-19
SB2-02-01	90022301	SB3-2-1
SB2-03-01	90022302	SB3-3-1
SB2-04-01	90022303	SB3-4-1
SB4-01-01	90022304	SB4-1-1
SB4-01-02	90022305	SB4-1-2
SB4-02-01	90022306	SB4-2-1
SB4-02-02	90022307	SB4-2-2
SB4-03-01	90022308	SB4-3-1
SB4-03-02	90022309	SB4-3-2
SB4-04-01	90022310	SB4-4-1
SB4-04-02	90022311	SB4-4-2
SB4-05-01	90022312	SB4-5-1
SB4-05-02	90022313	SB4-5-2
SB-B-01	90021706	BG1-1
SB-B-02	90021707	BG1-2
SD4-01	90022402	SD4-1
SD4-02	90022403	SD4-2

WATER SAMPLES (1991)

Former SAIC Sample ID	Laboratory Sample ID	Current SAIC Sample ID
EB1-1	14265, 14275	EB1-1
EB1A-1	14266, 14276	EB1A-1
EB2-1	14361	EB2-1
EB3-1	13179, 13187	EB3-1
EB4-1	13194, 13203	EB4-1
FB1-1	13299, 14223	FB1-1
FB2-1	14360	FB2-1
FB4-1	13195, 13204	FB4-1
GW1-1	13300	GW1-1
MW1-01	14354	MW1-1
MW1-02	14267, 14277	MW1-2
MW2-01	14355	MW3-1
MW2-01R	14356	MW3-1R
MW4-01	14357	MW4-1
MW4-02	14358	MW4-2
MW4-02R	14359	MW4-2R
P-1	14397	P-1
P-8	14398	P-8
TB10-30-91	13113	TB10-30-91
TB10-31-91	13180	TB10-31-91
TB11-1-91	13196	TB11-1-91
TB11-3-91	13301	TB11-3-91
TB11-6-91	14362	TB11-6-91
TB11-7-91	14399	TB11-7-91
TRIP BLK.	14268	TRIP BLK.

SOIL SAMPLES (1991)

Former SAIC Sample ID	Laboratory Sample ID	Current SAIC Sample ID
BG1-1-1	13278, 14202	BG2-1
BG1-1-2	13279, 14203	BG2-2
BG1-1-3	13280, 14204	BG2-3
BG1-1-4	13281, 14205	BG2-4
BG2-1-1	13282, 14206	BG3-1
BG2-1-2	13283, 14207	BG3-2
BG2-1-3	13284, 14208	BG3-3
SB1-1-1	13188, 13197	SB1-5-1
SB1-1-2	13189, 13198	SB1-5-2
SB1-1-3	13190, 13199	SB1-5-3
SB1-1-7	13289, 14222	SB1-5-7
SB1-2-1	13285, 14209	SB1-6-1
SB1-2-2	13286, 14210	SB1-6-2
SB1-2-3	13287, 14211	SB1-6-3
SB1-2-5	14352	SB1-6-5
SB1-2-5R	14353	SB1-6-5R
SB1-2-7	13288, 14212	SB1-6-7
SB1-3-1	14259, 14269	SB1-7-1
SB1-3-2	14260, 14270	SB1-7-2
SB1-3-3	14261, 14271	SB1-7-3
SB1-3-3R	14262, 14272	SB1-7-3R
SB1A-1-1	13290, 14213	SB1-8-1
SB1A-1-2	13291, 14214	SB1-8-2
SB1A-1-3	13292, 14215	SB1-8-3
SB1A-1-5	13293, 14216	SB1-8-5
SB1A-1-5R1	14348	SB1-8-5R1
SB1A-1-5R2	14349	SB1-8-5R2
SB1A-2-1	13294, 14217	SB1-9-1
SB1A-2-2	13295, 14218	SB1-9-2
SB1A-2-3	13296, 14219	SB1-9-3
SB1A-3-1	13297, 14220	SB1-10-1
SB1A-3-2	14263, 14273	SB1-10-2
SB1A-3-3	13298, 14221	SB1-10-3
SB1A-3-4	14350	SB1-10-4
SB1A-3-4R	14351	SB1-10-4R
SB1A-3-5	14264, 14274	SB1-10-5
SB3-1-1	13109, 13114	SB3-5-1
SB3-1-6	13175, 13183	SB3-5-6
SB3-1-9	13176, 13184	SB3-5-9
SB3-2-1	13174, 13182	SB3-6-1
SB3-2-2	13173, 13181	SB3-6-2
SB4-1-1	13110, 13115	SB4-6-1
SB4-1-2	13111, 13116	SB4-6-2
SB4-1-6	13112, 13117	SB4-6-6
SB4-2-1	13177, 13185	SB4-7-1
SB4-2-2	13178, 13186	SB4-7-2
SB4-3-1	13191, 13200	SB4-8-1
SB4-3-2	13192, 13201	SB4-8-2
SB4-3-4	13193, 13202	SB4-8-4
SED-1	14395	SD4-3
SED-2	14396	SD4-4

Table B-2. Data Presentation: Background Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		SB-B-01	SB-B-02	SB-B-02RE
Laboratory Sample Number		90021706	90021707	90021707RE
Associated Field QC Samples		FB-01,-02 TB-02 EW-01,-02	FB-01,-02 TB-02 EW-01,-02,-04	FB-01,-02 TB-02 EW-01,-02,-04
Parameter	Units			
Total Petroleum Hydrocarbons	mg/kg	670	10 U	NA
METALS				
Antimony	mg/kg	NA	NA	NA
Arsenic	mg/kg	NA	NA	NA
Beryllium	mg/kg	1.00	2.80	NA
Cadmium	mg/kg	0.34 J(MB,B)	0.49 J(MB,B)	NA
Chromium	mg/kg	15.50	34.00	NA
Copper	mg/kg	13.00 J(FB)	29.30	NA
Lead	mg/kg	NA	NA	NA
Mercury	mg/kg	NA	NA	NA
Nickel	mg/kg	11.00 J(MB)	28.30	NA
Selenium	mg/kg	NA	NA	NA
Silver	mg/kg	1.20 U	1.30 U	NA
Thallium	mg/kg	NA	NA	NA
Zinc	mg/kg	41.90 J(FB)	71.90 J(FB)	NA
VOLATILE ORGANIC COMPOUNDS				
Chloromethane	µg/kg	NA	12 U	12 UJ(SSR)
Bromomethane	µg/kg	NA	12 U	12 UJ(SSR)
Vinyl Chloride	µg/kg	NA	12 U	12 UJ(SSR)
Chloroethane	µg/kg	NA	12 U	12 UJ(SSR)
Methylene Chloride	µg/kg	NA	6 U	6 UJ(EB,SSR)
Acetone	µg/kg	NA	12 U	12 UJ(SSR)
Carbon Disulfide	µg/kg	NA	6 U	6 UJ(SSR)
1,1-Dichloroethene	µg/kg	NA	4 U	4 UJ(SSR)
1,1-Dichloroethane	µg/kg	NA	6 U	6 UJ(SSR)
1,2-Dichloroethene (total)	µg/kg	NA	6 U	6 UJ(SSR)
Chloroform	µg/kg	NA	6 U	6 UJ(SSR)
1,2-Dichloroethane	µg/kg	NA	4 U	4 UJ(SSR)
2-Butanone	µg/kg	NA	12 U	12 UJ(SSR)
1,1,1-Trichloroethane	µg/kg	NA	6 U	6 UJ(SSR,IS)
Carbon Tetrachloride	µg/kg	NA	4 U	4 UJ(SSR,IS)
Vinyl Acetate	µg/kg	NA	12 U	12 UJ(SSR,IS)
Bromodichloromethane	µg/kg	NA	6 U	6 UJ(SSR,IS)
1,2-Dichloropropane	µg/kg	NA	6 U	6 UJ(SSR,IS)
cis-1,3-Dichloropropene	µg/kg	NA	6 U	6 UJ(SSR,IS)
Trichloroethene	µg/kg	NA	6 U	6 UJ(SSR,IS)
Dibromochloromethane	µg/kg	NA	6 U	6 UJ(SSR,IS)
1,1,2-Trichloroethane	µg/kg	NA	6 U	6 UJ(SSR,IS)
Benzene	µg/kg	NA	4 U	4 UJ(SSR,IS)
trans-1,3-Dichloropropene	µg/kg	NA	6 U	6 UJ(SSR,IS)
Bromoform	µg/kg	NA	6 U	6 UJ(SSR,IS)
4-Methyl-2-pentanone	µg/kg	NA	12 UJ(SSR,IS)	12 UJ(SSR,IS)
2-Hexanone	µg/kg	NA	12 UJ(SSR,IS)	12 UJ(SSR,IS)
Tetrachloroethene	µg/kg	NA	4 UJ(SSR,IS)	4 UJ(SSR,IS)
1,1,2,2-Tetrachloroethane	µg/kg	NA	6 UJ(SSR,IS)	6 UJ(SSR,IS)
Toluene	µg/kg	NA	180 J(SSR,IS)	120 J(SSR,IS)
Chlorobenzene	µg/kg	NA	6 UJ(SSR,IS)	6 UJ(SSR,IS)
Ethylbenzene	µg/kg	NA	6 UJ(SSR,IS)	6 UJ(SSR,IS)
Styrene	µg/kg	NA	6 UJ(SSR,IS)	6 UJ(SSR,IS)
Total Xylenes	µg/kg	NA	6 UJ(SSR,IS)	6 UJ(SSR,IS)
2-Chloroethyl Vinyl Ether	µg/kg	NA	12 U	12 UJ(SSR,IS)
Iodomethane	µg/kg	NA	12 U	12 UJ(SSR,IS)
Acrolein	µg/kg	NA	49 U	49 UJ(SSR,IS)
Acrylonitrile	µg/kg	NA	49 U	49 UJ(SSR,IS)
Dibromomethane	µg/kg	NA	12 U	12 UJ(SSR,IS)
1,2,3-Trichloropropane	µg/kg	NA	12 U	12 UJ(SSR,IS)
1,4-Dichlorobutane	µg/kg	NA	12 U	12 UJ(SSR,IS)
Ethyl Methacrylate	µg/kg	NA	12 U	12 UJ(SSR,IS)
Trichlorofluoromethane	µg/kg	NA	12 U	12 UJ(SSR,IS)
Dichlorodifluoromethane	µg/kg	NA	37 U	37 UJ(SSR,IS)
TIC Totals	µg/kg	NA	0 (0)	0 (0)

Table B-2. Data Presentation: Background Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB-B-01	SB-B-02	SB-B-02RE
Laboratory Sample Number		90021706	90021707	90021707RE
Associated Field QC Samples		FB-01,-02 TB-02	FB-01,-02 TB-02	FB-01,-02 TB-02
Parameter	Units	EW-01,-02	EW-01,-02,-04	EW-01,-02,-04
SEMIVOLATILE ORGANIC COMPOUNDS				
Phenol	µg/kg	380 U	400 U	NA
bis(2-Chloroethyl)ether	µg/kg	380 U	400 U	NA
2-Chlorophenol	µg/kg	380 U	400 U	NA
1,3-Dichlorobenzene	µg/kg	380 U	400 U	NA
1,4-Dichlorobenzene	µg/kg	380 U	400 U	NA
Benzyl Alcohol	µg/kg	380 U	400 U	NA
1,2-Dichlorobenzene	µg/kg	380 U	400 U	NA
2-Methylphenol	µg/kg	380 U	400 U	NA
bis(2-Chloroisopropyl)ether	µg/kg	380 U	400 U	NA
4-Methylphenol	µg/kg	380 U	400 U	NA
N-Nitroso-di-N-propylamine	µg/kg	380 U	400 U	NA
Hexachloroethane	µg/kg	380 U	400 U	NA
Nitrobenzene	µg/kg	380 U	400 U	NA
Isophorone	µg/kg	380 U	400 U	NA
2-Nitrophenol	µg/kg	380 U	400 U	NA
2,4-Dimethylphenol	µg/kg	380 U	400 U	NA
Benzoic Acid	µg/kg	1800 U	2000 U	NA
bis(2-Chloroethoxy)methane	µg/kg	380 U	400 U	NA
2,4-Dichlorophenol	µg/kg	380 U	400 U	NA
1,2,4-Trichlorobenzene	µg/kg	380 U	400 U	NA
Naphthalene	µg/kg	380 U	400 U	NA
4-Chloroaniline	µg/kg	380 U	400 U	NA
Hexachlorobutadiene	µg/kg	380 U	400 U	NA
4-Chloro-3-methylphenol	µg/kg	380 U	400 U	NA
2-Methylnaphthalene	µg/kg	380 U	400 U	NA
Hexachlorocyclopentadiene	µg/kg	380 U	400 U	NA
2,4,6-Trichlorophenol	µg/kg	380 U	400 U	NA
2,4,5-Trichlorophenol	µg/kg	1800 U	2000 U	NA
2-Chloronaphthalene	µg/kg	380 U	400 U	NA
2-Nitroaniline	µg/kg	1800 U	2000 U	NA
Dimethyl Phthalate	µg/kg	380 U	400 U	NA
Acenaphthylene	µg/kg	380 U	400 U	NA
2,6-Dinitrotoluene	µg/kg	380 U	400 U	NA
3-Nitroaniline	µg/kg	1800 U	2000 U	NA
Acenaphthene	µg/kg	380 U	400 U	NA
2,4-Dinitrophenol	µg/kg	1800 U	2000 U	NA
4-Nitrophenol	µg/kg	1800 U	2000 U	NA
Dibenzofuran	µg/kg	380 U	400 U	NA
2,4-Dinitrotoluene	µg/kg	380 U	400 U	NA
Diethyl Phthalate	µg/kg	380 U	400 U	NA
4-Chlorophenyl-phenyl Ether	µg/kg	380 U	400 U	NA
Fluorene	µg/kg	380 U	400 U	NA
4-Nitroaniline	µg/kg	1800 U	2000 U	NA
4,6-Dinitro-2-methylphenol	µg/kg	1800 U	2000 U	NA
N-Nitrosodiphenylamine	µg/kg	380 U	400 U	NA
4-Bromophenyl-phenyl Ether	µg/kg	380 U	400 U	NA
Hexachlorobenzene	µg/kg	380 U	400 U	NA
Pentachlorophenol	µg/kg	1800 U	2000 U	NA
Phenanthrene	µg/kg	380 U	400 U	NA
Anthracene	µg/kg	380 U	400 U	NA
di-N-Butylphthalate	µg/kg	380 U	400 U	NA
Fluoranthene	µg/kg	220 J	400 U	NA
Pyrene	µg/kg	190 J	400 U	NA
Butylbenzyl Phthalate	µg/kg	380 U	400 U	NA
3,3'-Dichlorobenzidine	µg/kg	760 U	810 U	NA
Benzo(a)anthracene	µg/kg	380 U	400 U	NA
Chrysene	µg/kg	380 U	400 U	NA
bis(2-Ethylhexyl)phthalate	µg/kg	380 U	400 U	NA
di-N-Octyl Phthalate	µg/kg	380 U	400 U	NA
Benzo(b)fluoranthene	µg/kg	170 J	400 U	NA
Benzo(k)fluoranthene	µg/kg	320 J	400 U	NA
Benzo(a)pyrene	µg/kg	210 J	400 U	NA
Indeno(1,2,3-c,d)pyrene	µg/kg	380 U	400 U	NA
Dibenzo(a,h)anthracene	µg/kg	380 U	400 U	NA
Benzo(g,h,i)perylene	µg/kg	380 U	400 U	NA

Table B-2. Data Presentation: Background Soil Samples (1990)

122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB-B-01	SB-B-02	SB-B-02RE
Laboratory Sample Number		90021706	90021707	90021707RE
Associated Field QC Samples		FB-01,-02 TB-02 EW-01,-02	FB-01,-02 TB-02 EW-01,-02,-04	FB-01,-02 TB-02 EW-01,-02,-04
Parameter	Units			
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)				
N-Nitrosodimethylamine	µg/kg	1800 U	2000 U	NA
2-Picoline	µg/kg	1800 U	2000 U	NA
Methyl Methanesulfonate	µg/kg	1800 U	2000 U	NA
Ethyl Methanesulfonate	µg/kg	1800 U	2000 U	NA
Aniline	µg/kg	1800 U	2000 U	NA
Acetophenone	µg/kg	1800 U	2000 U	NA
N-Nitrosopiperidine	µg/kg	1800 U	2000 U	NA
Dimethylphenethylamine	µg/kg	1800 U	2000 U	NA
2,6-Dichlorophenol	µg/kg	1800 U	2000 U	NA
N-Nitroso-di-N-butylamine	µg/kg	1800 U	2000 U	NA
1,2,4,5-Tetrachlorobenzene	µg/kg	1800 U	2000 U	NA
1-Chloronaphthalene	µg/kg	1800 U	2000 U	NA
Pentachlorobenzene	µg/kg	1800 U	2000 U	NA
1-Naphthylamine	µg/kg	1800 U	2000 U	NA
2-Naphthylamine	µg/kg	1800 U	2000 U	NA
1,2-Diphenylhydrazine	µg/kg	1800 U	2000 U	NA
Phenacetin	µg/kg	1800 U	2000 U	NA
4-Aminobiphenyl	µg/kg	1800 U	2000 U	NA
Pronamide	µg/kg	1800 U	2000 U	NA
Benzidine	µg/kg	1800 U	2000 U	NA
p-Dimethylaminoazobenzene	µg/kg	1800 U	2000 U	NA
7,12-Dimethylbenzo(a)anthracene	µg/kg	1800 U	2000 U	NA
3-Methylcholanthrene	µg/kg	1800 U	2000 U	NA
TIC Totals	µg/kg	NA	NA	NA
ORGANOCHLORINE PESTICIDES/PCBs				
alpha-BHC	µg/kg	1.6 U	1.8 U	NA
beta-BHC	µg/kg	1.9 U	2.1 U	NA
gamma-BHC (Lindane)	µg/kg	2.1 U	2.4 U	NA
delta-BHC	µg/kg	2.5 U	2.7 U	NA
Heptachlor	µg/kg	2.5 U	2.7 U	NA
Aldrin	µg/kg	2.6 U	2.8 U	NA
Heptachlor Epoxide	µg/kg	2.3 U	2.6 U	NA
Endosulfan-I	µg/kg	2.3 U	2.6 U	NA
Dieldrin	µg/kg	2.2 U	2.5 U	NA
4,4'-DDE	µg/kg	2.5 U	2.8 U	NA
Endrin	µg/kg	3.4 U	3.8 U	NA
Endosulfan-II	µg/kg	2.9 U	3.3 U	NA
4,4'-DDD	µg/kg	2.5 U	2.7 U	NA
Endrin Aldehyde	µg/kg	2.9 U	3.3 U	NA
Endosulfan Sulfate	µg/kg	3.0 U	3.4 U	NA
4,4'-DDT	µg/kg	7.3 U	8.1 U	NA
Methoxychlor	µg/kg	9.2 U	10.0 U	NA
Chlordane	µg/kg	18.0 U	20.0 U	NA
Toxaphene	µg/kg	150.0 U	160.0 U	NA
Aroclor-1016	µg/kg	73.0 U	81.0 U	NA
Aroclor-1221	µg/kg	92.0 U	100.0 U	NA
Aroclor-1232	µg/kg	92.0 U	100.0 U	NA
Aroclor-1242	µg/kg	92.0 U	100.0 U	NA
Aroclor-1248	µg/kg	73.0 U	81.0 U	NA
Aroclor-1254	µg/kg	46.0 U	51.0 U	NA
Aroclor-1260	µg/kg	37.0 U	41.0 U	NA

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit (CRDL)
EB – compound/element was also detected in the associated equipment blank
FB – compound/element was also detected in the associated field blank
IS – internal standard outside control limits
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
NA – not analyzed
ND – not detected
SSR – sample surrogate recovery outside control limits
U – compound/element was included in analysis, but was not detected

Table E-3. Data Presentation: Background Soil Samples (1991) - 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		BG1-1-1	BG1-1-2	BG1-1-3	BG1-1-4	BG1-1-4RE	BG2-1-1	BG2-1-2	BG2-1-3
Laboratory Sample Number		13278, 14202	13279, 14203	13280, 14204	13281, 14205	13281RE, 14205RE	13282, 14206	13283, 14207	13284, 14208
Associated Field QC Samples		FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1
		TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1
Total Petroleum Hydrocarbons		220	100	50 U	50 U	NA	50 U	50 U	50 U
INORGANICS									
Antimony	µg/L	3 UJ(N)	3.3 UJ(N)	3.5 J(N,B)	3.2 UJ(N)	NA	3.6 UJ(N)	3.2 UJ(N)	3.3 UJ(N)
Arsenic	µg/L	8.5	9.3	7.6	7.1	NA	7.8	7.3	1.2 J(MB,B)
Beryllium	µg/L	0.69 J(B)	0.6 J(B)	0.5 J(B)	0.6 J(B)	NA	0.75 J(B)	0.53 J(B)	0.24 U
Cadmium	µg/L	0.67 J(MB,B)	0.34 J(MB,B)	0.71 J(MB,B)	0.64 J(MB,B)	NA	0.25 U	0.48 J(MB,B)	0.24 U
Chromium	µg/L	22.2	21.1	16.7	19.1	NA	16.3	17.9	3.9
Copper	µg/L	30.2 J(N,*)	28.6 J(N,*)	24.8 J(N,*)	23 J(N,*)	NA	46.2 J(N,*)	21.9 J(N,*)	7.9 J(N,*)
Lead	µg/L	30.6	14.1	9.1	10.3	NA	20.6	9.3	2
Mercury	µg/L	0.1 U	0.1 U	0.1 U	0.11 U	NA	0.11 U	0.12 U	0.12 U
Nickel	µg/L	26.3	34.7	27.9	37.4	NA	19	30.9	6 J(MB,B)
Selenium	µg/L	0.21 UW	0.24 UW	0.23 UW	0.23 UW	NA	0.24 U	0.23 UW	0.24 U
Silver	µg/L	0.43 U	0.47 U	0.45 U	0.46 U	NA	0.51 U	0.46 U	0.47 U
Thallium	µg/L	0.28 J(B)	0.4 J(B)	0.4 J(B)	0.54 J(B)	NA	0.24 U	0.43 J(B)	0.24 U
Zinc	µg/L	75.9	93	72.3	76.1	NA	85.9	63.8	16.1 J(MB)
VOLATILE ORGANICS (SOW 3/90)									
Chloromethane	µg/kg	11 U	55 U	57 U	12 UJ(IS)	62 U	63 U	59 U	12 U
Bromomethane	µg/kg	11 U	55 U	57 U	12 UJ(IS)	62 U	63 U	59 U	12 U
Vinyl Chloride	µg/kg	11 U	55 U	57 U	12 UJ(IS)	62 U	63 U	59 U	12 U
Chloroethane	µg/kg	11 U	55 U	57 U	12 UJ(IS)	62 U	63 U	59 U	12 U
Methylene Chloride	µg/kg	6 U	27 U	28 U	25 J(IS)	31 U	32 U	29 U	6 U
Acetone	µg/kg	11 U	55 U	57 U	29 J(IS)	62 U	63 U	59 U	12 U
Carbon Disulfide	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
1,1-Dichloroethene	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
1,1-Dichloroethane	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
1,2-Dichloroethene (Total)	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
Chloroform	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
1,2-Dichloroethane	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
2-Butanone	µg/kg	11 U	55 U	57 U	12 UJ(IS)	62 U	63 U	59 U	12 U
1,1,1-Trichloroethane	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
Carbon Tetrachloride	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
Bromodichloromethane	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
1,2-Dichloropropane	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
cis-1,3-Dichloropropene	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
Trichloroethene	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
Dibromochloromethane	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
1,1,2-Trichloroethane	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
Benzene	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
trans-1,3-Dichloropropene	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
Bromoform	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
4-Methyl-2-pentanone	µg/kg	11 U	55 U	57 U	12 UJ(IS)	62 U	63 U	59 UJ(IS)	12 U
2-Hexanone	µg/kg	11 U	55 U	57 U	12 UJ(IS)	62 U	63 U	59 UJ(IS)	12 U
Tetrachloroethene	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 UJ(IS)	6 U
1,1,2,2-Tetrachloroethane	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 U	6 U
Toluene	µg/kg	2 J	31	41	6 UJ(IS)	31 U	110	110 J(IS)	6 U
Chlorobenzene	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 UJ(IS)	6 U
Ethylbenzene	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 UJ(IS)	6 U
Styrene	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 UJ(IS)	6 U
Xylene(Total)	µg/kg	6 U	27 U	28 U	6 UJ(IS)	31 U	32 U	29 UJ(IS)	6 U
TIC Total	µg/kg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Table E-3. Data Presentation: Background Soil Samples (1991) - 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		BG1-1-1	BG1-1-2	BG1-1-3	BG1-1-4	BG1-1-4RE	BG2-1-1	BG2-1-2	BG2-1-3
Laboratory Sample Number		13278, 14202	13279, 14203	13280, 14204	13281, 14205	13281RE, 14205RE	13282, 14206	13283, 14207	13284, 14208
Associated Field QC Samples		FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1
		TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1
SEMIVOLATILE ORGANICS (SOW 3/90)									
Phenol	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
bis(2-Chloroethyl)ether	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2-Chlorophenol	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
1,3-Dichlorobenzene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
1,4-Dichlorobenzene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
1,2-Dichlorobenzene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2-Methylphenol	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2,2'-oxybis(1-Chloropropane)	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
4-Methylphenol	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
N-Nitroso-di-N-propylamine	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Hexachloroethane	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Nitrobenzene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Isophorone	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2-Nitrophenol	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2,4-Dimethylphenol	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
bis(2-Chloroethoxy)methane	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2,4-Dichlorophenol	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
1,2,4-Trichlorobenzene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Naphthalene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
4-Chloroaniline	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Hexachlorobutadiene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
4-Chloro-3-methylphenol	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Hexachlorocyclopentadiene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2,4,6-Trichlorophenol	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2-Methylnaphthalene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2,4,5-Trichlorophenol	µg/kg	1800 U	1700 U	1800 U	2000 U	NA	2000 U	1900 U	1900 U
2-Chloronaphthalene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2-Nitroaniline	µg/kg	1800 U	1700 U	1800 U	2000 U	NA	2000 U	1900 U	1900 U
Dimethyl phthalate	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Acenaphthylene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2,6-Dinitrotoluene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
3-Nitroaniline	µg/kg	1800 U	1700 U	1800 U	2000 U	NA	2000 U	1900 U	1900 U
Acenaphthene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2,4-Dinitrophenol	µg/kg	1800 U	1700 U	1800 U	2000 U	NA	2000 U	1900 U	1900 U
4-Nitrophenol	µg/kg	1800 U	1700 U	1800 U	2000 U	NA	2000 U	1900 U	1900 U
Dibenzofuran	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
2,4-Dinitrotoluene	µg/kg	3400	360 U	370 U	400 U	NA	420 U	390 U	390 U
Diethyl phthalate	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
4-Chlorophenyl phenyl ether	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Fluorene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
4-Nitroaniline	µg/kg	1800 U	1700 U	1800 U	2000 U	NA	2000 U	1900 U	1900 U
4,6-Dinitro-2-methylphenol	µg/kg	1800 U	1700 U	1800 U	2000 U	NA	2000 U	1900 U	1900 U
N-Nitrosodiphenylamine (1)	µg/kg	800	360 U	370 U	400 U	NA	420 U	390 U	390 U
4-Bromophenyl phenyl ether	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Hexachlorobenzene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Pentachlorophenol	µg/kg	1800 U	1700 U	1800 U	2000 U	NA	2000 U	1900 U	1900 U
Phenanthrene	µg/kg	600	410	370 U	400 U	NA	420 U	390 U	390 U
Anthracene	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Carbazole	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
di-N-Butyl phthalate	µg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Fluoranthene	µg/kg	1500	920	370 U	400 U	NA	420 U	390 U	390 U

Table E-3. Data Presentation: Background Soil Samples (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		BG1-1-1	BG1-1-2	BG1-1-3	BG1-1-4	BG1-1-4RE	BG2-1-1	BG2-1-2	BG2-1-3
Laboratory Sample Number		13278, 14202	13279, 14203	13280, 14204	13281, 14205	13281RE, 14205RE	13282, 14206	13283, 14207	13284, 14208
Associated Field QC Samples		FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1
		TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1
SEMIVOLATILE ORGANICS (SOW 3/90)									
(Continued)									
Pyrene	μg/kg	1600	880	370 U	400 U	NA	420 U	390 U	390 U
Butylbenzylphthalate	μg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
3,3'-Dichlorobenzidine	μg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Benzo(a)anthracene	μg/kg	1000	360 U	370 U	400 U	NA	420 U	390 U	390 U
Chrysene	μg/kg	370 U	490	370 U	400 U	NA	420 U	390 U	390 U
bis(2-Ethylhexyl)phthalate	μg/kg	370 U	370	370 U	400 U	NA	420 U	390 U	390 U
di-N-Octyl phthalate	μg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Benzo(b)fluoranthene	μg/kg	2200	1000	370 U	400 U	NA	420 U	390 U	390 U
Benzo(k)fluoranthene	μg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Benzo(a)pyrene	μg/kg	1100	360 U	370 U	400 U	NA	420 U	390 U	390 U
Indeno(1,2,3-cd)pyrene	μg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Dibenzo(a,h)anthracene	μg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
Benzo(g,h,i)perylene	μg/kg	370 U	360 U	370 U	400 U	NA	420 U	390 U	390 U
TIC Total	μg/kg	1[illegible]350 (2[illegible])	13700 (20)	12070 (20)	2650 (12)	NA	2270 (6)	8830 (20)	4280 (18)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
IS – internal standard outside control limits
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
NA – not analyzed
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance
* – duplicate sample analysis outside of control limits

Table E-4. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		SB1-01-11	SB1-01-12	SB1-02-03	SB1-02-03R	SB1-02-16	SB1-03-02	SB1-03-05	SB1-03-18
Laboratory Sample Number		90021702	90021701	90021801	90021802	90021803	90021703	90021704	90021705
Associated Field QC Samples		FB-01,-02 TB-01	FB-01,-02 TB-01	FB-01,-02 TB-04	FB-01,-02 TB-04	FB-01,-02 TB-04	FB-01,-02 TB-02	FB-01,-02 TB-02	FB-01,-02 TB-02
Parameter	Units	EW-01,-02	EW-01,-02	EW-03,-04	EW-03,-04	EW-03,-04	EW-01,-02	EW-01,-02	EW-01,-02
Total Petroleum Hydrocarbons	mg/kg	10 UJ(HT)	10 UJ(HT)	630	10 U	10 U	10 U	10 U	10 U
METALS									
Antimony	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	1.30	0.74	1.40	1.20	0.93	2.00	1.70	0.94
Cadmium	mg/kg	0.22 J(MB,B)	0.21 U	0.24 J(MB,B)	0.24 U	0.21 U	0.60 J(MB,B)	0.34 J(MB,B)	0.21 J(MB,B)
Chromium	mg/kg	11.10	7.90	24.60	15.90	18.30	27.00	20.60	9.60
Copper	mg/kg	29.20	24.60	19.70	31.00	27.00	19.30	27.00	34.70
Lead	mg/kg	12.80 *	7.00 *	14.00 *	15.80 *	17.90 *	13.70 *	10.00 *	7.50 *
Mercury	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	16.90 J(MB)	17.00	23.30	20.10	22.20	29.70	26.20	23.80
Selenium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	1.20 U	1.20 U	1.30 U	1.30 U	1.10 U	1.30 U	1.20 U	1.20 U
Thallium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	29.60 J(FB)	172.00	62.30 J(FB)	49.20 J(FB)	42.30 J(FB)	66.00 J(FB)	54.40 J(FB)	33.20 J(FB)
VOLATILE ORGANIC COMPOUNDS									
Chloromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Disulfide	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Tetrachloride	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Acetate	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloroethyl Vinyl Ether	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobutane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl Methacrylate	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
TIC Totals	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA

Table B-4. Data Presentation: Site 1 - Fire Training Area - Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-01-11	SB1-01-12	SB1-02-03	SB1-02-03R	SB1-02-16	SB1-03-02	SB1-03-05	SB1-03-18
Laboratory Sample Number		90021702	90021701	90021801	90021802	90021803	90021703	90021704	90021705
Associated Field QC Samples		FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02
		TB-01	TB-01	TB-04	TB-04	TB-04	TB-02	TB-02	TB-02
Parameter	Units	EW-01,-02	EW-01,-02	EW-03,-04	EW-03,-04	EW-03,-04	EW-01,-02	EW-01,-02	EW-01,-02
SEMIVOLATILE ORGANIC COMPOUNDS									
Phenol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
bis(2-Chloroethyl)ether	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2-Chlorophenol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
1,3-Dichlorobenzene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
1,4-Dichlorobenzene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Benzyl Alcohol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
1,2-Dichlorobenzene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2-Methylphenol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
bis(2-Chloroisopropyl)ether	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
4-Methylphenol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
N-Nitroso-di-N-propylamine	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Hexachloroethane	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Nitrobenzene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Isophorone	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2-Nitrophenol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2,4-Dimethylphenol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Benzoic Acid	µg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
bis(2-Chloroethoxy)methane	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2,4-Dichlorophenol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
1,2,4-Trichlorobenzene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Naphthalene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
4-Chloroaniline	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Hexachlorobutadiene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
4-Chloro-3-methylphenol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2-Methylnaphthalene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Hexachlorocyclopentadiene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2,4,6-Trichlorophenol	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2,4,5-Trichlorophenol	µg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
2-Chloronaphthalene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2-Nitroaniline	µg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Dimethyl Phthalate	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Acenaphthylene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2,6-Dinitrotoluene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
3-Nitroaniline	µg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Acenaphthene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2,4-Dinitrophenol	µg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
4-Nitrophenol	µg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Dibenzofuran	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
2,4-Dinitrotoluene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Diethyl Phthalate	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
4-Chlorophenyl-phenyl Ether	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Fluorene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
4-Nitroaniline	µg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
4,6-Dinitro-2-methylphenol	µg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
N-Nitrosodiphenylamine	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
4-Bromophenyl-phenyl Ether	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Hexachlorobenzene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Pentachlorophenol	µg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Phenanthrene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Anthracene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
di-N-Butylphthalate	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Fluoranthene	µg/kg	400 U	350 U	430 U	270 J	360 U	410 U	380 U	350 U
Pyrene	µg/kg	400 U	350 U	430 U	230 J	360 U	410 U	380 U	350 U
Butylbenzyl Phthalate	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
3,3'-Dichlorobenzidine	µg/kg	810 U	700 U	870 U	790 U	720 U	820 U	760 U	700 U
Benzo(a)anthracene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Chrysene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
bis(2-Ethylhexyl)phthalate	µg/kg	400 U	350 U	430 U	390 U	230 J	410 U	380 U	350 U
di-N-Octyl Phthalate	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Benzo(b)fluoranthene	µg/kg	400 U	350 U	430 U	170 J	360 U	410 U	380 U	350 U
Benzo(k)fluoranthene	µg/kg	400 U	350 U	430 U	330 J	360 U	410 U	380 U	350 U
Benzo(a)pyrene	µg/kg	400 U	350 U	430 U	230 J	360 U	410 U	380 U	350 U
Indeno(1,2,3-c,d)pyrene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Dibenzo(a,h)anthracene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U
Benzo(g,h,i)perylene	µg/kg	400 U	350 U	430 U	390 U	360 U	410 U	380 U	350 U

Table B-4. Data Presentation: Site 1 - Fire Training Area - Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-01-11	SB1-01-12	SB1-02-03	SB1-02-03R	SB1-02-16	SB1-03-02	SB1-03-05	SB1-03-18
Laboratory Sample Number		90021702	90021701	90021801	90021802	90021803	90021703	90021704	90021705
Associated Field QC Samples		FB-01,-02 TB-01 EW-01,-02	FB-01,-02 TB-01 EW-01,-02	FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-02 EW-01,-02	FB-01,-02 TB-02 EW-01,-02	FB-01,-02 TB-02 EW-01,-02
Parameter	Units								
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)									
N-Nitrosodimethylamine	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
2-Picoline	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Methyl Methanesulfonate	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Ethyl Methanesulfonate	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Aniline	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Acetophenone	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
N-Nitrosopiperidine	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Dimethylphenethylamine	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
2,6-Dichlorophenol	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
N-Nitroso-di-N-butylamine	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
1,2,4,5-Tetrachlorobenzene	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
1-Chloronaphthalene	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Pentachlorobenzene	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
1-Naphthylamine	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
2-Naphthylamine	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
1,2-Diphenylhydrazine	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Phenacetin	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
4-Aminobiphenyl	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Pronamide	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
Benzidine	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
p-Dimethylaminoazobenzene	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
7,12-Dimethylbenzo(a)anthracene	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
3-Methylcholanthrene	μg/kg	2000 U	1700 U	2100 U	1900 U	1700 U	2000 U	1800 U	1700 U
TIC Totals	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
ORGANOCHLORINE PESTICIDES/PCBs									
alpha-BHC	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan-I	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan-II	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1016	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA

B - the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
FB - compound/element was also detected in the associated field blank
HT - sample analysis holding time greater than control limit
J - estimated value
MB - compound/element was also detected in the associated laboratory method blank
NA - not analyzed
U - compound/element was included in analysis, but was not detected
* - duplicate sample analysis outside of control limits

Table E-4. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-04-01	SB1-04-02	SB1-04-02RE	SB1-04-03	SB1-04-04
Laboratory Sample Number		90023601	90023602	90023602RE	90023603	90023604
Associated Field QC Samples		FB-01,-02,-03 TB-07 EW-03,-05,-06	FB-01,-02,-03 TB-07 EW-03,-05,-06	FB-01,-02,-03 TB-07 EW-03,-05,-06	FB-01,-02,-03 TB-07 EW-03,-05,-06	FB-01,-02,-03 TB-07 EW-03,-05,-06
Parameter	Units					
Total Petroleum Hydrocarbons	mg/kg	2400	1500	NA	1400	1100
METALS						
Antimony	mg/kg	NA	NA	NA	NA	NA
Arsenic	mg/kg	NA	NA	NA	NA	NA
Beryllium	mg/kg	1.70	1.30	NA	1.70	1.60
Cadmium	mg/kg	0.66 J(MB)	0.49 J(MB)	NA	0.79 J(MB)	0.37 J(MB,B)
Chromium	mg/kg	19.40	16.60	NA	20.50	19.50
Copper	mg/kg	24.80	29.20	NA	30.30	34.20
Lead	mg/kg	23.00	12.20	NA	15.50	13.90
Mercury	mg/kg	NA	NA	NA	NA	NA
Nickel	mg/kg	24.80	22.30	NA	29.10	31.40
Selenium	mg/kg	NA	NA	NA	NA	NA
Silver	mg/kg	0.90 U	1.10 U	NA	0.96 U	1.00 U
Thallium	mg/kg	NA	NA	NA	NA	NA
Zinc	mg/kg	64.80	55.80	NA	76.20	67.70
VOLATILE ORGANIC COMPOUNDS						
Chloromethane	µg/kg	11 U	12 U	12 U	12 U	60 U
Bromomethane	µg/kg	11 U	12 U	12 U	12 U	60 U
Vinyl Chloride	µg/kg	11 U	12 U	12 U	12 U	60 U
Chloroethane	µg/kg	11 U	12 U	12 U	12 U	60 U
Methylene Chloride	µg/kg	6 U	6 U	6 UJ(TB)	6 U	30 U
Acetone	µg/kg	11 U	12 U	12 U	12 U	60 U
Carbon Disulfide	µg/kg	6 U	6 U	6 U	6 U	30 U
1,1-Dichloroethene	µg/kg	3 U	4 U	4 U	4 U	18 U
1,1-Dichloroethane	µg/kg	6 U	6 U	6 U	6 U	30 U
1,2-Dichloroethene (total)	µg/kg	6 U	6 U	6 U	6 U	30 U
Chloroform	µg/kg	6 U	6 U	6 U	6 U	30 U
1,2-Dichloroethane	µg/kg	3 U	4 U	4 U	4 U	18 U
2-Butanone	µg/kg	11 U	12 U	12 U	12 U	60 U
1,1,1-Trichloroethane	µg/kg	6 U	6 U	6 U	6 U	30 U
Carbon Tetrachloride	µg/kg	3 U	4 U	4 U	4 U	18 U
Vinyl Acetate	µg/kg	11 U	12 U	12 U	12 U	60 U
Bromodichloromethane	µg/kg	6 U	6 U	6 U	6 U	30 U
1,2-Dichloropropane	µg/kg	6 U	6 U	6 U	6 U	30 U
cis-1,3-Dichloropropene	µg/kg	6 U	6 U	6 U	6 U	30 U
Trichloroethene	µg/kg	6 U	6 U	6 U	6 U	30 U
Dibromochloromethane	µg/kg	6 U	6 U	6 U	6 U	30 U
1,1,2-Trichloroethane	µg/kg	6 U	6 U	6 U	6 U	30 U
Benzene	µg/kg	3 U	4 U	4 U	10	18 U
trans-1,3-Dichloropropene	µg/kg	6 U	6 U	6 U	6 U	30 U
Bromoform	µg/kg	6 U	6 U	6 U	6 U	30 U
4-Methyl-2-pentanone	µg/kg	11 U	12 UJ(IS)	12 U	12 U	60 U
2-Hexanone	µg/kg	11 U	12 UJ(IS)	12 U	12 U	60 U
Tetrachloroethene	µg/kg	3 U	4 UJ(IS)	4 U	4 U	18 U
1,1,2,2-Tetrachloroethane	µg/kg	6 U	6 UJ(IS)	6 U	6 U	30 U
Toluene	µg/kg	80	270 J(SSR,IS)	240	67	350
Chlorobenzene	µg/kg	6 U	6 UJ(IS)	6 U	6 U	30 U
Ethylbenzene	µg/kg	6 U	6 UJ(IS)	6 U	6 U	93
Styrene	µg/kg	6 U	6 UJ(IS)	6 U	6 U	30 U
Total Xylenes	µg/kg	6 U	6 UJ(IS)	6 U	6 U	30 U
2-Chloroethyl Vinyl Ether	µg/kg	11 U	12 U	12 U	12 U	60 U
Iodomethane	µg/kg	11 U	12 U	12 U	12 U	60 U
Acrolein	µg/kg	44 U	48 U	48 U	48 U	240 U
Acrylonitrile	µg/kg	44 U	48 U	48 U	48 U	240 U
Dibromomethane	µg/kg	11 U	12 U	12 U	12 U	60 U
1,2,3-Trichloropropane	µg/kg	11 U	12 U	12 U	12 U	60 U
1,4-Dichlorobutane	µg/kg	11 U	12 U	12 U	12 U	60 U
Ethyl Methacrylate	µg/kg	11 U	12 U	12 U	12 U	60 U
Trichlorofluoromethane	µg/kg	11 U	12 U	12 U	12 U	60 U
Dichlorodifluoromethane	µg/kg	33 U	36 U	36 U	36 U	180 U
TIC Totals	µg/kg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Table E-4. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-04-01	SB1-04-02	SB1-04-02RE	SB1-04-03	SB1-04-04
Laboratory Sample Number		90023601	90023602	90023602RE	90023603	90023604
Associated Field QC Samples		FB-01,-02,-03 TB-07 EW-03,-05,-06	FB-01,-02,-03 TB-07 EW-03,-05,-06	FB-01,-02,-03 TB-07 EW-03,-05,-06	FB-01,-02,-03 TB-07 EW-03,-05,-06	FB-01,-02,-03 TB-07 EW-03,-05,-06
Parameter	Units					
SEMIVOLATILE ORGANIC COMPOUNDS						
Phenol	µg/kg	330 U	400 U	NA	390 U	380 U
bis(2-Chloroethyl)ether	µg/kg	330 U	400 U	NA	390 U	380 U
2-Chlorophenol	µg/kg	330 U	400 U	NA	390 U	380 U
1,3-Dichlorobenzene	µg/kg	330 U	400 U	NA	390 U	380 U
1,4-Dichlorobenzene	µg/kg	330 U	400 U	NA	390 U	380 U
Benzyl Alcohol	µg/kg	330 U	400 U	NA	390 U	380 U
1,2-Dichlorobenzene	µg/kg	330 U	400 U	NA	390 U	380 U
2-Methylphenol	µg/kg	330 U	400 U	NA	390 U	380 U
bis(2-Chloroisopropyl)ether	µg/kg	330 U	400 U	NA	390 U	380 U
4-Methylphenol	µg/kg	330 U	400 U	NA	390 U	380 U
N-Nitroso-di-N-propylamine	µg/kg	330 U	400 U	NA	390 U	380 U
Hexachloroethane	µg/kg	330 U	400 U	NA	390 U	380 U
Nitrobenzene	µg/kg	330 U	400 U	NA	390 U	380 U
Isophorone	µg/kg	330 U	400 U	NA	390 U	380 U
2-Nitrophenol	µg/kg	330 U	400 U	NA	390 U	380 U
2,4-Dimethylphenol	µg/kg	330 U	400 U	NA	390 U	380 U
Benzoic Acid	µg/kg	1600 U	1900 U	NA	1900 U	1900 U
bis(2-Chloroethoxy)methane	µg/kg	330 U	400 U	NA	390 U	380 U
2,4-Dichlorophenol	µg/kg	330 U	400 U	NA	390 U	380 U
1,2,4-Trichlorobenzene	µg/kg	330 U	400 U	NA	390 U	380 U
Naphthalene	µg/kg	330 U	400 U	NA	390 U	380 U
4-Chloroaniline	µg/kg	330 U	400 U	NA	390 U	380 U
Hexachlorobutadiene	µg/kg	330 U	400 U	NA	390 U	380 U
4-Chloro-3-methylphenol	µg/kg	330 U	400 U	NA	390 U	380 U
2-Methylnaphthalene	µg/kg	330 U	400 U	NA	390 U	380 U
Hexachlorocyclopentadiene	µg/kg	330 U	400 U	NA	390 U	380 U
2,4,6-Trichlorophenol	µg/kg	330 U	400 U	NA	390 U	380 U
2,4,5-Trichlorophenol	µg/kg	1600 U	1900 U	NA	1900 U	1900 U
2-Chloronaphthalene	µg/kg	330 U	400 U	NA	390 U	380 U
2-Nitroaniline	µg/kg	1600 U	1900 U	NA	1900 U	1900 U
Dimethyl Phthalate	µg/kg	330 U	400 U	NA	390 U	380 U
Acenaphthylene	µg/kg	330 U	400 U	NA	390 U	380 U
2,6-Dinitrotoluene	µg/kg	330 U	400 U	NA	390 U	380 U
3-Nitroaniline	µg/kg	1600 U	1900 U	NA	1900 U	1900 U
Acenaphthene	µg/kg	330 U	400 U	NA	390 U	380 U
2,4-Dinitrophenol	µg/kg	1600 U	1900 U	NA	1900 U	1900 U
4-Nitrophenol	µg/kg	1600 U	1900 U	NA	1900 U	1900 U
Dibenzofuran	µg/kg	330 U	400 U	NA	390 U	380 U
2,4-Dinitrotoluene	µg/kg	330 U	400 U	NA	390 U	380 U
Diethyl Phthalate	µg/kg	330 U	400 U	NA	390 U	380 U
4-Chlorophenyl-phenyl Ether	µg/kg	330 U	400 U	NA	390 U	380 U
Fluorene	µg/kg	330 U	400 U	NA	390 U	380 U
4-Nitroaniline	µg/kg	1600 U	1900 U	NA	1900 U	1900 U
4,6-Dinitro-2-methylphenol	µg/kg	1600 U	1900 U	NA	1900 U	1900 U
N-Nitrosodiphenylamine	µg/kg	330 U	400 U	NA	390 U	380 U
4-Bromophenyl-phenyl Ether	µg/kg	330 U	400 U	NA	390 U	380 U
Hexachlorobenzene	µg/kg	330 U	400 U	NA	390 U	380 U
Pentachlorophenol	µg/kg	1600 U	1900 U	NA	1900 U	1900 U
Phenanthrene	µg/kg	330 U	400 U	NA	360 J	1100
Anthracene	µg/kg	330 U	400 U	NA	390 U	280 J
di-N-Butylphthalate	µg/kg	330 U	400 U	NA	390 U	380 U
Fluoranthene	µg/kg	330 U	400 U	NA	730	1100
Pyrene	µg/kg	330 U	400 U	NA	730	1000
Butylbenzyl Phthalate	µg/kg	330 U	400 U	NA	390 U	380 U
3,3'-Dichlorobenzidine	µg/kg	670 U	800 U	NA	790 U	770 U
Benzo(a)anthracene	µg/kg	330 U	400 U	NA	560	530
Chrysene	µg/kg	330 U	400 U	NA	620	560
bis(2-Ethylhexyl)phthalate	µg/kg	330 U	400 U	NA	390 U	380 U
di-N-Octyl Phthalate	µg/kg	330 U	400 U	NA	390 U	380 U
Benzo(b)fluoranthene	µg/kg	330 U	400 U	NA	720	530
Benzo(k)fluoranthene	µg/kg	330 U	400 U	NA	800	580
Benzo(a)pyrene	µg/kg	330 U	400 U	NA	790	540
Indeno(1,2,3-c,d)pyrene	µg/kg	330 U	400 U	NA	610	330 J
Dibenzo(a,h)anthracene	µg/kg	330 U	400 U	NA	260 J	380 U
Benzo(g,h,i)perylene	µg/kg	330 U	400 U	NA	760	370 J

Table B-4. Data Presentation: Site 1 - Fire Training Area - Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-04-01	SB1-04-02	SB1-04-02RE	SB1-04-03	SB1-04-04
Laboratory Sample Number		90023601	90023602	90023602RE	90023603	90023604
Associated Field QC Samples		FB-01,-02,-03 TB-07	FB-01,-02,-03 TB-07	FB-01,-02,-03 TB-07	FB-01,-02,-03 TB-07	FB-01,-02,-03 TB-07
Parameter	Units	EW-03,-05,-06	EW-03,-05,-06	EW-03,-05,-06	EW-03,-05,-06	EW-03,-05,-06
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)						
N-Nitrosodimethylamine	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
2-Picoline	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
Methyl Methanesulfonate	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
Ethyl Methanesulfonate	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
Aniline	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
Acetophenone	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
N-Nitrosopiperidine	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
Dimethylphenethylamine	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
2,6-Dichlorophenol	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
N-Nitroso-di-N-butylamine	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
1,2,4,5-Tetrachlorobenzene	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
1-Chloronaphthalene	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
Pentachlorobenzene	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
1-Naphthylamine	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
2-Naphthylamine	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
1,2-Diphenylhydrazine	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
Phenacetin	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
4-Aminobiphenyl	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
Pronamide	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
Benzidine	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
p-Dimethylaminoazobenzene	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
7,12-Dimethylbenzo(a)anthracene	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
3-Methylcholanthrene	μg/kg	1600 U	1900 U	NA	1900 U	1900 U
TIC Totals	μg/kg	NA	NA	NA	NA	NA
ORGANOCHLORINE PESTICIDES/PCBs						
alpha-BHC	μg/kg	NA	NA	NA	NA	NA
beta-BHC	μg/kg	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	μg/kg	NA	NA	NA	NA	NA
delta-BHC	μg/kg	NA	NA	NA	NA	NA
Heptachlor	μg/kg	NA	NA	NA	NA	NA
Aldrin	μg/kg	NA	NA	NA	NA	NA
Heptachlor Epoxide	μg/kg	NA	NA	NA	NA	NA
Endosulfan-I	μg/kg	NA	NA	NA	NA	NA
Dieldrin	μg/kg	NA	NA	NA	NA	NA
4,4'-DDE	μg/kg	NA	NA	NA	NA	NA
Endrin	μg/kg	NA	NA	NA	NA	NA
Endosulfan-II	μg/kg	NA	NA	NA	NA	NA
4,4'-DDD	μg/kg	NA	NA	NA	NA	NA
Endrin Aldehyde	μg/kg	NA	NA	NA	NA	NA
Endosulfan Sulfate	μg/kg	NA	NA	NA	NA	NA
4,4'-DDT	μg/kg	NA	NA	NA	NA	NA
Methoxychlor	μg/kg	NA	NA	NA	NA	NA
Chlordane	μg/kg	NA	NA	NA	NA	NA
Toxaphene	μg/kg	NA	NA	NA	NA	NA
Aroclor-1016	μg/kg	NA	NA	NA	NA	NA
Aroclor-1221	μg/kg	NA	NA	NA	NA	NA
Aroclor-1232	μg/kg	NA	NA	NA	NA	NA
Aroclor-1242	μg/kg	NA	NA	NA	NA	NA
Aroclor-1248	μg/kg	NA	NA	NA	NA	NA
Aroclor-1254	μg/kg	NA	NA	NA	NA	NA
Aroclor-1260	μg/kg	NA	NA	NA	NA	NA

IS - internal standard outside control limits
J - estimated value
MB - compound/element was also detected in the associated laboratory method blank
NA - not analyzed
SSR - sample surrogate recovery outside control limits
TB - compound/element was also detected in the associated trip blank
U - compound/element was included in analysis, but was not detected

Table E-5. Data Presentation: Site 1 – Fire Training Area – Groundwater Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		MW1-01	MW1-02	P-8
Laboratory Sample Number		90025102	90025101	90025105
Associated Field QC Samples		FB-01,-02,-03 TB-11 EW-07,-08,-09	FB-01,-02,-03 TB-11 EW-07,-08,-09	FB-01,-02,-03 TB-12 EW-08,-09
Parameter	Units			
Total Petroleum Hydrocarbons	mg/L	1 U	1 U	1 U
METALS				
Antimony	µg/L	1.00 U	1.00 U	1.00 U
Arsenic	µg/L	5.80 J(B)	5.40 J(B)	2.00 U
Beryllium	µg/L	2.00 U	2.00 U	2.00 U
Cadmium	µg/L	2.00 U	2.00 U	2.00 U
Chromium	µg/L	13.00 U	13.00 U	13.00 U
Copper	µg/L	11.00 J(FB,B)	32.00 J(FB)	37.00 J(FB)
Lead	µg/L	4.80 J(FB,B)	14.30 J(FB)	6.90 J(FB)
Mercury	µg/L	0.20 U	0.20 U	0.20 U
Nickel	µg/L	14.00 J(MB,B)	12.00 U	12.00 U
Selenium	µg/L	3.00 UW	3.00 UW	3.00 U
Silver	µg/L	11.00 U	11.00 U	11.00 U
Thallium	µg/L	2.00 UW	2.00 UW	2.00 UW
Zinc	µg/L	15.00 J(FB,B)	51.00 J(FB)	24.00 J(FB)
VOLATILE ORGANIC COMPOUNDS				
Chloromethane	µg/L	10 U	10 U	10 U
Bromomethane	µg/L	10 U	10 U	10 U
Vinyl Chloride	µg/L	10 U	10 U	10 U
Chloroethane	µg/L	10 U	10 U	10 U
Methylene Chloride	µg/L	5 U	5 U	5 U
Acetone	µg/L	10 U	10 U	10 U
Carbon Disulfide	µg/L	5 U	5 U	5 U
1,1-Dichloroethene	µg/L	3 U	3 U	3 U
1,1-Dichloroethane	µg/L	5 U	5 U	5 U
1,2-Dichloroethene (total)	µg/L	5 U	5 U	5 U
Chloroform	µg/L	5 U	5 U	5 U
1,2-Dichloroethane	µg/L	3 U	3 U	3 U
2-Butanone	µg/L	10 U	10 U	10 U
1,1,1-Trichloroethane	µg/L	5 U	5 U	5 U
Carbon Tetrachloride	µg/L	3 U	3 U	3 U
Vinyl Acetate	µg/L	10 U	10 U	10 U
Bromodichloromethane	µg/L	5 U	5 U	5 U
1,2-Dichloropropane	µg/L	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	5 U	5 U
Trichloroethene	µg/L	5 U	5 U	5 U
Dibromochloromethane	µg/L	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	5 U	5 U	5 U
Benzene	µg/L	3 U	3 U	3 U
trans-1,3-Dichloropropene	µg/L	5 U	5 U	5 U
Bromoform	µg/L	5 U	5 U	5 U
4-Methyl-2-pentanone	µg/L	10 U	10 U	10 U
2-Hexanone	µg/L	10 U	10 U	10 U
Tetrachloroethene	µg/L	3 U	3 U	3 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	5 U	5 U
Toluene	µg/L	5 U	5 U	5 U
Chlorobenzene	µg/L	5 U	5 U	5 U
Ethylbenzene	µg/L	5 U	5 U	5 U
Styrene	µg/L	5 U	5 U	5 U
Total Xylenes	µg/L	5 U	5 U	5 U
2-Chloroethyl Vinyl Ether	µg/L	10 U	10 U	10 U
Iodomethane	µg/L	10 U	10 U	10 U
Acrolein	µg/L	40 U	40 U	40 U
Acrylonitrile	µg/L	40 U	40 U	40 U
Dibromomethane	µg/L	10 U	10 U	10 U
1,2,3-Trichloropropane	µg/L	10 U	10 U	10 U
1,4-Dichlorobutane	µg/L	10 U	10 U	10 U
Ethyl Methacrylate	µg/L	10 U	10 U	10 U
Trichlorofluoromethane	µg/L	10 U	10 U	10 U
Dichlorodifluoromethane	µg/L	30 U	30 U	30 U
TIC Totals	µg/L	NA	NA	NA

Table E-5. Data Presentation: Site 1 - Fire Training Area - Groundwater Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW1-01	MW1-02	P-8
Laboratory Sample Number		90025102	90025101	90025105
Associated Field QC Samples		FB-01,-02,-03 TB-11	FB-01,-02,-03 TB-11	FB-01,-02,-03 TB-12
Parameter	Units	EW-07,-08,-09	EW-07,-08,-09	EW-08,-09
SEMIVOLATILE ORGANIC COMPOUNDS				
Phenol	µg/L	10 U	10 U	10 U
bis(2-Chloroethyl)ether	µg/L	10 U	10 U	10 U
2-Chlorophenol	µg/L	10 U	10 U	10 U
1,3-Dichlorobenzene	µg/L	5 U	5 U	5 U
1,4-Dichlorobenzene	µg/L	5 U	5 U	5 U
Benzyl Alcohol	µg/L	20 U	20 U	20 U
1,2-Dichlorobenzene	µg/L	5 U	5 U	5 U
2-Methylphenol	µg/L	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	µg/L	10 U	10 U	10 U
4-Methylphenol	µg/L	10 U	10 U	10 U
N-Nitroso-di-N-propylamine	µg/L	10 U	10 U	10 U
Hexachloroethane	µg/L	10 U	10 U	10 U
Nitrobenzene	µg/L	10 U	10 U	10 U
Isophorone	µg/L	10 U	10 U	10 U
2-Nitrophenol	µg/L	10 U	10 U	10 U
2,4-Dimethylphenol	µg/L	10 U	10 U	10 U
Benzoic Acid	µg/L	50 U	50 U	50 U
bis(2-Chloroethoxy)methane	µg/L	10 U	10 U	10 U
2,4-Dichlorophenol	µg/L	10 U	10 U	10 U
1,2,4-Trichlorobenzene	µg/L	10 U	10 U	10 U
Naphthalene	µg/L	10 U	10 U	10 U
4-Chloroaniline	µg/L	20 U	20 U	20 U
Hexachlorobutadiene	µg/L	10 U	10 U	10 U
4-Chloro-3-methylphenol	µg/L	10 U	10 U	10 U
2-Methylnaphthalene	µg/L	10 U	10 U	10 U
Hexachlorocyclopentadiene	µg/L	10 U	10 U	10 U
2,4,6-Trichlorophenol	µg/L	10 U	10 U	10 U
2,4,5-Trichlorophenol	µg/L	50 U	50 U	50 U
2-Chloronaphthalene	µg/L	10 U	10 U	10 U
2-Nitroaniline	µg/L	50 U	50 U	50 U
Dimethyl Phthalate	µg/L	10 U	10 U	10 U
Acenaphthylene	µg/L	10 U	10 U	10 U
2,6-Dinitrotoluene	µg/L	10 U	10 U	10 U
3-Nitroaniline	µg/L	50 U	50 U	50 U
Acenaphthene	µg/L	10 U	10 U	10 U
2,4-Dinitrophenol	µg/L	50 U	50 U	50 U
4-Nitrophenol	µg/L	50 U	50 U	50 U
Dibenzofuran	µg/L	10 U	10 U	10 U
2,4-Dinitrotoluene	µg/L	10 U	10 U	10 U
Diethylphthalate	µg/L	10 U	10 U	10 U
4-Chlorophenyl-phenyl Ether	µg/L	20 U	20 U	20 U
Fluorene	µg/L	10 U	10 U	10 U
4-Nitroaniline	µg/L	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	µg/L	50 U	50 U	50 U
N-Nitrosodiphenylamine	µg/L	10 U	10 U	10 U
4-Bromophenyl-phenyl Ether	µg/L	10 U	10 U	10 U
Hexachlorobenzene	µg/L	10 U	10 U	10 U
Pentachlorophenol	µg/L	30 U	30 U	30 U
Phenanthrene	µg/L	10 U	10 U	10 U
Anthracene	µg/L	10 U	10 U	10 U
di-N-Butylphthalate	µg/L	10 U	10 U	10 U
Fluoranthene	µg/L	10 U	10 U	10 U
Pyrene	µg/L	10 U	10 U	10 U
Butylbenzylphthalate	µg/L	10 U	10 U	10 U
3,3'-Dichlorobenzidine	µg/L	20 U	20 U	20 U
Benzo(a)anthracene	µg/L	10 U	10 U	10 U
Chrysene	µg/L	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	µg/L	10 U	10 U	10 U
di-N-Octyl Phthalate	µg/L	10 U	10 U	10 U
Benzo(b)fluoranthene	µg/L	10 U	10 U	10 U
Benzo(k)fluoranthene	µg/L	10 U	10 U	10 U
Benzo(a)pyrene	µg/L	10 U	10 U	10 U
Indeno(1,2,3-c,d)pyrene	µg/L	10 U	10 U	10 U
Dibenzo(a,h)anthracene	µg/L	10 U	10 U	10 U
Benzo(g,h,i)perylene	µg/L	10 U	10 U	10 U

Table E-5. Data Presentation: Site 1 – Fire Training Area – Groundwater Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW1-01	MW1-02	P-8
Laboratory Sample Number		90025102	90025101	90025105
Associated Field QC Samples		FB-01,-02,-03 TB-11 EW-07,-08,-09	FB-01,-02,-03 TB-11 EW-07,-08,-09	FB-01,-02,-03 TB-12 EW-08,-09
Parameter	Units			
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)				
N-Nitrosodimethylamine	µg/L	50 U	50 U	50 U
2-Picoline	µg/L	50 U	50 U	50 U
Methyl Methanesulfonate	µg/L	50 U	50 U	50 U
Ethyl Methanesulfonate	µg/L	50 U	50 U	50 U
Aniline	µg/L	50 U	50 U	50 U
Acetophenone	µg/L	50 U	50 U	50 U
N-Nitrosopiperidine	µg/L	50 U	50 U	50 U
Dimethylphenethylamine	µg/L	50 U	50 U	50 U
2,6-Dichlorophenol	µg/L	50 U	50 U	50 U
N-Nitroso-di-N-butylamine	µg/L	50 U	50 U	50 U
1,2,4,5-Tetrachlorobenzene	µg/L	50 U	50 U	50 U
1-Chloronaphthalene	µg/L	50 U	50 U	50 U
Pentachlorobenzene	µg/L	50 U	50 U	50 U
1-Naphthylamine	µg/L	50 U	50 U	50 U
2-Naphthylamine	µg/L	50 U	50 U	50 U
1,2-Diphenylhydrazine	µg/L	50 U	50 U	50 U
Phenacetin	µg/L	50 U	50 U	50 U
4-Aminobiphenyl	µg/L	50 U	50 U	50 U
Pronamide	µg/L	50 U	50 U	50 U
Benzidine	µg/L	50 U	50 U	50 U
p-Dimethylaminoazobenzene	µg/L	50 U	50 U	50 U
7,12-Dimethylbenzo(a)anthracene	µg/L	50 U	50 U	50 U
3-Methylcholanthrene	µg/L	50 U	50 U	50 U
TIC Total	µg/L	NA	NA	NA

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit (CRDL)
FB – compound/element was also detected in the associated field blank
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
NA – not analyzed
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance

Table E-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		SB1-1-1	SB1-1-2	SB1-1-3	SB1-1-7	SB1-2-1	SB1-2-1DL	SB1-2-2
Laboratory Sample Number		13188, 13197	13189, 13198	13190, 13199	13289, 14222	13285, 14209	13285, 14209	13286, 14210
Associated Field QC Samples		FB4-1 TB11-1-91 EB4-1	FB4-1 TB11-1-91 EB4-1	FB4-1 TB11-1-91 EB4-1	FB1-1 TB11-3-91 EB1-1, 1A-1, 4-1	FB1-1 TB11-3-91 EB1-1, 1A-1, 4-1	FB1-1 TB11-3-91 EB1-1, 1A-1, 4-1	FB1-1 TB11-3-91 EB1-1, 1A-1, 4-1
Parameter	Units							
Total Petroleum Hydrocarbons	mg/kg	50 U	50 U	50 U	50 U	50 U	NA	50 U
INORGANICS								
Antimony	mg/kg	3.1 UJ(N)	3.4 UJ(N)	3.2 UJ(N)	3.3 UJ(N)	3.3 UJ(N)	NA	3.3 UJ(N)
Arsenic	mg/kg	9.5	9.8	9.8	8 J(*)	9.7	NA	5.5
Beryllium	mg/kg	0.33 J(B)	0.8 J(B)	0.56 J(B)	0.44 J(B)	0.67 J(B)	NA	0.73 J(B)
Cadmium	mg/kg	0.22 U	0.74 J(MB,B)	0.83 UJ(MB,B)	0.33 J(MB,B)	0.72 J(MB,B)	NA	0.23 U
Chromium	mg/kg	8.5	18.6	19	17.3	20.3	NA	17.8
Copper	mg/kg	22.4 J(N,*)	27.4 J(N,*)	39 J(N,*)	23.6	20.1 J(N,*)	NA	18.8 J(N,*)
Lead	mg/kg	15.7	13.6	16.2	11.4	16.9	NA	18.2
Mercury	mg/kg	0.11 U	0.12 U	0.1 U	0.1 U	0.12 U	NA	0.12 U
Nickel	mg/kg	20.2	28.3	39.8	28.9	27	NA	21.8
Selenium	mg/kg	0.28 J(MB,B)	0.25 UW	0.23 UW	0.24 UJ(N)	0.23 UW	NA	0.24 U
Silver	mg/kg	0.44 U	0.48 U	0.46 U	0.48 U	0.47 U	NA	0.47 U
Thallium	mg/kg	0.39 J(B)	0.25 U	0.33 J(B)	0.35 J(MB,B)	0.31 J(B)	NA	0.28 J(B)
Zinc	mg/kg	59.3	83.5	80.4	63.9	69	NA	70
VOLATILE ORGANICS (SOW 3/90)								
Chloromethane	μg/kg	12 U	60 U	13 U	12 U	12 U	NA	12 U
Bromomethane	μg/kg	12 U	60 U	13 U	12 U	12 U	NA	12 U
Vinyl Chloride	μg/kg	12 U	60 U	13 U	12 U	12 U	NA	12 U
Chloroethane	μg/kg	12 U	60 U	13 U	12 U	12 U	NA	12 U
Methylene Chloride	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Acetone	μg/kg	12 U	60 U	13 U	12 U	12 U	NA	12 U
Carbon Disulfide	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
1,1-Dichloroethene	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
1,1-Dichloroethane	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
1,2-Dichloroethene (Total)	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Chloroform	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
1,2-Dichloroethane	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
2-Butanone	μg/kg	12 U	60 U	13 U	12 U	12 U	NA	12 U
1,1,1-Trichloroethane	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Carbon Tetrachloride	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Bromodichloromethane	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
1,2-Dichloropropane	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
cis-1,3-Dichloropropene	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Trichloroethene	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Dibromochloromethane	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
1,1,2-Trichloroethane	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Benzene	μg/kg	6 U	110	6 U	6 U	6 U	NA	6 U
trans-1,3-Dichloropropene	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Bromoform	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
4-Methyl-2-pentanone	μg/kg	12 U	60 U	13 U	12 U	12 U	NA	12 U
2-Hexanone	μg/kg	12 U	60 U	13 U	12 U	12 U	NA	12 U
Tetrachloroethene	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
1,1,2,2-Tetrachloroethane	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Toluene	μg/kg	6 U	180	6 U	6 U	6 U	NA	6 U
Chlorobenzene	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Ethylbenzene	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Styrene	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
Xylene(Total)	μg/kg	6 U	30 U	6 U	6 U	6 U	NA	6 U
TIC Total	μg/kg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	NA	0 (0)

Table E-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-1-1	SB1-1-2	SB1-1-3	SB1-1-7	SB1-2-1	SB1-2-1DL	SB1-2-2
Laboratory Sample Number		13188, 13197	13189, 13198	13190, 13199	13289, 14222	13285, 14209	13285, 14209	13286, 14210
Associated Field QC Samples		FB4-1	FB4-1	FB4-1	FB1-1	FB1-1	FB1-1	FB1-1
		TB11-1-91	TB11-1-91	TB11-1-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91
Parameter	Units	EB4-1	EB4-1	EB4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1
SEMIVOLATILE ORGANICS (SOW 3/90)								
Phenol	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
bis(2-Chloroethyl)ether	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2-Chlorophenol	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
1,3-Dichlorobenzene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
1,4-Dichlorobenzene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
1,2-Dichlorobenzene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2-Methylphenol	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2,2'-oxybis(1-Chloropropane)	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
4-Methylphenol	µg/kg	400 U	1900	420 U	400 U	NA	1900 U	400 U
N-Nitroso-di-N-propylamine	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Hexachloroethane	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Nitrobenzene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Isophorone	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2-Nitrophenol	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2,4-Dimethylphenol	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
bis(2-Chloroethoxy)methane	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2,4-Dichlorophenol	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
1,2,4-Trichlorobenzene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Naphthalene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
4-Chloroaniline	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Hexachlorobutadiene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
4-Chloro-3-methylphenol	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Hexachlorocyclopentadiene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2,4,6-Trichlorophenol	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2-Methylnaphthalene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2,4,5-Trichlorophenol	µg/kg	1900 U	1900 U	2000 U	2000 U	NA	9300 U	2000 U
2-Chloronaphthalene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2-Nitroaniline	µg/kg	1900 U	1900 U	2000 U	2000 U	NA	9300 U	2000 U
Dimethyl phthalate	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Acenaphthylene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2,6-Dinitrotoluene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
3-Nitroaniline	µg/kg	1900 U	1900 U	2000 U	2000 U	NA	9300 U	2000 U
Acenaphthene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2,4-Dinitrophenol	µg/kg	1900 U	1900 U	2000 U	2000 U	NA	9300 U	2000 U
4-Nitrophenol	µg/kg	1900 U	1900 U	2000 U	2000 U	NA	9300 U	2000 U
Dibenzofuran	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
2,4-Dinitrotoluene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Diethyl phthalate	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
4-Chlorophenyl phenyl ether	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Fluorene	µg/kg	400 U	390 U	420 U	400 U	NA	1500 DJ	400 U
4-Nitroaniline	µg/kg	1900 U	1900 U	2000 U	2000 U	NA	9300 U	2000 U
4,6-Dinitro-2-methylphenol	µg/kg	1900 U	1900 U	2000 U	2000 U	NA	9300 U	2000 U
N-Nitrosodiphenylamine (1)	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
4-Bromophenyl phenyl ether	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Hexachlorobenzene	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Pentachlorophenol	µg/kg	1900 U	1900 U	2000 U	2000 U	NA	9300 U	2000 U
Phenanthrene	µg/kg	400 U	390 U	420 U	400 U	NA	10000 D	400 U
Anthracene	µg/kg	400 U	390 U	420 U	400 U	NA	2100 D	400 U
Carbazole	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
di-N-Butyl phthalate	µg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Fluoranthene	µg/kg	400 U	390 U	420 U	400 U	NA	13000 D	400 U

Table E-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-1-1	SB1-1-2	SB1-1-3	SB1-1-7	SB1-2-1	SB1-2-1DL	SB1-2-2
Laboratory Sample Number		13188, 13197	13189, 13198	13190, 13199	13289, 14222	13285, 14209	13285, 14209	13286, 14210
Associated Field QC Samples		FB4-1	FB4-1	FB4-1	FB1-1	FB1-1	FB1-1	FB1-1
		TB11-1-91	TB11-1-91	TB11-1-91	TB11-3-91	TB11-3-91	TB11-3-91	TB11-3-91
Parameter	Units	EB4-1	EB4-1	EB4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1
SEMIVOLATILE ORGANICS (SOW 3/90)								
(Continued)								
Pyrene	μg/kg	400 U	390 U	420 U	400 U	NA	9400 D	400 U
Butylbenzylphthalate	μg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
3,3'-Dichlorobenzidine	μg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Benzo(a)anthracene	μg/kg	400 U	390 U	420 U	400 U	NA	4400 D	400 U
Chrysene	μg/kg	400 U	390 U	420 U	400 U	NA	4300 D	400 U
bis(2-Ethylhexyl)phthalate	μg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
di-N-Octyl phthalate	μg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Benzo(b)fluoranthene	μg/kg	400 U	390 U	420 U	400 U	NA	6900 D	400 U
Benzo(k)fluoranthene	μg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Benzo(a)pyrene	μg/kg	400 U	390 U	420 U	400 U	NA	3800 D	400 U
Indeno(1,2,3-cd)pyrene	μg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Dibenzo(a,h)anthracene	μg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
Benzo(g,h,i)perylene	μg/kg	400 U	390 U	420 U	400 U	NA	1900 U	400 U
TIC Total	μg/kg	12960 (18)	12980 (20)	0 (0)	6050 (16)	NA	11890 (7)	7050 (11)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
D – the identified compound was analyzed at a secondary dilution factor after exceeding the calibration range of the instrument on the first analysis
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
NA – not analyzed
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance
* – duplicate sample analysis outside of control limits

Table E-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-2-3	SB1-2-5	SB1-2-5R	SB1-2-7	SB1-3-1	SB1-3-2	SB1-3-3	SB1-3-3R
Laboratory Sample Number		13287, 14211	14352	14353	13288, 14212	14259, 14269	14260, 14270	14261, 14271	14262, 14272
Associated Field QC Samples		FB1-1	FB2-1	FB2-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1
		TB11-3-91	TB11-6-91	TB11-6-91	TB11-3-91	TB-11-05-91	TB-11-05-91	TB-11-05-91	TRIP BLK.
Parameter	Units	EB1-1, 1A-1, 4-1	EB2-1	EB2-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1	EB1-1, 1A-1	EB1-1, 1A-1	EB1-1, 1A-1
Total Petroleum Hydrocarbons	mg/kg	50 U	NA	NA	50 U	50 U	200	50 U	50 U
INORGANICS									
Antimony	mg/kg	3.6 UJ(N)	3.3 J(N,B)	3.3 UJ(N)	3.4 UJ(N)	3.3 UJ(N)	3.2 UJ(N)	3.3 UJ(N)	3.4 J(B,N)
Arsenic	mg/kg	8.2	7.8 R(N)	6.7 R(N)	6.7	8.3 J(*)	9.7 J(*)	3.9 J(*)	5.7 J(*)
Beryllium	mg/kg	0.76 J(B)	0.42 J(B)	0.46 J(B)	0.5 J(B)	0.61 J(B)	0.44 J(B)	0.48 J(B)	0.47 J(B)
Cadmium	mg/kg	2.6	0.45 J(B)	0.73 J(B)	0.53 J(MB,B)	0.68 J(MB,B)	0.79 J(MB,B)	0.79 J(MB,B)	0.53 J(MB,B)
Chromium	mg/kg	26.5	16.1	17.3	17.3	18.3	14.8	14.8	15.4
Copper	mg/kg	29.8 J(N,*)	28.2	23	29.1 J(N,*)	25.5	19.6	23.1	23.1
Lead	mg/kg	14.5	10.9	10.7	9.7	16.6	34.1	26.4	10.5
Mercury	mg/kg	0.11 U	0.1 UJ(HT)	0.11 UJ(HT)	0.12 U	0.1 U	0.11 U	0.11 U	0.1 U
Nickel	mg/kg	94.7	29.3	30.6	33.3	28.1	22.9	23.6	33.1
Selenium	mg/kg	0.25 UW	0.23 U	0.22 U	0.24 U	0.59 J(MB,N,B)	0.23 UJ(N)	0.23 UJ(N)	0.23 UJ(N)
Silver	mg/kg	0.51 U	0.46 U	0.47 U	0.48 U	0.48 U	0.46 U	0.47 U	0.46 U
Thallium	mg/kg	0.4 J(B)	0.26 J(MB,B)	0.22 U	0.37 J(B)	0.3 J(MB,B)	0.26 J(MB,B)	0.23 U	0.49 J(MB,B)
Zinc	mg/kg	111	77.2 *	67.7 *	69.6	87.5	58.7	60	62.9
VOLATILE ORGANICS (SOW 3/90)									
Chloromethane	µg/kg	13 U	62 U	62 U	12 U	60 U	61 U	61 U	NA
Bromomethane	µg/kg	13 U	62 U	62 U	12 U	60 U	61 U	61 U	NA
Vinyl Chloride	µg/kg	13 U	62 U	62 U	12 U	60 U	61 U	61 U	NA
Chloroethane	µg/kg	13 U	62 U	62 U	12 U	60 U	61 U	61 U	NA
Methylene Chloride	µg/kg	6 U	56	54	6 U	67 U(FB)	76 U(FB)	80 U(FB)	NA
Acetone	µg/kg	13 U	62 U	62 U	12 U	120 U(EB)	160	220	NA
Carbon Disulfide	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
1,1-Dichloroethene	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
1,1-Dichloroethane	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
1,2-Dichloroethene (Total)	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
Chloroform	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
1,2-Dichloroethane	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
2-Butanone	µg/kg	13 U	62 U	62 U	12 U	60 U	61 U	61 U	NA
1,1,1-Trichloroethane	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
Carbon Tetrachloride	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
Bromodichloromethane	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
1,2-Dichloropropane	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
cis-1,3-Dichloropropene	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
Trichloroethene	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
Dibromochloromethane	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
1,1,2-Trichloroethane	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
Benzene	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
trans-1,3-Dichloropropene	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
Bromoform	µg/kg	6 U	31 U	31 U	6 U	30 U	30 U	30 U	NA
4-Methyl-2-pentanone	µg/kg	13 U	62 UJ(IS)	62 UJ(IS)	12 U	60 U	61 U	61 U	NA
2-Hexanone	µg/kg	13 U	62 UJ(IS)	62 UJ(IS)	12 U	60 U	61 U	61 U	NA
Tetrachloroethene	µg/kg	6 U	31 UJ(IS)	31 UJ(IS)	6 U	30 U	30 U	30 U	NA
1,1,2,2-Tetrachloroethane	µg/kg	6 U	31 UJ(IS)	31 UJ(IS)	6 U	30 U	30 U	30 U	NA
Toluene	µg/kg	6 U	31 UJ(IS)	140 UJ(IS)	6 U	61	140	480	NA
Chlorobenzene	µg/kg	6 U	31 UJ(IS)	31 UJ(IS)	6 U	30 U	30 U	30 U	NA
Ethylbenzene	µg/kg	6 U	31 UJ(IS)	31 UJ(IS)	6 U	30 U	30 U	30 U	NA
Styrene	µg/kg	6 U	31 UJ(IS)	31 UJ(IS)	6 U	30 U	30 U	30 U	NA
Xylene(Total)	µg/kg	6 U	31 UJ(IS)	31 UJ(IS)	6 U	30 U	30 U	30 U	NA
TIC Total	µg/kg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	NA

Table B-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991)
122[nd] Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-2-3	SB1-2-5	SB1-2-5R	SB1-2-7	SB1-3-1	SB1-3-2	SB1-3-3	SB1-3-3R
Laboratory Sample Number		13287, 14211	14352	14353	13288, 14212	14259, 14269	14260, 14270	14261, 14271	14262, 14272
Associated Field QC Samples		FB1-1	FB2-1	FB2-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1
		TB11-3-91	TB11-6-91	TB11-6-91	TB11-3-91	TB-11-05-91	TB-11-05-91	TB-11-05-91	TRIP BLK.
Parameter	Units	EB1-1, 1A-1, 4-1	EB2-1	EB2-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1	EB1-1, 1A-1	EB1-1, 1A-1	EB1-1, 1A-1
SEMIVOLATILE ORGANICS (SOW 3/90)									
Phenol	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
bis(2-Chloroethyl)ether	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2-Chlorophenol	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
1,3-Dichlorobenzene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
1,4-Dichlorobenzene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
1,2-Dichlorobenzene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2-Methylphenol	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2,2'-oxybis(1-Chloropropane)	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
4-Methylphenol	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
N-Nitroso-di-N-propylamine	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Hexachloroethane	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Nitrobenzene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Isophorone	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2-Nitrophenol	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2,4-Dimethylphenol	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
bis(2-Chloroethoxy)methane	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2,4-Dichlorophenol	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
1,2,4-Trichlorobenzene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Naphthalene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
4-Chloroaniline	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Hexachlorobutadiene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
4-Chloro-3-methylphenol	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Hexachlorocyclopentadiene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2,4,6-Trichlorophenol	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2-Methylnaphthalene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2,4,5-Trichlorophenol	µg/kg	2000 U	2000 R(SSR)	2000 R(EHT)	1900 U	1900 U	1900 U	1900 U	1900 U
2-Chloronaphthalene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2-Nitroaniline	µg/kg	2000 U	2000 R(SSR)	2000 R(EHT)	1900 U	1900 U	1900 U	1900 U	1900 U
Dimethyl phthalate	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Acenaphthylene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
2,6-Dinitrotoluene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
3-Nitroaniline	µg/kg	2000 U	2000 R(SSR)	2000 R(EHT)	1900 U	1900 U	1900 U	1900 U	1900 U
Acenaphthene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	180 J	400 U	400 U
2,4-Dinitrophenol	µg/kg	2000 U	2000 R(SSR)	2000 R(EHT)	1900 U	1900 U	1900 U	1900 U	1900 U
4-Nitrophenol	µg/kg	2000 U	2000 R(SSR)	2000 R(EHT)	1900 U	1900 U	1900 U	1900 U	1900 U
Dibenzofuran	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	71 J	400 U	400 U
2,4-Dinitrotoluene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Diethyl phthalate	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
4-Chlorophenyl phenyl ether	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Fluorene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	140 J	400 U	400 U
4-Nitroaniline	µg/kg	2000 U	2000 R(SSR)	2000 R(EHT)	1900 U	1900 U	1900 U	1900 U	1900 U
4,6-Dinitro-2-methylphenol	µg/kg	2000 U	2000 R(SSR)	2000 R(EHT)	1900 U	1900 U	1900 U	1900 U	1900 U
N-Nitrosodiphenylamine (1)	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
4-Bromophenyl phenyl ether	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Hexachlorobenzene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Pentachlorophenol	µg/kg	2000 U	2000 R(SSR)	2000 R(EHT)	1900 U	1900 U	1900 U	1900 U	1900 U
Phenanthrene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	1400	400 U	400 U
Anthracene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	220 J	400 U	400 U
Carbazole	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	230 J	400 U	400 U
di-N-Butyl phthalate	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Fluoranthene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	400	1500	400 U	400 U

Table E-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1-2-3	SB1-2-5	SB1-2-5R	SB1-2-7	SB1-3-1	SB1-3-2	SB1-3-3	SB1-3-3R
Laboratory Sample Number		13287, 14211	14352	14353	13288, 14212	14259, 14269	14260, 14270	14261, 14271	14262, 14272
Associated Field QC Samples		FB1-1	FB2-1	FB2-1	FB1-1	FB1-1	FB1-1	FB1-1	FB1-1
		TB11-3-91	TB11-6-91	TB11-6-91	TB11-3-91	TB-11-05-91	TB-11-05-91	TB-11-05-91	TRIP BLK.
Parameter	Units	EB1-1, 1A-1, 4-1	EB2-1	EB2-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1	EB1-1, 1A-1	EB1-1, 1A-1	EB1-1, 1A-1
SEMIVOLATILE ORGANICS (SOW 3/90)									
(Continued)									
Pyrene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 J	1700	400 U	400 U
Butylbenzylphthalate	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
3,3'-Dichlorobenzidine	µg/kg	420 U	400 R(SSR)	810 R(EHT)	380 U	390 U	400 U	400 U	400 U
Benzo(a)anthracene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	740	400 U	400 U
Chrysene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	730	400 U	400 U
bis(2-Ethylhexyl)phthalate	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
di-N-Octyl phthalate	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Benzo(b)fluoranthene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 J	1300	400 U	400 U
Benzo(k)fluoranthene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Benzo(a)pyrene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	160 J	540	400 U	400 U
Indeno(1,2,3-cd)pyrene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	370 J	400 U	400 U
Dibenzo(a,h)anthracene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
Benzo(g,h,i)perylene	µg/kg	420 U	400 R(SSR)	410 R(EHT)	380 U	390 U	400 U	400 U	400 U
TIC Total	µg/kg	3990 (12)	6540 (14)	13970 (7)	18530 (20)	4420 (8)	2450 (9)	7320 (19)	5910 (15)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
EB – compound/element was also detected in the associated equipment blank
EHT – extraction holding time outside control limits
FB – compound/element was also detected in the associated field blank
HT – sample analysis holding time greater than control limit
IS – internal standard outside control limits
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
NA – not analyzed
R – rejected value
SSR – sample surrogate recovery outside control limits
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance
* – duplicate sample analysis outside of control limits

Table E-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1A-1-1	SB1A-1-2	SB1A-1-3	SB1A-1-5	SB1A-1-5	SB1A-1-5R	SB1A-2-1	SB1A-2-2
Laboratory Sample Number		13290, 14213	13291, 14214	13292, 14215	14348	13293, 14216	14349	13294, 14217	13295, 14218
Associated Field QC Samples		FB1-1	FB1-1	FB1-1, 2-1	FB2-1	FB1-1, 2-1	FB2-1	FB1-1	FB1-1
		TB11-3-91	TB11-3-91	TB11-3-91	TB11-6-91	TB11-3-91	TB11-6-91	TB11-3-91	TB11-3-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 2-1, 4-1	EB2-1, 4-1	EB1-1, 1A-1, 2-1	EB2-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1
Total Petroleum Hydrocarbons	mg/kg	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
INORGANICS									
Antimony	mg/kg	3.2 UJ(N)	3.4 UJ(N)	3.2 UJ(N)	3.3 UJ(N)	3.2 UJ(N)	3.2 UJ(N)	3.2 UJ(N)	3.2 UJ(N)
Arsenic	mg/kg	8.1	6.4	5.1	10.6 R(N)	7.5	9 R(N)	12.6	4.5
Beryllium	mg/kg	0.51 J(B)	0.61 J(B)	0.43 J(B)	0.6 J(B)	0.5 J(B)	0.61 J(B)	0.68 J(B)	0.47 J(B)
Cadmium	mg/kg	1.2 J(MB)	2.9	0.85 J(MB,B)	0.23 U	0.92 J(MB,B)	0.34 J(B)	0.44 J(MB,B)	0.74 J(MB,B)
Chromium	mg/kg	15.2	16	15.9	19.5	17	19	15.3	15.9
Copper	mg/kg	17.1 J(N,*)	19.7 J(N,*)	24.2 J(N,*)	42.6	24 J(N,*)	25	34.6 J(N,*)	20.7 J(N,*)
Lead	mg/kg	33.9	31.3	11	11.4	10.2	10.8	21.6	9
Mercury	mg/kg	0.1 U	0.14	0.11 U	0.12 UJ(HT)	0.1 U	0.11 UJ(HT)	0.11 U	0.12 U
Nickel	mg/kg	20.4	23.7	28.1	30.4	33.9	30.2	36.5	25.5
Selenium	mg/kg	0.23 UW	0.24 U	0.98 J(MB,B)	0.23 U	0.22 U	0.23 UW	0.23 UW	0.66 J(MB,B)
Silver	mg/kg	0.46 U	0.48 U	0.46 U	0.47 U	0.45 U	0.46 U	0.45 U	0.46 U
Thallium	mg/kg	0.29 J(B)	0.27 J(B)	0.52 J(B)	0.23 U	0.68 J(B)	0.24 J(MB,B)	0.55 J(B)	0.31 J(B)
Zinc	mg/kg	62.5	69.6	71.6	108 *	72.7	70 *	116	58.3
VOLATILE ORGANICS (SOW 3/90)									
Chloromethane	µg/kg	61 U	62 U	60 U	62 U	61 U	62 U	60 U	64 U
Bromomethane	µg/kg	61 U	62 U	60 U	62 U	61 U	62 U	60 U	64 U
Vinyl Chloride	µg/kg	61 U	62 U	60 U	62 U	61 U	62 U	60 U	64 U
Chloroethane	µg/kg	61 U	62 U	60 U	62 U	61 U	62 U	60 U	64 U
Methylene Chloride	µg/kg	30 U	31 U	30 U	36	30 U	31 U	30 U	32 U(FB)
Acetone	µg/kg	61 U	62 U	60 U	58 J	61 U	60 J	60 U	120
Carbon Disulfide	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
1,1-Dichloroethene	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
1,1-Dichloroethane	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
1,2-Dichloroethene (Total)	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Chloroform	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
1,2-Dichloroethane	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
2-Butanone	µg/kg	61 U	62 U	60 U	62 U	61 U	62 U	60 U	64 U
1,1,1-Trichloroethane	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Carbon Tetrachloride	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Bromodichloromethane	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
1,2-Dichloropropane	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
cis-1,3-Dichloropropene	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Trichloroethene	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Dibromochloromethane	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
1,1,2-Trichloroethane	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Benzene	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
trans-1,3-Dichloropropene	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Bromoform	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
4-Methyl-2-pentanone	µg/kg	61 U	62 U	60 U	62 U	61 U	62 U	60 U	64 U
2-Hexanone	µg/kg	61 U	62 U	60 U	62 U	61 U	62 U	60 U	64 U
Tetrachloroethene	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
1,1,2,2-Tetrachloroethane	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Toluene	µg/kg	26 J	36	190	670	60	440	250	170
Chlorobenzene	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Ethylbenzene	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Styrene	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
Xylene(Total)	µg/kg	30 U	31 U	30 U	31 U	30 U	31 U	30 U	32 U
TIC Total	µg/kg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Table E-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1A-1-1	SB1A-1-2	SB1A-1-3	SB1A-1-5	SB1A-1-5	SB1A-1-5R	SB1A-2-1	SB1A-2-2
Laboratory Sample Number		13290, 14213	13291, 14214	13292, 14215	14348	13293, 14216	14349	13294, 14217	13295, 14218
Associated Field QC Samples		FB1-1	FB1-1	FB1-1, 2-1	FB2-1	FB1-1, 2-1	FB2-1	FB1-1	FB1-1
		TB11-3-91	TB11-3-91	TB11-3-91	TB11-6-91	TB11-3-91	TB11-6-91	TB11-3-91	TB11-3-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 2-1, 4-1	EB2-1, 4-1	EB1-1, 1A-1, 2-1	EB2-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1
SEMIVOLATILE ORGANICS (SOW 3/90)									
Phenol	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
bis(2-Chloroethyl)ether	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2-Chlorophenol	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
1,3-Dichlorobenzene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
1,4-Dichlorobenzene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
1,2-Dichlorobenzene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2-Methylphenol	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2,2'-oxybis(1-Chloropropane)	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
4-Methylphenol	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
N-Nitroso-di-N-propylamine	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Hexachloroethane	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Nitrobenzene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Isophorone	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2-Nitrophenol	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2,4-Dimethylphenol	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
bis(2-Chloroethoxy)methane	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2,4-Dichlorophenol	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
1,2,4-Trichlorobenzene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Naphthalene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
4-Chloroaniline	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Hexachlorobutadiene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
4-Chloro-3-methylphenol	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Hexachlorocyclopentadiene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2,4,6-Trichlorophenol	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2-Methylnaphthalene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2,4,5-Trichlorophenol	µg/kg	2000 U	2000 R(EHT)	1900 R(EHT)	2000 UJ(EHT)	1900 U	2000 R(EHT)	1900 U	2000 U
2-Chloronaphthalene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2-Nitroaniline	µg/kg	2000 U	2000 R(EHT)	1900 R(EHT)	2000 UJ(EHT)	1900 U	2000 R(EHT)	1900 U	2000 U
Dimethyl phthalate	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Acenaphthylene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2,6-Dinitrotoluene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
3-Nitroaniline	µg/kg	2000 U	2000 R(EHT)	1900 R(EHT)	2000 UJ(EHT)	1900 U	2000 R(EHT)	1900 U	2000 U
Acenaphthene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2,4-Dinitrophenol	µg/kg	2000 U	2000 R(EHT)	1900 R(EHT)	2000 UJ(EHT)	1900 U	2000 R(EHT)	1900 U	2000 U
4-Nitrophenol	µg/kg	2000 U	2000 R(EHT)	1900 R(EHT)	2000 UJ(EHT)	1900 U	2000 R(EHT)	1900 U	2000 U
Dibenzofuran	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
2,4-Dinitrotoluene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Diethyl phthalate	µg/kg	400 U	4800 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
4-Chlorophenyl phenyl ether	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Fluorene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
4-Nitroaniline	µg/kg	2000 U	2000 R(EHT)	1900 R(EHT)	2000 UJ(EHT)	1900 U	2000 R(EHT)	1900 U	2000 U
4,6-Dinitro-2-methylphenol	µg/kg	2000 U	2000 R(EHT)	1900 R(EHT)	2000 UJ(EHT)	1900 U	2000 R(EHT)	1900 U	2000 U
N-Nitrosodiphenylamine (1)	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
4-Bromophenyl phenyl ether	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Hexachlorobenzene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Pentachlorophenol	µg/kg	2000 U	2000 R(EHT)	1900 R(EHT)	2000 UJ(EHT)	1900 U	2000 R(EHT)	1900 U	2000 U
Phenanthrene	µg/kg	400 U	330 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Anthracene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Carbazole	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
di-N-Butyl phthalate	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Fluoranthene	µg/kg	400 U	790 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	610	420 U

Table B-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1A-1-1	SB1A-1-2	SB1A-1-3	SB1A-1-5	SB1A-1-5	SB1A-1-5R	SB1A-2-1	SB1A-2-2
Laboratory Sample Number		13290, 14213	13291, 14214	13292, 14215	14348	13293, 14216	14349	13294, 14217	13295, 14218
Associated Field QC Samples		FB1-1	FB1-1	FB1-1, 2-1	FB2-1	FB1-1, 2-1	FB2-1	FB1-1	FB1-1
		TB11-3-91	TB11-3-91	TB11-3-91	TB11-6-91	TB11-3-91	TB11-6-91	TB11-3-91	TB11-3-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 2-1, 4-1	EB2-1, 4-1	EB1-1, 1A-1, 2-1	EB2-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1
SEMIVOLATILE ORGANICS (SOW 3/90)									
(Continued)									
Pyrene	µg/kg	400 U	810 J(EHT)	63 J(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	620 J(RPD)	420 U
Butylbenzylphthalate	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
3,3'-Dichlorobenzidine	µg/kg	400 U	820 R(EHT)	780 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Benzo(a)anthracene	µg/kg	400 U	510 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Chrysene	µg/kg	400 U	590 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
bis(2-Ethylhexyl)phthalate	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
di-N-Octyl phthalate	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Benzo(b)fluoranthene	µg/kg	400 U	710 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	1300	420 U
Benzo(k)fluoranthene	µg/kg	400 U	860 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Benzo(a)pyrene	µg/kg	400 U	800 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	640	420 U
Indeno(1,2,3-cd)pyrene	µg/kg	400 U	570 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	500	420 U
Dibenzo(a,h)anthracene	µg/kg	400 U	410 R(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
Benzo(g,h,i)perylene	µg/kg	400 U	700 J(EHT)	390 R(EHT)	410 UJ(EHT)	400 U	410 R(EHT)	390 U	420 U
TIC Total	µg/kg	14480 (20)	830 (2)	1340 (6)	4990 (15)	12600 (20)	20320 (19)	16760 (18)	800 (3)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit (CRDL)
EHT – extraction holding time outside control limits
FB – compound/element was also detected in the associated field blank
HT – sample analysis holding time greater than control limit
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
R – rejected value
RPD – matrix spike/matrix spike duplicate (MS/MSD) relative percent differences (RPDs) greater than the control limits
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance
* – duplicate sample analysis outside of control limits

Table E–6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1A–2–3	SB1A–3–1	SB1A–3–2	SB1A–3–2DL	SB1A–3–3	SB1A–3–4	SB1A–3–4R	SB1A–3–5
Laboratory Sample Number		13296, 14219	13297, 14220	14263, 14273	14263, 14273	13298, 14221	14350	14351	14264, 14274
Associated Field QC Samples		FB1–1	FB1–1	FB1–1	FB1–1	FB1–1	FB2–1	FB2–1	FB1–1
		TB11–3–91	TB11–3–91	TB–11–05–91	TB–11–05–91	TB11–3–91	TB11–6–91	TB11–6–91	TB11–7–91
Parameter	Units	EB1–1, 1A–1, 4–1	EB1–1, 1A–1, 4–1	EB1–1, 1A–1	EB1–1, 1A–1	EB1–1, 1A–1, 4–1	EB2–1	EB2–1	EB1–1, 1A–1, 2–1
Total Petroleum Hydrocarbons	mg/kg	50 U	50 U	1900	NA	50 U	50 U	1 U	50 U
INORGANICS									
Antimony	mg/kg	3.5 UJ(N)	4.9 J(N,B)	5.2 J(B,N)	NA	3.2 UJ(N)	3.3 UJ(N)	3.2 UJ(N)	3.2 UJ(N)
Arsenic	mg/kg	5.3 J(*)	4.8 J(*)	7 J(*)	NA	7 J(*)	5.7 R(N)	11.8 R(N)	7.5 J(*)
Beryllium	mg/kg	0.8 J(B)	0.22 U	0.27 J(B)	NA	0.47 J(B)	0.45 J(B)	0.54 J(B)	0.48 J(B)
Cadmium	mg/kg	0.5 J(MB,B)	0.51 J(MB,B)	0.22 U	NA	0.23 J(MB,B)	0.71 J(B)	0.46 J(B)	1.3 J(MB)
Chromium	mg/kg	19	8.4	9.5	NA	17.9	19.3	17.4	17.1
Copper	mg/kg	20.8	12.9	20.6	NA	23.2	43.7	24	23.1
Lead	mg/kg	11.9	9.3	14.4	NA	10.7	13.8	11.9	10.7
Mercury	mg/kg	0.1 U	0.1 U	0.1 U	NA	0.1 U	0.1 UJ(HT)	0.1 UJ(HT)	0.1 U
Nickel	mg/kg	29.9	14.4	14.9	NA	25.5	30.4	27.9	33.3
Selenium	mg/kg	0.24 UJ(N)	0.22 UJ(N)	0.22 UJ(N)	NA	0.23 UJ(N)	0.42 J(B)	0.24 UW	0.22 UJ(N)
Silver	mg/kg	0.5 U	0.43 U	0.43 U	NA	0.46 U	0.46 U	0.46 U	0.45 U
Thallium	mg/kg	0.24 U	0.22 U	0.26 J(MB,B)	NA	0.23 U	1.1 J(MB,B)	0.24 U	0.38 J(MB,B)
Zinc	mg/kg	74.5	36	55.8	NA	62.8	95.3 (*)	67.2 (*)	61.6
VOLATILE ORGANICS (SOW 3/90)									
Chloromethane	µg/kg	62 U	60 U	68 U	NA	58 U	62 U	62 U	59 U
Bromomethane	µg/kg	62 U	60 U	68 U	NA	58 U	62 U	62 U	59 U
Vinyl Chloride	µg/kg	62 U	60 U	68 U	NA	58 U	62 U	62 U	59 U
Chloroethane	µg/kg	62 U	60 U	68 U	NA	58 U	62 U	62 U	59 U
Methylene Chloride	µg/kg	31 U(FB)	30 U	69 U(FB)	NA	60 U(FB)	66	18 J	29 U
Acetone	µg/kg	55 J	70	190	NA	75	190	62 U	130
Carbon Disulfide	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
1,1–Dichloroethene	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
1,1–Dichloroethane	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
1,2–Dichloroethene (Total)	µg/kg	31 U	30 U	34 U	NA	49	31 U	31 U	29 U
Chloroform	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
1,2–Dichloroethane	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
2–Butanone	µg/kg	62 U	60 U	68 U	NA	58 U	62 U	62 U	59 U
1,1,1–Trichloroethane	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
Carbon Tetrachloride	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
Bromodichloromethane	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
1,2–Dichloropropane	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
cis–1,3–Dichloropropene	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
Trichloroethene	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
Dibromochloromethane	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
1,1,2–Trichloroethane	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
Benzene	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
trans–1,3–Dichloropropene	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
Bromoform	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
4–Methyl–2–pentanone	µg/kg	62 U	60 U	68 U	NA	58 U	62 U	62 U	59 U
2–Hexanone	µg/kg	62 U	60 U	68 U	NA	58 U	62 U	62 U	59 U
Tetrachloroethene	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
1,1,2,2–Tetrachloroethane	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
Toluene	µg/kg	1000	160	160	NA	99	640 J(FR)	110 J(FR)	370
Chlorobenzene	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
Ethylbenzene	µg/kg	31 U	30 U	34 U	NA	12 J	31 U	31 U	29 U
Styrene	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
Xylene(Total)	µg/kg	31 U	30 U	34 U	NA	29 U	31 U	31 U	29 U
TIC Total	µg/kg	0 (0)	0 (0)	0 (0)	NA	0 (0)	0 (0)	0 (0)	0 (0)

Table E-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1A-2-3	SB1A-3-1	SB1A-3-2	SB1A-3-2DL	SB1A-3-3	SB1A-3-4	SB1A-3-4R	SB1A-3-5
Laboratory Sample Number		13296, 14219	13297, 14220	14263, 14273	14263, 14273	13298, 14221	14350	14351	14264, 14274
Associated Field QC Samples		FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB2-1	FB2-1	FB1-1
		TB11-3-91	TB11-3-91	TB-11-05-91	TB-11-05-91	TB11-3-91	TB11-6-91	TB11-6-91	TB11-7-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1	EB1-1, 1A-1	EB1-1, 1A-1, 4-1	EB2-1	EB2-1	EB1-1, 1A-1, 2-1
SEMIVOLATILE ORGANICS (SOW 3/90)									
Phenol	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
bis(2-Chloroethyl)ether	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2-Chlorophenol	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
1,3-Dichlorobenzene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
1,4-Dichlorobenzene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
1,2-Dichlorobenzene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2-Methylphenol	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2,2'-oxybis(1-Chloropropane)	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
4-Methylphenol	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
N-Nitroso-di-N-propylamine	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Hexachloroethane	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Nitrobenzene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Isophorone	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2-Nitrophenol	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2,4-Dimethylphenol	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
bis(2-Chloroethoxy)methane	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2,4-Dichlorophenol	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
1,2,4-Trichlorobenzene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Naphthalene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
4-Chloroaniline	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Hexachlorobutadiene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
4-Chloro-3-methylphenol	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Hexachlorocyclopentadiene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2,4,6-Trichlorophenol	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2-Methylnaphthalene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2,4,5-Trichlorophenol	µg/kg	2000 U	1900 U	NA	11000 U	1900 U	2000 U	2000 UJ(SSR)	1900 U
2-Chloronaphthalene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2-Nitroaniline	µg/kg	2000 U	1900 U	NA	11000 U	1900 U	2000 U	2000 UJ(SSR)	1900 U
Dimethyl phthalate	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Acenaphthylene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2,6-Dinitrotoluene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
3-Nitroaniline	µg/kg	2000 U	1900 U	NA	11000 U	1900 U	2000 U	2000 UJ(SSR)	1900 U
Acenaphthene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2,4-Dinitrophenol	µg/kg	2000 U	1900 U	NA	11000 U	1900 U	2000 U	2000 UJ(SSR)	1900 U
4-Nitrophenol	µg/kg	2000 U	1900 U	NA	11000 U	1900 U	2000 U	2000 UJ(SSR)	1900 U
Dibenzofuran	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
2,4-Dinitrotoluene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Diethyl phthalate	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
4-Chlorophenyl phenyl ether	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Fluorene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
4-Nitroaniline	µg/kg	2000 U	1900 U	NA	11000 U	1900 U	2000 U	2000 UJ(SSR)	1900 U
4,6-Dinitro-2-methylphenol	µg/kg	2000 U	1900 U	NA	11000 U	1900 U	2000 U	2000 UJ(SSR)	1900 U
N-Nitrosodiphenylamine (1)	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
4-Bromophenyl phenyl ether	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Hexachlorobenzene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Pentachlorophenol	µg/kg	2000 U	1900 U	NA	13000 D	1900 U	2000 U	2000 UJ(SSR)	1900 U
Phenanthrene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Anthracene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Carbazole	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
di-N-Butyl phthalate	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Fluoranthene	µg/kg	400 U	710	NA	2300 U	81 J	410 U	410 UJ(SSR)	390 U

Table E-6. Data Presentation: Site 1 – Fire Training Area – Soil Samples (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1A-2-3	SB1A-3-1	SB1A-3-2	SB1A-3-2DL	SB1A-3-3	SB1A-3-4	SB1A-3-4R	SB1A-3-5
Laboratory Sample Number		13296, 14219	13297, 14220	14263, 14273	14263, 14273	13298, 14221	14350	14351	14264, 14274
Associated Field QC Samples		FB1-1	FB1-1	FB1-1	FB1-1	FB1-1	FB2-1	FB2-1	FB1-1
		TB11-3-91	TB11-3-91	TB-11-05-91	TB-11-05-91	TB11-3-91	TB11-6-91	TB11-6-91	TB11-7-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB1-1, 1A-1	EB1-1, 1A-1	EB1-1, 1A-1, 4-1	EB2-1	EB2-1	EB1-1, 1A-1, 2-1
SEMIVOLATILE ORGANICS (SOW 3/90)									
(Continued)									
Pyrene	µg/kg	400 U	700	NA	2300 U	94 J	410 U	410 UJ(SSR)	390 U
Butylbenzylphthalate	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
3,3'-Dichlorobenzidine	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Benzo(a)anthracene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Chrysene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
bis(2-Ethylhexyl)phthalate	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
di-N-Octyl phthalate	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Benzo(b)fluoranthene	µg/kg	400 U	660	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Benzo(k)fluoranthene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Benzo(a)pyrene	µg/kg	400 U	300 J	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Indeno(1,2,3-cd)pyrene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Dibenzo(a,h)anthracene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
Benzo(g,h,i)perylene	µg/kg	400 U	400 U	NA	2300 U	380 U	410 U	410 UJ(SSR)	390 U
TIC Total	µg/kg	6540 (14)	21080 (20)	NA	29840 (11)	4790 (11)	7610 (18)	6240 (13)	5650 (15)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
D – the identified compound was analyzed at a secondary dilution factor after exceeding the calibration range of the instrument on the first analysis
FB – compound/element was also detected in the associated field blank
FR – field replicate relative percent differences (RPDs) outside control limits
HT – sample analysis holding time greater than control limit
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
NA – not analyzed
R – rejected value
SSR – sample surrogate recovery outside control limits
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance
* – duplicate sample analysis outside of control limits

Table B-7. Data Presentation: Site 1 – Fire Training Area – Groundwater Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		GW1-1	GW-1RE	MW1-01	MW1-02	P-8
Laboratory Sample Number		13300	13300RE	14354	14267,14277	14398
Associated Field QC Samples		FB1-1	FB1-1	FB2-1	FB1-1	FB2-1
		TB11-3-91	TB11-3-91	TB11-6-91	TB11-05-91	TB11-7-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB2-1	EB1-1, 1A-1	EB2-1
Total Petroleum Hydrocarbons	mg/L	NA	NA	1 U	1 U	1
INORGANICS						
Antimony	µg/L	NA	NA	14.2 J(N,B)	14 U	14.6 J(B,N)
Arsenic	µg/L	NA	NA	42.4	7.4 J(MB,B)	24.4
Beryllium	µg/L	NA	NA	1.8 J(B)	1.1 J(B)	2.2 J(B)
Cadmium	µg/L	NA	NA	1 U	1.7 J(MB,B)	1 U
Chromium	µg/L	NA	NA	60.9	21.2	71.8
Copper	µg/L	NA	NA	79.6	30.2	75.7
Lead	µg/L	NA	NA	49	15	38.1
Mercury	µg/L	NA	NA	0.2 UJ(HT)	0.2 U	0.2 UJ(HT)
Nickel	µg/L	NA	NA	74.1	30.2 J(B)	84.6
Selenium	µg/L	NA	NA	1 UJ(N)	3.6 J(N,B)	1 UJ(N)
Silver	µg/L	NA	NA	2 UJ(N)	2 U	2 UJ(N)
Thallium	µg/L	NA	NA	1 U	1 U	1 U
Zinc	µg/L	NA	NA	221	96.4	212
VOLATILE ORGANICS (SOW 3/90)						
Chloromethane	µg/L	10 U	NA	10 U	10 U	10 U
Bromomethane	µg/L	10 U	NA	10 U	10 U	10 U
Vinyl Chloride	µg/L	10 U	NA	10 U	10 U	10 U
Chloroethane	µg/L	10 U	NA	10 U	10 U	10 U
Methylene Chloride	µg/L	5 U	NA	5 U	5 U	13 U(MB)
Acetone	µg/L	10 U	NA	10 U	10 U	10 U
Carbon Disulfide	µg/L	5 U	NA	5 U	5 U	5 U
1,1-Dichloroethene	µg/L	5 U	NA	5 U	5 U	5 U
1,1-Dichloroethane	µg/L	5 U	NA	5 U	5 U	5 U
1,2-Dichloroethene (total)	µg/L	5 U	NA	5 U	5 U	5 U
Chloroform	µg/L	5 U	NA	5 U	5 U	5 U
1,2-Dichloroethane	µg/L	5 U	NA	5 U	5 U	5 U
2-Butanone	µg/L	10 U	NA	10 U	10 U	10 U
1,1,1-Trichloroethane	µg/L	5 U	NA	5 U	5 U	5 U
Carbon Tetrachloride	µg/L	5 U	NA	5 U	5 U	5 U
Bromodichloromethane	µg/L	5 U	NA	5 U	5 U	5 U
1,2-Dichloropropane	µg/L	5 U	NA	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	NA	5 U	5 U	5 U
Trichloroethene	µg/L	5 U	NA	5 U	5 U	5 U
Dibromochloromethane	µg/L	5 U	NA	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	5 U	NA	5 U	5 U	5 U
Benzene	µg/L	5 U	NA	5 U	5 U	5 U
trans-1,3-Dichloropropene	µg/L	5 U	NA	5 U	5 U	5 U
Bromoform	µg/L	5 U	NA	5 U	5 U	5 U
4-Methyl-2-pentanone	µg/L	10 U	NA	10 U	10 U	10 U
2-Hexanone	µg/L	10 U	NA	10 U	10 U	10 U
Tetrachloroethene	µg/L	5 U	NA	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	NA	5 U	5 U	5 U
Toluene	µg/L	5 U	NA	5 U	5 U	5 U
Chlorobenzene	µg/L	5 U	NA	5 U	5 U	5 U
Ethylbenzene	µg/L	5 U	NA	5 U	5 U	5 U
Styrene	µg/L	5 U	NA	5 U	5 U	5 U
Total Xylenes	µg/L	5 U	NA	5 U	5 U	5 U
TIC Total	µg/L	0 (0)	NA	0 (0)	0 (0)	0 (0)

Table E-7. Data Presentation: Site 1 – Fire Training Area – Groundwater Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		GW1-1	GW-1RE	MW1-01	MW1-02	P-8
Laboratory Sample Number		13300	13300RE	14354	14267,14277	14398
Associated Field QC Samples		FB1-1	FB1-1	FB2-1	FB1-1	FB2-1
		TB11-3-91	TB11-3-91	TB11-6-91	TB11-05-91	TB11-7-91
Parameter	Units	EB1-1, 1A-1, 4-1	EB1-1, 1A-1, 4-1	EB2-1	EB1-1, 1A-1	EB2-1
SEMIVOLATILE ORGANICS (SOW 3/90)						
Phenol	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
bis(2-Chloroethyl)ether	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2-Chlorophenol	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
1,3-Dichlorobenzene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
1,4-Dichlorobenzene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
1,2-Dichlorobenzene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2-Methylphenol	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
4-Methylphenol	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
N-Nitroso-di-N-propylamine	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Hexachloroethane	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Nitrobenzene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Isophorone	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2-Nitrophenol	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2,4-Dimethylphenol	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2,4-Dichlorophenol	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
1,2,4-Trichlorobenzene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Naphthalene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
4-Chloroaniline	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Hexachlorobutadiene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
4-Chloro-3-methylphenol	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Hexachlorocyclopentadiene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2,4,6-Trichlorophenol	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2-Methylnaphthalene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2,4,5-Trichlorophenol	µg/L	50 R(SSR)	50 R(SSR)	50 U	50 U	50 U
2-Chloronaphthalene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2-Nitroaniline	µg/L	50 R(SSR)	50 R(SSR)	50 U	50 U	50 U
Dimethyl Phthalate	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Acenaphthylene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2,6-Dinitrotoluene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
3-Nitroaniline	µg/L	50 R(SSR)	50 R(SSR)	50 U	50 U	50 U
Acenaphthene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2,4-Dinitrophenol	µg/L	50 R(SSR)	50 R(SSR)	50 U	50 U	50 U
4-Nitrophenol	µg/L	50 R(SSR)	50 R(SSR)	50 U	50 U	50 U
Dibenzofuran	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
2,4-Dinitrotoluene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Diethylphthalate	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Fluorene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
4-Nitroaniline	µg/L	50 R(SSR)	50 R(SSR)	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	µg/L	50 R(SSR)	50 R(SSR)	50 U	50 U	50 U
N-Nitrosodiphenylamine	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
4-Bromophenyl phenyl ether	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Hexachlorobenzene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Pentachlorophenol	µg/L	50 R(SSR)	50 R(SSR)	50 U	50 U	50 U
Phenanthrene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Anthracene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Carbazole	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
di-N-Butylphthalate	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Fluoranthene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U

Table E-7. Data Presentation: Site 1 – Fire Training Area – Groundwater Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		GW1-1	GW-1RE	MW1-01	MW1-02	P-8
Laboratory Sample Number		13300	13300RE	14354	14267,14277	14398
Associated Field QC Samples		FB1-1 TB11-3-91 EB1-1, 1A-1, 4-1	FB1-1 TB11-3-91 EB1-1, 1A-1, 4-1	FB2-1 TB11-6-91 EB2-1	FB1-1 TB11-05-91 EB1-1, 1A-1	FB2-1 TB11-7-91 EB2-1
Parameter	Units					
SEMIVOLATILE ORGANICS (SOW 3/90) (Continued)						
Pyrene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Butylbenzylphthalate	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
3,3'-Dichlorobenzidine	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Benzo(a)anthracene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Chrysene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
di-N-Octyl phthalate	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Benzo(b)fluoranthene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Benzo(k)fluoranthene	µg/l	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Benzo(a)pyrene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Dibenzo(a,h)anthracene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
Benzo(g,h,i)perylene	µg/L	10 R(SSR)	10 R(SSR)	10 U	10 U	10 U
TIC Total	µg/L	0 (0)	62 (11)	30 (3)	15 (1)	9 (1)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
HT – sample analysis holding time greater than control limit
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
NA – not analyzed
R – rejected value
SSR – sample surrogate recovery outside control limits
U – compound/element was included in analysis, but was not detected

Table E-8. Data Presentation: Site 3 – Hazardous Waste Collection Area – Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		SB2-01-01	SB2-01-02	SB2-01-19	SB2-01-19RE	SB2-02-01	SB2-03-01	SB2-04-01
Laboratory Sample Number		90021804	90021805	90021806	90021806RE	90022301	90022302	90022303
Associated Field QC Samples		FB-01,-02 TB-04	FB-01,-02 TB-04	FB-01,-02 TB-04	FB-01,-02 TB-04	FB-01,-02 TB-05	FB-01,-02 TB-05	FB-01,-02 TB-05
Parameter	Units	EW-03,-04	EW-03,-04	EW-03,-04	EW-03,-04	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05
Total Petroleum Hydrocarbons	mg/kg	5900 J(HT)	NA	10 U	NA	10 UJ(HT)	1500 J(HT)	3000 J(HT)
METALS								
Antimony	mg/kg	0.10 R(N)	NA	0.10 R(N)	NA	0.11 R(N)	0.11 R(N)	0.11 R(N)
Arsenic	mg/kg	1.30 J(MB,N)	NA	14.30 J(N)	NA	1.70 J(N)	20.70 J(N)	11.50 J(N)
Beryllium	mg/kg	0.20 U	NA	0.73	NA	0.21 U	0.98	0.91
Cadmium	mg/kg	0.20 U	NA	0.31 J(MB,B)	NA	0.21 U	0.65 J(MB)	0.23 J(MB,B)
Chromium	mg/kg	2.00	NA	8.60	NA	2.80	11.70	10.00
Copper	mg/kg	19.30	NA	24.10	NA	17.40	26.50	31.40
Lead	mg/kg	6.20 J(EB)	NA	7.60 J(EB)	NA	3.70 J(EB)	16.30 (*)	15.60 (*)
Mercury	mg/kg	0.02	NA	0.02 U	NA	0.02 U	0.03	0.02 U
Nickel	mg/kg	1.70 J(MB,B)	NA	15.60 J(MB)	NA	1.60 J(MB,B)	19.50	18.70
Selenium	mg/kg	0.20 UW	NA	0.21 UW	NA	0.21 UW	0.21 UW	0.23 UW
Silver	mg/kg	1.10 U	NA	1.10 U	NA	1.20 U	1.20 U	1.30 U
Thallium	mg/kg	0.20 UW	NA	0.30 J(B)	NA	0.21 U	0.37 J(B)	0.58 J(B)
Zinc	mg/kg	6.90 J(FB)	NA	208.00	NA	4.60 J(FB)	66.90 J(FB)	64.50 J(FB)
VOLATILE ORGANIC COMPOUNDS								
Chloromethane	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR)	11 U	11 U	58 U
Bromomethane	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR)	11 U	11 U	58 U
Vinyl Chloride	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR)	11 U	11 U	58 U
Chloroethane	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR)	11 U	11 U	58 U
Methylene Chloride	µg/kg	5 U	6 U	6 UJ(SSR,IS)	21 UJ(TB,SSR)	14 U(TB)	16 U(TB)	84
Acetone	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR)	11 U	70	820
Carbon Disulfide	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR)	5 U	5 U	29 U
1,1-Dichloroethene	µg/kg	3 U	4 U	4 UJ(SSR,IS)	4 UJ(SSR)	3 U	3 U	17 U
1,1-Dichloroethane	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR)	5 U	5 U	29 U
1,2-Dichloroethene (total)	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR)	5 U	5 U	29 U
Chloroform	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR)	5 U	5 U	29 U
1,2-Dichloroethane	µg/kg	3 U	4 U	4 UJ(SSR,IS)	4 UJ(SSR)	3 U	3 U	17 U
2-Butanone	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR)	11 U	11 U	58 U
1,1,1-Trichloroethane	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
Carbon Tetrachloride	µg/kg	3 U	4 U	4 UJ(SSR,IS)	4 UJ(SSR,IS)	3 U	3 U	17 U
Vinyl Acetate	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	58 U
Bromodichloromethane	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
1,2-Dichloropropane	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
cis-1,3-Dichloropropene	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
Trichloroethene	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
Dibromochloromethane	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
1,1,2-Trichloroethane	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
Benzene	µg/kg	3 U	6	4 UJ(SSR,IS)	4 UJ(SSR,IS)	3 U	3 U	17 U
trans-1,3-Dichloropropene	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
Bromoform	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
4-Methyl-2-pentanone	µg/kg	11 U	34	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	58 U
2-Hexanone	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	1100
Tetrachloroethene	µg/kg	3 U	4 U	4 UJ(SSR,IS)	4 UJ(SSR,IS)	3 U	3 U	17 U
1,1,2,2-Tetrachloroethane	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
Toluene	µg/kg	38 U(FB)	45 U(FB)	100 J(SSR,IS)	240 J(SSR,IS)	5 U	15 U(FB)	91
Chlorobenzene	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
Ethylbenzene	µg/kg	5 U	16	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
Styrene	µg/kg	5 U	6 U	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	29 U
Total Xylenes	µg/kg	5 U	190	6 UJ(SSR,IS)	6 UJ(SSR,IS)	5 U	5 U	140
2-Chloroethyl Vinyl Ether	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	58 U
Iodomethane	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	58 U
Acrolein	µg/kg	43 U	51 U	50 UJ(SSR,IS)	50 UJ(SSR,IS)	44 U	44 U	230 U
Acrylonitrile	µg/kg	43 U	51 U	50 UJ(SSR,IS)	50 UJ(SSR,IS)	44 U	44 U	230 U
Dibromomethane	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	58 U
1,2,3-Trichloropropane	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	58 U
1,4-Dichlorobutane	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	58 U
Ethyl Methacrylate	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	58 U
Trichlorofluoromethane	µg/kg	11 U	13 U	13 UJ(SSR,IS)	13 UJ(SSR,IS)	11 U	11 U	58 U
Dichlorodifluoromethane	µg/kg	32 U	38 U	38 UJ(SSR,IS)	38 UJ(SSR,IS)	33 U	33 U	170 U
TIC Totals	µg/kg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Table B-8. Data Presentation: Site 3 – Hazardous Waste Collection Area – Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB2-01-01	SB2-01-02	SB2-01-19	SB2-01-19RE	SB2-02-01	SB2-03-01	SB2-04-01
Laboratory Sample Number		90021804	90021805	90021806	90021806RE	90022301	90022302	90022303
Associated Field QC Samples		FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05
Parameter	Units							
SEMIVOLATILE ORGANIC COMPOUNDS								
Phenol	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
bis(2-Chloroethyl)ether	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
2-Chlorophenol	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
1,3-Dichlorobenzene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
1,4-Dichlorobenzene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
Benzyl Alcohol	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
1,2-Dichlorobenzene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
2-Methylphenol	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
bis(2-Chloroisopropyl)ether	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
4-Methylphenol	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
N-Nitroso-di-N-propylamine	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
Hexachloroethane	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
Nitrobenzene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Isophorone	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
2-Nitrophenol	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
2,4-Dimethylphenol	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Benzoic Acid	µg/kg	1700 UJ(SSR,IS)	NA	2000 U	NA	1800 U	1800 U	1900 U
bis(2-Chloroethoxy)methane	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
2,4-Dichlorophenol	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
1,2,4-Trichlorobenzene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Naphthalene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
4-Chloroaniline	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Hexachlorobutadiene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
4-Chloro-3-methylphenol	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
2-Methylnaphthalene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Hexachlorocyclopentadiene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
2,4,6-Trichlorophenol	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
2,4,5-Trichlorophenol	µg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
2-Chloronaphthalene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
2-Nitroaniline	µg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Dimethyl Phthalate	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
Acenaphthylene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
2,6-Dinitrotoluene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
3-Nitroaniline	µg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Acenaphthene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
2,4-Dinitrophenol	µg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
4-Nitrophenol	µg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Dibenzofuran	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
2,4-Dinitrotoluene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
Diethyl Phthalate	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
4-Chlorophenyl-phenyl Ether	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
Fluorene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
4-Nitroaniline	µg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
4,6-Dinitro-2-methylphenol	µg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
N-Nitrosodiphenylamine	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
4-Bromophenyl-phenyl Ether	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
Hexachlorobenzene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
Pentachlorophenol	µg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Phenanthrene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
Anthracene	µg/kg	350 UJ(SSR)	NA	410 U	NA	360 U	360 U	380 U
di-N-Butylphthalate	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Fluoranthene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Pyrene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Butylbenzyl Phthalate	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
3,3'-Dichlorobenzidine	µg/kg	700 UJ(SSR,IS)	NA	810 U	NA	730 U	730 U	770 U
Benzo(a)anthracene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Chrysene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
bis(2-Ethylhexyl)phthalate	µg/kg	350 UJ(SSR,IS)	NA	400 J	NA	360 U	360 U	380 U
di-N-Octyl Phthalate	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Benzo(b)fluoranthene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Benzo(k)fluoranthene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Benzo(a)pyrene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Indeno(1,2,3-c,d)pyrene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Dibenzo(a,h)anthracene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U
Benzo(g,h,i)perylene	µg/kg	350 UJ(SSR,IS)	NA	410 U	NA	360 U	360 U	380 U

Table E-8. Data Presentation: Site 3 – Hazardous Waste Collection Area – Soil Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB2-01-01	SB2-01-02	SB2-01-19	SB2-01-19RE	SB2-02-01	SB2-03-01	SB2-04-01
Laboratory Sample Number		90021804	90021805	90021806	90021806RE	90022301	90022302	90022303
Associated Field QC Samples		FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-04 EW-03,-04	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05
Parameter	Units							
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)								
N-Nitrosodimethylamine	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
2-Picoline	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Methyl Methanesulfonate	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Ethyl Methanesulfonate	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Aniline	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Acetophenone	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
N-Nitrosopiperidine	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Dimethylphenethylamine	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
2,6-Dichlorophenol	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
N-Nitroso-di-N-butylamine	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
1,2,4,5-Tetrachlorobenzene	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
1-Chloronaphthalene	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Pentachlorobenzene	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
1-Naphthylamine	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
2-Naphthylamine	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
1,2-Diphenylhydrazine	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Phenacetin	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
4-Aminobiphenyl	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Pronamide	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
Benzidine	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
p-Dimethylaminoazobenzene	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
7,12-Dimethylbenzo(a)anthracene	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
3-Methylcholanthrene	μg/kg	1700 UJ(SSR)	NA	2000 U	NA	1800 U	1800 U	1900 U
TIC Total	μg/kg	NA	NA	NA	NA	NA	NA	NA
ORGANOCHLORINE PESTICIDES/PCBs								
alpha-BHC	μg/kg	1.5 UJ(SSR)	NA	1.9 UJ(SSR)	NA	1.6 U	1.6 U	1.6 UJ(SSR)
beta-BHC	μg/kg	1.7 UJ(SSR)	NA	2.1 UJ(SSR)	NA	1.8 U	1.8 U	1.9 UJ(SSR)
gamma-BHC (Lindane)	μg/kg	2.0 UJ(SSR)	NA	2.4 UJ(SSR)	NA	2.1 U	2.0 U	2.1 UJ(SSR)
delta-BHC	μg/kg	2.3 UJ(SSR)	NA	2.8 UJ(SSR)	NA	2.4 U	2.3 U	2.4 UJ(SSR)
Heptachlor	μg/kg	2.3 UJ(SSR)	NA	2.8 UJ(SSR)	NA	2.4 U	2.3 U	2.4 UJ(SSR)
Aldrin	μg/kg	2.4 UJ(SSR)	NA	2.9 UJ(SSR)	NA	2.5 U	2.4 U	2.6 UJ(SSR)
Heptachlor Epoxide	μg/kg	2.1 UJ(SSR)	NA	2.6 UJ(SSR)	NA	2.3 U	2.2 U	2.3 UJ(SSR)
Endosulfan-I	μg/kg	2.1 UJ(SSR)	NA	2.6 UJ(SSR)	NA	2.3 U	2.2 U	2.3 UJ(SSR)
Dieldrin	μg/kg	2.1 UJ(SSR)	NA	2.5 UJ(SSR)	NA	2.2 U	2.1 U	2.2 UJ(SSR)
4,4'-DDE	μg/kg	2.3 UJ(SSR)	NA	2.8 UJ(SSR)	NA	2.4 U	2.4 U	2.5 UJ(SSR)
Endrin	μg/kg	3.1 UJ(SSR)	NA	3.9 UJ(SSR)	NA	3.3 U	3.2 U	3.4 UJ(SSR)
Endosulfan-II	μg/kg	2.7 UJ(SSR)	NA	3.3 UJ(SSR)	NA	2.9 U	2.8 U	2.9 UJ(SSR)
4,4'-DDD	μg/kg	2.3 UJ(SSR)	NA	2.8 UJ(SSR)	NA	2.4 U	2.3 U	2.4 UJ(SSR)
Endrin Aldehyde	μg/kg	2.7 UJ(SSR)	NA	3.3 UJ(SSR)	NA	2.9 U	2.8 U	2.9 UJ(SSR)
Endosulfan Sulfate	μg/kg	2.8 UJ(SSR)	NA	3.4 UJ(SSR)	NA	3.0 U	2.9 U	3.0 UJ(SSR)
4,4'-DDT	μg/kg	6.7 UJ(SSR)	NA	8.3 UJ(SSR)	NA	7.2 U	7.0 U	7.3 UJ(SSR)
Methoxychlor	μg/kg	8.4 UJ(SSR)	NA	10.0 UJ(SSR)	NA	9.0 U	8.7 U	9.1 UJ(SSR)
Chlordane	μg/kg	17.0 UJ(SSR)	NA	21.0 UJ(SSR)	NA	18.0 U	17.0 U	18.0 UJ(SSR)
Toxaphene	μg/kg	130.0 UJ(SSR)	NA	170.0 UJ(SSR)	NA	140.0 U	140.0 U	150.0 UJ(SSR)
Aroclor-1016	μg/kg	67.0 UJ(SSR)	NA	83.0 UJ(SSR)	NA	72.0 U	70.0 U	73.0 UJ(SSR)
Aroclor-1221	μg/kg	84.0 UJ(SSR)	NA	100.0 UJ(SSR)	NA	90.0 U	87.0 U	91.0 UJ(SSR)
Aroclor-1232	μg/kg	84.0 UJ(SSR)	NA	100.0 UJ(SSR)	NA	90.0 U	87.0 U	91.0 UJ(SSR)
Aroclor-1242	μg/kg	84.0 UJ(SSR)	NA	100.0 UJ(SSR)	NA	90.0 U	87.0 U	91.0 UJ(SSR)
Aroclor-1248	μg/kg	67.0 UJ(SSR)	NA	83.0 UJ(SSR)	NA	72.0 U	70.0 U	73.0 UJ(SSR)
Aroclor-1254	μg/kg	42.0 UJ(SSR)	NA	52.0 UJ(SSR)	NA	45.0 U	44.0 U	46.0 UJ(SSR)
Aroclor-1260	μg/kg	34.0 UJ(SSR)	NA	41.0 UJ(SSR)	NA	36.0 U	35.0 U	36.0 UJ(SSR)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
EB – compound/element was also detected in the associated equipment blank
FB – compound/element was also detected in the associated field blank
FR – field replicate relative percent differences (RPDs) outside control limits
HT – sample analysis holding time greater than control limit
IS – internal standard outside control limits
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
NA – not analyzed
R – rejected value
SSR – sample surrogate recovery outside control limits
TB – compound/element was also detected in the associated trip blank
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance
* – duplicate sample analysis outside of control limits

Table E-9. Data Presentation: Site 3 –
Hazardous Waste Collection Area – Groundwater Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard,
Ft. Wayne, Indiana

SAIC ID Number		MW2-01
Laboratory Sample Number		90024902
Associated Field QC Samples		FB-01,-02,-03 TB-10 EW-04,-07,-08
Parameter	Units	
Total Petroleum Hydrocarbons	mg/L	1 U
METALS		
Antimony	µg/L	1.00 U
Arsenic	µg/L	6.30 J(B)
Beryllium	µg/L	2.00 U
Cadmium	µg/L	2.00 U
Chromium	µg/L	13.00 U
Copper	µg/L	22.00 J(B)
Lead	µg/L	27.90
Mercury	µg/L	0.20 U
Nickel	µg/L	12.00 U
Selenium	µg/L	3.00 UW
Silver	µg/L	11.00 U
Thallium	µg/L	2.00 U
Zinc	µg/L	26.00 J(FB)
VOLATILE ORGANIC COMPOUNDS		
Chloromethane	µg/L	10 U
Bromomethane	µg/L	10 U
Vinyl Chloride	µg/L	10 U
Chloroethane	µg/L	10 U
Methylene Chloride	µg/L	5 U(TB)
Acetone	µg/L	10 U
Carbon Disulfide	µg/L	5 U
1,1-Dichloroethene	µg/L	3 U
1,1-Dichloroethane	µg/L	5 U
1,2-Dichloroethene (total)	µg/L	5 U
Chloroform	µg/L	5 U
1,2-Dichloroethane	µg/L	3 U
2-Butanone	µg/L	10 U
1,1,1-Trichloroethane	µg/L	5 U
Carbon Tetrachloride	µg/L	3 U
Vinyl Acetate	µg/L	10 U
Bromodichloromethane	µg/L	5 U
1,2-Dichloropropane	µg/L	5 U
cis-1,3-Dichloropropene	µg/L	5 U
Trichloroethene	µg/L	5 U
Dibromochloromethane	µg/L	5 U
1,1,2-Trichloroethane	µg/L	5 U
Benzene	µg/L	3 U
	µg/L	5 U
	µg/L	5 U
	µg/L	10 U
2-Hexanone	µg/L	10 U
Tetrachloroethene	µg/L	3 U
1,1,2,2-Tetrachloroethane	µg/L	5 U
Toluene	µg/L	5 U
Chlorobenzene	µg/L	5 U
Ethylbenzene	µg/L	5 U
Styrene	µg/L	5 U
Total Xylenes	µg/L	5 U
2-Chloroethyl Vinyl Ether	µg/L	10 U
Iodomethane	µg/L	10 U
Acrolein	µg/L	40 U
Acrylonitrile	µg/L	40 U
Dibromomethane	µg/L	10 U
1,2,3-Trichloropropane	µg/L	10 U
1,4-Dichlorobutane	µg/L	10 U
Ethyl Methacrylate	µg/L	10 U
Trichlorofluoromethane	µg/L	10 U
Dichlorodifluoromethane	µg/L	30 U
TIC Totals	µg/L	NA

Table E-9. Data Presentation: Site 3 – Hazardous Waste Collection Area – Groundwater Samples (1990) 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW2-01
Laboratory Sample Number		90024902
Associated Field QC Samples		FB-01, -02, -03 TB-10 EW-04, -07, -08
Parameter	Units	
SEMIVOLATILE ORGANIC COMPOUNDS		
Phenol	µg/L	10 U
bis(2-Chloroethyl)ether	µg/L	10 U
2-Chlorophenol	µg/L	10 U
1,3-Dichlorobenzene	µg/L	5 U
1,4-Dichlorobenzene	µg/L	5 U
Benzyl Alcohol	µg/L	20 U
1,2-Dichlorobenzene	µg/L	5 U
2-Methylphenol	µg/L	10 U
bis(2-Chloroisopropyl)ether	µg/L	10 U
4-Methylphenol	µg/L	10 U
N-Nitroso-di-N-propylamine	µg/L	10 U
Hexachloroethane	µg/L	10 U
Nitrobenzene	µg/L	10 U
Isophorone	µg/L	10 U
2-Nitrophenol	µg/L	10 U
2,4-Dimethylphenol	µg/L	10 U
Benzoic Acid	µg/L	50 U
bis(2-Chloroethoxy)methane	µg/L	10 U
2,4-Dichlorophenol	µg/L	10 U
1,2,4-Trichlorobenzene	µg/L	10 U
Naphthalene	µg/L	10 U
4-Chloroaniline	µg/L	20 U
Hexachlorobutadiene	µg/L	10 U
4-Chloro-3-methylphenol	µg/L	10 U
2-Methylnaphthalene	µg/L	10 U
Hexachlorocyclopentadiene	µg/L	10 U
2,4,6-Trichlorophenol	µg/L	10 U
2,4,5-Trichlorophenol	µg/L	50 U
2-Chloronaphthalene	µg/L	10 U
2-Nitroaniline	µg/L	50 U
Dimethyl Phthalate	µg/L	10 U
Acenaphthylene	µg/L	10 U
2,6-Dinitrotoluene	µg/L	10 U
3-Nitroaniline	µg/L	50 U
Acenaphthene	µg/L	10 U
2,4-Dinitrophenol	µg/L	50 U
4-Nitrophenol	µg/L	50 U
Dibenzofuran	µg/L	10 U
2,4-Dinitrotoluene	µg/L	10 U
Diethylphthalate	µg/L	10 U
4-Chlorophenyl-phenyl Ether	µg/L	20 U
Fluorene	µg/L	10 U
4-Nitroaniline	µg/L	50 U
4,6-Dinitro-2-methylphenol	µg/L	50 U
N-Nitrosodiphenylamine	µg/L	10 U
4-Bromophenyl-phenyl Ether	µg/L	10 U
Hexachlorobenzene	µg/L	10 U
Pentachlorophenol	µg/L	30 U
Phenanthrene	µg/L	10 U
Anthracene	µg/L	10 U
di-N-Butylphthalate	µg/L	10 U
Fluoranthene	µg/L	10 U
Pyrene	µg/L	10 U
Butylbenzylphthalate	µg/L	10 U
3,3'-Dichlorobenzidine	µg/L	20 U
Benzo(a)anthracene	µg/L	10 U
Chrysene	µg/L	10 U
bis(2-Ethylhexyl)phthalate	µg/L	10 U
di-N-Octyl Phthalate	µg/L	10 U
Benzo(b)fluoranthene	µg/L	10 U
Benzo(k)fluoranthene	µg/L	10 U
Benzo(a)pyrene	µg/L	10 U
Indeno(1,2,3-c,d)pyrene	µg/L	10 U
Dibenzo(a,h)anthracene	µg/L	10 U
Benzo(g,h,i)perylene	µg/L	10 U

Table E-9. Data Presentation: Site 3 – Hazardous Waste Collection Area – Groundwater Samples (1990) 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW2-01
Laboratory Sample Number		90024902
Associated Field QC Samples		FB-01, -02, -03
		TB-10
Parameter	Units	EW-04, -07, -08
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)		
N-Nitrosodimethylamine	µg/L	50 U
2-Picoline	µg/L	50 U
Methyl Methanesulfonate	µg/L	50 U
Ethyl Methanesulfonate	µg/L	50 U
Aniline	µg/L	50 U
Acetophenone	µg/L	50 U
N-Nitrosopiperidine	µg/L	50 U
Dimethylphenethylamine	µg/L	50 U
2,6-Dichlorophenol	µg/L	50 U
N-Nitroso-di-N-butylamine	µg/L	50 U
1,2,4,5-Tetrachlorobenzene	µg/L	50 U
1-Chloronaphthalene	µg/L	50 U
Pentachlorobenzene	µg/L	50 U
1-Naphthylamine	µg/L	50 U
2-Naphthylamine	µg/L	50 U
1,2-Diphenylhydrazine	µg/L	50 U
Phenacetin	µg/L	50 U
4-Aminobiphenyl	µg/L	50 U
Pronamide	µg/L	50 U
Benzidine	µg/L	50 U
p-Dimethylaminoazobenzene	µg/L	50 U
7,12-Dimethylbenzo(a)anthracene	µg/L	50 U
3-Methylcholanthrene	µg/L	50 U
TIC Total	µg/L	NA
ORGANOCHLORINE PESTICIDES/PCBs		
alpha-BHC	µg/L	0.05 UJ(SSR)
beta-BHC	µg/L	0.05 UJ(SSR)
gamma-BHC (Lindane)	µg/L	0.05 UJ(SSR)
delta-BHC	µg/L	0.05 UJ(SSR)
Heptachlor	µg/L	0.05 UJ(SSR)
Aldrin	µg/L	0.05 UJ(SSR)
Heptachlor Epoxide	µg/L	0.05 UJ(SSR)
Endosulfan-I	µg/L	0.05 UJ(SSR)
Dieldrin	µg/L	0.10 UJ(SSR)
4,4'-DDE	µg/L	0.10 UJ(SSR)
Endrin	µg/L	0.10 UJ(SSR)
Endosulfan-II	µg/L	0.10 UJ(SSR)
4,4'-DDD	µg/L	0.10 UJ(SSR)
Endrin Aldehyde	µg/L	0.10 UJ(SSR)
Endosulfan Sulfate	µg/L	0.10 UJ(SSR)
4,4'-DDT	µg/L	0.10 R(MS)
Methoxychlor	µg/L	0.25 UJ(SSR)
Chlordane	µg/L	0.45 UJ(SSR)
Toxaphene	µg/L	4.00 UJ(SSR)
Aroclor-1016	µg/L	2.00 UJ(SSR)
Aroclor-1221	µg/L	2.50 UJ(SSR)
Aroclor-1232	µg/L	2.50 UJ(SSR)
Aroclor-1242	µg/L	2.50 UJ(SSR)
Aroclor-1248	µg/L	2.00 UJ(SSR)
Aroclor-1254	µg/L	1.30 UJ(SSR)
Aroclor-1260	µg/L	1.00 UJ(SSR)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit (CRDL)
FB – compound/element was also detected in the associated field blank
J – estimated value
MS – matrix spike percent recovery outside control limits
NA – not analyzed
R – rejected value
SSR – sample surrogate recovery outside control limits
U – compound/element was included in analysis, but was not detected
TB – compound/element was also detected in the associated trip blank
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance

Table E-10. Data Presentation: Site 3 – Hazardous Waste Collection Area – Soil Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		SB3-1-1	SB3-1-6	SB3-1-9	SB3-2-1	SB3-2-2
Laboratory Sample Number		13109, 13114	13175, 13183	13109, 13114	13174, 13182	13173, 13181
Associated Field QC Samples		FB4-1	FB4-1	FB4-1	FB4-1	FB4-1
		TB10-30-91	TB10-31-91	TB10-31-91	TB10-31-91	TB10-31-91
Parameter	Units	FB3-1,4-1	FB3-1,4-1	FB3-1,4-1	FB3-1,4-1	FB3-1,4-1
Oil And Grease	mg/kg	7300	50 U	50 U	50 U	50 U
Total Petroleum Hydrocarbons	mg/kg	7700	50 U	50 U	98	50 U
INORGANICS						
Antimony	mg/kg	3.8 UJ(N)	4 UJ(N)	3.9 UJ(N)	4.1 UJ(N)	4.4 UJ(N)
Arsenic	mg/kg	12.8 J(N)	5.1 J(N)	5.9 J(N)	4.8 J(N)	3.9 J(N)
Beryllium	mg/kg	0.34 J(B)	0.56 J(B)	0.24 J(B)	0.58 J(B)	0.81 J(B)
Cadmium	mg/kg	1.8 J(FB)	2 J(FB)	1.5 J(FB)	2 J(FB)	2.7
Chromium	mg/kg	9.4	18.3	6.5	15.3	23.1
Copper	mg/kg	26.2	23.9	18	18.1	24.3
Lead	mg/kg	11.3 R(N)	8.5 R(N)	5.8 R(N)	13.5 R(N)	3.6 R(N)
Mercury	mg/kg	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Nickel	mg/kg	24.1	31.9	14.7	21.9	36.4
Selenium	mg/kg	0.21 UJ(N)	0.23 UJ(N)	0.22 UJ(N)	0.23 UJ(N)	0.25 UJ(N)
Silver	mg/kg	0.49 U	0.52 U	0.5 U	0.52 U	0.56 U
Thallium	mg/kg	0.31 UJ(N)	0.33 UJ(N)	0.32 UJ(N)	0.33 UJ(N)	0.35 UJ(N)
Zinc	mg/kg	75.7	63.1	47.3	61.4	64.2
VOLATILE ORGANICS (SOW 3/90)						
Chloromethane	µg/kg	11 U	12 U	11 U	10 U	11 U
Bromom?thane	µg/kg	11 U	12 U	11 U	10 U	11 U
Vinyl Chloride	µg/kg	11 U	12 U	11 U	10 U	11 U
Chloroethane	µg/kg	11 U	12 U	11 U	10 U	11 U
Methylene Chloride	µg/kg	6 U	6 U	6 U	5 U	6 U
Acetone	µg/kg	11 U	12 U	11 U	10 U	11 U
Car?on Disulfide	µg/kg	6 U	6 U	6 U	5 U	6 U
1,1-Dichloroethene	µg/kg	6 U	6 U	6 U	5 U	6 U
1,1-Dichloroethane	µg/kg	6 U	6 U	6 U	5 U	6 U
1,2-Dichloroethene (Total)	µg/kg	6 U	6 U	6 U	5 U	6 U
Chloroform	µg/kg	6 U	6 U	6 U	5 U	6 U
1,2-Dichloroethane	µg/kg	6 U	6 U	6 U	5 U	6 U
2-Butanone	µg/kg	11 U	12 U	11 U	10 U	11 U
1,1,1-Trichloroethane	µg/kg	6 U	6 U	6 U	5 U	6 U
Carbon Tetrachloride	µg/kg	6 U	6 U	6 U	5 U	6 U
Bromodichloromethane	µg/kg	6 U	6 U	6 U	5 U	6 U
1,2-Dichloropropane	µg/kg	6 U	6 U	6 U	5 U	6 U
cis-1,3-Dichloropropene	µg/kg	6 U	6 U	6 U	5 U	6 U
Trichloroethene	µg/kg	6 U	6 U	6 U	5 U	6 U
Dibromochloromethane	µg/kg	6 U	6 U	6 U	5 U	6 U
1,1,2-Trichloroethane	µg/kg	6 U	6 U	6 U	5 U	6 U
Benzene	µg/kg	6 U	6 U	6 U	5 U	6 U
trans-1,3-Dichloropropene	µg/kg	6 U	6 U	6 U	5 U	6 U
Bromoform	µg/kg	6 U	6 U	6 U	5 U	6 U
4-Methyl-2-pentanone	µg/kg	11 U	12 U	11 U	10 U	11 U
2-Hexanone	µg/kg	11 U	12 U	11 U	10 U	11 U
Tetrachloroethene	µg/kg	6 U	6 U	6 U	5 U	6 U
1,1,2,2-Tetrachloroethane	µg/kg	6 U	6 U	6 U	5 U	6 U
Toluene	µg/kg	6 U	6 U	6 U	5 U	6 U
Chlorobenzene	µg/kg	6 U	6 U	6 U	5 U	6 U
Ethylbenzene	µg/kg	6 U	6 U	6 U	5 U	6 U
Styrene	µg/kg	6 U	6 U	6 U	5 U	6 U
Xylene(Total)	µg/kg	6 U	6 U	6 U	5 U	6 U
TIC Total	µg/kg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Table E-10. Data Presentation: Site 3 – Hazardous Waste Collection Area – Soil Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB3-1-1	SB3-1-6	SB3-1-9	SB3-2-1	SB3-2-2
Laboratory Sample Number		13109, 13114	13175, 13183	13176, 13184	13174, 13182	13173, 13181
Associated Field QC Samples		FB4-1	FB4-1	FB4-1	FB4-1	FB4-1
		TB10-30-91	TB10-31-91	TB10-31-91	TB10-31-91	TB10-31-91
Parameter	Units	EB3-1, 4-1	EB3-1, 4-1	EB3-1, 4-1	EB3-1, 4-1	EB3-1, 4-1
SEMIVOLATILE ORGANICS (SOW 3/90)						
Phenol	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
bis(2-Chloroethyl)ether	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2-Chlorophenol	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
1,3-Dichlorobenzene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
1,4-Dichlorobenzene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
1,2-Dichlorobenzene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2-Methylphenol	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2,2'-oxybis(1-Chloropropane)	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
4-Methylphenol	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
N-Nitroso-di-N-propylamine	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Hexachloroethane	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Nitrobenzene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Isophorone	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2-Nitrophenol	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2,4-Dimethylphenol	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
bis(2-Chloroethoxy)methane	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2,4-Dichlorophenol	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
1,2,4-Trichlorobenzene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Naphthalene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
4-Chloroaniline	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Hexachlorobutadiene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
4-Chloro-3-methylphenol	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Hexachlorocyclopentadiene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2,4,6-Trichlorophenol	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2-Methylnaphthalene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2,4,5-Trichloorophenol	μg/kg	1800 UJ(EHT)	1900 U	1800 U	1700 U	1800 U
2-Chloronaphthalene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2-Nitroaniline	μg/kg	1800 UJ(EHT)	1900 U	1800 U	1700 U	1800 U
Dimethyl phthalate	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Acenaphthylene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2,6-Dinitrotoluene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
3-Nitroaniline	μg/kg	1800 UJ(EHT)	1900 U	1800 U	1700 U	1800 U
Acenaphthene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2,4-Dinitrophenol	μg/kg	1800 UJ(EHT)	1900 U	1800 U	1700 U	1800 U
4-Nitrophenol	μg/kg	1800 UJ(EHT)	1900 U	1800 U	1700 U	1800 U
Dibenzofuran	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
2,4-Dinitrotoluene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Diethyl phthalate	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
4-Chlorophenyl phenyl ether	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Fluorene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
4-Nitroaniline	μg/kg	1800 UJ(EHT)	1900 U	1800 U	1700 U	1800 U
4,6-Dinitro-2-methylphenol	μg/kg	1800 UJ(EHT)	1900 U	1800 U	1700 U	1800 U
N-Nitrosodiphenylamine (1)	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
4-Bromophenyl phenyl ether	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Hexachlorobenzene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Pentachlorophenol	μg/kg	1800 UJ(EHT)	1900 U	1800 U	1700 U	1800 U
Phenanthrene	μg/kg	360 UJ(EHT)	390 U	370 U	350	370 U
Anthracene	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Carbazole	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
di-N-Butyl phthalate	μg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Fluoranthene	μg/kg	360 UJ(EHT)	390 U	370 U	660	370 U

Table E-10. Data Presentation: Site 3 – Hazardous Waste Collection Area – Soil Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB3-1-1	SB3-1-6	SB3-1-9	SB3-2-1	SB3-2-2
Laboratory Sample Number		13109, 13114	13175, 13183	13176, 13184	13174, 13182	13173, 13181
Associated Field QC Samples		FB4-1	FB4-1	FB4-1	FB4-1	FB4-1
		TB10-30-91	TB10-31-91	TB10-31-91	TB10-31-91	TB10-31-91
Parameter	Units	EB3-1, 4-1	EB3-1, 4-1	EB3-1, 4-1	EB3-1, 4-1	EB3-1, 4-1
SEMIVOLATILE ORGANICS (SOW 3/90)						
(Continued)						
Pyrene	µg/kg	360 UJ(EHT)	390 U	370 U	560	370 U
Butylbenzylphthalate	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
3,3'-Dichlorobenzidine	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Benzo(a)anthracene	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Chrysene	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
bis(2-Ethylhexyl)phthalate	µg/kg	2400 J(EHT)	390 U	370 U	240 J	370 U
di-N-Octyl phthalate	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Benzo(b)fluoranthene	µg/kg	360 UJ(EHT)	390 U	370 U	650	370 U
Benzo(k)fluoranthene	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Benzo(a)pyrene	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Indeno(1,2,3-cd)pyrene	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Dibenzo(a,h)anthracene	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
Benzo(g,h,i)perylene	µg/kg	360 UJ(EHT)	390 U	370 U	340 U	370 U
TIC Total	µg/kg	6720 (11)	4000 (16)	11070 (20)	34640 (20)	28410 (20)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit (CRDL)
EHT – extraction holding time outside control limits
FB – compound/element was also detected in the associated field blank
J – estimated value
N – spiked sample recovery outside of control limits
NA – not analyzed
R – rejected value
U – compound/element was included in analysis, but was not detected

**Table E-11. Data Presentation: Site 3 –
Hazardous Waste Collection Area – Groundwater Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard,
Ft. Wayne, Indiana**

SAIC ID Number		MW2-01	MW2-01R
Laboratory Sample Number		14355	14356
Associated Field QC Samples		FB2-1 TB11-6-91 EB2-1	FB2-1 TB11-6-91 EB2-1
Parameter	Units		
Oil And Grease	mg/L	1 U	3
Total Petroleum Hydrocarbons	mg/L	1 U	1 U
INORGANICS			
Antimony	µg/L	14 UJ(N)	17 J(N,B)
Arsenic	µg/L	24.8	23.3
Beryllium	µg/L	1.8 J(B)	1.5 J(B)
Cadmium	µg/L	1 U	1 U
Chromium	µg/L	69.1	60.2
Copper	µg/L	82.3	74.9
Lead	µg/L	43.4	39
Mercury	µg/L	0.2 U	0.2 U
Nickel	µg/L	76.8	68.4
Selenium	µg/L	1 UJ(N)	1 UJ(N)
Silver	µg/L	2 UJ(N)	2 UJ(N)
Thallium	µg/L	1 UW	1 UW
Zinc	µg/L	179	165
VOLATILE ORGANICS (SOW 3/90)			
Chloromethane	µg/L	10 U	10 U
Bromomethane	µg/L	10 U	10 U
Vinyl Chloride	µg/L	10 U	10 U
Chloroethane	µg/L	10 U	10 U
Methylene Chloride	µg/L	5 U	5 U(MB)
Acetone	µg/L	10 U	10 U
Carbon Disulfide	µg/L	5 U	5 U
1,1-Dichloroethene	µg/L	5 U	5 U
1,1-Dichloroethane	µg/L	5 U	5 U
1,2-Dichloroethene (Total)	µg/L	5 U	5 U
Chloroform	µg/L	5 U	5 U
1,2-Dichloroethane	µg/L	5 U	5 U
2-Butanone	µg/L	10 U	10 U
1,1,1-Trichloroethane	µg/L	5 U	5 U
Carbon Tetrachloride	µg/L	5 U	5 U
Bromodichloromethane	µg/L	5 U	5 U
1,2-Dichloropropane	µg/L	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	5 U
Trichloroethene	µg/L	5 U	5 U
Dibromochloromethane	µg/L	5 U	5 U
1,1,2-Trichloroethane	µg/L	5 U	5 U
Benzene	µg/L	5 U	5 U
trans-1,3-Dichloropropene	µg/L	5 U	5 U
Bromoform	µg/L	5 U	5 U
4-Methyl-2-pentanone	µg/L	10 U	10 U
2-Hexanone	µg/L	10 U	10 U
Tetrachloroethene	µg/L	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	5 U
Toluene	µg/L	5 U	5 U
Chlorobenzene	µg/L	5 U	5 U
Ethylbenzene	µg/L	5 U	5 U
Styrene	µg/L	5 U	5 U
Xylene(Total)	µg/L	5 U	5 U
TIC Total	µg/L	0 (0)	0 (0)

Table B-11. Data Presentation: Site 3 – Hazardous Waste Collection Area – Groundwater Samples (1991) 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW2-01	MW2-01R
Laboratory Sample Number		14355	14356
Associated Field QC Samples		FB2-1	FB2-1
		TB11-6-91	TB11-6-91
Parameter	Units	EB2-1	EB2-1
SEMIVOLATILE ORGANICS (SOW 3/90)			
Phenol	μg/L	10 U	10 U
bis(2-Chloroethyl)ether	μg/L	10 U	10 U
2-Chlorophenol	μg/L	10 U	10 U
1,3-Dichlorobenzene	μg/L	10 U	10 U
1,4-Dichlorobenzene	μg/L	10 U	10 U
1,2-Dichlorobenzene	μg/L	10 U	10 U
2-Methylphenol	μg/L	10 U	10 U
2,2'-oxybis(1-Chloropropane)	μg/L	10 U	10 U
4-Methylphenol	μg/L	10 U	10 U
N-Nitroso-di-N-propylamine	μg/L	10 U	10 U
Hexachloroethane	μg/L	10 U	10 U
Nitrobenzene	μg/L	10 U	10 U
Isophorone	μg/L	10 U	10 U
2-Nitrophenol	μg/L	10 U	10 U
2,4-Dimethylphenol	μg/L	10 U	10 U
bis(2-Chloroethoxy)methane	μg/L	10 U	10 U
2,4-Dichlorophenol	μg/L	10 U	10 U
1,2,4-Trichlorobenzene	μg/L	10 U	10 U
Naphthalene	μg/L	10 U	10 U
4-Chloroaniline	μg/L	10 U	10 U
Hexachlorobutadiene	μg/L	10 U	10 U
4-Chloro-3-methylphenol	μg/L	10 U	10 U
Hexachlorocyclopentadiene	μg/L	10 U	10 U
2,4,6-Trichlorophenol	μg/L	10 U	10 U
2-Methylnaphthalene	μg/L	10 U	10 U
2,4,5-Trichloorophenol	μg/L	50 U	50 U
2-Chloronaphthalene	μg/L	10 U	10 U
2-Nitroaniline	μg/L	50 U	50 U
Dimethyl phthalate	μg/L	10 U	10 U
Acenaphthylene	μg/L	10 U	10 U
2,6-Dinitrotoluene	μg/L	10 U	10 U
3-Nitroaniline	μg/L	50 U	50 U
Acenaphthene	μg/L	10 U	10 U
2,4-Dinitrophenol	μg/L	50 U	50 U
4-Nitrophenol	μg/L	50 U	50 U
Dibenzofuran	μg/L	10 U	10 U
2,4-Dinitrotoluene	μg/L	10 U	10 U
Diethyl phthalate	μg/L	10 U	10 U
4-Chlorophenyl phenyl ether	μg/L	10 U	10 U
Fluorene	μg/L	10 U	10 U
4-Nitroaniline	μg/L	50 U	50 U
4,6-Dinitro-2-methylphenol	μg/L	50 U	50 U
N-Nitrosodiphenylamine (1)	μg/L	10 U	10 U
4-Bromophenyl phenyl ether	μg/L	10 U	10 U
Hexachlorobenzene	μg/L	10 U	10 U
Pentachlorophenol	μg/L	50 U	50 U
Phenanthrene	μg/L	10 U	10 U
Anthracene	μg/L	10 U	10 U
Carbazole	μg/L	10 U	10 U
di-N-Butyl phthalate	μg/L	10 U	10 U
Fluoranthene	μg/L	10 U	10 U

Table E-11. Data Presentation: Site 3 –
Hazardous Waste Collection Area – Groundwater Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard,
Ft. Wayne, Indiana (Continued)

Parameter	Units		
SAIC ID Number		MW2-01	MW2-01R
Laboratory Sample Number		14355	14356
Associated Field QC Samples		FB2-1 TB11-6-91 EB2-1	FB2-1 TB11-6-91 EB2-1
SEMIVOLATILE ORGANICS (SOW 3/90) (Continued)			
Pyrene	μg/L	10 U	10 U
Butylbenzylphthalate	μg/L	10 U	10 U
3,3'-Dichlorobenzidine	μg/L	10 U	10 U
Benzo(a)anthracene	μg/L	10 U	10 U
Chrysene	μg/L	10 U	10 U
bis(2-Ethylhexyl)phthalate	μg/L	10 U	10 U
di-N-Octyl phthalate	μg/L	10 U	10 U
Benzo(b)fluoranthene	μg/L	10 U	10 U
Benzo(k)fluoranthene	μg/L	10 U	10 U
Benzo(a)pyrene	μg/L	10 U	10 U
Indeno(1,2,3-cd)pyrene	μg/L	10 U	10 U
Dibenzo(a,h)anthracene	μg/L	10 U	10 U
Benzo(g,h,i)perylene	μg/L	10 U	10 U
TIC Total	μg/L	19 (1)	8 (2)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance

Table E-12. Data Presentation: Site 4 - POL Spill Area - Soil Samples (1990) - 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		SB4-01-01	SB4-01-02	SB4-02-01	SB4-02-02	SB4-03-01	SB4-03-02	SB4-04-01	SB4-04-02
Laboratory Sample Number		90022304	90022305	90022306	90022307	90022308	90022309	90022310	90022311
Associated Field QC Samples		FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02
		TB-05	TB-05	TB-05	TB-05	TB-05	TB-05	TB-05	TB-05
Parameter	Units	EW-03,-04	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05
Total Petroleum Hydrocarbons	mg/kg	10 UJ(HT)	10 UJ(HT)	1500 J(HT)	10 UJ(HT)	320 J(HT)	10 UJ(HT)	10 UJ(HT)	10 UJ(HT)
METALS									
Antimony	mg/kg	0.12 R(N)	0.11 R(N)	0.12 R(N)	0.12 R(N)	0.11 R(N)	0.12 R(N)	0.10 R(N)	0.10 R(N)
Arsenic	mg/kg	8.40 J(N)	11.10 J(N)	10.90 J(N)	9.80 J(N)	9.70 J(N)	11.40 J(N)	10.80 J(N)	8.20 J(N)
Beryllium	mg/kg	1.20	2.10	1.70	1.90	1.90	1.90	1.10	1.40
Cadmium	mg/kg	0.36 J(MB,B)	0.21 U	0.36 J(MB,B)	0.24 J(MB,B)	0.45 J(MB,B)	0.23 U	0.21 J(MB,B)	0.49 J(MB)
Chromium	mg/kg	7.70	29.60	21.60	22.30	25.30	28.30	13.10	16.90
Copper	mg/kg	54.80	22.60	28.80	29.60	16.70	28.00	16.90	31.30
Lead	mg/kg	14.10 (*)	9.40 (*)	11.70 (*)	10.50 (*)	13.60 (*)	14.50 (*)	25.60	10.40
Mercury	mg/kg	0.04	0.03	0.09	0.03	0.04	0.04	0.02	0.02 U
Nickel	mg/kg	11.20 J(MB)	21.30	23.40	32.30	24.90	36.90	14.50 J(MB)	31.50
Selenium	mg/kg	0.39 J(B)	0.33 J(B)	0.24 UW	0.23 UW	0.38 J(B)	0.22 U	0.45 J(B)	0.52 J(FB)
Silver	mg/kg	1.30 U	1.20 U	1.30 U	1.30 U	1.20 U	1.30 U	1.10 U	1.10 U
Thallium	mg/kg	0.49 J(B)	0.47 J(B)	0.28 J(B)	0.23 U	0.22 U	0.38 J(B)	0.24 UW	0.23 UW
Zinc	mg/kg	22.00 J(FB)	66.70 J(FB)	66.00 J(FB)	66.80 J(FB)	77.10 J(FB)	87.00 J(FB)	51.20 J(FB)	66.70 J(FB)
VOLATILE ORGANIC COMPOUNDS									
Chloromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Disulfide	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Tetrachloride	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Acetate	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloroethyl Vinyl Ether	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobutane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl Methacrylate	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA
TIC Totals	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA

Table E-12. Data Presentation: Site 4 – POL Spill Area – Soil Samples (1990) – 122nd Tactical Fighter Wing – Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB4-01-01	SB4-01-02	SB4-02-01	SB4-02-02	SB4-03-01	SB4-03-02	SB4-04-01	SB4-04-02
Laboratory Sample Number		90022304	90022305	90022306	90022307	90022308	90022309	90022310	90022311
Associated Field QC Samples		FB-01,-02 TB-05	FB-01,-02 TB-05	FB-01,-02 TB-05	FB-01,-02 TB-05	FB-01,-02 TB-05	FB-01,-02 TB-05	FB-01,-02 TB-05	FB-01,-02 TB-05
Parameter	Units	EW-03,-04	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05	EW-03,-04,-05
SEMIVOLATILE ORGANIC COMPOUNDS									
Phenol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
bis(2-Chloroethyl)ether	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2-Chlorophenol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
1,3-Dichlorobenzene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
1,4-Dichlorobenzene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Benzyl Alcohol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
1,2-Dichlorobenzene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2-Methylphenol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
bis(2-Chloroisopropyl)ether	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
4-Methylphenol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
N-Nitroso-di-N-propylamine	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Hexachloroethane	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Nitrobenzene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Isophorone	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2-Nitrophenol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2,4-Dimethylphenol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Benzoic Acid	µg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
bis(2-Chloroethoxy)methane	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2,4-Dichlorophenol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
1,2,4-Trichlorobenzene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Naphthalene	µg/kg	290 J	350 U	390 U	400 U	390 U	400 U	400 U	400 U
4-Chloroaniline	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Hexachlorobutadiene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
4-Chloro-3-methylphenol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2-Methylnaphthalene	µg/kg	360 J	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Hexachlorocyclopentadiene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2,4,6-Trichlorophenol	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2,4,5-Trichlorophenol	µg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
2-Chloronaphthalene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2-Nitroaniline	µg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Dimethyl Phthalate	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Acenaphthylene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2,6-Dinitrotoluene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
3-Nitroaniline	µg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Acenaphthene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2,4-Dinitrophenol	µg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
4-Nitrophenol	µg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Dibenzofuran	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
2,4-Dinitrotoluene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Diethyl Phthalate	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
4-Chlorophenyl-phenyl Ether	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Fluorene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
4-Nitroaniline	µg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
4,6-Dinitro-2-methylphenol	µg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
N-Nitrosodiphenylamine	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
4-Bromophenyl-phenyl Ether	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Hexachlorobenzene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Pentachlorophenol	µg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Phenanthrene	µg/kg	720	350 U	390 U	300 J	390 U	400 U	400 U	400 U
Anthracene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
di-N-Butylphthalate	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Fluoranthene	µg/kg	660	350 U	390 U	520	390 U	400 U	400 U	400 U
Pyrene	µg/kg	600	350 U	390 U	480	390 U	400 U	400 U	400 U
Butylbenzyl Phthalate	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
3,3'-Dichlorobenzidine	µg/kg	790 U	710 U	780 U	810 U	790 U	800 U	810 U	800 U
Benzo(a)anthracene	µg/kg	390 U	350 U	390 U	380 J	390 U	400 U	400 U	400 U
Chrysene	µg/kg	380 J	350 U	390 U	400	390 U	400 U	400 U	400 U
bis(2-Ethylhexyl)phthalate	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
di-N-Octyl Phthalate	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Benzo(b)fluoranthene	µg/kg	370 J	350 U	280 J	520	390 U	400 U	400 U	400 U
Benzo(k)fluoranthene	µg/kg	350 J	350 U	360 J	830	390 U	400 U	400 U	400 U
Benzo(a)pyrene	µg/kg	240 J	350 U	280 J	590	390 U	400 U	400 U	400 U
Indeno(1,2,3-c,d)pyrene	µg/kg	390 U	350 U	390 U	410	390 U	400 U	400 U	400 U
Dibenzo(a,h)anthracene	µg/kg	390 U	350 U	390 U	400 U	390 U	400 U	400 U	400 U
Benzo(g,h,i)perylene	µg/kg	390 U	350 U	230 J	540	390 U	400 U	400 U	400 U

Table E-12. Data Presentation: Site 4 - POL Spill Area - Soil Samples (1990) - 122nd Tactical Fighter Wing - Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB4-01-01	SB4-01-02	SB4-02-01	SB4-02-02	SB4-03-01	SB4-03-02	SB4-04-01	SB4-04-02
Laboratory Sample Number		90022304	90022305	90022306	90022307	90022308	90022309	90022310	90022311
Associated Field QC Samples		FB-01,-02 TB-05 EW-03,-04	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05
Parameter	Units								
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)									
N-Nitrosodimethylamine	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
2-Picoline	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Methyl Methanesulfonate	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Ethyl Methanesulfonate	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Aniline	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Acetophenone	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
N-Nitrosopiperidine	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Dimethylphenethylamine	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
2,6-Dichlorophenol	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
N-Nitroso-di-N-butylamine	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
1,2,4,5-Tetrachlorobenzene	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
1-Chloronaphthalene	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Pentachlorobenzene	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
1-Naphthylamine	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
2-Naphthylamine	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
1,2-Diphenylhydrazine	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Phenacetin	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
4-Aminobiphenyl	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Pronamide	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
Benzidine	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
p-Dimethylaminoazobenzene	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
7,12-Dimethylbenzo(a)anthracene	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
3-Methylcholanthrene	μg/kg	1900 U	1700 U	1900 U	1900 U	1900 U	1900 U	2000 U	1900 U
TIC Total	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
ORGANOCHLORINE PESTICIDES/PCBs									
alpha-BHC	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan-I	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan-II	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1016	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	μg/kg	NA	NA	NA	NA	NA	NA	NA	NA

B - the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
FB - compound/element was also detected in the associated field blank
HT - sample analysis holding time greater than control limit
J - estimated value
MB - compound/element was also detected in the associated laboratory method blank
N - spiked sample recovery outside of control limits
NA - not analyzed
R - rejected value
U - compound/element was included in analysis, but was not detected
W - post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85-115%), while sample absorbance is less than 50% of the spike absorbance
* - duplicate sample analysis outside of control limits

Table E-12. Data Presentation: Site 4 – POL Spill Area – Soil and Sediment Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB4-05-01	SB4-05-02	SD4-01	SD4-02
Laboratory Sample Number		90022312	90022313	90022402	90022403
Associated Field QC Samples		FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-06 EW-03,-05	FB-01,-02 TB-06 EW-03,-05
Parameter	Units				
Total Petroleum Hydrocarbons	mg/kg	180 J(HT)	64 J(HT)	1400 J(HT)	880 J(HT)
METALS					
Antimony	mg/kg	0.08 R(N)	0.09 R(N)	0.11 R(N)	0.12 R(N)
Arsenic	mg/kg	2.80 J(N)	7.00 J(N)	11.00 J(N)	9.60 J(N)
Beryllium	mg/kg	0.25 J(B)	1.60	1.70	2.00
Cadmium	mg/kg	0.17 U	0.28 J(MB,B)	0.22 J(MB,B)	0.35 J(MB,B)
Chromium	mg/kg	5.40	21.20	20.90	19.30
Copper	mg/kg	16.10	27.40	31.10	28.10
Lead	mg/kg	11.00	10.80	13.80	20.40
Mercury	mg/kg	0.03	0.02 U	0.03 U	0.04
Nickel	mg/kg	9.20 J(MB)	28.60	33.70	26.10
Selenium	mg/kg	0.36 J(B)	0.22 UW	0.23 UW	0.26 U
Silver	mg/kg	0.91 U	1.00 U	1.20 U	1.30 U
Thallium	mg/kg	0.20 UW	0.22 U	0.27 J(B)	0.30 J(B)
Zinc	mg/kg	13.80 J(FB)	55.30 J(FB)	73.90 J(FB)	71.30 J(FB)
VOLATILE ORGANIC COMPOUNDS					
Chloromethane	μg/kg	NA	NA	NA	NA
Bromomethane	μg/kg	NA	NA	NA	NA
Vinyl Chloride	μg/kg	NA	NA	NA	NA
Chloroethane	μg/kg	NA	NA	NA	NA
Methylene Chloride	μg/kg	NA	NA	NA	NA
Acetone	μg/kg	NA	NA	NA	NA
Carbon Disulfide	μg/kg	NA	NA	NA	NA
1,1-Dichloroethene	μg/kg	NA	NA	NA	NA
1,1-Dichloroethane	μg/kg	NA	NA	NA	NA
1,2-Dichloroethene (total)	μg/kg	NA	NA	NA	NA
Chloroform	μg/kg	NA	NA	NA	NA
1,2-Dichloroethane	μg/kg	NA	NA	NA	NA
2-Butanone	μg/kg	NA	NA	NA	NA
1,1,1-Trichloroethane	μg/kg	NA	NA	NA	NA
Carbon Tetrachloride	μg/kg	NA	NA	NA	NA
Vinyl Acetate	μg/kg	NA	NA	NA	NA
Bromodichloromethane	μg/kg	NA	NA	NA	NA
1,2-Dichloropropane	μg/kg	NA	NA	NA	NA
cis-1,3-Dichloropropene	μg/kg	NA	NA	NA	NA
Trichloroethene	μg/kg	NA	NA	NA	NA
Dibromochloromethane	μg/kg	NA	NA	NA	NA
1,1,2-Trichloroethane	μg/kg	NA	NA	NA	NA
Benzene	μg/kg	NA	NA	NA	NA
trans-1,3-Dichloropropene	μg/kg	NA	NA	NA	NA
Bromoform	μg/kg	NA	NA	NA	NA
4-Methyl-2-pentanone	μg/kg	NA	NA	NA	NA
2-Hexanone	μg/kg	NA	NA	NA	NA
Tetrachloroethene	μg/kg	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	μg/kg	NA	NA	NA	NA
Toluene	μg/kg	NA	NA	NA	NA
Chlorobenzene	μg/kg	NA	NA	NA	NA
Ethylbenzene	μg/kg	NA	NA	NA	NA
Styrene	μg/kg	NA	NA	NA	NA
Total Xylenes	μg/kg	NA	NA	NA	NA
2-Chloroethyl Vinyl Ether	μg/kg	NA	NA	NA	NA
Iodomethane	μg/kg	NA	NA	NA	NA
Acrolein	μg/kg	NA	NA	NA	NA
Acrylonitrile	μg/kg	NA	NA	NA	NA
Dibromomethane	μg/kg	NA	NA	NA	NA
1,2,3-Trichloropropane	μg/kg	NA	NA	NA	NA
1,4-Dichlorobutane	μg/kg	NA	NA	NA	NA
Ethyl Methacrylate	μg/kg	NA	NA	NA	NA
Trichlorofluoromethane	μg/kg	NA	NA	NA	NA
Dichlorodifluoromethane	μg/kg	NA	NA	NA	NA
TIC Totals	μg/kg	NA	NA	NA	NA

Table E-12. Data Presentation: Site 4 - POL Spill Area - Soil and Sediment Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB4-05-01	SB4-05-02	SD4-01	SD4-02
Laboratory Sample Number		90022312	90022313	90022402	90022403
Associated Field QC Samples		FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-05 EW-03,-04,-05	FB-01,-02 TB-06 EW-03,-05	FB-01,-02 TB-06 EW-03,-05
Parameter	Units				
SEMIVOLATILE ORGANIC COMPOUNDS					
Phenol	µg/kg	340 U	380 U	430 U	420 U
bis(2-Chloroethyl)ether	µg/kg	340 U	380 U	430 U	420 U
2-Chlorophenol	µg/kg	340 U	380 U	430 U	420 U
1,3-Dichlorobenzene	µg/kg	340 U	380 U	430 U	420 U
1,4-Dichlorobenzene	µg/kg	340 U	380 U	430 U	420 U
Benzyl Alcohol	µg/kg	340 U	380 U	430 U	420 U
1,2-Dichlorobenzene	µg/kg	340 U	380 U	430 U	420 U
2-Methylphenol	µg/kg	340 U	380 U	430 U	420 U
bis(2-Chloroisopropyl)ether	µg/kg	340 U	380 U	430 U	420 U
4-Methylphenol	µg/kg	340 U	380 U	430 U	420 U
N-Nitroso-di-N-propylamine	µg/kg	340 U	380 U	430 U	420 U
Hexachloroethane	µg/kg	340 U	380 U	430 U	420 U
Nitrobenzene	µg/kg	340 U	380 U	430 U	420 U
Isophorone	µg/kg	340 U	380 U	430 U	420 U
2-Nitrophenol	µg/kg	340 U	380 U	430 U	420 U
2,4-Dimethylphenol	µg/kg	340 U	380 U	430 U	420 U
Benzoic Acid	µg/kg	1700 U	1800 U	2100 U	2000 U
bis(2-Chloroethoxy)methane	µg/kg	340 U	380 U	430 U	420 U
2,4-Dichlorophenol	µg/kg	340 U	380 U	430 U	420 U
1,2,4-Trichlorobenzene	µg/kg	340 U	380 U	430 U	420 U
Naphthalene	µg/kg	1800	380 U	430 U	420 U
4-Chloroaniline	µg/kg	340 U	380 U	430 U	420 U
Hexachlorobutadiene	µg/kg	340 U	380 U	430 U	420 U
4-Chloro-3-methylphenol	µg/kg	340 U	380 U	430 U	420 U
2-Methylnaphthalene	µg/kg	340 U	380 U	430 U	420 U
Hexachlorocyclopentadiene	µg/kg	340 U	380 U	430 U	420 U
2,4,6-Trichlorophenol	µg/kg	340 U	380 U	430 U	420 U
2,4,5-Trichlorophenol	µg/kg	1700 U	1800 U	2100 U	2000 U
2-Chloronaphthalene	µg/kg	340 U	380 U	430 U	420 U
2-Nitroaniline	µg/kg	1700 U	1800 U	2100 U	2000 U
Dimethyl Phthalate	µg/kg	340 U	380 U	430 U	420 U
Acenaphthylene	µg/kg	340 U	380 U	430 U	420 U
2,6-Dinitrotoluene	µg/kg	340 U	380 U	430 U	420 U
3-Nitroaniline	µg/kg	1700 U	1800 U	2100 U	2000 U
Acenaphthene	µg/kg	340 U	380 U	430 U	420 U
2,4-Dinitrophenol	µg/kg	1700 U	1800 U	2100 U	2000 U
4-Nitrophenol	µg/kg	1700 U	1800 U	2100 U	2000 U
Dibenzofuran	µg/kg	280 J	380 U	430 U	420 U
2,4-Dinitrotoluene	µg/kg	340 U	380 U	430 U	420 U
Diethyl Phthalate	µg/kg	340 U	380 U	430 U	420 U
4-Chlorophenyl-phenyl Ether	µg/kg	340 U	380 U	430 U	420 U
Fluorene	µg/kg	340 U	380 U	430 U	420 U
4-Nitroaniline	µg/kg	1700 U	1800 U	2100 U	2000 U
4,6-Dinitro-2-methylphenol	µg/kg	1700 U	1800 U	2100 U	2000 U
N-Nitrosodiphenylamine	µg/kg	340 U	380 U	430 U	420 U
4-Bromophenyl-phenyl Ether	µg/kg	340 U	380 U	430 U	420 U
Hexachlorobenzene	µg/kg	340 U	380 U	430 U	420 U
Pentachlorophenol	µg/kg	1700 U	1800 U	2100 U	2000 U
Phenanthrene	µg/kg	340 U	380 U	430 U	420 U
Anthracene	µg/kg	340 U	380 U	430 U	420 U
di-N-Butylphthalate	µg/kg	340 U	380 U	430 U	420 U
Fluoranthene	µg/kg	340 U	380 U	430 U	420 U
Pyrene	µg/kg	340 U	380 U	430 U	420 U
Butylbenzyl Phthalate	µg/kg	340 U	380 U	430 U	420 U
3,3'-Dichlorobenzidine	µg/kg	680 U	760 U	860 U	830 U
Benzo(a)anthracene	µg/kg	340 U	380 U	430 U	420 U
Chrysene	µg/kg	340 U	380 U	430 U	420 U
bis(2-Ethylhexyl)phthalate	µg/kg	340 U	380 U	430 U	420 U
di-N-Octyl Phthalate	µg/kg	340 U	380 U	430 U	420 U
Benzo(b)fluoranthene	µg/kg	340 U	380 U	430 U	420 U
Benzo(k)fluoranthene	µg/kg	340 U	380 U	430 U	420 U
Benzo(a)pyrene	µg/kg	340 U	380 U	430 U	420 U
Indeno(1,2,3-c,d)pyrene	µg/kg	340 U	380 U	430 U	420 U
Dibenzo(a,h)anthracene	µg/kg	340 U	380 U	430 U	420 U
Benzo(g,h,i)perylene	µg/kg	340 U	380 U	430 U	420 U

Table E-12. Data Presentation: Site 4 - POL Spill Area - Soil and Sediment Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB4-05-01	SB4-05-02	SD4-01	SD4-02
Laboratory Sample Number		90022312	90022313	90022402	90022403
Associated Field QC Samples		FB-01,-02	FB-01,-02	FB-01,-02	FB-01,-02
		TB-05	TB-05	TB-06	TB-06
Parameter	Units	EW-03,-04,-05	EW-03,-04,-05	EW-03,-05	EW-03,-05
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)					
N-Nitrosodimethylamine	μg/kg	1700 U	1800 U	2100 U	2000 U
2-Picoline	μg/kg	1700 U	1800 U	2100 U	2000 U
Methyl Methanesulfonate	μg/kg	1700 U	1800 U	2100 U	2000 U
Ethyl Methanesulfonate	μg/kg	1700 U	1800 U	2100 U	2000 U
Aniline	μg/kg	1700 U	1800 U	2100 U	2000 U
Acetophenone	μg/kg	1700 U	1800 U	2100 U	2000 U
N-Nitrosopiperidine	μg/kg	1700 U	1800 U	2100 U	2000 U
Dimethylphenethylamine	μg/kg	1700 U	1800 U	2100 U	2000 U
2,6-Dichlorophenol	μg/kg	1700 U	1800 U	2100 U	2000 U
N-Nitroso-di-N-butylamine	μg/kg	1700 U	1800 U	2100 U	2000 U
1,2,4,5-Tetrachlorobenzene	μg/kg	1700 U	1800 U	2100 U	2000 U
1-Chloronaphthalene	μg/kg	1700 U	1800 U	2100 U	2000 U
Pentachlorobenzene	μg/kg	1700 U	1800 U	2100 U	2000 U
1-Naphthylamine	μg/kg	1700 U	1800 U	2100 U	2000 U
2-Naphthylamine	μg/kg	1700 U	1800 U	2100 U	2000 U
1,2-Diphenylhydrazine	μg/kg	1700 U	1800 U	2100 U	2000 U
Phenacetin	μg/kg	1700 U	1800 U	2100 U	2000 U
4-Aminobiphenyl	μg/kg	1700 U	1800 U	2100 U	2000 U
Pronamide	μg/kg	1700 U	1800 U	2100 U	2000 U
Benzidine	μg/kg	1700 U	1800 U	2100 U	2000 U
p-Dimethylaminoazobenzene	μg/kg	1700 U	1800 U	2100 U	2000 U
7,12-Dimethylbenzo(a)anthracene	μg/kg	1700 U	1800 U	2100 U	2000 U
3-Methylcholanthrene	μg/kg	1700 U	1800 U	2100 U	2000 U
TIC Total	μg/kg	NA	NA	NA	NA
ORGANOCHLORINE PESTICIDES/PCBs					
alpha-BHC	μg/kg	NA	NA	NA	NA
beta-BHC	μg/kg	NA	NA	NA	NA
gamma-BHC (Lindane)	μg/kg	NA	NA	NA	NA
delta-BHC	μg/kg	NA	NA	NA	NA
Heptachlor	μg/kg	NA	NA	NA	NA
Aldrin	μg/kg	NA	NA	NA	NA
Heptachlor Epoxide	μg/kg	NA	NA	NA	NA
Endosulfan-I	μg/kg	NA	NA	NA	NA
Dieldrin	μg/kg	NA	NA	NA	NA
4,4'-DDE	μg/kg	NA	NA	NA	NA
Endrin	μg/kg	NA	NA	NA	NA
Endosulfan-II	μg/kg	NA	NA	NA	NA
4,4'-DDD	μg/kg	NA	NA	NA	NA
Endrin Aldehyde	μg/kg	NA	NA	NA	NA
Endosulfan Sulfate	μg/kg	NA	NA	NA	NA
4,4'-DDT	μg/kg	NA	NA	NA	NA
Methoxychlor	μg/kg	NA	NA	NA	NA
Chlordane	μg/kg	NA	NA	NA	NA
Toxaphene	μg/kg	NA	NA	NA	NA
Aroclor-1016	μg/kg	NA	NA	NA	NA
Aroclor-1221	μg/kg	NA	NA	NA	NA
Aroclor-1232	μg/kg	NA	NA	NA	NA
Aroclor-1242	μg/kg	NA	NA	NA	NA
Aroclor-1248	μg/kg	NA	NA	NA	NA
Aroclor-1254	μg/kg	NA	NA	NA	NA
Aroclor-1260	μg/kg	NA	NA	NA	NA

B - the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
FB - compound/element was also detected in the associated field blank
HT - sample analysis holding time greater than control limit
J - estimated value
MB - compound/element was also detected in the associated laboratory method blank
N - spiked sample recovery outside of control limits
NA - not analyzed
R - rejected value
U - compound/element was included in analysis, but was not detected
W - post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85-115%), while sample absorbance is less than 50% of the spike absorbance

Table E-13. Data Presentation: Site 4 – POL Spill Area – Groundwater Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		MW4-02	P-2
Laboratory Sample Number		90023901	90024801
Associated Field QC Samples		FB-03	FB-01,-02,-03
		TB-06	TB-08,-09
Parameter	Units	EW-05,-06,-08,-09	EW-05,-06,-07,-08
Total Petroleum Hydrocarbons	mg/L	1 U	1 U(HT)
METALS			
Antimony	µg/L	1.00 U	1.00 U
Arsenic	µg/L	3.30 J(MB,B)	3.30 J(B)
Beryllium	µg/L	2.00 U	2.00 U
Cadmium	µg/L	2.00 U	2.00 U
Chromium	µg/L	13.00 U	13.00 U
Copper	µg/L	27.00	43.00 J(FB)
Lead	µg/L	29.40	10.50 J(EB)
Mercury	µg/L	0.20 R(HT)	0.20 U
Nickel	µg/L	16.00 J(MB,B)	32.00 J(MB,B)
Selenium	µg/L	3.00 UW	3.00 UW
Silver	µg/L	11.00 U	11.00 U
Thallium	µg/L	2.00 U	2.00 UW
Zinc	µg/L	32.00 J(MB)	25.00 J(FB)
VOLATILE ORGANIC COMPOUNDS			
Chloromethane	µg/L	10 U	10 U
Bromomethane	µg/L	10 U	10 U
Vinyl Chloride	µg/L	10 U	10 U
Chloroethane	µg/L	10 U	10 U
Methylene Chloride	µg/L	5 U(TB)	5 U(TB)
Acetone	µg/L	10 U	10 U
Carbon Disulfide	µg/L	5 U	5 U
1,1-Dichloroethene	µg/L	3 U	3 U
1,1-Dichloroethane	µg/L	5 U	5 U
1,2-Dichloroethene (total)	µg/L	5 U	5 U
Chloroform	µg/L	5 U	5 U
1,2-Dichloroethane	µg/L	3 U	3 U
2-Butanone	µg/L	10 U	10 U
1,1,1-Trichloroethane	µg/L	5 U	5 U
Carbon Tetrachloride	µg/L	3 U	3 U
Vinyl Acetate	µg/L	10 U	10 U
Bromodichloromethane	µg/L	5 U	5 U
1,2-Dichloropropane	µg/L	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	5 U
Trichloroethene	µg/L	5 U	5 U
Dibromochloromethane	µg/L	5 U	5 U
1,1,2-Trichloroethane	µg/L	5 U	5 U
Benzene	µg/L	3 U	3 U
trans-1,3-Dichloropropene	µg/L	5 U	5 U
Bromoform	µg/L	5 U	5 U
4-Methyl-2-pentanone	µg/L	10 U	10 U
2-Hexanone	µg/L	10 U	10 U
Tetrachloroethene	µg/L	3 U	3 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	5 U
Toluene	µg/L	5 U	5 U
Chlorobenzene	µg/L	5 U	5 U
Ethylbenzene	µg/L	5 U	5 U
Styrene	µg/L	5 U	5 U
Total Xylenes	µg/L	5 U	5 U
2-Chloroethyl Vinyl Ether	µg/L	10 U	10 U
Iodomethane	µg/L	10 U	10 U
Acrolein	µg/L	40 U	40 U
Acrylonitrile	µg/L	40 U	40 U
Dibromomethane	µg/L	10 U	10 U
1,2,3-Trichloropropane	µg/L	10 U	10 U
1,4-Dichlorobutane	µg/L	10 U	10 U
Ethyl Methacrylate	µg/L	10 U	10 U
Trichlorofluoromethane	µg/L	10 U	10 U
Dichlorodifluoromethane	µg/L	30 U	30 U
TIC Totals	µg/L	0 (0)	0 (0)

Table E-13. Data Presentation: Site 4 - POL Spill Area - Groundwater Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW4-02	P-2
Laboratory Sample Number		90023901	90024801
Associated Field QC Samples		FB-03	FB-01,-02,-03
		TB-08	TB-08,-09
Parameter	Units	EW-05,-06,-08,-09	EW-05,-06,-07,-08
SEMIVOLATILE ORGANIC COMPOUNDS			
Phenol	µg/L	10 R(EHT)	10 R(SSR)
bis(2-Chloroethyl)ether	µg/L	10 R(EHT)	10 R(SSR)
2-Chlorophenol	µg/L	10 R(EHT)	10 R(SSR)
1,3-Dichlorobenzene	µg/L	5 R(EHT)	5 R(SSR)
1,4-Dichlorobenzene	µg/L	5 R(EHT)	5 R(SSR)
Benzyl Alcohol	µg/L	20 R(EHT)	20 R(SSR)
1,2-Dichlorobenzene	µg/L	5 R(EHT)	5 R(SSR)
2-Methylphenol	µg/L	10 R(EHT)	10 R(SSR)
bis(2-Chloroisopropyl)ether	µg/L	10 R(EHT)	10 R(SSR)
4-Methylphenol	µg/L	10 R(EHT)	10 R(SSR)
N-Nitroso-di-N-propylamine	µg/L	10 R(EHT)	10 R(SSR)
Hexachloroethane	µg/L	10 R(EHT)	10 R(SSR)
Nitrobenzene	µg/L	10 R(EHT)	10 R(SSR)
Isophorone	µg/L	10 R(EHT)	10 R(SSR)
2-Nitrophenol	µg/L	10 R(EHT)	10 R(SSR)
2,4-Dimethylphenol	µg/L	10 R(EHT)	10 R(SSR)
Benzoic Acid	µg/L	50 R(EHT)	50 R(SSR)
bis(2-Chloroethoxy)methane	µg/L	10 R(EHT)	10 R(SSR)
2,4-Dichlorophenol	µg/L	10 R(EHT)	10 R(SSR)
1,2,4-Trichlorobenzene	µg/L	10 R(EHT)	10 R(SSR)
Naphthalene	µg/L	10 R(EHT)	10 R(SSR)
4-Chloroaniline	µg/L	20 R(EHT)	20 R(SSR)
Hexachlorobutadiene	µg/L	10 R(EHT)	10 R(SSR)
4-Chloro-3-methylphenol	µg/L	10 R(EHT)	10 R(SSR)
2-Methylnaphthalene	µg/L	10 R(EHT)	10 R(SSR)
Hexachlorocyclopentadiene	µg/L	10 R(EHT)	10 R(SSR)
2,4,6-Trichlorophenol	µg/L	10 R(EHT)	10 R(SSR)
2,4,5-Trichlorophenol	µg/L	50 R(EHT)	50 R(SSR)
2-Chloronaphthalene	µg/L	10 R(EHT)	10 R(SSR)
2-Nitroaniline	µg/L	50 R(EHT)	50 R(SSR)
Dimethyl Phthalate	µg/L	10 R(EHT)	10 R(SSR)
Acenaphthylene	µg/L	10 R(EHT)	10 R(SSR)
2,6-Dinitrotoluene	µg/L	10 R(EHT)	10 R(SSR)
3-Nitroaniline	µg/L	50 R(EHT)	50 R(SSR)
Acenaphthene	µg/L	10 R(EHT)	10 R(SSR)
2,4-Dinitrophenol	µg/L	50 R(EHT)	50 R(SSR)
4-Nitrophenol	µg/L	50 R(EHT)	50 R(SSR)
Dibenzofuran	µg/L	10 R(EHT)	10 R(SSR)
2,4-Dinitrotoluene	µg/L	10 R(EHT)	10 R(SSR)
Diethylphthalate	µg/L	10 R(EHT)	10 R(SSR)
4-Chlorophenyl-phenyl Ether	µg/L	20 R(EHT)	20 R(SSR)
Fluorene	µg/L	10 R(EHT)	10 R(SSR)
4-Nitroaniline	µg/L	50 R(EHT)	50 R(SSR)
4,6-Dinitro-2-methylphenol	µg/L	50 R(EHT)	50 R(SSR)
N-Nitrosodiphenylamine	µg/L	10 R(EHT)	10 R(SSR)
4-Bromophenyl-phenyl Ether	µg/L	10 R(EHT)	10 R(SSR)
Hexachlorobenzene	µg/L	10 R(EHT)	10 R(SSR)
Pentachlorophenol	µg/L	30 R(EHT)	30 R(SSR)
Phenanthrene	µg/L	10 R(EHT)	10 R(SSR)
Anthracene	µg/L	10 R(EHT)	10 R(SSR)
di-N-Butylphthalate	µg/L	10 R(EHT)	10 R(SSR)
Fluoranthene	µg/L	10 R(EHT)	10 R(SSR)
Pyrene	µg/L	10 R(EHT)	10 R(SSR)
Butylbenzylphthalate	µg/L	10 R(EHT)	10 R(SSR)
3,3'-Dichlorobenzidine	µg/L	20 R(EHT)	20 R(SSR)
Benzo(a)anthracene	µg/L	10 R(EHT)	10 R(SSR)
Chrysene	µg/L	10 R(EHT)	10 R(SSR)
bis(2-Ethylhexyl)phthalate	µg/L	10 R(EHT)	10 R(SSR)
di-N-Octyl Phthalate	µg/L	10 R(EHT)	10 R(SSR)
Benzo(b)fluoranthene	µg/L	10 R(EHT)	10 R(SSR)
Benzo(k)fluoranthene	µg/L	10 R(EHT)	10 R(SSR)
Benzo(a)pyrene	µg/L	10 R(EHT)	10 R(SSR)
Indeno(1,2,3-c,d)pyrene	µg/L	10 R(EHT)	10 R(SSR)
Dibenzo(a,h)anthracene	µg/L	10 R(EHT)	10 R(SSR)
Benzo(g,h,i)perylene	µg/L	10 R(EHT)	10 R(SSR)

Table E-13. Data Presentation: Site 4 – POL Spill Area – Groundwater Samples (1990)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW4-02	P-2
Laboratory Sample Number		90023901	90024801
Associated Field QC Samples		FB-03 TB-08 EW-05,-06,-08,-09	FB-01,-02,-03 TB-08,-09 EW-05,-06,-07,-08
Parameter	Units		
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)			
N-Nitrosodimethylamine	µg/L	50 R(EHT)	50 R(SSR)
2-Picoline	µg/L	50 R(EHT)	50 R(SSR)
Methyl Methanesulfonate	µg/L	50 R(EHT)	50 R(SSR)
Ethyl Methanesulfonate	µg/L	50 R(EHT)	50 R(SSR)
Aniline	µg/L	50 R(EHT)	50 R(SSR)
Acetophenone	µg/L	50 R(EHT)	50 R(SSR)
N-Nitrosopiperidine	µg/L	50 R(EHT)	50 R(SSR)
Dimethylphenethylamine	µg/L	50 R(EHT)	50 R(SSR)
2,6-Dichlorophenol	µg/L	50 R(EHT)	50 R(SSR)
N-Nitroso-di-N-butylamine	µg/L	50 R(EHT)	50 R(SSR)
1,2,4,5-Tetrachlorobenzene	µg/L	50 R(EHT)	50 R(SSR)
1-Chloronaphthalene	µg/L	50 R(EHT)	50 R(SSR)
Pentachlorobenzene	µg/L	50 R(EHT)	50 R(SSR)
1-Naphthylamine	µg/L	50 R(EHT)	50 R(SSR)
2-Naphthylamine	µg/L	50 R(EHT)	50 R(SSR)
1,2-Diphenylhydrazine	µg/L	50 R(EHT)	50 R(SSR)
Phenacetin	µg/L	50 R(EHT)	50 R(SSR)
4-Aminobiphenyl	µg/L	50 R(EHT)	50 R(SSR)
Pronamide	µg/L	50 R(EHT)	50 R(SSR)
Benzidine	µg/L	50 R(EHT)	50 R(SSR)
p-Dimethylaminoazobenzene	µg/L	50 R(EHT)	50 R(SSR)
7,12-Dimethylbenzo(a)anthracene	µg/L	50 R(EHT)	50 R(SSR)
3-Methylcholanthrene	µg/L	50 R(EHT)	50 R(SSR)
TIC Total	µg/L	NA	NA

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
EB – compound/element was also detected in the associated equipment blank
EHT – extraction holding time outside control limits
FB – compound/element was also detected in the associated field blank
HT – sample analysis holding time greater than control limit
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
NA – not analyzed
R – rejected value
SSR – sample surrogate recovery outside control limits
TB – compound/element was also detected in the associated trip blank
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance

Table E-14. Data Presentation: Site 4 – POL Spill Area – Soil and Sedimet Results (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		SED-1	SED-2	SB4-1-1	SB4-1-2	SB4-1-6	SB4-2-1
Laboratory Sample Number		14395	14396	13110, 13115	13111, 13116	13112, 13117	13177, 13185
Associated Field QC Samples		FB2-1	FB2-1	FB4-1	FB4-1	FB4-1	FB4-1
		TB11-7-91	TB11-7-91	TB10-30-91	TB10-30-91	TB10-30-91	TB10-31-91
Parameter	Units	EB2-1	EB2-1	EB3-1, 4-1	EB3-1, 4-1	EB3-1, 4-1	EB3-1, 4-1
TPH as Gasoline	mg/kg	NA	NA	1 U	1 U	1 U	1 U
TPH As Diesel	mg/kg	1 U	1 U	4.9	1 U	98	12
TPH As Motor Oil	mg/kg	17	17	11	10 U	150	40
INORGANICS							
Antimony	mg/kg	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	NA	NA	3.6 J(N)	7.1 J(N)	4.6 J(N)	6.5 J(N)
Beryllium	mg/kg	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	NA	NA	NA	NA	NA	NA
Chromium	mg/kg	NA	NA	NA	NA	NA	NA
Copper	mg/kg	NA	NA	NA	NA	NA	NA
Lead	mg/kg	39.3 J(*)	7.4 J(*)	0.2	0.2	0.2	0.2
Mercury	mg/kg	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	NA	NA	0.23 UJ(N)	0.23 UJ(N)	0.24 UJ(N)	0.22 UJ(N)
Silver	mg/kg	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	NA	NA	0.33 UJ(N)	0.34 UJ(N)	0.35 UJ(N)	0.32 UJ(N)
Zinc	mg/kg	NA	NA	NA	NA	NA	NA
VOLATILE ORGANICS (SOW 3/90)							
Chloromethane	µg/kg	70 U	71 U	NA	NA	NA	NA
Bromomethane	µg/kg	70 U	71 U	NA	NA	NA	NA
Vinyl Chloride	µg/kg	70 U	71 U	NA	NA	NA	NA
Chloroethane	µg/kg	70 U	71 U	NA	NA	NA	NA
Methylene Chloride	µg/kg	35 U	36 U	NA	NA	NA	NA
Acetone	µg/kg	290	280	NA	NA	NA	NA
Carbon Disulfide	µg/kg	35 U	36 U	NA	NA	NA	NA
1,1-Dichloroethene	µg/kg	35 U	36 U	NA	NA	NA	NA
1,1-Dichloroethane	µg/kg	35 U	36 U	NA	NA	NA	NA
1,2-Dichloroethene (Total)	µg/kg	35 U	36 U	NA	NA	NA	NA
Chloroform	µg/kg	35 U	36 U	NA	NA	NA	NA
1,2-Dichloroethane	µg/kg	35 U	36 U	NA	NA	NA	NA
2-Butanone	µg/kg	70 U	71 U	NA	NA	NA	NA
1,1,1-Trichloroethane	µg/kg	35 U	36 U	NA	NA	NA	NA
Carbon Tetrachloride	µg/kg	35 U	36 U	NA	NA	NA	NA
Bromodichloromethane	µg/kg	35 U	36 U	NA	NA	NA	NA
1,2-Dichloropropane	µg/kg	35 U	36 U	NA	NA	NA	NA
cis-1,3-Dichloropropene	µg/kg	35 U	36 U	NA	NA	NA	NA
Trichloroethene	µg/kg	35 U	36 U	NA	NA	NA	NA
Dibromochloromethane	µg/kg	35 U	36 U	NA	NA	NA	NA
1,1,2-Trichloroethane	µg/kg	35 U	36 U	NA	NA	NA	NA
Benzene	µg/kg	35 U	36 U	0.59 U	0.61 U	0.62 U	0.61 U
trans-1,3-Dichloropropene	µg/kg	35 U	36 U	NA	NA	NA	NA
Bromoform	µg/kg	35 U	36 U	NA	NA	NA	NA
4-Methyl-2-pentanone	µg/kg	70 U	71 U	NA	NA	NA	NA
2-Hexanone	µg/kg	70 U	71 U	NA	NA	NA	NA
Tetrachloroethene	µg/kg	35 U	36 U	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	µg/kg	35 U	36 U	NA	NA	NA	NA
Toluene	µg/kg	35 U	36 U	0.59 U	0.7	1.6	0.61 U
Chlorobenzene	µg/kg	35 U	36 U	0.59 U	0.61 U	0.62 U	0.61 U
Ethylbenzene	µg/kg	35 U	36 U	0.59 U	0.61 U	0.62 U	0.61 U
Styrene	µg/kg	35 U	36 U	1.20 U	1.2 U	1.2 U	1.2 U
Xylene(Total)	µg/kg	35 U	36 U	NA	NA	NA	NA
M-P-Xylene	µg/kg	NA	NA	1.20 U	1.2 U	1.2 U	1.2 U
TIC Total	µg/kg	0 (0)	0 (0)	NA	NA	NA	NA

Table E-14. Data Presentation: Site 4 – POL Spill Area – Soil and Sedimet Results (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SED-1	SED-2	SB4-1-1	SB4-1-2	SB4-1-6	SB4-2-1
Laboratory Sample Number		14395	14396	13110, 13115	13111, 13116	13112, 13117	13177, 13185
Associated Field QC Samples		FB2-1 TB11-7-91 EB2-1	FB2-1 TB11-7-91 EB2-1	FB4-1 TB10-30-91 EB3-1, 4-1	FB4-1 TB10-30-91 EB3-1, 4-1	FB4-1 TB10-30-91 EB3-1, 4-1	FB4-1 TB10-31-91 EB3-1, 4-1
Parameter	Units						
SEMIVOLATILE ORGANICS (SOW 3/90)							
Phenol	μg/kg	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	μg/kg	NA	NA	NA	NA	NA	NA
2-Chlorophenol	μg/kg	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	μg/kg	NA	NA	0.59 U	0.61 U	0.62 U	0.61 U
1,4-Dichlorobenzene	μg/kg	NA	NA	0.59 U	0.61 U	0.62 U	0.61 U
1,2-Dichlorobenzene	μg/kg	NA	NA	0.59 U	0.61 U	0.62 U	0.61 U
2-Methylphenol	μg/kg	NA	NA	NA	NA	NA	NA
2,2'-oxybis(1-Chloropropane)	μg/kg	NA	NA	NA	NA	NA	NA
4-Methylphenol	μg/kg	NA	NA	NA	NA	NA	NA
N-Nitroso-di-N-propylamine	μg/kg	NA	NA	NA	NA	NA	NA
Hexachloroethane	μg/kg	NA	NA	NA	NA	NA	NA
Nitrobenzene	μg/kg	NA	NA	NA	NA	NA	NA
Isophorone	μg/kg	NA	NA	NA	NA	NA	NA
2-Nitrophenol	μg/kg	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	μg/kg	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	μg/kg	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	μg/kg	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	μg/kg	NA	NA	NA	NA	NA	NA
Naphthalene	μg/kg	NA	NA	NA	NA	NA	NA
4-Chloroaniline	μg/kg	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	μg/kg	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	μg/kg	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	μg/kg	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	μg/kg	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	μg/kg	NA	NA	NA	NA	NA	NA
2,4,5-Trichloorophenol	μg/kg	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	μg/kg	NA	NA	NA	NA	NA	NA
2-Nitroaniline	μg/kg	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	μg/kg	NA	NA	NA	NA	NA	NA
Acenaphthylene	μg/kg	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	μg/kg	NA	NA	NA	NA	NA	NA
3-Nitroaniline	μg/kg	NA	NA	NA	NA	NA	NA
Acenaphthene	μg/kg	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	μg/kg	NA	NA	NA	NA	NA	NA
4-Nitrophenol	μg/kg	NA	NA	NA	NA	NA	NA
Dibenzofuran	μg/kg	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	μg/kg	NA	NA	NA	NA	NA	NA
Diethyl phthalate	μg/kg	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	μg/kg	NA	NA	NA	NA	NA	NA
Fluorene	μg/kg	NA	NA	NA	NA	NA	NA
4-Nitroaniline	μg/kg	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	μg/kg	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	μg/kg	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	μg/kg	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	μg/kg	NA	NA	NA	NA	NA	NA
Pentachlorophenol	μg/kg	NA	NA	NA	NA	NA	NA
Phenanthrene	μg/kg	NA	NA	NA	NA	NA	NA
Anthracene	μg/kg	NA	NA	NA	NA	NA	NA
Carbazole	μg/kg	NA	NA	NA	NA	NA	NA
di-N-Butyl phthalate	μg/kg	NA	NA	NA	NA	NA	NA
Fluoranthene	μg/kg	NA	NA	NA	NA	NA	NA

Table E−14. Data Presentation: Site 4 − POL Spill Area − Soil and Sedimet Results (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SED−1	SED−2	SB4−1−1	SB4−1−2	SB4−1−6	SB4−2−1
Laboratory Sample Number		14395	14396	13110, 13115	13111, 13116	13112, 13117	13177, 13185
Associated Field QC Samples		FB2−1 TB11−7−91 EB2−1	FB2−1 TB11−7−91 EB2−1	FB4−1 TB10−30−91 EB3−1, 4−1	FB4−1 TB10−30−91 EB3−1, 4−1	FB4−1 TB10−30−91 EB3−1, 4−1	FB4−1 TB10−31−91 EB3−1, 4−1
Parameter	Units						
SEMIVOLATILE ORGANICS (SOW 3/90) (Continued)							
Pyrene	µg/kg	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	µg/kg	NA	NA	NA	NA	NA	NA
3,3'−Dichlorobenzidine	µg/kg	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	µg/kg	NA	NA	NA	NA	NA	NA
Chrysene	µg/kg	NA	NA	NA	NA	NA	NA
bis(2−Ethylhexyl)phthalate	µg/kg	NA	NA	NA	NA	NA	NA
di−N−Octyl phthalate	µg/kg	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	µg/kg	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	µg/kg	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	µg/kg	NA	NA	NA	NA	NA	NA
Indeno(1,2,3−cd)pyrene	µg/kg	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	µg/kg	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	µg/kg	NA	NA	NA	NA	NA	NA
TIC Total	µg/kg	NA	NA	NA	NA	NA	NA

J − estimated value
N − spiked sample recovery outside of control limits
NA − not analyzed
U − compound/element was included in analysis, but was not detected
* − duplicate sample analysis outside of control limits

Table E-14. Data Presentation: Site 4 - POL Spill Area - Soil and Sedimet Results (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB4-2-2	SB4-3-1	SB4-3-2	SB4-3-4
Laboratory Sample Number		13178, 13186	13191, 13200	13192, 13201	13193, 13202
Associated Field QC Samples		FB4-1 TB10-31-91	FB4-1 TB11-1-91	FB4-1 TB11-1-91	FB4-1 TB11-1-91
Parameter	Units	EB3-1, 4-1	EB4-1	EB4-1	EB4-1
TPH as Gasoline	mg/kg	1 U	1 U	1 U	1 U
TPH As Diesel	mg/kg	1 U	1 U	1 U	16
TPH As Motor Oil	mg/kg	10 U	10 U	10 U	27
INORGANICS					
Antimony	mg/kg	NA	NA	NA	NA
Arsenic	mg/kg	6.3 J(N)	NA	NA	NA
Beryllium	mg/kg	NA	NA	NA	NA
Cadmium	mg/kg	NA	NA	NA	NA
Chromium	mg/kg	NA	NA	NA	NA
Copper	mg/kg	NA	NA	NA	NA
Lead	mg/kg	0.2	19.3 J(*)	11.7 J(*)	10.1 J(*)
Mercury	mg/kg	NA	NA	NA	NA
Nickel	mg/kg	NA	NA	NA	NA
Selenium	mg/kg	0.23 UJ(N)	NA	NA	NA
Silver	mg/kg	NA	NA	NA	NA
Thallium	mg/kg	0.34 UJ(N)	NA	NA	NA
Zinc	mg/kg	NA	NA	NA	NA
VOLATILE ORGANICS (SOW 3/90)					
Chloromethane	μg/kg	NA	NA	NA	NA
Bromomethane	μg/kg	NA	NA	NA	NA
Vinyl Chloride	μg/kg	NA	NA	NA	NA
Chloroethane	μg/kg	NA	NA	NA	NA
Methylene Chloride	μg/kg	NA	NA	NA	NA
Acetone	μg/kg	NA	NA	NA	NA
Carbon Disulfide	μg/kg	NA	NA	NA	NA
1,1-Dichloroethene	μg/kg	NA	NA	NA	NA
1,1-Dichloroethane	μg/kg	NA	NA	NA	NA
1,2-Dichloroethene (Total)	μg/kg	NA	NA	NA	NA
Chloroform	μg/kg	NA	NA	NA	NA
1,2-Dichloroethane	μg/kg	NA	NA	NA	NA
2-Butanone	μg/kg	NA	NA	NA	NA
1,1,1-Trichloroethane	μg/kg	NA	NA	NA	NA
Carbon Tetrachloride	μg/kg	NA	NA	NA	NA
Bromodichloromethane	μg/kg	NA	NA	NA	NA
1,2-Dichloropropane	μg/kg	NA	NA	NA	NA
cis-1,3-Dichloropropene	μg/kg	NA	NA	NA	NA
Trichloroethene	μg/kg	NA	NA	NA	NA
Dibromochloromethane	μg/kg	NA	NA	NA	NA
1,1,2-Trichloroethane	μg/kg	NA	NA	NA	NA
Benzene	μg/kg	0.57 U	0.67 U	0.63 U	0.59 U
trans-1,3-Dichloropropene	μg/kg	NA	NA	NA	NA
Bromoform	μg/kg	NA	NA	NA	NA
4-Methyl-2-pentanone	μg/kg	NA	NA	NA	NA
2-Hexanone	μg/kg	NA	NA	NA	NA
Tetrachloroethene	μg/kg	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	μg/kg	NA	NA	NA	NA
Toluene	μg/kg	3.5	0.67 U	0.98	0.59 U
Chlorobenzene	μg/kg	0.57 U	0.67 U	0.63 U	0.59 U
Ethylbenzene	μg/kg	0.57 U	0.67 U	0.63 U	0.59 U
Styrene	μg/kg	1.1 U	1.3 U	1.3 U	1.2 U
Xylene(Total)	μg/kg	NA	NA	NA	NA
M-P-Xylene	μg/kg	1.1 U	1.3 U	1.3 U	1.2 U
TIC Total	μg/kg	NA	NA	NA	NA

Table E-14. Data Presentation: Site 4 – POL Spill Area – Soil and Sedimet Results (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB4-2-2	SB4-3-1	SB4-3-2	SB4-3-4
Laboratory Sample Number		13178, 13186	13191, 13200	13192, 13201	13193, 13202
Associated Field QC Samples		FB4-1 TB10-31-91 EB3-1, 4-1	FB4-1 TB11-1-91 EB4-1	FB4-1 TB11-1-91 EB4-1	FB4-1 TB11-1-91 EB4-1
Parameter	Units				
SEMIVOLATILE ORGANICS (SOW 3/90)					
Phenol	µg/kg	NA	NA	NA	NA
bis(2-Chloroethyl)ether	µg/kg	NA	NA	NA	NA
2-Chlorophenol	µg/kg	NA	NA	NA	NA
1,3-Dichlorobenzene	µg/kg	0.57 U	0.67 U	0.63 U	0.59 U
1,4-Dichlorobenzene	µg/kg	0.57 U	0.67 U	0.63 U	0.59 U
1,2-Dichlorobenzene	µg/kg	0.57 U	0.67 U	0.63 U	0.59 U
2-Methylphenol	µg/kg	NA	NA	NA	NA
2,2'-oxybis(1-Chloropropane)	µg/kg	NA	NA	NA	NA
4-Methylphenol	µg/kg	NA	NA	NA	NA
N-Nitroso-di-N-propylamine	µg/kg	NA	NA	NA	NA
Hexachloroethane	µg/kg	NA	NA	NA	NA
Nitrobenzene	µg/kg	NA	NA	NA	NA
Isophorone	µg/kg	NA	NA	NA	NA
2-Nitrophenol	µg/kg	NA	NA	NA	NA
2,4-Dimethylphenol	µg/kg	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	µg/kg	NA	NA	NA	NA
2,4-Dichlorophenol	µg/kg	NA	NA	NA	NA
1,2,4-Trichlorobenzene	µg/kg	NA	NA	NA	NA
Naphthalene	µg/kg	NA	NA	NA	NA
4-Chloroaniline	µg/kg	NA	NA	NA	NA
Hexachlorobutadiene	µg/kg	NA	NA	NA	NA
4-Chloro-3-methylphenol	µg/kg	NA	NA	NA	NA
Hexachlorocyclopentadiene	µg/kg	NA	NA	NA	NA
2,4,6-Trichlorophenol	µg/kg	NA	NA	NA	NA
2-Methylnaphthalene	µg/kg	NA	NA	NA	NA
2,4,5-Trichloorophenol	µg/kg	NA	NA	NA	NA
2-Chloronaphthalene	µg/kg	NA	NA	NA	NA
2-Nitroaniline	µg/kg	NA	NA	NA	NA
Dimethyl phthalate	µg/kg	NA	NA	NA	NA
Acenaphthylene	µg/kg	NA	NA	NA	NA
2,6-Dinitrotoluene	µg/kg	NA	NA	NA	NA
3-Nitroaniline	µg/kg	NA	NA	NA	NA
Acenaphthene	µg/kg	NA	NA	NA	NA
2,4-Dinitrophenol	µg/kg	NA	NA	NA	NA
4-Nitrophenol	µg/kg	NA	NA	NA	NA
Dibenzofuran	µg/kg	NA	NA	NA	NA
2,4-Dinitrotoluene	µg/kg	NA	NA	NA	NA
Diethyl phthalate	µg/kg	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	µg/kg	NA	NA	NA	NA
Fluorene	µg/kg	NA	NA	NA	NA
4-Nitroaniline	µg/kg	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	µg/kg	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	µg/kg	NA	NA	NA	NA
4-Bromophenyl phenyl ether	µg/kg	NA	NA	NA	NA
Hexachlorobenzene	µg/kg	NA	NA	NA	NA
Pentachlorophenol	µg/kg	NA	NA	NA	NA
Phenanthrene	µg/kg	NA	NA	NA	NA
Anthracene	µg/kg	NA	NA	NA	NA
Carbazole	µg/kg	NA	NA	NA	NA
di-N-Butyl phthalate	µg/kg	NA	NA	NA	NA
Fluoranthene	µg/kg	NA	NA	NA	NA

Table E-14. Data Presentation: Site 4 – POL Spill Area – Soil and Sedimet Results (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB4-2-2	SB4-3-1	SB4-3-2	SB4-3-4
Laboratory Sample Number		13178, 13186	13191, 13200	13192, 13201	13193, 13202
Associated Field QC Samples		FB4-1 TB10-31-91	FB4-1 TB11-1-91	FB4-1 TB11-1-91	FB4-1 TB11-1-91
Parameter	Units	EB3-1, 4-1	EB4-1	EB4-1	EB4-1
SEMIVOLATILE ORGANICS (SOW 3/90) (Continued)					
Pyrene	µg/kg	NA	NA	NA	NA
Butylbenzylphthalate	µg/kg	NA	NA	NA	NA
3,3'-Dichlorobenzidine	µg/kg	NA	NA	NA	NA
Benzo(a)anthracene	µg/kg	NA	NA	NA	NA
Chrysene	µg/kg	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	µg/kg	NA	NA	NA	NA
di-N-Octyl phthalate	µg/kg	NA	NA	NA	NA
Benzo(b)fluoranthene	µg/kg	NA	NA	NA	NA
Benzo(k)fluoranthene	µg/kg	NA	NA	NA	NA
Benzo(a)pyrene	µg/kg	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	µg/kg	NA	NA	NA	NA
Dibenzo(a,h)anthracene	µg/kg	NA	NA	NA	NA
Benzo(g,h,i)perylene	µg/kg	NA	NA	NA	NA
TIC Total	µg/kg	NA	NA	NA	NA

J – estimated value
N – spiked sample recovery outside of control limits
NA – not analyzed
U – compound/element was included in analysis, but was not detected
* – duplicate sample analysis outside of control limits

Table E-15. Data Presentation: Site 4 - POL Spill Area - Groundwater Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		MW4-01	MW4-02	MW4-02R	P-1
Laboratory Sample Number		14357	14358	14359	14397
Associated Field QC Samples		FB2-1 TB11-6-91 EB2-1	FB2-1 TB11-6-91 EB2-1	FB2-1 TB11-6-91 EB2-1	FB2-1 TB11-7-91 EB2-1
Parameter	Units				
TPH as Gasoline	mg/L	0.05 U	0.05 U	0.05 U	NA
TPH As Diesel	mg/L	0.05 U	0.05 U	0.05 U	0.52
TPH As Motor Oil	mg/L	0.5 U	0.5 U	0.5 U	0.5 U
INORGANICS					
Antimony	µg/L	NA	NA	NA	NA
Arsenic	µg/L	NA	NA	NA	NA
Beryllium	µg/L	NA	NA	NA	NA
Cadmium	µg/L	NA	NA	NA	NA
Chromium	µg/L	NA	NA	NA	NA
Copper	µg/L	NA	NA	NA	NA
Lead	µg/L	229	10.2	11.6	10.6
Mercury	µg/L	NA	NA	NA	NA
Nickel	µg/L	NA	NA	NA	NA
Selenium	µg/L	NA	NA	NA	NA
Silver	µg/L	NA	NA	NA	NA
Thallium	µg/L	NA	NA	NA	NA
Zinc	µg/L	NA	NA	NA	NA
VOLATILE ORGANICS (SOW 3/90)					
Chloromethane	µg/L	NA	NA	NA	NA
Bromomethane	µg/L	NA	NA	NA	NA
Vinyl Chloride	µg/L	NA	NA	NA	NA
Chloroethane	µg/L	NA	NA	NA	NA
Methylene Chloride	µg/L	NA	NA	NA	NA
Acetone	µg/L	NA	NA	NA	NA
Carbon Disulfide	µg/L	NA	NA	NA	NA
1,1-Dichloroethene	µg/L	NA	NA	NA	NA
1,1-Dichloroethane	µg/L	NA	NA	NA	NA
1,2-Dichloroethene (Total)	µg/L	NA	NA	NA	NA
Chloroform	µg/L	NA	NA	NA	NA
1,2-Dichloroethane	µg/L	NA	NA	NA	NA
2-Butanone	µg/L	NA	NA	NA	NA
1,1,1-Trichloroethane	µg/L	NA	NA	NA	NA
Carbon Tetrachloride	µg/L	NA	NA	NA	NA
Bromodichloromethane	µg/L	NA	NA	NA	NA
1,2-Dichloropropane	µg/L	NA	NA	NA	NA
cis-1,3-Dichloropropene	µg/L	NA	NA	NA	NA
Trichloroethene	µg/L	NA	NA	NA	NA
Dibromochloromethane	µg/L	NA	NA	NA	NA
1,1,2-Trichloroethane	µg/L	NA	NA	NA	NA
Benzene	µg/L	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L	NA	NA	NA	NA
Bromoform	µg/L	NA	NA	NA	NA
4-Methyl-2-pentanone	µg/L	NA	NA	NA	NA
2-Hexanone	µg/L	NA	NA	NA	NA
Tetrachloroethene	µg/L	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	µg/L	NA	NA	NA	NA
Toluene	µg/L	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	1 U	1 U	1 U	1 U
Xylene(Total)	µg/L	NA	NA	NA	NA
M-P-Xylene	µg/L	1 U	1 U	1 U	1 U
TIC Total	µg/L	NA	NA	NA	NA

Table E-15. Data Presentation: Site 4 - POL Spill Area - Groundwater Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW4-01	MW4-02	MW4-02R	P-1
Laboratory Sample Number		14357	14358	14359	14397
Associated Field QC Samples		FB2-1	FB2-1	FB2-1	FB2-1
		TB11-6-91	TB11-6-91	TB11-6-91	TB11-7-91
Parameter	Units	EB2-1	EB2-1	EB2-1	EB2-1
SEMIVOLATILE ORGANICS (SOW 3/90)					
Phenol	µg/L	NA	NA	NA	NA
bis(2-Chloroethyl)ether	µg/L	NA	NA	NA	NA
2-Chlorophenol	µg/L	NA	NA	NA	NA
1,3-Dichlorobenzene	µg/L	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	0.5 U	0.5 U	0.5 U	0.5 U
2-Methylphenol	µg/L	NA	NA	NA	NA
2,2'-oxybis(1-Chloropropane)	µg/L	NA	NA	NA	NA
4-Methylphenol	µg/L	NA	NA	NA	NA
N-Nitroso-di-N-propylamine	µg/L	NA	NA	NA	NA
Hexachloroethane	µg/L	NA	NA	NA	NA
Nitrobenzene	µg/L	NA	NA	NA	NA
Isophorone	µg/L	NA	NA	NA	NA
2-Nitrophenol	µg/L	NA	NA	NA	NA
2,4-Dimethylphenol	µg/L	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	µg/L	NA	NA	NA	NA
2,4-Dichlorophenol	µg/L	NA	NA	NA	NA
1,2,4-Trichlorobenzene	µg/L	NA	NA	NA	NA
Naphthalene	µg/L	NA	NA	NA	NA
4-Chloroaniline	µg/L	NA	NA	NA	NA
Hexachlorobutadiene	µg/L	NA	NA	NA	NA
4-Chloro-3-methylphenol	µg/L	NA	NA	NA	NA
Hexachlorocyclopentadiene	µg/L	NA	NA	NA	NA
2,4,6-Trichlorophenol	µg/L	NA	NA	NA	NA
2-Methylnaphthalene	µg/L	NA	NA	NA	NA
2,4,5-Trichloorophenol	µg/L	NA	NA	NA	NA
2-Chloronaphthalene	µg/L	NA	NA	NA	NA
2-Nitroaniline	µg/L	NA	NA	NA	NA
Dimethyl phthalate	µg/L	NA	NA	NA	NA
Acenaphthylene	µg/L	NA	NA	NA	NA
2,6-Dinitrotoluene	µg/L	NA	NA	NA	NA
3-Nitroaniline	µg/L	NA	NA	NA	NA
Acenaphthene	µg/L	NA	NA	NA	NA
2,4-Dinitrophenol	µg/L	NA	NA	NA	NA
4-Nitrophenol	µg/L	NA	NA	NA	NA
Dibenzofuran	µg/L	NA	NA	NA	NA
2,4-Dinitrotoluene	µg/L	NA	NA	NA	NA
Diethyl phthalate	µg/L	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	µg/L	NA	NA	NA	NA
Fluorene	µg/L	NA	NA	NA	NA
4-Nitroaniline	µg/L	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	µg/L	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	µg/L	NA	NA	NA	NA
4-Bromophenyl phenyl ether	µg/L	NA	NA	NA	NA
Hexachlorobenzene	µg/L	NA	NA	NA	NA
Pentachlorophenol	µg/L	NA	NA	NA	NA
Phenanthrene	µg/L	NA	NA	NA	NA
Anthracene	µg/L	NA	NA	NA	NA
Carbazole	µg/L	NA	NA	NA	NA
di-N-Butyl phthalate	µg/L	NA	NA	NA	NA
Fluoranthene	µg/L	NA	NA	NA	NA

Table E-15. Data Presentation: Site 4 - POL Spill Area - Groundwater Samples (1991)
122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW4-01	MW4-02	MW4-02R	P-1
Laboratory Sample Number		14357	14358	14359	14397
Associated Field QC Samples		FB2-1 TB11-6-91 EB2-1	FB2-1 TB11-6-91 EB2-1	FB2-1 TB11-6-91 EB2-1	FB2-1 TB11-7-91 EB2-1
Parameter	Units				
SEMIVOLATILE ORGANICS (SOW 3/90) (Continued)					
Pyrene	μg/L	NA	NA	NA	NA
Butylbenzylphthalate	μg/L	NA	NA	NA	NA
3,3'-Dichlorobenzidine	μg/L	NA	NA	NA	NA
Benzo(a)anthracene	μg/L	NA	NA	NA	NA
Chrysene	μg/L	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	μg/L	NA	NA	NA	NA
di-N-Octyl phthalate	μg/L	NA	NA	NA	NA
Benzo(b)fluoranthene	μg/L	NA	NA	NA	NA
Benzo(k)fluoranthene	μg/L	NA	NA	NA	NA
Benzo(a)pyrene	μg/L	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	μg/L	NA	NA	NA	NA
Dibenzo(a,h)anthracene	μg/L	NA	NA	NA	NA
Benzo(g,h,i)perylene	μg/L	NA	NA	NA	NA
TIC Total	μg/L	NA	NA	NA	NA

NA - not analyzed

U - compound/element was included in analysis, but was not detected

Table E-16. Data Presentation: Equipment Blanks (1990) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		EW-01	EW-02	EW-03	EW-04	EW-05	EW-06	EW-07	EW-08	EW-09
Laboratory Sample Number		90021710	90021711	90021808	90022314	90022401	90023605	90024901	90025103	90025104
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA	NA	NA
Parameter	Units									
Total Petroleum Hydrocarbons	mg/L	1 UJ(HT)	NA	1 UJ(HT)	NA	1 U	NA	1 U	1 U	1 U
Oil And Grease	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH as Gasoline	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH As Diesel	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH As Motor Oil	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS										
Antimony	µg/L	1.00 U	NA	1.00 U	NA	1.00 U	NA	1.00 U	NA	1.00 U
Arsenic	µg/L	2.00 UW	NA	2.00 U	NA	2.00 UW	NA	4.30 J(B)	NA	2.00 U
Beryllium	µg/L	2.00 U	NA	2.00 U	NA	2.00 U	NA	2.00 U	NA	2.00 U
Cadmium	µg/L	2.00 U	NA	2.00 U	NA	2.00 U	NA	2.00 U	NA	2.00 U
Chromium	µg/L	13.00 U	NA	13.00 U	NA	13.00 U	NA	13.00 U	NA	13.00 U
Copper	µg/L	10.00 U	NA	10.00 U	NA	10.00 U	NA	10.00 U	NA	10.00 U
Lead	µg/L	1.30 J(MB,B)	NA	1.30 J(MB,B)	NA	8.20 J(MB)	NA	2.10 J(MB,B)	NA	2.30 J(MB,B)
Mercury	µg/L	0.20 U	NA	0.20 U	NA	0.20 U	NA	0.20 U	NA	0.20 U
Nickel	µg/L	12.00 U	NA	12.00 U	NA	12.00 U	NA	12.00 U	NA	12.00 U
Selenium	µg/L	3.00 U	NA	3.00 U	NA	3.00 U	NA	3.00 UW	NA	3.00 U
Silver	µg/L	11.00 U	NA	11.00 U	NA	11.00 U	NA	11.00 U	NA	11.00 U
Thallium	µg/L	2.00 U	NA	2.00 U	NA	2.00 U	NA	2.00 U	NA	2.00 U
Zinc	µg/L	9.00 J(MB,B)	NA	14.00 J(MB,B)	NA	7.00 U	NA	7.00 U	NA	9.00 J(MB,B)
VOLATILE ORGANIC COMPOUNDS										
Chloromethane	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Bromomethane	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Vinyl Chloride	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Chloroethane	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Methylene Chloride	µg/L	NA	NA	NA	3 J	NA	5 U	10	4 J	6
Acetone	µg/L	NA	NA	NA	10 U	NA	10 U	21	40	14
Carbon Disulfide	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
1,1-Dichloroethene	µg/L	NA	NA	NA	3 U	NA	3 U	3 U	3 U	3 U
1,1-Dichloroethane	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Chloroform	µg/L	NA	NA	NA	21	NA	14	25	36	26
1,2-Dichloroethane	µg/L	NA	NA	NA	3 U	NA	3 U	3 U	3 U	3 U
2-Butanone	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Carbon Tetrachloride	µg/L	NA	NA	NA	3 U	NA	3 U	3 U	3 U	3 U
Vinyl Acetate	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Bromodichloromethane	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
1,2-Dichloropropane	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Trichloroethene	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Benzene	µg/L	NA	NA	NA	3 U	NA	3 U	3 U	3 U	3 U
trans-1,3-Dichloropropene	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Bromoform	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Tetrachloroethene	µg/L	NA	NA	NA	3 U	NA	3 U	3 U	3 U	3 U
1,1,2,2-Tetrachloroethane	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Toluene	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Chlorobenzene	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Ethylbenzene	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Styrene	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
Total Xylenes	µg/L	NA	NA	NA	5 U	NA	5 U	5 U	5 U	5 U
2-Chloroethyl Vinyl Ether	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Iodomethane	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Acrolein	µg/L	NA	NA	NA	40 U	NA	40 U	40 U	40 U	40 U
Acrylonitrile	µg/L	NA	NA	NA	40 U	NA	40 U	40 U	40 U	40 U
Dibromomethane	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
1,2,3-Trichloropropane	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
1,4-Dichlorobutane	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Ethyl Methacrylate	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Trichlorofluoromethane	µg/L	NA	NA	NA	10 U	NA	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	µg/L	NA	NA	NA	30 U	NA	30 U	30 U	30 U	30 U
TIC Totals	µg/L	NA	NA	NA	0 (0)	NA	0 (0)	NA	NA	NA

Table E-16. Data Presentation: Equipment Blanks (1990) - 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		EW-01	EW-02	EW-03	EW-04	EW-05	EW-06	EW-07	EW-08	EW-09
Laboratory Sample Number		90021710	90021711	90021808	90022314	90022401	90023605	90024901	90025103	90025104
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA	NA	NA
Parameter	Units									
SEMIVOLATILE ORGANIC COMPOUNDS										
Phenol	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
bis(2-Chloroethyl)ether	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2-Chlorophenol	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
1,3-Dichlorobenzene	µg/L	5 U	NA	5 U	NA	5 R(EHT)	NA	5 U	NA	5 U
1,4-Dichlorobenzene	µg/L	5 U	NA	5 U	NA	5 R(EHT)	NA	5 U	NA	5 U
Benzyl Alcohol	µg/L	20 U	NA	20 U	NA	20 R(EHT)	NA	20 U	NA	20 U
1,2-Dichlorobenzene	µg/L	5 U	NA	5 U	NA	5 R(EHT)	NA	5 U	NA	5 U
2-Methylphenol	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
bis(2-Chloroisopropyl)ether	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
4-Methylphenol	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
N-Nitroso-di-N-propylamine	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Hexachloroethane	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Nitrobenzene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Isophorone	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2-Nitrophenol	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2,4-Dimethylphenol	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Benzoic Acid	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
bis(2-Chloroethoxy)methane	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2,4-Dichlorophenol	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
1,2,4-Trichlorobenzene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Naphthalene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
4-Chloroaniline	µg/L	20 U	NA	20 U	NA	20 R(EHT)	NA	20 U	NA	20 U
Hexachlorobutadiene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
4-Chloro-3-methylphenol	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2-Methylnaphthalene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Hexachlorocyclopentadiene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2,4,6-Trichlorophenol	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2,4,5-Trichlorophenol	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
2-Chloronaphthalene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2-Nitroaniline	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Dimethylphthalate	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Acenaphthylene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2,6-Dinitrotoluene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
3-Nitroaniline	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Acenaphthene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2,4-Dinitrophenol	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
4-Nitrophenol	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Dibenzofuran	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
2,4-Dinitrotoluene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Diethylphthalate	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
4-Chlorophenyl-phenyl Ether	µg/L	20 U	NA	20 U	NA	20 R(EHT)	NA	20 U	NA	20 U
Fluorene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
4-Nitroaniline	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
4,6-Dinitro-2-methylphenol	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
N-Nitrosodiphenylamine	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
4-Bromophenyl-phenyl Ether	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Hexachlorobenzene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Pentachlorophenol	µg/L	30 U	NA	30 U	NA	30 R(EHT)	NA	30 U	NA	30 U
Phenanthrene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Anthracene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
di-N-Butylphthalate	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Fluoranthene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Pyrene	µg/L	1[illegible] U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Butylbenzylphthalate	µg/L	[illegible]0 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
3,3'-Dichlorobenzidine	µg/L	20 U	NA	20 U	NA	20 R(EHT)	NA	20 U	NA	20 U
Benzo(a)anthracene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Chrysene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
bis(2-Ethylhexyl)phthalate	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
di-N-Octyl phthalate	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Benzo(b)fluoranthene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Benzo(k)fluoranthene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Benzo(a)pyrene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Indeno(1,2,3-cd)pyrene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Dibenzo(a,h)anthracene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U
Benzo(g,h,i)perylene	µg/L	10 U	NA	10 U	NA	10 R(EHT)	NA	10 U	NA	10 U

Table E-16. Data Presentation: Equipment Blanks (1990) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		EW-01	EW-02	EW-03	EW-04	EW-05	EW-06	EW-07	EW-08	EW-09
Laboratory Sample Number		90021710	90021711	90021808	90022314	90022401	90023605	90024901	90025103	90025104
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA	NA	NA
Parameter	Units									
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)										
N-Nitrosodimethylamine	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
2-Picoline	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Methyl Methanesulfonate	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Ethyl Methanesulfonate	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Aniline	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Acetophenone	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
N-Nitrosopiperidine	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Dimethylphenethylamine	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
2,6-Dichlorophenol	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
N-Nitroso-di-N-butylamine	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
1,2,4,5-Tetrachlorobenzene	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
1-Chloronaphthalene	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Pentachlorobenzene	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
1-Naphthylamine	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
2-Naphthylamine	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
1,2-Diphenylhydrazine	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Phenacetin	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
4-Aminobiphenyl	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Pronamide	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
Benzidine	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
p-Dimethylaminoazobenzene	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
7,12-Dimethylbenzo(a)anthracene	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
3-Methylcholanthrene	µg/L	50 U	NA	50 U	NA	50 R(EHT)	NA	50 U	NA	50 U
TIC Total	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
ORGANOCHLORINE PESTICIDES/PCBs										
alpha-BHC	µg/L	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA
beta-BHC	µg/L	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA
gamma-BHC(Lindane)	µg/L	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA
delta-BHC	µg/L	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA
Heptachlor	µg/L	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA
Aldrin	µg/L	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA
Heptachlor Epoxide	µg/L	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA
Endosulfan-I	µg/L	NA	NA	NA	0.05 U	NA	NA	NA	NA	NA
Dieldrin	µg/L	NA	NA	NA	0.10 U	NA	NA	NA	NA	NA
4,4'-DDE	µg/L	NA	NA	NA	0.10 U	NA	NA	NA	NA	NA
Endrin	µg/L	NA	NA	NA	0.10 U	NA	NA	NA	NA	NA
Endosulfan-II	µg/L	NA	NA	NA	0.10 U	NA	NA	NA	NA	NA
4,4'-DDD	µg/L	NA	NA	NA	0.10 U	NA	NA	NA	NA	NA
Endrin Aldehyde	µg/L	NA	NA	NA	0.10 U	NA	NA	NA	NA	NA
Endosulfan Sulfate	µg/L	NA	NA	NA	0.10 U	NA	NA	NA	NA	NA
4,4'-DDT	µg/L	NA	NA	NA	0.10 U	NA	NA	NA	NA	NA
Methoxychlor	µg/L	NA	NA	NA	0.25 U	NA	NA	NA	NA	NA
Chlordane	µg/L	NA	NA	NA	0.45 U	NA	NA	NA	NA	NA
Toxaphene	µg/L	NA	NA	NA	4.00 U	NA	NA	NA	NA	NA
Aroclor-1016	µg/L	NA	NA	NA	2.00 U	NA	NA	NA	NA	NA
Aroclor-1221	µg/L	NA	NA	NA	2.50 U	NA	NA	NA	NA	NA
Aroclor-1232	µg/L	NA	NA	NA	2.50 U	NA	NA	NA	NA	NA
Aroclor-1242	µg/L	NA	NA	NA	2.50 U	NA	NA	NA	NA	NA
Aroclor-1248	µg/L	NA	NA	NA	2.00 U	NA	NA	NA	NA	NA
Aroclor-1254	µg/L	NA	NA	NA	1.30 U	NA	NA	NA	NA	NA
Aroclor-1260	µg/L	NA	NA	NA	1.00 U	NA	NA	NA	NA	NA

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
BHT – extraction holding time outside control limits
HT – sample analysis holding time greater than control limit
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
NA – not analyzed
R – rejected value
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance

Table E-17. Data Presentation: Equipment Blanks (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		EB1A-1	EB1-1	EB2-1	EB3-1	EB4-1
Laboratory Sample Number		14266	14265	14361	13179	13194
Associated Field QC Samples						
Parameter	Units					
Total Petroleum Hydrocarbons	mg/L	1 U	1 U	1 U	1 U	NA
Oil And Grease	mg/L	NA	NA	1 U	1 U	NA
TPH as Gasoline	mg/L	NA	NA	NA	NA	NA
TPH As Diesel	mg/L	NA	NA	NA	NA	0.05 U
TPH As Motor Oil	mg/L	NA	NA	NA	NA	0.5 U
METALS						
Antimony	µg/L	14 U	14 U	14 UJ(N)	NA	NA
Arsenic	µg/L	1 U	1 U	1 U	NA	NA
Beryllium	µg/L	1 U	1 U	1 U	NA	NA
Cadmium	µg/L	1 U	1.8 J(B)	1 U	NA	NA
Chromium	µg/L	3 U	3 U	3 U	NA	NA
Copper	µg/L	3.7 J(MB,B)	4.3 J(MB,B)	2 U	NA	NA
Lead	µg/L	1 U	1 U	1 U	NA	1 U
Mercury	µg/L	0.2 U	0.2 U	0.2 UJ(HT)	NA	NA
Nickel	µg/L	6 U	6 U	6 U	NA	NA
Selenium	µg/L	1 UJ(N)	1 UJ(N)	1 UJ(N)	NA	NA
Silver	µg/L	2 U	2 U	2 UJ(N)	NA	NA
Thallium	µg/L	1 U	1 U	1 U	NA	NA
Zinc	µg/L	8.4 J(MB,B)	8.2 J(MB,B)	5 U	NA	NA
VOLATILE ORGANIC COMPOUNDS						
Chloromethane	µg/L	10 U	10 U	10 U	10 U	10 U
Bromomethane	µg/L	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	µg/L	10 U	10 U	10 U	10 U	10 U
Chloroethane	µg/L	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	µg/L	3 J	5 U	5 U(MB)	5 U	5 U
Acetone	µg/L	11	10 U	10 U	10 U	10 U
Carbon Disulfide	µg/L	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	µg/L	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	µg/L	5 U	5 U	5 U	5 U	5 U
Chloroform	µg/L	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U
2-Butanone	µg/L	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	µg/L	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	µg/L	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	µg/L	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	5 U	5 U	5 U	5 U
Trichloroethene	µg/L	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U
Benzene	µg/L	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	µg/L	5 U	5 U	5 U	5 U	5 U
Bromoform	µg/L	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	µg/L	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	µg/L	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	µg/L	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	µg/L	5 U	5 U	5 U	5 U	5 U
Styrene	µg/L	5 U	5 U	5 U	5 U	5 U
Total Xylenes	µg/L	5 U	5 U	5 U	5 U	5 U
TIC Totals	µg/L	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Table E-17. Data Presentation: Equipment Blanks (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		EB1A-1	EB1-1	EB2-1	EB3-1	EB4-1
Laboratory Sample Number		14266	14265	14361	13179	13194
Associated Field QC Samples						
Parameter	Units					
SEMIVOLATILE ORGANIC COMPOUNDS						
Phenol	µg/L	10 U	10 U	10 U	10 U	NA
bis(2-Chloroethyl)ether	µg/L	10 U	10 U	10 U	10 U	NA
2-Chlorophenol	µg/L	10 U	10 U	10 U	10 U	NA
1,3-Dichlorobenzene	µg/L	10 U	10 U	10 U	10 U	NA
1,4-Dichlorobenzene	µg/L	10 U	10 U	10 U	10 U	NA
1,2-Dichlorobenzene	µg/L	10 U	10 U	10 U	10 U	NA
2-Methylphenol	µg/L	10 U	10 U	10 U	10 U	NA
bis(2-Chloroisopropyl)ether	µg/L	10 U	10 U	10 U	10 U	NA
4-Methylphenol	µg/L	10 U	10 U	10 U	10 U	NA
N-Nitroso-di-N-propylamine	µg/L	10 U	10 U	10 U	10 U	NA
Hexachloroethane	µg/L	10 U	10 U	10 U	10 U	NA
Nitrobenzene	µg/L	10 U	10 U	10 U	10 U	NA
Isophorone	µg/L	10 U	10 U	10 U	10 U	NA
2-Nitrophenol	µg/L	10 U	10 U	10 U	10 U	NA
2,4-Dimethylphenol	µg/L	10 U	10 U	10 U	10 U	NA
bis(2-Chloroethoxy)methane	µg/L	10 U	10 U	10 U	10 U	NA
2,4-Dichlorophenol	µg/L	10 U	10 U	10 U	10 U	NA
1,2,4-Trichlorobenzene	µg/L	10 U	10 U	10 U	10 U	NA
Naphthalene	µg/L	10 U	10 U	10 U	10 U	NA
4-Chloroaniline	µg/L	10 U	10 U	10 U	10 U	NA
Hexachlorobutadiene	µg/L	10 U	10 U	10 U	10 U	NA
4-Chloro-3-methylphenol	µg/L	10 U	10 U	10 U	10 U	NA
2-Methylnaphthalene	µg/L	10 U	10 U	10 U	10 U	NA
Hexachlorocyclopentadiene	µg/L	10 U	10 U	10 U	10 U	NA
2,4,6-Trichlorophenol	µg/L	10 U	10 U	10 U	10 U	NA
2,4,5-Trichlorophenol	µg/L	50 U	50 U	50 U	50 U	NA
2-Chloronaphthalene	µg/L	10 U	10 U	10 U	10 U	NA
2-Nitroaniline	µg/L	50 U	50 U	50 U	50 U	NA
Dimethylphthalate	µg/L	10 U	10 U	10 U	10 U	NA
Acenaphthylene	µg/L	10 U	10 U	10 U	10 U	NA
2,6-Dinitrotoluene	µg/L	10 U	10 U	10 U	10 U	NA
3-Nitroaniline	µg/L	50 U	50 U	50 U	50 U	NA
Acenaphthene	µg/L	10 U	10 U	10 U	10 U	NA
2,4-Dinitrophenol	µg/L	50 U	50 U	50 U	50 U	NA
4-Nitrophenol	µg/L	50 U	50 U	50 U	50 U	NA
Dibenzofuran	µg/L	10 U	10 U	10 U	10 U	NA
2,4-Dinitrotoluene	µg/L	10 U	10 U	10 U	10 U	NA
Diethylphthalate	µg/L	10 U	10 U	10 U	10 U	NA
Fluorene	µg/L	10 U	10 U	10 U	10 U	NA
4-Nitroaniline	µg/L	50 U	50 U	50 U	50 U	NA
4,6-Dinitro-2-methylphenol	µg/L	50 U	50 U	50 U	50 U	NA
N-Nitrosodiphenylamine	µg/L	10 U	10 U	10 U	10 U	NA
Hexachlorobenzene	µg/L	10 U	10 U	10 U	10 U	NA
Pentachlorophenol	µg/L	50 U	50 U	50 U	50 U	NA
Phenanthrene	µg/L	10 U	10 U	10 U	10 U	NA
Anthracene	µg/L	10 U	10 U	10 U	10 U	NA
Carbazole	µg/L	10 U	10 U	10 U	10 U	NA
di-N-Butylphthalate	µg/L	10 U	10 U	10 U	10 U	NA
Fluoranthene	µg/L	10 U	10 U	10 U	10 U	NA
Pyrene	µg/L	10 U	10 U	10 U	10 U	NA
Butylbenzylphthalate	µg/L	10 U	10 U	10 U	10 U	NA
3,3'-Dichlorobenzidine	µg/L	10 U	10 U	10 U	10 U	NA
Benzo(a)anthracene	µg/L	10 U	10 U	10 U	10 U	NA
Chrysene	µg/L	10 U	10 U	10 U	10 U	NA
bis(2-Ethylhexyl)phthalate	µg/L	10 U	10 U	10 U	10 U	NA
di-N-Octyl phthalate	µg/L	10 U	10 U	10 U	10 U	NA
Benzo(b)fluoranthene	µg/L	10 U	10 U	10 U	10 U	NA
Benzo(k)fluoranthene	µg/L	10 U	10 U	10 U	10 U	NA
Benzo(a)pyrene	µg/L	10 U	10 U	10 U	10 U	NA
Indeno(1,2,3-cd)pyrene	µg/L	10 U	10 U	10 U	10 U	NA
Dibenzo(a,h)anthracene	µg/L	10 U	10 U	10 U	10 U	NA
Benzo(g,h,i)perylene	µg/L	10 U	10 U	10 U	10 U	NA

Table E-17. Data Presentation: Equipment Blanks (1991) - 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		EB1A-1	EB1-1	EB2-1	EB3-1	EB4-1
Laboratory Sample Number		14266	14265	14361	13179	13194
Associated Field QC Samples						
Parameter	Units					
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)						
N-Nitrosodimethylamine	μg/L	NA	NA	NA	NA	NA
2-Picoline	μg/L	NA	NA	NA	NA	NA
Methyl Methanesulfonate	μg/L	NA	NA	NA	NA	NA
Ethyl Methanesulfonate	μg/L	NA	NA	NA	NA	NA
Aniline	μg/L	NA	NA	NA	NA	NA
Acetophenone	μg/L	NA	NA	NA	NA	NA
N-Nitrosopiperidine	μg/L	NA	NA	NA	NA	NA
Dimethylphenethylamine	μg/L	NA	NA	NA	NA	NA
2,6-Dichlorophenol	μg/L	NA	NA	NA	NA	NA
N-Nitroso-di-N-butylamine	μg/L	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	μg/L	NA	NA	NA	NA	NA
1-Chloronaphthalene	μg/L	NA	NA	NA	NA	NA
Pentachlorobenzene	μg/L	NA	NA	NA	NA	NA
1-Naphthylamine	μg/L	NA	NA	NA	NA	NA
2-Naphthylamine	μg/L	NA	NA	NA	NA	NA
1,2-Diphenylhydrazine	μg/L	NA	NA	NA	NA	NA
Phenacetin	μg/L	NA	NA	NA	NA	NA
4-Aminobiphenyl	μg/L	NA	NA	NA	NA	NA
Pronamide	μg/L	NA	NA	NA	NA	NA
Benzidine	μg/L	NA	NA	NA	NA	NA
p-Dimethylaminoazobenzene	μg/L	NA	NA	NA	NA	NA
7,12-Dimethylbenzo(a)anthracene	μg/L	NA	NA	NA	NA	NA
3-Methylcholanthrene	μg/L	NA	NA	NA	NA	NA
TIC Total	μg/L	0 (0)	0 (0)	0 (0)	0 (0)	NA
ORGANOCHLORINE PESTICIDES/PCBs						
alpha-BHC	μg/L	NA	NA	NA	NA	NA
beta-BHC	μg/L	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	μg/L	NA	NA	NA	NA	NA
delta-BHC	μg/L	NA	NA	NA	NA	NA
Heptachlor	μg/L	NA	NA	NA	NA	NA
Aldrin	μg/L	NA	NA	NA	NA	NA
Heptachlor Epoxide	μg/L	NA	NA	NA	NA	NA
Endosulfan-I	μg/L	NA	NA	NA	NA	NA
Dieldrin	μg/L	NA	NA	NA	NA	NA
4,4'-DDE	μg/L	NA	NA	NA	NA	NA
Endrin	μg/L	NA	NA	NA	NA	NA
Endosulfan-II	μg/L	NA	NA	NA	NA	NA
4,4'-DDD	μg/L	NA	NA	NA	NA	NA
Endrin Aldehyde	μg/L	NA	NA	NA	NA	NA
Endosulfan Sulfate	μg/L	NA	NA	NA	NA	NA
4,4'-DDT	μg/L	NA	NA	NA	NA	NA
Methoxychlor	μg/L	NA	NA	NA	NA	NA
Chlordane	μg/L	NA	NA	NA	NA	NA
Toxaphene	μg/L	NA	NA	NA	NA	NA
Aroclor-1016	μg/L	NA	NA	NA	NA	NA
Aroclor-1221	μg/L	NA	NA	NA	NA	NA
Aroclor-1232	μg/L	NA	NA	NA	NA	NA
Aroclor-1242	μg/L	NA	NA	NA	NA	NA
Aroclor-1248	μg/L	NA	NA	NA	NA	NA
Aroclor-1254	μg/L	NA	NA	NA	NA	NA
Aroclor-1260	μg/L	NA	NA	NA	NA	NA

B - the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
HT - sample analysis holding time greater than control limit
J - estimated value
MB - compound/element was also detected in the associated laboratory method blank
N - spiked sample recovery outside of control limits
NA - not analyzed
U - compound/element was included in analysis, but was not detected

Table E-18. Data Presentation: Field Blanks (1990 and 1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		FB-01	FB-02	FB-03	HT-01	FB1-1	FB2-1	FB4-1
Laboratory Sample Number		90021708	90021709	90023606	90025106	13299, 14223	14360	13195, 13204
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA
Parameter	Units							
Total Petroleum Hydrocarbons	mg/L	1 UJ(HT)	1 UJ(HT)	1 U	1 U	1 U	1 U	NA
Oil And Grease	mg/L	NA	NA	NA	NA	NA	NA	1 U
TPH as Gasoline	mg/L	NA	NA	NA	NA	NA	NA	0.05 U
TPH As Diesel	mg/L	NA	NA	NA	NA	NA	NA	0.05 U
TPH As Motor Oil	mg/L	NA	NA	NA	NA	NA	NA	0.5 U
METALS								
Antimony	µg/L	1.00 U	1.00 U	1.00 U	1.00 U	14 U	14 UJ(N)	14 U
Arsenic	µg/L	2.00 U	2.00 U	2.00 UW	2.00 U	1 U	1 U	3 J(MB,B)
Beryllium	µg/L	2.00 U	2.00 U	2.00 U	2.00 U	1 U	1 U	1 U
Cadmium	µg/L	2.00 U	2.00 U	2.00 U	2.00 U	1 J(B)	1 U	1.8 J(B)
Chromium	µg/L	13.00 U	13.00 U	13.00 U	13.00 U	3 U	3 U	3 U
Copper	µg/L	14.00 J(B)	10.00 U	10.00 U	12.00 J(B)	2 J(MB,B)	2 U	16.5 J(B)
Lead	µg/L	3.40 J(MB)	2.60 J(MB,B)	1.40 J(MB,B)	2.10 J(MB,B)	1 U	1 U	3 J(MB,B)
Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	0.2 UJ(HT)	0.2 U
Nickel	µg/L	12.00 U	12.00 U	12.00 U	19.00 J(MB,B)	6 U	6 U	6 U
Selenium	µg/L	3.00 UW	3.00 UW	3.00 U	3.00 U	1 UJ(N)	1 UJ(N)	1 UJ(N)
Silver	µg/L	11.00 U	11.00 U	11.00 U	11.00 U	2 U	2 UJ(N)	2 U
Thallium	µg/L	2.00 UW	2.00 U	2.00 U	2.00 UW	1 U	1 U	1 U
Zinc	µg/L	7.00 U	80.00	7.00 U	11.00 J(MB,B)	5.1 J(MB,B)	5 U	11.1 J(MB,B)
VOLATILE ORGANIC COMPOUNDS								
Chloromethane	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	µg/L	5 U	5 U	4 J	5 U	14 U	5 U(MB)	5 U
Acetone	µg/L	10 U	10 U	32	10 U	10 U	10 U	10 U
Carbon Disulfide	µg/L	5 U	6	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	µg/L	3 U	3 U	3 U	3 U	5 U	5 U	5 U
1,1-Dichloroethane	µg/L	5 U	5	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	µg/L	5 U	7	26	5 U	5 U	5 U	12
1,2-Dichloroethane	µg/L	3 U	3 U	3 U	3 U	5 U	5 U	5 U
2-Butanone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	µg/L	3 U	3 U	3 U	3 U	5 U	5 U	5 U
Vinyl Acetate	µg/L	10 U	10 U	10 U	10 U	NA	NA	NA
Bromodichloromethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	µg/L	5 U	5	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	3 J	5 U	5 U	5 U	5 U	5 U
Trichloroethene	µg/L	5 U	10	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	µg/L	3 U	6	3 U	3 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	µg/L	3 U	3 U	3 U	3 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	5	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	5 U	6	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	µg/L	5 U	5	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	µg/L	5 U	5	5 U	5 U	5 U	5 U	5 U
Total Xylenes	µg/L	5 U	51	5 U	5 U	5 U	5 U	5 U
2-Chloroethyl Vinyl Ether	µg/L	10 U	10 U	10 U	10 U	NA	NA	NA
Iodomethane	µg/L	10 U	10 U	10 U	10 U	NA	NA	NA
Acrolein	µg/L	40 U	40 U	40 U	40 U	NA	NA	NA
Acrylonitrile	µg/L	40 U	40 U	40 U	40 U	NA	NA	NA
Dibromomethane	µg/L	10 U	10 U	10 U	10 U	NA	NA	NA
1,2,3-Trichloropropane	µg/L	10 U	5 J	10 U	10 U	NA	NA	NA
1,4-Dichlorobutane	µg/L	10 U	10 U	10 U	10 U	NA	NA	NA
Ethyl Methacrylate	µg/L	10 U	10 U	10 U	10 U	NA	NA	NA
Trichlorofluoromethane	µg/L	10 U	10 U	10 U	10 U	NA	NA	NA
Dichlorodifluoromethane	µg/L	30 U	30 U	30 U	30 U	NA	NA	NA
TIC Totals	µg/L	0 (0)	0 (0)	0 (0)	NA	0 (0)	0 (0)	0 (0)

Table E-18. Data Presentation: Field Blanks (1990 and 1991) - 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		FB-01	FB-02	FB-03	HT-01	FB1-1	FB2-1	FB4-1
Laboratory Sample Number		90021708	90021709	90023606	90025106	13299, 14223	14360	13195, 13204
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA
Parameter	Units							
SEMIVOLATILE ORGANIC COMPOUNDS								
Phenol	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	µg/L	5 U	5 U	5 U	5 U	10 U	10 U	10 U
1,4-Dichlorobenzene	µg/L	5 U	5 U	5 U	5 U	10 U	10 U	10 U
Benzyl Alcohol	µg/L	20 U	20 U	20 U	20 U	NA	NA	NA
1,2-Dichlorobenzene	µg/L	5 U	5 U	5 U	5 U	10 U	10 U	10 U
2-Methylphenol	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-N-propylamine	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzoic Acid	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
bis(2-Chloroethoxy)methane	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	µg/L	20 U	20 U	20 U	20 U	10 U	10 U	10 U
Hexachlorobutadiene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	µg/L	50 U	50 U	50 U	50 U	50 U	50 U	50 U
2-Chloronaphthalene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	µg/L	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Dimethyl Phthalate	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	µg/L	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Acenaphthene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	µg/L	50 U	50 U	50 U	50 U	50 U	50 U	50 U
4-Nitrophenol	µg/L	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Dibenzofuran	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenyl Ether	µg/L	20 U	20 U	20 U	20 U	NA	NA	NA
Fluorene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	µg/L	50 U	50 U	50 U	50 U	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	µg/L	50 U	50 U	50 U	50 U	50 U	50 U	50 U
N-Nitrosodiphenylamine	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenyl Ether	µg/L	10 U	10 U	10 U	10 U	NA	NA	NA
Hexachlorobenzene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	µg/L	30 U	30 U	30 U	30 U	50 U	50 U	50 U
Phenanthrene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	µg/L	NA	NA	NA	NA	10 U	10 U	10 U
di-N-Butylphthalate	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	µg/L	20 U	20 U	20 U	20 U	10 U	10 U	10 U
Benzo(a)anthracene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	µg/L	10 U	12	10 U	10 U	10 U	10 U	10 U
di-N-Octyl phthalate	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Table E-18. Data Presentation: Field Blanks (1990 and 1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		FB-01	FB-02	FB-03	HT-01	FB1-1	FB2-1	FB4-1
Laboratory Sample Number		90021708	90021709	90023606	90025106	13299, 14223	14360	13195, 13204
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA
Parameter	Units							
SEMIVOLATILE ORGANIC COMPOUNDS (Continued)								
N-Nitrosodimethylamine	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
2-Picoline	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
Methyl Methanesulfonate	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
Ethyl Methanesulfonate	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
Aniline	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
Acetophenone	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
N-Nitrosopiperidine	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
Dimethylphenethylamine	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
2,6-Dichlorophenol	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
N-Nitroso-di-N-butylamine	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
1-Chloronaphthalene	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
Pentachlorobenzene	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
1-Naphthylamine	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
2-Naphthylamine	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
1,2-Diphenylhydrazine	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
Phenacetin	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
4-Aminobiphenyl	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
Pronamide	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
Benzidine	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
p-Dimethylaminoazobenzene	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
7,12-Dimethylbenzo(a)anthracene	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
3-Methylcholanthrene	µg/L	50 U	50 U	50 U	50 U	NA	NA	NA
TIC Total	µg/L	NA	NA	NA	NA	0 (0)	8 (1)	0 (0)
ORGANOCHLORINE PESTICIDES/PCBs								
alpha-BHC	µg/L	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA
beta-BHC	µg/L	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA
gamma-BHC (Lindane)	µg/L	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA
delta-BHC	µg/L	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA
Heptachlor	µg/L	0.05 U	0.05 U	3.05 U	0.05 U	NA	NA	NA
Aldrin	µg/L	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA
Heptachlor Epoxide	µg/L	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA
Endosulfan-I	µg/L	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA
Dieldrin	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA
4,4'-DDE	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA
Endrin	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA
Endosulfan-II	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA
4,4'-DDD	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA
Endrin Aldehyde	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA
Endosulfan Sulfate	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA
4,4'-DDT	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA
Methoxychlor	µg/L	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	NA
Chlordane	µg/L	0.45 U	0.45 U	0.45 U	0.45 U	NA	NA	NA
Toxaphene	µg/L	4.00 U	4.00 U	4.00 U	4.00 U	NA	NA	NA
Aroclor-1016	µg/L	2.00 U	2.00 U	2.00 U	2.00 U	NA	NA	NA
Aroclor-1221	µg/L	2.50 U	2.50 U	2.50 U	2.50 U	NA	NA	NA
Aroclor-1232	µg/L	2.50 U	2.50 U	2.50 U	2.50 U	NA	NA	NA
Aroclor-1242	µg/L	2.50 U	2.50 U	2.50 U	2.50 U	NA	NA	NA
Aroclor-1248	µg/L	2.00 U	2.00 U	2.00 U	2.00 U	NA	NA	NA
Aroclor-1254	µg/L	1.30 U	1.30 U	1.30 U	1.30 U	NA	NA	NA
Aroclor-1260	µg/L	1.00 U	1.00 U	1.00 U	1.00 U	NA	NA	NA

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
HT – sample analysis holding time greater than control limit
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
NA – not analyzed
U – compound/element was included in analysis, but was not detected
W – post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50% of the spike absorbance

Table E-19. Data Presentation: Trip Blanks (1990) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		TB-01	TB-02	TB-03	TB-04	TB-05	TB-06	TB-07	TB-08	TB-09(a)	TB-10	TB-11	TB-12
Laboratory Sample Number		90021712	90021713	90021714	90021807	90022315	900224TB	900236TB	90023902	90024802	90024903	90024904	90025107
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Parameter	Units												
VOLATILE ORGANIC COMPOUNDS													
Chloromethane	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	µg/L	5 U	5 U	5 U	150	3 J	NA	4 J	4 J	24	29	23	4 J
Acetone	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	µg/L	3 J	4 J	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	µg/L	3 U	3 U	3 U	3 U	3 U	NA	3 U	3 U	3 U	3 U	3 U	3 U
1,1-Dichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	µg/L	3 U	3 U	3 U	3 U	3 U	NA	3 U	3 U	3 U	3 U	3 U	3 U
2-Butanone	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	µg/L	3 U	3 U	3 U	3 U	3 U	NA	3 U	3 U	3 U	3 U	3 U	3 U
Vinyl Acetate	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	µg/L	4 J	3 J	3 J	3 U	3 U	NA	3 U	3 U	3 U	3 U	3 U	3 U
trans-1,3-Dichloropropene	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	µg/L	3 U	3 U	3 U	3 U	3 U	NA	3 U	3 U	3 U	3 U	3 U	3 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	µg/L	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Total Xylenes	µg/L	27	20	15	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
2-Chloroethyl Vinyl Ether	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Iodomethane	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Acrolein	µg/L	40 U	40 U	40 U	40 U	40 U	NA	40 U	40 U	40 U	40 U	40 U	40 U
Acrylonitrile	µg/L	40 U	40 U	40 U	40 U	40 U	NA	40 U	40 U	40 U	40 U	40 U	40 U
Dibromomethane	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
1,2,3-Trichloropropane	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobutane	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Ethyl Methacrylate	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	µg/L	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	µg/L	30 U	30 U	30 U	30 U	30 U	NA	30 U	30 U	30 U	30 U	30 U	30 U
TIC Totals	µg/L	0(0)	0(0)	0(0)	0(0)	0(0)	NA	0(0)	0(0)	0(0)	NA	NA	NA

J – estimated value
NA – not analyzed
U – compound/element was included in analysis, but was not detected
(a) Sample was incorrectly labelled on Chain-of-custody as TB-08

Table E-20. Data Presentation: Trip Blanks (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		TB10-30-91	TB10-31-91	TB11-1-91	TB11-3-91	TRIP BLNK	TB11-6-91	TB11-7-91
Laboratory Sample Number		13113	13180	13196	13301	14268	14362	14399
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA
Parameter	Units							
VOLATILE ORGANIC COMPOUNDS								
Chloromethane	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	µg/L	5 U	5 U	5 U	5 U	5 U	5 U(MB)	5 U(MB)
Acetone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	µg/L	5 U	5 U	5 U	5 ''	5 U	5 U	5 U
Bromodichloromethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TIC Totals	µg/L	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

MB – compound/element was also detected in the associated laboratory method blank
NA – not analyzed
U – compound/element was included in analysis, but was not detected

APPENDIX F
DATA QUALITY ASSESSMENT

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APPENDIX F. DATA QUALITY ASSESSMENT

F.1 INTRODUCTION

A standardized quality assurance/quality control (QA/QC) program was followed during the Site Investigation (SI) conducted at the Indiana Air National Guard Base (ANGB), located at Baer Field near Fort Wayne, Indiana, to ensure that analytical results and the decisions based on these results were representative of the environmental condition at the sites. The objective of the SI was to confirm the presence of contamination, collect and analyze sufficient numbers of samples to determine the lateral and vertical extent of contamination detected during the original field effort, and conclude SI activities at three sites. The SI was conducted using the Hazardous Waste Remedial Actions Program (HAZWRAP) Levels B and C (i.e., U.S. Environmental Protection Agency [EPA] Levels II and III) QC requirements described in *Requirements For Quality Control Of Analytical Data* (DOE/HWP-65/R1, July 1990). Tables F-1a and F-1b present the numbers of soil and sediment samples and groundwater samples, respectively, collected during the Indiana ANGB Fort Wayne, Indiana Field SI, in addition to the numbers of field QC samples collected and selected laboratory QC (i.e., matrix spikes and duplicates) samples analyzed. The data validation worksheets are referenced within the subsection describing the applicable analysis. The QC checks and results, applicable to the 1990 and 1991 field effort, are summarized below.

F.1.1 Data Quality Objectives

The following sections summarize the data quality objectives (DQOs) for precision, accuracy, representativeness, comparability, and completeness (PARCC) obtained during the Indiana ANGB.

F.1.1.1 Precision

Precision was defined as the reproducibility, or degree of agreement, among replicate measurements of the same quantity. The closer the numerical values of the measurements are to each other, the more precise the measurement is. Analytical precision was expressed as the

TABLE F-1a. ANALYTICAL METHODS AND TOTAL NUMBERS OF SOIL AND SEDIMENT SAMPLES COLLECTED DURING THE SITE INSPECTION, INDIANA AIR NATIONAL GUARD BASE, FORT WAYNE, INDIANA

PARAMETER	ANALYTICAL DETECTION METHOD	ANALYTICAL DETECTION LIMIT	SOIL SAMPLES	REPLICATES	TRIP BLANKS	FIELD BLANKS	EQUIPMENT BLANKS	MS/MSD	TOTAL NUMBER OF ANALYSES
Volatile Organic Compounds	SW 5030/8240	a	11	0	6	2	3	2	26
Volatile Organic Compounds	CLP SOW 3/90	a	39	3	5	2	2	3	57
Aromatic Volatile (BTEX)	SW 5030/8020	a	9	0	--	--	--	1	11
Semivolatile Organic Compounds	SW 3550/8270	a	30	1	--	2	3	2	40
Semivolatile Organic Compounds	CLP SOW 3/90	a	36	3	--	2	2	2	47
Pesticide/PCB	SW 3530/8080	a	7	0	--	2	1	1	12
Priority Pollutant Metals	SW 3050/6010	a	68	4	--	5	4	6	93
Arsenic	SW 3050/7060	a							
Lead	SW 3050/7421	a							
Mercury	SW 7471	a							
Selenium	SW 3050/7740	a							
Antimony	SW 3005/7041	a							
Thallium	SW 3050/7841	a							
Lead (Total)	SW 3050/7421	a	10	0	--	0	1	1	13
Total Petroleum Hydrocarbons and Oil and Grease	SW 3550/E 418.1 SW 3550/E 413.2	a	72	5	--	3	5	5	95

a – Detection limits are matrix and sample specific. All detection limits are listed on the comprehensive data tables located in Appendix E.

Sediment samples: SD4-01, SD4-02, SED-1, and SED-2.

TABLE F-1b. ANALYTICAL METHODS AND TOTAL NUMBERS OF GROUNDWATER SAMPLES COLLECTED DURING THE SITE INSPECTION, INDIANA AIR NATIONAL GUARD BASE, FORT WAYNE, INDIANA

PARAMETER	ANALYTICAL DETECTION METHOD	ANALYTICAL DETECTION LIMIT	WATER SAMPLES	REPLICATES	TRIP BLANKS	FIELD BLANKS	EQUIPMENT BLANKS	MS/MSD	TOTAL NUMBER OF ANALYSES
Volatile Organic Compounds	SW 8240	a	7	0	5	1	2	0	15
Volatile Organic Compounds	CLP SOW 3/90	a	6	1	2	1	3	2	17
Aromatic Volatile (BTEX)	SW 8020	a	4	1	--	--	--	1	7
Semivolatile Organic Compounds	SW 3510/8270	a	7	0	--	1	2	0	10
Semivolatile Organic Compounds	CLP SOW 3/90	a	5	1	--	1	2	1	11
Pesticide/PCB	SW 3510/8080	a	2	0	--	1	0	1*	4
Priority Pollutant Metals	SW 3005/6010	a	10	1	--	1	2	3	20
Arsenic	SW 3050/7060	a							
Lead	SW 3020/7420	a							
Mercury	SW 7470	a							
Selenium	SW 3050/7740	a							
Antimony	SW 3005/7041	a							
Thallium	SW 3020/7841	a							
Lead (Total)	SW 3020/7420	a	3	1	--	0	1	1	7
TDS	E 160.1	a	5	0	--	2	1	1**	9
Total Petroleum Hydrocarbons and Oil and Grease	SW 3550/E 418.1 SW 3550/E 413.2	a	11	1	--	1	4	0	17

a – Detection limits are matrix and sample specific. All detection limits are listed on the comprehensive data tables located in Appendix E.

* MS anlysis only.

** Duplicate analysis only

percentage of the difference between results of duplicate samples for a given compound or element. Relative percent difference (RPD) was calculated as:

$$\frac{/C_1 - C_2/}{\left(\frac{C_1 + C_2}{2}\right)} x\ 100$$

where:

C_1 = Concentration of the compound or element in the sample

C_2 = Concentration of the compound or element in the duplicate/replicate.

Precision was determined using matrix spike/matrix spike duplicate (MS/MSD) and duplicate sample analyses conducted on samples collected for volatile organic compound (VOC), semivolatile organic compound (SVOC), pesticide/polychlorinated biphenyl (PCB) analyses and, total petroleum hydrocarbon (TPH), oil and grease, priority pollutant metals and total dissolved solids (TDS) analyses during the Fort Wayne SI. The laboratory selected 1 sample in 20 and split the sample into 2 additional aliquots. MS/MSD samples were prepared by routinely analyzing the first aliquot for the parameters of interest, while the remaining two aliquots were spiked with known quantities of the parameters of interest before analysis. The RPD between the spike results was calculated and used as an indication of the analytical precision for the VOC and SVOC analyses performed. Duplicate samples (i.e., for priority pollutant metals, oil and greases, TPH, and TDS analyses) were prepared by subdividing 1 sample of every 20 samples received and analyzing both samples of the duplicate pair. The RPD between the spike results was calculated and used as an indication of the analytical precision for VOC, SVOC, and pesticide/PCB analyses performed. The RPD between two detected concentrations was calculated and used as an indication of the analytical precision for the analyses performed.

All RPD values calculated from the VOC analyses were within the EPA Contract Laboratory Program (CLP) advisory control limits for analytical precision. Thirteen RPD values (of 55 total values) calculated from the SVOC analyses and one RPD value (of 6 total values) calculated from the pesticide/PCB analyses were outside the EPA CLP advisory control limits for analytical precision. Since each analysis was evaluated according to the required QC criteria described in Section F.3 and all of these criteria were met for the environmental samples analyzed, these RPD values are considered to be more representative reflection of the variability characteristic of the environmental condition at the Indiana ANGB, and as a result, the analytical DQO for VOC, SVOC, and pesticide/PCB (in soils only) precision is considered to have been met. The analytical precision DQO for pesticides/PCBs in groundwater could not be evaluated, since the MS/MSD analyses for that matrix was conducted using a Field QC blank, rather than an environmental sample. All priority pollutant metals RPD values were within the control limits, except aluminum, arsenic, chromium, cooper, lead, manganese, and zinc. As a result, data validation qualifiers were applied to these elements in numerous soil samples associated with those samples analyzed in duplicate. These results are considered to have little impact on the environmental data quality and considered more likely to be a result of the regional matrix variability, since all other analytical QC criteria were met. Therefore, the analytical precision DQO for these metals analyses is considered to have been met. Four RPD values calculated from TPH analysis, one RPD value calculated from oil and grease analysis, and one RPD value was calculated from TDS analysis were within the appropriate limit; therefore, the analytical precision DQO for these analyses is considered to have been met. The analytical QC evaluation criteria used to evaluate analytical precision and all MS/MSD results are discussed in Section F.3.

Sample collection reproducibility and media variability were measured in the laboratory by the analysis of field replicates. Field replicates were collected using the same sample techniques as those used to collect the environmental samples. One in 10 similar matrices was collected, and sample collection reproducibility and media variability were evaluated based on the RPD values between two duplicate samples. No corrective action was taken based on RPD values.

All soil samples to be analyzed by the laboratory were collected using brass (i.e., for VOC, SVOC, TPH, and oil and grease analyses) and stainless steel (i.e., for priority pollutant metals analyses) liners. Each split spoon was filled with sufficient liners such that replicate samples could be collected at any sample collection interval. After the split spoon sampler was retrieved from the borehole, these liners were capped and labeled and each sample was shipped to the laboratory in the liner. Therefore, the replicate concentrations measured by the laboratory reflect the natural matrix variability inherent in the surface soil at the Indiana ANGB. Field RPD values were calculated only for compounds and elements detected above the contract required detection limits (CRDLs) in both replicate pair samples and only for those compounds and elements not considered to be common laboratory contaminants (e.g., methylene chloride). Toluene was detected in one soil replicate pair (i.e., SB1A-3-4 and SB1A-3-4R). The RPD value was calculated at 141 percent. All other VOC, SVOC, and TPH RPDs values met the evaluation criteria. Priority pollutant metals replicate RPD values met the evaluation criteria, except for lead (i.e., 86 percent) in one soil replicate pair (i.e.,SB1-3-3 and SB12-3-3R). Based on these RPD results and the acceptable QC results, the sample collection DQO for reproducibility is considered to have been met. A comprehensive discussion of all replicate sample results is presented in Section F.2.4.

F.1.1.2 Accuracy

Accuracy was defined as the degree of difference between measured or calculated values and the true value. The closer the numerical value of the measurement approaches the true value, or actual concentration, the more accurate the measurement is. Analytical accuracy is expressed as the percent recovery of a compound or element that has been added to the environmental sample at a known concentration before analysis. The following equation was used to calculate percent recovery:

$$\frac{A_r - A_o}{A_f} \times 100$$

where:

A_r = Total compound or element concentration detected in the spiked sample

A_o = Concentration of the compound or element detected in the unspiked sample

A_f = Concentration of the compound or element added to the sample.

Laboratory accuracy was qualitatively assessed by evaluating the sample holding times, method blank, tuning and mass calibration (gas chromatography/mass spectrometry [GC/MS] only), system performance compound and surrogate recovery (GC/MS and GC, respectively, only), internal standard (GC/MS only), Laboratory Control Sample (LCS) and method blank spike recovery, and initial and continuing calibration results calculated from all analyses conducted on environmental samples.

Seven (of 150 values), three (of 110 values), and one (of 18 values) percent recovery values were outside the required control limits. All supporting VOC, SVOC, and pesticide/PCB information cited above was qualitatively evaluated with respect to the analytical accuracy. Selected data validation qualifiers were applied to the VOC environmental sample results due to method blank interference (i.e., methylene chloride), internal standard performance, and poor surrogate recoveries. Selected data validation qualifiers were applied to the SVOC environmental sample results due to the exceeded holding times, internal standard performance, and poor surrogate recoveries. Undetected compounds in three soil samples and two groundwater samples were rejected due to the exceeded holding times. In addition, two soil samples and three groundwater samples were rejected due to poor surrogate recoveries. Of the qualified SVOC data points these values have the greatest adverse impact on the environmental data quality. On pesticide compound (i.e., 4,4'-DDT) in one water sample was rejected due to matrix spike recovery. Selected data validation qualifiers were applied to the pesticide/PCB environmental samples due to poor surrogate recoveries.

Data validation qualifiers were applied to 17 antimony, 6 arsenic and 10 lead concentrations to indicate that these values were rejected due to unacceptable (i.e., less than 30 percent recovery) matrix spike recoveries. Mercury in one groundwater sample was rejected due to the exceeded holding time. In addition, data validation qualifiers were applied to numerous other priority pollutant metals concentrations to indicate that the matrix spike recoveries were outside the applicable control limits. Despite these values, no systematic laboratory error was detected, since all LCS criteria for soil and water samples were met. As a result, all associated soil and groundwater samples data were qualified for data validation purposes, as required by EPA validation quidelines; however, the results are considered to have little impact on the overall data quality. All supporting priority pollutant metals QC information cited above also was qualitatively evaluated with respect to the analytical accuracy DQO. Of this information, numerous data points in selected environmental samples were estimated due to method blank interference and mercury in selected samples was estimated due to the exceeded holding time. Based on the evaluation of the MS/MSD results and the associated QC results summarized in Section F.3, the overall laboratory accuracy is acceptable, and as such, the analytical DQO for accuracy was met, except where noted.

Sampling accuracy was maximized by adherence to the strict QA program presented in DOE/HWP-65/R1. All procedures (i.e., soil boring and monitoring well installation, soil and groundwater collection procedures, equipment decontamination, and health monitoring equipment calibration and operation) used during the Indiana ANGB SI were documented as standard operating procedures (SOPs). Field QC blanks (i.e., trip blanks, field blanks, and equipment blanks) were prepared to ensure that all samples represent the particular site from which they were collected, asses any cross contamination that may have occurred, and qualify the associated analytical accordingly.

Data validation qualifiers were applied to the methylene chloride, toluene, and acetone in 10 selected (i.e., 3 groundwater and 7 soil samples) environmental samples to indicate that these compounds were considered not detected due to associated field QC blank interference. These samples were validated using the highest concentration of the applicable interferent detected in the associated field QC blank. Data validation qualifiers were applied to selected priority pollutant metals (i.e., predominantly cadmium, cooper, lead, sodium, and zinc) and TDS detected in soil and groundwater samples to indicate that these concentrations are considered estimated, since the concentrations detected in the environmental samples did not exceed five times that detected in the associated field QC blank. Despite the data validation qualifiers, these field QC blanks are not considered to have adversely impacted the soil sample data quality, since metals are relatively nonvolatile and the possibility of cross contamination between field QC blanks and soil samples is considered remote. Therefore, it is unlikely that the water used to prepare the field QC blanks was a source of those elements and TDS detected in the associated groundwater samples, since the bailer was effectively raised numerous times with the sample media during the well preparation activities. Based on an evaluation of the compounds and elements detected in the field QC blanks, the overall field accuracy is acceptable, except where noted. As a result, the field DQO for accuracy is considered to have met. A comprehensive discussion of the field QC results is presented in Section F.2.

F.1.1.3 Representativeness

Representativeness was defined as the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling location, a process condition, or an environmental condition. Sample representativeness was ensured during the SI by collecting sufficient samples of a population medium, properly distributed with respect to location and time. Representativeness was assessed by reviewing the drilling techniques and equipment; well installation procedures and materials; and sample collection methods, equipment, and sample containers used during the Indiana ANGB SI, in addition to the onsite GC analysis results and evaluating the RPD values calculated from the duplicate samples and the concentrations of interferents detected in the field and laboratory QC blanks. The reproducibility of a representative set of samples reflects the degree of heterogeneity of the sampled medium, as well as the effectiveness of the sample collection techniques.

All monitoring wells were installed using hollow stem auger drilling techniques. This method is commonly used to install monitoring wells to depths less than 100 feet. All samples were collected using the split-spoon driven in front of the auger. As originally specified in the project Work Plan, California ring samplers (i.e., brass or stainless steel liners inserted into a split-spoon sampler) were to be used to collect all soil samples. All other data are considered to be representative.

Based on the evaluation of the factors described above and summarized in Section F.3 the samples collected during the SI are considered representative of the environmental condition at the Indiana ANGB.

F.1.1.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another and is limited to the other PARCC parameters, because only when precision and accuracy are known can one data set be compared to another. To optimize comparability, only the specific methods and protocols that were required by DOE/HWP-65/R1 were used to collect and analyze samples during the Indiana ANGB SI. By using consistent sampling and analysis procedures, all data sets were comparable within the sites at the Indiana ANGB, between sites at the installation, or among ANGB facilities nationwide, to ensure that remedial action decisions and priorities were based on a consistent data base. Comparability also was ensured by the analysis of EPA reference materials, establishing that the analytical procedures used were generating valid data.

All samples collected in 1990 and 1991 for VOC and SVOC analyses were analyzed using EPA solid waste methods and the March 1990 EPA CLP Statement of Work (SOW), respectively. All samples collected for pesticides/PCBs, priority pollutant metals, TPH were analyzed using EPA solid waste methods. Water samples collected for oil and grease and TDS analyses were analyzed using EPA waste water methods.

Based on the precision and accuracy assessment presented above, the data collected during the SI are considered to be comparable with the data collected during previous investigations.

F.1.1.5 Completeness

Completeness was defined as the percentage of valid data obtained from a measurement system. For data to be considered valid, they must have met all acceptance criteria, including accuracy and precision, as well as any other criteria specified by the analytical methods used. Based on the evaluation of the field and laboratory QC results presented in Sections F.2 and F.3, 99.4 percent of the sample data collected for VOC analyses; 91 percent of the sample data collected for SVOC analyses; 99.7 percent of the sample data collected for pesticide/PCB analyses; 98.5 percent of the sample collected for priority pollutant metals analyses; and 100 percent of the sample data collected for BTEX, TPH, and TDS analyses were used as the basis for recommendations presented in this report.

Project completeness was defined as the percentage of data used to prepare a preliminary risk evaluation and upon which recommendations for the site remediation are based. For analytical data to be considered usable for risk assessment and remediation recommendations, they must be satisfactorily validated. Rejected (i.e., due to holding time, surrogate and matrix spike recoveries) values and concentrations reported for all analyses were not used in the risk estimates or for remediation recommendations due to the increased potential of using the concentrations of false positive compounds and elements or omitting compounds or elements (i.e., false negatives) that may have an adverse impact on human health. As a result, 564 SVOCs, 1 pesticide/PCB, and 35 priority pollutant metals data points were rejected, and as a result, were not included in preliminary risk evaluation. A complete list of these data points is presented in Table F-2.

F.2 FIELD QUALITY CONTROL ASSESSMENT

Nineteen ~~Eleven~~ trip blanks, 7 ~~2~~ field blanks, 14 4 equipment blanks, and 7 4 field replicates were collected and analyzed for the same compounds and using the same laboratory techniques as those used for the 95 environmental samples. The analytical results obtained from the field QC blanks are used to assess the efficiency and effectiveness of the sample collection, handling, and equipment decontamination procedures used in the field. Table F-2a contains a cross-reference of environmental samples to the associated field QC blank sample.

F.2.1 Trip Blanks

Trip blanks were prepared by the NET Laboratory (former SAIC Laboratory), located in San Diego, California. These blanks were prepared with American Society for Testing and Materials (ASTM) Type II water preserved with HCl to a pH of less than 2, sent to the Indiana ANGB, stored with the unused sample bottles, and returned to the laboratory with each cooler

Table F-2. List of Rejected Data

Sample Identification	Analysis	Compound/Element Impacted	Cause QC Result
EW-05	SVOC	All compounds	Holding Time
MW4-02	SVOC	All compounds	Holding Time
SB1A-1-2 (2nd round)	SVOC	All compounds except: diethylphthate, phenonthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthrene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene	Holding Time
SB1A-1-3 (2nd round)	SVOC	All compounds except: pyrene	Holding Time
SB1-2-5R (2nd round)	SVOC	All compounds	Holding Time
P-2	SVOC	All compounds	Surrogate recoveries
GW1-1	SVOC	All compounds	Surrogate recoveries
GW1-1RE	SVOC	All compounds	Surrogate recoveries
SB1-2-5R	SVOC	All compounds	Surrogate recoveries
SB1-2-5	SVOC	All compounds	Surrogate recoveries
MW2-01	Pesticide/PCB	4,4'-DDT	Spiked Sample
MW4-02	Priority Pollutant Metals	Mercury	Holding Time
SB2-01-01	Priority Pollutant Metals	Antimony	Spiked Sample
SB2-01-19	Priority Pollutant Metals	Antimony	Spiked Sample
SB2-02-01	Priority Pollutant Metals	Antimony	Spiked Sample
SB2-03-01	Priority Pollutant Metals	Antimony	Spiked Sample
SB2-04-01	Priority Pollutant Metals	Antimony	Spiked Sample
SB4-01-01	Priority Pollutant Metals	Antimony	Spiked Sample
SB4-01-02	Priority Pollutant Metals	Antimony	Spiked Sample
SB4-02-01	Priority Pollutant Metals	Antimony	Spiked Sample
SB4-02-02	Priority Pollutant Metals	Antimony	Spiked Sample
SB4-03-02	Priority Pollutant Metals	Antimony	Spiked Sample
SB4-04-01	Priority Pollutant Metals	Antimony	Spiked Sample

Table F-2. List of Rejected Data (Continued)

Sample Identification	Analysis	Compound/Element Impacted	Cause QC Result
SB4-04-02	Priority Pollutant Metals	Antimony	Spiked Sample
SB4-05-01	Priority Pollutant Metals	Antimony	Spiked Sample
SB4-05-02	Priority Pollutant Metals	Antimony	Spiked Sample
SD4-01	Priority Pollutant Metals	Antimony	Spiked Sample
SD4-02	Priority Pollutant Metals	Antimony	Spiked Sample
SB4-1-1	Priority Pollutant Metals	Lead	Spiked Sample
SB4-1-2	Priority Pollutant Metals	Lead	Spiked Sample
SB4-1-6	Priority Pollutant Metals	Lead	Spiked Sample
SB3-2-2	Priority Pollutant Metals	Lead	Spiked Sample
SB3-2-1	Priority Pollutant Metals	Lead	Spiked Sample
SB3-1-6	Priority Pollutant Metals	Lead	Spiked Sample
SB3-1-9	Priority Pollutant Metals	Lead	Spiked Sample
SB4-2-1	Priority Pollutant Metals	Lead	Spiked Sample
SB4-2-2	Priority Pollutant Metals	Lead	Spiked Sample
SB3-1-1	Priority Pollutant Metals	Lead	Spiked Sample
SB1A-1-5	Priority Pollutant Metals	Arsenic	Spiked Sample
SB1A-1-5R	Priority Pollutant Metals	Arsenic	Spiked Sample
SB1-2-5	Priority Pollutant Metals	Arsenic	Spiked Sample
SB1-2-5R	Priority Pollutant Metals	Arsenic	Spiked Sample
SB1A-3-4	Priority Pollutant Metals	Arsenic	Spiked Sample
SB1A-3-4R	Priority Pollutant Metals	Arsenic	Spiked Sample

Table 2a. Field QC to Environmental Sample Cross-Reference

WATER SAMPLES (1990)

SAIC Sample ID	Laboratory Sample ID	Associated Field Blank	Associated Trip Blank	Associated Equipment Blank
FB-01	90021708	NA	NA	NA
FB-02	90021709	NA	NA	NA
EW-01	90021710	NA	NA	NA
EW-02	90021711	NA	NA	NA
TB-01	90021712	NA	NA	NA
TB-02	90021713	NA	NA	NA
TB-03	90021714	NA	NA	NA
TB-04	90021807	NA	NA	NA
EW-03	90021808	NA	NA	NA
EW-04	90022314	NA	NA	NA
TB-05	90022315	NA	NA	NA
EW-05	90022401	NA	NA	NA
TB-06	900224TB	NA	NA	NA
EW-06	90023605	NA	NA	NA
FB-03	90023606	NA	NA	NA
TB-07	900236TB	NA	NA	NA
MW4-02	90023901	FB-03	TB-08	EW-05,-06,-08,-09
TB-08	90023902	NA	NA	NA
P-2	90024801	FB-01,-02,-03	TB-08,-09	EW-05,-06,-07,-08
TB-09	90024802	NA	NA	NA
EW-07	90024901	NA	NA	NA
MW2-01	90024902	FB-01,-02,-03	TB-10	EW-04,-07,-08
TB-10	90024903	NA	NA	NA
TB-11	90024904	NA	NA	NA
MW1-02	90025101	FB-01,-02,-03	TB-11	EW-07,-08,-09
MW1-01	90025102	FB-01,-02,-03	TB-11	EW-07,-08,-09
EW-08	90025103	NA	NA	NA
EW-09	90025104	NA	NA	NA
P-8	90025105	FB-01,-02,-03	TB-12	EW-08,-09
HT-01	90025106	NA	NA	NA
TB-12	90025107	NA	NA	NA

SOIL SAMPLES (1990)

SAIC Sample ID	Laboratory Sample ID	Associated Field Blank	Associated Trip Blank	Associated Equipment Blank
SB1-01-12	90021701	FB-01,-02	TB-01	EW-01,-02
SB1-01-11	90021702	FB-01,-02	TB-01	EW-01,-02
SB1-03-02	90021703	FB-01,-02	TB-02	EW-01,-02
SB1-03-06	90021704	FB-01,-02	TB-02	EW-01,-02
SB1-03-18	90021705	FB-01,-02	TB-02	EW-01,-02
SB-B-01	90021706	FB-01,-02	TB-02	EW-01,-02
SB-B-02	90021707	FB-01,-02	TB-02	EW-01,-02,-04
SB1-02-03	90021801	FB-01,-02	TB-04	EW-03,-04
SB1-02-03R	90021802	FB-01,-02	TB-04	EW-03,-04
SB1-02-16	90021803	FB-01,-02	TB-04	EW-03,-04
SB2-01-01	90021804	FB-01,-02	TB-04	EW-03,-04
SB2-01-02	90021805	FB-01,-02	TB-04	EW-03,-04
SB2-01-19	90021806	FB-01,-02	TB-04	EW-03,-04
SB2-02-01	90022301	FB-01,-02	TB-05	EW-03,-04,-05
SB2-03-01	90022302	FB-01,-02	TB-05	EW-03,-04,-05
SB2-04-01	90022303	FB-01,-02	TB-05	EW-03,-04,-05
SB4-01-01	90022304	FB-01,-02	TB-05	EW-03,-04
SB4-01-02	90022305	FB-01,-02	TB-05	EW-03,-04,-05
SB4-02-01	90022306	FB-01,-02	TB-05	EW-03,-04,-05
SB4-02-02	90022307	FB-01,-02	TB-05	EW-03,-04,-05
SB4-03-01	90022308	FB-01,-02	TB-05	EW-03,-04,-05
SB4-03-02	90022309	FB-01,-02	TB-05	EW-03,-04,-05
SB4-04-01	90022310	FB-01,-02	TB-05	EW-03,-04,-05
SB4-04-02	90022311	FB-01,-02	TB-05	EW-03,-04,-05
SB4-05-01	90022312	FB-01,-02	TB-05	EW-03,-04,-05
SB4-05-02	90022313	FB-01,-02	TB-05	EW-03,-04,-05
SD4-01	90022402	FB-01,-02	TB-06	EW-03,-05
SD4-02	90022403	FB-01,-02	TB-06	EW-03,-05
SB1-04-01	90023601	FB-01,-02,-03	TB-07	EW-03,-05,-06
SB1-04-02	90023602	FB-01,-02,-03	TB-07	EW-03,-05,-06
SB1-04-03	90023603	FB-01,-02,-03	TB-07	EW-03,-05,-06
SB1-04-04	90023604	FB-01,-02,-03	TB-07	EW-03,-05,-06

WATER SAMPLES (1991)

SAIC Sample ID	Laboratory Sample ID	Associated Field Blank	Associated Trip Blank	Associated Equipment Blank
TB10-30-91	13113	NA	NA	NA
TB10-31-91	13180	NA	NA	NA
EB3-1	13179, 13187	NA	NA	NA
EB4-1	13194, 13203	NA	NA	NA
FB4-1	13195, 13204	NA	NA	NA
TB11-1-91	13196	NA	NA	NA
FB1-1	13299, 14223	NA	NA	NA
GW1-1	13300	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
TB11-3-91	13301	NA	NA	NA
EB1A-1	14266, 14276	NA	NA	NA
EB1-1	14265, 14275	NA	NA	NA
MW1-02	14267, 14277	FB1-1	TB11-05-91	EB1-1, 1A-1
TRIP BLK.	14268	NA	NA	NA
FB2-1	14360	NA	NA	NA
EB2-1	14361	NA	NA	NA
MW1-01	14354	FB2-1	TB11-6-91	EB2-1
MW2-01	14355	FB2-1	TB11-6-91	EB2-1
MW2-01R	14356	FB2-1	TB11-6-91	EB2-1
MW4-02	14358	FB2-1	TB11-6-91	EB2-1
MW4-02R	14359	FB2-1	TB11-6-91	EB2-1
MW4-01	14357	FB2-1	TB11-6-91	EB2-1
TB11-6-91	14362	NA	NA	NA
P-8	14398	FB2-1	TB11-7-91	EB2-1
P-1	14397	FB2-1	TB11-7-91	EB2-1
TB11-7-91	14399	NA	NA	NA

SOIL SAMPLES (1991)

SAIC Sample ID	Laboratory Sample ID	Associated Field Blank	Associated Trip Blank	Associated Equipment Blank
SB4-1-1	13110, 13115	FB4-1	TB10-30-91	EB3-1, 4-1
SB4-1-2	13111, 13116	FB4-1	TB10-30-91	EB3-1, 4-1
SB4-1-6	13112, 13117	FB4-1	TB10-30-91	EB3-1, 4-1
SB3-1-1	13109, 13114	FB4-1	TB10-30-91	EB3-1, 4-1
SB3-2-2	13173, 13181	FB4-1	TB10-31-91	EB3-1, 4-1
SB4-2-2	13178, 13186	FB4-1	TB10-31-91	EB3-1, 4-1
SB3-2-1	13174, 13182	FB4-1	TB10-31-91	EB3-1, 4-1
SB4-2-1	13177, 13185	FB4-1	TB10-31-91	EB3-1, 4-1
SB3-1-6	13175, 13183	FB4-1	TB10-31-91	EB3-1, 4-1
SB3-1-9	13176, 13184	FB4-1	TB10-31-91	EB3-1, 4-1
SB4-3-1	13191, 13200	FB4-1	TB11-1-91	EB4-1
SB4-3-2	13192, 13201	FB4-1	TB11-1-91	EB4-1
SB4-3-4	13193, 13202	FB4-1	TB11-1-91	EB4-1
SB1-1-1	13188, 13197	FB4-1	TB11-1-91	EB4-1
SB1-1-2	13189, 13198	FB4-1	TB11-1-91	EB4-1
SB1-1-3	13190, 13199	FB4-1	TB11-1-91	EB4-1
BG1-1-1	13278, 14202	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
BG1-1-2	13279, 14203	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
BG1-1-3	13280, 14204	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
BG1-1-4	13281, 14205	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
BG2-1-1	13282, 14206	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
BG2-1-2	13283, 14207	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
BG2-1-3	13284, 14208	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1-2-1	13285, 14209	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1-2-2	13286, 14210	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1-2-3	13287, 14211	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1-2-7	13288, 14212	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1-1-7	13289, 14222	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1A-1-1	13290, 14213	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1A-1-2	13291, 14214	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1A-1-3	13292, 14215	FB1-1, 2-1	TB11-3-91	EB1-1, 1A-1, 2-1, 4-1
SB1A-1-5	13293, 14216	FB1-1, 2-1	TB11-3-91	EB1-1, 1A-1, 2-1
SB1A-2-1	13294, 14217	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1A-2-2	13295, 14218	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1A-2-3	13296, 14219	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1A-3-1	13297, 14220	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1A-3-3	13298, 14221	FB1-1	TB11-3-91	EB1-1, 1A-1, 4-1
SB1A-3-5	14264, 14274	FB1-1	TB11-7-91	EB1-1, 1A-1, 2-1
SB1A-3-2	14263, 14273	FB1-1	TB-11-05-91	EB1-1, 1A-1
SB1-3-1	14259, 14269	FB1-1	TB-11-05-91	EB1-1, 1A-1
SB1-3-2	14260, 14270	FB1-1	TB-11-05-91	EB1-1, 1A-1
SB1-3-3	14261, 14271	FB1-1	TB-11-05-91	EB1-1, 1A-1
SB1-3-3R	14262, 14272	FB1-1	TRIP BLK.	EB1-1, 1A-1
SB1A-1-5	14348	FB2-1	TB11-6-91	EB2-1, 4-1
SB1A-1-5R	14349	FB2-1	TB11-6-91	EB2-1
SB1A-3-4	14350	FB2-1	TB11-6-91	EB2-1
SB1A-3-4R	14351	FB2-1	TB11-6-91	EB2-1
SB1-2-5	14352	FB2-1	TB11-6-91	EB2-1
SB1-2-5R	14353	FB2-1	TB11-6-91	EB2-1
SED-1	14395	FB2-1	TB11-7-91	EB2-1
SED-2	14396	FB2-1	TB11-7-91	EB2-1

containing the environmental samples to be analyzed for VOCs using EPA Method 8240 and the March 1990 EPA CLP SOW. Table F-2b summarizes the concentrations of the detected VOCs in the trip blank samples collected during Indiana ANGB SI.

Twelve ~~Eleven~~ trip blanks were collected and analyzed for VOCs using EPA Method 8240 and 7 trip blanks were collected and analyzed for VOCs using the March 1990 CLP SOW. Methylene chloride was detected in TB-04 (150 μg/L), TB-05 (3J μg/L), TB-07 (4J μg/L), TB-08 (4J μg/L), TB-09 (24 μg/L), TB-10 (29 μg/L), TB-11 (23J μg/L), and TB-12 (4J μg/L). Data validation qualifiers (i.e., "U[TB]) were applied to the methylene chloride detected in the MW4-02 associated with TB-08, P-2 associated with TB-09, MW2-01 associated with TB-11, SB2-02-01 and SB2-03-1 associated with TB-05, and SB2-01-19R associated with TB-07. Methylene chloride was detected in TB11-6-91 and TB11-7-91. No data validation qualifiers were applied to the methylene chloride associated with environmental samples, since the methylene chloride was detected in the laboratory blank associated with these field QC blanks, the methylene chloride concentrations were considered undetected (i.e., "U[MB]). Carbon disulfide was detected in TB-01 (3J μg/L) and TB-02 (4J μg/L), benzene was detected in TB-01 (4 μg/L), TB-02 (3 μg/L), and TB-03 (3 μg/L), and xylenes was detected in TB-01 (27 μg/L), TB-02 (20 μg/L), and TB-03 (15 μg/L). No data validation qualifiers were applied since carbon disulfide, benzene, and xylenes were not detected in the associated environmental samples. No other VOCs were detected in the trip blanks.

F.2.2 Field Blanks

Field blanks were collected to provide baseline analytical data for the water used for equipment decontamination (i.e., ASTM Type II reagent water) and in the steamcleaner equipment (i.e., potable water). They are collected at a rate of 1 per source per event. Field blanks were collected by randomly selecting sample containers from the supply, filling them with the appropriate water source, and then preserving and analyzing these blanks for the same compounds and using the same laboratory methods as those used for the associated environmental samples. Table F-2c summarizes the concentrations of the elements and compounds detected in the field blanks collected during the Indiana ANGB SI.

Table F-2b. Data Summary: Trip Blanks (1990) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		TB-01	TB-02	TB-03	TB-04	TB-05	TB-06	TB-07	TB-08	TB-09(a)	TB-10	TB-11	TB-12
Laboratory Sample Number		90021712	90021713	90021714	90021807	90022315	900224TB	900236TB	90023902	90024802	90024903	90024904	90025107
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Parameter	Units												
VOLATILE ORGANIC COMPOUNDS													
Methylene Chloride	µg/L	5 U	5 U	5 U	150	3 J	NA	4 J	4 J	24	29	23	4 J
Carbon Disulfide	µg/L	3 J	4 J	5 U	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	µg/L	4	3	3	3 U	3 U	NA	3 U	3 U	3 U	3 U	3 U	3 U
Total Xylenes	µg/L	27	20	15	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U
TIC Totals	µg/L	0(0)	0(0)	0(0)	0(0)	0(0)	NA	0(0)	0(0)	0(0)	NA	NA	NA

J – estimated value

NA – not analyzed

U – compound/element was included in analysis, but was not detected

(a) Sample was incorrectly labelled on Chain-of-custody as TB-08

Table F-2b. Data Summary: Trip Blanks (1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		TB10-30-91	TB10-31-91	TB11-1-91	TB11-3-91	TRIP BLNK	TB11-6-91	TB11-7-91
Laboratory Sample Number		13113	13180	13196	13301	14268	14362	14399
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA
Parameter	Units							
VOLATILE ORGANIC COMPOUNDS								
Methylene Chloride	μg/L	5 U	5 U	5 U	5 U	5 U	5 U(MB)	5 U(MB)
Carbon Disulfide	μg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	μg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	μg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TIC Totals	μg/L	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

MB – compound/element was also detected in the associated laboratory method blank
U – compound/element was included in analysis, but was not detected

Table F-2c. Data Summary: Field Blanks (1990 and 1991) – 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		FB-01	FB-02	FB-03	FB1-1	FB2-1	FB4-1
Laboratory Sample Number		90021708	90021709	90023606	13299, 14223	14360	13195, 13204
Associated Field QC Samples		NA	NA	NA	NA	NA	NA
Parameter	Units						
Total Petroleum Hydrocarbons	mg/L	1 UJ(HT)	1 UJ(HT)	1 U	1 U	1 U	NA
Oil And Grease	mg/L	NA	NA	NA	NA	NA	1 U
TPH as Gasoline	mg/L	NA	NA	NA	NA	NA	0.05 U
TPH As Diesel	mg/L	NA	NA	NA	NA	NA	0.05 U
TPH As Motor Oil	mg/L	NA	NA	NA	NA	NA	0.5 U
METALS							
Arsenic	µg/L	2.00 U	2.00 U	2.00 UW	1 U	1 U	3 J(MB,B)
Cadmium	µg/L	2.00 U	2.00 U	2.00 U	1 J(B)	1 U	1.8 J(B)
Copper	µg/L	14.00 J(B)	10.00 U	10.00 U	2 J(MB,B)	2 U	16.5 J(B)
Lead	µg/L	3.40 J(MB)	2.60 J(MB,B)	1.40 J(MB,B)	1 U	1 U	3 J(MB,B)
Nickel	µg/L	12.00 U	12.00 U	12.00 U	6 U	6 U	6 U
Zinc	µg/L	7.00 U	80.00	7.00 U	5.1 J(MB,B)	5 U	11.1 J(MB,B)
Total Dissolved Solids	µg/L	230	150	NA	NA	NA	NA
VOLATILE ORGANIC COMPOUNDS							
Methylene Chloride	µg/L	5 U	5 U	4 J	14 U	5 U(MB)	5 U
Acetone	µg/L	10 U	10 U	32	10 U	10 U	10 U
Carbon Disulfide	µg/L	5 U	6	5 U	5 U	5 U	5 U
1,1-Dichloroethane	µg/L	5 U	5	5 U	5 U	5 U	5 U
Chloroform	µg/L	5 U	7	26	5 U	5 U	12
1,2-Dichloropropane	µg/L	5 U	5	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	3 J	5 U	5 U	5 U	5 U
Trichloroethene	µg/L	5 U	10	5 U	5 U	5 U	5 U
Benzene	µg/L	3 U	6	3 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	5	5 U	5 U	5 U	5 U
Toluene	µg/L	5 U	6	5 U	5 U	5 U	5 U
Chlorobenzene	µg/L	5 U	5	5 U	5 U	5 U	5 U
Styrene	µg/L	5 U	5	5 U	5 U	5 U	5 U
Total Xylenes	µg/L	5 U	51	5 U	5 U	5 U	5 U
1,2,3-Trichloropropane	µg/L	10 U	5 J	10 U	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS							
bis(2-Ethylhexyl)phthalate	µg/L	10 U	12	10 U	10 U	10 U	10 U
TIC Total	µg/L	NA	NA	NA	0 (0)	8 (1)	0 (0)
ORGANOCHLORINE PESTICIDES/PCBs		ND	ND	ND	ND	ND	ND

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
HT – sample analysis holding time greater than control limit
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
NA – not analyzed
ND – not detected
U – compound/element was included in analysis, but was not detected

Volatile Organic Compound Analysis--Three field blanks (i.e, FB-01, FB-02, and FB-03) were collected and analyzed for VOCs using EPA Method 8240 and 3 field blanks (i.e., FB4-1, FB1-1, and FB2-1) were collected and analyzed for VOCs using the March 1990 CLP SOW. Toluene was detected in FB-02 (6 μg/L). Data validation qualifiers (i.e., "U[FB]") were applied to the toluene detected in SB2-01-02 and SB2-03-01. Carbon disulfide, 1,1-dichloroethane, chloroform, 1,2-dichloropropane, cis-1,3-dichloropropene, trichloroethene, benzene, 1,1,2,2-tetrachloroethane, chlorobenzene, styrene, and xylenes were detected in FB-02; methylene chloride, acetone, and chloroform were detected in FB-03; chloroform was detected in FB4-1; and methylene chloride was detected in FB1-1. No data validation qualifiers were applied, since these VOCs were not detected in the associated environmental samples. Methylene chloride was detected in FB2-1. Since methylene chloride also was detected in the laboratory method blank associated with FB2-1, the methylene chloride concentration was considered undetected (i.e., "U[MB]"). No other VOCs were detected in the field blanks.

Semivolatile Organic Compound Analysis--Three field blanks (i.e., FB-01,FB-02, and FB-03) were collected, extracted, and analyzed for SVOCs using EPA Method 8270. Three field blanks (i.e., FB4-1, FB1-1, and FB2-1) were collected, extracted, and analyzed for SVOCs using the March 1990 CLP SOW. bis(2-Ethylhexyl)phthalate was detected in FB-02 (12μg/L). No data validation qualifiers were applied, since this SVOC was not detected in the associated environmental samples.

Pesticides/PCBs Analysis--Three field blanks (i.e., FB-01, FB-02, and FB-03) were collected, extracted, and analyzed for pesticides/PCBs using EPA Method 8080. No pesticides or PCBs were detected, and as a result, data validation qualifiers were not applied.

Total Dissolved Solids (TDS) Analysis -- Two field blanks (i.e., FB-01 and FB-02) were collected and analyzed for TDS using EPA Method 160.1. TDS was detected in FB-01 (i.e., 230 mg/L) and FB-02 (i.e., 150 mg/L). As a results data validation qualifiers were applied to MW4-02 (i.e., 620J[FB] mg/L), P-2 (i.e., 610J[FB] mg/L), MW2-01 (i.e., 560J[FB]

Priority Pollutant Metals -- Six field blanks (i.e., FB-1, FB-2, FB-3, FB1-1, FB2-1, and FB4-1) were collected during the Indiana ANGB SI and analyzed by the NET Laboratory for priority pollutant metals. Interferences were detected in all field blanks associated with the environmental samples. As a result, all element concentrations detected in the associated environmental samples were qualified (i.e., "J[FB]") to indicate that the element concentrations were less than five times the concentrations detected in the associated field blanks. These results are presented in the data presentation tables located in Appendix E. However, the potable water used to prepared the field blank is not considered to be a source of the elements detected in these samples nor are the QC blank results considered to have any adverse impact on the environmental data quality.

Total Petroleum Hydrocarbon and Oil and Grease Analyses -- Five field blanks (i.e., FB-01, FB-02, FB-03, FB1-1 and FB2-1) were prepared during the Indiana ANGB SI and analyzed by NET Laboratory for TPH. Two field blanks (i.e., FB2-1 and FB4-1) were prepared during the Indiana ANGB SI and analyzed by NET laboratory for oil and grease. No TPH and oil and grease interferences were detected.

F.2.3 Equipment Blanks

Equipment blanks were prepared for manual and small automated sampling equipment used to collect environmental samples. Equipment blanks were collected each day by pouring ASTM Type II reagent water through a recently decontaminated piece of equipment into a prepared sample container appropriate for the required analysis. Equipment blanks were collected at a rate of 10 percent of the samples collected. Equipment blanks were shipped to the laboratory on alternate days to be analyzed using the methods required for the environmental samples collected on the same day. Table F-2d summarizes the concentrations of the compounds and elements detected in the equipment blanks collected during the Indiana ANGB SI. The following subsections summarize the compounds and elements detected in these blanks and the impact of this interference on the environmental data quality.

Table F-2d. Data Summary: Equipment Blanks (1990) - 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		EW-01	EW-02	EW-03	EW-04	EW-05	EW-06	EW-07	EW-08	EW-09
Laboratory Sample Number		90021710	90021711	90021808	90022314	90022401	90023605	90024901	90025103	90025104
Associated Field QC Samples		NA	NA	NA	NA	NA	NA	NA	NA	NA
Parameter	Units									
Total Petroleum Hydrocarbons	mg/L	1 UJ(HT)	NA	1 UJ(HT)	NA	1 U	NA	1 U	1 U	1 U
Oil And Grease	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH as Gasoline	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH As Diesel	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH As Motor Oil	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS										
Arsenic	μg/L	2.00 UW	NA	2.00 U	NA	2.00 UW	NA	4.30 J(B)	NA	2.00 U
Cadmium	μg/L	2.00 U	NA	2.00 U	NA	2.00 U	NA	2.00 U	NA	2.00 U
Copper	μg/L	10.00 U	NA	10.00 U	NA	10.00 U	NA	10.00 U	NA	10.00 U
Lead	μg/L	1.30 J(MB,B)	NA	1.30 J(MB,B)	NA	8.20 J(MB)	NA	2.10 J(MB,B)	NA	2.30 J(MB,B)
Zinc	μg/L	9.00 J(MB,B)	NA	14.00 J(MB,B)	NA	7.00 U	NA	7.00 U	NA	9.00 J(MB,B)
Total Dissolved Solids	μg/L	NA	NA	NA	NA	NA	NA	NA	50 J(MB)	NA
VOLATILE ORGANIC COMPOUNDS										
Methylene Chloride	μg/L	NA	NA	NA	3 J	NA	5 U	10	4 J	6
Acetone	μg/L	NA	NA	NA	10 U	NA	10 U	21	40	14
Chloroform	μg/L	NA	NA	NA	21	NA	14	25	36	26
TIC Totals	μg/L	NA	NA	NA	0 (0)	NA	0 (0)	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS		ND	NA	ND	NA	ND R(EHT)	NA	ND	NA	ND
TIC Total	μg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
ORGANOCHLORINE PESTICIDES/PCBs		NA	NA	NA	ND	NA	NA	NA	NA	NA

B - the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
EHT - extraction holding time outside control limits
HT - sample analysis holding time greater than control limit
J - estimated value
MB - compound/element was also detected in the associated laboratory method blank
NA - not analyzed
R - rejected value
U - compound/element was included in analysis, but was not detected
W - post-digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85-115%), while sample absorbance is less than 50% of the spike absorbance

Table F-2d. Data Summary: Equipment Blanks (1991) - 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		EB1A-1	EB1-1	EB2-1	EB3-1	EB4-1
Laboratory Sample Number		14266	14265	14361	13179	13194
Associated Field QC Samples						
Parameter	Units					
Total Petroleum Hydrocarbons	mg/L	1 U	1 U	1 U	1 U	NA
Oil And Grease	mg/L	NA	NA	1 U	1 U	NA
TPH as Gasoline	mg/L	NA	NA	NA	NA	NA
TPH As Diesel	mg/L	NA	NA	NA	NA	0.05 U
TPH As Motor Oil	mg/L	NA	NA	NA	NA	0.5 U
METALS						
Arsenic	μg/L	1 U	1 U	1 U	NA	NA
Cadmium	μg/L	1 U	1.8 J(B)	1 U	NA	NA
Copper	μg/L	3.7 J(MB,B)	4.3 J(MB,B)	2 U	NA	NA
Lead	μg/L	1 U	1 U	1 U	NA	1 U
Zinc	μg/L	8.4 J(MB,B)	8.2 J(MB,B)	5 U	NA	NA
VOLATILE ORGANIC COMPOUNDS						
Methylene Chloride	μg/L	3 J	5 U	5 U(MB)	5 U	5 U
Acetone	μg/L	11	10 U	10 U	10 U	10 U
Chloroform	μg/L	5 U	5 U	5 U	5 U	5 U
TIC Totals	μg/L	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
SEMIVOLATILE ORGANIC COMPOUNDS		ND	ND	ND	ND	NA
TIC Total	μg/L	0 (0)	0 (0)	0 (0)	0 (0)	NA
ORGANOCHLORINE PESTICIDES/PCBs		NA	NA	NA	NA	NA

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
NA – not analyzed
ND – not detected
U – compound/element was included in analysis, but was not detected

Volatile Organic Compound Analysis -- Five equipment blanks (i.e., EW-04, EW-06, EW-07, EW-08, and EW-09) were collected and analyzed by NET Laboratory (former SAIC Laboratory) for VOCs using EPA Method 8240. Five equipment blanks (i.e., EB1-1 ~~EB-1~~, EB1A-1, EB3-1, EB4-1, and EB2-1) were collected and analyzed by the NET Laboratory for VOCs using the March 1990 CLP SOW. Methylene chloride was detected in EW-04 (3J μg/L). As a result, data validation qualifier has been applied to the SB-B-02R (6U[EB]) μg/kg) to indicate that the concentration detected in SB-B-02R is less than 10 times than that detected in the EW-04. Methylene chloride was detected in EW-07, EW-09, and EB1A-1. Data validation qualifiers were not applied, since no methylene chloride was detected in the associated environmental samples. Methylene chloride detected in EB2-1 was qualified (i.e., "U[MB]") to indicate that methylene chloride concentration detected in EB2-1 was less than 10 times that detected in the associated laboratory method blank. Acetone was detected in EB1A-1, as a result acetone concentration in SB1-3-1 was qualified (i.e., "U[EB]") to indicate that the acetone concentration in the sample is less than that detected in the associated equipment blank. Chloroform was detected in EW-04 (21 μg/L), EW-06 (14 μg/L), EW-07 (25 μg/L), EW-08 (36 μg/L), and EW-09 (26 μg/L) and acetone was detected in EW-07 (21 μg/L) and EW-09 (14 μg/L). No data validation qualifiers were applied since these VOCs were not detected in the associated environmental samples.

Semivolatile Organic Compound Analysis -- Five equipment blanks (i.e., EW-01, EW-03, EW-05, EW-07, and EW-09) were collected, extracted, and analyzed by the NET Laboratory for SVOCs using EPA Method 8270. Four equipment blanks (i.e., EB1-1, EB1A-1, EB3-1, and EB2-1) were collected, extracted, and analyzed by the NET Laboratory for SVOCs using the March 1990 CLP SOW. No SVOCs were detected.

Pesticides/PCBs Analysis -- One equipment blank (i.e., EW-04) were collected, extracted, and analyzed for organochlorine pesticides and PCBs using EPA Method 8080. No pesticides/PCBs were detected.

Priority Pollutant Metals -- Eight equipment blanks (i.e., EW-01, EW-03, EW-05, EW-07, EW-09, EB1A-1, EB2-1, and EB4-1) were collected and analyzed by the NET

Laboratory for priority pollutant metals. No interferences were detected in these equipment blanks at the concentrations that were greater than 5 times that detected in the associated samples, except sodium in EB1A-1. As a result, sodium concentration detected in the associated sample were qualified (i.e., "J[EB]") to indicate that the sodium concentrations were less than five times the concentrations detected in EB1A-1. These results are presented in the data presentation tables located in Appendix E.

Total Petroleum Hydrocarbon and Oil and Grease Analyses -- Ten equipment blanks (i.e., EW-01, EW-03, EW-05, EW-07, EW-08, EW-09, EB3-1, EB1-1, EB1A-1, and EB2-1) were collected and analyzed by NET Laboratory for TPH. Two equipment blanks (i.e., EB3-1 and EB3-1) were collected and analyzed by NET Laboratory for oil and grease. No TPH and oil and grease interferences were detected.

Total Dissolved Solids (TDS) Analysis -- One equipment blank (i.e., EW-08) was collected and analyzed by NET Laboratory for TDS using EPA Method 160.1. TDS was detected in EW-08 (i.e., 50 mg/L). No data validation qualifiers were applied, since no TDS was detected in the associated environmental samples at the concentration less than 5 times that detected in EW-08.

F.2.4 Field Replicates

One replicate environmental sample was collected for every 10 environmental samples, per matrix, as required by DOE/HWP-6965/R1. The RPD value of each detected compound or element was reviewed to assess the sample collection reproducibility and matrix variability. A total of 78 soil samples (i.e., soil and sediment) and 5 replicate samples, in addition to 13 water and 3 replicate samples were collected. Samples to be analyzed for VOCs were collected during the 1990 field effort in 40-mL vials immediately and the remainder of the split-spoon contents were spread onto a Teflon® board. Samples to be analyzed for SVOCs, pesticides/PCBs, and priority pollutant metals were containerized after the entire split-spoon contents were mixed as thoroughly as possible. Samples were collected in split spoon liners during the 1991 field effort. A 25 and 35 percent RPD reference value for water and soil samples, respectively, was used to determine matrix interferences that could not be overcome values exceeded 25 and 35 RPD for the compounds and elements detected were not qualified. Table F-2e summarize the concentrations of the compounds and elements detected with the soil and groundwater replicate pour collected during the Indian ANGB SI.

Volatile Organic Compound Analysis -- Three soil (i.e., SB1A-1-5, SB1-2-5, and SB1A-3-4) and 1 groundwater (i.e., MW2-01) samples were collected during the Indiana ANGB SI and analyzed for VOCs using the March 1990 EPA CLP SOW. RPD values were not calculated for compounds not detected in both the sample and duplicate sample and for compounds detected at concentrations below the sample detection limit. The RPD values calculated for all other detected compounds were less than the applicable control limit, except toluene in SB1A-3-4 and SB1A-3-4R [141 percent]. As a results, data validation qualifiers (i.e., "J[FR]") have been added to the applicable toluene values presented in the data presentation tables located in the Appendix E to indicate soil matrix variability. The results from re-analyzed SB1-2-5 and SB1-2-5R were used to calculate RPD values.

Semivolatile Organic Analysis--One replicate soil (i.e., SB1-02-03) sample were collected, extracted, and analyzed during the Indiana ANGB SI and analyzed for SVOCs using EPA Method 8270. Four soil samples (i.e., SB1A-3-4, SB1-3-3, SB1A-1-5, and SB1-2-5) and one groundwater samples (i.e., MW2-01) were collected, extracted, and analyzed for SVOCs using the March 1990 EPA CLP SOW. RPD values were not calculated for compounds not detected in both the sample and duplicate sample, for compounds detected in one sample and reported at concentrations below the sample detection limit in the duplicate sample, for compounds commonly considered laboratory contaminants (e.g., phthalates), and for Tentatively Identified Compounds (TICs). Therefore, no RPD values were calculated for SB1A-3-4, SB1A-3-4R, SB1-3-3, SB1-3-3R, SB1A-1-5, SB1-2-5, SB1-2-5R, MW2-01, and MW2-01R. All RPD values were less than the applicable control limit.

Pesticide/PCB Analysis -- No replicate field samples were collected during the Indiana ANGB SI and analyzed for pesticides/PCBs.

Table F–2e. Results of Replicated Soil Sampling and Analysis (1990 and 1991) for 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana

SAIC ID Number		SB1–02–03	SB1–02–03R	SB1–2–5	SB1–2–5R	SB1–3–3	SB1–3–3R
Laboratory Sample Number		90021801	90021802	14352	14353	14261, 14271	14262, 14272
Associated Field QC Samples		FB–01,–02	FB–01,–02	FB2–1	FB2–1	FB1–1	FB1–1
		TB–04	TB–04	TB11–6–91	TB11–6–91	TB–11–05–91	TRIP BLK.
		EW–03,–04	EW–03,–04	EB2–1	EB2–1	EB1–1, 1A–1	EB1–1, 1A–1
Parameter	Units						
Total Petroleum Hydrocarbons	mg/kg	630	10 U	NA	NA	50 U	50 U
INORGANICS							
Antimony	mg/kg	NA	NA	3.3 J(N,B)	3.3 UJ(N)	3.3 UJ(N)	3.4 J(B,N)
Arsenic	mg/kg	NA	NA	7.8 R(N)	6.7 R(N)	3.9 J(*)	5.7 J(*)
Beryllium	mg/kg	1.40	1.20	0.42 J(B)	0.46 J(B)	0.48 J(B)	0.47 J(B)
Cadmium	mg/kg	0.24 J(MB,B)	0.24 U	0.45 J(B)	0.73 J(B)	0.79 J(MB,B)	0.53 J(MB,B)
Chromium	mg/kg	24.60	15.90	16.1	17.3	14.8	15.4
Copper	mg/kg	19.70	31.00	28.2	23	23.1	23.1
Lead	mg/kg	14.00 *	15.80 *	10.9	10.7	26.4	10.5
Mercury	mg/kg	NA	NA	0.1 UJ(HT)	0.11 UJ(HT)	0.11 U	0.1 U
Nickel	mg/kg	23.30	20.10	29.3	30.6	23.6	33.1
Selenium	mg/kg	NA	NA	0.23 U	0.22 U	0.23 UJ(N)	0.23 UJ(N)
Silver	mg/kg	1.30 U	1.30 U	0.46 U	0.47 U	0.47 U	0.46 U
Thallium	mg/kg	NA	NA	0.26 J(MB,B)	0.22 U	0.23 U	0.49 J(MB,B)
Zinc	mg/kg	62.30 J(FB)	49.20 J(FB)	77.2 *	67.7 *	60	62.9
VOLATILE ORGANICS (SOW 3/90)							
Methylene Chloride	µg/kg	NA	NA	56	54	80 U(FB)	NA
Acetone	µg/kg	NA	NA	62 U	62 U	220	NA
Toluene	µg/kg	NA	NA	31 UJ(IS)	140 UJ(IS)	480	NA
TIC Total	µg/kg	NA	NA	0 (0)	0 (0)	0 (0)	NA
SEMIVOLATILE ORGANICS (SOW 3/90)							
Fluoranthene	µg/kg	430 U	270 J	400 R(SSR)	410 R(EHT)	400 U	400 U
Pyrene	µg/kg	430 U	230 J	400 R(SSR)	410 R(EHT)	400 U	400 U
Benzo(b)fluoranthene	µg/kg	430 U	170 J	400 R(SSR)	410 R(EHT)	400 U	400 U
Benzo(k)fluoranthene	µg/kg	430 U	330 J	400 R(SSR)	410 R(EHT)	400 U	400 U
Benzo(a)pyrene	µg/kg	430 U	230 J	400 R(SSR)	410 R(EHT)	400 U	400 U
TIC Total	µg/kg	NA	NA	6540 (14)	13970 (7)	7320 (19)	5910 (15)

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
EHT – extraction holding time outside control limits
FB – compound/element was also detected in the associated field blank
HT – sample analysis holding time greater than control limit
IS – internal standard outside control limits
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
NA – not analyzed
R – rejected value
SSR – sample surrogate recovery outside control limits
U – compound/element was included in analysis, but was not detected
* – duplicate sample analysis outside of control limits

Table F–2e. Results of Replicated Soil Sampling and Analysis (1990 and 1991) for 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		SB1A–1–5	SB1A–1–5R	SB1A–1–5	SB1A–3–4	SB1A–3–4R
Laboratory Sample Number		14348	14349	13293, 14216	14350	14351
Associated Field QC Samples		FB2–1	FB2–1	FB1–1, 2–1	FB2–1	FB2–1
		TB11–6–91	TB11–6–91	TB11–3–91	TB11–6–91	TB11–6–91
Parameter	Units	EB2–1, 4–1	EB2–1	EB1–1, 1A–1, 2–1	EB2–1	EB2–1
Total Petroleum Hydrocarbons	mg/kg	50 U	50 U	50 U	50 U	1 U
INORGANICS						
Antimony	mg/kg	3.3 UJ(N)	3.2 UJ(N)	3.2 UJ(N)	3.3 UJ(N)	3.2 UJ(N)
Arsenic	mg/kg	10.6 R(N)	9 R(N)	7.5	5.7 R(N)	11.8 R(N)
Beryllium	mg/kg	0.6 J(B)	0.61 J(B)	0.5 J(B)	0.45 J(B)	0.54 J(B)
Cadmium	mg/kg	0.23 U	0.34 J(B)	0.92 J(MB,B)	0.71 J(B)	0.46 J(B)
Chromium	mg/kg	19.5	19	17	19.3	17.4
Copper	mg/kg	42.6	25	24 J(N,*)	43.7	24
Lead	mg/kg	11.4	10.8	10.2	13.8	11.9
Mercury	mg/kg	0.12 UJ(HT)	0.11 UJ(HT)	0.1 U	0.1 UJ(HT)	0.1 UJ(HT)
Nickel	mg/kg	30.4	30.2	33.9	30.4	27.9
Selenium	mg/kg	0.23 U	0.23 UW	0.22 U	0.42 J(B)	0.24 UW
Silver	mg/kg	0.47 U	0.46 U	0.45 U	0.46 U	0.46 U
Thallium	mg/kg	0.23 U	0.24 J(MB,B)	0.68 J(B)	1.1 J(MB,B)	0.24 U
Zinc	mg/kg	108 *	70 *	72.7	95.3 (*)	67.2 (*)
VOLATILE ORGANICS (SOW 3/90)						
Methylene Chloride	μg/kg	36	31 U	30 U	66	18 J
Acetone	μg/kg	58 J	60 J	61 U	190	62 U
Toluene	μg/kg	670	440	60	640 J(FR)	110 J(FR)
TIC Total	μg/kg	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
SEMIVOLATILE ORGANICS (SOW 3/90)						
Fluoranthene	μg/kg	410 UJ(EHT)	400 U	410 R(EHT)	410 U	410 UJ(SSR)
Pyrene	μg/kg	410 UJ(EHT)	400 U	410 R(EHT)	410 U	410 UJ(SSR)
Benzo(b)fluoranthene	μg/kg	410 UJ(EHT)	400 U	410 R(EHT)	410 U	410 UJ(SSR)
Benzo(k)fluoranthene	μg/kg	410 UJ(EHT)	400 U	410 R(EHT)	410 U	410 UJ(SSR)
Benzo(a)pyrene	μg/kg	410 UJ(EHT)	400 U	410 R(EHT)	410 U	410 UJ(SSR)
TIC Total	μg/kg	4990 (15)	20320 (19)	12600 (20)	7610 (18)	6240 (13)

of the spike absorbance

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)
EHT – extraction holding time outside control limits
FR – field replicate relative percent differences (RPDs) outside control limits
HT – sample analysis holding time greater than control limit
J – estimated value
MB – compound/element was also detected in the associated laboratory method blank
N – spiked sample recovery outside of control limits
R – rejected value
SSR – sample surrogate recovery outside control limits
U – compound/element was included in analysis, but was not detected
W – post–digestion spike for Graphite Furnace Atomic Absorption (GFAA) analysis is out of control limits (85–115%), while sample absorbance is less than 50%
* – duplicate sample analysis outside of control limits

Table F–2e. Results of Replicated Groundwater Sampling and Analysis (1991) for 122nd Tactical Fighter Wing, Indiana Air National Guard, Ft. Wayne, Indiana (Continued)

SAIC ID Number		MW2–01	MW2–01R	MW4–02	MW4–02R
Laboratory Sample Number		14355	14356	14358	14359
Associated Field QC Samples		FB2–1	FB2–1	FB2–1	FB2–1
		TB11–6–91	TB11–6–91	TB11–6–91	TB11–6–91
Parameter	Units	EB2–1	EB2–1	EB2–1	EB2–1
Oil And Grease	mg/L	1 U	3	NA	NA
Total Petroleum Hydrocarbons	mg/L	1 U	1 U	NA	NA
TPH as Gasoline	mg/L	NA	NA	0.05 U	0.05 U
TPH As Diesel	mg/L	NA	NA	0.05 U	0.05 U
TPH As Motor Oil	mg/L	NA	NA	0.5 U	0.5 U
INORGANICS					
Antimony	μg/L	14 UJ(N)	17 J(N,B)	NA	NA
Arsenic	μg/L	24.8	23.3	NA	NA
Beryllium	μg/L	1.8 J(B)	1.5 J(B)	NA	NA
Chromium	μg/L	69.1	60.2	NA	NA
Copper	μg/L	82.3	74.9	NA	NA
Lead	μg/L	43.4	39	10.2	11.6
Nickel	μg/L	76.8	68.4	NA	NA
Zinc	μg/L	179	165	NA	NA
VOLATILEORGANICS(SOW 3/90)		ND	ND	NA	NA
SEMIVOLATILEORGANICS(SOW 3/90)					
TIC Total	μg/L	19 (1)	8 (2)	NA	NA

B – the reported value is estimated because it is greater than the Instrument Detection Limit (IDL), but less than the Contract Required Detection Limit(CRDL)

J – estimated value

N – spiked sample recovery outside of control limits

NA – not analyzed

ND – not detected

U – compound/element was included in analysis, but was not detected

Priority Pollutant Metals -- Five replicate soil (i.e., SB1-02-03, SB1-3-3, SB1A-1-5, SB1-2-5, and SB1A-3-4) and 2 groundwater (i.e., MW4-02 and MW2-01) samples were collected during Indiana ANGB SI and analyzed for priority pollutant metals using the EPA solid waste methods cited in Section F.3. RPD values were not calculated for those elements that were not detected in both the sample and duplicate sample, for elements that were detected in one sample and not detected in the duplicate sample. All RPD values were within control limits (i.e., 30 and 50 percent for water and soil samples, respectively) for all element concentrations greater than five times the CRDL in both the sample and duplicate sample, except for lead in (86 percent) in SB1-3-3 and SB1-3-3R. As a result data validation qualifiers were applied (i.e., "J[FR]") to the applicable lead values presented in the data presentation tables located in Appendix E to indicate this matrix variability.

The CRDL criteria were met for all elements detected in concentrations less than five times the CRDL in the sample or in the duplicate samples, or in both the sample and duplicate samples.

Total Petroleum Hydrocarbon and Oil and Grease Analyses -- Seventy soil samples, 2 sediment samples and 11 groundwater samples were collected during the Indiana ANGB SI and analyzed for TPH using EPA Method 418.1. Five soil samples (i.e., SB1-02-03, SB1-3-3, SB1A-1-5, SB1A-3-4, and SB1-2-5) and one groundwater sample (i.e., MW2-01) was collected in duplicate. Five soil samples and 2 groundwater samples were collected during Indiana ANGB SI and analyzed for oil and grease using EPA Method 413.2. One groundwater sample (i.e., MW2-01) was collected in duplicate. No soil samples were collected in duplicate and analyzed for oil and grease. RPD values were not calculated for TPH that was not detected in both sample and duplicate or for the TPH detected in one sample and not in the duplicate sample. Therefore, RPD values were not calculated for the soil or groundwater samples.

Total Dissolved Solids (TDS) Analysis -- No replicate field samples were collected during the Indiana ANGB SI and analyzed for TDS.

F.3 LABORATORY QUALITY CONTROL ASSESSMENT

All soil and groundwater samples collected at the Indiana ANGB were analyzed using the March 1990 EPA CLP SOW for GC/MS analyses described in the *Statement Of Work For Organic Analysis, Multi-Media, Multi-Concentration*, EPA CLP, March 1990 (VOCs and SVOCs) and *Test Methods For Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, September 1986, with 1989 revisions (pesticides/PCBs, chlorinated herbicides, and priority pollutant metals). HAZWRAP Level C documentation was required and submitted by the NET Laboratory for all analyses. All data were validated and qualified using the guidelines and specifications described in *Laboratory Data Validation Functional Guidelines For Evaluating Organics Analyses*, EPA CLP, February 1988 (VOCs, SVOCs, and pesticides/PCBs ~~and chlorinated herbicides~~) and *Laboratory Data Validation Functional Guidelines For Evaluating Inorganics Analyses*, EPA CLP, February 1988 (priority pollutant metals).

All descriptive data validation qualifiers applied to the reported values by the laboratory are reported in parentheses. Each data point has been assessed to determine whether the value is considered usable (i.e., no qualifier), usable but estimated (i.e., "J"), or not usable (i.e., "R"). All usability qualifiers are followed by the applicable laboratory or field QC qualifier, presented in parentheses and defined in the table footnotes. Usability qualifiers were not applied to values qualified by the laboratory, but were not considered to have adversely impacted by the applicable laboratory QC result (e.g., duplicate and matrix spike analysis), as per EPA CLP validation guidelines. All laboratory and data validation qualifiers used were applied to all data (i.e., detected and nondetected values), as necessary, on the comprehensive data presentation tables located in Appendix G and to the appropriate detected values summarized in the data tables presented within the SI report text. All qualifiers are defined at the bottom of each table presenting analytical data.

For the purposes of the SI, VOC TICs and SVOC TICs that could not be directly attributed to laboratory method blank or field QC blank interference were used to indicate contamination resulting from past JP-4 use at the applicable site. All TIC concentrations were added together and reported in the Section F3 data validation worksheets ~~summary data tables~~

and the Appendix E presentation data tables as a single estimated value. The number of individual compounds detected was presented in parentheses adjacent to the cumulative concentration.

F.3.1 Organic Analyses

Soil and groundwater samples and field QC blanks (i.e., field blanks, equipment blanks, and trip blanks [VOC analysis only]) collected during the Indiana ANGB SI were submitted to the NET Laboratory (former SAIC Laboratory) for VOC and SVOC analyses using EPA SW 8240 and 8270, respectively, and the March 1990 CLP SOW. Also, NET Laboratory was required to perform aromatic volatile (BTEX) analyses using EPA SW 8020 and pesticide/PCB analyses using EPA SW 8080. A data quality assessment is presented in the following subsections.

F.3.1.1 Volatile Organic Compound Analysis (EPA Method 8240 and March 1990 SOW)

Fourteen soil samples, 7 groundwater samples, and 19 field QC blanks (i.e., trip blanks, field blanks, and equipment blanks) were collected and submitted for VOCs analyses using EPA Method 8240. Forty soil samples, 2 sediment samples, 6 groundwater samples and 15 field QC (i.e., trip blanks, field blanks, and equipment blanks) were collected and analyzed for VOCs by the NET Laboratory using the March 1990 CLP SOW. Data quality was evaluated using the guidelines and control limits specified for holding times, tuning and mass calibration results, initial and continuing calibration verification, method blank spike, method blank, surrogate recovery, internal standard area, and MS/MSD results. A presentation of the significant qualified sample results follows the laboratory QC results discussion. The VOC data validation worksheets are presented in Tables F-3.

Holding Times -- Holding times were defined as the maximum amount of time allowed to elapse between the date and time of sample collection and the date and time of sample analysis. The NET Laboratory was required by the SOW prepared for the SI to meet holding times of 7 days for unpreserved water samples, 14 days for preserved (i.e., sufficient hydrochloric acid to lower the pH to 2) water samples, and 14 days for soil samples collected for VOC analysis. Preservation information was either listed on the chain-of-custody forms completed during the SI or the field logbooks were consulted to verify that each water sample

Table F-3a. Data Validation Tables: Volatile Organic Compounds

SAIC Sample Number	Laboratory Identification Number	Collection Date	Analysis Date	Volatile Surrogate Recovery	Volatile MS/MSD Analyses	Volatile Blank Analyses	Laboratory Check Sample Evaluation	Volatile Tuning/Mass Calibration	Initial Calibration Check
WATERS									
VBSEP5	VBSEP5	NA	9/05/90	All OK	ALL	NONE DETECTED		ALL BFB	9/05/90 (CASE # VW030)
FB-01	90021708	8/28/90	9/05/90		WITHIN	TIC TOTAL=0		CRITERIA	DAILY TUNE IN CONTROL:
FB-02	90021709	8/28/90	9/05/90		LIMITS			WITHIN	ALL SPCC RRF > 0.300
								CONTROL	TBME > 0.250
								LIMITS	CCC %RSD < 30%
TB-01	90021712	8/27/90	9/05/90						
TB-02	90021713	8/27/90	9/05/90						
TB-03	90021714	8/28/90	9/05/90						
TB-03 MS	90021714 MS	8/28/90	9/05/90						
TB-03 MSD	90021714 MSD	8/28/90	9/05/90						
WATERS									
VBSEP6	VBSEP6	NA	9/06/90	All OK		NONE DETECTED		ALL BFB	
TB-04	90021807	8/29/90	9/06/90			TIC TOTAL=0		CRITERIA	
								WITHIN	
								CONTROL	
								LIMITS	
WATERS									
VBSEP12	VBSEP12	NA	9/12/90	All OK		NONE DETECTED		ALL BFB	
EW-04	90022314	8/30/90	9/12/90			TIC TOTAL=0		CRITERIA	
TB-05	90022315	8/30/90	9/12/90					WITHIN	
								CONTROL	
								LIMITS	
WATERS									
VBSEP17	VBSEP17	NA	9/17/90	All OK		NONE DETECTED		ALL BFB	
EW-06	90023605	9/08/90	9/17/90			TIC TOTAL=0		CRITERIA	
FB-03	90023606	9/11/90	9/17/90					WITHIN	
TB-07	900236TB	9/08/90	9/17/90					CONTROL	
								LIMITS	

Table F-3a. Data Validation Tables: Volatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Continuing Calibration Check	Volatile Internal Standard	Field Blank Analysis	Trip Blank Analysis	Equipment Blank Analysis
WATERS						
VBSEP5	VBSEP5	9/05/90 (CASE # VW030)	ALL AREAS AND	NA	NA	NA
FB-01	90021708	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	NA	NA	NA
FB-02	90021709	ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS	NA	NA	NA
		TBME > 0.250				
		CCC %D < 25%				
TB-01	90021712			NA	NA	NA
TB-02	90021713			NA	NA	NA
TB-03	90021714			NA	NA	NA
TB-03 MS	90021714 MS			NA	NA	NA
TB-03 MSD	90021714 MSD			NA	NA	NA
WATERS						
VBSEP6	VBSEP6	9/06/90 (CASE # VW030)	ALL AREAS AND	NA	NA	NA
TB-04	90021807	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	NA	NA	NA
		ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS			
		TBME > 0.250				
		CCC %D < 25%				
WATERS						
VBSEP12	VBSEP12	9/12/90 (CASE # VW030)	ALL AREAS AND	NA	NA	NA
EW-04	90022314	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	NA	NA	NA
TB-05	90022315	ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS	NA	NA	NA
		TBME > 0.250				
		CCC %D < 25%				
WATERS						
VBSEP17	VBSEP17	9/17/90 (CASE # VW030)	ALL AREAS AND	NA	NA	NA
EW-06	90023605	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	NA	NA	NA
FB-03	90023606	ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS	NA	NA	NA
TB-07	900236TB	TBME > 0.250		NA	NA	NA
		CCC %D < 25%				

Table F-3a. Data Validation Tables: Volatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Tentatively Identified Compounds	Data Qualifiers
WATERS				
VBSEP5	VBSEP5	None Detected	0 (0)	
FB-01	90021708	None Detected	0 (0)	None Applied
FB-02	90021709	CDS=6/DCA11=5/TCLME=7/DCPA12=5/ DCPEc13=3J/TCE=10/BZ=6/PCA=5/BZME=6/ CLBZ=5/STY=5/XYLENES=51/ TCPA123=5J µg/L	0 (0)	None Applied
TB-01	90021712	CDS=3J/BZ=4J/XYLENES=27 µg/L	0 (0)	None Applied
TB-02	90021713	CDS=4J/BZ=3J/XYLENES=20 µg/L	0 (0)	None Applied
TB-03	90021714	BZ=3J/XYLENES=15 µg/L	0 (0)	None Applied
TB-03 MS	90021714 MS	Not Applicable	Data Not Provided	Not Applicable
TB-03 MSD	90021714 MSD	Not Applicable	Data Not Provided	Not Applicable
WATERS				
VBSEP6	VBSEP6	None Detected	0 (0)	
TB-04	90021807	MTLNCL=150 µg/L	0 (0)	None Applied
WATERS				
VBSEP12	VBSEP12	None Detected	0 (0)	
EW-04	90022314	MTLNCL=3J/TCLME=21 µg/L	0 (0)	None Applied
TB-05	90022315	MTLNCL=3J µg/L	0 (0)	None Applied
WATERS				
VBSEP17	VBSEP17	None Detected	0 (0)	
EW-06	90023605	TCLME=14 µg/L	0 (0)	None Applied
FB-03	90023606	MTLNCL=4J/ACE=32/TCLME=26 µg/L	0 (0)	None Applied
TB-07	900236TB	MTLNCL=43 µg/L	0 (0)	None Applied

Table F-3b. Data Validation Tables: Volatile Organic Compounds

SAIC Sample Number	Laboratory Identification Number	Collection Date	Analysis Date	Volatile Surrogate Recovery	Volatile MS/MSD Analyses	Volatile Blank Analyses	Laboratory Check Sample Evaluation	Volatile Tuning/Mass Calibration	Initial Calibration Check
WATERS									
VBSEP19	VBSEP19	NA	9/19/90	All OK		NONE DETECTED	(*) ALL	ALL BFB	9/19/90 (CASE # VW030)
MW4-02	90023901	9/12/90	9/19/90			TIC TOTAL=0	PARAMETERS	CRITERIA	DAILY TUNE IN CONTROL:
TB-08	90023902	9/12/90	9/19/90				WITHIN CONTROL	WITHIN	ALL SPCC RRF > 0.300
LCS_VW030	LCS_VW030	NA	9/19/90				LIMITS	CONTROL	TBME > 0.250
								LIMITS	CCC %RSD < 30%
WATERS									
VBSEP22	VBSEP22	NA	9/22/90	All OK		NONE DETECTED		ALL BFB	
P-2	90024801	9/13/90	9/22/90			TIC TOTAL=0		CRITERIA	
*TB-09	90024802	9/13/90	9/22/90					WITHIN	
								CONTROL	
								LIMITS	
WATERS									
VBSEP24	VBSEP24	NA	9/24/90	All OK	ALL	NONE DETECTED	(*) ALL	ALL BFB	9/19/90 (CASE # VW044)
EW-07	90024901	9/14/90	9/24/90		WITHIN		PARAMETERS	CRITERIA	DAILY TUNE IN CONTROL:
MW2-01	90024902	9/14/90	9/24/90		LIMITS		WITHIN CONTROL	WITHIN	ALL SPCC RRF > 0.300
TB-10	90024903	9/14/90	9/24/90				LIMITS	CONTROL	TBME > 0.250
TB-11	90024904	9/14/90	9/24/90					LIMITS	CCC %RSD < 30%
MW1-02	90025101	9/14/90	9/24/90						
MW1-01	90025102	9/15/90	9/24/90						
EW-08	90025103	9/15/90	9/24/90						
TB-11 MS	90024904 MS	9/14/90	9/24/90						
TB-11 MSD	90024904 MSD	9/14/90	9/24/90						
VW044_LCS	VW044_LCS	NA	9/24/90						
WATERS									
VBSEP25	VBSEP25	NA	9/25/90	All OK		NONE DETECTED		ALL BFB	
EW-09	90025104	9/16/90	9/25/90					CRITERIA	
P-8	90025105	9/16/90	9/25/90					WITHIN	
HT-01	90025106	9/16/90	9/25/90					CONTROL	
TB-12	90025107	9/16/90	9/25/90					LIMITS	

Table F-3b. Data Validation Tables: Volatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Continuing Calibration Check	Volatile Internal Standard	Field Blank Analysis	Trip Blank Analysis	Equipment Blank Analysis
WATERS						
VBSEP19	VBSEP19	9/19/90 (CASE # VW030)	ALL AREAS AND	NA	NA	NA
MW4-02	90023901	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	FB-03	TB-08	EW-06
TB-08	90023902	ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS	NA	NA	NA
LCS_VW030	LCS_VW030	TBME > 0.250		NA	NA	NA
		CCC %D < 25%				
WATERS						
VBSEP22	VBSEP22	9/22/90 (CASE # VW030)	ALL AREAS AND	NA	NA	NA
P-2	90024801	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	FB-03	TB-09	EW-06
*TB-09	90024802	ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS	NA	NA	NA
		TBME > 0.250				
		CCC %D < 25%				
WATERS						
VBSEP24	VBSEP24	9/24/90 (CASE # VW044)	ALL AREAS AND	NA	NA	NA
EW-07	90024901	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	NA	NA	NA
MW2-01	90024902	ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS	FB-03	TB-11	EW-07
TB-10	90024903	TBME > 0.250		NA	NA	NA
TB-11	90024904	CCC %D < 25%		NA	NA	NA
MW1-02	90025101			FB-03	TB-11	EW-08
MW1-01	90025102			FB-03	TB-11	EW-08
EW-08	90025103			NA	NA	NA
TB-11 MS	90024904 MS			NA	NA	NA
TB-11 MSD	90024904 MSD			NA	NA	NA
VW044_LCS	VW044_LCS			NA	NA	NA
WATERS						
VBSEP25	VBSEP25	9/25/90 (CASE # VW044)	ALL AREAS AND	NA	NA	NA
EW-09	90025104	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	NA	NA	NA
P-8	90025105	ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS	FB-03	TB-12	EW-09
HT-01	90025106	TBME > 0.250		NA	NA	NA
TB-12	90025107	CCC %D < 25%		NA	NA	NA

Table F–3b. Data Validation Tables: Volatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Tentatively Identified Compounds	Data Qualifiers
WATERS				
VBSEP19	VBSEP19	None Detected	0 (0)	
MW4–02	90023901	MTLNCL=2J μg/L	0 (0)	MTLNCL=5U(TB)
TB–08	90023902	MTLNCL=4J μg/L	0 (0)	None Applied
LCS_VW030	LCS_VW030	Not Applicable	NA	None Applied
WATERS				
VBSEP22	VBSEP22	None Detected	0 (0)	
P–2	90024801	MTLNCL=4J μg/L	0 (0)	MTLNCL=5U(TB)
*TB–09	90024802	MTLNCL=24 μg/L	0 (0)	None Applied
WATERS				
VBSEP24	VBSEP24	None Detected	Not Performed	
EW–07	90024901	MTLNCL=10/ACE=21/TCLME=25 μg/L	Not Performed	None Applied
MW2–01	90024902	MTLNCL=5 μg/L	Not Performed	MTLNCL=5U(TB)
TB–10	90024903	MTLNCL=29 μg/L	Not Performed	None Applied
TB–11	90024904	MTLNCL=23 μg/L	Not Performed	None Applied
MW1–02	90025101	None Detected	Not Performed	None Applied
MW1–01	90025102	None Detected	Not Performed	None Applied
EW–08	90025103	MTLNCL=4J/ACE=40/TCLME=36 μg/L	Not Performed	None Applied
TB–11 MS	90024904 MS	Not Applicable	Not Analyzed	Not Applicable
TB–11 MSD	90024904 MSD	Not Applicable	Not Analyzed	Not Applicable
VW044_LCS	VW044_LCS	Not Applicable	NA	None Applied
WATERS				
VBSEP25	VBSEP25	None Detected	Not Performed	
EW–09	90025104	MTLNCL=6/ACE=14/TCLME=26 μg/L	Not Performed	None Applied
P–8	90025105	None Detected	Not Performed	None Applied
HT–01	90025106	None Detected	Not Performed	None Applied
TB–12	90025107	MTLNCL=4J μg/L	Not Performed	None Applied

Table F-3c. Data Validation Tables: Volatile Organic Compounds

SAIC Sample Number	Laboratory Identification Number	Collection Date	Analysis Date	Volatile Surrogate Recovery	Volatile MS/MSD Analyses	Volatile Blank Analyses	Laboratory Check Sample Evaluation	Volatile Tuning/Mass Calibration	Initial Calibration Check
SOILS									
VBSEP6	VBSEP6	NA	9/06/90	ALL SURROGATES OK EXCEPT BFB IN SB-B-02 (71%) AND SB2-01-19 (72%); AND TOL IN SB2-01-19 (131%)		NONE DETECTED TIC TOTAL=0		ALL BFB CRITERIA WITHIN CONTROL LIMITS	8/31/90 (CASE # VS033) DAILY TUNE IN CONTROL: ALL SPCC RRF > 0.300 TBME > 0.250 CCC %RSD < 30%
SB-B-02	90021707	8/28/90	9/06/90						
SB2-01-01	90021804	8/29/90	9/06/90						
SB2-01-02	90021805	8/29/90	9/06/90						
SB2-01-19	90021806	8/29/90	9/06/90						
SOILS									
VBSEP7	VBSEP7	NA	9/07/90	All OK	ALL WITHIN LIMITS	NONE DETECTED TIC TOTAL=0	CTCL BELOW CONTROL LIMIT; ALL OTHER PARAMETERS WITHIN LIMITS	ALL BFB CRITERIA WITHIN CONTROL LIMITS	
SB2-02-01	90022301	8/30/90	9/07/90						
SB2-03-01	90022302	8/30/90	9/07/90						
SB2-04-01	90022303	8/30/90	9/07/90						
SB2-04-01 MS	90022303 MS	8/30/90	9/07/90						
SB2-04-01 MSD	90022303 MSD	8/30/90	9/07/90						
LCS_VSO33	LCS_VSO33	NA	9/07/90						
SOILS									
VBSEP10	VBSEP10	NA	9/10/90	ALL SURROGATES OK EXCEPT TOL IN SB-B-02R (122%) AND SB2-01-19R (136%); AND BFB IN SB2-01-19R (72%)		NONE DETECTED TIC TOTAL=0		ALL BFB CRITERIA WITHIN CONTROL LIMITS	
SB-B-02Re	90021707R	8/28/90	9/10/90						
SB2-01-19Re	90021806R	8/29/90	9/10/90						
SOILS									
VBSEP14	VBSEP14	NA	9/14/90	ALL SURROGATES OK EXCEPT TOL IN SB1-04-02 (128%)	ALL WITHIN LIMITS	NONE DETECTED TIC TOTAL=0		ALL BFB CRITERIA WITHIN CONTROL LIMITS	
SB1-04-01	90023601	9/08/90	9/14/90						
SB1-04-02	90023602	9/08/90	9/14/90						
SB1-04-03	90023603	9/08/90	9/14/90						
SB1-04-04	90023604	9/08/90	9/14/90						
SB1-04-04 MS	90023604 MS	9/08/90	9/14/90						
SB1-04-04 MSD	90023604 MSD	9/08/90	9/14/90						
SOILS									
VBSEP20	VBSEP20	NA	9/20/90	All OK		NONE DETECTED TIC TOTAL=0		ALL BFB CRITERIA WITHIN CONTROL LIMITS	9/19/90 (CASE # VS033) DAILY TUNE IN CONTROL: ALL SPCC RRF > 0.300 TBME > 0.250 CCC %RSD < 30%
SB1-04-02Re	90023602R	9/08/90	9/20/90						

Table F–3c. Data Validation Tables: Volatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Continuing Calibration Check	Volatile Internal Standard	Field Blank Analysis	Trip Blank Analysis	Equipment Blank Analysis
SOILS						
VBSEP6	VBSEP6	9/06/90 (CASE # VS033)	SB–B–02 BELOW AREA	NA	NA	NA
SB–B–02	90021707	DAILY TUNE IN CONTROL:	CONTROL LIMIT FOR CBZ;	FB–02	TB–02	EW–04
		ALL SPCC RRF50 > 0.300	SB2–01–19 BELOW AREA			
SB2–01–01	90021804	TBME > 0.250	CONTROL LIMITS FOR	FB–02	TB–04	EW–04
SB2–01–02	90021805	CCC %D < 25%	BCM, DFB, AND CBZ;	FB–02	TB–04	EW–04
			ALL OTHER AREAS AND			
SB2–01–19	90021806		RETENTION TIMES WERE	FB–02	TB–04	EW–04
			WITHIN CONTROL LIMITS			
SOILS						
VBSEP7	VBSEP7	9/07/90 (CASE # VS033)	ALL AREAS AND	NA	NA	NA
SB2–02–01	90022301	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	FB–02	TB–05	EW–04
SB2–03–01	90022302	ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS	FB–02	TB–05	EW–04
SB2–04–01	90022303	TBME > 0.250		FB–02	TB–05	EW–04
		CCC %D < 25%				
SB2–04–01 MS	90022303 MS			FB–02	TB–05	EW–04
SB2–04–01 MSD	90022303 MSD			FB–02	TB–05	EW–04
LCS_VSO33	LCS_VSO33			NA	NA	NA
SOILS						
VBSEP10	VBSEP10	9/10/90 (CASE # VS033)	SB–B–02R AND SB2–01–19R	NA	NA	NA
SB–B–02Re	90021707R	DAILY TUNE IN CONTROL:	BELOW AREA CONTROL	FB–02	TB–02	EW–04
		ALL SPCC RRF50 > 0.300	LIMITS FOR DFB AND			
		TBME > 0.250	CBZ; ALL OTHER AREAS			
SB2–01–19Re	90021806R	CCC %D < 25%	AND RETENTION TIMES	FB–02	TB–04	EW–04
			WERE WITHIN CONTROL			
			LIMITS			
SOILS						
VBSEP14	VBSEP14	9/14/90 (CASE # VS033)	SB1–04–02 BELOW AREA	NA	NA	NA
SB1–04–01	90023601	DAILY TUNE IN CONTROL:	CONTROL LIMIT FOR CBZ;	FB–03	TB–07	EW–06
SB1–04–02	90023602	ALL SPCC RRF50 > 0.300	ALL OTHER AREAS AND	FB–03	TB–07	EW–06
		TBME > 0.250	RETENTION TIMES WERE			
SB1–04–03	90023603	CCC %D < 25%	WITHIN CONTROL LIMITS	FB–03	TB–07	EW–06
SB1–04–04	90023604			FB–03	TB–07	EW–06
SB1–04–04 MS	90023604 MS			FB–03	TB–07	EW–06
SB1–04–04 MSD	90023604 MSD			FB–03	TB–07	EW–06
SOILS						
VBSEP20	VBSEP20	9/20/90 (CASE # VS033)	ALL AREAS AND	NA	NA	NA
SB1–04–02Re	90023602R	DAILY TUNE IN CONTROL:	RETENTION TIMES WERE	FB–03	TB–07	EW–06
		ALL SPCC RRF50 > 0.300	WITHIN CONTROL LIMITS			
		TBME > 0.250				
		CCC %D < 25%				

Table F-3c. Data Validation Tables: Volatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Tentatively Identified Compounds	Data Qualifiers
SOILS				
VBSEP6	VBSEP6	None Detected	0 (0)	
SB-B-02	90021707	BZME=180 μg/Kg	0 (0)	HXO2,4ME2PENT,PCE,CLBZ,EBZ,STY,XYLENES/TCA112=UJ(SSR,IS)/ BZME=180J(SSR,IS)/All other compounds=UJ(SSR)
SB2-01-01	90021804	BZME=38 μg/Kg	0 (0)	BZME=38U(FB)
SB2-01-02	90021805	BZ=6/4ME2PENT=34/BZME=45/EBZ=16/ XYLENES=190 μg/Kg	0 (0)	BZ=6U(FB)/BZME=45U(FB)
SB2-01-19	90021806	BZME=100 μg/Kg	0 (0)	BZME=100J(SSR,IS)/All other compounds=UJ(SSR,IS)
SOILS				
VBSEP7	VBSEP7	None Detected	0 (0)	
SB2-02-01	90022301	MTLNCL=14 μg/Kg	0 (0)	MTLNCL=14U(TB)
SB2-03-01	90022302	MTLNCL=16/ACE=70/BZME=15 μg/Kg	0 (0)	MTLNCL=16U(TB)/BZME=15U(FB)
SB2-04-01	90022303	MTLNCL=84/ACE=820/HXO2=1100/BZME=91/ XYLENES=140 μg/Kg	0 (0)	None Applied
SB2-04-01 MS	90022303 MS	Not Applicable	Not Analyzed	Not Applicable
SB2-04-01 MSD	90022303 MSD	Not Applicable	Not Analyzed	Not Applicable
LCS_VSO33	LCS_VSO33	Not Applicable	NA	None Applied
SOILS				
VBSEP10	VBSEP10	None Detected	0 (0)	
SB-B-02Re	90021707R	MTLNCL=5J/BZME=120 μg/Kg	0 (0)	MTLNCL=6UJ(EB,SSR)/BZME=120J(SSR,IS)/All other compounds except CLME,BRME, VC,CLEA,ACE,CDS,DCE11,DCA11,DCE12,TCLME,DCA12,MEK=UJ(IS)/ All compounds except MTLNCL and BZME=UJ(SSR)
SB2-01-19Re	90021806R	MTLNCL=21/BZME=240 μg/Kg	0 (0)	MTLNCL=21UJ(TB,SSR)/All compounds except MTLNCL and BZME=UJ(SSR)/ BZME=240J(SSR,IS)/All compounds except CLME,BRME,VC,CLEA,ACE,CDS,DCE11, DCA11,DCE12,TCLME,DCA12,MEK=UJ(IS)
SOILS				
VBSEP14	VBSEP14	None Detected	0 (0)	
SB1-04-01	90023601	BZME=80 μg/Kg	0 (0)	None Applied
SB1-04-02	90023602	BZME=270E μg/Kg	0 (0)	All compounds except BZME=UJ(SSR)/BZME=270J(SSR,IS)/HXO2,4ME2PENT,PCE,PCA, CLBZ,EBZ,STY,XYLENES/TCA112=UJ(IS)
SB1-04-03	90023603	BZ=10/BZME=67 μg/Kg	0 (0)	None Applied
SB1-04-04	90023604	BZME=350/EBZ=93 μg/Kg	0 (0)	None Applied
SB1-04-04 MS	90023604 MS	Not Applicable	Not Analyzed	Not Applicable
SB1-04-04 MSD	90023604 MSD	Not Applicable	Not Analyzed	Not Applicable
SOILS				
VBSEP20	VBSEP20	None Detected	0 (0)	
SB1-04-02Re	90023602R	MTLNCL=5J/BZME=240 μg/Kg	0 (0)	MTLNCL=6U(TB)

Footnotes to Tables F–3a through F–3c.

* – On the Chain of Custody form, this sample was incorrectly identified as TB–08.

Note: Tentatively Identified Compound (TIC) analyses were not requested for VOC samples. The laboratory, however, performed this analysis for some of the samples. Before all of the VOCs were analyzed, though, the laboratory personnel discovered their error and did not perform TIC analyses for the remaining VOC samples. The results for these samples are denoted in the TIC column as "Not Performed."

NA – Not Applicable

Control Limits for Water VOC Surrogate Recoveries
- d8–Toluene (TOL): 88–110
- Bromofluorobenzene (BFB): 86–115
- d4–1,2–Dichloroethane (DCE): 76–114

Control Limits for Soil VOC Surrogate Recoveries
- d8–Toluene (TOL): 81–117
- Bromofluorobenzene (BFB): 74–121
- d4–1,2–Dichloroethane (DCE): 70–121

Control Limits for Water VOC MS/MSD Percent Recoveries
- 1,1–Dichloroethene (DCE11): 61–145, %RPD= 14
- Trichloroethene (TCE): 71–120, %RPD= 14
- Benzene (BZ): 76–127, %RPD= 11
- Toluene (BZME): 76–125, %RPD= 13
- Chlorobenzene (CLBZ): 75–130, %RPD= 13

Control Limits for Soil VOC MS/MSD Percent Recoveries
- 1,1–Dichloroethene (DCE11): 59–172, %RPD= 22
- Trichloroethene (TCE): 62–137, %RPD= 24
- Benzene (BZ): 66–142, %RPD= 21
- Toluene (BZME): 59–139, %RPD= 21
- Chlorobenzene (CLBZ): 60–133, %RPD= 21

Control Limits for Soil VOC LCS Evaluations
- Methylene chloride (MTLNCL): 8.1–47
- Chloroform (TCLME): 7–13
- Carbon tetrachloride (CTCL): 19–32
- 1,1,2–Trichloroethane (TCA112): 30–78
- Benzene (BZ): 40–140
- Bromoform (TBME): 11–39
- Chlorobenzene (CLBZ): 21–77

Tuning and mass calibration performed with Bromofluorobenzene (BFB).

System Performance Check Compounds (SPCCs):
Chloromethane (CLME), 1,1–Dichloroethane (DCA11), Bromoform (TBME), 1,1,2,2–Tetrachloroethane (PCA), and Chlorobenzene (CLBZ).

Calibration Check Compounds (CCCs):
Vinyl Chloride (VC), 1,1–Dichloroethene (DCE11), Chloroform (TCLME), 1,2–Dichloropropane (DCPA12), Toluene (BZME), and Ethylbenzene (EBZ).

Volatile Internal Standard Area Summary Compounds:
- Bromochloromethane (BCM)
- 1,4–Difluorobenzene (DFB)
- Chlorobenzene (CBZ)

Significant sample result data qualifiers:
- E – analyte present in concentrations above the calibration range of the instrument.
- J – analyte present between lower detection limit of instrument and lower quantitation limit.
- B – analyte present in the method blank as well in the sample.

Table F-3d. Volatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Analyzed	Volatile Surrogate Recovery	Volatile MS/MSD Analyses	Volatile Blank Analyses	Volatile Tuning/Mass Calibration	Volatile Internal Standards
WATERS								
VBLK1	VBNOV8	NA	11/08/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR WATER SAMPLES	MW1-02 ALL RECOVERY AND DIFFERENCE VALUES WITHIN LIMITS	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN2: 11/08/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
EB1-1	14265	11/05/91	11/08/91					
EB1A-1	14266	11/05/91	11/08/91					
EB3-1	13179	10/31/91	11/08/91					
EB4-1	13194	11/01/91	11/08/91					
FB4-1	13195	11/01/91	11/08/91					
MW1-02	14267	11/05/91	11/08/91					
TB10-30-91	13113	10/30/91	11/08/91					
TB10-31-91	13180	10/31/91	11/08/91					
TB11-1-91	13196	11/01/91	11/08/91					
TB11-05-91	14268	11/05/91	11/08/91					
MW1-02 MS	14267 MS	11/05/91	11/08/91					
MW1-02 MSD	14267 MSD	11/05/91	11/08/91					
WATERS								
VBLK2	VBNOV15	NA	11/15/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR WATER SAMPLES	(SEE ANALYSES FOR MW1-02)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN2: 11/15/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
FB1-1	13299	11/04/91	11/15/91					
GW1-1	13300	11/02/91	11/15/91					
TB11-03-91	13301	11/03/91	11/15/91					
WATERS								
VBLK3	VBNOV19	NA	11/19/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR WATER SAMPLES	(SEE ANALYSES FOR MW1-02)	INTERFERENCE DETECTED, MTLNCL=9 µg/L, TIC TOTAL=0	INST# FINN2: 11/19/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
MW1-01	14354	11/06/91	11/20/91					
MW2-01	14355	11/06/91	11/20/91					
WATERS								
VBLK4	VBNOV20	NA	11/20/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR WATER SAMPLES	(SEE ANALYSES FOR MW1-02)	INTERFERENCE DETECTED, MTLNCL=21 µg/L, TIC TOTAL=0	INST# FINN2: 11/20/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
EB2-1	14361	11/06/91	11/20/91					
FB2-1	14360	11/06/91	11/20/91					
MW2-01R	14356	11/06/91	11/20/91					
TB11-6-91	14362	11/06/91	11/20/91					
TB11-7-91	14399	11/07/91	11/20/91					
WATERS								
VBLK5	VBNOV21	NA	11/21/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR WATER SAMPLES	P-8 ALL RECOVERY AND DIFFERENCE VALUES WITHIN LIMITS EXCEPT RECOVERIES: TCE=125% MS(120%), BZME=128% MS(125%), AND CLBZ=131% MS(130%)	INTERFERENCE DETECTED, MTLNCL=11 µg/L, TIC TOTAL=0	INST# FINN2: 11/21/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
P-8	14398	11/07/91	11/21/91					
P-8 MS	14398 MS	11/07/91	11/21/91					
P-8 MSD	14398 MSD	11/07/91	11/21/91					
SOILS								
VBLK1	VBNOV11	NA	11/11/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	BG1-1-4 ALL RECOVERY AND DIFFERENCE VALUES WITHIN LIMITS EXCEPT RECOVERIES: BZME=141% MS(139%), BZME=144% MSD(139%), AND CLBZ=137% MSD(133%)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN2: 11/11/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY, EXCEPT THE AREAS FOR BG1-1-4, BG1-1-4 MS, AND BG1-1-4 MSD FOR BCM, DFB, AND CBZ
BG1-1-4	13281	11/03/91	11/11/91					
BG1-1-4 MS	13281 MS	11/03/91	11/11/91					
BG1-1-4 MSD	13281 MSD	11/03/91	11/11/91					
SOILS								
VBLK2	VBNOV12	NA	11/12/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	(SEE ANALYSES FOR BG1-1-4)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN2: 11/12/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY, EXCEPT THE AREA FOR BG2-1-1 FOR CBZ
BG1-1-1	13278	11/03/91	11/12/91					
BG1-1-2	13279	11/03/91	11/12/91					
BG1-1-3	13280	11/03/91	11/12/91					
BG1-1-4RE	13281RE	11/03/91	11/12/91					
BG2-1-1	13282	11/03/91	11/12/91					
BG2-1-2	13283	11/03/91	11/12/91					
SB1-1-1	13188	11/01/91	11/12/91					
SB1-1-2	13189	11/01/91	11/12/91					
SB1-1-3	13190	11/01/91	11/12/91					
SB3-1-1	13109	10/30/91	11/12/91					
SB3-1-6	13175	10/31/91	11/12/91					
SB3-1-9	13176	10/31/91	11/12/91					
SB3-2-1	13174	10/31/91	11/12/91					
SB3-2-2	13173	10/31/91	11/12/91					

Table F-3d. Volatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Initial Calibration	Continuing Calibration	Field Blank Analysis	Equipment Blank Analysis	Trip Blank Analysis
WATERS						
VBLK1	VBNOV8	11/06/91 (INST# FINN2)	11/08/91 (INST# FINN2)	NA	NA	NA
EB1-1	14265	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	NA	NA	NA
EB1A-1	14266	ALL RRF > 0.010	ALL RRF50 > 0.010	NA	NA	NA
EB3-1	13179	%RSD < 40%	%D < 40%	NA	NA	NA
EB4-1	13194			NA	NA	NA
FB4-1	13195			NA	NA	NA
MW1-02	14267			FB1-1	EB1A-1,1-1	TB11-05-91
TB10-30-91	13113			NA	NA	NA
TB10-31-91	13180			NA	NA	NA
TB11-1-91	13196			NA	NA	NA
TB11-05-91	14268			NA	NA	NA
MW1-02 MS	14267 MS			FB1-1	EB1A-1,1-1	TB11-05-91
MW1-02 MSD	14267 MSD			FB1-1	EB1A-1,1-1	TB11-05-91
WATERS						
VBLK2	VBNOV15	11/15/91 (INST# FINN2)	11/15/91 (INST# FINN2)	NA	NA	NA
FB1-1	13299	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	NA	NA	NA
GW1-1	13300	ALL RRF > 0.010	ALL RRF50 > 0.010	FB1-1	EB4-1	TB11-05-91
TB11-05-91	13301	%RSD < 40%	%D < 40%	NA	NA	NA
WATERS						
VBLK3	VBNOV19	11/19/91 (INST# FINN2)	11/19/91 (INST# FINN2)	NA	NA	NA
MW1-01	14354	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB2-1	EB2-1	TB11-6-91
MW2-01	14355	ALL RRF > 0.010	ALL RRF50 > 0.010	FB2-1	EB2-1	TB11-6-91
		%RSD < 40%	%D < 40%			
WATERS						
VBLK4	VBNOV20		11/20/91 (INST# FINN2)	NA	NA	NA
EB2-1	14361		DAILY TUNE IN CONTROL:	NA	NA	NA
FB2-1	14360		ALL RRF50 > 0.010	NA	NA	NA
MW2-01R	14356		%D < 40%	FB2-1	EB2-1	TB11-6-91
TB11-6-91	14362			NA	NA	NA
TB11-7-91	14399			NA	NA	NA
WATERS						
VBLK5	VBNOV21		11/21/91 (INST# FINN2)	NA	NA	NA
P-8	14398		DAILY TUNE IN CONTROL:	FB2-1	EB2-1	TB11-7-91
P-8 MS	14398 MS		ALL RRF50 > 0.010	FB2-1	EB2-1	TB11-7-91
P-8 MSD	14398 MSD		%D < 40%	FB2-1	EB2-1	TB11-7-91
SOILS						
VBLK1	VBNOV11	11/06/91 (INST# FINN2)	11/11/91 (INST# FINN2)	NA	NA	NA
BG1-1-4	13281	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB1-1	EB4-1	TB11-05-91
BG1-1-4 MS	13281 MS	ALL RRF > 0.010	ALL RRF50 > 0.010	FB1-1	EB4-1	TB11-05-91
BG1-1-4 MSD	13281 MSD	%RSD < 40%	%D < 40%	FB1-1	EB4-1	TB11-05-91
SOILS						
VBLK2	VBNOV12	11/12/91 (INST# FINN1)	11/12/91 (INST# FINN2)	NA	NA	NA
BG1-1-1	13278	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB1-1	EB4-1	TB11-05-91
BG1-1-2	13279	ALL RRF > 0.010	ALL RRF50 > 0.010	FB1-1	EB4-1	TB11-05-91
BG1-1-3	13280	%RSD < 40%	%D < 40%	FB1-1	EB4-1	TB11-05-91
BG1-1-4RE	13281RE			FB1-1	EB4-1	TB11-05-91
BG2-1-1	13282			FB1-1	EB4-1	TB11-05-91
BG2-1-2	13283			FB1-1	EB4-1	TB11-05-91
SB1-1-1	13188			FB4-1	EB4-1	TB11-1-91
SB1-1-2	13189			FB4-1	EB4-1	TB11-1-91
SB1-1-3	13190			FB4-1	EB4-1	TB11-1-91
SB3-1-1	13109			FB4-1	EB3-1	TB10-30-91
SB3-1-6	13175			FB4-1	EB3-1	TB10-31-91
SB3-1-9	13176			FB4-1	EB3-1	TB10-31-91
SB3-2-1	13174			FB4-1	EB3-1	TB10-31-91
SB3-2-2	13173			FB4-1	EB3-1	TB10-31-91

Table F-3d. Volatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Tentatively Identified Compounds	Data Validation Qualifiers
WATERS				
VBLK1	VBNOV8	None Detected	0(0)	
EB1-1	14265	None Detected	0(0)	None Applied
EB1A-1	14266	MTLNCL=3J/ACE=11 µg/l	0(0)	None Applied
EB3-1	13179	None Detected	0(0)	None Applied
EB4-1	13194	None Detected	0(0)	None Applied
FB4-1	13195	TCLME=12 µg/l	0(0)	None Applied
MW1-02	14267	None Detected	0(0)	None Applied
TB10-30-91	13113	None Detected	0(0)	None Applied
TB10-31-91	13180	None Detected	0(0)	None Applied
TB11-1-91	13196	None Detected	0(0)	None Applied
TB11-05-91	14268	None Detected	0(0)	None Applied
MW1-02 MS	14267 MS	Not Applicable	Data Not Provided	Not Applicable
MW1-02 MSD	14267 MSD	Not Applicable	Data Not Provided	Not Applicable
WATERS				
VBLK2	VBNOV15	None Detected	0(0)	
FB1-1	13299	MTLNCL=14 µg/l	0(0)	None Applied
GW1-1	13300	None Detected	0(0)	None Applied
TB11-03-91	13301	None Detected	0(0)	None Applied
WATERS				
VBLK3	VBNOV19	MTLNCL=9 µg/l	0(0)	
MW1-01	14354	None Detected	0(0)	None Applied
MW2-01	14355	None Detected	0(0)	None Applied
WATERS				
VBLK4	VBNOV20	MTLNCL=2J µg/l	0(0)	
EB2-1	14361	MTLNCL=5B µg/l	0(0)	MTLNCL=5U(MB)
FB2-1	14360	MTLNCL=3BJ µg/l	0(0)	MTLNCL=5U(MB)
MW2-01R	14356	MTLNCL=3BJ µg/l	0(0)	MTLNCL=5U(MB)
TB11-6-91	14362	MTLNCL=4BJ µg/l	0(0)	MTLNCL=5U(MB)
TB11-7-91	14399	MTLNCL=4BJ µg/l	0(0)	MTLNCL=5U(MB)
WATERS				
VBLK5	VBNOV21	MTLNCL=11 µg/l	0(0)	
P-8	14398	MTLNCL=13B µg/l	0(0)	MTLNCL=13U(MB)
P-8 MS	14398 MS	Not Applicable	Data Not Provided	Not Applicable
P-8 MSD	14398 MSD	Not Applicable	Data Not Provided	Not Applicable
SOILS				
VBLK1	VBNOV11	None Detected	0(0)	
BG1-1-4	13281	MTLNCL=25/ACE=29 µg/kg	0(0)	MTLNCL=25J(IS)/ACE=29J(IS)/All other compounds=UJ(IS)
BG1-1-4 MS	13281 MS	Not Applicable	Data Not Provided	Not Applicable
BG1-1-4 MSD	13281 MSD	Not Applicable	Data Not Provided	Not Applicable
SOILS				
VBLK2	VBNOV12	None Detected	0(0)	
BG1-1-1	13278	BZME=2J µg/kg	0(0)	None Applied
BG1-1-2	13279	BZME=31 µg/kg	0(0)	None Applied
BG1-1-3	13280	BZME=41 µg/kg	0(0)	None Applied
BG1-1-4RE	13281RE	None Detected	0(0)	None Applied
BG2-1-1	13282	BZME=110 µg/kg	0(0)	BZME=110J(IS)/HXO2,4ME2PENT,PCE,PCA,CLBZ,EBZ,STY,XYLENES=UJ(IS)
BG2-1-2	13283	BZME=110 µg/kg	0(0)	None Applied
SB1-1-1	13188	None Detected	0(0)	None Applied
SB1-1-2	13189	BZ=90/BZME=150 µg/kg	0(0)	None Applied
SB1-1-3	13190	None Detected	0(0)	None Applied
SB3-1-1	13109	None Detected	0(0)	None Applied
SB3-1-6	13175	None Detected	0(0)	None Applied
SB3-1-9	13176	None Detected	0(0)	None Applied
SB3-2-1	13174	None Detected	0(0)	None Applied
SB3-2-2	13173	None Detected	0(0)	None Applied

Table F-3e. Volatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Analyzed	Volatile Surrogate Recovery	Volatile MS/MSD Analyses	Volatile Blank Analyses	Volatile Tuning/Mass Calibration	Volatile Internal Standards
SOILS								
VBLK3	VBNOV13	NA	11/13/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	(SEE ANALYSES FOR BG1-1-4)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN2: 11/13/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
BG2-1-3	13284	11/05/91	11/13/91					
SB1-2-1	13285	11/02/91	11/13/91					
SB1-2-3	13287	11/02/91	11/13/91					
SB1A-1-1	13290	11/04/91	11/13/91					
SOILS								
VBLK4	VBNOV15	NA	11/15/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	(SEE ANALYSES FOR BG1-1-4)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN1: 11/15/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
SB1-1-7	13289	11/02/91	11/15/91					
SB1-2-7	13288	11/02/91	11/15/91					
SOILS								
VBLK1	VBNOV13	NA	11/13/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	SB1-2-2 ALL RECOVERY AND DIFFERENCE VALUES WITHIN LIMITS EXCEPT RECOVERY: BZ=65% MS(66%)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN2: 11/13/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
SB1-2-2	13286	11/02/91	11/13/91					
SB1A-1-2	13291	11/04/91	11/13/91					
SB1-2-2 MS	13286 MS	11/02/91	11/13/91					
SB1-2-2 MSD	13286 MSD	11/02/91	11/13/91					
SOILS								
VBLK2	VBNOV15	NA	11/15/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	(SEE ANALYSES FOR SB1-2-2)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN1: 11/15/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
SB1-3-1	14259	11/05/91	11/15/91					
SB1-3-2	14260	11/05/91	11/15/91					
SB1-3-3	14261	11/05/91	11/15/91					
SB1A-1-3	13292	11/04/91	11/15/91					
SB1A-1-5	13293	11/04/91	11/15/91					
SB1A-2-1	13294	11/04/91	11/15/91					
SB1A-2-2	13295	11/04/91	11/15/91					
SB1A-2-3	13296	11/04/91	11/15/91					
SB1A-3-1	13297	11/04/91	11/15/91					
SB1A-3-2	14263	11/04/91	11/15/91					
SB1A-3-3	13298	11/04/91	11/15/91					
SOILS								
VBLK3	VBNOV16	NA	11/16/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	SED-2 ALL RECOVERY AND DIFFERENCE VALUES WITHIN LIMITS	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN1: 11/16/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY, EXCEPT THE AREAS FOR SB1-2-5 AND SB1-2-5R FOR CBZ
SB1A-1-5	14348	11/04/91	11/16/91					
SB1A-1-5R	14349	11/04/91	11/16/91					
SB1-2-5	14352	11/02/91	11/16/91					
SB1-2-5R	14353	11/02/91	11/16/91					
SB1A-3-4	14350	11/05/91	11/16/91					
SB1A-3-4R	14351	11/05/91	11/16/91					
SB1A-3-5	14264	11/05/91	11/16/91					
SED-1	14395	11/07/91	11/16/91					
SED-2	14396	11/07/91	11/16/91					
SED-2 MS	14396 MS	11/07/91	11/16/91					
SED-2 MSD	14396 MSD	11/07/91	11/16/91					
SOILS								
VBLK4	VBNOV18	NA	11/18/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	(SEE ANALYSES FOR SED-2)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# FINN1: 11/18/91 ALL BFB TUNING AND MASS CALIBRATION CRITERIA MET.	BCM, DFB, AND CBZ ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
SB1-2-5RE	14352RE	11/02/91	11/18/91					
SB1-2-5RRE	14353RE	11/02/91	11/18/91					

Table F-3e. Volatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Initial Calibration	Continuing Calibration	Field Blank Analysis	Equipment Blank Analysis	Trip Blank Analysis
SOILS						
VBLK3	VBNOV13		11/13/91 (INST# FINN2)	NA	NA	NA
BG2-1-3	13284		DAILY TUNE IN CONTROL:	FB1-1	EB4-1	TB11-03-91
SB1-2-1	13285		ALL RRF50 > 0.010	FB1-1	EB4-1	TB11-03-91
SB1-2-3	13287		%D < 40%	FB1-1	EB4-1	TB11-03-91
SB1A-1-1	13290			FB1-1	EB4-1	TB11-03-91
SOILS						
VBLK4	VBNOV15		11/15/91 (INST# FINN1)	NA	NA	NA
SB1-1-7	13289		DAILY TUNE IN CONTROL:	FB1-1	EB4-1	TB11-03-91
SB1-2-7	13288		ALL RRF50 > 0.010	FB1-1	EB4-1	TB11-03-91
			%D < 40%			
SOILS						
VBLK1	VBNOV13	11/06/91 (INST# FINN2)	11/13/91 (INST# FINN2)	NA	NA	NA
SB1-2-2	13286	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB1-1	EB4-1	TB11-03-91
SB1A-1-2	13291	ALL RRF > 0.010	ALL RRF50 > 0.010	FB1-1	EB4-1	TB11-03-91
SB1-2-2MS	13286MS	%RSD < 40%	%D < 40%	FB1-1	EB4-1	TB11-03-91
SB1-2-2MSD	13286MSD			FB1-1	EB4-1	TB11-03-91
		11/12/91 (INST# FINN1)				
		DAILY TUNE IN CONTROL:				
		ALL RRF > 0.010				
		%RSD < 40%				
SOILS						
VBLK2	VBNOV15		11/15/91 (INST# FINN1)	NA	NA	NA
SB1-3-1	14259		DAILY TUNE IN CONTROL:	FB1-1	EB1A-1,1-1	TB11-05-91
SB1-3-2	14260		ALL RRF50 > 0.010	FB1-1	EB1A-1,1-1	TB11-05-91
SB1-3-3	14261		%D < 40%	FB1-1	EB1A-1,1-1	TB11-05-91
SB1A-1-3	13292			FB1-1	EB4-1	TB11-03-91
SB1A-1-5	13293			FB1-1	EB4-1	TB11-03-91
SB1A-2-1	13294			FB1-1	EB4-1	TB11-03-91
SB1A-2-2	13295			FB1-1	EB4-1	TB11-03-91
SB1A-2-3	13296			FB1-1	EB4-1	TB11-03-91
SB1A-3-1	13297			FB1-1	EB4-1	TB11-03-91
SB1A-3-2	14263			FB1-1	EB1A-1,1-1	TB11-05-91
SB1A-3-3	13298			FB1-1	EB4-1	TB11-03-91
SOILS						
VBLK3	VBNOV16		11/16/91 (INST# FINN1)	NA	NA	NA
SB1A-1-5	14348		DAILY TUNE IN CONTROL:	FB2-1	EB2-1	TB11-6-91
SB1A-1-5R	14349		ALL RRF50 > 0.010	FB2-1	EB2-1	TB11-6-91
SB1-2-5	14352		%D < 40%	FB2-1	EB2-1	TB11-6-91
SB1-2-5R	14353			FB2-1	EB2-1	TB11-6-91
SB1A-3-4	14350			FB2-1	EB2-1	TB11-6-91
SB1A-3-4R	14351			FB2-1	EB2-1	TB11-6-91
SB1A-3-5	14264			FB1-1	EB1A-1,1-1	TB11-05-91
SED-1	14395			FB2-1	EB2-1	TB11-7-91
SED-2	14396			FB2-1	EB2-1	TB11-7-91
SED-2MS	14396MS			FB2-1	EB2-1	TB11-7-91
SED-2MSD	14396MSD			FB2-1	EB2-1	TB11-7-91
SOILS						
VBLK4	VBNOV18		11/18/91 (INST# FINN1)	NA	NA	NA
SB1-2-5RE	14352RE		DAILY TUNE IN CONTROL:	FB2-1	EB2-1	TB11-6-91
SB1-2-5RRE	14353RE		ALL RRF50 > 0.010	FB2-1	EB2-1	TB11-6-91
			%D < 40%			

Table F-3e. Volatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Tentatively Identified Compounds	Data Validation Qualifiers
SOILS				
VBLK3	VBNOV13	None Detected	0 (0)	
BG2-1-3	13284	None Detected	0 (0)	None Applied
SB1-2-1	13285	None Detected	0 (0)	None Applied
SB1-2-3	13287	None Detected	0 (0)	None Applied
SB1A-1-1	13290	BZME=26J µg/kg	0 (0)	None Applied
SOILS				
VBLK4	VBNOV15	None Detected	0 (0)	
SB1-1-7	13289	None Detected	0 (0)	None Applied
SB1-2-7	13288	None Detected	0 (0)	None Applied
SOILS				
VBLK1	VBNOV13	None Detected	0 (0)	
SB1-2-2	13286	None Detected	0 (0)	None Applied
SB1A-1-2	13291	BZME=36 µg/kg	0 (0)	None Applied
SB1-2-2 MS	13286 MS	Not Applicable	Data Not Provided	Not Applicable
SB1-2-2 MSD	13286 MSD	Not Applicable	Data Not Provided	Not Applicable
SOILS				
VBLK2	VBNOV15	None Detected	0 (0)	
SB1-3-1	14259	MTLNCL=67/ACE=120/BZME=61 µg/kg	0 (0)	MTLNCL=67U(FB)/ACE=120U(EB)
SB1-3-2	14260	MTLNCL=76/ACE=160/BZME=140 µg/kg	0 (0)	MTLNCL=76U(FB)
SB1-3-3	14261	MTLNCL=80/ACE=220/BZME=480 µg/kg	0 (0)	MTLNCL=80U(FB)
SB1A-1-3	13292	BZME=190 µg/kg	0 (0)	None Applied
SB1A-1-5	13293	BZME=60 µg/kg	0 (0)	None Applied
SB1A-2-1	13294	BZME=250 µg/kg	0 (0)	None Applied
SB1A-2-2	13295	MTLNCL=14J/ACE=120/BZME=170 µg/kg	0 (0)	MTLNCL=32U(FB)
SB1A-2-3	13296	MTLNCL=21J/ACE=55J/BZME=1000 µg/kg	0 (0)	MTLNCL=31U(FB)
SB1A-3-1	13297	ACE=70/BZME=160 µg/kg	0 (0)	None Applied
SB1A-3-2	14263	MTLNCL=69/ACE=190/BZME=160 µg/kg	0 (0)	MTLNCL=69U(FB)
SB1A-3-3	13298	MTLNCL=60/ACE=75/DCE12=49/BZME=99/EBZ=12J µg/kg	0 (0)	MTLNCL=60U(FB)
SOILS				
VBLK3	VBNOV16	None Detected	0 (0)	
SB1A-1-5	14348	MTLNCL=36/ACE=58J/BZME=670 µg/kg	0 (0)	None Applied
SB1A-1-5R	14349	ACE=60J/BZME=440 µg/kg	0 (0)	None Applied
SB1-2-5	14352	MTLNCL=80X µg/kg	0 (0)	HXO2,4ME2PENT,PCE,PCA,BZME,EBZ,STY,XYLENES=UJ(IS)
SB1-2-5R	14353	MTLNCL=18JX/BZME=940X µg/kg	0 (0)	BZME=940J(IS)/HXO2,4ME2PENT,PCE,PCA,EBZ,STY,XYLENES=UJ(IS)
SB1A-3-4	14350	MTLNCL=66/ACE=190/BZME=640 µg/kg	0 (0)	BZME=640J(FR)
SB1A-3-4R	14351	MTLNCL=18J/BZME=110 µg/kg	0 (0)	BZME=110J(FR)
SB1A-3-5	14264	ACE=130/BZME=370 µg/kg	0 (0)	None Applied
SED-1	14395	ACE=290 µg/kg	0 (0)	None Applied
SED-2	14396	ACE=280 µg/kg	0 (0)	None Applied
SED-2 MS	14396 MS	Not Applicable	Data Not Provided	Not Applicable
SED-2 MSD	14396 MSD	Not Applicable	Data Not Provided	Not Applicable
SOILS				
VBLK4	VBNOV18	None Detected	0 (0)	
SB1-2-5RE	14352RE	MTLNCL=56 µg/kg	0 (0)	None Applied
SB1-2-5RRE	14353RE	MTLNCL=54/BZME=140 µg/kg	0 (0)	None Applied

Footnotes to Table F-3d through F-3e. Volatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana

Control limits for Water VOC Surrogate Recovery
- Toluene-d8 (TOL): 88-110
- 4-Bromofluorobensene (BFB): 86-115
- 1,2-Dichloroethane-d4 (DCE): 76-114

Control Limits for Soil VOC Surrogate Recovery
- Toluene-d8 (TOL): 84-138
- Bromofluorobenzene (BFB): 59-113
- 1,2-Dichloroethane-d4 (DCE): 70-121

Control Limits for Soil VOC MS/MSD Analyses
1,1-Dichloroethene (DCE11): 59-172, %RPD=22
Trichloroethene (TCE): 62-137, %RPD=24
Benzene (BZ): 66-142, %RPD=21
Toluene (TOL): 59-139, %RPD=21
Chlorobenzene (CLBZ): 60-133, %RPD=21
Tuning and mass calibration performed with bromofluorobenzene (BFB)
Volatile Internal Standard Area Summary Compounds:
- Bromochloromethane(BCM)
- 1,4-Difluorobenzene(DFB)
- Chlorobenzene-d5(CBZ)

NA - Not Applicable
Significant sample result data qualifiers:
- D - analyte identified in an analysis at a secondary dilution factor.
- E - analyte's concentration exceeds the calibration range of the instrument for this specific analysis
- J - analyte present between the lower detection limit of the instrument and the lower quantitation limit
- B - analyte present in the method blank as well in the sample.

was properly preserved. Therefore, the 14-day holding time requirement was applied for the data collected during the Indiana ANGB SI.

Analysis of samples that have exceeded the method-recommended holding times may result in the following: 1) concentrations of compounds that would have been detected ordinarily are undetected due to chemical transformation, compound volatilization, or biodegradation; 2) reported concentrations lower than those originally present, due to the factors previously stated; or 3) reported concentrations greater than those originally present in the sample, due to external contamination of water samples or changes in soil moisture content. Based on an evaluation of all environmental samples and field QC blanks analyzed for VOCs all holding time criteria were met, except for SB1-2-5 RE and SB1-2-5R RE which were analyzed 16 days after collection. This holding time is considered to have no adverse impact on the associated environmental samples data quality; therefore, no action was taken.

Tuning and Mass Calibration Results -- The first step in the calibration of the GC/MS system is the demonstration of satisfactory ionization and fragmentation of standard mass spectral tuning compounds. This was accomplished, in addition to a sensitivity check using p-bromofluorobenzene (p-BFB) injected at a concentration near the instrument detection limit, for EPA Method 8240 and the March 1990 CLP SOW protocol. This standard was analyzed every 12 hours to ensure that the GC/MS was tuned correctly. Tuning and mass calibration requirements used to evaluate the acceptable instrument operation are described in EPA Method 8240 and the March 1990 CLP SOW. Based on an evaluation of the ionization and fragmentation criteria, in addition to the instrument tune frequency, all p-BFB tuning and mass calibration criteria requirements were met.

Initial Calibration Results -- Calibration of the GC/MS used to analyze the samples collected during the Indiana ANGB SI was established by injecting EPA-traceable standards at five concentrations spanning the expected sample concentration range Initial calibration was conducted after the GC/MS tune criteria were met and before any samples were analyzed to determine the instrument sensitivity and the linearity of each target compound. Following the initial calibration, the average relative response factors (RRFs) and percent relative standard deviation (%RSD) for all VOCs were evaluated to verify the validity of the initial calibration. Calibration criteria requirements for VOC analyses are presented in EPA Method 8240 and the March 1990 CLP SOW. Based on an evaluation of the initial calibrations conducted for VOC analyses, all calibration criteria requirements were met.

Continuing Calibration Results -- A check of the calibration curve was conducted once every 12 hours. The continuing calibration of the GC/MS system is evaluated based on the magnitude of the RRFs and percent difference (%D) between the average RRF of each compound for the initial calibration and the RRF of that compound in the continuing calibration standard. Minimum RRF and maximum %D criteria are presented in EPA Method 8240 and the March 1990 CLP SOW. Based on an evaluation of the continuing calibrations conducted for VOC analyses, all criteria requirements were met.

Internal Standard Summaries -- Three internal standards (i.e., bromochloromethane, 1,4-difluorobenzene, and chlorobenzene-d_5) were added to each sample immediately before analysis as indicators of instrumental operating variations. The concentration of VOCs detected was calculated with reference to the response factor (RF) of the internal standard for each sample. Internal standard area and retention time requirements are described in EPA Method 8240 and the March 1990 CLP SOW. Based on an evaluation of all analyses, all internal standard areas and retention times were within acceptable limits in all analyses, except chlorobenzene-d_5 in SB-B-02, SB1-04-02, BG2-1-1, SB1-2-5, and SB1-2-5R; bromochloromethane and chlorobenzene-d_5 in SB-B-02R and SB2-01-19R; and bromochlorobenzene, 1,4-difluorobenzene, and chlorobenzene-d_5 in SB2-01-19, BG1-1-4, BG1-1-4 MS, and BG1-1-4 MSD, which were less than the lower control limit. As a result, the VOCs quantified based on the RF of those ISs were qualified (i.e., all undetected values will be presented as "UJ[IS]" and all detected values will be presented "J[IS]") to indicate that the internal standard areas were outside the appropriate limits.

Blank Spike Recoveries -- The surrogate recovery results of each method blank analyzed were evaluated as a method blank spike, as required by DOE/HWP-65/R1. Surrogate recovery control limits are described in the SOW prepared for the Indiana ANGB SI. Based on an evaluation of all method blank spike analyses, the percent recoveries of all spike compounds were within acceptable limits.

System Performance Compound Summaries (Surrogate Recoveries) -- Three compounds (i.e., toluene-d_8, P-BFB, and 1,2-dichloroethane-d_4) were added to each environmental sample, and laboratory and field QC sample prior to purging. The control limits for surrogate recoveries in soil and water samples are described in the SOW prepared for the Indiana ANGB SI and the March 1990 CLP SOW. All surrogate recoveries were within the control limits, except for P-BFB in SB-B-02 (i.e., 71 percent); P-BFB and toluene-d_8 in SB2-01-19 (i.e., 72 and 131 percent respectively) and SB2-01-19R (i.e., 136 and 72 percent, respectively); and toluene-d_8 in SB-B-02R (i.e., 122 percent) and SB1-04-02 (i.e., 122 percent). All SB-B-02, SB2-01-19, SB2-01-19R, SB-B-02R, and SB1-01-02 analytical results were considered estimated and data validation qualifiers were applied accordingly (i.e., "UJ[SR]" for undetected compounds or "J[SR]" for detected concentrations) to indicate that the surrogate recoveries were outside the appropriate limits. Tables F-4 and F-5 summarizes the surrogate recovery results for groundwater and soil samples.

Method Blank Results -- At least one volatile method blank was used to define the level of laboratory background and reagent contamination. Each method blank was evaluated for interferents that prevent accurate quantitation of a target compound. According to CLP method blank criteria, a laboratory blank may not contain methylene chloride, 2-butanone, or acetone in concentrations five times greater than the CRQL or any other target compound in concentrations greater than the CRQL. Methylene chloride was detected in one method blank (i.e., VBLK4 [2J μg/L]) associated with one groundwater sample batch. As a result, the concentration of all affected samples (i.e., EB2-1 [5U(MB) μg/L], FB2-1 [5U(MB) μg/L], MW2-01R [5U(MB) μg/L], TB11-6-91 [5U(MB) μg/L], and TB11-7-91 [5U(MB) μg/L], associated with VBLK4 were qualified (i.e., "U[MB]") to indicate that the methylene chloride reported was considered undetected, since the concentrations reported did not exceed 10 times that detected in the method blanks. No other VOCs were detected in the laboratory method blanks.

TABLE F-4. VOC SURROGATE RECOVERY QC SUMMARY: GROUNDWATER
INDIANA ANGB, FORT WAYNE, INDIANA

PARAMETER	TOTAL NUMBER ANALYSES*	PERCENT RECOVERY RANGES	PERCENT RECOVERY CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
Toluene-d8	45	(88-110)	(88-110)	45	0
Bromofluorobenzene	45	(91-115)	(86-115)	45	0
1,2-Dichloroethane-d4	45	(76-108)	(76-114)	45	0

* GROUND WATER, MATRIX SPIKE, MATRIX SPIKE DUPLICATE, METHOD BLANKS, TRIP BLANKS, FIELD BLANKS, EQUIPMENT BLANKS, TRIP BLANKS.

TABLE F-5. VOC SURROGATE RECOVERY QC SUMMARY: SOIL/SEDIMENT
INDIANA ANGB FORT WAYNE, INDIANA

PARAMETER	TOTAL NUMBER ANALYSES*	PERCENT RECOVERY RANGES	PERCENT RECOVERY CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
Toluene-d8	23	(81-117)**	(85-136)	19	4
	55	(84-138)***	(85-129)	55	0
Bromofluorobenzene	23	(74-121)**	(71-108)	20	3
	55	(59-113)***	(74-110)	55	0
1,2-Dichloroethane-d4	23	(70-121)**	(75-117)	23	0
	55	(70-121)***	(72-116)	55	0

* SOIL/SEDIMENT, MATRIX SPIKE, MATRIX SPIKE DUPLICATE, METHOD BLANKS.

** PERCENT RECOVERY RANGES FOR SW8240

*** PERCENT RECOVERY RANGES FOR CLP SOW 3/90

Matrix Spike/Matrix Spike Duplicate Results -- MS/MSD analyses were conducted to assess the accuracy and precision of the laboratory and to evaluate the matrix effect of the sample upon the analytical methodology based upon the percent recovery of each compound. Accuracy was expressed as the percent recovery of the spike compounds. Precision was expressed as the RPD of the concentrations of the spike compounds in the MS/MSD samples. The control limits for percent recoveries in soil and water samples were described in EPA Method 8240 and the March 1990 CLP SOW. No action was taken based on percent recovery or RPD values; however, MS/MSDs were evaluated to verify that 1 MS/MSD analysis was conducted for each 20 environmental samples received by the laboratory (excluding dilutions and reanalyses conducted), that these analyses were conducted on environmental samples only, and that the recovery and difference results did not indicate systematic laboratory control problems. Tables F-6 and F-7 summarizes the MS/MSD results for groundwater and soil samples.

Four MS/MSD analyses (i.e., SB2-04-01, SB1-04-04, BG1-1-4, and SB1-2-2) were conducted using soil samples and 1 MS/MSD analysis (i.e., SED-2) was conducted using sediment sample collected during the Indiana ANGB, Fort Wayne Field SI. All percent recovery values were within the control limits, except for toluene in BG1-1-4 (141 and 144 percent), chlorobenzene in BG1-1-4 (137 percent), and benzene in SB1-2-2 (65 percent). Two MS/MSD analyses (i.e., MW1-02 and P-8) were conducted using groundwater samples collected during the Indiana ANGB SI. All percent recovery values were within control limits, except for toluene in P-8 (128 percent), trichlorethene in P-8 (125 percent), and chlorobenzene in P-8 (131 percent). All RPD values were within the control limits. No data validation qualifiers were applied, since trichloroethene, benzene, toluene, and chlorobenzene were not detected in the unspiked samples.

Significant Qualified Sample Results -- Data validation qualifiers have been added to EB2-1 (i.e., 5U[MB] μg/L), FB2-1 (i.e., 5U[MB] μg/L), MW2-01R (i.e., 5U[MB] μg/L), TB11-6-91 (i.e., 5U[MB] μg/L), and TB11-7-91 (i.e., 5U[MB] μg/l) sample results to indicate that methylene chloride was detected in the associated laboratory method blanks. Data validation qualifiers have been applied to SB-B-02, SB2-01-19, SB-B-02R, and SB2-01-19R (i.e., "UJ[SSR,IS]" for nondetected compounds and "J[SSR,IS]" for detected compound concentrations) to indicate that the selected internal standard areas and surrogate recoveries

TABLE F-6. VOC MS/MSD QC SUMMARY: GROUNDWATER
INDIANA ANGB FORT WAYNE, INDIANA

	ACCURACY					PRECISION				
PARAMETER	MS/MSD TOTAL No. ANALYSES	PERCENT RECOVERY RANGES	%R CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS	MSD TOTAL No. ANALYSES	RPD RANGE	RPD LIMIT	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
1,1-Dichloroethane	4	(94-127)	(61-145)	4	0	3	(0-2)	14	2	0
Trichloroethane	4	(106-125)	(71-120)	3	1	3	(1-7)	14	2	0
Benzene	4	(94-102)	(76-127)	4	0	3	(0-5)	11	2	0
Toluene	4	(108-128)	(76-125)	3	1	3	(-1-7)	13	2	0
Chlorobenzene	4	(114-131)	(75-130)	3	1	3	(-1-6)	13	2	0

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE ANALYSES PERFORMED ON SAMPLES MW2-01R, P-8.

TABLE F-7. VOC MS/MSD QC SUMMARY: SOIL/SEDIMENT
INDIANA ANGB FORT WAYNE, INDIANA

	ACCURACY					PRECISION				
PARAMETER	MS/MSD TOTAL No. ANALYSES	PERCENT RECOVERY RANGES	%R CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS	MSD TOTAL No. ANALYSES	RPD RANGE	RPD LIMIT	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
1,1-Dichloroethane	10	(94-125)	(59-172)	10	0	5	[(-14)-6]	22	5	0
Trichloroethane	10	(65-95)	(62-137)	10	0	5	[(-16)-3]	24	5	0
Benzene	10	(65-115)	(66-142)	9	1	5	[(-12)-18]	21	5	0
Toluene	10	(95-144)	(59-139)	8	2	5	[(-5)-2]	21	5	0
Chlorobenzene	10	(86-137)	(60-133)	9	1	5	[(-13)-2]	21	5	0

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE ANALYSES PERFORMED ON SAMPLES SB2-04-01, SB1-04-04, BG1-1-4, SB1-2-2, AND SED-2.

were outside the appropriate control limits. Data validation qualifiers have been applied to BG1-1-4, BG2-1-1, SB1-2-5, and SB1-2-5R (i.e., "UJ[IS]" for nondetected compounds and "J[IS]"for detected compounds) to indicate that the selected internal standard areas were outside the appropriate control limits. A data validation qualifier has been applied to toluene in SB2-01-19 and SB2-01-19R (i.e., "J[FR]") to indicate matrix variability.

F.3.1.2 Aromatic Volatile (BTEX) Analysis (EPA Method 8020)

Thirteen samples (i.e., 4 groundwater samples and 9 soil samples) were collected and submitted to the NET Laboratory using EPA Method 8020 for BTEX analysis. A validation process was not required by the SOW prepared for the Indiana ANGB SI. The BTEX analytical results are presented in Table F-8.

F.3.1.3 Semivolatile Organic Compound Analysis (EPA Methods 3550/8270, 3510/8270 and March 1990 CLP SOW)

Twenty nine soil samples, 2 sediment samples, 7 groundwater samples, and 8 field QC blanks (i.e., field blanks and equipment blanks) were collected and analyzed by the NET Laboratory using EPA Methods 3550/8270 and 3510/8270. Thirty nine soil samples, 6 groundwater samples and 7 field QC blanks (i.e., field blanks and equipment blanks) were collected and analyzed by the NET Laboratory for SVOCs using the March 1990 CLP SOW. Data quality will be evaluated using the guidelines and control limits specified for holding times, tuning and mass calibration, initial and continuing calibration verification, method blank spike, method blank, surrogate recovery, internal standard area, and MS/MSD results. A presentation of the significant qualified sample results follows the laboratory QC results discussion. The SVOC data validation worksheets are presented in Table F-9.

Holding Times -- Holding times were defined as the maximum amount of time allowed to elapse between the date and time of sample collection and the date and time the sample was extracted. Holding times were further defined as the maximum amount of time allowed to elapse between the date and time of extraction and sample analysis. The NET Laboratory was required to meet extraction holding times of 7 days for water samples and 14 days for soil samples collected for SVOC analysis. All analyses were required within 40 days of extraction.

Table F-8. BTEX Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	ate Collected	Date Analyzed (Primary)	Date Analyzed (Secondary)	Volatile Surrogate Recovery	Volatile MS/MSD Analyses	Volatile Blank Analyses
WATERS							
WATER BLANK	H2O	NA	11/14/91	11/14/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR WATER SAMPLES	CONDUCTED BUT NOT REVIEWED	NO INTERFERENCE DETECTED
MW4-01	14357	11/06/91	11/14/91	11/14/91			
MW4-02	14358	11/06/91	11/15/91	11/15/91			
MW4-02R	14359	11/06/91	11/15/91	11/15/91			
P-1	14397	11/07/91	11/15/91	11/15/91			
MW4-01 MS	14357 MS	11/06/91	11/14/91	11/14/91			
MW4-01 MSD	14357 MSD	11/06/91	11/14/91	11/14/91			
SOILS							
WATER BLANK	H2O	NA	11/08/91	11/08/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES EXCEPT: $\boxed{\text{SB4-3-4}}$ FOR 1CL2FBZ= 34.7% (50%), $\boxed{\text{SB4-1-1}}$ FOR 1CL2FBZ= 5.8% (50%), $\boxed{\text{SB4-1-1RE}}$ FOR 1CL2FBZ= 5934.7% (125%).	CONDUCTED BUT NOT REVIEWED	NO INTERFERENCE DETECTED
SB4-1-6	13112	10/30/91	11/08/91	11/08/91			
SB4-2-1	13177	10/31/91	11/08/91	11/08/91			
SB4-3-4	13193	11/01/91	11/08/91	11/08/91			
SB4-2-2	13178	10/31/91	11/08/91	11/08/91			
SB4-1-2	13111	10/30/91	11/08/91	11/08/91			
SB4-1-1	13110	10/30/91	11/08/91	11/08/91			
SB4-3-1	13191R	11/01/91	11/08/91	11/08/91			
SB4-3-2	13192R	11/01/91	11/08/91	11/08/91			
SB4-1-1	13110R	10/30/91	11/08/91	11/08/91			
SB4-3-4 MS	13193 MS	11/01/91	11/08/91	11/08/91			
SB4-3-4 MSD	13193 MSD	11/01/91	11/08/91	11/08/91			

Table F-8. BTEX Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Initial Calibration	Continuing Calibration
WATERS			
WATER BLANK	H20	INFORMATION ON FILE AT LABORATORY	INFORMATION ON FILE AT LABORATORY
MW4-01	14357		
MW4-02	14358		
MW4-02R	14359		
P-1	14397		
MW4-01 MS	14357 MS		
MW4-01 MSD	14357 MSD		
SOILS			
WATER BLANK	H2O	INFORMATION ON FILE AT LABORATORY	INFORMATION ON FILE AT LABORATORY
SB4-1-6	13112		
SB4-2-1	13177		
SB4-3-4	13193		
SB4-2-2	13178		
SB4-1-2	13111		
SB4-1-1	13110		
SB4-3-1	13191R		
SB4-3-2	13192R		
SB4-1-1	13110R		
SB4-3-4 MS	13193 MS		
SB4-3-4 MSD	13193 MSD		

Table F–8. BTEX Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results
WATERS		
WATER BLANK	H20	None Detected
MW4–01	14357	None Detected
MW4–02	14358	None Detected
MW4–02R	14359	None Detected
P–1	14397	None Detected
MW4–01 MS	14357 MS	Not Applicable
MW4–01 MSD	14357 MSD	Not Applicable
SOILS		
WATER BLANK	H2O	None Detected
SB4–1–6	13112	BZME=1.60 μg/kg
SB4–2–1	13177	None Detected
SB4–3–4	13193	None Detected
SB4–2–2	13178	BZME=3.50 μg/kg
SB4–1–2	13111	BZME=0.70 μg/kg
SB4–1–1	13110	None Detected
SB4–3–1	13191R	None Detected
SB4–3–2	13192R	BZME=0.98 μg/kg
SB4–1–1	13110R	EBZ=210.00/m&p–XYLENES=110.00/ o–XYLENES & STY=84.00 μg/kg
SB4–3–4 MS	13193 MS	Not Applicable
SB4–3–4 MSD	13193 MSD	Not Applicable

Footnotes to Table F−8. BTEX Compound Data Validation Worksheets Indiana Air National Guard Base, Fort Wayne, Indiana
Control limits for Water BTEX Surrogate Recovery 1−Chloro−2−Flourobenzene (1CL2FBZ): 50−125 Control Limits for Soil BTEX Surrogate Recovery 1−Chloro−2−Flourobenzene (1CL2FBZ): 50−125 Significant Sample Results Abbreviations: BZME = TOLUENE EBZ = ETHYLBENZENE STY = STYRENE

Table F-9a. Data Validation Tables: Semivolatile Organic Compounds

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Semivolatile Surrogate Recovery	Semivolatile MS/MSD Analyses	Semivolatile Blank Analyses	Semivolatile Tuning/Mass Calibration	Semivolatile Internal Standards
BATCH SW173									
FB-01	90021708	08-28-90	08-30-90	09-14-90	ALL OK	ALL WITHIN LIMITS (90021501)	NO INTERFERENTS DETECTED	ALL DFTPP CRITERIA WITHIN CONTROL LIMITS 2 TUNES APPLY (09/12,13/90)	(09/12,13/90) ALL AREAS WERE WITHIN CONTROL LIMITS
FB-02	90021709	08-28-90	08-30-90	09-14-90					
EW-01	90021710	08-28-90	08-30-90	09-14-90					
	MB173	NA	NO DATE	09-12-90					
	90021501	NA	08-30-90	09-12-90					
	MBS173	NA	NO DATE	09-12-90	(NO DATA PROVIDED)				
BATCH SW181									
EW-03	90021808	08-29-90	08-31-90	09-15-90	ALL OTHERS OK	NONE CONDUCTED	NO INTERFERENTS DETECTED	ALL DFTPP CRITERIA WITHIN CONTROL LIMITS (09/14/90)	(09/14/90) ALL AREAS WERE WITHIN CONTROL LIMITS
	MBS181	NA	08-31-90	09-14-90					
	MB181	NA	08-31-90	09-14-90	2FP(8)				
BATCH SW214B									
P-2	90024801	09-13-90	09-20-90	10-10-90	S1-S5 LOW	NONE CONDUCTED	NO INTERFERENTS DETECTED	ALL DFTPP CRITERIA WITHIN CONTROL LIMITS (10/10/90)	(09/14/90) ALL AREAS WERE WITHIN CONTROL LIMITS
EW-07	90024901	09-14-90	09-20-90	10-10-90	ALL OK				
MW2-01	90024902	09-14-90	09-20-90	10-10-90	ALL OK				
MW1-02	90025101	09-14-90	09-20-90	10-10-90	ALL OK				
MW1-01	90025102	09-15-90	09-20-90	10-10-90	ALL OK				
EW-09	90025104	09-16-90	09-20-90	10-10-90	ALL OK				
P-8	90025105	09-16-90	09-20-90	10-10-90	ALL OK				
HT-01	90025106	09-16-90	09-20-90	10-10-90	ALL OK				
	MBS214B	NA	09-20-90	10-10-90	ALL OK				
	MB214B	NA	09-20-90	10-10-90	ALL OUT				
BATCH SW253R									
EW-05	90022401	08-31-90	10-19-90	11-05-90	S2(33)	NONE CONDUCTED	NO INTERFERENTS DETECTED	ALL DFTPP CRITERIA WITHIN CONTROL LIMITS (10/02/90, 11/01/90)	(10/02/90, 11/05/90) ALL AREAS WERE WITHIN CONTROL LIMITS
FB-03	90023606	09-11-90	09-14-90	10-02-90	ALL OK				
MW4-02	90023901	09-12-90	10-19-90	11-05-90	S2(41)				
	MB253R	NA	10-19-90	11-01-90	S2(42)				

Table F-9a. Data Validation Tables: Semivolatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Initial Calibration SPCC/CCC	Continuing Calibration SPCC/CCC	Trip Blank Analysis	Field Blank Analysis	Equipment Blank Analysis
BATCH SW173						
FB-01	90021708	09-11-90 (CASE # SW173W)	09-12-90 (CASE # SW173W)	NA	NA	NA
FB-02	90021709	DAILY (09-11-90) TUNE IN CONTROL	DAILY TUNE IN CONTROL	NA	NA	NA
EW-01	90021710	ALL SPCC RRF > 0.050	ALL SPCC RRF50 > 0.050	NA	NA	NA
	MB173	CCC %RSD < 30%	CCC %D < 25%			
	90021501		09-13-90(CASE #SW173W)			
	MBS173		ALL SPCC RRF50 > 0.050			
			CCC %D < 25%			
BATCH SW181						
EW-03	90021808	09-11-90 (CASE SW181W)	09-14-90 (CASE SW181W)	NA	NA	NA
	MBS181	DAILY (09-11-90) TUNE IN CONTROL	DAILY TUNE IN CONTROL			
	MB181	ALL SPCC RRF > 0.050	ALL SPCC RRF50 > 0.050			
		CCC %RSD < 30%	CCC %D < 25%			
BATCH SW214B						
P-2	90024801	10-02-90 (CASE SW214B)	10-10-90 (CASE SW214B)	TB-08	FB-01,-02	EW-07
EW-07	90024901	DAILY (10-02-90) TUNE IN CONTROL	DAILY TUNE IN CONTROL	NA	NA	NA
MW2-01	90024902	ALL SPCC RRF > 0.050	ALL SPCC RRF50 > 0.050	TB-10	FB-01,-02	EW-07
MW1-02	90025101	CCC %RSD < 30%	CCC %D < 25%	TB-11	FB-01,-02	EW-07
MW1-01	90025102			TB-11	FB-01,-02	EW-07
EW-09	90025104			NA	NA	NA
P-8	90025105			TB-12	FB-01,-02	EW-09
HT-01	90025106			NA	NA	NA
	MBS214B					
	MB214B					
BATCH SW253R						
EW-05	90022401	10-02-90 (CASE SW253R)	10-02-90, 11-01-90	NA	NA	NA
FB-03	90023606	DAILY (10-02-90) TUNE IN CONTROL	(CASE SW253R)	NA	NA	NA
MW4-02	90023901	ALL SPCC RRF > 0.050	DAILY TUNE IN CONTROL	TB-08	FB-03	EW-05
	MB253R	CCC %RSD < 30%	ALL SPCC RRF50 > 0.050	NA	NA	NA
		11-01-90 (CASE SW253R)	CCC %D < 25%			
		DAILY (11-01-90) TUNE IN CONTROL				
		ALL SPCC RRF > 0.050				
		CCC %RSD < 30%				

Table F–9a. Data Validation Tables: Semivolatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Data Qualifiers	Tentatively Identified Compounds
BATCH SW173				
FB-01	90021708	ALL ND	None Applied	NO TIC DATA PROVIDED
FB-02	90021709	BIS2EHP(12)	None Applied	
EW-01	90021710	ALL ND	None Applied	
	MB173	Not Applicable		
	90021501	ALL ND		
	MBS173			
BATCH SW181				
EW-03	90021808	ALL ND	None Applied	
	MBS181	Not Applicable		
	MB181	Not Applicable		
BATCH SW214B				
P-2	90024801	ALL ND	All compounds=R(SSR)	NO TIC DATA PROVIDED
EW-07	90024901	ALL ND	None Applied	
MW2-01	90024902	ALL ND	None Applied	
MW1-02	90025101	ALL ND	None Applied	
MW1-01	90025102	ALL ND	None Applied	
EW-09	90025104	ALL ND	None Applied	
P-8	90025105	ALL ND	None Applied	
HT-01	90025106	ALL ND	None Applied	
	MBS214B	Not Applicable		
	MB214B	Not Applicable		
BATCH SW253R				
EW-05	90022401	ALL ND	All compounds=R(EHT)	NO TIC DATA PROVIDED
FB-03	90023606	ALL ND	None Applied	
MW4-02	90023901	ALL ND	All compounds=R(EHT)	
	MB253R	Not Applicable		

Table F-9b. Data Validation Tables: Semivolatile Organic Compounds

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Semivolatile Surrogate Recovery	Semivolatile MS/MSD Analyses	Semivolatile Blank Analyses	Semivolatile Tuning/Mass Calibration	Semivolatile Internal Standards
BATCH SS177									
SB1-01-12	90021701	08-27-90	09-06-90	09-17-90	ALL OK		NO INTERFERENTS DETECTED	ALL DFTPP CRITERIA WITHIN CONTROL LIMITS 2 TUNES APPLY (09/17,18/90)	(09/17/90) ALL AREAS WERE WITHIN CONTROL LIMITS (09/18/90) ALL AREAS WERE WITHIN CONTROL LIMITS EXCEPT NPT, CRY, AND PRY (SMP# 21804) NO REANALYSIS
SB1-01-11	90021702	08-27-90	09-06-90	09-17-90	ALL OK				
SB1-03-02	90021703	08-28-90	09-06-90	09-17-90	ALL OK				
SB1-03-05	90021704	08-28-90	09-06-90	09-17-90	ALL OK				
SB1-03-18	90021705	08-28-90	09-06-90	09-17-90	ALL OK				
SB-B-01	90021706	08-28-90	09-06-90	09-18-90	ALL OK				
SB-B-02	90021707	08-28-90	09-06-90	09-18-90	ALL OK				
SB1-02-03	90021801	08-29-90	09-06-90	09-18-90	ALL OK				
SB1-02-03R	90021802	08-29-90	09-06-90	09-18-90	ALL OK				
SB1-02-16	90021803	08-28-90	09-06-90	09-18-90	ALL OK				
SB2-01-01	90021804	08-29-90	09-06-90	09-18-90	S1(134), S2(15)				
SB2-01-19	90021806	08-29-90	09-06-90	09-19-90	ALL OK				
	MBS177	NA	09-06-90	09-17-90	ALL OK				
SB1-02-16	90021803MS	08-28-90	09-06-90	09-18-90	ALL OK	ALL WITHIN LIMITS			
SB1-02-16	90021803MSD	08-28-90	09-06-90	09-18-90	ALL OK				
	MB177	NA	09-06-90	09-17-90	ALL OK				
BATCH SS190									
SB2-02-01	90022301	08-30-90	09-04-90	09-19-90	ALL OK	NONE CONDUCTED	NO INTERFERENTS DETECTED	ALL DFTPP CRITERIA WITHIN CONTROL LIMITS 2 TUNES APPLY (09/19,20/90)	(09/19/90) ALL AREAS WERE WITHIN CONTROL LIMITS (09/20/90) ALL AREAS WERE WITHIN CONTROL LIMITS
SB2-03-01	90022302	08-30-90	09-04-90	09-19-90	ALL OK				
SB2-04-01	90022303	08-30-90	09-04-90	09-19-90	ALL OK				
SB4-01-01	90022304	08-30-90	09-04-90	09-19-90	ALL OK				
SB4-01-02	90022305	08-30-90	09-04-90	09-20-90	ALL OK				
SB4-02-01	90022306	08-30-90	09-04-90	09-19-90	ALL OK				
SB4-02-02	90022307	08-30-90	09-04-90	09-19-90	ALL OK				
SB4-03-01	90022308	08-30-90	09-04-90	09-20-90	ALL OK				
SB4-03-02	90022309	08-30-90	09-04-90	09-20-90	ALL OK				
SB4-04-01	90022310	08-30-90	09-04-90	09-20-90	ALL OK				
SB4-04-02	90022311	08-30-90	09-04-90	09-21-90	ALL OK				
SB4-05-01	90022312	08-30-90	09-04-90	09-21-90	ALL OK				
SB4-05-02	90022313	08-30-90	09-04-90	09-21-90	ALL OK				
	MBS190	NA	09-04-90	09-19-90	ALL OK				
	MB190	NA	09-04-90	09-19-90	ALL OK				

Table F–9b. Data Validation Tables: Semivolatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Initial Calibration SPCC/CCC	Continuing Calibration SPCC/CCC	Trip Blank Analysis	Field Blank Analysis	Equipment Blank Analysis
BATCH SS177						
SB1–01–12	90021701	09–11–90 (CASE # SS177)	2 CCVs APPLY	NA	FB–01,–02	EW–01
SB1–01–11	90021702	DAILY (09–11–90) TUNE IN CONTROL	09–17–90 (CASE # SS177)	NA	FB–01,–02	EW–01
SB1–03–02	90021703	ALL SPCC RRF > 0.050	ALL SPCC RRF50 > 0.050	NA	FB–01,–02	EW–01
SB1–03–05	90021704	CCC %RSD < 30%	CCC %D < 25%	NA	FB–01,–02	EW–01
SB1–03–18	90021705		09–18–90 (CASE # SS177)	NA	FB–01,–02	EW–01
SB–B–01	90021706		ALL SPCC RRF50 > 0.050	NA	FB–01,–02	EW–01
			CCC %D < 25%			
SB–B–02	90021707			NA	FB–01,–02	EW–01
SB1–02–03	90021801			NA	FB–01,–02	EW–03
SB1–02–03R	90021802			NA	FB–01,–02	EW–03
SB1–02–16	90021803			NA	FB–01,–02	EW–03
SB2–01–01	90021804			NA	FB–01,–02	EW–03
SB2–01–19	90021806			NA	FB–01,–02	EW–03
	MBS177					
SB1–02–16	90021803MS			NA		
SB1–02–16	90021803MSD			NA		
	MB177					
BATCH SS190		2 ICVs APPLY	2 CCVs APPLY			
SB2–02–01	90022301	09–11–90 (CASE # SS190)	09–19–90 (CASE SS190)	NA	FB–01,–02	EW–03
SB2–03–01	90022302	DAILY (09–11–90) TUNE IN CONTROL	ALL SPCC RRF50 > 0.050	NA	FB–01,–02	EW–03
SB2–04–01	90022303	ALL SPCC RRF > 0.050	CCC %D < 25%	NA	FB–01,–02	EW–03
SB4–01–01	90022304	CCC %RSD < 30%	09–20–90 (CASE # SS190)	NA	FB–01,–02	EW–03
		09–19–90 (CASE # SS190)	ALL SPCC RRF50 > 0.050			
		DAILY (09–19–90) TUNE IN CONTROL	CCC %D < 25%			
SB4–01–02	90022305	ALL SPCC RRF > 0.050		NA	FB–01,–02	EW–03
SB4–02–01	90022306	CCC %RSD < 30%		NA	FB–01,–02	EW–03
SB4–02–02	90022307			NA	FB–01,–02	EW–03
SB4–03–01	90022308			NA	FB–01,–02	EW–03
SB4–03–02	90022309			NA	FB–01,–02	EW–03
SB4–04–01	90022310			NA	FB–01,–02	EW–03
SB4–04–02	90022311			NA	FB–01,–02	EW–03
SB4–05–01	90022312			NA	FB–01,–02	EW–03
SB4–05–02	90022313			NA	FB–01,–02	EW–03
	MBS190					
	MB190					

Table F–9b. Data Validation Tables: Semivolatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Data Qualifiers	Tentatively Identified Compounds
BATCH SS177				
SB1–01–12	90021701	ALL ND	None Applied	NO TIC DATA PROVIDED
SB1–01–11	90021702	ALL ND	None Applied	
SB1–03–02	90021703	ALL ND	None Applied	
SB1–03–05	90021704	ALL ND	None Applied	
SB1–03–18	90021705	ALL ND	None Applied	
SB–B–01	90021706	FLA(220J),PYR(190J),BZBF(170J), BZKF(320J),BZAP(210J)	None Applied	
SB–B–02	90021707	ALL ND	None Applied	
SB1–02–03	90021801	ALL ND	None Applied	
SB1–02–03R	90021802	FLA(270J),PYR(230J),BZBF(170J), BZKF(330J),BZAP(230J)	None Applied	
SB1–02–16	90021803	ALL ND	None Applied	
SB2–01–01	90021804	ALL ND	NO2BZ,ISOP,NTPH2,DMPH24,BECEM,DCP24,TCB124,NAPH, 4CLAN,HCBU,C4M3PH,MTNPH2,PYR,BTBZNATE,DBZD33, BZAA,BIS2EHP,CHRY,DNOP,BZKF,BZBF,BZAP,INP123, DBAHA,BZGHIP=UJ(SSR,IS) / All other compounds=UJ(SSR)	
SB2–01–19	90021806	BIS2EHP(400J)	None Applied	
	MBS177	Not Applicable		
SB1–02–16	90021803MS	Not Applicable		
SB1–02–16	90021803MSD	Not Applicable		
	MB177	Not Applicable		
BATCH SS190				
SB2–02–01	90022301	ALL ND	None Applied	NO TIC DATA PROVIDED
SB2–03–01	90022302	ALL ND	None Applied	
SB2–04–01	90022303	ALL ND	None Applied	
SB4–01–01	90022304	NAPH(290J),CNPH2(360J),PHAN(720), FLA(660),PYR(600),CHRY(380J),BZBF(370J), BZKF(350J),BZAP(240J)	None Applied	
SB4–01–02	90022305	ALL ND	None Applied	
SB4–02–01	90022306	BZBF(280J),BZKF(360J), BZAP(280J),BZGHIP(230J)	None Applied	
SB4–02–02	90022307	PHAN(300J),FLA(520),PYR(480),BZAA(380J), CHRY(400),BZBF(520),BZKF(830), BZAP(590),INP123(410),BZGHIP(540)	None Applied	
SB4–03–01	90022308	ALL ND	None Applied	
SB4–03–02	90022309	ALL ND	None Applied	
SB4–04–01	90022310	ALL ND	None Applied	
SB4–04–02	90022311	ALL ND	None Applied	
SB4–05–01	90022312	NAPH(1800),DBZFUR(280J)	None Applied	
SB4–05–02	90022313	ALL ND	None Applied	
	MBS190	Not Applicable		
	MB190	Not Applicable		

Table F-9c. Data Validation Tables: Semivolatile Organic Compounds

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Semivolatile Surrogate Recovery	Semivolatile MS/MSD Analyses	Semivolatile Blank Analyses	Semivolatile Tuning/Mass Calibration	Semivolatile Internal Standards
BATCH SS192									
SD4-01	90022402	08-31-90	09-14-90	09-21-90	ALL OK		NO INTERFERENTS DETECTED	ALL DFTPP CRITERIA WITHIN CONTROL LIMITS (09/21/90)	(09/20/90) ALL AREAS WERE WITHIN CONTROL LIMITS (09/21/90) ALL AREAS WERE WITHIN CONTROL LIMITS
SD4-02	90022403	08-31-90	09-14-90	09-21-90	ALL OK				
SB1-04-01	90023601	09-08-90	09-14-90	09-21-90	ALL OK				
SB1-04-02	90023602	09-08-90	09-14-90	09-21-90	ALL OK				
SB1-04-03	90023603	09-08-90	09-14-90	09-21-90	ALL OK				
SB1-04-04	90023604	09-08-90	09-14-90	09-21-90	S6(10)				
	MBS192	NA	NO DATE	09-21-90	ALL OK				
SB1-04-04	90023604MS	09-08-90	09-14-90	09-21-90	ALL OK	PCP(0 %R)			
SB1-04-04	90023604MSD	09-08-90	09-14-90	09-21-90	ALL OK	PCP(0 %R)			
	MB192	NA	09-14-90	09-21-90	ALL OK				

Table F-9c. Data Validation Tables: Semivolatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Initial Calibration SPCC/CCC	Continuing Calibration SPCC/CCC	Trip Blank Analysis	Field Blank Analysis	Equipment Blank Analysis
BATCH SS192						
SD4-01	90022402	09-19-90 (CASE # SS192)	2 CCVs APPLY	NA	FB-01,-02	EW-03
SD4-02	90022403	DAILY (09-19-90) TUNE IN CONTROL	09-20-90 (CASE # SS192)	NA	FB-01,-02	EW-03
SB1-04-01	90023601	ALL SPCC RRF > 0.050	ALL SPCC RRF50 > 0.050	NA	FB-01,-02	EW-03
SB1-04-02	90023602	CCC %RSD < 30%	CCC %D < 25%	NA	FB-01,-02	EW-03
SB1-04-03	90023603		09-21-90 (CASE # SS192)	NA	FB-01,-02	EW-03
			ALL SPCC RRF50 > 0.050			
			CCC %D < 25%			
SB1-04-04	90023604			NA	FB-01,-02	EW-03
	MBS192					
SB1-04-04	90023604MS			NA		
SB1-04-04	90023604MSD			NA		
	MB192					

Table F-9c. Data Validation Tables: Semivolatile Organic Compounds (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Data Qualifiers	Tentatively Identified Compounds
BATCH SS192				
SD4-01	90022402	ALL ND	None Applied	NO TIC DATA PROVIDED
SD4-02	90022403	ALL ND	None Applied	
SB1-04-01	90023601	ALL ND	None Applied	
SB1-04-02	90023602	ALL ND	None Applied	
SB1-04-03	90023603	PHAN(360J),FLA(730),PYR(730),BZAA(560), CHRY(620),BZBF(720),BZKF(800), BZAP(790),INP123(610), DBAHA(260J),BZGHIP(760)	None Applied	
SB1-04-04	90023604	PHAN(1100),ANTH(280J),FLA(1100),PYR(1000), BZAA(530),CHRY(560),BZBF(530), BZKF(580),BZAP(540), INP123(330J),DBAHA(370J)	None Applied	
	MBS192	Not Applicable		
SB1-04-04	90023604MS	Not Applicable		
SB1-04-04	90023604MSD	Not Applicable		
	MB192	Not Applicable		

Footnotes to Table F-9a through F-9c.

Control Limits for Water SVOA Surrogate Recovery
(S1) Nitrobenzene-d5: 35-114
(S2) 2-Fluorobiphenyl: 43-116
(S3) Terphenyl: 33-141
(S4) Phenol-d5: 10-94
(S5) 2-Fluorophenol: 21-100
(S6) 2,4,6-Tribromophenol: 10-123

Control Limits for Soil SVOA Surrogate Recovery
(S1) Nitrobenzene-d5: 23-120
(S2) 2-Fluorobiphenyl: 30-115
(S3) Terphenyl: 18-137
(S4) Phenol-d5: 24-113
(S5) 2-Fluorophenol: 25-121
(S6) 2,4,6-Tribromophenol: 19-122

Control Limits for Water SVOA MS/MSD Analyses
Phenol: 12-86, %RPD= 42
2-Chlorophenol: 27-123, %RPD= 40
1,4-Dichlorobenzene: 36-97, %RPD= 28
N-Nitroso-di-n-propylamine: 41-116, %RPD= 38
1,2,4-Trichlorobenzene: 39-98, %RPD= 28
4-Chloro-3-methylphenol: 23-97, %RPD= 42
Acenaphthene: 46-118, %RPD= 31
4-Nitrophenol: 10-80, %RPD= 50
2,4-Dinitrotoluene: 24-96, %RPD= 38
Pentachlorophenol: 9-103, %RPD= 50
Pyrene: 26-127, %RPD= 31

Control Limits for Soil SVOA MS/MSD Analyses
Phenol: 26-90, %RPD= 35
2-Chlorophenol: 25-102, %RPD= 50
1,4-Dichlorobenzene: 28-104, %RPD= 27
N-Nitroso-di-n-propylamine: 41-126, %RPD= 38
1,2,4-Trichlorobenzene: 38-107, %RPD= 23
4-Chloro-3-methylphenol: 26-103, %RPD= 33
Acenaphthene: 31-137, %RPD= 19
4-Nitrophenol: 11-114, %RPD= 50
2,4-Dinitrotoluene: 28-89, %RPD= 47
Pentachlorophenol: 17-109, %RPD= 47
Pyrene: 35-142, %RPD= 36

System Performance Check Compounds (SPCCs):
N-nitroso-di-n-propylamine (NNSPR), Hexachlorocyclopentadiene (HCCP), 2,4-Dinitrophenol (DNP24), and 4-Nitrophenol (NTPH4)

Calibration Check Compounds (CCCs):
Phenol (PHENOL), 1,4-Dichlorobenzene (DCBZ14), 2-Nitrophenol (NTPH2), 2,4-Dichlorophenol (DCP24), Hexachlorobutadiene (HCBU), 4-Chloro-3-methylphenol (C4M3PH), 2,4,6-Trichlorophenol (TCP246), Acenaphthene (ACNP), N-nitrosodiphenylamine(1) (NNSPH), Pentachlorophenol (PCP), Fluoranthene (FLA), Di-n-octylphthalate (DNOP), and Benzo(a)pyrene (BZAP)

Footnotes to Table F-9a through F-9c (Continued)
Semivolatile Internal Standard Area Summary Compounds: 1,4-Dichlorobenzene-d4 (DCB) Naphthalene-d8 (NPT) Acenaphthene-d10 (ANT) Phenanthrene-d10 (PHN) Chrysene-d12 (CRY) Perylene-d12 (PRY) NA - Not Applicable **Sample result data qualifiers:** ND-none detected J-estimated concentration U-not detected SSR-surrogate spike recovery IS-internal standard R-analysis was rejected EHT-extraction holding time **Abreviations used for compounds:** Nitrobenzene=NO2BZ Isophorone=ISOP 2-Nitrophenol=NTPH2 2,4-Dimethylphenol=DMPH24 bis(2-Chloroethoxy)methane=BECEM 2,4-Dichlorophenol=DCP24 1,2,4-Trichlorobenzene=TCB124 Naphthalene=NAPH 4-Chloroaniline=4CLAN Hexachlorobutadiene=HCBU 4-Chloro-3-methylphenol=C4M3PH 2-Methylnaphthalene=MTNPH2 2-Chloronaphthalene=CNPH2 Dibenzofuran=DBZFUR Phenanthrene=PHAN Anthracene=ANTH Fluoranthene=FLA Pyrene=PYR Butylbenzylphthalate=BTBZNATE 3,3'-Dichlorobenzidine=DBZD33 Benzo(a)anthracene=BZAA Chrysene=CHRY bis-(2-Ethylhexyl)phthalate=BIS2EHP Di-n-octylphthalate=DNOP Benzo(b)fluoranthene=BZBF Benzo(k)fluoranthene=BZKF Benzo(a)pyrene=BZAP Indeno(1,2,3-cd)pyrene=INP123 Dibenz(a,h)anthracene=DBAHA Benzo(g,h,i)perylene=BZGHIP

Table F-9d. Semivolatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Semivolatile Surrogate Recovery	Semivolatile MS/MSD Analyses	Semivolatile Blank Analyses	Semivolatile Tuning/Mass Calibration	Semivolatile Internal Standards
WATERS									
SBLK1	MB735	NA	11/07/91	12/05/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR WATER SAMPLES, EXCEPT: GW1-1 FBP=15% (43%), TPH=19% (33%), TBP=5% (10%); GW1-1RE FBP=15% (43%), TPH=20% (33%), TBP=0% (10%); AND MW1-02 MSD TBP=124% (123%)	MW1-02 ALL RECOVERY AND DIFFERENCE VALUES WITHIN LIMITS EXCEPT RECOVERIES: C4M3PH=103% MS, 106% MSD(97%); DNT24=104% MS, 113% MSD(96%); AND PCP=122% MS, 126% MSD(103%)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# HP1: ALL DFTPP TUNING AND MASS CALIBRATION CRITERIA WITHIN CONTROL LIMITS 2 TUNES APPLY: (12/03,04/91)	DCB, NPT, ANT, PHN, CRY, AND PRY: ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
EB1-1	14265	11/05/91	11/07/91	12/04/91					
EB1A-1	14266	11/05/91	11/07/91	12/04/91					
MW1-02	14267	11/05/91	11/07/91	12/04/91					
EB3-1	13179	10/31/91	11/07/91	12/05/91					
FB4-1	13195	11/01/91	11/07/91	12/05/91					
FB1-1	13299	11/04/91	11/07/91	12/04/91					
GW1-1	13300	11/02/91	11/07/91	12/04/91					
GW1-1RE	13300RE	11/02/91	11/07/91	12/04/91					
MW1-02 MS	14267 MS	11/05/91	11/07/91	12/04/91					
MW1-02 MSD	14267 MSD	11/05/91	11/07/91	12/04/91					
WATERS									
SBLK3	MB742	NA	11/08/91	12/14/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR WATER SAMPLES, EXCEPT: MW1-01 NBZ=118% (114%), MW2-01R TPH=23% (33%), AND P-8 TPH=21% (33%)	(SEE ANALYSES FOR MW1-02)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST# HP1: ALL DFTPP TUNING AND MASS CALIBRATION CRITERIA WITHIN CONTROL LIMITS. 2 TUNES APPLY: (12/12,13/91)	DCB, NPT, ANT, PHN, CRY, AND PRY: ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
MW1-01	14354	11/06/91	11/08/91	12/12/91					
MW2-01	14355	11/06/91	11/08/91	12/12/91					
MW2-01R	14356	11/06/91	11/08/91	12/13/91					
FB2-1	14360	11/06/91	11/08/91	12/13/91					
EB2-1	14361	11/06/91	11/08/91	12/13/91					
SBLK5	MB746	NA	11/14/91	12/14/91			NO INTERFERENCE DETECTED, TIC TOTAL=0		
P-8	14398	11/07/91	11/14/91	12/14/91					
SOILS									
SBLK2	MB737	NA	11/07/91	12/04/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	SB1-2-7 ALL RECOVERY AND DIFFERENCE VALUES WITHIN LIMITS EXCEPT RECOVERIES: DNT24=90% MS(89%); AND RPDs: PHENOL=36% (35%), DCBZ14=46% (27%), NNSPR=45% (38%), TCB124=41% (23%), AND ACNP=31% (19%)	NO INTERFERENCE DETECTED, TIC TOTAL=3	INST# HP1: ALL DFTPP TUNING AND MASS CALIBRATION CRITERIA WITHIN CONTROL LIMITS. 6 TUNES APPLY: (12/03,04,05,10,11,13/91)	DCB, NPT, ANT, PHN, CRY, AND PRY: ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
SB3-2-2	13173	10/31/91	11/07/91	12/04/91					
SB3-2-1	13174	10/31/91	11/07/91	12/04/91					
SB3-1-6	13175	10/31/91	11/07/91	12/04/91					
SB3-1-9	13176	10/31/91	11/07/91	12/05/91					
SB1-1-1	13188	11/01/91	11/07/91	12/05/91					
SB1-1-2	13189	11/01/91	11/07/91	12/05/91					
SB1-1-3	13190	11/01/91	11/07/91	12/05/91					
BO1-1-1	13278	11/05/91	11/07/91	12/10/91					
BO1-1-2	13279	11/05/91	11/07/91	12/05/91					
BO1-1-3	13280	11/05/91	11/07/91	12/05/91					
BO1-1-4	13281	11/03/91	11/07/91	12/05/91					
BO2-1-1	13282	11/03/91	11/07/91	12/05/91					
BO2-1-2	13283	11/05/91	11/07/91	12/05/91					
BO2-1-3	13284	11/05/91	11/07/91	12/05/91					
SB1-2-1DL	13285DL	11/02/91	11/07/91	12/14/91					
SB1-2-2	13286	11/02/91	11/07/91	12/06/91					
SB1-2-3	13287	11/02/91	11/07/91	12/06/91					
SB1-2-7	13288	11/02/91	11/07/91	12/06/91					
SB1-1-7	13289	11/02/91	11/07/91	12/11/91					
SB1-2-7 MS	13288 MS	11/02/91	11/07/91	12/06/91					
SB1-2-7 MSD	13288 MSD	11/02/91	11/07/91	12/06/91					
SOILS									
SBLK4	MB738	NA	11/08/91	12/10/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES, EXCEPT: SB1-2-3 NBZ=16% (23%), 2FP=9% (25%), DCB=11% (20%) AND SB1A-3-4R NBZ=20% (23%), 2FP=12% (25%), DCB=13% (20%)	SB1A-2-1 ALL RECOVERY AND DIFFERENCE VALUES WITHIN LIMITS EXCEPT RECOVERIES: NTPH4=4% MS(11%); AND RPDs: PHENOL=38% (35%), DCBZ14=37% (27%), NNSPR=44% (38%), TCB124=39% (23%), C4M3PH=39% (33%), ACNP=37% (19%), NTPH4=157% (50%), AND PYR=57% (36%)	NO INTERFERENCE DETECTED, TIC TOTAL=1	INST# HP1: ALL DFTPP TUNING AND MASS CALIBRATION CRITERIA WITHIN CONTROL LIMITS. 4 TUNES APPLY: (12/10,11,12,14/91)	DCB, NPT, ANT, PHN, CRY, AND PRY: ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY, EXCEPT THE AREA FOR SB1A-2-1 MSD FOR PRY
SB1A-3-4	14350	11/05/91	11/08/91	12/12/91					
SB1A-3-4R	14351	11/05/91	11/08/91	12/12/91					
SB1A-3-5	14264	11/05/91	11/08/91	12/12/91					
SB1-3-3	14261	11/05/91	11/08/91	12/12/91					
SB1-3-5R	14262	11/05/91	11/08/91	12/12/91					
SB1A-1-1	13290	11/04/91	11/08/91	12/10/91					
SB1A-1-3 (1st round)	13292 (1st round)	11/04/91	11/08/91	12/11/91					
SB1A-1-5	14348	11/04/91	11/08/91	12/12/91					
SB1A-1-5R	14349	11/04/91	11/08/91	12/12/91					
SB1A-2-2	13295	11/04/91	11/08/91	12/11/91					
SB1A-2-3	13296	11/04/91	11/08/91	12/11/91					
SB1-2-3	14352	11/02/91	11/08/91	12/12/91					
SB1A-3-2DL	14263DL	11/04/91	11/08/91	12/14/91					
SB1-3-2	14260	11/05/91	11/08/91	12/12/91					
SB1-3-1	14259	11/05/91	11/08/91	12/12/91					
SB1A-3-3	13298	11/04/91	11/08/91	12/11/91					
SB1A-3-1	13297	11/04/91	11/08/91	12/11/91					
SB1A-1-2 (1st round)	13291 (1st round)	11/04/91	11/08/91	12/11/91					
SB1A-2-1	13294	11/04/91	11/08/91	12/11/91					
SB1A-2-1 MS	13294 MS	11/04/91	11/08/91	12/11/91					
SB1A-2-1 MSD	13294 MSD	11/04/91	11/08/91	12/11/91					

Table F-9d. Semivolatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Initial Calibration	Continuing Calibration	Field Blank Analysis	Equipment Blank Analysis
WATERS					
SBLK1	MB735	12/05/91 (INST# HP1)	12/05/91 (INST# HP1)	NA	NA
EB1-1	14265	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	NA	NA
EB1A-1	14266	ALL RRF > 0.010	ALL RRF 50 > 0.010	NA	NA
MW1-02	14267	%RSD < 40%	%D < 40%	FB1-1	EB1A-1,1-1
EB3-1	13179			NA	NA
FB4-1	13195		12/04/91 (INST# HP1)	NA	NA
FB1-1	13299		DAILY TUNE IN CONTROL:	NA	NA
GW1-1	13300		ALL RRF 50 > 0.010	FB1-1	EB4-1
GW1-1RE	13300RE		%D < 40%	FB1-1	EB4-1
MW1-02 MS	14267 MS			FB1-1	EB1A-1,1-1
MW1-02 MSD	14267 MSD			FB1-1	EB1A-1,1-1
WATERS					
SBLK3	MB742	12/05/91 (INST# HP1)	12/12/91 (INST# HP1)	NA	NA
MW1-01	14354	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB2-1	EB2-1
MW2-01	14355	ALL RRF > 0.010	ALL RRF 50 > 0.010	FB2-1	EB2-1
MW2-01R	14356	%RSD < 40%	%D < 40%	FB2-1	EB2-1
FB2-1	14360	12/13/91 (INST# HP1)	12/13/91 (INST# HP1)	NA	NA
EB2-1	14361	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	NA	NA
SBLK5	MB746	ALL RRF > 0.010	ALL RRF 50 > 0.010	NA	NA
P-8	14398	%RSD < 40%	%D < 40%	FB2-1	EB2-1
SOILS					
SBLK2	MB737	12/05/91 (INST# HP1)	12/05/91 (INST# HP1)	NA	NA
SB3-2-2	13173	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB4-1	EB3-1
SB3-2-1	13174	ALL RRF > 0.010	ALL RRF 50 > 0.010	FB4-1	EB3-1
		%RSD < 40%	%D < 40%		
SB3-1-6	13175	12/13/91 (INST# HP1)	12/04/91 (INST# HP1)	FB4-1	EB3-1
SB3-1-9	13176	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:		EB3-1
SB1-1-1	13188	ALL RRF > 0.010	ALL RRF 50 > 0.010	FB4-1	EB4-1
SB1-1-2	13189	%RSD < 40%	%D < 40%	FB4-1	EB4-1
SB1-1-3	13190		12/05/91 (INST# HP1)	FB4-1	EB4-1
BO1-1-1	13278		DAILY TUNE IN CONTROL:	FB1-1	EB4-1
			ALL RRF 50 > 0.010		
			%D < 40%		
BO1-1-2	13279		12/10/91 (INST# HP1)	FB1-1	EB4-1
			DAILY TUNE IN CONTROL:		
BO1-1-3	13280		ALL RRF 50 > 0.010	FB1-1	EB4-1
BO1-1-4	13281		%D < 40%	FB1-1	EB4-1
BO2-1-1	13282		12/11/91 (INST# HP1)	FB1-1	EB4-1
BO2-1-2	13283		DAILY TUNE IN CONTROL:	FB1-1	EB4-1
BO2-1-3	13284		ALL RRF 50 > 0.010	FB1-1	EB4-1
SB1-2-1DL	13285DL		%D < 40%	FB1-1	EB4-1
			12/13/91 (INST# HP1)		
			DAILY TUNE IN CONTROL:		
SB1-2-2	13286		ALL RRF 50 > 0.010	FB1-1	EB4-1
SB1-2-3	13287		%D < 40%	FB1-1	EB4-1
SB1-2-7	13288			FB1-1	EB4-1
SB1-1-7	13289			FB1-1	EB4-1
SB1-2-7 MS	13288 MS			FB1-1	EB4-1
SB1-2-7 MSD	13288 MSD			FB1-1	EB4-1
SOILS					
SBLK4	MB738	12/05/91 (INST# HP1)	12/10/91 (INST# HP1)	NA	NA
SB1A-3-4	14350	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB2-1	EB2-1
SB1A-3-4R	14351	ALL RRF > 0.010	ALL RRF 50 > 0.010	FB2-1	EB2-1
SB1A-3-5	14264	%RSD < 40%	%D < 40%	FB1-1	EB1A-1,1-1
SB1-3-3	14261	12/13/91 (INST# HP1)	12/11/91 (INST# HP1)	FB1-1	EB1A-1,1-1
SB1-3-3R	14262	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB1-1	EB1A-1,1-1
SB1A-1-1	13290	ALL RRF > 0.010	ALL RRF 50 > 0.010	FB1-1	EB4-1
SB1A-1-3 (1st round)	13292 (1st round)	%RSD < 40%	%D < 40%	FB1-1	EB4-1
SB1A-1-5	14348		12/12/91 (INST# HP1)	FB2-1	EB2-1
SB1A-1-5R	14349		DAILY TUNE IN CONTROL:	FB2-1	EB2-1
SB1A-2-2	13295		ALL RRF 50 > 0.010	FB1-1	EB4-1
SB1A-2-3	13296		%D < 40%	FB1-1	EB4-1
SB1-2-5	14352		12/14/91 (INST# HP1)	FB2-1	EB2-1
SB1A-3-2DL	14263DL		DAILY TUNE IN CONTROL:	FB1-1	EB1A-1,1-1
SB1-3-2	14260		ALL RRF 50 > 0.010	FB1-1	EB1A-1,1-1
			%D < 40%		
SB1-3-1	14259			FB1-1	EB1A-1,1-1
SB1A-3-3	13298			FB1-1	EB4-1
SB1A-3-1	13297			FB1-1	EB4-1
SB1A-1-2 (1st round)	13291 (1st round)			FB1-1	EB4-1
SB1A-2-1	13294			FB1-1	EB4-1
SB1A-2-1 MS	13294 MS			FB1-1	EB4-1
SB1A-2-1 MSD	13294 MSD			FB1-1	EB4-1

Table F-9d. Semivolatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Tentatively Identified Compounds	Data Validation Qualifiers
WATERS				
SBLK1	MB735	None Detected	0 (0)	
EB1-1	14265	None Detected	0 (0)	None Applied
EB1A-1	14266	None Detected	0 (0)	None Applied
MW1-02	14267	None Detected	15 (1)	None Applied
EB3-1	15179	None Detected	0 (0)	None Applied
FB4-1	13195	None Detected	0 (0)	None Applied
FB1-1	13299	None Detected	0 (0)	None Applied
GW1-1	13300	None Detected	62 (11)	All compounds=R(SSR)
GW1-1RE	13300RE	None Detected	62 (12)	All compounds=R(SSR)
MW1-02 MS	14267 MS	Not Applicable	Data Not Provided	Not Applicable
MW1-02 MSD	14267 MSD	Not Applicable	Data Not Provided	Not Applicable
WATERS				
SBLK3	MB742	None Detected	0 (0)	
MW1-01	14354	None Detected	30 (5)	None Applied
MW2-01	14355	None Detected	19 (1)	None Applied
MW2-01R	14356	None Detected	8 (2)	None Applied
FB2-1	14360	None Detected	8 (1)	None Applied
EB2-1	14361	None Detected	0 (0)	None Applied
SBLK5	MB746	None Detected	0 (0)	
P-8	14398	None Detected	9 (1)	None Applied
SOILS				
SBLK2	MB737	None Detected	860 (5)	
SB3-2-2	13173	None Detected	28410 (20)	None Applied
SB3-2-1	13174	PHAN=350/FLA=660/PYR=560/BIS2EHP=240J/ BZBF=660 µg/kg	34640 (20)	None Applied
SB3-1-6	13175	None Detected	4000 (16)	None Applied
SB3-1-9	13176	None Detected	11070 (20)	None Applied
SB1-1-1	13188	None Detected	12960 (18)	None Applied
SB1-1-2	13189	4MPH=1900 µg/kg	12980 (20)	None Applied
SB1-1-3	13190	None Detected	0 (0)	None Applied
BO1-1-1	13278	DNT24=3400/NNSPH=800/PHAN=600/FLA=1500/ PYR=1600/BZAA=1000/BZBF=2200/ BZAP=1100 µg/kg	16050 (20)	None Applied
BO1-1-2	13279	PHAN=420/FLA=920/PYR=880/CHRY=490/ BIS2EHP=370/BZBF=1000 µg/kg	13700 (20)	None Applied
BO1-1-3	13280	None Detected	12070 (20)	None Applied
BO1-1-4	13281	None Detected	2650 (12)	None Applied
BO2-1-1	13282	None Detected	2270 (6)	None Applied
BO2-1-2	13283	None Detected	8830 (20)	None Applied
BO2-1-3	13284	None Detected	4280 (18)	None Applied
SB1-2-1DL	13285DL	FL=1500DJ/PHAN=16000D/ANTH=2200D/ FLA=13000D/PYR=9400D/BZAA=4400D/ CHRY=4300D/BZBF=6900D/BZAP=3800D µg/kg	11890 (7)	None Applied
SB1-2-2	13286	None Detected	7050 (11)	None Applied
SB1-2-3	13287	None Detected	3990 (12)	None Applie.
SB1-2-7	13288	None Detected	18500 (20)	None Applied
SB1-1-7	13289	None Detected	6050 (16)	None Applied
SB1-2-7 MS	13288 MS	Not Applicable	Data Not Provided	Not Applicable
SB1-2-7 MSD	13288 MSD	Not Applicable	Data Not Provided	Not Applicable
SOILS				
SBLK4	MB738	None Detected	730 (1)	
SB1A-3-4	14350	None Detected	7610 (18)	None Applied
SB1A-3-4R	14351	None Detected	6240 (13)	All compounds=UJ(SSR)
SB1A-3-5	14264	None Detected	5650 (15)	None Applied
SB1-3-5	14261	None Detected	7320 (19)	None Applied
SB1-3-5R	14262	None Detected	5910 (15)	None Applied
SB1A-1-1	13290	None Detected	14480 (20)	None Applied
SB1A-1-3 (1st round)	13292 (1st round)	None Detected	21550 (20)	None Applied
SB1A-1-5	14348	None Detected	11670 (20)	None Applied
SB1A-1-5R	14349	None Detected	12600 (20)	None Applied
SB1A-2-2	13295	None Detected	800 (3)	None Applied
SB1A-2-3	13296	None Detected	5120 (13)	None Applied
SB1-2-5	14352	None Detected	6540 (14)	All compounds=R(SSR)
SB1A-3-2DL	14263DL	PCP=13000D µg/kg	29040 (11)	None Applied
SB1-3-2	14260	ACNP=180J/DBZFUR=71J/FL=140J/PHAN=1400/ ANTH=220J/CAR=230J/FLA=1500/PYR=1700/ BZAA=740/CHRY=730/BZBF=1300/BZAP=540/ INP123=570J µg/kg	2450 (9)	None Applied
SB1-3-1	14259	FLA=400/PYR=390J/BZBF=390J/BZAP=160J µg/kg	4420 (8)	None Applied
SB1A-3-3	13298	FLA=81J/PYR=94J µg/kg	4790 (11)	None Applied
SB1A-3-1	13297	FLA=710/PYR=700/BZBF=660/BZAP=300 µg/kg	4240 (16)	None Applied
SB1A-1-2 (1st round)	13291 (1st round)	FLA=100J µg/kg	21080 (20)	None Applied
SB1A-2-1	13294	FLA=610/PYR=620/BZBF=1300/BZAP=660/ INP123=300 µg/kg	16760 (18)	PYR=620J(RPD)
SB1A-2-1 MS	13294 MS	Not Applicable	Data Not Provided	Not Applicable
SB1A-2-1 MSD	13294 MSD	Not Applicable	Data Not Provided	Not Applicable

Table F–9e. Semivolatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Semivolatile Surrogate Recovery	Semivolatile MS/MSD Analyses	Semivolatile Blank Analyses	Semivolatile Tuning/Mass Calibration	Semivolatile Internal Standards
SOILS									
SBLK6	MB720	NA	11/14/91	12/14/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES, EXCEPT: SB1–2–SR NBZ=0% (23%), FBP=0% (30%), PHL=0% (24%), 2FP=0% (25%), 2CP=0% (20%), DCB=0% (20%); AND SBLK6 NBZ=0% (23%), FBP=0% (30%), PHL=0% (24%), 2FP=0% (25%), TBP=0% (19%), 2CP=0% (20%), DCB=0% (20%);	(SEE ANALYSES FOR SB1A–2–1)	NO INTERFERENCE DETECTED, TIC TOTAL=0	INST # HP1: ALL DFTPP TUNING AND MASS CALIBRATION CRITERIA WITHIN CONTROL LIMITS. 1 TUNE APPLIES: (12/14/91)	DCB, NPT, ANT, PHN, CRY, AND PRY: ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
SB1–2–SR (1st round)	14353 (1st round)	11/02/91	11/14/91	12/14/91					
SBLK7	MB758	NA	11/21/91	12/14/91			NO INTERFERENCE DETECTED, TIC TOTAL=0		
SBS–1–1	13109	10/30/91	11/21/91	12/14/91					
SB1A–1–5	13295	11/04/91	11/21/91	12/14/91					
SOILS									
SBLK9	MB782	NA	12/19/91	12/24/91	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES		INTERFERENCE DETECTED, TIC TOTAL=1	INST # HP1: ALL DFTPP TUNING AND MASS CALIBRATION CRITERIA WITHIN CONTROL LIMITS. 2 TUNES APPLY: (12/24/91, 01/08/92)	DCB, NPT, ANT, PHN, CRY, AND PRY: ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
SB1A–1–2 (2nd round)	13291 (2nd round)	11/04/91	12/19/91	12/24/91		(SEE RESULTS ASSOCIATED WITH SB1A–1–2 (1st round))			
SBLK10	MB795	NA	12/30/91	01/08/92			NO INTERFERENCE DETECTED, TIC TOTAL=2		
SB1A–1–5 (2nd round)	13292 (2nd round)	11/04/91	12/30/91	01/08/92		(SEE RESULTS ASSOCIATED WITH SB1A–1–5 (1st round))			
SOILS									
SBLK11	MB802	NA	01/09/92	01/19/92	ALL SURROGATE RECOVERIES WITHIN CONTROL LIMITS FOR SOIL SAMPLES	(SEE RESULTS ASSOCIATED WITH SB1–2–SR (1st round))	NO INTERFERENCE DETECTED, TIC TOTAL=4	INST # HP1: ALL DFTPP TUNING AND MASS CALIBRATION CRITERIA WITHIN CONTROL LIMITS. 1 TUNE APPLIES: (01/19/92)	DCB, NPT, ANT, PHN, CRY, AND PRY: ALL AREAS AND RETENTION TIMES WERE WITHIN CONTROL LIMITS AND WINDOWS, RESPECTIVELY.
SB1–2–SR (2nd round)	14353 (2nd round)	11/02/91	01/09/92	01/20/92					

Table F-9e. Semivolatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Initial Calibration	Continuing Calibration	Field Blank Analysis	Equipment Blank Analysis
SOILS					
SBLK6	MB720	12/13/91 (INST# HP1)	12/14/91 (INST# HP1)	NA	NA
SB1-2-5R (1st round)	14353 (1st round)	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB2-1	EB2-1
SBLK7	MB758	ALL RRF > 0.010	ALL RRF50 > 0.010	~~NA~~	NA
SB3-1-1	13109	%RSD < 40%	%D < 40%	FB4-1	EB3-1
SB1A-1-5	13293			FB1-1	EB4-1
SOILS					
SBLK9	MB782	12/13/91 (INST# HP1)	12/24/91 (INST# HP1)	NA	NA
SB1A-1-2 (2nd round)	13291 (2nd round)	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB1-1	EB4-1
		ALL RRF > 0.010	ALL RRF50 > 0.010		
		%RSD < 40%	%D < 40%		
SBLK10	MB795		01/08/92 (INST# HP1)	NA	NA
SB1A-1-3 (2nd round)	13292 (2nd round)		DAILY TUNE IN CONTROL:	FB1-1	EB4-1
			ALL RRF50 > 0.010		
			%D < 40%		
SOILS					
SBLK11	MB802	01/19/92 (INST# HP1)	01/19/92 (INST# HP1)	NA	NA
SB1-2-5R (2nd round)	14353 (2nd round)	DAILY TUNE IN CONTROL:	DAILY TUNE IN CONTROL:	FB2-1	EB2-1
		ALL RRF > 0.010	ALL RRF50 > 0.010		
		%RSD < 40%	%D < 40%		

Table F-9e. Semivolatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Tentatively Identified Compounds	Data Validation Qualifiers
SOILS				
SBLK6	MB720	None Detected	0 (0)	
SB1-2-5R (1st round)	14353 (1st round)	None Detected	1390 (7)	All compounds=R(SSR)
SBLK7	MB758	None Detected	0 (0)	None Applied
SB3-1-1	13109	BIS2EHP=2400X µg/kg	6720 (11)	BIS2EHP=2400J(EHT)/All other compounds=UJ(EHT)
SB1A-1-5	13293	None Detected	4990 (15)	All compounds=UJ(EHT)
SOILS				
SBLK9	MB782	DEPH=2300 µg/kg	260 (1)	
SB1A-1-2 (2nd round)	13291 (2nd round)	DEPH=4800E/PHAN=330J/FLA=790/PYR=810/ BZAA=510/CHRY=590/BZBF=710/BZKF=860/ BZAP=800/INP123=570/BZGHIP=700 µg/kg	830 (2)	DEPH,PHAN,FLA,PYR,BZAA,CHRY,BZBF,BZKF,BZAP,INP123,BZGHIP=J(EHT)/ All other compounds=R(EHT)
SBLK10	MB795	None Detected	460 (2)	
SB1A-1-3 (2nd round)	13292 (2nd round)	PYR=63J µg/kg	1340 (6)	PYR=63J(EHT)/All other compounds=R(EHT)
SOILS				
SBLK11	MB802	None Detected	800 (4)	
SB1-2-5R (2nd round)	14353 (2nd round)	None Detected	20320 (19)	All compounds=R(EHT)

Footnotes to Table F−9d and F−9e. Semivolatile Organic Compound Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana

Control limits for Water SVOC Surrogate Recovery
- Nitrobenzene−d5 (NBZ): 35−114
- 2−Fluorobiphenyl (FBP): 43−116
- Terphenyl−d14 (TPH): 33−141
- Phenol−d5 (PHL): 10−110
- 2−Fluorophenol (2FP): 21−110
- 2,4,6−Tribromophenol (TBP): 10−123
- 2−Chlorophenol−d4 (2CP): 33−110 (advisory)
- 1,2−Dichlorophenol−d4 (DCB): 16−110 (advisory)

Control Limits for Soil SVOC Surrogate Recovery
- Nitrobenzene−d5 (NBZ): 23−120
- 2−Fluorobiphenyl (FBP): 30−115
- Terphenyl−d14 (TPH): 18−137
- Phenol−d5 (PHL): 24−113
- 2−Fluorophenol (2FP): 25−121
- 2,4,6−Tribromophenol (TBP): 19−122
- 2−Chlorophenol−d4 (2CP): 20−130 (advisory)
- 1,2−Dichlorophenol−d4 (DCB): 20−130 (advisory)

Control Limits for Water SVOC MS/MSD Analyses
- Phenol (PHENOL): 12−110, %RPD= 42
- 2−Chlorophenol (CLPH2): 27−123, %RPD= 40
- 1,4−Dichlorobenzene (DCBZ14): 36−97, %RPD= 28
- N−Nitroso−di−n−propylamine (NNSPR): 41−116, %RPD= 38
- 1,2,4−Trichlorobenzene (TCB124): 39−98, %RPD= 28
- 4−Chloro−3−methylphenol (C4M3PH): 23−97, %RPD= 42
- Acenaphthene (ACNP): 46−118, %RPD= 31
- 4−Nitrophenol (NTPH4): 10−80, %RPD= 50
- 2,4−Dinitrotoluene (DNT24): 24−96, %RPD= 38
- Pentachlorophenol (PCP): 9−103, %RPD= 50
- Pyrene (PYR): 26−127, %RPD= 31

Footnotes to Table F-9d and F-9e. Semivolatile Organic Compound Data Validation Worksheets Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

Control Limits for Soil SVOC MS/MSD Analyses
- Phenol (PHENOL): 26-90, %RPD= 35
- 2-Chlorophenol (CLPH2): 25-102, %RPD= 50
- 1,4-Dichlorobenzene (DCBZ14): 28-104, %RPD= 27
- N-Nitroso-di-n-propylamine (NNSPR): 41-126, %RPD= 38
- 1,2,4-Trichlorobenzene (TCB124): 38-107, %RPD= 23
- 4-Chloro-3-methylphenol (C4M3PH): 26-103, %RPD= 33
- Acenaphthene (ACNP): 31-137, %RPD= 19
- 4-Nitrophenol (NTPH4): 11-114, %RPD= 50
- 2,4-Dinitrotoluene (DNT24): 28-89, %RPD= 47
- Pentachlorophenol (PCP): 17-109, %RPD= 47
- Pyrene (PYR): 35-142, %RPD= 36

Tuning and mass calibration performed with decafluorotriphenylphosphine (DFTPP).

Semivolatile Internal Standard Area Summary Compounds:
- 1,4-Dichlorobenzene-d4 (DCB)
- Naphthalene-d8 (NPT)
- Acenaphthene-d10 (ANT)
- Phenanthrene-d10 (PHN)
- Chrysene-d12 (CRY)
- Perylene-d12 (PRY)

Sample result data qualifiers:
- J-estimated concentration
- D-the compound was analyzed at a secondary dilution factor after exceeding the calibration range of the instrument on the first analysis.
- X-identification criteria not met, but presence is strongly suspected
- E-the reported value is estimated due to the presence of interference
- R-analysis was rejected
- EHT-extraction holding time
- U-not detected
- SSR-surrogate spike recovery
- RPD-relative percent difference

Abreviations used for compounds
- 4-Methylphenol=4MPH
- Acenaphthene=ACNP
- Dibenzofuran=DBZFUR
- 2,4-Dinitrotoluene=DNT24
- Diethylphthalate=DEPH
- Fluorene=FL
- N-Nitrosodiphenylamine (1)=NNSPH
- Pentachlorophenol=PCP
- Phenanthrene=PHAN
- Anthracene=ANTH
- Carbazole=CAR
- Fluoranthene=FLA
- Pyrene=PYR
- Benzo(a)anthracene=BZAA
- Chrysene=CHRY
- bis-(2-Ethylhexyl)phthalate=BIS2EHP
- Benzo(b)fluoranthene=BZBF
- Benzo(k)fluoranthene=BZKF
- Benzo(a)pyrene=BZAP
- Indeno(1,2,3-cd)pyrene=INP123
- Benzo(g,h,i)perylene=BZGHIP

Based on an evaluation of all environmental samples and field QC blanks analyzed for SVOCs using EPA Method 3550/8270 and the March 1990 CLP SOW, all holding time criteria were met, except for SB3-1-1 which was extracted 22 days after sample collection. As a result, the analytical results were qualified (i.e., "UJ[EHT]" and for undetected compounds and "J[EHT]" for detected compounds) to indicate that the results should be considered estimated due to the exceeded extraction holding time.

One equipment blank (i.e., EW-05), 1 groundwater sample (i.e., MW4-02), and 3 soil samples (i.e., SB1A-1-3 collected in 1990 and SB1A-1-2 and SB1-2-5 collected in 1991 were extracted more than 24 days beyond the applicable extraction holding time. As a result, all undetected results were rejected and all detected results were estimated (i.e., "R[EHT]"and "J[EHT]" respectively) to indicate the exceeded holding times.

Tuning and Mass Calibration Results -- The first step in the calibration of the GC/MS system is the demonstration of satisfactory ionization and fragmentation of standard mass spectral tuning compounds. This was accomplished, in addition to a sensitivity check, using decafluorotriphenylphosphine (DFTPP) injected at a concentration near the instrument detection limit for EPA Method 8270 and the March 1990 CLP SOW protocol. This standard was analyzed every 12 hours to ensure that the GC/MS was tuned correctly. Tuning and mass calibration requirements used to evaluate the acceptable instrument operation are described in EPA Method and the March 1990 CLP SOW. Based on an evaluation of the ionization and fragmentation criteria, in addition to the instrument tune frequency, all DFTPP tuning and mass calibration criteria requirements were met.

Initial Calibration Results -- After the tuning and mass calibration criteria were verified and before samples were analyzed,calibration of each GC/MS used to analyzed samples collected during the Indiana ANGB SI was established and validated by injecting traceable standards at five concentrations spanning the expected sample concentration range to determine instrument sensitivity and the linear range of each target compound. Initial calibration was conducted after the GC/MS tune criteria were met and before any samples were analyzed. The average RRF and percent RSD values for all SVOCs were evaluated to verify the validity of the initial calibration. Initial calibration criteria requirements for SVOC analyses were described in EPA Method 8270 and the March 1990 CLP SOW. Based on an evaluation of the initial calibrations conducted for SVOC analyses, all criteria requirements were met.

Continuing Calibration Results -- Every 12 hours, a CCV standard was analyzed. The continuing calibration was evaluated based on the magnitude of the RRFs and percent difference (%D) between the average RRF of each compound for the initial calibration and RRFs of that compound in the continuing calibration standard. Minimum RRF and maximum %D criteria are presented in EPA Method 8270 and the March 1990 CLP SOW. Based on an evaluation of the continuing calibrations conducted for SVOC analyses, all criteria requirements were met.

Internal Standard -- Six internal standards (i.e., 1,4-dichlorobenzene-d_4, naphthalene-d_8, acenaphthene-d_{10}, phenanthrene-d_{10}, chrysene-d_{12}, and perylene-d_{12}) were added to each sample immediately before analysis as indicators of instrumental operating variations. The concentrations of SVOCs detected were calculated with reference to the RF of the internal standard (IS) for each sample. IS area requirements were described in EPA Method 8270 and the March 1990 CLP SOW. Based on an evaluation of all analyses, all IS areas were within acceptable limits, except for naphthalene-d_8, chrysene-$d_{12,}$ perylene-d_{12} (i.e., area counts less than the lower minimum) in SB2-01-01. As a result, data validation qualifiers (i.e., "UJ[IS]") were applied to the applicable SVOC analytical results (i.e., nitrobenzene, isophorone, 2-nitrophenol, 2,4-dimethylphenol, bis(2-chloroethoxy)methane, 2,4-dichlorophenol, 1,2,4-trichlorobenzene, naphthalene, 4-chloraniline, hexachlorobutadiene, 4-chloro-3-methylphenol, 2-methylnaphthalene, pyrene, butylbenzyl phthalate, 3,3'-dichlorobenzidine, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, di-n-octyl phthalate, benzo(k)fluoranthene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene) to indicate that these values should be considered estimated.

Internal standard area criteria were not met for perylene-d_{12} in SB1A-2-1MSD. No data validation qualifiers were applied to the matrix spike duplicate sample.

System Performance Compound Summaries (Surrogate Recoveries) -- Six compounds (i.e., nitrobenzene-d_5, 2-fluorobiphenyl, terphenyl, phenol-d_5, 2-fluorophenol, and 2,4,6-tribromo-phenol) were added to each sample to be analyzed using SW 8270 immediately before extraction. The control limits for surrogate recoveries in soil and water samples were described in EPA Method 8270. Eight compounds (i.e., phenol-d_5, 2-fluorophenol, 2,4,6-tribromophenol, nitrobenzene-d_5, 2-fluorobiphenyl, 2-chlorophenol, 1,2-dichlorobenzene-d_4, and terphenyl) were added to each sample to be analyzed using the CLP SOW prior to extraction. The control limits for surrogate recoveries in soil and water samples and the March 1990 CLP SOW. All surrogate recoveries were within the control limits, except nitrobenzene-d_5 (34 percent), 2-fluorobiphenyl (40 percent), terphenyl (28 percent), phenol-d5 (8 percent), and 2-fluorophenol (11 percent) in P-2 and nitrobenzene-d_5 (0 percent), 2-fluorobiphenyl (0 percent), phenol-d5 (0 percent), 2-fluorophenol (0 percent), 2-chlorophenol (0 percent), and 1,2-dichlorophenol-d_4 (0 percent) in SB1-2-5R. In addition, all surrogate recoveries were less than the lower control limits in the associated method blanks (i.e., MB214B and SBLK6) surrogate recoveries were outside the applicable control limits in GW1-1 (i.e., 2-fluorobiphenyl [15 percent], terphenyl [19 percent], and 2,4,6-tribromophenol [0 percent]); GW1-1RE (i.e., 2-fluorobiphenyl [15 percent], terphenyl [20 percent], and 2,4,6-tribromophenol [0 percent]); and SB1-2-5 (i.e., nitrobenzene-d_5 [16 percent], 2-fluorophenol [9 percent], and 1,2-dichlorophenol-d_4 [11 percent]. As a result, all P-2, SB1-2-5R, GW1-1, GW1-1RE and SB1-2-5 analytical results were rejected (i.e., "R[SSR]") and will not be included in the SI decision making process.

Surrogate recoveries did not meet the applicable control limits in SB2-01-01 (i.e., nitrobenzene-d_5 [134 percent] and 2-fluorobiphenyl [15 percent]) and SB1A-3-4R (nitrobenzene-d5 [20 percent], 2-fluorophenol [12 percent], and 1,2-dichlorophenol-d_4 [13 percent]). Therefore, all SB2-01-01 and SB1A-3-4R analytical results have been estimated (i.e., "UJ[SSR]" for undetected compounds and "J[SSR]" for detected compounds) to indicate that the surrogate recoveries were outside the appropriate limits. Also, surrogate recoveries were outside the control limits in EW-05 (i.e., 2-fluorobiphenyl [33 percent]), FB-03 (i.e., 2-fluorobiphenyl [41 percent]), SB1-04-04 (i.e., 2,4,6-tribromophenol [10 percent]), MW1-01 (i.e., nitrobenzene-d_5 [118 percent]) collected in 1991, MW2-01R (i.e., terphenyl [23 percent]), and P-8 (i.e., 21 percent]) collected in 1991. No data validation qualifiers were applied to these environmental samples, since the applicable surrogate recoveries values were greater than 10 percent and involved only a single system performance compound. Tables F-10 and F-11 summarize the surrogate recovery results for groundwater and soil samples.

Method Blank Results -- One method blank analysis was conducted for each batch of water and soil samples received. Each method blank was evaluated for interferents that might potentially interfere with accurate quantitation of a target compound. According to CLP method blank criteria, a laboratory blank may not contain phthalate esters in concentrations five times greater than the CRQL or any other target compound in concentrations greater than the CRQL. Based on an evaluation of all method blanks analyzed for SVOCs using the March 1990 CLP SOW, no interferents were detected, except butyl benzyl phthalate (18 and 10 μg/L) in the method blanks analyzed on August 24 and 26, 1991 (i.e., SBLK2 and SBLK5 respectively). This compound was not detected in the associated environmental samples; therefore, data validation qualifiers were not applied.

Blank Spike Recoveries -- The surrogate recovery results of each method blank analyzed were evaluated as a method blank spike, as required by DOE/HWP-65/R1. Surrogate recovery control limits were described in the SOW prepared for the Indiana ANGB SI and the March 1990 CLP SOW. Based on an evaluation of all method blank spike analyses, the percent recoveries of all spike compounds were within acceptable limits, except nitrobenzene-d_5 (0 percent), 2-fluorobiphenyl (0 percent), phenol-d_8 (0 percent), 2-fluorophenol (0 percent), 2-chlorophenol-d_4 (0 percent), and 1,2-dichlorobenzene-d_4 (0 percent) in SBLK6. No data validation qualifiers have been applied to the environmental samples (i.e., SB1-2-5R) associated with SBLK6, since the analytical results in SB1-2-5R were rejected due to surrogate recovery values less than 10 percent. Also, surrogate recoveries were outside the control limits for MB181 (i.e, 2-fluorophenol [8 percent]) and for MB253R (i.e., 2-fluorobiphenyl [42 percent]). No data validation qualifiers have been applied to the associated environmental samples, since those surrogate recoveries were within the applicable limits.

TABLE F-10. SVOC SURROGATE RECOVERY QC SUMMARY: GROUNDWATER
INDIANA ANGB FORT WAYNE, INDIANA

PARAMETER	TOTAL NUMBER ANALYSES*	PERCENT RECOVERY RANGES	PERCENT RECOVERY CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
NITROBENZENE-d5	37	(21-118)	(35-114)	34	3
2-FLUROBIPHENYL	37	(15-108)	(43-116)	34	3
TERPHENYL-d14	37	(19-131)	(33-141)	32	5
PHENOL-d5	37	(1-84)	(10-110)	35	2
2-FLUOROPHENOL	37	(2-99)	(21-100)	34	3
2,4,6-TRIBROMOPHENOL	37	(2-108)	(10-123)	34	3
2-CHLOROPHENOL-d4	18	(61-86)	(33-110)	18	0
1,2-DICHLOROBENZENE-d4	18	(39-92)	(16-110)	18	0

* GROUNDWATER, MATRIX SPIKE, MATRIX SPIKE DUPLICATE, METHOD BLANKS,TRIP BLANKS, FIELD BLANKS, EQUIPMENT BLANKS.

TABLE F-11. SVOC SURROGATE RECOVERY QC SUMMARY: SOIL/SEDIMENT
INDIANA ANGB FORT WAYNE, INDIANA

PARAMETER	TOTAL NUMBER ANALYSES*	PERCENT RECOVERY RANGES	PERCENT RECOVERY CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
NITROBENZENE-d5	85	(0-134)	(23-120)	82	5
2-FLUROBIPHENYL	85	(0-107)	(30-115)	80	3
TERPHENYL-d14	85	(28-129)	(18-137)	85	0
PHENOL-d5	85	(0-101)	(24-113)	83	2
2-FLUOROPHENOL	85	(0-82)	(25-121)	81	4
2,4,6-TRIBROMOPHENOL	85	(8-114)	(19-122)	83	2
2-CHLOROPHENOL-d4	47	(0-78)	(20-130)	83	2
1,2-DICHLOROBENZENE-d4	47	(11-77)	(20-130)	81	4

* SOIL/SEDIMENT, MATRIX SPIKE, MATRIX SPIKE DUPLICATE, METHOD BLANKS.

Matrix Spike/Matrix Spike Duplicate Results -- MS/MSD analyses were conducted to assess the accuracy and precision of the laboratory and to evaluate the matrix effect of the sample upon the analytical methodology based upon the percent recovery of each compound. Accuracy was expressed as the percent recovery of the spike compounds. Precision was expressed as the RPD of the concentrations of the spike compounds in the MS/MSD samples. The control limits for percent recoveries in soil and water samples were described in EPA Method 8270 and the March 1990 CLP SOW. No action was taken based on percent recovery; however, MS/MSDs were evaluated to verify that 1 MS/MSD analysis was conducted for each 20 environmental samples received by the laboratory (excluding dilutions and reanalyses conducted), that these analyses were conducted on environmental samples only, and that the recovery and difference results did not indicate systematic laboratory control problems.

Four MS/MSD analyses (i.e., SB1-02-16, SB1-04-04, SB1-2-7, and SB1A-2-1) were conducted using soil samples collected during the Indiana ANGB SI. All percent recovery values were within the control limits, except for pentachlorophenol (0 percent) in SB1-04-04, 2,4-dinitrotoluene (89 percent) in SB1-2-7,and 4-nitrophenol (4 percent) in SB1A-2-1. All precision values were within the control limits, except phenol (36 percent), 1,4-dichlorobenzene (46 percent), N-nitroso-di-n-propylamine (45 percent), 1,2,4-trichloro-benzene (41 percent), and acenaphthene (31 percent) in SB1-2-7 and phenol (38 percent), 1,4-dichlorobenzene (37), N-nitroso-di-n-propylamine (44 percent), 1,2,4-trichlorobenzene (39 percent), 4-chloro-3-methyl phenol (39 percent), acenaphthene (37 percent), 4-nitrophenol (157 percent), and pyrene (57 percent) in SB1A-2-1. As a result, data validation qualifiers have been applied to pyrene (i.e., "620J[MSD]") in SB1A-2-1 due to the RPD value described above.

Two soil samples (i.e., SB1A-1-2 and SB1A-1-3), originally extracted on November 8, 1991, were spiked with matrix spike compounds by mistake. These samples were re-extracted on December 19, 1991, which was outside of holding time. Since accuracy and precision frequency criteria had been satisfied, these analytical results were not included in this review.

One MS/MSD analysis (i.e., MW1-02) was conducted using a groundwater sample collected during the Indiana ANGB SI. All percent recovery and differences values were within the control limits, except 4-chloro-3-methyl phenol (103 and 106 percent recoveries), 2,4-dinitrotoluene (104 and 113 percent recoveries), and pentachlorophenol (122 and 126 percent recoveries). Tables F-12 and F-13 summarizes the MS/MSD results for groundwater and soil samples.

Significant Qualified Sample Results -- Data validation qualifiers (i.e., "UJ[EHT]" for undetected compounds and "J[EHT]" for detected compounds) have been applied to SB3-1-1 and to EW-05, MW4-02, SB1A-1-2 collected in 1991, SB1A-1-3, and SB1-2-5R collected in 1991 (i.e., "R[EHT] for undetected compounds and "J[EHT]" for detected compounds) to indicate that these sample were extracted outside the appropriate method holding time. Data validation qualifiers (i.e., UJ[IS]) have been applied to nitrobenzene, isophorone, 2-nitrophenol, 2,4-dimethylphenol, bis(2-chloroethoxy)methane, 2,4-dichlorophenol, 1,2,4-trichlorobenzene, naphthalene, 4-chloroaniline, hexachlorobutadiene, 4-chloro-3-methylphenol, 2-methylnaphthalene, pyrene, butylbenzyl phthalate, 3,3'-dichlorobenzidine, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, di-n-octyl phthalate, benzo-(k)fluoranthene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i,)perylene in SB2-01-01 to indicate that the applicable IS areas was outside the appropriate limits. Data validation qualifiers (i.e., "R[SSR]") have been added to P-2, SB1-2-5R, GW1-1, GW1-1RE, and SB1-2-5 and to SB2-01-01 and SB1A-3-4R (i.e., 'UJ[SSR]" for undetected compounds and "J[SSR]" for detected compounds) to indicate that the surrogate recoveries were outside the applicable control limits. Data validation qualifiers have been applied to pyrene (i.e., "J[MSD]") in SB1A-2-1 due to MS/MSD results. These qualifiers are applied to all data presented in the data summary tables within the SI report text and in the comprehensive data presentation tables in Appendix E.

F.3.1.4 Pesticide/PCB Analysis (EPA Method 3510/3550/8080)

Thirteen samples (i.e., 2 groundwater samples, 7 soil samples and 4 field QC blank samples) were collected and submitted to the NET Laboratory using EPA Method 8080 for water samples and soil samples. Data quality was evaluated using the guidelines and control limits specified for holding times, initial and continuing calibration verification, method blank spikes, method blanks, surrogate recoveries, MS/MSDs, and endrin/dieldrin breakdown described in the

TABLE F-12. SVOC MS/MSD QC SUMMARY: GROUNDWATER
INDIANA ANGB FORT WAYNE, INDIANA

	ACCURACY					PRECISION				
PARAMETER	MS/MSD TOTAL No. ANALYSES	PERCENT RECOVERY RANGES	%R CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS	MSD TOTAL No. ANALYSES	RPD RANGE	RPD LIMIT	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
Phenol	2	(70–75)	(12–110)	2	0	1	7	42	1	0
2–Chlorophenol	2	(70–72)	(27–123)	2	0	1	15	40	1	0
1,4–Dichlorobenzene	2	(93–96)	(36–97)	2	0	1	3	28	1	0
N–Nitroso–di–n–propylamine	2	(90–92)	(41–116)	2	0	1	2	38	1	0
1,2,4–Trichlorobenzene	2	(86–96)	(39–98)	2	0	1	11	28	1	0
4–Chloro–3–methylphenol	2	(103–106)	(23–97)	0	2	1	3	42	1	0
Acenaphthene	2	(99–103)	(46–118)	2	0	1	4	31	1	0
4–Nitrophenol	2	(65–70)	(10–80)	2	0	1	7	50	1	0
2,4–Dinitrotoluene	2	(104–113)	(24–96)	0	2	1	8	38	1	0
Pentachlorophenol	2	(122–126)	(9–103)	0	2	1	3	50	1	0
Pyrene	2	(92–96)	(26–127)	2	0	1	4	31	1	0

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE ANALYSES PERFORMED ON SAMPLES MW1–02.

TABLE F-13. SVOC MS/MSD QC SUMMARY: SOIL/SEDIMENT
INDIANA ANGB FORT WAYNE, INDIANA

	ACCURACY					PRECISION				
PARAMETER	MS/MSD TOTAL No. ANALYSES	PERCENT RECOVERY RANGES	%R CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS	MSD TOTAL No. ANALYSES	RPD RANGE	RPD LIMIT	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
Phenol	8	(43-68)	(26-90)	8	0	4	[(-8)-38)]	35	2	2
2-Chlorophenol	8	(43-72)	(25-102)	8	0	4	[(-4)-38)]	50	4	0
1,4-Dichlorobenzene	8	(42-67)	(28-104)	8	0	4	[(-19)-46)]	27	2	2
N-Nitroso-di-n-propylamine	8	(47-89)	(41-126)	8	0	4	(4-45)	38	2	2
1,2,4-Trichlorobenzene	8	(44-85)	(38-107)	8	0	4	[(-10)-41)]	23	2	2
4-Chloro-3-methylphenol	8	(52-93)	(26-103)	8	0	4	[(-12)-37)]	33	3	1
Acenaphthene	8	(50-81)	(31-137)	8	0	4	(0-157)	19	2	2
4-Nitrophenol	8	(4-67)	(11-114)	7	1	4	[(-5)-35)]	50	4	0
2,4-Dinitrotoluene	8	(51-90)	(28-89)	7	1	4	(0-43)	47	4	0
Pentachlorophenol	8	(0-38)	(17-109)	6	2	4	[(-34)-57)]	47	3	1
Pyrene	8	(42-121)	(35-142)	8	0	4	[(-2)-29)]	36	4	0

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE ANALYSES PERFORMED ON SAMPLES: SB1-02-16, SB1-04-04, SB1-2-7, AND SB1A-2-1.

documents listed in Section F.1.3. The pesticide/PCB data validation worksheets are presented in Tables F-14.

Holding Times--Holding times were defined as the maximum amount of time allowed to elapse between the date and time of sample collection and the date and time of sample extraction and analysis. Extraction holding times were defined further as the maximum amount of time allowed to elapse between the date and time of sample collection and the date and time the sample is concentrated to the final injection volume, excluding any extract cleanup techniques.

The NET Laboratory was required by the SOW prepared for this SI to meet extraction holding times of 7 days for groundwater samples and 14 days for soil samples collected for organochlorine pesticide/PCB analysis. A maximum analysis holding time of 40 days was specified for water and soil extracts. Based on an evaluation of all environmental samples and field QC blanks extracted and analyzed for organochlorine pesticides/PCBs using EPA Method 8080, all holding time criteria were met, except SB-B-01 (3 days), SB-B-02 (3 days), SB2-01-01 (2 days), SB2-01-19 (2 days), SB2-02-01 (1 day), SB-03-01 (1 day), and SB2-04-01 (1 day). These holding times are considered to have no adverse impact on the associated environmental sample data quality; therefore, no data validation qualifiers have been applied.

Initial Calibration Results -- Initial calibration verification analyses conducted for soil and water samples were evaluated using 10 percent (i.e., aldrin, endrin, 4,4'-DDT, and dibutyl chlorendate [DBC]) control limits for RSD between standard areas. Two initial column (i.e., DB-5 and DB5-30W) Initial Calibration Verification (ICV) analyses were conducted for the soil and water samples collected at the Indiana ANGB. All RSD values were greater than 10 percent (i.e., aldrin, endrin, 4,4'-DDT, and DBC) in the initial calibration associated with soil and water samples. No data validation qualifiers were applied, since no organochloride pesticide/PCBs were detected in the associated samples. Organochlorine pesticides and PCBs were not detected in these samples, and as a result, the initial calibration results from the confirmation column (i.e., DB-1701) were not included in this review.

Table F-14a. Data Validation Tables: Pesticides/PCBs

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Pesticide/PCBs Surrogate Recovery	TCMX Surrogate Control Limits	DBC Surrogate Control Limits	Method Blank Spike Analysis	Pesticide/PCBs MS/MSD Analyses
WATERS									
MB180	MB180	NA	8/31/90	9/15/90	ALL SURROGATES WITHIN	56-96	29-117	g-BHC %R=130;	FIELD QC NO MS/MSD
FB-01	90021708	8/28/90	8/31/90	9/15/90	CONTROL LIMITS EXCEPT	56-96	29-117	ALDRIN %R=0;	REQUIRED
FB-02	90021709	8/28/90	8/31/90	9/15/90	FB-02 DBC=120% (117%)	59-113	29-117	ALL OTHERS	
								WITHIN CONTROL	
								LIMITS	
WATERS									
MB187	MB187	NA	9/06/90	9/15/90	ALL SURROGATES WITHIN	56-96	29-117	ALDRIN %R=0; ALL	FIELD QC NO MS/MSD
EW-04	90022314	8/30/90	9/06/90	9/15/90	CONTROL LIMITS.	56-96	29-117	OTHERS WITHIN	REQUIRED
								CONTROL LIMITS	
WATERS									
MB201A	MB201A	NA	9/17/90	9/29/90	ALL SURROGATES WITHIN	59-113	48-130	4,4'-DDT %R=220;	FIELD QC NO MS/MSD
FB-03	90023606	9/11/90	9/17/90	9/29/90	CONTROL LIMITS EXCEPT	59-113	34-133	ALL OTHERS	REQUIRED
					MB201A TCMX=56% (59%).			WITHIN CONTROL	
								LIMITS	
WATERS									
MB215	MB215	NA	9/20/90	9/29/90	ALL SURROGATES WITHIN	59-116	48-130	**THERE WAS NO	4,4'-DDT MS %R=5;
MW2-01	90024902	9/14/90	9/20/90	9/29/90	CONTROL LIMITS EXCEPT	59-113	34-133	RECOVERY OF	ALL OTHER MS %R
HT-01	90025106	9/16/90	9/20/90	9/29/90	MB215 TCMX=0% (59%)	59-113	34-133	ANY OF THE SPIKE	VALUES WITHIN
MW2-01 MS	90024902 MS	9/14/90	9/20/90	9/29/90	MW2-01 TCMX=38% (59%)	59-113	34-133	COMPOUNDS FOR	CONTROL LIMITS; MSD
					MW2-01MS TCMX=31% (59%)			MBS215	DATA NOT PROVIDED;
					MB215 DBC=0% (48%)				%RPD DATA NOT
					MW2-01 DBC=24% (34%) AND				PROVIDED
					MW2-01MS DBC=20% (59%)				
SOILS									
MB178	MB178	NA	9/07/90	9/15/90	ALL SURROGATES WITHIN	51-119	43-117	MBS178 WITHIN	ALL RECOVRRIES
SB-B-01	90021706	8/28/90	9/07/90	9/15/90	CONTROL LIMITS EXCEPT	51-119	43-117	CONTROL LIMITS	WITHIN CONTROL LIMITS
SB-B-02	90021707	8/28/90	9/07/90	9/15/90	MB178 TCMX=47% (51%)	51-119	50-139		ALL DIFFERENCES WITHIN
SB2-01-01	90021804	8/29/90	9/07/90	9/15/90	SB2-01-01 TCMX=41% (51%)	51-119	50-139		CONTROL LIMITS, EXCEPT
SB2-01-19	90021806	8/29/90	9/07/90	9/17/90	SB2-01-19 TCMX=49% (51%)	51-119	50-139		DIELDRIN=40%.
SB2-02-01	90022301	8/30/90	9/07/90	9/15/90	SB2-04-01 TCMX=50% (51%)	51-119	50-139		
SB2-03-01	90022302	8/30/90	9/07/90	9/15/90	SB2-01-01 DBC=191% (139%)	51-119	50-139		
SB2-04-01	90022303	8/30/90	9/07/90	9/17/90	MW2-01MS DBC=20% (59%)	51-119	50-139		
SB2-03-01 MS	90022302 MS	8/30/90	9/07/90	9/15/90	SB2-01-19 DBC=166% (139%)	51-119	50-139		
SB2-03-01 MSD	90022302 MSD	8/30/90	9/07/90	9/17/90	SB2-04-01 DBC=167% (139%)	51-119	50-139		

Table F-14a. Data Validation Tables: Pesticides/PCBs (Continued)

SAIC Sample Number	Laboratory Identification Number	Pesticide/PCBs Blank Analysis	Initial Calibration	Continuing Calibration
WATERS				
MB180	MB180	NO INTERFERENCE DETECTED	INST ID: HP5890 INITIAL COLUMN DB-5: RSDs>10% FOR ALDRIN, ENDRIN, 4,4'-DDT AND DBC.	INST ID: HP5890 INTIAL COLUMN DB-5 Ds<15%.
FB-01	90021708			
FB-02	90021709			
WATERS				
MB187	MB187	NO INTERFERENCE DETECTED	INST ID: HP5890 INITIAL COLUMN DB-5: RSDs>10% FOR ALDRIN, ENDRIN, 4,4'-DDT AND DBC.	INST ID: HP5890 INTIAL COLUMN DB-5 Ds<15%.
EW-04	90022314			
WATERS				
MB201A	MB201A	NO INTERFERENCE DETECTED	INST ID: HP5890 INITIAL COLUMN DB5-30W: RSDs>10% FOR ALDRIN, ENDRIN, 4,4'-DDT AND DBC.	INST ID: HP5890 INTIAL COLUMN DB5-30W Ds<15% EXCEPT 4,4'-DDT D=100%.
FB-03	90023606			
WATERS				
MB215	MB215	NO INTERFERENCE DETECTED	INST ID: HP5890 INITIAL COLUMN DB5-30W: RSDs>10% FOR ALDRIN, ENDRIN, 4,4'-DDT AND DBC.	INST ID: HP5890 INTIAL COLUMN DB5-30W Ds<15% EXCEPT 4,4'-DDT D=100%.
MW2-01	90024902			
HT-01	90025106			
MW2-01 MS	90024902 MS			
SOILS				
MB178	MB178	NO INTERFERENCE DETECTED	INST ID: HP5890 INITIAL COLUMN DB-5: RSDs>10% FOR ALDRIN, ENDRIN, 4,4'-DDT AND DBC.	INST ID: HP5890 INTIAL COLUMN DB-5 Ds<15%.
SB-B-01	90021706			
SB-B-02	90021707			
SB2-01-01	90021804			
SB2-01-19	90021806			
SB2-02-01	90022301			
SB2-03-01	90022302			
SB2-04-01	90022303			
SB2-03-01 MS	90022302 MS			
SB2-03-01 MSD	90022302 MSD			

Table F-14a. Data Validation Tables: Pesticides/PCBs (Continued)

SAIC Sample Number	Laboratory Identification Number	Field Blank Analysis	Equipment Blank Analysis	Significant Sample Results	Data Qualifiers
WATERS					
MB180	MB180	NA	NA	None Detected	
FB-01	90021708	NA	NA	None Detected	None Applied
FB-02	90021709	NA	NA	None Detected	None Applied
WATERS					
MB187	MB187	NA	NA	None Detected	
EW-04	90022314	NA	NA	None Detected	None Applied
WATERS					
MB201A	MB201A	NA	NA	None Detected	
FB-03	90023606	NA	NA	None Detected	None Applied
WATERS					
MB215	MB215	NA	NA	None Detected	
MW2-01	90024902	FB-03	EW-04	None Detected	All Compounds except 4,4'DDT=UJ(SSR)/4,4'-DDT=R(MS)
HT-01	90025106	NA	NA	None Detected	None Applied
MW2-01 MS	90024902 MS	FB-03	EW-04	Not Applicable	None Applied
SOILS					
MB178	MB178	NA	NA	None Detected	
SB-B-01	90021706	FB-02	EW-04	None Detected	None Applied
SB-B-02	90021707	FB-02	EW-04	None Detected	None Applied
SB2-01-01	90021804	FB-02	EW-04	None Detected	All Compounds=UJ(SSR)
SB2-01-19	90021806	FB-02	EW-04	None Detected	All Compounds=UJ(SSR)
SB2-02-01	90022301	FB-02	EW-04	None Detected	None Applied
SB2-03-01	90022302	FB-02	EW-04	None Detected	None Applied
SB2-04-01	90022303	FB-02	EW-04	None Detected	All Compounds=UJ(SSR)
SB2-03-01 MS	90022302 MS	FB-02	EW-04	Not Applicable	None Applied
SB2-03-01 MSD	90022302 MSD	FB-02	EW-04	Not Applicable	None Applied

Footnotes to Table F–14a.

** – For this Method Blank Spike, the laboratory noted that the lack of any percent recovery (%R) was possibly due to improper spiking or failure to spike the sample.

(*) – The recovery for this compound was 0 and, therefore, resulted in a percent difference (%D) of 100%. This suggests that the compound was not added to the calibration standard.

NA – Not Applicable

Control limits for Soil Pesticide/PCB Method Blank Spike Analysis
- Gamma–BHC (Lindane): 46–127
- Heptachlor: 35–130
- Aldrin: 34–132
- Dieldrin: 31–134
- Endrin: 42–139
- 4,4'–DDT: 23–134

Control limits for Water Pesticide/PCB Method Blank Spike Analysis
- Gamma–BHC (Lindane): 25–121
- Heptachlor: 25–127
- Aldrin: 32–128
- Dieldrin: 23–137
- Endrin: 26–140
- 4,4'–DDT: 30–132

Control limits for Soil Pesticide/PCB MS/MSD Analysis
- Gamma–BHC (Lindane): 46–127
- Heptachlor: 35–130
- Aldrin: 34–132
- Dieldrin: 31–134
- Endrin: 42–139
- 4,4'–DDT: 23–134

Control limits for Water Pesticide/PCB MS/MSD Analysis
- Gamma–BHC (Lindane): 25–121
- Heptachlor: 25–127
- Aldrin: 32–128
- Dieldrin: 23–137
- Endrin: 26–140
- 4,4'–DDT: 30–132

Control limits for Initial and Continuing Calibration:
- Initial: %RSD < 10%
- Continuing: %D < 15%

Continuing Calibration Results -- CCV analyses conducted for soil and water samples were evaluated using a 15 percent control limit for percent difference between initial and continuing standard areas. Two initial column (i.e., DB-5 and DB5-30W) CCV analyses were conducted for the water and soil samples collected during the Indiana ANGB SI. All percent difference values were less than 15 percent in the continuing calibrations analysis, except for 4,4'-DDT (i.e., 100 percent) in the CCV analysis conducted on September 29, 1991. No organochloride pesticides/PCBs were detected in the associated water and soil samples, therefore the impact of this calibration result is minimal, and as a result, no data validation qualifiers were applied. Since organochloride pesticide/PCBs were not detected in the associated water and soil samples, the continuing calibration results from the confirmation column (i.e., DB-1701) were not included in this review.

Blank Spike Recoveries -- Dibutylchloroendate (DBC) and 2,4,5,6-tetrachloro-meta-xylene (TCMX) were used as spiking compounds in the method blank spike for the pesticide/PCB analysis. One blank spike was conducted for each batch of samples analyzed for pesticides/PCBs. The recovery of each spike compound was evaluated according to the control limit used for surrogate recoveries. Based on an evaluation of all method blank spike analyses, the percent recoveries of all spike compounds were within acceptable limits, (59 to 139 and 50 to 150 percent, respectively) except TCMX in MB201A (i.e., 56 percent), MB215 (i.e., 0 percent), and MB178 (i.e., 47 percent). Data validation qualifiers were not applied, since the DBC recovery results were within the advisory limits.

Surrogate Recoveries -- DBC and TCMX were added to each sample collected during the Indiana ANGB SI and extracted and analyzed for pesticide/PCBs. All DBC and TCMX recoveries were within the advisory limits established by EPA Method 8080 in all samples, except MW2-01 (i.e., 24 and 38 percent respectively), SB2-01-01 (i.e., 191 and 41 percent, respectively), SB-01-19 (i.e., 166 and 49 percent, respectively), and SB2-04-01 (i.e., 167 and 50 percent, respectively). Based on an evaluation of the surrogate recoveries, all analytical results in SB2-01-01, SB2-01-19, and SB2-04-01 and all analytical results except 4,4'-DDT in MW2-01 were estimated (i.e., "UJ[SSR]") to indicate that the applicable surrogate recoveries were outside the applicable limits. Also, DBC recovery was greater than the upper control limit in FB-02 (i.e., 120 percent). These data were not qualified, since the TCMX recovery was within the advisory limits. Tables F-15 and F-16 summarizes the surrogate recovery results for groundwater and soil samples.

Method Blank Results -- One method blank analysis was conducted with each batch of environmental samples collected for pesticide/PCB analysis. Each method blank was evaluated for interferents that might potentially interfere with accurate quantitation of a target compound. Based on an evaluation of all method blanks analyzed for pesticides/PCBs using EPA Method 8080, no interferents were detected.

Matrix Spike/Matrix Spike Duplicate Results -- MS/MSD analyses were conducted to assess the accuracy and precision of the laboratory and to evaluate the matrix effect of the sample upon the analytical methodology based upon the percent recovery of each compound. Accuracy was expressed as the percent recovery of the spike compounds. Precision was expressed as the RPD of the concentrations of the spike compounds in the MS/MSD samples. One MS/MSD analysis was required for each set of 20 samples of similar matrix, excluding dilutions and re-analyses conducted. One MS analysis was conducted using the groundwater sample (i.e., MW2-01) collected during the Indiana ANGB SI. All percent recoveries were within the control limits, except 4,4'-DDT (i.e., 5 percent). As a result, 4,4'-DDT in MW2-01 was rejected (i.e., "R[MS]") to indicate that the matrix spike recovery was less than 10 percent. One MS/MSD analysis was conducted using the soil sample (i.e., SB2-03-01). All recoveries values were within the control limits. All RPD values were within the appropriate control limits, except dieldrin (40 percent); however, the associated data were not qualified based on this RPD value. Tables F-17 and F-18 summarizes the MS/MSD recovery and differences results for groundwater and soil samples.

4,4'-DDT/Endrin Breakdown Results -- Endrin (i.e., endrin ketone and endrin aldehyde) and 4,4'-DDT (i.e., 4,4'-DDD and 4,4'-DDE) breakdown is evaluated using one mid-level calibration standard to determine whether the endrin ketone, endrin aldehyde, 4,4'-DDD, or 4,4'-DDE detected in any sample is representative of the environmental condition at the Indiana ANGB or is the result of poor instrument performance (e.g., contaminated GC column or

TABLE F-15. PESTICIDE/PCB SURROGATE RECOVERY QC SUMMARY: GROUNDWATER
INDIANA ANGB FORT WAYNE, INDIANA

PARAMETER	TOTAL NUMBER ANALYSES*	PERCENT RECOVERY RANGES	PERCENT RECOVERY CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
TETRACHLORO-M-XYLENE	11	(0-97)	(59-113)	7	4
DIBUTYLCHLORENDATE	11	(0-150)	(48-130)	7	4

* WATER SAMPLE, METHOD BLANK, FIELD BLANK, EQUIPMENT BLANK, AND MATRIX SPIKE.

TABLE F-16. PESTICIDE/PCB SURROGATE RECOVERY QC SUMMARY: SOIL/SEDIMENT
INDIANA ANGB FORT WAYNE, INDIANA

PARAMETER	TOTAL NUMBER ANALYSES*	PERCENT RECOVERY RANGES	PERCENT RECOVERY CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
TETRACHLORO-M-XYLENE	10	(47-166)	(51-119)	6	4
DIBUTYLCHLORENDATE	10	(49-191)	(43-117)	6	4

* SOIL SAMPLE, METHOD BLANK, MATRIX SPIKE, AND MATRIX SPIKE DUPLICATE.

TABLE F-17. PESTICIDE/PCB MS/MSD QC SUMMARY: GROUNDWATER
INDIANA ANBG FORT WAYNE, INDIANA

	ACCURACY					PRECISION				
PARAMETER	MS/MSD TOTAL No. ANALYSES	PERCENT RECOVERY RANGES	%R CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS	MSD TOTAL No. ANALYSES	RANGE RPD	RPD LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
LINDANE	1	30%	(25-121)	1	0	NOT PERFORMED				
HEPTACHLOR	1	33%	(25-127)	1	0	NOT PERFORMED				
ALDRIN	1	33%	(32-128)	1	0	NOT PERFORMED				
DIELDRIN		34%	(23-137)		0	NOT PERFORMED				
ENDRIN	1	34%	(26-140)	1	C	NOT PERFORMED				
4, 4' DDT	1	5%	(30-132)	0	1	NOT PERFORMED				

MATRIX SPIKE ON SAMPLES MW2-01.

TABLE F-18. PESTICIDE/PCB MS/MSD QC SUMMARY: SOIL/SEDIMENT
INDIANA ANGB FORT WAYNE, INDIANA

	ACCURACY					PRECISION				
PARAMETER	MS/MSD TOTAL No. ANALYSES	PERCENT RECOVERY RANGES	%R CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS	MSD TOTAL No. ANALYSES	RANGE RPD	RPD LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
LINDANE	2	(71-96)	(46-127)	2	0	1	33	50	1	0
HEPTACHLOR	2	(80-103)	(35-130)	2	0	1	22	31	1	0
ALDRIN	2	(81-103)	(34-132)	2	0	1	22	43	1	0
DIELDRIN	2	(67-83)	(31-134)	2	0	1	40	38	0	1
ENDRIN	2	(72-89)	(42-139)	2	0	1	32	45	1	0
4, 4' DDT	2	(72-94)	(23-134)	2	0	1	32	50	1	0

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE PERFORMED ON SAMPLES SB2-03-01.

injection port). No breakdown calculations were conducted; however, neither 4,4'-DDT, endrin, or their breakdown products were detected. As a result, no data validation qualifiers were applied.

Significant Qualified Sample Results -- Data validation qualifiers (i.e., "UJ[SSR]") have been applied MW2-01, SB2-01-01, SB2-01-19, and SB2-04-01 to indicate that the surrogate recoveries were outside the control limits. Data validation qualifiers (i.e., "R[MS]") have been applied to 4,4'-DDT in MW2-01 to indicate that the matrix spike recovery was less than 10 percent.

F.3.2 Inorganic Analyses

Seventy eight soil samples, 4 sediment samples, 15 groundwater samples, and 15 field QC blanks (i.e., field blanks and equipment blanks) were collected during the Indiana ANGB SI were submitted to the NET Laboratory for priority pollutant metals, which included total lead only, analyses using EPA solid waste test methods. A data quality assessment is presented in the following subsections.

F.3.2.1 Priority Pollutant Metals, including Total Lead Only

Seventy eight soil samples, 4 sediment samples, 15 groundwater samples, and 15 field QC blanks (i.e., equipment blanks and field blanks) were collected and analyzed using the EPA document *Test Methods For Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition. Soil and groundwater samples collected for total lead (i.e., SW 3020/7421 and 3050/7421, respectively) analyses were analyzed using graphite furnace atomic absorption (GFAA). All environmental and field QC samples collected for antimony (SW 3005/7421), arsenic (SW 3050/7060), lead (SW 3050/7421 and 3020/7421), selenium (SW 3050/7740), and thallium (SW 3050/7841 and 3020/7841) were analyzed using GFAA. Environmental samples collected for mercury (SW 7470 and SW 7471) analyses were analyzed using cold vapor generation and the remainder of the metals were analyzed using Inductively Coupled Argon Plasma (ICAP) spectroscopy (SW 3005/6010 and 3050/6010). Data quality will be evaluated using the guidelines and control limits specified for holding times, initial and continuing calibration verification, method blanks, interference check sample analysis, spiked sample analysis, duplicate sample analysis, laboratory check sample analysis, and CRDL verification. A presentation of the significant qualified sample results follows the laboratory QC results discussion. The data validation worksheets are presented in Table F-19.

Holding Times -- Holding times were defined as the maximum amount of time allowed to elapse between the date and time of sample collection and the date and time the sample was analyzed. The NET Laboratory was required to meet analysis holding times (for both soil and water samples) of 28 days for mercury and 6 months for all other priority pollutant metals. Based on an evaluation of all environmental samples and QC blanks analyzed, all holding time criteria were met, except for mercury in MW4-02, which was analyzed 27 days beyond the applicable holding time for water samples. As a result mercury in MW4-02 was rejected to indicate the exceeded holding time (i.e., "R[HT]"). Mercury in six water samples (i.e., P-8, EB2-1, FB2-1, MW2-01, MW2-01R, and MW1-01) and six soil samples (i.e., SB1A-1-5, SB1A-1-5R, SB1-2-5, SB1-2-5R, SB1A-3-4, and SB1A-3-4R) were analyzed more than 14 days beyond the applicable holing times. The mercury results in these samples were qualified to indicate the exceeded holding times (i.e., all undetected values were presented in the comprehensive data presentation tables as "UJ[HT]").

Initial Calibration Verification -- Calibration of the ICAP was established and validated by injecting a blank and at least one standard to establish an analytical curve. Calibration of the GFAA was established and validated by injecting a blank and at least three standards (one of which must be at the CRDL) to establish the analytical curve. Four standards were analyzed to establish the mercury calibration curve for that analysis. Following the initial calibration, percent recovery values were evaluated to verify the validity of the calibration. Priority pollutant metals calibration criteria requirements included 80 to 120 percent for mercury and 90 to 110 percent for all other elements, as specified by the DOE/HWP-65/R1. Based on an evaluation of the initial calibrations conducted, all percent recovery values were within control limits.

Table F-19a. Data Validation Tables: Priority Pollutant Metals

SAIC Sample Number	Laboratory ID Number	Collection Dates	Analysis Dates	CALIBRATION: Initial Calibration	CALIBRATION: Continuing Calibration	BLANKS: Initial Blank	BLANKS: Continuing Blank	BLANKS: Procedural Blank
SOIL:BATCH 1								
SB-B-02	90021707	08/28/90	09/17-11/03/90	ALL INITIAL (4) AND CONTINUING (17) CALIBRATIONS WITHIN %R CONTROL LIMITS FOR ALL METALS		4 ICBs APPLY NO CONTAMINANTS WERE DETECTED IN ANY OF THE INITIAL BLANKS, EXCEPT Sb(-1.3B)	17 CCBs APPLY NO CONTAMINANTS WERE DETECTED IN ANY OF THE CONTINUING BLANKS EXCEPT Sb(1.3B), As(2.8B), Cd(4B AND 5B) Ni(14B AND 15B), Zn(11B)	1 APPLICABLE PBW Sb(0.125B) NO CONTAMINANTS WERE DETECTED IN THE PBW BLANKS GREATER THE CRDL
SB1-01-11	90021702	08/27/12	09/17-11/03/90					
SB1-01-12	90021701	08/27/12	09/17-11/03/90					
SB1-02-03	90021801	08/29/90	09/17-11/03/90					
SB1-02-03R	90021802	08/29/90	09/17-11/03/90					
SB1-02-16	90021803	08/29/90	09/17-11/03/90					
SB1-03-02	90021703	08/28/90	09/17-11/03/90					
SB1-03-05	90021704	08/28/90	09/17-11/03/90					
SB1-03-18	90021705	08/28/90	09/17-11/03/90					
SB2-01-01	90021804	08/29/90	09/17-11/03/90					
SB2-01-19	90021806	08/29/90	09/17-11/03/90					
SB2-02-01	90022301	08/30/90	09/17-11/03/90					
SB2-03-01	90022302	08/30/90	09/17-11/03/90					
SB2-04-01	90022303	08/30/90	09/17-11/03/90					
SB4-01-01	90022304	08/30/90	09/17-11/03/90					
SB4-01-02	90022305	08/30/90	09/17-11/03/90					
SB4-01-02D	90022305D	08/30/90	09/17-11/03/90					
SB4-01-02S	90022305S	08/30/90	09/17-11/03/90					
SB4-02-01	90022306	08/30/90	09/17-11/03/90					
SB4-02-02	90022307	08/30/90	09/17-11/03/90					
SB4-03-01	90022308	08/30/90	09/17-11/03/90					
SB4-03-02	90022309	08/30/90	09/17-11/03/90					
SB-B-01	90021706	08/28/90	11/12-11/13/90	INITIAL(1) AND CONTINUING CALIBRATION (5) WITHIN %R CONTROL LIMITS FOR ALL METALS.		1 ICB APPLIES NO CONTAMINANTS WERE DETECTED IN ANY OF THE INITIAL BLANKS, EXCEPT Cd(3B)	5 CCBs APPLY NO CONTAMINANTS WERE DETECTED IN ANY OF THE CONTINUING BLANKS EXCEPT Cd(3B) AND Ni(-15B), (-18B)	1 APPLICABLE PBW NO CONTAMINANTS WERE DETECTED IN THE PBW BLANKS GREATER THE CRDL

Table F-19a. Data Validation Tables: Priority Pollutant Metals (Continued)

SAIC Sample Number	Laboratory ID Number	ICP/ICS Initial	ICP/ICS Final	ACCURACY Spike Sample	PRECISION Duplicate Sample	Laboratory Control Sample
SOIL:BATCH 1						
SB-B-02	90021707	ALL INITIAL ICP/ICS WITHIN CONTROL LIMITS (80-120%)	ALL FINAL ICP/ICS WITHIN CONTROL LIMITS (80-120%)	SB4-01-02 ALL PERCENT RECOVERY VALUES WITHIN LIMITS, (75-125%), EXCEPT Sb(0) AND As(131)	SB4-01-02 ALL DUPLICATE SAMPLE RPDs WERE LESS THAN 35%.	ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (80-120%)
SB1-01-11	90021702					
SB1-01-12	90021701					
SB1-02-03	90021801					
SB1-02-03R	90021802					
SB1-02-16	90021803					
SB1-03-02	90021703					
SB1-03-05	90021704					
SB1-03-18	90021705					
SB2-01-01	90021804					
SB2-01-19	90021806					
SB2-02-01	90022301					
SB2-03-01	90022302					
SB2-04-01	90022303					
SB4-01-01	90022304					
SB4-01-02	90022305					
SB4-01-02D	90022305D					
SB4-01-02S	90022305S					
SB4-02-01	90022306					
SB4-02-02	90022307					
SB4-03-01	90022308					
SB4-03-02	90022309					
SB-B-01	90021706	INTIAL ICP/ICS %R WITHIN CONTROL LIMITS (80-120%)	FINAL ICP/ICS %R WITHIN CONTROL LIMITS (80-120%)			ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (80-120%)

Table F-19a. Data Validation Tables: Priority Pollutant Metals (Continued)

SAIC Sample Number	Laboratory ID Number	Standard Addition Results	Field Blank Results	Equipment Blank Results	Significant Sample Results	Data Qualifiers
SOIL:BATCH 1						
SB-B-02	90021707	NA	FB-01, -02	EW-01	Be(2.8), Cd(0.49B), Cr(34), Cu(29.3), Ni(28.3), Zn(71.9)	Cd=0.49J(MB,B)/Zn=71.9J(FB)
SB1-01-11	90021702		FB-01, -02	EW-01	Be(1.3), Cd(0.22B), Cr(11.1), Cu(29.2), Pb(12.8*), Ni(16.9), Zn(29.6)	Cd=0.22J(MB,B)/Ni=16.9J(MB)/Zn=29.6J(FB)
SB1-01-12	90021701		FB-01, -02	EW-01	Be(0.74), Cr(7.9), Cu(24.6), Pb(7.0*), Ni(17), Zn(172)	None Applied
SB1-02-03	90021801		FB-01, -02	EW-03	Be(1.4), Cd(0.24B), Cr(24.6), Cu(19.7), Pb(14*), Ni(23.3), Zn(62.3)	Cd=0.24J(MB,B)/Zn=62.3J(FB)
SB1-02-03R	90021802		FB-01, -02	EW-03	Be(1.2), Cr(15.9), Cu(31), Pb(15.8*), Ni(20.1), Zn(49.2)	Zn=49.2J(FB)
SB1-02-16	90021803		FB-01, -02	EW-03	Be(0.93), Cr(18.3), Cu(27), Pb(17.9*), Ni(22.2), Zn(42.3)	Zn=42.3J(FB)
SB1-03-02	90021703		FB-01, -02	EW-01	Be(2.0), Cd(0.60), Cr(27), Cu(19.3), Pb(13.7*), Ni(29.7), Zn(66)	Cd=0.6J(MB,B)/Zn=66J(FB)
SB1-03-05	90021704		FB-01, -02	EW-01	Be(1.7), Cd(0.34B), Cr(20.6), Cu(27.8), Pb(10*), Ni(26.2), Zn(54.4)	Cd=0.34J(MB,B)/Zn=54.4J(FB)
SB1-03-18	90021705		FB-01, -02	EW-01	Be(0.94), Cd(0.21B), Cr(9.6), Cu(34.7), Pb(7.5*), Ni(23.8), Zn(33.2)	Cd=0.21J(MB,B)/Zn=33.2J(FB)
SB2-01-01	90021804		FB-01, -02	EW-03	Sb(0.10UWN), As(1.3N), Cr(2.0), Cu(19.3), Pb(6.2*), Hg(0.02), Ni(1.7B), Se(0.2UW), Tl(0.20UW), Zn(33.2)	Sb=0.1R(N)/As=1.3J(N,MB)/Pb=6.2J(EB)/Ni=1.7J(MB,B)/ Zn=6.9J(FB)
SB2-01-19	90021806		FB-01, -02	EW-03	Sb(0.10UWN), As(14.3N), Be(0.73), Cd(0.31B), Cr(8.6), Cu(24.1), Pb(7.6*), Ni(15.6), Se(0.21UW), Tl(0.3B), Zn(208)	Sb=0.1R(N)/As=14.3J(N)/Cd=0.31J(MB,B)/Pb=7.6J(EB)/ Ni=15.6J(MB)/Tl=0.3J(B)
SB2-02-01	90022301		FB-01, -02	EW-03, -05	Sb(0.11UWN), As(1.7N), Cr(2.8), Cu(17.4), Pb(3.7*), Ni(1.6B), Se(0.21UW), Zn(4.6)	Sb=0.11R(N)/As=1.7J(N,MB)/Pb=3.7J(EB)/ Ni=1.6J(MB,B)/Zn=4.6J(FB)
SB2-03-01	90022302		FB-01, -02	EW-03, -05	Sb(0.11UWN), As(20.7N), Be(0.98), Cd(0.65), Cr(11.7), Cu(26.5), Pb(16.3*), Hg(0.03), Ni(19.5), Se(0.21UW), Tl(0.57BW), Zn(66.9)	Sb=0.11R(N)/As=20.7J(N)/Cd=0.65J(MB)/Tl=0.37J(B)/ Zn=66.9J(FB)
SB2-04-01	90022303		FB-01, -02	EW-03, -05	Sb(0.11UWN), As(11.5N), Be(0.91), Cd(0.23), Cr(10), Cu(31.4), Pb(15.6*), Ni(18.7), Se(0.23UW), Tl(0.58BW), Zn(64.5)	Sb=0.11R(N)/As=11.5J(N)/Cd=0.23J(MB,B)/Tl=0.58J(B)/ Zn=64.5J(FB)
SB4-01-01	90022304		FB-01, -02	EW-03, -05	Sb(0.12UWN), As(8.4N), Be(1.2), Cd(0.36), Cr(7.7), Cu(54.8), Pb(14.1*), Hg(0.04), Ni(11.2), Se(0.39BW), Tl(0.49B), Zn(22)	Sb=0.12R(N)/As=8.4J(N)/Cd=0.36J(MB,B)/Ni=11.2J(MB)/ Se=0.39J(B)/Tl=0.49J(B)/Zn=22J(FB)
SB4-01-02	90022305		FB-01, -02	EW-03, -05	Sb(0.11UWN), As(11.1N), Be(2.1), Cr(29.6), Cu(22.6), Pb(9.4*), Hg(0.03), Ni(21.3), Se(0.33BW), Tl(0.47B), Zn(66.7)	Sb=0.11R(N)/As=11.1J(N)/Se=0.33J(B)/Tl=0.47J(B)/ Zn=66.7J(FB)
SB4-01-02D	90022305D		FB-01, -02	EW-03, -05	NA	None Applied
SB4-01-02S	90022305S		FB-01, -02	EW-03, -05	NA	None Applied
SB4-02-01	90022306		FB-01, -02	EW-03, -05	Sb(0.12UWN), As(10.9N), Be(1.7), Cd(0.36B), Cr(21.6), Cu(28.8), Pb(11.7*), Hg(0.09), Ni(23.4), Se(0.24BW), Tl(0.28B), Zn(66.0)	Sb=0.11R(N)/As=10.9J(N)/Cd=0.36J(MB,B)/Tl=0.28J(B)/ Zn=66J(FB)
SB4-02-02	90022307		FB-01, -02	EW-03, -05	Sb(0.12UWN), As(9.8N), Be(1.9), Cd(0.24B), Cr(22.3), Cu(29.6), Pb(10.5*), Hg(0.03), Ni(32.3), Se(0.23UW), Zn(66.8)	Sb=0.12R(N)/As=9.8J(N)/Cd=0.24J(MB,B)/Zn=66.8J(FB)
SB4-03-01	90022308		FB-01, -02	EW-03, -05	Sb(0.11UWN), As(9.7N), Be(1.9), Cd(0.45B), Cr(25.3), Cu(16.7), Pb(13.6*), Hg(0.04), Ni(24.9), Se(0.38BW), Zn(77.1)	Sb=0.11R(N)/As=9.7J(N)/Cd=0.45J(MB,B)/Se=0.38J(B)/ Zn=77.1J(FB)
SB4-03-02	90022309		FB-01, -02	EW-03, -05	Sb(0.12UWN), As(11.4N), Be(1.9), Cr(28.3), Cu(28), Pb(14.5*), Hg(0.04), Ni(36.9), Tl(0.38B), Zn(87)	Sb=0.12R(N)/As=11.4J(N)/Tl=0.38J(B)/Zn=87J(FB)
SB-B-01	90021706	NA	FB-01, -02	EW-01	Be(1.0), Cd(0.34B), Cr(15.5), Cu(13), Ni(11), Zn(41.9)	Cd=0.34J(MB,B)/Cu=13J(FB)/Ni=11J(MB)/Zn=41.9J(FB)

Table F-19b. Data Validation Tables: Priority Pollutant Metals

SAIC Sample Number	Laboratory ID Number	Collection Dates	Analysis Dates	CALIBRATION: Initial Calibration	CALIBRATION: Continuing Calibration	BLANKS: Initial Blank	BLANKS: Continuing Blank	BLANKS: Procedural Blank
SOIL:BATCH 2								
SB1-04-01	90023601	09/08/90	09/25-11/03/90	ALL INITIAL (4) AND CONTINUING (15) CALIBRATIONS WITHIN %R CONTROL LIMITS FOR ALL METALS		4 ICBs APPLY Sb(-1.3B) AND Pb(1.1B) NO CONTAMINANTS WERE DETECTED IN THE INITIAL BLANKS GREATER THE CRDL	15 CCBs APPLY Sb(-1.3B), Cd(5B), Pb(-1.8B, -1.1B) AND Ni(14B, 15B) NO CONTAMINANTS WERE DETECTED IN THE CONTINUING CALIBRATION BLANKS GREATER THAN THE CRDL.	1 APPLICABLE PBW Sb(0.103B) AND Zn(0.952B) NO CONTAMINANTS WERE DETECTED IN THE PBW BLANKS GREATER THE CRDL
SB1-04-02	90023602	09/08/90	09/25-11/03/90					
SB1-04-03	90023603	09/08/90	09/25-11/03/90					
SB1-04-04	90023604	09/08/90	09/25-11/03/90					
SB4-04-01	90022310	08/30/90	09/25-11/03/90					
SB4-04-02	90022311	08/30/90	09/25-11/03/90					
SB4-05-01	90022312	08/30/90	09/25-11/03/90					
SB4-05-02	90022313	08/30/90	09/25-11/03/90					
SB4-05-02D	90022313D	08/30/90	09/25-11/03/90					
SB4-05-02S	90022313S	08/30/90	09/25-11/03/90					
SD4-01	90022402	08/31/90	09/25-11/03/90					
SD4-02	90022403	08/31/90	09/25-11/03/90					

Table F-19b. Data Validation Tables: Priority Pollutant Metals (Continued)

SAIC Sample Number	Laboratory ID Number	ICP/ICS Initial	ICP/ICS Final	ACCURACY Spike Sample	PRECISION Duplicate Sample	Laboratory Control Sample
SOIL:BATCH 2						
SB1-04-01	90023601	ALL INITIAL ICP/ICS %R WITHIN COTROL LIMITS (80-120%)	ALL FINAL ICP/ICS %R WITHIN COTROL LIMITS (80-120%)	SB4-05-02 PERCENT RECOVERY FOR ALL SPIKED ELEMENTS WITHIN LIMITS (75-125%), EXCEPT Sb(0) AND As(165.4)	SB4-05-02 ALL RPDs WITHIN CONTROL LIMITS (35%).	ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (80-120%)
SB1-04-02	90023602					
SB1-04-03	90023603					
SB1-04-04	90023604					
SB4-04-01	90022310					
SB4-04-02	90022311					
SB4-05-01	90022312					
SB4-05-02	90022313					
SB4-05-02D	90022313D					
SB4-05-02S	90022313S					
SD4-01	90022402					
SD4-02	90022403					

Table F-19b. Data Validation Tables: Priority Pollutant Metals (Continued)

SAIC Sample Number	Laboratory ID Number	Standard Addition Results	Field Blank Results	Equipment Blank Results	Significant Sample Results	Data Qualifiers
SOIL:BATCH 2						
SB1-04-01	90023601		FB-03	EW-05	Be(1.7), Cd(0.66), Cr(19.4), Cu(24.8), Pb(23), Ni(24.8), Zn(64.8)	Cd=0.66J(MB)
SB1-04-02	90023602		FB-03	EW-05	Be(1.5), Cd(0.49), Cr(16.6), Cu(29.2), Pb(12.2), Ni(22.5), Zn(55.8)	Cd=0.49J(MB)
SB1-04-03	90023603		FB-03	EW-05	Be(1.7), Cd(0.79), Cr(20.5), Cu(30.3), Pb(15.5), Ni(29.1), Zn(76.2)	Cd=0.79J(MB)
SB1-04-04	90023604		FB-03	EW-05	Be(1.6), Cd(0.37B), Cr(19.5), Cu(34.2), Pb(13.9), Ni(31.4), Zn(67.7)	Cd=0.37J(MB,B)
SB4-04-01	90022310		[illegible]-01,-02	EW-03,-05	Sb(0.1UWN), As(10.8N), Be(1.1), Cd(0.21B), Cr(13.1), Cu(16.9), Pb(25.6), Hg(0.02), Ni(14.5), Se(0.45B), Tl(0.24UW), Zn(51.2)	Sb=0.1R(N)/As=10.8J(N)/Cd=0.21J(MB,B)/Ni=14.5J(MB)/ Se=0.45J(B)/Zn=51.2J(FB)
SB4-04-02	90022311		FB-01,-02	EW-03,-05	Sb(0.1UWN), As(8.2N), Be(1.4), Cd(0.49), Cr(16.9), Cu(31.3), Pb(10.4), Ni(31.5), Se(0.52BW), Tl(0.23UW), Zn(66.7)	Sb=0.1R(N)/As=8.2J(N)/Cd=0.49J(MB)/Se=0.52J(B)/ Zn=66.7J(FB)
SB4-05-01	90022312	Se: r=1.000, FINAL CONC.=4.1	FB-01,-02	EW-03,-05	Sb(0.08UWN), As(2.8N), Be(0.25B), Cr(5.4), Cu(16.1), Pb(11), Hg(0.03), Ni(9.2), Se(0.36BW), Tl(0.20UW), Zn(13.8)	Sb=0.08R(N)/As=2.8J(N)/Be=0.25J(B)/Ni=9.2J(MB)/ Se=0.36J(B)/Zn=13.8J(FB)
SB4-05-02	90022313		FB-01,-02	EW-03,-05	Sb(0.09UWN), As(7.0N), Be(1.6), Cd(0.28B), Cr(21.2), Cu(27.4), Pb(10.8), Ni(28.6), Se(0.22BW), Zn(55.3)	Sb=0.09R(N)/As=7J(N)/Cd=0.28J(MB,B)/Zn=55.3J(FB)
SB4-05-02D	90022313D		FB-01,-02	EW-03,-05	NA	None Applied
SB4-05-02S	90022313S		FB-01,-02	EW-03,-05	NA	None Applied
SD4-01	90022402		FB-01,-02	EW-05	Sb(0.11UWN), As(11.0N), Be(1.7), Cd(0.22B), Cr(20.9), Cu(31.1), Pb(13.8), Ni(33.7), Se(0.23UW), Tl(0.27B), Zn(73.9)	Sb=0.11R(N)/As=11J(N)/Cd=0.22J(MB,B)/Tl=0.27J(B)/ Zn=73.9J(FB)
SD4-02	90022403		FB-01,-02	EW-05	Sb(0.12UWN), As(9.6N), Be(2.0), Cd(0.35B), Cr(19.3), Cu(28.1), Pb(20.4, Hg(0.04), Ni(26.1), Tl(0.30B), Zn(71.3)	Sb=0.12R(N)/As=9.6J(N)/Cd=0.35J(MB,B)/Tl=0.30J(B)/ Zn=71.3J(FB)

Table F-19c. Data Validation Tables: Priority Pollutant Metals

SAIC Sample Number	Laboratory ID Number	Collection Dates	Analysis Dates	CALIBRATION: Initial Calibration	CALIBRATION: Continuing Calibration	BLANKS: Initial Blank	BLANKS: Continuing Blank	BLANKS: Procedural Blank
WATER								
EW-01	90021710	08/28/90	09/26-10/25/90	ALL INITIAL (1) AND CONTINUING CALIBRATIONS (15) WITHIN %R CONTROL LIMITS FOR ALL METALS		4 ICBs APPLY. Sb(-1.3B) NO CONTAMINANTS WERE DETECTED IN THE INITIAL BLANKS GREATER THE CRDL	16 CCBs APPLY Sb(-1.3B) Cd(5B,-3B), Pb(-1.2B, -1.1B) AND Ni(-14B, 16B, 18B) NO CONTAMINANTS WERE DETECTED IN THE CONTINUING CALIBRATION BLANKS GREATER THAN THE CRDL.	1 APPLICABLE PBW Sb(-1.3B), Pb(1.4B), Zn(14B) NO CONTAMINANTS WERE DETECTED IN THE PBW BLANKS GREATER THE CRDL
EW-03	90021808	08/29/90	09/26-10/25/90					
EW-05	90022401	08/31/90	09/26-10/25/90					
EW-07	90024901	09/14/90	09/26-10/25/90					
EW-09	90025104	09/16/90	09/26-10/25/90					
FB-01	90021708	08/28/90	09/26-10/25/90					
FB-02	90021709	08/28/90	09/26-10/25/90					
FB-03	90023606	09/11/90	09/26-10/25/90					
HT-01	90025106	09/16/90	09/26-10/25/90					
MW1-01	90025102	09/15/90	09/26-10/25/90					
MW1-02	90025101	09/14/90	09/26-10/25/90					
MW1-02D	90025101D	09/14/90	09/26-10/25/90					
MW1-02S	90025101S	09/14/90	09/26-10/25/90					
MW2-01	90024902	09/14/90	09/26-10/25/90					
MW2-01D	90024902D	09/14/90	09/26-10/25/90					
MW2-01S	90024902S	09/14/90	09/26-10/25/90					
P-2	90024801	09/13/90	09/26-10/25/90					
P-8	90025105	09/16/90	09/26-10/25/90					
MW4-02	90023901	09/12/90	11/06-11/14/90	INITIAL(2) AND CONTINUING (10) CALIBRATIONS WITHIN %R CONTROL LIMITS FOR ALL METALS		2 ICBs APPLY. Cd(3B) NO CONTAMINANTS WERE DETECTED IN THE INITIAL BLANKS GREATER THE CRDL	10 CCBs APPLY As(-2.5B, -2.8B), Cd(3B), Ni(-15B) NO CONTAMINANTS WERE DETECTED IN THE CONTINUING CALIBRATION BLANKS GREATER THAN THE CRDL.	1 APPLICABLE PBW As(-3.4B), Cd(3B), Zn(9B) NO CONTAMINANTS WERE DETECTED IN THE PBW BLANKS GREATER THE CRDL
MW4-02 S	90023901S	09/12/90	11/06-11/14/90					
MW4-02 D	90023901D	09/12/90	11/06-11/14/90					

Table F-19c. Data Validation Tables: Priority Pollutant Metals (Continued)

SAIC Sample Number	Laboratory ID Number	ICP/ICS Initial	ICP/ICS Final	ACCURACY Spike Sample	PRECISION Duplicate Sample	Laboratory Control Sample
WATER						
EW-01	90021710	ALL INITIAL ICP/ICS %R WITHIN COTROL LIMITS (80-120%)	ALL FINAL ICP/ICS %R WITHIN COTROL LIMITS (80-120%)	MW1-02 PERCENT RECOVERY FOR ALL SPIKED ELEMENTS WITHIN LIMITS (75-125%)	MW1-02 ALL RPDs WITHIN CONTROL LIMITS (20%).	ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (80-120%)
EW-03	90021808					
EW-05	90022401					
EW-07	90024901					
EW-09	90025104					
FB-01	90021708					
FB-02	90021709					
FB-03	90023606					
HT-01	90025106			MW2-01 PERCENT RECOVERY FOR ALL SPIKED ELEMENTS WITHIN LIMITS (75-125%)	MW2-01 ALL RPDs WITHIN CONTROL LIMITS (20%), EXCEPT Cr(200%), Cu(58.8%) AND Zn(41.9%)	
MW1-01	90025102					
MW1-02	90025101					
MW1-02D	90025101D					
MW1-02S	90025101S					
MW2-01	90024902					
MW2-01D	90024902D					
MW2-01S	90024902S					
P-2	90024801					
P-8	90025105					
MW4-02	90023901	INITIAL ICP/ICS %R WITHIN COTROL LIMITS (80-120%)	INITIAL ICP/ICS %R WITHIN COTROL LIMITS (80-120%)	MW4-02 PERCENT RECOVERY FOR ALL SPIKED ELEMENTS WITHIN LIMITS (75-125%)	MW4-02 ALL RPDs WITHIN CONTROL LIMITS (20%), EXCEPT Cu(58.8) AND Zn(41.9)	ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (80-120%)
MW4-02 S	90023901S					
MW4-02 D	90023901D					

Table F-19c. Data Validation Tables: Priority Pollutant Metals (Continued)

SAIC Sample Number	Laboratory ID Number	Standard Addition Results	Field Blank Results	Equipment Blank Results	Significant Sample Results	Data Qualifiers
WATER						
EW-01	90021710		NA	NA	As(2UW), Pb(1.3B), Zn(9.0B)	Pb=1.3J(MB,B)/Zn=9J(MB,B)
EW-03	90021808		NA	NA	Pb(1.3B), Zn(14.0B)	Pb=1.3J(MB,B)/Zn=14J(MB,B)
EW-05	90022401		NA	NA	As(2.0UW), Pb(8.2)	Pb=8.2J(MB)
EW-07	90024901		NA	NA	As(4.3B), Pb(2.1B), Se(3.OUW)	Pb=2.1J(MB,B)
EW-09	90025104		NA	NA	Pb(2.3B), Zn(9B)	Pb=2.3J(MB,B)/Zn=9J(MB,B)
FB-01	90021708		NA	NA	Cu(14B), Pb(3.4), Se(3UW), Tl(2UW)	Cu=14J(B)/Pb=3.4J(MB,B)
FB-02	90021709		NA	NA	Pb(2.6BW), Se(3UW), Zn(80)	Pb=2.6J(MB,B)
FB-03	90023606		NA	NA	As(2.0UW), Pb(1.4BW)	Pb=1.4J(MB,B)
HT-01	90025106		NA	NA	Cu(12B), Pb(2.1B), Ni(19B), Tl(2.0UW), Zn(11B)	Cu=12J(B)/Pb=2.1J(MB,B)/Ni=19J(MB,B)/Zn=11J(MB,B)
MW1-01	90025102		FB-01,-02,-03	EB-07	As(5.8B), Cu(11B), Pb(4.8B), Ni(14B), Se(3UW), Tl(2UW), Zn(15B)	As=5.8J(B)/Cu=11J(FB,B)/Pb=4.8J(FB,B)/Ni=14J(MB,B)/ Zn=15J(FB,B)
MW1-02	90025101	Se: r=O.9994, FINAL CONC.=9.5	FB-01,-02,-03	EB-07	As(5.4B),Cu(32),Pb(14.3),Se(3UW),Tl(2UW),Zn(51)	As=5.4J(B)/Cu=32J(FB)/Pb=14.3J(FB)/Zn=51J(FB)
MW1-02D	90025101D		FB-01,-02,-03	EB-07	NA	None Applied
MW1-02S	90025101S		FB-01,-02,-03	EB-07	NA	None Applied
MW2-01	90024902		FB-01,-02,-03	EB-07	As(6.3B), Cu(22B), Pb(27.9), Se(3.0W), Zn(26)	As=6.3J(B)/Cu=22J(B)/Zn=26J(FB)
MW2-01D	90024902D		FB-01,-02,-03	EB-07	NA	None Applied
MW2-01S	90024902S		FB-01,-02,-03	EB-07	NA	None Applied
P-2	90024801		FB-01,-02,-03	EB-05	As(3.3B), Cu(43), Pb(10.5), Ni(32B), Se(3UW), Tl(2UW), Zn(25)	As=3.3J(B)/Cu=43J(FB)/Pb=10.5J(EB)/Ni=32J(MB,B)/ Zn=25J(FB)
P-8	90025105		FB-01,-02,-03	EB-09	Cu(37), Pb(6.9), Tl(2.0UW), Zn(24)	Cu=37J(FB)/Pb=6.9J(FB)/Zn=24J(FB)
MW4-02	90023901	NA	FB-03	EW-09	As(3.3BW), Cu(27), Pb(29.4), Ni(16B), Se(3UW), Zn(32)	As=3.3J(MB,B)/Ni=16J(MB,B)/Hg=0.2R(HT)/ Zn=32J(MB)
MW4-02 S	90023901S		FB-03	EW-09	NA	None Applied
MW4-02 D	90023901D		FB-03	EW-09	NA	None Applied

Table F-19d. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Sampling Dates	Preparation Dates	Analysis Dates	Initial Calibration (ICV)	Continuing Calibration (CCV)	BLANKS Initial Calibration Blank (ICB)	BLANKS Continuing Calibration Blank (CCB)	BLANKS Preparation Blank (PB)
WATERS									
EB4-1	13203	11/01/91	11/19/91	11/19-25/91	ALL ICV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	ALL CCV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	NO INTERFERENCE DETECTED IN THE INITIAL CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL.	NO INTERFERENCE DETECTED IN THE CONTINUING CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *CCB7: Pb=-1.3B µg/l	NO INTERFERENCE DETECTED IN THE PREPARATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL.
MW4-01	14357	11/06/91	11/19/91	11/19-25/91					
MW4-02	14358	11/06/91	11/19/91	11/19-25/91					
MW4-02R	14359	11/06/91	11/19/91	11/19-25/91					
P-1	14397	11/07/91	11/19/91	11/19-25/91					
SOILS									
SB4-3-1	13200	11/01/91	11/18/91	11/19-20/91	ALL ICV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	ALL CCV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	NO INTERFERENCE DETECTED IN THE INITIAL CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL.	NO INTERFERENCE DETECTED IN THE CONTINUING CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *CCB6: Pb=-1.3B µg/l *CCB8: Pb=-1.2B µg/l *CCB10: Pb=-1.0B µg/l *CCB11: Pb=-1.1B µg/l	NO INTERFERENCE DETECTED IN THE PREPARATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL.
SB4-3-2	13201	11/01/91	11/18/91	11/19-20/91					
SB4-3-4	13202	11/01/91	11/18/91	11/19-20/91					
SED-1	14395	11/07/91	11/18/91	11/19-20/91					
SED-2	14396	11/07/91	11/18/91	11/19-20/91					
WATERS									
EB1A-1	119629	11/05/91	11/14/91	11/20/91	ALL ICV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	ALL CCV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110) EXCEPT CCV3: Se=-2.8%	NO INTERFERENCE DETECTED IN THE INITIAL CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *ICB: As=-1.0B/Fe=8.1B/Pb=-1.6B/ Na=9.9B µg/l	NO INTERFERENCE DETECTED IN THE CONTINUING CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *CCB1: Al=11.2B/As=-1.2B/Fe=3.1B/ Pb=-1.6B/Na=9.8B µg/l *CCB2: Fe=3.7B/Pb=-1.4B µg/l *CCB3: Al=19.9B/As=-1.6B/Fe=3.1B/ Pb=-1.4B/Na=10.2B µg/l *CCB4: Al=21.9B/As=-1.4B/Fe=12.2B/ Pb=-1.8B/Na=12.4B µg/l *CCB5: As=-1.4B/Pb=-1.3B µg/l	NO INTERFERENCE DETECTED IN THE PREPARATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *PBW: Al=31.1B/As=-1.1B/Ca=189.2B/ Cu=2.1B/Fe=28.4B/Pb=-1.4B/ Mg=33.5B/Se=-1.2B/Na=37.9B/ Zn=7.6B µg/l
MW1-02	119630	11/05/91	11/14/91	11/20/91					
EB1-1	119628	11/05/91	11/14/91	11/20/91					
FB1-1	119621	11/04/91	11/21-25/91	11/22-26/91					
FB4-1	119599	11/01/91	11/14/91	11/26/91					
SOILS									
BO1-1-1	119600	11/03/91	11/20-21/91	11/21-25/91	ALL ICV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	ALL CCV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110) EXCEPT: CCV4: Se=-2.2%, CCV10: Se=88.3%	NO INTERFERENCE DETECTED IN THE INITIAL CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *ICB1: Fe=-3.2B µg/l *ICB3: Se=4.0B µg/l	NO INTERFERENCE DETECTED IN THE CONTINUING CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *CCB1: Fe=-4.9B/Ni=-6.5B µg/l *CCB2: Ca=9.8B/Fe=3.8B/Mg=1.4B/ Na=-8.8B µg/l *CCB3: Na=-8.5B µg/l *CCB4: As=-1.1B/Mn=1.2B/ Na=-8.5B µg/l *CCB5: As=-1.0B/Cd=1.1B/Fe=4.9B/ Mn=1.2B/Na=-9.2B µg/l *CCB6: As=-1.0B µg/l *CCB7: Pb=-1.0B µg/l *CCB9: Pb=-1.1B µg/l *CCB11: Pb=-1.0B µg/l *CCB12: Se=1.3B µg/l *CCB13: Se=2.6B µg/l *CCB14: Se=2.9B µg/l *CCB15: Se=2.4B µg/l *CCB16: Se=2.2B µg/l	NO INTERFERENCE DETECTED IN THE PREPARATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *PBS1: Al=27.467B/Ca=27.292B/ Fe=3.435B/Mg=3.698B/ Mn=0.231B/Zn=2.700B mg/kg *PBS2: As=-0.260B/Se=0.220B mg/kg
BO1-1-2	119601	11/03/91	11/20-21/91	11/21-25/91					
BO1-1-3	119602	11/03/91	11/20-21/91	11/21-25/91					
BO1-1-4	119603	11/03/91	11/20-21/91	11/21-25/91					
BO2-1-1	119604	11/03/91	11/20-21/91	11/21-25/91					
BO2-1-2	119605	11/03/91	11/20-21/91	11/21-25/91					
BO2-1-3	119606	11/03/91	11/20-21/91	11/21-25/91					
SB1-1-1	119596	11/01/91	11/20-21/91	11/21-25/91					
SB1-1-2	119597	11/01/91	11/20-21/91	11/21-25/91					

Table F-19d. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	ICP/ICS Initial	ICP/ICS Final	ACCURACY Spike Sample	PRECISION Duplicate Sample	Laboratory Control Sample (LCS)	Field Blank Results	Equipment Blank Results
WATERS								
EB4-1	13203	NA	NA	MW4-02 ALL SPIKE SAMPLE RECOVERIES WITHIN CONTROL LIMITS (75-125%)	MW4-02 ALL RPDs WITHIN CONTROL LIMITS FOR SAMPLE AND DUPLICATE CONCENTRATIONS GREATER THAN 5X THE CRDL ($\leq$ 35 %) AND WITHIN CONTROL LIMIT OF (±)2XCRDL FOR SAMPLE OR DUPLICATE CONCENTRATIONS LESS THAN 5X THE CRDL	ALL LCS %Rs WITHIN CONTROL LIMITS (80-120%) FOR ALL ELEMENTS	NA	NA
MW4-01	14357						FB2-1	EB2-1
MW4-02	14358						FB2-1	EB2-1
MW4-02R	14359						FB2-1	EB2-1
P-1	14397						FB2-1	EB2-1
SOILS								
SB4-3-1	13200	NA	NA	SED-2 ALL SPIKE SAMPLE RECOVERIES WITHIN CONTROL LIMITS (75-125%)	SED-2 RPD OUTSIDE CONTROL LIMITS FOR SAMPLE AND DUPLICATE CONCENTRATIONS GREATER THAN 5X THE CRDL ($\leq$ 35 %), Pb=35.6%	ALL LCS %Rs WITHIN CONTROL LIMITS (80-120%) FOR ALL ELEMENTS	FB4-1	EB4-1
SB4-3-2	13201						FB4-1	EB4-1
SB4-3-4	13202						FB4-1	EB4-1
SED-1	14395						FB2-1	EB2-1
SED-2	14396						FB2-1	EB2-1
WATERS								
EB1A-1	119629	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	MW1-02 ALL SPIKE SAMPLE RECOVERIES WITHIN CONTROL LIMITS (75-125%) EXCEPT Se=43.5%	MW1-02 ALL RPDs WITHIN CONTROL LIMITS FOR SAMPLE AND DUPLICATE CONCENTRATIONS GREATER THAN 5X THE CRDL ($\leq$ 35 %) AND WITHIN CONTROL LIMIT OF (±)2XCRDL FOR SAMPLE OR DUPLICATE CONCENTRATIONS LESS THAN 5X THE CRDL	DATA NOT PROVIDED	NA	NA
MW1-02	119630						FB1-1	EB1A-1,1-1
EB1-1	119628						NA	NA
FB1-1	119621						NA	NA
FB4-1	119599						NA	NA
SOILS								
BG1-1-1	119600	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	BG2-1-1 (TWO TIMES) ALL SPIKE SAMPLE RECOVERIES WITHIN CONTROL LIMITS (75-125%), EXCEPT: Sb=42.8%, Cu=51.6%, Mn=305.9%, AND 2nd LEAD ANALYSIS Pb=39.5%	BG2-1-1 (TWO TIMES) ALL RPDs WITHIN CONTROL LIMITS FOR SAMPLE AND DUPLICATE CONCENTRATIONS GREATER THAN 5X THE CRDL ($\leq$ 35 %) AND WITHIN CONTROL LIMIT OF (±)2XCRDL FOR SAMPLE OR DUPLICATE CONCENTRATIONS LESS THAN 5X THE CRDL, EXCEPT: Cu=88.9%, AND Mn=67.5%	DATA NOT PROVIDED	FB1-1	EB4-1
BG1-1-2	119601						FB1-1	EB4-1
BG1-1-3	119602						FB1-1	EB4-1
BG1-1-4	119603						FB1-1	EB4-1
BG2-1-1	119604						FB1-1	EB4-1
BG2-1-2	119605						FB1-1	EB4-1
BG2-1-3	119606						FB1-1	EB4-1
SB1-1-1	119596						FB4-1	EB4-1
SB1-1-2	119597						FB4-1	EB4-1

Table F-19d. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Data Validation Qualifiers
WATERS			
EB4-1	13203	None Detected	None Applied
MW4-01	14357	Pb=229μg/l	None Applied
MW4-02	14358	Pb=10.2μg/l	None Applied
MW4-02R	14359	Pb=11.6μg/l	None Applied
P-1	14397	Pb=10.6μg/l	None Applied
SOILS			
SB4-3-1	13200	Pb=19.3* mg/kg	19.3J(*)
SB4-3-2	13201	Pb=11.7* mg/kg	11.7J(*)
SB4-3-4	13202	Pb=10.1* mg/kg	10.1J(*)
SED-1	14395	Pb=39.3* mg/kg	39.3J(*)
SED-2	14396	Pb=7.4* mg/kg	7.4J(*)
WATERS			
EB1A-1	119629	Al=28.1B/Ca=119B/Cu=3.7B/Fe=34.2B/Mg=20.9B/Se=1.0UN/ Na=143B/Zn=8.4Bμg/l	Al=28.1J(MB,B)/Ca=119J(MB,B)/Cu=3.7J(MB,B)/Fe=34.2J(MB,B)/Mg=20.9J(MB,B)/Se=1UJ(N)/ Na=143J(MB,B)/Zn=8.4J(MB,B)
MW1-02	119630	Al=10600/As=7.4B/Ba=285/Be=1.1B/Cd=1.7B/Ca=234000/ Cr=21.2/Co=9.1B/Cu=30.2/Fe=23600/Pb=15.0/Mg=61900/ Mn=577/Ni=30.2B/K=5320/Se=3.6BN/Na=11800/V=25.9B/ Zn=96.4 μg/l	As=7.4J(MB,B)/Be=1.1J(MB,B)/Cd=1.7J(B)/Co=9.1J(B)/Ni=30.2J(B)/Se=3.6J(N,B)/V=25.9J(B)
EB1-1	119628	Al=37.3B/Cd=1.8B/Ca=116B/Cu=4.3B/Fe=29.0B/Mg=27.0B/ Se=1.0UN/Na=97.1B/Zn=8.2B μg/l	Al=37.3J(MB,B)/Cd=1.8J(B)/Ca=116J(MB,B)/Cu=4.3J(MB,B)/Fe=29J(MB,B)/Mg=27J(MB,B)/Se=1UJ(N)/ Na=97.1J(MB,B)/Zn=8.2J(MB,B)
FB1-1	119621	Al=26.0B/Ca=86.3B/Fe=14.0B/Mg=15.8B/Se=1.0UN/Na=122B/ Zn=5.1B μg/l	Al=26J(MB,B)/Ca=86.3J(MB,B)/Fe=14J(MB,B)/Mg=15.8J(MB,B)/Se=1UJ(N)/ Na=122J(MB,B)/Zn=5.1J(MB,B)
FB4-1	119599	Al=40.2B/As=3.0BW/Ba=15.9B/Cd=1.8B/Ca=37300/Cu=16.5B/ Fe=912/Pb=3.0B/Mg=1970B/Mn=9.9B/K=5990/Se=1.0UNW/ Na=8470/V=5.1B/Zn=11.1B μg/l	Al=40.2J(MB,B)/As=3J(MB,B)/Ba=15.9J(B)/Cd=1.8J(B)/Cu=16.5J(B)/Pb=3J(MB,B)/Mg=1970J(B)/ Mn=9.9J(B)/Se=1UJ(N)/V=5.1J(B)/Zn=11.1J(MB,B)
SOILS			
BG1-1-1	119600	Al=11300/Sb=3.0UN/As=8.5/Ba=99.1/Be=0.69B/Cd=0.67B/ Ca=43200*/Cr=22.2/Co=11.9/Cu=30.2N*/Fe=20700/Pb=30.6/ Mg=13000/Mn=578N*/Ni=26.3/K=1440/Se=0.21UW/Na=92.2B/ Tl=0.28B/V=25.9/Zn=75.9 mg/kg	Sb=3UJ(N)/Be=0.69J(B)/Cd=0.67J(MB,B)/Cu=30.2J(N,*)/Mn=578J(N,*)/Na=92.2J(FB,B)/ Tl=0.28J(B)
BG1-1-2	119601	Al=13100/Sb=3.3UN/As=9.3/Ba=110/Be=0.60B/Cd=0.34B/ Ca=38000*/Cr=21.1/Co=13.2/Cu=28.6N*/Fe=27800/Pb=14.1/ Mg=9210/Mn=575N*/Ni=34.7/K=1560/Se=0.24UW/Na=87.0B/ Tl=0.40B/V=30.3/Zn=93.0 mg/kg	Sb=3.3UJ(N)/Be=0.60J(B)/Cd=0.34J(MB,B)/Cu=28.6J(N,*)/Mn=575J(N,*)/Na=87J(FB,B)/ Tl=0.40J(B)
BG1-1-3	119602	Al=9300/Sb=3.5BN/As=7.6/Ba=73.6/Be=0.50B/Cd=0.71B/ Ca=83400*/Cr=16.7/Co=10.2B/Cu=24.8N*/Fe=20500/Pb=9.1/ Mg=18700/Mn=432N*/Ni=27.9/K=2120/Se=0.23UW/Na=147B/ Tl=0.40B/V=21.0/Zn=72.3 mg/kg	Sb=3.5J(N,B)/Be=0.50J(B)/Cd=0.71J(MB,B)/Co=10.2J(B)/Cu=24.8J(N,*)/Mn=432J(N,*)/ Na=147J(B)/Tl=0.40J(B)
BG1-1-4	119603	Al=10300/Sb=3.2UN/As=7.1/Ba=79.6/Be=0.60B/Cd=0.64B/ Ca=64600*/Cr=19.1/Co=13.3/Cu=23.0N*/Fe=22100/Pb=10.3/ Mg=16800/Mn=392N*/Ni=37.4/K=2270/Se=0.23UW/Na=149B/ Tl=0.54B/V=23.9/Zn=76.1 mg/kg	Sb=3.2UJ(N)/Be=0.60J(B)/Cd=0.64J(MB,B)/Cu=23J(N,*)/Mn=392J(N,*)/Na=149J(B)/ Tl=0.54J(B)
BG2-1-1	119604	Al=10500/Sb=3.6UN/As=7.8/Ba=102/Be=0.75B/Ca=6830*/ Cr=16.3/Co=7.8B/Cu=46.2N*/Fe=19100/Pb=18.6/Mg=3140/ Mn=336N*/Ni=19.0/K=1180B/Na=35.0B/V=26.4/Zn=85.9 mg/kg	Sb=3.6UJ(N)/Be=0.75J(B)/Co=7.8J(B)/Cu=46.2J(N,*)/Mn=336J(N,*)/K=1180J(B)/Na=35J(FB,B)
BG2-1-2	119605	Al=9670/Sb=3.2UN/As=7.3/Ba=79.3/Be=0.53B/Cd=0.48B/ Ca=79900*/Cr=17.9/Co=10.4B/Cu=21.9N*/Fe=20000/Pb=9.3/ Mg=18000/Mn=421N*/Ni=30.9/K=2270/Se=0.23UW/Na=142B/ Tl=0.43B/V=22.5/Zn=63.8 mg/kg	Sb=3.2UJ(N)/Be=0.53J(B)/Cd=0.48J(MB,B)/Co=10.4J(B)/Cu=21.9J(N,*)/Mn=421J(N,*)/ Na=142J(FB,B)/Tl=0.43J(B)
BG2-1-3	119606	Al=1230/Sb=3.3UN/As=1.2B/Ba=8.7B/Ca=49100*/Cr=3.9/ Co=1.5B/Cu=7.9N*/Fe=3480/Pb=2.0/Mg=8530/Mn=124N*/ Ni=6.0B/K=272B/Na=60.6B/V=4.2B/Zn=16.1 mg/kg	Sb=3.3UJ(N)/As=1.2J(MB,B)/Ba=8.7J(B)/Co=1.5J(B)/Cu=7.9J(N,*)/Pb=2J(FB)/ Mn=124J(N,*)/Ni=6J(MB,B)/K=272J(B)/Na=60.6J(FB,B)/V=4.2J(B)/Zn=16.1J(MB)
SB1-1-1	119596	Al=4800/Sb=3.1UN/As=9.5/Ba=38.3B/Be=0.33B/Ca=106000*/ Cr=8.5/Co=6.8B/Cu=22.4N*/Fe=15800/Pb=15.7/Mg=19100/ Mn=374N*/Ni=20.2/K=657B/Se=0.28BW/Na=81.9B/Tl=0.39B/ V=13.4/Zn=59.3 mg/kg	Sb=3.1UJ(N)/Ba=38.3J(B)/Be=0.33J(B)/Co=6.8J(B)/Cu=22.4J(N,*)/Mn=374J(N,*)/K=657J(B)/ Se=0.28J(MB,B)/Na=81.9J(FB,B)/Tl=0.39J(B)
SB1-1-2	119597	Al=11600/Sb=3.4UN/As=9.8/Ba=108/Be=0.80B/Cd=0.74B/ Ca=4600*/Cr=18.6/Co=8.7B/Cu=27.4N*/Fe=23700/Pb=13.6/ Mg=3370/Mn=525N*/Ni=28.3/K=1150B/Se=0.25UW/Na=48.0B/ V=27.5/Zn=83.5 mg/kg	Sb=3.4UJ(N)/Ba=38.3J(B)/Be=0.80J(B)/Cd=0.74J(MB,B)/Co=8.7J(B)/Cu=27.4J(N,*)/Mn=525J(N,*)/ K=1150J(B)/Na=48J(FB,B)

Table F-19e. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Sampling Dates	Preparation Dates	Analysis Dates	Initial Calibration (ICV)	Continuing Calibration (CCV)	BLANKS Initial Calibration Blank (ICB)	BLANKS Continuing Calibration Blank (CCB)	BLANKS Preparation Blank (PB)
SOILS									
SB1-1-3	119598	11/01/91	11/20-21/91	11/21-25/91					
SB1-2-1	119607	11/02/91	11/20-21/91	11/21-25/91					
SB1-2-2	119608	11/02/91	11/20-21/91	11/21-25/91					
SB1-2-3	119609	11/02/91	11/20-21/91	11/21-25/91					
SB1-2-7	119610	11/02/91	11/20-21/91	11/21-25/91					
SB1A-1-1	119611	11/04/91	11/20-21/91	11/21-25/91					
SB1A-1-2	119612	11/04/91	11/20-21/91	11/21-25/91					
SB1A-1-3	119613	11/04/91	11/20-21/91	11/21-25/91					
SB1A-1-5	119614	11/04/91	11/20-21/91	11/21-25/91					
SB1A-2-1	119615	11/04/91	11/20-21/91	11/21-25/91					
SB1A-2-2	119616	11/04/91	11/20-21/91	11/21-25/91					
SOILS									
SB1-1-7	119620	11/02/91	11/20-23/91	11/21-25/91	ALL ICV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	ALL CCV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110) EXCEPT: CCV3: Pb=111.7%	NO INTERFERENCE DETECTED IN THE INITIAL CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *ICB1: Al=-13.9B/Fe=13.5B/ Tl=-1.0B µg/l *ICB2: Pb=-1.2B µg/l	NO INTERFERENCE DETECTED IN THE CONTINUING CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *CCB1: Fe=12.8B/Se=-1.0B/ Tl=-1.2B µg/l *CCB2: Cd=2.4B/Fe=10.2B µg/l *CCB3: Fe=14.6B µg/l *CCB4: Fe=10.9B µg/l *CCB5: Cd=1.4B/Fe=9.5B µg/l *CCB7: Pb=-1.2B µg/l *CCB9: Pb=-1.0B µg/l	NO INTERFERENCE DETECTED IN THE PREPARATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *PBS: Al=29.787B/Be=0.211B/ Ca=26.858B/Fe=4.195B/ Mg=5.650B/Na=5.094B/ Tl=-0.210B/Zn=2.370B mg/kg
SB1-3-1	119622	11/05/91	11/20-23/91	11/21-25/91					
SB1-3-2	119623	11/05/91	11/20-23/91	11/21-25/91					
SB1-3-3	119624	11/05/91	11/20-23/91	11/21-25/91					
SB1-3-3R	119625	11/05/91	11/20-23/91	11/21-25/91					
SB1A-2-3	119617	11/04/91	11/20-23/91	11/21-25/91					
SB1A-3-1	119618	11/04/91	11/20-23/91	11/21-25/91					
SB1A-3-2	119626	11/04/91	11/20-23/91	11/21-25/91					
SB1A-3-3	119619	11/04/91	11/20-23/91	11/21-25/91					
SB1A-3-5	119627	11/05/91	11/20-23/91	11/21-25/91					

Table F-19e. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	ICP/ICS Initial	ICP/ICS Final	ACCURACY: Spike Sample	PRECISION: Duplicate Sample	Laboratory Control Sample (LCS)	Field Blank Results	Equipment Blank Results
SOILS								
SBI-1-3	119598						FBI-1	EB4-1
SBI-2-1	119607						FBI-1	EB4-1
SBI-2-2	119608						FBI-1	EB4-1
SBI-2-3	119609						FBI-1	EB4-1
SBI-2-7	119610						FBI-1	EB4-1
SBIA-1-1	119611						FBI-1	EB4-1
SBIA-1-2	119612						FBI-1	EB4-1
SBIA-1-3	119613						FBI-1	EB4-1
SBIA-1-5	119614						FBI-1	EB4-1
SBIA-2-1	119615						FBI-1	EB4-1
SBIA-2-2	119616						FBI-1	EB4-1
SOILS								
SBI-1-7	119620	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	SBIA-3-3 ALL SPIKE SAMPLE RECOVERIES WITHIN CONTROL LIMITS (75-125%), EXCEPT: Sb=59.4% AND Se=59.0%	SBIA-3-3 ALL RPDs WITHIN CONTROL LIMITS FOR SAMPLE AND DUPLICATE CONCENTRATIONS GREATER THAN 5X THE CRDL (≤ 35 %) AND WITHIN CONTROL LIMIT OF (±)2XCRDL FOR SAMPLE OR DUPLICATE CONCENTRATIONS LESS THAN 5X THE CRDL, EXCEPT: As=52.2%	DATA NOT PROVIDED	FBI-1	EB4-1
SBI-3-1	119622						FBI-1	EBIA-1,1-1
SBI-3-2	119623						FBI-1	EBIA-1,1-1
SBI-3-3	119624						FBI-1	EBIA-1,1-1
SBI-3-3R	119625						FBI-1	EBIA-1,1-1
SBIA-2-3	119617						FBI-1	EB4-1
SBIA-3-1	119618						FBI-1	EB4-1
SBIA-3-2	119626						FBI-1	EBIA-1,1-1
SBIA-3-3	119619						FBI-1	EB4-1
SBIA-3-5	119627						FBI-1	EBIA-1,1-1

Table F-19e. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Data Validation Qualifiers
SOILS			
SB1-1-3	119598	Al=10000/Sb=3.2UN/As=9.8/Ba=176/Be=0.56B/Cd=0.83B/ Ca=75500*/Cr=19.0/Co=14.5/Cu=39.0N*/Fe=23000/Pb=16.2/ Mg=15000/Mn=1320N*/Ni=39.8/K=2160/Se=0.23UW/Na=106B/ Tl=0.33B/V=26.2/Zn=80.4 mg/kg	Sb=3.2UJ(N)/Be=0.56J(B)/Cd=0.83J(MB,B)/Cu=39J(N,*)/Mn=1320J(N,*)/ Na=106J(FB,B)/Tl=0.33J(B)
SB1-2-1	119607	Al=12000/Sb=3.3UN/As=9.7/Ba=119/Be=0.67B/Cd=0.72B/ Ca=64200*/Cr=20.3/Co=8.8B/Cu=20.1N*/Fe=20900/Pb=16.9/ Mg=13600/Mn=393N*/Ni=27.0/K=1710/Se=0.23UW/Na=92.0B/ Tl=0.31B/V=27.3/Zn=69.0 mg/kg	Sb=3.3UJ(N)/Be=0.67J(B)/Cd=0.72J(MB,B)/Co=8.8J(B)/Cu=20.1J(N,*)/Mn=393J(N,*)/ Na=92J(FB,B)/Tl=0.31J(B)
SB1-2-2	119608	Al=11900/Sb=3.5UN/As=5.5/Ba=96.9/Be=0.73B/Ca=4160*/ Cr=17.8/Co=10.4B/Cu=18.8N*/Fe=22300/Pb=18.2/Mg=3220/ Mn=203N*/Ni=21.8/K=1000B/Na=55.4B/Tl=0.28B/V=31.1/ Zn=70.0 mg/kg	Sb=3.5UJ(N)/Be=0.73J(B)/Co=10.4J(B)/Cu=18.8J(N,*)/Mn=203J(N,*)/ K=1000J(B)/Na=55.4J(FB,B)/Tl=0.28J(B)
SB1-2-3	119609	Al=15500/Sb=3.6UN/As=8.2/Ba=261/Be=0.76B/Cd=2.6/ Ca=4670*/Cr=26.5/Co=55.4/Cu=29.8N*/Fe=37600/Pb=14.5/ Mg=5620/Mn=3220N*/Ni=94.7/K=1810/Se=0.25UW/Na=69.7B/ Tl=0.40B/V=30.3/Zn=111 mg/kg	Sb=3.6UJ(N)/Be=0.76J(B)/Cu=29.8J(N,*)/Mn=3220J(N,*)/ Na=69.7J(FB,B)/Tl=0.40J(B)
SB1-2-7	119610	Al=9070/Sb=3.4UN/As=6.7/Ba=86.3/Be=0.50B/Cd=0.53B/ Ca=73700*/Cr=17.3/Co=10.8B/Cu=29.1N*/Fe=21000/Pb=9.7/ Mg=17000/Mn=390N*/Ni=33.3/K=2020/Na=145B/Tl=0.37B/ V=21.7/Zn=60.6 mg/kg	Sb=3.4UJ(N)/Be=0.50J(B)/Cd=0.53J(MB,B)/Co=10.8J(B)/Cu=29.1J(N,*)/Mn=390J(N,*)/ Na=145J(FB,B)/Tl=0.37J(B)
SB1A-1-1	119611	Al=8520/Sb=3.2UN/As=8.1/Ba=81.9/Be=0.51B/Cd=1.2/ Ca=27700*/Cr=15.2/Co=8.4B/Cu=17.1N*/Fe=21300/Pb=33.9/ Mg=7070/Mn=488N*/Ni=20.4/K=703B/Se=0.23UW/Na=53.2B/ Tl=0.29B/V=22.3/Zn=62.5 mg/kg	Sb=3.2UJ(N)/Be=0.51J(B)/Cd=1.2J(MB)/Co=8.4J(B)/Cu=17.1J(N,*)/Mn=488J(N,*)/ K=703J(B)/Na=53.2J(FB,B)/Tl=0.29J(B)
SB1A-1-2	119612	Al=9340/Sb=3.4UN/As=6.4/Ba=88.7/Be=0.61B/Cd=2.9/ Ca=45400*/Cr=16.0/Co=10.5B/Cu=19.7N*/Fe=19800/Pb=31.3/ Mg=9420/Mn=546N*/Ni=23.7/K=1070B/Na=80.0B/Tl=0.27B/ V=22.4/Zn=60.6 mg/kg	Sb=3.4UJ(N)/Be=0.61J(B)/Co=10.5J(B)/Cu=19.7J(N,*)/Mn=546J(N,*)/ K=1070J(B)/Na=80J(FB,B)/Tl=0.27J(B)
SB1A-1-3	119613	Al=8090/Sb=3.2UN/As=5.1/Ba=85.3/Be=0.43B/Cd=0.85B/ Ca=83700*/Cr=15.6/Co=9.6B/Cu=24.2N*/Fe=18400/Pb=11.0/ Mg=17100/Mn=314N*/Ni=28.1/K=1560/Se=0.98B/Na=104B/ Tl=0.52B/V=19.3/Zn=71.6 mg/kg	Sb=3.2UJ(N)/Be=0.43J(B)/Cd=0.85J(MB,B)/Co=9.6J(B)/Cu=24.2J(N,*)/Mn=314J(N,*)/ Se=0.98J(MB,B)/Na=104J(FB,B)/Tl=0.52J(B)
SB1A-1-5	119614	Al=8820/Sb=3.2UN/As=7.5/Ba=83.0/Be=0.50B/Cd=0.92B/ Ca=83400*/Cr=17.0/Co=10.7B/Cu=24.0N*/Fe=23500/Pb=10.2/ Mg=19100/Mn=416N*/Ni=33.9/K=2000/Na=136B/Tl=0.60B/ V=20.3/Zn=72.7 mg/kg	Sb=3.2UJ(N)/Be=0.50J(B)/Cd=0.92J(MB,B)/Co=10.7J(B)/Cu=24J(N,*)/Mn=416J(N,*)/ Na=136J(FB,B)/Tl=0.60J(B)
SB1A-2-1	119615	Al=9200/Sb=3.2UN/As=12.6/Ba=76.4/Be=0.68B/Cd=0.44B/ Ca=9040*/Cr=15.3/Co=14.6/Cu=34.6N*/Fe=27800/Pb=21.6/ Mg=4800/Mn=663N*/Ni=36.5/K=699B/Se=0.23UW/Na=52.5B/ Tl=0.55B/V=23.0/Zn=116 mg/kg	Sb=3.2UJ(N)/Be=0.68J(B)/Cd=0.44J(MB,B)/Cu=34.6J(N,*)/Mn=663J(N,*)/ K=699J(B)/Na=52.5J(FB,B)/Tl=0.55J(B)
SB1A-2-2	119616	Al=8260/Sb=3.2UN/As=4.5/Ba=56.1/Be=0.47B/Cd=0.74B/ Ca=110000*/Cr=15.9/Co=7.6B/Cu=20.7N*/Fe=16100/Pb=9.6/ Mg=17100/Mn=347N*/Ni=25.5/K=1690/Se=0.66BW/Na=105B/ Tl=0.31B/V=18.9/Zn=50.3 mg/kg	Sb=3.2UJ(N)/Be=0.47J(B)/Cd=0.74J(MB,B)/Co=7.6J(B)/Cu=20.7J(N,*)/Mn=347J(N,*)/ Se=0.66J(MB,B)/Na=105J(FB,B)/Tl=0.31J(B)
SOILS			
SB1-1-7	119620	Al=9530/Sb=3.3UN/As=8.0*/Ba=82.4/Be=0.44B/Cd=0.33B/ Ca=71000/Cr=17.3/Co=10.3B/Cu=23.6/Fe=20500/Pb=11.4/ Mg=17100/Mn=384/Ni=28.9/K=2100/Se=0.24UN/Na=155B/ Tl=0.35B/V=21.6/Zn=63.9 mg/kg	Sb=3.3UJ(N)/As=8J(*)/Be=0.44J(B)/Cd=0.33J(MB,B)/Co=10.3J(B)/Se=0.24UJ(N)/ Na=105J(BB,B)/Tl=0.35J(MB,B)
SB1-3-1	119622	Al=11500/Sb=3.5UN/As=8.3*/Ba=102/Be=0.61B/Cd=0.68B/ Ca=52100/Cr=18.3/Co=10.2B/Cu=25.5/Fe=24200/Pb=16.6/ Mg=13600/Mn=543/Ni=28.1/K=1460/Se=0.59BNW/Na=88.0B/ Tl=0.30B/V=26.2/Zn=87.5 mg/kg	Sb=3.5UJ(N)/As=8.3J(*)/Be=0.61J(B)/Cd=0.68J(MB,B)/Co=10.2J(B)/Se=0.59J(MB,N,B)/ Na=88J(BB,B)/Tl=0.30J(MB,B)
SB1-3-2	119623	Al=8940/Sb=3.2UN/As=9.7*/Ba=72.9/Be=0.44B/Cd=0.79B/ Ca=58000/Cr=14.8/Co=9.2B/Cu=19.6/Fe=17800/Pb=34.1/ Mg=14600/Mn=435/Ni=22.9/K=1100B/Se=0.23UN/Na=87.8B/ Tl=0.26B/V=20.9/Zn=58.7 mg/kg	Sb=3.2UJ(N)/As=9.7J(*)/Be=0.44J(B)/Cd=0.79J(MB,B)/Co=9.2J(B)/K=1100J(B)/ Se=0.23UJ(N)/Na=87.8J(BB,B)/Tl=0.26J(MB,B)
SB1-3-3	119624	Al=8650/Sb=3.3UN/As=3.9*/Ba=70.3/Be=0.48B/Cd=0.79B/ Ca=52200/Cr=14.8/Co=7.5B/Cu=23.1/Fe=18500/Pb=26.4/ Mg=13600/Mn=393/Ni=23.6/K=1090B/Se=0.23UN/Na=79.8B/ V=21.3/Zn=60.0 mg/kg	Sb=3.3UJ(N)/As=3.9J(*)/Be=0.48J(B)/Cd=0.79J(MB,B)/Co=7.5J(B)/Pb=26.4J(FR)/K=1090J(B)/ Se=0.23UJ(N)/Na=79.8J(BB,B)
SB1-3-3R	119625	Al=8170/Sb=3.4BN/As=5.7*/Ba=104/Be=0.47B/Cd=0.53B/ Ca=76500/Cr=15.4/Co=11.4B/Cu=23.1/Fe=19900/Pb=10.5/ Mg=16700/Mn=330/Ni=33.1/K=1760/Se=0.23UNW/Na=113B/ Tl=0.49B/V=18.8/Zn=62.9 mg/kg	Sb=3.4J(N,B)/As=5.7J(*)/Be=0.47J(B)/Cd=0.53J(MB,B)/Co=11.4J(B)/Pb=10.5J(FR)/ Se=0.23UJ(N)/Na=113J(BB,B)/Tl=0.49J(MB,B)
SB1A-2-3	119617	Al=11000/Sb=3.5UN/As=5.3*/Ba=112/Be=0.80B/Cd=0.50B/ Ca=4220/Cr=19.0/Co=7.4B/Cu=20.8/Fe=23300/Pb=11.9/ Mg=3850/Mn=301/Ni=29.9/K=977B/Se=0.21UNW/Na=54.0B/ V=24.6/Zn=74.5 mg/kg	Sb=3.5UJ(N)/As=5.3J(*)/Be=0.80J(B)/Cd=0.50J(MB,B)/Co=7.4J(B)/ Se=0.24UJ(N)/Na=54J(FB,B)
SB1A-3-1	119618	Al=4500/Sb=4.9BN/As=4.8*/Ba=44.2/Cd=0.51B/Ca=124000/ Cr=8.4/Co=4.6B/Cu=12.9/Fe=11100/Pb=9.3/Mg=51700/Mn=398/ Ni=14.4/K=690B/Se=0.22UN/Na=108B/V=15.7/Zn=36.8 mg/kg	Sb=4.9J(N,B)/As=4.8J(*)/Cd=0.51J(MB,B)/Co=4.6J(B)/K=690J(B)/ Se=0.22UJ(N)/Na=108J(FB,B)
SB1A-3-2	119626	Al=5010/Sb=5.2BN/As=7.0*/Ba=35.5B/Be=0.27B/Ca=96200/ Cr=9.5/Co=5.4B/Cu=20.6/Fe=12300/Pb=14.4/Mg=23000/ Mn=309/Ni=14.9/K=843B/Se=0.22UNW/Na=95.2B/Tl=0.26B/ V=14.5/Zn=55.8 mg/kg	Sb=5.2J(N,B)/As=7J(*)/Ba=35.5J(B)/Be=0.27J(B)/Co=5.4J(B)/K=843J(B)/ Se=0.22UJ(N)/Na=95.2J(BB,B)/Tl=0.26J(MB,B)
SB1A-3-3	119619	Al=9550/Sb=3.2UN/As=7.0*/Ba=67.4/Be=0.47B/Cd=0.23B/ Ca=70000/Cr=17.9/Co=6.1B/Cu=23.2/Fe=19200/Pb=10.7/ Mg=18000/Mn=325/Ni=25.5/K=2100/Se=0.23UNW/Na=156B/ V=22.0/Zn=62.0 mg/kg	Sb=3.2UJ(N)/As=7J(*)/Be=0.47J(B)/Cd=0.23J(MB,B)/Co=6.1J(B)/ Se=0.23UJ(N)/Na=156J(BB,B)
SB1A-3-5	119627	Al=9410/Sb=3.2UN/As=7.5*/Ba=83.2/Be=0.48B/Cd=1.3/ Ca=75500/Cr=17.1/Co=11.0B/Cu=23.1/Fe=20600/Pb=10.7/ Mg=17500/Mn=400/Ni=33.3/K=2100/Se=0.22UNW/Na=156B/ Tl=0.38B/V=21.6/Zn=61.6 mg/kg	Sb=3.2UJ(N)/As=7.5J(*)/Be=0.48J(B)/Cd=1.3J(MB)/Co=11J(B)/ Se=0.22UJ(N)/Na=156J(BB,B)/Tl=0.38J(MB,B)

Table F-19f. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Sampling Dates	Preparation Dates	Analysis Dates	Initial Calibration (ICV)	Continuing Calibration (CCV)	BLANKS: Initial Calibration Blank (ICB)	BLANKS: Continuing Calibration Blank (CCB)	BLANKS: Preparation Blank (PB)
WATERS									
P-8	120963	11/07/91	12/17&26/91	12/19-27/91	ALL ICV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	ALL CCV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	NO INTERFERENCE DETECTED IN THE INITIAL CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *ICB: Cd=-1.8B/Fe=18.7B/Na=-7.0B/ Tl=-1.4B µg/l	NO INTERFERENCE DETECTED IN THE CONTINUING CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *CCB1: Cd=-1.4B/Fe=23.0B/Na=-13.5B/ Tl=-1.2B µg/l *CCB2: Al=16.0B/Fe=25.1B/Na=-17.5B/ Tl=-1.4B µg/l *CCB3: Al=15.0B/Cd=-1.5B/Fe=36.5B/ Pb=-1.6B/Na=-21.4B µg/l	NO INTERFERENCE DETECTED IN THE PREPARATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *PBW: Al=28.7B/Cd=-1.8B/Cr=37.8B/ Fe=14.8B/Mg=30.5B/ Na=10.8B µg/l
EB2-1	120962	11/06/91	12/17&26/91	12/19-27/91					
FB2-1	120961	11/06/91	12/17&26/91	12/19-27/91					
MW2-01	120959	11/06/91	12/17&26/91	12/19-27/91					
MW2-01R	120960	11/06/91	12/17&26/91	12/19-27/91					
MW1-01	120958	11/06/91	12/17&26/91	12/19-27/91					
SOILS									
SB4-1-1	13115	10/30/91	11/14/91	11/20/91	ALL ICV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	ALL CCV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	NO INTERFERENCE DETECTED IN THE INITIAL CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *ICB1: Pb=-1.8B/Se=-1.1B/ Tl=-5.2B µg/l *ICB2: Pb=-2.2B µg/l *ICB3: As=-1.4B µg/l	NO INTERFERENCE DETECTED IN THE CONTINUING CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *CCB1: Pb=-1.5B/Se=-1.2B/ Tl=-5.1B µg/l *CCB2: Pb=-2.6B/Se=-1.1B/ Tl=-4.4B µg/l *CCB3: Pb=-2.5B/Se=-1.0B/ Tl=-3.9B µg/l *CCB4: Pb=-2.2B µg/l *CCB6: As=-1.6B µg/l *CCB7: As=-1.9B µg/l	NO INTERFERENCE DETECTED IN THE PREPARATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *PBS: Pb=-0.366B/Se=-0.233B/ Tl=-0.955B mg/kg
SB4-1-2	13116	10/30/91	11/14/91	11/20/91					
SB4-1-6	13117	10/30/91	11/14/91	11/20/91					
SB3-2-2	13181	10/31/91	11/14/91	11/20/91					
SB3-2-1	13182	10/31/91	11/14/91	11/20/91					
SB3-1-6	13183	10/31/91	11/14/91	11/20/91					
SB3-1-9	13184	10/31/91	11/14/91	11/20/91					
SB4-2-1	13185	10/31/91	11/14/91	11/20/91					
SB4-2-2	13186	10/31/91	11/14/91	11/20/91					
SB3-1-1	13114	10/30/91	11/14/91	11/20/91					
SOILS									
SB1A-1-5	120952	11/04/91	12/16&18/91	12/17-19/91	ALL ICV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110)	ALL CCV %Rs WITHIN CONTROL LIMITS (Hg=80-120, ALL OTHER METALS=90-110) EXCEPT: CCV4: As=3.9%, CCV5: Pb=77.7%, AND CCV9: Pb=118.9%	NO INTERFERENCE DETECTED IN THE INITIAL CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *ICB1: Tl=-1.4B µg/l *ICB3: Pb=-1.4B µg/l	NO INTERFERENCE DETECTED IN THE CONTINUING CALIBRATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *CCB1: Fe=4.1B/Pb=-1.1B/Mg=-14.1B/ Se=1.0B µg/l *CCB2: Fe=5.1B/Tl=-1.0B µg/l *CCB3: As=1.5B/Pb=-1.2B µg/l *CCB5: Tl=-1.5B µg/l *CCB8: As=-1.0B µg/l *CCB9: As=-2.0B µg/l *CCB10: As=-2.9B/Pb=-1.2B µg/l *CCB11: Pb=-1.4B µg/l	NO INTERFERENCE DETECTED IN THE PREPARATION BLANKS AT CONCENTRATION GREATER THAN THE CLP CRDL. *PBS: Al=25.406B/As=-0.250B/ Cr=10.356B/Fe=3.515B/ Pb=-0.240B/Mn=0.252B/ Na=3.970B/Tl=-0.290B mg/kg
SB1A-1-5R	120953	11/04/91	12/16&18/91	12/17-19/91					
SB1-2-5	120956	11/02/91	12/16&18/91	12/17-19/91					
SB1-2-5R	120957	11/02/91	12/16&18/91	12/17-19/91					
SB1A-3-4	120954	11/05/91	12/16&18/91	12/17-19/91					
SB1A-3-4R	120955	11/05/91	12/16&18/91	12/17-19/91					

Table F-19f. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	ICP/ICS Initial	ICP/ICS Final	ACCURACY Spike Sample	PRECISION Duplicate Sample	Laboratory Control Sample (LCS)	Field Blank Results	Equipment Blank Results
WATERS								
P-8	120963	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	MW1-01 ALL SPIKE SAMPLE RECOVERIES WITHIN CONTROL LIMITS (75-125%), EXCEPT: Sb=61.6% AND Se=57.0%	MW1-01 ALL RPDs WITHIN CONTROL LIMITS FOR SAMPLE AND DUPLICATE CONCENTRATIONS GREATER THAN 5X THE CRDL (≤ 35 %) AND WITHIN CONTROL LIMIT OF (±)2XCRDL FOR SAMPLE OR DUPLICATE CONCENTRATIONS LESS THAN 5X THE CRDL, EXCEPT: Al=26.9%	DATA NOT PROVIDED	FB2-1	EB2-1
EB2-1	120962						NA	NA
FB2-1	120961						NA	NA
MW2-01	120959						FB2-1	EB2-1
MW2-01R	120960			MW2-01R MERCURY SPIKE SAMPLE RECOVERY WITHIN CONTROL LIMITS (75-125%).	MW2-01R MERCURY ALL RPDs WITHIN CONTROL LIMITS FOR SAMPLE AND DUPLICATE CONCENTRATIONS		FB2-1	EB2-1
MW1-01	120958						FB2-1	EB2-1
SOILS								
SB4-1-1	13115	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	SB3-1-1 ALL SPIKE SAMPLE RECOVERIES WITHIN CONTROL LIMITS (75-125%), EXCEPT: Sb=37.4%, As=135.8%, Pb=-138.0%, Se=68.0%, AND Tl=59.6%	SB3-1-1 ALL RPDs WITHIN CONTROL LIMITS FOR SAMPLE AND DUPLICATE CONCENTRATIONS GREATER THAN 5X THE CRDL (≤ 35 %) AND WITHIN CONTROL LIMIT OF (±)2XCRDL FOR SAMPLE OR DUPLICATE CONCENTRATIONS LESS THAN 5X THE CRDL, EXCEPT: Pb=93.8%	DATA NOT PROVIDED	FB4-1	EB4-1
SB4-1-2	13116							
SB4-1-6	13117							
SB3-2-2	13181						FB4-1	EB4-1
SB3-2-1	13182						FB4-1	EB4-1
SB3-1-6	13183						FB4-1	EB4-1
SB3-1-9	13184						FB4-1	EB4-1
SB4-2-1	13185						FB4-1	EB4-1
SB4-2-2	13186						FB4-1	EB4-1
SB3-1-1	13114							
SOILS								
SB1A-1-5	120952	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	ALL %Rs WERE BETWEEN 80-120% FOR ALL ELEMENTS	SB1A-1-5 ALL SPIKE SAMPLE RECOVERIES WITHIN CONTROL LIMITS (75-125%), EXCEPT: Sb=39.1%, As=25.6%, AND Mn=34.6%	SB1A-1-5 ALL RPDs WITHIN CONTROL LIMITS FOR SAMPLE AND DUPLICATE CONCENTRATIONS GREATER THAN 5X THE CRDL (≤ 35 %) AND WITHIN CONTROL LIMIT OF (±)2XCRDL FOR SAMPLE OR DUPLICATE CONCENTRATIONS LESS THAN 5X THE CRDL, EXCEPT: As=56.0%.	DATA NOT PROVIDED	FB2-1	EB2-1
SB1A-1-5R	120953						FB2-1	EB2-1
SB1-2-5	120956						FB2-1	EB2-1
SB1-2-5R	120957						FB2-1	EB2-1
SB1A-3-4	120954						FB2-1	EB2-1
SB1A-3-4R	120955						FB2-1	EB2-1

Table F-19f. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Significant Sample Results	Data Validation Qualifiers
WATERS			
P-8	120963	Al=42800*/Sb=14.6BN/As=24.4/Ba=2320/Be=2.2B/Ca=419000/ Cr=71.8/Co=30.8B/Cu=75.7/Fe=65100/Pb=38.1/Mg=109000/ Mn=1360/Ni=84.6/K=28400/Se=1.0UNW/Ag=2.0UN/Na=18800/ V=112/Zn=212 µg/l	Al=42800J(*)/Sb=14.6J(N,B)/Be=2.2J(B)/Co=30.8J(B)/Hg=0.2UJ(HT)/Se=1UJ(N)/Ag=2UJ(N)
EB2-1	120962	Al=34.3B*/Sb=14.0UN/Ca=223B/Fe=37.7B/Mg=52.9B/Mn=1.3B/ Se=1.0UN/Ag=2.0UN/Na=77.2B µg/l	Al=34.3J(MB, B,*)/Sb=14UJ(N)/Ca=223J(MB,B)/Fe=37.7J(MB,B)/Mg=52.9J(MB,B)/ Mn=1.3J(B)/Hg=0.2UJ(HT)/Se=1UJ(N)/Ag=2UJ(N)/Na=77.2J(MB,B)
FB2-1	120961	Al=41.4B*/Sb=14.0UN/Ba=1.1B/Ca=249B/Fe=40.3B/Mg=66.5B/ Mn=1.1B/Se=1.0UN/Ag=2.0UN/Na=332B µg/l	Al=41.4J(MB, B,*)/Sb=14UJ(N)/Ba=1.1J(B)/Ca=249J(MB,B)/Fe=40.3J(MB,B)/Mg=66.5J(MB,B)/ Mn=1.1J(B)/Hg=0.2UJ(HT)/Se=1UJ(N)/Ag=2UJ(N)/Na=332J(B)
MW2-01	120959	Al=30600*/Sb=14.0UN/As=24.8/Ba=513/Be=1.8B/Ca=379000/ Cr=69.1/Co=27.9B/Cu=82.3/Fe=58700/Pb=43.4/Mg=118000/ Mn=1270/Ni=76.8/K=11700/Se=1.0UNW/Ag=2.0UN/Na=22200/ Tl=1.0UW/V=79.1/Zn=179 µg/l	Al=30600J(*)/Sb=14UJ(N)/Be=1.8J(B)/Co=27.9J(B)/Hg=0.2UJ(HT)/Se=1UJ(N)/Ag=2UJ(N)
MW2-01R	120960	Al=25700*/Sb=17.0BN/As=23.3/Ba=467/Be=1.5B/Ca=383000/ Cr=60.2/Co=24.9B/Cu=74.9/Fe=52500/Pb=39.0/Mg=119000/ Mn=1210/Ni=68.4/K=10100/Se=1.0UNW/Ag=2.0UN/Na=21800/ Tl=1.0UW/V=65.1/Zn=165 µg/l	Al=25700(*)/Sb=17J(N,B)/Be=1.5J(B)/Co=24.9J(B)/Hg=0.2UJ(HT)/Se=1UJ(N)/Ag=2UJ(N)
MW1-01	120958	Al=29400*/Sb=14.2BN/As=42.4/Ba=369/Be=1.8B/Ca=324000/ Cr=60.9/Co=25.4B/Cu=79.6/Fe=58000/Pb=49.0/Mg=86100/ Mn=1140/Ni=74.1/K=11400/Se=1.0UNW/Ag=2.0UN/Na=10400/ V=79.1/Zn=221 µg/l	Al=29400(*)/Sb=14.2J(N,B)/Be=1.8J(B)/Co=25.4J(B)/Hg=0.2UJ(HT)/Se=1UJ(N)/Ag=2UJ(N)
SOILS			
SB4-1-1	13115	As=3.60SN/Pb=12.10N*/Se=0.23UN/Tl=0.33UNW mg/kg	As=3.6J(N)/Pb=12.1R(N)/Se=0.23UJ(N)/Tl=0.33UJ(N)
SB4-1-2	13116	As=7.10N/Pb=10.30N*/Se=0.23UN/Tl=0.34UNW mg/kg	As=7.1J(N)/Pb=10.3R(N)/Se=0.23UJ(N)/Tl=0.34UJ(N)
SB4-1-6	13117	As=4.60N/Pb=10.50N*/Se=0.24UN/Tl=0.35UNW mg/kg	As=4.6J(N)/Pb=10.5R(N)/Se=0.24UJ(N)/Tl=0.35UJ(N)
SB3-2-2	13181	Sb=4.40UN/As=3.90SN/Be=0.81B/Cd=2.70/Cr=23.10/Cu=24.30/ Pb=3.60SN*/Ni=36.40/Se=0.25UN/Tl=0.35UNW/Zn=64.20 mg/kg	Sb=4.4UJ(N)/As=3.9J(N)/Be=0.81J(B)/Pb=3.6R(N)/Se=0.25UJ(N)/Tl=0.35UJ(N)
SB3-2-1	13182	Sb=4.10UN/As=4.80N/Be=0.58B/Cd=2.00/Cr=15.30/Cu=18.10/ Pb=13.50N*/Ni=21.90/Se=0.23UN/Tl=0.33UNW/Zn=61.40 mg/kg	Sb=4.1UJ(N)/As=4.8J(N)/Be=0.58J(B)/Cd=2J(FB)/Cu=18.1J(FB)/Pb=3.6R(N)/ Se=0.23UJ(N)/Tl=0.33UJ(N)
SB3-1-6	13183	Sb=4.00UN/As=5.10SN/Be=0.56B/Cd=2.00/Cr=18.30/Cu=23.90/ Pb=8.50N*/Ni=31.90/Se=0.23UN/Tl=0.33UNW/Zn=63.10 mg/kg	Sb=4UJ(N)/As=5.1J(N)/Be=0.56J(B)/Cd=2J(FB)/Pb=8.5R(N)/ Se=0.23UJ(N)/Tl=0.33UJ(N)
SB3-1-9	13184	Sb=3.90UN/As=5.90N/Be=0.24B/Cd=1.50/Cr=6.50/Cu=18.00/ Pb=5.80N*/Ni=14.70/Se=0.22UN/Tl=0.32UNW/Zn=47.30 mg/kg	Sb=3.9UJ(N)/As=5.9J(N)/Be=0.24J(B)/Cd=1.5J(FB)/Cu=18J(FB)/Pb=5.8R(N)/ Se=0.22UJ(N)/Tl=0.32UJ(N)
SB4-2-1	13185	As=6.50N/Pb=10.90N*/Se=0.22UN/Tl=0.32UNW mg/kg	As=6.5J(N)/Pb=10.9R(N)/Se=0.22UJ(N)/Tl=0.32UJ(N)
SB4-2-2	13186	As=6.30N/Pb=8.30N*/Se=0.23UN/Tl=0.34UNW mg/kg	As=6.3J(N)/Pb=8.3R(N)/Se=0.23UJ(N)/Tl=0.34UJ(N)
SB3-1-1	13114	Sb=3.80UN/As=12.80N/Be=0.34B/Cd=1.80/Cr=9.40/Cu=26.20/ Pb=11.30N*/Ni=24.10/Se=0.21UNW/Tl=0.31UNW/Zn=75.70 mg/kg	Sb=3.8UJ(N)/As=12.8J(N)/Be=0.34J(B)/Cd=1.8J(FB)/Pb=11.3R(N)/ Se=0.21UJ(N)/Tl=0.31UJ(N)
SOILS			
SB1A-1-5	120952	Al=11500/Sb=3.3UN/As=10.6N*/Ba=83.8/Be=0.60B/Ca=79200/ Cr=19.5/Co=10.0B/Cu=42.6/Fe=24500*/Pb=11.4/Mg=18000/ Mn=370N/Ni=30.4/K=2880/Na=156B/V=27.8/Zn=108* mg/kg	Sb=3.3UJ(N)/As=10.6R(N)/0.6J(B)/Co=10J(B)/Mn=370J(N)/Hg=0.12UJ(HT)/Na=156J(FB,B)
SB1A-1-5R	120953	Al=10900/Sb=3.2UN/As=9.0N*/Ba=92.2/Be=0.61B/Cd=0.34B/ Ca=78900/Cr=19.0/Co=12.2/Cu=25.0/Fe=24300*/Pb=10.8/ Mg=17700/Mn=420N/Ni=30.2/K=2760/Se=0.23UW/Na=146B/ Tl=0.24B/V=26.2/Zn=70.0* mg/kg	Sb=3.2UJ(N)/As=9R(N)/Be=0.61J(B)/Cd=0.34J(B)/Mn=420J(N)/Hg=0.11UJ(HT)/Na=146J(FB,B)/ Tl=0.24J(MB,B)
SB1-2-5	120956	Al=8850/Sb=3.3BN/As=7.8N*/Ba=78.5/Be=0.42B/Cd=0.45B/ Ca=79500/Cr=16.1/Co=9.7B/Cu=28.2/Fe=20000*/Pb=10.9/ Mg=17700/Mn=401N/Ni=29.3/K=2210/Na=169B/Tl=0.26B/ V=20.4/Zn=77.2* mg/kg	Sb=3.3UJ(N)/As=7.8R(N)/Be=0.42J(B)/Cd=0.45J(B)/Co=9.7J(B)/Mn=401J(N)/Hg=0.10UJ(HT)/ Na=169J(FB,B)/Tl=0.26J(MB,B)
SB1-2-5R	120957	Al=9520/Sb=3.3UN/As=6.7N*/Ba=79.8/Be=0.46B/Cd=0.73B/ Ca=88700/Cr=17.3/Co=9.9B/Cu=23.0/Fe=20500*/Pb=10.7/ Mg=18400/Mn=420N/Ni=30.6/K=2300/Na=165B/V=21.6/ Zn=67.7* mg/kg	Sb=3.3UJ(N)/As=6.7R(N)/Be=0.46J(B)/Cd=0.73J(B)/Co=9.9J(B)/Mn=420J(N)/Hg=0.11UJ(HT)/ Na=165J(FB,B)
SB1A-3-4	120954	Al=10400/Sb=3.3UN/As=5.7N*/Ba=88.0/Be=0.45B/Cd=0.71B/ Ca=83700/Cr=19.3/Co=10.0B/Cu=43.7/Fe=19900*/Pb=13.8/ Mg=18700/Mn=371N/Ni=30.4/K=2630/Se=0.42B/Na=165B/ Tl=1.1B/V=25.7/Zn=95.3* mg/kg	Sb=3.3UJ(N)/As=5.7R(N)/Be=0.45J(B)/Cd=0.71J(B)/Co=10J(B)/Mn=371J(N)/Hg=0.10UJ(HT)/ Se=0.42J(B)/Na=165J(FB,B)/Tl=1.1J(MB,B)
SB1A-3-4R	120955	Al=9830/Sb=3.2UN/As=11.8N*/Ba=93.3/Be=0.54B/Cd=0.46B/ Ca=81400/Cr=17.4/Co=11.2B/Cu=24.0/Fe=24700*/Pb=11.9/ Mg=17800/Mn=487N/Ni=27.9/K=2330/Se=0.24UW/Na=165B/ V=23.6/Zn=67.2* mg/kg	Sb=3.2UJ(N)/As=11.8R(N)/Be=0.54J(B)/Cd=0.46J(B)/Co=11.2J(B)/Mn=487J(N)/Hg=0.10UJ(HT)/ Na=165J(FB,B)

Footnotes to Tables F–19a through F–19f. Priority Pollutant Metals Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana

CLP holding time for metals is 6 months, except Hg, which will be analyzed 28 days from sample collection.
Control limits for initial calibrations:
Percent recoveries (%R) must be greater than 90.0% and less than 110.0% for all metals except mercury (80–120 %R).
Control limits for continuing calibrations:
Percent recoveries (%R) must be greater than 90.0% and less than 110.0% for all metals exept mercury (80–120 %R)
Control limits for ICP interference check sample (ICS) are 80–120 percent recoveries for all elements.
Blank spike control limits are 80–120 percent recovery.
Spike sample control limits are 75–125% for all elements for analytes.
RPD control limits must not exceed 20 percent for water sample and 35 percent for soil sample.
Laboratory control sample (LCS) control limits are 80–120 percent recovery.
* – Duplicate analysis outside control limits.
E – Concentration was estimated due to the presence of interferents.
B – Concentration is greater than or equal to the instrument detection limit (IDL), but less than the contract required detection limit (CRDL).
N – Spiked sample recovery outside control limits.
S – The reported value was determined by the method of standard additions (MSA).
U – Analyte was analyzed but not detected.
M – Duplicate injection precision not met.
W – Post–digestion spike for furnace AA analysis is outside control limits (85–115%), while sampling absorbance is less than 50% of spike absorbance.
+ – Correlation coefficient for MSA is less than 0.995.

Continuing Calibration Verification -- At a frequency of 10 percent and every 2 hours, a CCV standard was analyzed. Following the standard analysis, percent recovery values were calculated for each element to ensure calibration accuracy during each analysis run. Priority pollutant metals CCV criteria requirements included 80 to 120 percent for mercury and 90 to 110 percent for all other elements, as specified by the DOE/HWP-65/R1. Based on an evaluation of the initial calibrations conducted, all percent recovery values were within control limits.

Method Blanks -- One method blank analysis was conducted with each batch of environmental samples analyzed for priority pollutant metals. Each method blank was evaluated for interferents that might potentially interfere with accurate quantitation of a target element. According to CLP criteria, a laboratory blank may not contain any target element concentration greater than the CRDL. Based on an evaluation of all method blanks (i.e., initial calibration blanks [ICBs], continuing calibration blanks [CCBs], and preparation blanks [PBs]) analyzed by the NET Laboratory, no interferents were detected in concentrations greater than the absolute CRDL value. However, numerous interferents were detected at concentrations greater than the IDL and less than the CRDL in many laboratory method blanks. All elements detected in the laboratory method blanks are presented in Table F-19. Data validation qualifiers (i.e., "J[MB]") were applied to all elements detected in the environmental samples in concentrations less than five times that detected in an associated laboratory method blank. All results are presented in Tables F-19 and in the data presentation tables located in Appendix E.

Interference Check Sample (ICS) Analysis -- To verify ICAP interelement and background correction factors, one ICS was analyzed at the beginning and end of each sample analysis run, or twice per 8-hour work period, whichever was more frequent. Each element in the ICS solution AB must be recovered within 20 percent of the true concentration of that element in the ICS solution AB. ICS criteria requirements are described in the SOW prepared for the Indiana ANGB SI. Based on an evaluation of the interference check sample analyses conducted for priority pollutant metals in soil and groundwater, all recovery criteria were within control limits.

Spiked Sample Analysis -- Spiked sample analyses were conducted to assess the accuracy of the laboratory and to evaluate the matrix effect of the sample upon the analytical methodology based upon the percent recovery of each element. Accuracy was expressed as the percent recovery of the spiked compounds. The control limits for percent recoveries in soil and water samples were described in the DOE/HWP-65/R1. Spiked samples were evaluated to verify that 1 spiked sample analysis was conducted for each 20 environmental samples received by the laboratory (excluding dilutions and reanalyses conducted), that these analyses were conducted on environmental samples only, and that the recovery results did not indicate systematic laboratory control problems. Tables F-20 and F-21 summarizes the matrix spike results for soil and groundwater samples.

Six spiked sample analyses (i.e., SB4-01-02, SB4-05-02, BG2-1-1, SB1A-3-3, SB3-1-1, and SB1A-1-5) were conducted using soil samples collected during the Indiana ANGB SI. All percent recoveries were within the control limits, except antimony (0 percent) and arsenic (131 percent) in SB4-01-02; antimony (0 percent) and arsenic (165.4 percent) in SB4-05-02; antimony (42.8 percent), copper (51.6 percent), manganese (305.6 percent), and lead (39.5 percent) in BG2-1-1; antimony (59.4 percent) and selenium (59.6 percent) in SB1A-3-3; antimony (37.4 percent), arsenic (135.8 percent), lead (-138 percent), selenium (68 percent), and thallium (59.6 percent) in SB3-1-1; antimony (39.1 percent), arsenic (25.6 percent), and manganese (34.6 percent) in SB1A-1-5.

Antimony, arsenic, and lead in selected soil samples have been rejected (i.e., all undetected and detected results were presented in the data presentation tables as "R[N]") to indicate that the percent recoveries in the associated spike sample analyses were less than 30 percent. Antimony, copper, lead, manganese, selenium, and thallium results in selected samples have been estimated (i.e., all undetected results and detected values were presented in the data presentation tables as "UJ[N]" and "J[N]", respectively) to indicate that the percent recoveries in the associated spike sample analyses were less than 75 percent, but greater than 30 percent. Arsenic and manganese results in selected samples have been estimated (i.e., all detected results were presented in the data presentation tables as "J[N]") to indicate that the percent recoveries

TABLE F-20. PRIORITY POLLUANT METALS MATRIX SPIKE AND LABORATORY DUPLICATE QC SUMMARY: GROUNDWATER
INDIANA ANGB FORT WAYNE, INDIANA

	ACCURACY					PRECISION				
PARAMETER	MATRIX SPIKE TOTAL No. ANALYSES	PERCENT RECOVERY RANGES	%R CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS	LAB. DUPLICATE TOTAL No. ANALYSES	RANGE RPD	RPD LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
Aluminum	2	[(-30)-45.7)	(75-125)	2	0	2	(4.5-26.9)	20	1	1
Antimony	4	(61.6-93.9)	(75-125)	3	1	4	(NC-67.3)	20	4	0
Arsenic	3	(88.1-104.1)	(75-125)	3	0	3	(0.6-14.5)	20	3	0
Barium	2	(85.4-88.2)	(75-125)	2	0	2	(0.3-1.9)	20	2	0
Beryllium	4	(87.5-105)	(75-125)	4	0	4	(7.3-19.8)	20	4	0
Cadmium	4	([illegible]-100)	(75-125)	4	0	4	(NC-42.2)	20	4	0
Calcium	NR			NR	NR	2	(0.1-2.8)	20	2	0
Chromium	4	(80.6-107)	(75-125)	4	0	4	(3.1-200)	20	4	0
Cobalt	2	(81.9-88.6)	(75-125)	4	0	2	(3.4-6)	20	2	0
Copper	4	(86.1-95.2)	(75-125)	4	0	4	(2-58.8)	20	4	0
Iron	2	(52.8-192.5)	(75-125)	2	0	2	(1.7-5)	20	2	0
Lead	5	(93-107.2)	(75-125)	4	0	5	(0.7-18.4)	20	5	0
Magnesium	NR			NR	NR	2	(0.3-1.2)	20	2	0
Manganese	2	(90.9-91.1)	(75-125)	2	0	2	(0.3-0.6)	20	2	0
Mercury	3	(91.6-115)	(75-125)	3	0	3	NC	20	3	0
Nickel	4	(82.4-98.8)	(75-125)	4	0	4	(4.2-7.6)	20	4	0
Potassium	NR			NR	NR	2	(1.6-23.9)	20	2	0
Selenium	3	(43.5-104.6)	(75-125)	1	2	3	(NC-200)	20	3	0
Silver	4	(74.9-92)	(75-125)	4	0	4	NC	20	4	0
Sodium	NR			NR	NR	2	(0.7-0.9)	20	2	0
Thallium	4	(83.1-115.9)	(75-125)	4	0	4	NC	20	4	0
Vanadium	2	(82.4-90.1)	(75-125)	2	0	2	(7.1-32.2)	20	2	0
Zinc	4	(84.1-92.8)	(75-125)	4	0	4	(3.2-41.9)	20	4	0

MATRIX SPIKE AND DUPLICATE ANALYSES PERFORMED ON SAMPLES: MW4-02 [14358] (LEAD ONLY), MW4-02, MW1-02 [119630], MW1-02 (ARSENIC, LEAD, AND SELENIUM), MW1-01, MW2-01R (MERCURY ONLY) AND MW2-01.

NC-NOT CALCULABLE (SAMPLE AND DUPLICATE RESULTS NON-DETECTED).
NR-ANALYSIS NOT REQUIRED

TABLE F-21. PRIORITY POLLUANT METALS MATRIX SPIKE AND LABORATORY DUPLICATE QC SUMMARY: SOIL/SEDIMENT
INDIANA ANGB FORT WAYNE, INDIANA

	ACCURACY					PRECISION				
PARAMETER	MATRIX SPIKE TOTAL No. ANALYSES	PERCENT RECOVERY RANGES	%R CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS	LAB. DUPLICATE TOTAL No. ANALYSES	RANGE RPD	RPD LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
Aluminum	NR			NR	NR	3	(0.3–49.6)	35	3	0
Antimony	6	(0–59.4)	(75–125)	0	6	6	(14.5–37.6)	35	6	0
Arsenic	6	(25.6–165.4)	(75–125)	2	4	6	(2–52.2)	35	5	1
Barium	3	(92–104)	(75–125)	3	0	3	(0.0–45)	35	3	0
Beryllium	6	(90.8–104.2)	(75–125)	6	0	6	(0.5–20.9)	35	6	0
Cadmium	6	(85–108.7)	(75–125)	6	0	6	(4.4–84.7)	35	6	0
Calcium	NR			NR	NR	3	(0.2–200)	35	3	0
Chromium	6	(84.7–103.9)	(75–125)	6	0	6	(0.2–89.6)	35	6	0
Cobalt	3	(87.1–101.5)	(75–125)	3	0	3	(0.1–200)	35	3	0
Copper	6	(51.6–112.5)	(75–125)	5	1	6	(1.1–88.9)	35	5	1
Iron	NR			NR	NR	3	(0.4–30.6)	35	3	0
Lead	7	[(−138)–315.8)]	(75–125)	6	1	7	(1.2–93.8)	35	5	2
Magnesium	NR			NR	NR	3	(1.8–57.8)	35	3	0
Manganese	3	(34.6–305.9)	(75–125)	1	2	3	(0.1–90.1)	35	2	1
Mercury	6	(91.4–124.1)	(75–125)	6	0	6	NC	35	6	0
Nickel	6	(81.9–100.7)	(75–125)	6	0	6	(0.1–200)	35	6	0
Potassium	NR			NR	NR	3	(1.3–95.2)	35	3	0
Selenium	6	(59.6–93)	(75–125)	4	2	6	(0–1.1)	35	6	0
Silver	6	(81.2–102)	(75–125)	6	0	6	(0–11.5)	35	6	0
Sodium	NR			NR	NR	3	(0.4–71.1)	35	3	0
Thalium	6	(59.6–104.7)	(75–125)	5	1	6	NC	35	6	0
Vanadium	3	(86.2–100.9)	(75–125)	3	0	3	(1–31.3)	35	3	0
Zinc	6	(82.4–97.9)	(75–125)	6	0	6	(0.7–133.5)	35	6	0

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE PERFORMED ON SAMPLES SB4-01-02, SB4-05-02, SED-2 (LEAD ONLY), BG2-1-1, SB1A-3-3, SB3-1-1, AND SB1A-1-5.
NC–NOT CALCULABLE (SAMPLE AND DUPLICATE RESULTS NON-DETECTED).
NR – ANALYSIS NOT REQUIRED

for spike sample analyses were greater than 125 percent. These results are presented in Tables F-20 and F-21 and in the data presentation tables located in Appendix E.

One matrix spike analysis (i.e., SED-2 [lead only]) was conducted using the sediment sample collected at the Indiana ANGB. All recoveries were within the control limits.

Seven matrix spike analyses (i.e., MW1-02, MW2-01, MW4-02, MW4-02 [14358] [lead only], MW1-02 [119630], MW1-01, and MW2-01R [mercury only]) were conducted using the groundwater samples collected at the Indiana ANGB. All recoveries were within the control limits, except selenium (43.5 percent) in MW1-02 (119630); antimony (61.6 percent) and selenium (57 percent) in MW1-01. Antimony and selenium in selected samples have been estimated (i.e., all undetected and detected values were presented in the data presentation tables as "UJ[N]" and "J[N]", respectively) to indicate that the percent recoveries in the associated spike sample analyses were less than 75 percent, but greater than 30 percent. These results are presented in Tables F-20 and F-21 and in the data presentation tables located in Appendix E.

Duplicate Sample Analyses -- Duplicate samples were analyzed and the RPD value of each detected element was calculated. A control limit of 35 percent RPD in soil samples and a control limit of 20 percent RPD in water samples were used for original and duplicate sample values greater or equal to 5 times the CRDL. A control limit of plus or minus 2 times the CRDL in soil samples and plus or minus the CRDL in water samples were used for original samples or duplicate values less than 5 times the CRDL. Duplicate samples were evaluated to verify that 1 duplicate sample analysis was conducted for each 20 environmental samples received by the laboratory (excluding dilutions and reanalyses conducted), that these analyses were conducted on environmental samples only, and that the difference results did not indicate systematic laboratory control problems. Precision was expressed as the RPD of the concentrations of the elements detected in the duplicate samples. Duplicate soil and groundwater sample results are summarized in Tables F-20 and F-21.

Six duplicate sample analyses (i.e., SB4-01-02, SB4-05-02, BG2-1-1, SB1A-3-3, SB3-1-1, and SB1A-1-5) were conducted using soil samples collected during the Indiana ANGB

SI. All criteria were within the control limits, except copper (88.9 percent) and manganese (67.3 percent) in BG2-1-1, arsenic (52.2 percent) in SB1A-3-3, lead (93.8 percent) in SB3-1-1; and arsenic (56 percent) in SB1A-1-5. As a result, data validation qualifiers (i.e., presented as "J[*]") were applied to the copper, manganese, lead, and arsenic in selected samples associated with these duplicate samples. These results are presented in Tables F-20 and F-21 and in the data presentation tables located in Appendix E.

One duplicate sample analysis (i.e., SED-2 [lead only]) was conducted using the sediment samples collected at the Indiana ANGB. One lead RPD value was outside the control limits (35.6 percent), and as a result, data validation qualifiers were applied to all associated sample results.

Seven duplicate sample analyses (i.e., MW1-02, MW2-01, MW4-02, MW4-02 [14358], MW1-02 [119630], MW1-01, MW2-01R [mercury only]) were conducted using groundwater samples collected at the Indiana ANGB. All RPD values were within the control limits.

Laboratory Check Sample (LCS) Analysis -- One LCS analysis was conducted with each batch of soil and groundwater samples analyzed by the NET Laboratory, as required by DOE/HWP-65/R1. The recovery results of each LCS analyzed were evaluated against a 80 to 120 percent control limit for all elements. Based on an evaluation of the LCS analyses conducted, all acceptance criteria were met.

Significant Qualified Sample Results -- Data validation qualifiers have been applied to selected environmental sample results to indicate that these results were considered estimated due to holding time, method blank interference, matrix spike recoveries, duplicate sample RPD values, and detection limit considerations (i.e., values reported at concentrations less than the CRDL but greater than the instrument detection limit [IDL] and qualified by the laboratory ["B"]). These qualifiers were applied to all data presented in the data summary tables within the SI report text and in the comprehensive data presentation tables in Appendix E, in addition to the data validation worksheets previously cited.

F.3.3.2 Total Petroleum Hydrocarbon (TPH) Analysis (EPA Method 3550/418.1) and Oil and Grease

Seventy soil samples, 2 sediment samples, 12 groundwater samples, and 13 field QC (i.e., field blank and equipment blank) were collected during the Indiana ANGB SI and were analyzed for TPH analysis by NET Laboratory using EPA Method 3550/418.1. Two groundwater samples (i.e., MW2-01 and MW2-01R), 5 soil samples (i.e., SB3-1-1, SB3-2-2, SB3-2-1, SB3-1-6, and SB3-1-9), and 4 field QC blanks (i.e., EB3-1, EB2-1, FB2-1, and FB4-1) were analyzed for oil and grease using EPA Method 3550/413.1. Eight soil samples, 4 groundwater samples, and 2 field QC (i.e., EB4-1 and FB4-1) were collected and analyzed for TPH as diesel and motor oil. Data quality was evaluated using the guidelines and control limit specified for holding times, instrument calibration, method blank, laboratory control sample, and MS/MSDs. The TPH (as diesel and motor oil) data was evaluated for holding time only. A presentation of the significant qualified sample results follows the laboratory QC results discussion. The data validation worksheets are presented in Tables F-22.

Holding Times -- The NET Laboratory was required to meet a 28-day holding time for water and soil samples collected for TPH, oil and grease, and TPH as diesel and motor oil. Based on evaluation of all environmental samples and field QC blanks extracted and analyzed for TPH, oil and grease, and TPH as diesel and motor oil all holding time criteria were met, except in FB-1 (3 days), FB-2 (3 days), EW-1 (3 days), EW-3 (2 days), SB2-01-01 (8 days), SB4-01-01 (1 day), SB4-01-02 (1 day), SB4-02-01 (3 days), SB4-02-02 (1 day), SB4-03-01 (3 days), SB4-03-02 (1 day), SB4-04-04 (1 day), SB4-04-02 (1 day), SB4-05-01 (3 days), SB4-05-02 (1 day), SD4-01 (2 days), and SD4-02 (2 days). The TPH results for the samples listed above were estimated to indicate the exceeded holding time (i.e., all undetected value will be presented in the comprehensive data tables as "UJ[HT]") and all detected value will be presented in the comprehensive data tables as "J[HT]").

Instrument Calibration -- Calibration of the infrared spectrophotometer was established by injecting a blank and five standards to ensure that the instrument is capable of producing acceptable quantitative data. The NET Laboratory was required by DOE/HWP-65/R1 to conduct an initial calibration every 12 hours and to ensure that the correlation coefficient for the

Table F-22a. Total Petroleum Hydrocarbons Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Holding Time	Laboratory Control Sample(LCS)	ACCURACY Spike Sample	PRECISION Duplicate Sample	Blank Analysis	Date 5-Point Calibration	Correlation Coefficient
WATERS											
METHOD BLANK	MB183	NA	09/24/90	09/28/90	NA	[MBS 183] ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (80-120%)	DATA NOT PROVIDED	DATA NOT PROVIDED	NO INTERFERENCE DETECTED	09/28/90	0.9984
FB-1	90021708	08/28/90	09/24/90	09/28/90	31 DAYS					09/28/90	0.9984
FB-2	90021709	08/28/90	09/24/90	09/28/90	31 DAYS					09/28/90	0.9984
EW-1	90021710	08/28/90	09/24/90	09/28/90	31 DAYS					09/28/90	0.9984
EW-3	90021808	08/29/90	09/24/90	09/28/90	30 DAYS					09/28/90	0.9984
EW-5	90022401	08/31/90	09/24/90	09/28/90	28 DAYS					09/28/90	0.9984
FB-3	90023606	09/11/90	09/24/90	09/28/90	17 DAYS					09/28/90	0.9984
MW4-2	90023901	09/12/90	09/24/90	09/28/90	17 DAYS					09/28/90	0.9984
METHOD BLANK	MB213	NA	10/09/90	10/12/90	NA	[MBS 213] ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (80-120%)	DATA NOT PROVIDED	DATA NOT PROVIDED	NO INTERFERENCE DETECTED	10/12/90	0.9994
P-2	90024801	09/13/90	10/09/90	10/12/90	29 DAYS					10/12/90	0.9994
EW-07	90024901	09/14/90	10/09/90	10/12/90	28 DAYS					10/12/90	0.9994
MW2-01	90024902	09/14/90	10/09/90	10/12/90	28 DAYS					10/12/90	0.9994
MW1-02	90025101	09/14/90	10/09/90	10/12/90	28 DAYS					10/12/90	0.9994
MW1-01	90025102	09/15/90	10/09/90	10/12/90	27 DAYS					10/12/90	0.9994
EW-08	90025103	09/15/90	10/09/90	10/12/90	27 DAYS					10/12/90	0.9994
EW-09	90025104	09/16/90	10/09/90	10/12/90	26 DAYS					10/12/90	0.9994
P-8	90025105	09/16/90	10/09/90	10/12/90	26 DAYS					10/12/90	0.9994
HT-01	90025106	09/16/90	10/09/90	10/12/90	26 DAYS					10/12/90	0.9994
SOILS											
METHOD BLANK	MB179	NA	09/20/90	09/25/90	NA	[MBS 179] ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (75-125%)	[SB2-01-19] RECOVERY VALUE WITHIN LIMITS (75-125%).	[SB2-01-19] RECOVERY VALUE (75-125%) AND RPD VALUE ($\leq$ 35) WITHIN CONTROL LIMITS	NO INTERFERENCE DETECTED	09/25/90	0.9996
SB1-01-12	90021701	08/27/90	09/20/90	09/25/90	29 DAYS					09/25/90	0.9996
SB1-01-11	90021702	08/27/90	09/20/90	09/25/90	29 DAYS					09/25/90	0.9996
SB1-03-02	90021703	08/28/90	09/20/90	09/25/90	28 DAYS					09/25/90	0.9996
SB1-03-05	90021704	08/28/90	09/20/90	09/25/90	28 DAYS					09/25/90	0.9996
SB1-03-18	90021705	08/28/90	09/20/90	09/25/90	28 DAYS					09/25/90	0.9996
SB-B-01	90021706	08/28/90	09/20/90	09/25/90	28 DAYS					09/25/90	0.9996
SB-B-02	90021707	08/28/90	09/20/90	09/25/90	28 DAYS					09/25/90	0.9996
SB1-02-03	90021801	08/29/90	09/20/90	09/25/90	27 DAYS					09/25/90	0.9996
SB1-02-03R	90021802	08/29/90	09/20/90	09/25/90	27 DAYS					09/25/90	0.9996
SB1-02-16	90021803	08/29/90	09/20/90	09/25/90	27 DAYS					09/25/90	0.9996
SB2-01-01	90021804	08/29/90	09/20/90	10/04/90	36 DAYS					10/04/90	0.9996
SB2-01-19	90021806	08/29/90	09/20/90	09/25/90	27 DAYS					09/25/90	0.9996
SB2-01-19 MS	90021806 MS	08/29/90	09/20/90	09/25/90	27 DAYS					09/25/90	0.9996
SB2-01-19 MSD	90021806 MSD	08/29/90	09/20/90	09/25/90	27 DAYS					09/25/90	0.9996
SOILS											
METHOD BLANK	MB191	NA	09/25/90	09/30/90	NA	[MBS 191] ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (75-125%)	(SEE SB2-01-19)	(SEE SB2-01-19)	NO INTERFERENCE DETECTED	09/30/90	0.9984
SB2-02-01	90022301	08/30/90	09/25/90	09/28/90	29 DAYS					09/28/90	0.9984
SB2-03-01	90022302	08/30/90	09/25/90	09/30/90	31 DAYS					09/30/90	0.9984
SB2-04-01	90022303	08/30/90	09/25/90	09/30/90	31 DAYS					09/30/90	0.9984
SB4-01-01	90022304	08/30/90	09/25/90	09/28/90	29 DAYS					09/28/90	0.9984
SB4-01-02	90022305	08/30/90	09/25/90	09/28/90	29 DAYS					09/28/90	0.9984
SB4-02-01	90022306	08/30/90	09/25/90	09/30/90	31 DAYS					09/30/90	0.9984
SB4-02-02	90022307	08/30/90	09/25/90	09/28/90	29 DAYS					09/28/90	0.9984
SB4-03-01	90022308	08/30/90	09/25/90	09/30/90	31 DAYS					09/30/90	0.9984
SB4-03-02	90022309	08/30/90	09/25/90	09/28/90	29 DAYS					09/28/90	0.9984
SB4-04-01	90022310	08/30/90	09/25/90	09/28/90	29 DAYS					09/28/90	0.9984
SB4-04-02	90022311	08/30/90	09/25/90	09/28/90	29 DAYS					09/28/90	0.9984
SB4-05-01	90022312	08/30/90	09/25/90	09/30/90	31 DAYS					09/30/90	0.9984
SB4-05-02	90022313	08/30/90	09/25/90	09/28/90	29 DAYS					09/28/90	0.9984
SOILS											
METHOD BLANK	MB193	NA	09/28/90	09/30/90	NA	[MBS 193] ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (75-125%)	(SEE SB2-01-19)	(SEE SB2-01-19)	NO INTERFERENCE DETECTED	09/30/90	0.9984
SD4-01	90022402	08/31/90	09/28/90	09/30/90	30 DAYS					09/30/90	0.9984
SD4-02	90022403	08/31/90	09/28/90	09/30/90	30 DAYS					09/30/90	0.9984
SB1-04-01	90023601	09/08/90	09/28/90	09/30/90	22 DAYS					09/30/90	0.9984
SB1-04-02	90023602	09/08/90	09/28/90	09/30/90	22 DAYS					09/30/90	0.9984
SB1-04-03	90023603	09/08/90	09/28/90	09/30/90	22 DAYS					09/30/90	0.9984
SB1-04-04	90023604	09/08/90	09/28/90	09/30/90	22 DAYS					09/30/90	0.9984

Table F-22a. Total Petroleum Hydrocarbons Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Post-run Calibration Check Point	Field Blank Analysis	Equipment Blank Analysis	Significant Sample Results	Data Validation Qualifiers
WATERS						
METHOD BLANK	MB183	2.2%	NA	NA	None Detected	
FB-1	90021708	2.2%	NA	NA	None Detected	1UJ(HT)
FB-2	90021709	2.2%	NA	NA	None Detected	1UJ(HT)
EW-1	90021710	2.2%	NA	NA	None Detected	1UJ(HT)
EW-3	90021808	2.2%	NA	NA	None Detected	1UJ(HT)
EW-5	90022401	2.2%	NA	NA	None Detected	None Applied
FB-3	90023606	2.2%	NA	NA	None Detected	None Applied
MW4-2	90023901	2.2%	FB-3	EW-5	None Detected	None Applied
METHOD BLANK	MB213	8.6%	NA	NA	None Detected	
P-2	90024801	8.6%	FB-03	EW-06	None Detected	1UJ(HT)
EW-07	90024901	8.6%	NA	NA	None Detected	None Applied
MW2-01	90024902	8.6%	FB-03	EW-07	None Detected	None Applied
MW1-02	90025101	8.6%	FB-03	EW-08,-09	None Detected	None Applied
MW1-01	90025102	8.6%	FB-03	EW-08,-09	None Detected	None Applied
EW-08	90025103	8.6%	NA	NA	None Detected	None Applied
EW-09	90025104	8.6%	NA	NA	None Detected	None Applied
P-8	90025105	8.6%	FB-03	EW-08,-09	None Detected	None Applied
HT-01	90025106	8.6%	FB-03	EW-08,-09	None Detected	None Applied
SOILS						
METHOD BLANK	MB179	0%	NA	NA	None Detected	
SB1-01-12	90021701	0%	FB-01,-02	EW-01.-02	None Detected	10UJ(HT)
SB1-01-11	90021702	0%	FB-01,-02	EW-01.-02	None Detected	10UJ(HT)
SB1-03-02	90021703	0%	FB-01,-02	EW-01.-02	None Detected	None Applied
SB1-03-05	90021704	0%	FB-01,-02	EW-01.-02	None Detected	None Applied
SB1-03-18	90021705	0%	FB-01,-02	EW-01.-02	None Detected	None Applied
SB-B-01	90021706	0%	FB-01,-02	EW-01.-02	670 mg/kg	None Applied
SB-B-02	90021707	0%	FB-01,-02	EW-01.-02	None Detected	None Applied
SB1-02-03	90021801	0%	FB-01,-02	EW-03	650 mg/kg	None Applied
SB1-02-03R	90021802	0%	FB-01,-02	EW-03	None Detected	None Applied
SB1-02-16	90021803	0%	FB-01,-02	EW-03	None Detected	None Applied
SB2-01-01	90021804	0%	FB-01,-02	EW-03	5900 mg/kg	5900J(HT)
SB2-01-19	90021806	0%	FB-01,-02	EW-03	None Detected	None Applied
SB2-01-19 MS	90021806 MS	0%	FB-01,-02	EW-03	Not Applicable	None Applied
SB2-01-19 MSD	90021806 MSD	0%	FB-01,-02	EW-03	Not Applicable	None Applied
SOILS						
METHOD BLANK	MB191	2.2%	NA	NA	None Detected	
SB2-02-01	90022301	2.2%	FB-01,-02	EW-04	None Detected	10UJ(HT)
SB2-03-01	90022302	2.2%	FB-01,-02	EW-04	1500 mg/kg	1500J(HT)
SB2-04-01	90022303	2.2%	FB-01,-02	EW-04	3000 mg/kg	3000J(HT)
SB4-01-01	90022304	2.2%	FB-01,-02	EW-04	None Detected	10UJ(HT)
SB4-01-02	90022305	2.2%	FB-01,-02	EW-04	None Detected	10UJ(HT)
SB4-02-01	90022306	2.2%	FB-01,-02	EW-04	1500 mg/kg	1500J(HT)
SB4-02-02	90022307	2.2%	FB-01,-02	EW-04	None Detected	10UJ(HT)
SB4-03-01	90022308	2.2%	FB-01,-02	EW-04	520 mg/kg	520J(HT)
SB4-03-02	90022309	2.2%	FB-01,-02	EW-04	None Detected	10UJ(HT)
SB4-04-01	90022310	2.2%	FB-01,-02	EW-04	None Detected	10UJ(HT)
SB4-04-02	90022311	2.2%	FB-01,-02	EW-04	None Detected	10UJ(HT)
SB4-05-01	90022312	2.2%	FB-01,-02	EW-04	180 mg/kg	180J(HT)
SB4-05-02	90022313	2.2%	FB-01,-02	EW-04	64 mg/kg	64J(HT)
SOILS						
METHOD BLANK	MB193	Not Applicable	NA	NA	None Detected	
SD4-01	90022402	Not Applicable	FB-01,-02	EW-05	1400 mg/kg	1400J(HT)
SD4-02	90022403	Not Applicable	FB-01,-02	EW-05	880 mg/kg	880J(HT)
SB1-04-01	90023601	Not Applicable	FB-03	EW-06	2400 mg/kg	None Applied
SB1-04-02	90023602	Not Applicable	FB-03	EW-06	1500 mg/kg	None Applied
SB1-04-03	90023603	Not Applicable	FB-03	EW-06	1400 mg/kg	None Applied
SB1-04-04	90023604	Not Applicable	FB-03	EW-06	1100 mg/kg	None Applied

Table F-22b. Total Petroleum Hydrocarbons Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Holding Time	Laboratory Control Sample(LCS)	ACCURACY Spike Sample	PRECISION Duplicate Sample	Blank Analysis	Date 5-Point Calibration	Correlation Coefficient
WATERS											
METHOD BLANK	MB741	NA	11/11/91	11/11/91	NA	LCS 741 ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (80-120%)	DATA NOT PROVIDED	DATA NOT PROVIDED	NO INTERFERENCE DETECTED	11/11/91	0.9986
EB3-1	13179	10/31/91	11/11/91	11/11/91	11 DAYS					11/11/91	
FB1-1	13299	11/04/91	11/11/91	11/11/91	7 DAYS					11/11/91	
EB1-1	14265	11/05/91	11/11/91	11/11/91	6 DAYS					11/11/91	
EB1A-1	14266	11/05/91	11/11/91	11/11/91	6 DAYS					11/11/91	
MW1-02	14267	11/05/91	11/11/91	11/11/91	6 DAYS					11/11/91	
MW1-01	14354	11/06/91	11/11/91	11/11/91	5 DAYS					11/11/91	
MW2-01	14355	11/06/91	11/11/91	11/11/91	5 DAYS					11/11/91	
MW2-01R	14356	11/06/91	11/11/91	11/11/91	5 DAYS					11/11/91	
FB2-1	14360	11/06/91	11/11/91	11/11/91	5 DAYS					11/11/91	
EB2-1	14361	11/06/91	11/11/91	11/11/91	5 DAYS					11/11/91	
WATERS											
METHOD BLANK	MB766	NA	11/26/91	11/26/91	NA	LCS 766a ALL PERCENT RECOVERIES WITHIN CONTROL LIMITS (80-120%)	DATA NOT PROVIDED	DATA NOT PROVIDED	NO INTERFERENCE DETECTED	11/26/91	0.9982
P-8	14398	11/07/91	11/26/91	11/26/91	19 DAYS					11/26/91	
SOILS											
METHOD BLANK	MB736	NA	11/11/91	11/11/91	NA	LCS 736 PERCENT RECOVERY (73%) BELOW CONTROL LIMITS (75-125%)	BG2-1-1 RECOVERY VALUE (68%) OUTSIDE LIMITS (75-125%).	BG2-1-1 RECOVERY VALUE (71%) OUTSIDE LIMITS (75-125%), BUT RPD VALUE WITHIN CONTROL LIMIT (≤ 35).	NO INTERFERENCE DETECTED	11/11/91	0.9986
SB3-1-1	13114	10/30/91	11/11/91	11/11/91	12 DAYS					11/11/91	
SB3-1-1RE	13114RE	10/30/91	11/18/91	11/21/91	22 DAYS					11/21/91	0.9997
SB3-2-2	13173	10/31/91	11/11/91	11/11/91	11 DAYS					11/11/91	
SB3-2-1	13174	10/31/91	11/11/91	11/11/91	11 DAYS					11/11/91	
SB3-1-6	13175	10/31/91	11/11/91	11/11/91	11 DAYS					11/11/91	
SB3-1-9	13176	10/31/91	11/11/91	11/11/91	11 DAYS					11/11/91	
SB1-1-1	13188	11/01/91	11/11/91	11/11/91	10 DAYS					11/11/91	
SB1-1-2	13189	11/01/91	11/11/91	11/11/91	10 DAYS					11/11/91	
SB1-1-3	13190	11/01/91	11/11/91	11/11/91	10 DAYS					11/11/91	
BG1-1-1	13278	11/03/91	11/11/91	11/11/91	8 DAYS					11/11/91	
BG1-1-2	13279	11/03/91	11/11/91	11/11/91	8 DAYS					11/11/91	
BG1-1-3	13280	11/03/91	11/11/91	11/11/91	8 DAYS					11/11/91	
BG1-1-4	13281	11/03/91	11/11/91	11/11/91	8 DAYS					11/11/91	
BG2-1-1	13282	11/03/91	11/11/91	11/11/91	8 DAYS					11/11/91	
BG2-1-2	13283	11/03/91	11/11/91	11/11/91	8 DAYS					11/11/91	
BG2-1-3	13284	11/03/91	11/11/91	11/11/91	8 DAYS					11/11/91	
SB1-2-1	13285	11/02/91	11/11/91	11/11/91	9 DAYS					11/11/91	
SB1-2-2	13286	11/02/91	11/11/91	11/11/91	9 DAYS					11/11/91	
SB1-2-3	13287	11/02/91	11/11/91	11/11/91	9 DAYS					11/11/91	
SB1-2-7	13288	11/02/91	11/11/91	11/11/91	9 DAYS					11/11/91	
SB1-1-7	13289	11/02/91	11/11/91	11/11/91	9 DAYS					11/11/91	
BG2-1-1 MS	13282 MS	11/03/91	11/11/91	11/11/91	8 DAYS					11/11/91	
BG2-1-1 MSD	13282 MSD	11/03/91	11/11/91	11/11/91	8 DAYS					11/11/91	
SOILS											
METHOD BLANK	MB748	NA	11/18/91	11/21/91	NA	LCS 748 PERCENT RECOVERY WITHIN CONTROL LIMITS (75-125%)	SB1A-2-2 RECOVERY VALUE WITHIN LIMITS (75-125%).	SB1A-2-2 RECOVERY VALUE (75-125%) AND RPD VALUE (≤ 35) WITHIN CONTROL LIMITS	NO INTERFERENCE DETECTED	11/21/91	0.9997
SB1A-1-1	13290	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-1-2	13291	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-1-3	13292	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-1-5	13293	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-2-1	13294	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-2-2	13295	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-2-3	13296	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-3-1	13297	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-3-3	13298	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1-3-1	14259	11/05/91	11/18/91	11/21/91	16 DAYS					11/21/91	
SB1-3-2	14260	11/05/91	11/18/91	11/21/91	16 DAYS					11/21/91	
SB1-3-3	14261	11/05/91	11/18/91	11/21/91	16 DAYS					11/21/91	
SB1-3-3R	14262	11/05/91	11/18/91	11/21/91	16 DAYS					11/21/91	
SB1A-3-2	14263	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-3-5	14264	11/05/91	11/18/91	11/21/91	16 DAYS					11/21/91	
SB1A-1-5	14348	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-1-5R	14349	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-3-4	14350	11/05/91	11/18/91	11/21/91	16 DAYS					11/21/91	
SB1A-2-2 MS	13295 MS	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	
SB1A-2-2 MSD	13295 MSD	11/04/91	11/18/91	11/21/91	17 DAYS					11/21/91	

Table F-22b. Total Petroleum Hydrocarbons Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Post-run Calibration Check Point	Field Blank Analysis	Equipment Blank Analysis	Significant Sample Results	Data Validation Qualifiers
WATERS						
METHOD BLANK	MB741	3.57%	NA	NA	None Detected	
EB3-1	13179	3.57%	NA	NA	None Detected	None Applied
FB1-1	13299	3.57%	NA	NA	None Detected	None Applied
EB1-1	14265	3.57%	NA	NA	None Detected	None Applied
EB1A-1	14266	3.57%	NA	NA	None Detected	None Applied
MW1-02	14267	3.57%	FB1-1	EB1A-1,1-1	None Detected	None Applied
MW1-01	14354	3.57%	FB2-1	EB2-1	None Detected	None Applied
MW2-01	14355	3.57%	FB2-1	EB2-1	None Detected	None Applied
MW2-01R	14356	3.57%	FB2-1	EB2-1	None Detected	None Applied
FB2-1	14360	3.57%	NA	NA	None Detected	None Applied
EB2-1	14361	3.57%	NA	NA	None Detected	None Applied
WATERS						
METHOD BLANK	MB766	2.2%	NA	NA	None Detected	
P-8	14398	2.2%	FB2-1	EB2-1	1 mg/l	None Applied
SOILS						
METHOD BLANK	MB736	3.57%	NA	NA	None Detected	
SB3-1-1	13114	3.57%	FB4-1	EB3-1	Too Concentrated to Analyze	None Applied
SB3-1-1RE	13114RE	3.57%	FB4-1	EB3-1	7700 mg/kg	None Applied
SB3-2-2	13173	3.57%	FB4-1	EB3-1	None Detected	None Applied
SB3-2-1	13174	3.57%	FB4-1	EB3-1	98 mg/kg	None Applied
SB3-1-6	13175	3.57%	FB4-1	EB3-1	None Detected	None Applied
SB3-1-9	13176	3.57%	FB4-1	EB3-1	None Detected	None Applied
SB1-1-1	13188	3.57%	FB4-1	EB4-1	None Detected	None Applied
SB1-1-2	13189	3.57%	FB4-1	EB4-1	None Detected	None Applied
SB1-1-3	13190	3.57%	FB4-1	EB4-1	None Detected	None Applied
BG1-1-1	13278	3.57%	FB1-1	EB4-1	220 mg/kg	None Applied
BG1-1-2	13279	3.57%	FB1-1	EB4-1	100 mg/kg	None Applied
BG1-1-3	13280	3.57%	FB1-1	EB4-1	None Detected	None Applied
BG1-1-4	13281	3.57%	FB1-1	EB4-1	None Detected	None Applied
BG2-1-1	13282	3.57%	FB1-1	EB4-1	None Detected	None Applied
BG2-1-2	13283	3.57%	FB1-1	EB4-1	None Detected	None Applied
BG2-1-3	13284	3.57%	FB1-1	EB4-1	None Detected	None Applied
SB1-2-1	13285	3.57%	FB1-1	EB4-1	None Detected	None Applied
SB1-2-2	13286	3.57%	FB1-1	EB4-1	None Detected	None Applied
SB1-2-3	13287	3.57%	FB1-1	EB4-1	None Detected	None Applied
SB1-2-7	13288	3.57%	FB1-1	EB4-1	None Detected	None Applied
SB1-1-7	13289	3.57%	FB1-1	EB4-1	None Detected	None Applied
BG2-1-1 MS	13282 MS	3.57%	FB1-1	EB4-1	Not Applicable	None Applied
BG2-1-1 MSD	13282 MSD	3.57%	FB1-1	EB4-1	Not Applicable	None Applied
SOILS						
METHOD BLANK	MB748	2%	NA	NA	None Detected	
SB1A-1-1	13290	2%	FB1-1	EB4-1	None Detected	None Applied
SB1A-1-2	13291	2%	FB1-1	EB4-1	None Detected	None Applied
SB1A-1-3	13292	2%	FB1-1	EB4-1	None Detected	None Applied
SB1A-1-5	13293	2%	FB1-1	EB4-1	None Detected	None Applied
SB1A-2-1	13294	2%	FB1-1	EB4-1	None Detected	None Applied
SB1A-2-2	13295	2%	FB1-1	EB4-1	None Detected	None Applied
SB1A-2-3	13296	2%	FB1-1	EB4-1	None Detected	None Applied
SB1A-3-1	13297	2%	FB1-1	EB4-1	None Detected	None Applied
SB1A-3-3	13298	2%	FB1-1	EB4-1	None Detected	None Applied
SB1-3-1	14259	2%	FB1-1	EB1A-1,1-1	None Detected	None Applied
SB1-3-2	14260	2%	FB1-1	EB1A-1,1-1	200 mg/kg	None Applied
SB1-3-3	14261	2%	FB1-1	EB1A-1,1-1	None Detected	None Applied
SB1-3-3R	14262	2%	FB1-1	EB1A-1,1-1	None Detected	None Applied
SB1A-3-2	14263	2%	FB1-1	EB1A-1,1-1	1900 mg/kg	None Applied
SB1A-3-5	14264	2%	FB1-1	EB1A-1,1-1	None Detected	None Applied
SB1A-1-5	14348	2%	FB2-1	EB2-1	None Detected	None Applied
SB1A-1-5R	14349	2%	FB2-1	EB2-1	None Detected	None Applied
SB1A-3-4	14350	2%	FB2-1	EB2-1	None Detected	None Applied
SB1A-2-2 MS	13295 MS	2%	FB1-1	EB4-1	Not Applicable	None Applied
SB1A-2-2 MSD	13295 MSD	2%	FB1-1	EB4-1	Not Applicable	None Applied

Table F-22c. Total Petroleum Hydrocarbons Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Holding Time	Laboratory Control Sample(LCS)	ACCURACY: Spike Sample	PRECISION: Duplicate Sample	Blank Analysis	Date 5-Point Calibration	Correlation Coefficient
SOILS											
METHOD BLANK	MB749	NA	11/22/91	11/26/91	NA	LCS 749 PERCENT RECOVERY WITHIN CONTROL LIMITS (75-125%)	SB1A-3-4R RECOVERY VALUE WITHIN LIMITS (75-125%).	SB1A-3-4R RECOVERY VALUE (75-125%) AND RPD VALUE (≤ 35) WITHIN CONTROL LIMITS	NO INTERFERENCE DETECTED	11/26/91	0.9982
SB1A-3-4R	14351	11/05/91	11/22/91	11/26/91	21 DAYS					11/26/91	
SB1-2-5	14352	11/02/91	11/22/91	11/26/91	24 DAYS					11/26/91	
SB1-2-5R	14353	11/02/91	11/22/91	11/26/91	24 DAYS					11/26/91	
SB1A-3-4R MS	14351 MS	11/05/91	11/22/91	11/26/91	21 DAYS					11/26/91	
SB1A-3-4R MSD	14351 MSD	11/05/91	11/22/91	11/26/91	21 DAYS					11/26/91	
WATERS (Oil & Grease)											
METHOD BLANK	MB766	NA	11/26/91	11/26/91	NA	LCS 766 PERCENT RECOVERY WITHIN CONTROL LIMITS (80-120%)	DATA NOT PROVIDED	DATA NOT PROVIDED	NO INTERFERENCE DETECTED	11/26/91	0.9982
EB3-1	13187	10/31/91	11/26/91	11/26/91	26 DAYS					11/26/91	
FB4-1	13204	11/01/91	11/26/91	11/26/91	25 DAYS					11/26/91	
MW2-01	14355	11/06/91	11/26/91	11/26/91	20 DAYS					11/26/91	
MW2-01R	14356	11/06/91	11/26/91	11/26/91	20 DAYS					11/26/91	
FB2-1	14360	11/06/91	11/26/91	11/26/91	20 DAYS					11/26/91	
EB2-1	14361	11/06/91	11/26/91	11/26/91	20 DAYS					11/26/91	
SOILS (Oil & Grease)											
METHOD BLANK	MB767	NA	11/26/91	11/26/91	NA	LCS 767 PERCENT RECOVERY WITHIN CONTROL LIMITS (75-125%)	SB3-2-1 RECOVERY VALUE WITHIN LIMITS (75-125%).	SB3-2-1 RECOVERY VALUE (75-125%) AND RPD VALUE (≤ 35) WITHIN CONTROL LIMITS	NO INTERFERENCE DETECTED	11/26/91	0.9982
SB3-1-1	13114	10/30/91	11/26/91	11/26/91	27 DAYS					11/26/91	
SB3-2-2	13181	10/31/91	11/26/91	11/26/91	26 DAYS					11/26/91	
SB3-2-1	13182	10/31/91	11/26/91	11/26/91	26 DAYS					11/26/91	
SB3-1-6	13183	10/31/91	11/26/91	11/26/91	26 DAYS					11/26/91	
SB3-1-9	13184	10/31/91	11/26/91	11/26/91	26 DAYS					11/26/91	
SB3-2-1 MS	13182 MS	10/31/91	11/26/91	11/26/91	26 DAYS					11/26/91	
SB3-2-1 MSD	13182 MSD	10/31/91	11/26/91	11/26/91	26 DAYS					11/26/91	
SOILS & WATERS											
SB4-1-1 (M 5030)	13115	10/30/91	Not Provided	11/12/91	13 DAYS	DATA NOT PROVIDED	ALL RECOVERY VALUES WITHIN LIMITS FOR WATERS (80-120%), AND SOILS (75-125%) EXCEPT: WATERS: %R1 [for Diesel] (69%) AND %R3 [for Diesel] (69%); AND SOILS: %R1 [for Diesel] (787%)	ALL RECOVERY VALUES WITHIN LIMITS FOR WATERS (80-120%), AND SOILS (75-125%) AND RPD VALUES (≤ 35) EXCEPT: WATERS: %R1 [for Diesel] (74%) AND %R3 [for Diesel] (74%); AND SOILS %R2 [for Diesel] (63%)	NO INTERFERENCE DETECTED	Not Provided	Not Provided
SB4-1-1 (M 3550)	13115	10/30/91	11/10/91	11/17/91	18 DAYS					Not Provided	
SB4-1-2 (M 5030)	13116	10/30/91	Not Provided	11/12/91	13 DAYS					Not Provided	
SB4-1-2 (M 3550)	13116	10/30/91	11/10/91	11/17/91	18 DAYS					Not Provided	
SB4-1-6 (M 5030)	13117	10/30/91	Not Provided	11/12/91	13 DAYS					Not Provided	
SB4-1-6 (M 3550)	13117	10/30/91	11/10/91	11/17/91	18 DAYS					Not Provided	
SB4-2-1 (M 5030)	13185	10/31/91	Not Provided	11/12/91	12 DAYS					Not Provided	
SB4-2-1 (M 3550)	13185	10/31/91	11/10/91	11/17/91	17 DAYS					Not Provided	
SB4-2-2 (M 5030)	13186	10/31/91	Not Provided	11/12/91	12 DAYS					Not Provided	
SB4-2-2 (M 3550)	13186	10/31/91	11/10/91	11/17/91	17 DAYS					Not Provided	
FB4-1 (M 5030)	13195	11/01/91	Not Provided	11/13/91	12 DAYS					Not Provided	
TB11-1-91 (M 5030)	13196	11/01/91	Not Provided	11/13/91	12 DAYS					Not Provided	
SB4-3-1 (M 5030)	13200	11/01/91	Not Provided	11/14/91	13 DAYS					Not Provided	
SB4-3-1 (M 3550)	13200	11/01/91	11/07/91	11/17/91	16 DAYS					Not Provided	
SB4-3-2 (M 5030)	13201	11/01/91	Not Provided	11/22/91	21 DAYS					Not Provided	
SB4-3-2 (M 3550)	13201	11/01/91	11/07/91	11/17/91	16 DAYS					Not Provided	
SB4-3-4 (M 5030)	13202	11/01/91	Not Provided	11/14/91	13 DAYS					Not Provided	
SB4-3-4 (M 3550)	13202	11/01/91	11/07/91	11/17/91	16 DAYS					Not Provided	
EB4-1 (M 3510)	13203	11/01/91	11/14/91	11/17/91	16 DAYS					Not Provided	
FB4-. (M 3510)	13204	11/01/91	11/14/91	11/17/91	16 DAYS					Not Provided	
MW4-01 (M 5030)	14357	11/06/91	Not Provided	11/13/91	7 DAYS					Not Provided	
MW4-01 (M 3510)	14357	11/06/91	11/14/91	11/17/91	11 DAYS					Not Provided	
MW4-02 (M 5030)	14358	11/06/91	Not Provided	11/13/91	7 DAYS					Not Provided	
MW4-02 (M 3510)	14358	11/06/91	11/14/91	11/17/91	11 DAYS					Not Provided	
MW4-02R (M 5030)	14359	11/06/91	Not Provided	11/13/91	/DAYS					Not Provided	
MW4-02R (M 3510)	14359	11/06/91	11/14/91	11/17/91	11 DAYS					Not Provided	
SED-1 (M 3550)	14395	11/07/91	11/15/91	11/17/91	10 DAYS					Not Provided	
SED-2 (M 3550)	14396	11/07/91	11/15/91	11/17/91	10 DAYS					Not Provided	
P-1 (M 3510)	14397	11/07/91	11/14/91	11/17/91	10 DAYS					Not Provided	

Table F-22c. Total Petroleum Hydrocarbons Data Validation Worksheets
Indiana Air National Guard Base, Fort Wayne, Indiana (Continued)

SAIC Sample Number	Laboratory Identification Number	Post-run Calibration Check Point	Field Blank Analysis	Equipment Blank Analysis	Significant Sample Results	Data Validation Qualifiers
SOILS						
METHOD BLANK	MB749	2.17%	NA	NA	None Detected	
SB1A-3-4R	14351	2.17%	FB2-1	EB2-1	None Detected	None Applied
SB1-2-5	14352	2.17%	FB2-1	EB2-1	21 mg/kg	None Applied
SB1-2-5R	14353	2.17%	FB2-1	EB2-1	None Detected	None Applied
SB1A-3-4R MS	14351 MS	2.17%	FB2-1	EB2-1	Not Applicable	None Applied
SB1A-3-4R MSD	14351 MSD	2.17%	FB2-1	EB2-1	Not Applicable	None Applied
WATERS (Oil & Grease)						
METHOD BLANK	MB766	2.2%	NA	NA	None Detected	
EB3-1	13187	2.2%	NA	NA	None Detected	None Applied
FB4-1	13204	2.2%	NA	NA	None Detected	None Applied
MW2-01	14355	2.2%	FB2-1	EB2-1	None Detected	None Applied
MW2-01R	14356	2.2%	FB2-1	EB2-1	3 mg/l	None Applied
FB2-1	14360	2.2%	NA	NA	None Detected	None Applied
EB2-1	14361	2.2%	NA	NA	None Detected	None Applied
SOILS (Oil & Grease)						
METHOD BLANK	MB767	2.17%	NA	NA	None Detected	
SB3-1-1	13114	2.17%	FB4-1	EB3-1	7300 mg/kg	None Applied
SB3-2-2	13181	2.17%	FB4-1	EB3-1	None Detected	None Applied
SB3-2-1	13182	2.17%	FB4-1	EB3-1	None Detected	None Applied
SB3-1-6	13183	2.17%	FB4-1	EB3-1	None Detected	None Applied
SB3-1-9	13184	2.17%	FB4-1	EB3-1	None Detected	None Applied
SB3-2-1 MS	13182 MS	2.17%	FB4-1	EB3-1	Not Applicable	None Applied
SB3-2-1 MSD	13182 MSD	2.17%	FB4-1	EB3-1	Not Applicable	None Applied
SOILS & WATERS						
SB4-1-1 (M 5030)	13115	No data provided	FB4-1	EB3-1	as Gasoline: None Detected	None Applied
SB4-1-1 (M 3550)	13115	No data provided	FB4-1	EB3-1	as Diesel: 4.9 mg/kg as Motor Oil: 11 mg/kg	None Applied
SB4-1-2 (M 5030)	13116	No data provided	FB4-1	EB3-1	as Gasoline: None Detected	None Applied
SB4-1-2 (M 3550)	13116	No data provided	FB4-1	EB3-1	as Diesel: None Detected as Motor Oil: None Detected	None Applied
SB4-1-6 (M 5030)	13117	No data provided	FB4-1	EB3-1	as Gasoline: None Detected	None Applied
SB4-1-6 (M 3550)	13117	No data provided	FB4-1	EB3-1	as Diesel: 98 mg/kg as Motor Oil: 150 mg/kg	None Applied
SB4-2-1 (M 5030)	13185	No data provided	FB4-1	EB3-1	as Gasoline: None Detected	None Applied
SB4-2-1 (M 3550)	13185	No data provided	FB4-1	EB3-1	as Diesel: 12 mg/kg as Motor Oil: 40 mg/kg	None Applied
SB4-2-2 (M 5030)	13186	No data provided	FB4-1	EB3-1	as Gasoline: None Detected	None Applied
SB4-2-2 (M 3550)	13186	No data provided	FB4-1	EB3-1	as Diesel: None Detected as Motor Oil: None Detected	None Applied
FB4-1 (M 5030)	13195	No data provided	NA	NA	as Gasoline: None Detected	None Applied
TB11-1-91 (M 5030)	13196	No data provided	NA	NA	as Gasoline: None Detected	None Applied
SB4-3-1 (M 5030)	13200	No data provided	FB4-1	EB4-1	as Gasoline: None Detected	None Applied
SB4-3-1 (M 3550)	13200	No data provided	FB4-1	EB4-1	as Diesel: None Detected as Motor Oil: None Detected	None Applied
SB4-3-2 (M 5030)	13201	No data provided	FB4-1	EB4-1	as Gasoline: None Detected	None Applied
SB4-3-2 (M 3550)	13201	No data provided	FB4-1	EB4-1	as Diesel: None Detected as Motor Oil: None Detected	None Applied
SB4-3-4 (M 5030)	13202	No data provided	FB4-1	EB4-1	as Gasoline: None Detected	None Applied
SB4-3-4 (M 3550)	13202	No data provided	FB4-1	EB4-1	as Diesel: 16 mg/kg as Motor Oil: 27 mg/kg	None Applied
EB4-1 (M 3510)	13203	No data provided	NA	NA	as Diesel: None Detected as Motor Oil: None Detected	None Applied
FB4-1 (M 3510)	13204	No data provided	NA	NA	as Diesel: None Detected as Motor Oil: None Detected	None Applied
MW4-01 (M 5030)	14357	No data provided	FB2-1	EB2-1	as Gasoline: None Detected	None Applied
MW4-01 (M 3510)	14357	No data provided	FB2-1	EB2-1	as Diesel: None Detected as Motor Oil: None Detected	None Applied
MW4-02 (M 5030)	14358	No data provided	FB2-1	EB2-1	as Gasoline: None Detected	None Applied
MW4-02 (M 3510)	14358	No data provided	FB2-1	EB2-1	as Diesel: None Detected as Motor Oil: None Detected	None Applied
MW4-02R (M 5030)	14359	No data provided	FB2-1	EB2-1	as Gasoline: None Detected	None Applied
MW4-02R (M 3510)	14359	No data provided	FB2-1	EB2-1	as Diesel: None Detected as Motor Oil: None Detected	None Applied
SED-1 (M 3550)	14395	No data provided	FB2-1	EB2-1	as Diesel: None Detected as Motor Oil: 17 mg/kg	None Applied
SED-2 (M 3550)	14396	No data provided	FB2-1	EB2-1	as Diesel: None Detected as Motor Oil: 17 mg/kg	None Applied
P-1 (M 3510)	14397	No data provided	FB2-1	EB2-1	as Diesel: 0.52 mg/l as Motor Oil: None Detected	None Applied

Footnotes to Tables F−22a through F−22c. Total Petroleum Hydrocarbons Data Validation Worksheets Indiana Air National Guard Base, Fort Wayne, Indiana
Holding time for both soils and waters is 28 days. Control Limits for LCS Analyses %R: 80−120 Control Limits for Water TPH MS/MSD Analyses R%: 75−125, %RPD= 20 Control Limits for Soil TPH MS/MSD Analyses R%: 75−125, %RPD= 35

calibration curve were greater than 0.995. Based on an evaluation of instrument calibration requirements all initial calibration criteria were met.

Method Blank Results -- One method blank was extracted and analyzed with each batch of samples collected during the Indiana ANGB SI for TPH and oil and grease. Based on evaluation of all method blanks analyzed, no interferents were detected.

Laboratory Control Sample Analysis -- One LCS was conducted with each batch of soil and groundwater samples analyzed by the NET Laboratory, as required by the DOE/HWP-65/R1. The recovery results of each LCS analyzed with the groundwater and soil samples were evaluated against an 80 to 120 percent control limit. Based on an evaluation of all LCS analyses conducted, the percent recoveries of all LCS values were within acceptable limits.

Matrix Spike/Matrix Spike Duplicate Results -- MS/MSD analyses were conducted to assess the accuracy and precision of the laboratory and to evaluate the matrix effect of the sample upon the analytical methodology based upon the percent recovery of the spike compounds. Precision was expressed as the RPD of the concentrations of the spike compounds in the MS/MSD samples. One MS/MSD analysis was required for each set of the 20 samples of the similar matrix, excluding dilutions and re-analyses conducted.

Five MS/MSD analyses were conducted using soil sample (i.e., SB2-01-19 [TPH], BG2-1-1 [TPH], SB1A-2-2 [TPH], SB1A-3-4R [TPH], and SB3-2-1 [oil and grease]. All recoveries were within the control limits, except for TPH (68 and 71 percent) in BG 2-1-1. NO data validation qualifiers have been applied, since TPH was not detected in the original samples. All differences were within the control limits. Tables F-23 summarized the MS/MSD results for soil samples. No MS/MSD analysis was performed for water samples.

Significant Sample Results -- TPH, oil and grease, and TPH as diesel and motor oil results in all samples are presented in the data summary tables, in the data presentation tables located in Appendix E, and in Tables F-22. Data validation qualifiers have been applied to

TABLE F-23. TPH AND OIL AND GREASE MATRIX SPIKE AND MATRIX SPIKE DUPLICATE QC SUMMARY: SOIL/SEDIMENT
WRIGHT PATTERSON AIR FORCE BASE, FAIRBORN, OHIO

	ACCURACY					PRECISION				
PARAMETER	MATRIX SPIKE TOTAL No. ANALYSES	PERCENT RECOVERY RANGES	%R CONTROL LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS	MSD TOTAL No. ANALYSES	RANGE RPD	RPD LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
TPH	8	(68-102)	(75-125)	6	2	4	(1-9.5)	35	4	0
OIL AND GREASE	2	(92-95)	(75-125)	1	0	1	4	35	1	0

MATRX SPIKE AND LABORATORY DUPLICATE PERFORMED ON SAMPLES SB2-01-19, BG2-1-1, SB1A-2-2, SB1A-3-4R, AND SB3-2-1.

selected sample results to indicate that these results were considered estimated due to holding time violation.

F.3.3.3. Total Dissolved Solids (TDS) Analyses Results

Five groundwater samples and 3 field QC blanks (i.e., field blanks and equipment blank) were collected and during the Indiana ANGB SI and were analyzed for TDS by the NET Laboratory using the EPA Method 160.1. Data quality was evaluated using the guidelines and control limits for holding times, method blank, and duplicate sample analysis. The data validation worksheets are presented in Tables F-24.

Holding Times--Holding times were defined as the maximum amount of time allowed to elapse between the date and time of sample collection and date and time the sample was analyzed. The NET Laboratory was required by the SOW prepared for the Indiana ANGB, Fort Wayne SI to meet the holding time of 7 days for water samples. Based on an evaluation of the environmental samples and field QC blanks analyzed for TDS, all holding time criteria were met.

Method Blanks--One method blanks analysis was conducted with each batch of environmental samples and field QC blanks analyzed for TDS. Each method blanks was evaluated for interferents that might potentially interfere with accurate quantitation of a target element. Based on an evaluation of method blanks analyzed by the NET Laboratory TDS was detected in MB171 (11 mg/L) and MB200 (20 mg/L). As a result the concentration of EW-08 (i.e., 50J[MB) associated with MB200 was qualified (i.e., "J[MB]") to indicate that the TDS reported was considered estimated, since the concentration reported did not exceed 10 times that reported in the method blank.

Duplicate Analysis -- One duplicate analysis was analyzed and the RPD value was calculated. Precision was express as the RPD of detected compound. The control limits for RPD were described in DOE/HWP-65/R1. Duplicate sample was evaluated to verify that 1 duplicate sample analysis was conducted on environmental samples only and that the difference

TABLE F-24. TOTAL DISSOLVED SOLIDS DATA VALIDATION WORKSHEETS
INDIANA AIR NATIONAL GUARD BASE, FORT WAYNE, INDIANA

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Analyzed	Holding Time	Laboratory Precision Duplicate Sample Analysis	Blank Analysis
WATER						
MB171	MB171	NA	08/30/90	NA	$\boxed{\text{MW1-01}}$ RPD VALUE WITHIN LIMITS (≤ 20%)	INTERFERENCE DETECTED
MB200	MB200	NA	09/18/90	NA		
FB-01	90021708	08/27/90	08/30/90	7 DAYS		
FB-02	90021709	08/27/90	08/30/90	7 DAYS		
EW-08	90025103	09/15/90	09/18/90	3 DAYS		
MW4-02	90023901	09/12/90	09/18/90	6 DAYS		
P-2	90024801	09/13/90	09/18/90	5 DAYS		
MW2-01	90024902	09/14/90	09/18/90	4 DAYS		
MW1-02	90025101	09/14/90	09/18/90	4 DAYS		
MW1-01	90025102	09/15/90	09/18/90	3 DAYS		
MW1-01 DUP	90025102 DUP	09/15/90	09/18/90	3 DAYS		
P-8	90025105	09/16/90	09/18/90	2 DAYS		

TABLE F-24. TOTAL DISSOLVED SOLIDS DATA VALIDATION WORKSHEETS
INDIANA AIR NATIONAL GUARD BASE, FORT WAYNE, INDIANA (CONTINUED)

SAIC Sample Number	Laboratory Identification Number	Field Blank Analysis	Equipment Blank Analysis	Significant Sample Results	Data Validation Qualifiers
WATER					
MB171	MB171	NA	NA	11 mg/L	
MB200	MB200	NA	NA	20 mg/L	
FB-01	90021708	NA	NA	230 mg/L	None Applied
FB-02	90021709	NA	NA	150 mg/L	None Applied
EW-08	90025103	NA	NA	50 mg/L	50J(MB)
MW4-02	90023901	FB-01,-02	EW-08	620 mg/L	620J(FB)
P-2	90024801	FB-01,-02	EW-08	610 mg/L	610J(FB)
MW2-01	90024902	FB-01,-02	EW-08	560 mg/L	560J(FB)
MW1-02	90025101	FB-01,-02	EW-08	700 mg/L	700J(FB)
MW1-01	90025102	FB-01,-02	EW-08	530 mg/L	530J(FB)
MW1-01 DUP	90025102 DUP	FB-01,-02	EW-08	520 mg/L	None Applied
P-8	90025105	FB-01,-02	EW-08	540 mg/L	540J(FB)

FOOTNOTES TO TABLE F–24. TOTAL DISSOLVED SOLIDS DATA VALIDATION WORKSHEETS
INDIANA AIR NATIONAL GUARD BASE, FORT WAYNE, INDIANA

Holding time for water sample is 7 days.

Control Limits for Water TDS Laboratory Duplicate Analysis
%RPD: $\leq$ 20% .

results did not indicate systematic laboratory control problems. Duplicate sample result is presented in Table F-25.

One duplicate analysis (i.e., MW1-01) was conducted using groundwater sample collected during the Indiana ANGB SI. The percent difference was within the control limits.

Significant Qualified Sample Results -- Data validation qualifiers have been applied to EW-08 (i.e., 50J[MB]) to indicate that TDS was detected in the associated laboratory method blanks.

TABLE F-25. TDS LABORATORY DUPLICATE QC SUMMARY: GROUNDWATER
INDIANA AIR NATIONAL GUARD BASE, FORT WAYNE, INDIANA

PARAMETER	LAB. DUPLICATE TOTAL No. ANALYSES	RANGE RPD	RPD LIMITS	NUMBER WITHIN CONTROL LIMITS	NUMBER OUTSIDE CONTROL LIMITS
TDS	1	1.9	25	1	0

DUPLICATE SAMPLE ANALYSES PERFORMED ON SAMPLE MW1-01.

APPENDIX G
RISK ASSESSMENT PROCEDURES

APPENDIX G. HUMAN HEALTH RISK ASSESSMENT PROCESS INDIANA AIR NATIONAL GUARD BASE

G.1 INTRODUCTION

Risk assessment is an essential component of the Remedial Investigation/Feasibility Study (RI/FS) process at hazardous waste sites. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP: the regulation that implements CERCLA) require that actions selected to remedy hazardous waste sites be protective of human health and the environment. An overview of risk assessment in the RI/FS process is presented in the NCP and in the U.S. Environmental Protection Agency (EPA) manual *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA 1988b). A baseline risk assessment is conducted as part of the RI to assess site conditions in the absence of remedial actions. As part of the FS process, risk assessment is used to evaluate the acceptability of proposed remedial actions and as a tool in the development of remediation objectives (target cleanup levels).

Because of the limited scope of work, a preliminary human health risk assessment has been conducted as part of the Site Investigation (SI) for the Indiana Air National Guard Base (ANGB). The risk evaluation examines the presence and release of chemicals from the waste sites under investigation, the observed levels of the compounds in the environment, the potential routes of exposure to human receptors, and the likelihood of adverse health effects following contact with contaminated environmental media. A detailed overview of the evaluation methods used is presented in the following discussion.

The focus of this evaluation is not an absolute assessment of the risks of exposure to the chemicals present at the Indiana ANGB. Rather, this evaluation is an assessment of the relative magnitude of anticipated health problems that may be associated with exposure to chemicals detected at the site. The intention is to determine if there is a significant threat to human health and to assess the need for site remediation.

G.2 OVERVIEW OF METHODS

The general approach to human health risk evaluation of exposure to chemical contaminants has been well-established. The National Research Council (NRC) prepared a comprehensive overview of the structure of this assessment (NRC 1983) that has become the foundation for subsequent EPA guidance. The *Human Health Evaluation Manual* and the *Environmental Evaluation Manual* (USEPA 1989a,b) provide a detailed presentation of the risk assessment process. These documents along with three recently published reports (USEPA 1991a,b,c) are the Agency's key guidance on risk assessment under the Superfund Program.

As specified by EPA, the human health evaluation process may be divided into four fundamental component analyses: (1) data evaluation and hazard identification, (2) exposure assessment, (3) toxicity or hazard assessment, and (4) risk characterization. These analyses are briefly described in the following sections.

G.2.1 Data Evaluation and Hazard Identification

The first step in the risk evaluation process is to obtain and evaluate all available data on contaminants present at the sites under investigation. The objective is to organize the data into a form appropriate for the baseline risk assessment. Once the preliminary data set has been obtained and sorted by environmental medium, the following evaluation steps should be completed:

- Evaluate the analytical methods used to determine if results are appropriate for use in quantitative risk assessment
- Evaluate the quality of data with respect to sample quantitation and detection limits
- Examine laboratory qualifiers assigned to monitoring data and evaluate potential quality assurance/quality control (QA/QC) problems
- Evaluate the quality of data with respect to blanks and tentatively identified compounds (TICs)
- Summarize information on background concentrations of chemicals and compare with observed levels of site-related contamination
- Identify chemicals of potential concern: develop a data set that may be appropriately used in the risk assessment process

- If appropriate, further limit the number of chemicals to be used as the subject of the risk assessment.

From the full listing of all chemicals identified at a waste site or facility, a subset may be identified that is of sufficient quality to be used in risk evaluation. It may be impractical to evaluate all chemicals that have passed through QA/AC review. Representative "highest risk" compounds may be selected on the basis of: (1) quantities present at the site; (2) extent of environmental contamination, toxicity, or hazardousness; and (3) mobility and persistence of the chemical in the environment. This final step is specified as optional by EPA and does not improve the quality or accuracy of the risk evaluation. It is suggested as a device for facilitating the risk evaluation process when time and resources prohibit the evaluation of the full (and often complex) data set.

G.2.2 Exposure Assessment

The objectives of the exposure assessment are to: (1) delineate exposure pathways; (2) identify receptors at risk; and (3) measure or estimate for each receptor the intensity, duration, and frequency of the exposure. Critical to the exposure assessment is a quantification of the releases of contaminants of concern to each environmental medium (from all sources at the waste site) and an assessment of the transport and transformation of the subject compounds. The results of these analyses provide data on the magnitude and extent of contamination. Both monitoring data and environmental transport modeling typically are used in the exposure assessment.

EPA has specified that actions at hazardous waste sites should be based on an estimate of the reasonable maximum exposure (RME) expected to occur under both current and future land-use conditions (USEPA 1989a). EPA defines the RME as the highest exposure that is reasonably expected to occur at a site. RMEs are estimated for individual pathways, and combined across exposure routes if appropriate.

Once receptors at risk are identified, environmental concentrations at points of exposure must be determined or projected. In the evaluation of Indiana ANGB, exposure concentrations are based completely on the results of site monitoring. No transport modeling has been used.

Representative concentrations for use in risk evaluation are taken as the arithmetic mean of the sampling results. "Not detected" results were treated as one-half the limit of detection and included in calculation of the arithmetic mean.

Intake and dose estimates (in mg/kg/day) are developed for each chemical of concern using the representative environmental concentrations (i.e., mean values). Estimates of dose are needed in the risk characterization and are generally determined as follows:

$$\text{Dose} = C \times \frac{CR \times EF \times ED \times ABS}{BW \times AT}$$

where:

C	=	Chemical concentration in the environmental medium under evaluation
CR	=	Contact rate; the amount of contaminated medium contacted per unit time or event
EF	=	Exposure frequency
ED	=	Exposure duration
ABS	=	Absorption factor
BW	=	Body weight; the average over the exposure period
AT	=	Averaging time; the period over which exposure is averaged.

The above expression is the general form of the equation used to derive estimates of subchronic or chronic intake or dose (lifetime assumed to be 70 years). The chronic dose estimate based on mean concentrations in environmental samples (arithmetic mean) was used as the basis of the risk characterization at all sites under investigation.

Identification of Exposure Pathways

Exposure pathways and contaminated media are identified and used to project exposure of receptor population to site contaminants. Characterization of each contaminant pathway consists of the following five elements:

- Identify potential receptor populations
- Characterize source and mechanism of chemical release to the environment
- Identify environmental transport media for release
- Identify exposure points where a receptor population may come in contact with the contaminated media
- Characterize exposure routes at the exposure point.

Exposure profiles for each area and receptor group are discussed in Section 4.

G.2.2.3 Comparison with Applicable or Relevant and Appropriate Requirements

Once the baseline concentrations of subject chemicals have been determined at the waste sites, these levels are compared to applicable or relevant and appropriate requirements (ARARs). CERCLA of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, requires the selection of remedial actions at Superfund hazardous waste sites that are protective of human health and the environment, cost-effective, and technologically and administratively feasible. Section 121 of CERCLA specifies that response action must be undertaken in compliance with ARARs established in Federal and state environmental laws.

In the revised NCP (NCP: 55 FR 8666) and the guidance document *CERCLA Compliance with Other Laws Manual* (USEPA 1988a), several different types of requirements are identified with which Superfund remedial actions must comply: (1) ambient or chemical-specific requirements, (2) action-specific requirements, and (3) location-specific requirements. Because situations at CERCLA sites vary widely, EPA cannot categorically specify requirements that will be ARARs for every National Priorities List (NPL) site. ARARs can only be identified on a site-specific basis (i.e., established in connection with the characteristics of the particular site, the chemicals present at the site, and the remedial alternatives suggested by the circumstances of the site).

According to the guidance presented in the revised NCP, protectiveness (i.e., the ability to protect human health and the environment) means that a given remedial alternative meets or exceeds ARARs, or other risk-based levels established through a risk evaluation when ARARs do not exist or are waived. In the NCP and in the guidance manual on CERCLA compliance with other laws (55 FR 8666, USEPA 1988a, 1989d), EPA specifies that when ARARs are not available for a given chemical, or where such ARARs are not sufficient to be protective, health advisory levels should be identified or developed to ensure that a remedy is protective.

For carcinogenic effects, these health advisory or cleanup levels are to be selected such that the total risk of all contaminants falls within the acceptable range of 10^{-4} to 10^{-6}. Although the 10^{-6} risk level is identified by EPA as a "point of departure" in evaluating the results of risk evaluation, the revised NCP clearly indicates that the 10^{-4} level is the upper bound of the acceptable range (55 FR 8666). In cases where noncarcinogenic effects are a concern, EPA specifies that cleanup should be based on acceptable levels of exposure as determined by the EPA reference doses (RfDs), taking into account the effects of multiple contaminants and multiple exposure pathways at the site.

Therefore, chemical-specific ARARs serve two primary purposes: (1) requirements that must be met by a selected remedial alternative (unless a waiver is obtained), and (2) as a basis for establishing appropriate cleanup levels. The preliminary health risk evaluation of a given remedial action alternative characterizes the actual risk of exposure of human receptors to contaminants under investigation. For carcinogens, risk characterization yields a probabilistic estimate of the additional lifetime risk of cancer in the exposed individual or the incidence of new cases of cancer in populations. For noncarcinogens, exposure levels or doses for all subject compounds are evaluated to determine if these exceed EPA RfDs or reference concentrations (RfCs). When an ARAR is available for all subject compounds of concern, and the ARARs are determined to be protective, these requirements become the chemical-specific cleanup goals. However, as noted above, when ARARs are found not to be protective or are not available, the results of the risk assessment (i.e., health advisory levels) are used to establish the more stringent target cleanup goals.

Thus, the requirement that a remedial alternative meet chemical-specific ARARs does not ensure that the proposed alternative is protective, and thereby potentially acceptable. This can be determined only by: (1) evaluating the combined carcinogenic risk associated with the ARAR limits for all chemicals at a given site (assuming additivity of effect in the absence of data on synergism or antagonism); (2) establishing that ARARs do not exceed USEPA RfDs for noncarcinogenic effects, and are sufficiently protective when multiple chemicals are present; (3) determining whether environmental effects (in addition to human health considerations) are adequately addressed by the ARARs; and (4) evaluating whether the ARARs adequately cover all significant pathways of human exposure identified in the preliminary risk evaluation. EPA has provided guidance on evaluating multiple exposure to chemicals (carcinogenic and noncarcinogenic effects) and on establishing acceptable exposure levels when no ARARs exist (USEPA 1986c, 1989a).

A listing of chemical-specific ARARs for all chemicals under investigation at the Indianan ANGB is provided in Section 4.

G.2.3 Toxicity Assessment

The objectives of the toxicity or hazard assessment are to evaluate the inherent toxicity of the compounds under investigation, and to identify and select toxicological measures for use in evaluating the significance of the exposure. In the development of these toxicological measures, available dose-response data are reviewed on the adverse effects to human and nonhuman receptors.

EPA derives RfDs and RfCs based on estimates of the no-observable-adverse-effect level (NOAEL) or lowest-observable-adverse-effect level (LOAEL) in humans or test animals. As follows:

$$RFD = \frac{NOAEL}{(UF \times MF)}$$

where:

NOAEL = No-observable-adverse-effect level (mg/kg body weight/day)

UF = Uncertainty factor (unitless)

MF = Modifying factor (unitless).

The NOAEL is the highest experimental dose at which there was no statistically significant increase in a toxicologically significant end point. Uncertainty factors (UFs) are intended to account for: (1) the variation in sensitivity among the members of the human population; (2) the uncertainty in extrapolating animal data to humans; (3) the uncertainty in extrapolation from data obtained in a study that is of less than lifetime exposure; and (4) the uncertainty in using LOAEL data rather than NOAEL data. Commonly, each of these factors is set equal to 10. The modifying factor (MF) is an additional optionally used factor, the magnitude of which reflects professional judgment regarding the quality of the data used in the toxicological assessment (e.g., the completeness of the overall data base and the number of animals tested).

The inhalation RfC methodology requires conversion of the NOAEL levels observed in animals to human equivalent concentrations (HECs) before the data sets and effects levels can be evaluated and compared. The inhalation RfC is derived as follows:

$$RfC = \frac{NOAEL_{[HEC]}}{(UF \times MF)}$$

where:

$NOAEL_{[HEC]}$	=	No-observable-adverse-effect level (mg/kg body weight/day) adjusted to human equivalent concentration
UF	=	Uncertainty factor (unitless)
MF	=	Modifying factor (unitless).

The $NOAEL_{HEC}$ is the key datum obtained from the evaluation of the dose-response relationship. EPA is currently attempting to standardize its approach to determining RfCs. Final guidance has not yet been released by the Agency.

The inhalation RfCs are derived by EPA according to the Interim Methods for Development of Inhalation Reference Doses (EPA/600/8-88/066F August 1989). These methods were developed by Agency scientists in the Office of Research and Development and peer reviewed at a workshop/public meeting held at the U.S. EPA Environmental Research Center in Research Triangle Park on October 6, 1987. It was intended that these methods would be interim and that improvements in the supporting scientific data base and advancements in risk assessment extrapolation procedures would be incorporated on a regular basis.

The assessment of the potential for noncarcinogenic effects (i.e., the use of RfDs and RfCs in risk assessment) is based on the assumption of a threshold below which adverse health effects are not anticipated to occur. Carcinogenesis, however, is generally thought to be a phenomenon for which the presumption of threshold effects is inappropriate (USEPA 1989a). Therefore, EPA does not estimate an effects threshold for this class of chemicals. Alternately, EPA uses a two-part evaluation in which the subject chemical is first assigned a weight-of-evidence classification, and then a cancer potency (slope factor) is calculated.

The weight-of-evidence classification evaluates the evidence that a given chemical is a carcinogen in human and animal systems. These ratings are as follows:

- A: Human carcinogen
- B1: Probable human carcinogen - limited human data are available
- B2: Probable human carcinogen - sufficient data in animals, and inadequate or no evidence in humans
- C: Possible human carcinogen
- D: Not classifiable as to human carcinogenicity
- E: Evidence of noncarcinogenicity for humans.

EPA develops cancer slope factors, for oral exposure, for carcinogens that have been rated A, B1, B2, and C. The cancer slope factor is a plausible upper-bound estimate of the slope of the dose-response curve in the low dose range. It is interpreted as the probability of a cancer response per unit oral intake of a chemical over a lifetime. In risk assessment, the cancer potency factor is used to estimate the excess lifetime probability of a carcinogenic effect occurring in exposed receptors.

As of January 1991, inhalation slope factors have been removed from the Integrated Risk Information System (IRIS) data base at the request of the Carcinogen Risk Assessment Verification Endeavor (CRAVE) Work Group. EPA notes that slope factors are expressed in terms of per (mg/kg)/day, and as such represent an ingestion risk. A unit risk factor is a dimensionless number expressed in terms of per (ug/cu.m)/day for air. According to EPA, an inhalation slope factor expressed as per (mg/kg)/day is not a logical application of the data. Converting an inhalation unit risk to a risk in terms of per (mg/kg)/day may be a misleading use of the data and cause users to assume a comparability between routes that is inappropriate. As specified by EPA:

> "When dose-response data from both oral and inhalation studies are available for risk calculations, the oral slope factor is calculated directly from the oral data and represents the carcinogenic potential associated with 1 mg/kg/day of "administered body" dose. To calculate a slope factor from inhalation data, many assumptions must be made, including those for conversion between an air concentration and body dose. When pharmacokinetic modeling is applied to inhalation risk estimation, dose-response relationships are figured on the basis of internal or metabolized dose. A slope factor in terms of per (mg/kg)/day represents a back calculation using different absorption assumptions than the pharmacokinetic models. (IRIS Data Base January 1991)"

Following EPA guidance, inhalation unit risk factors should be used when available. In the absence of these measures, inhalation slope factors are adopted.

RfDs or slope factors have not been developed by EPA for the dermal exposure route. In the absence of these factors, the common practice has been use the available toxicity measures for the oral route of exposure. This approach has been adopted in the preliminary risk assessment of the Indianan ANGB waste sites. Note, however, that there is considerable uncertainty with the use of oral measures for the dermal exposure pathway. The results of risk assessment that incorporate these measures should not be interpreted as characterizing actual risks to human health via the dermal exposure pathway. The risk measures derived should be considered only a screening-level tool for evaluating the relative significance of the observed levels of contamination in environmental media.

In evaluating the dermal pathway, EPA recommends expressing chemical intake as absorbed dose and adjusting the oral toxicity measures also to reflect absorbed dose (USEPA 1989a). Most of the toxicity measures available from EPA are expressed as administered dose (i.e., intake) rather than dose at the tissue level (i.e., absorbed dose). The adjustment of the oral toxicity measure can be accomplished only if sufficient data are available in the principal laboratory studies, on oral absorption efficiency in the species on which the toxicity measures are based. EPA notes that exposure estimates for absorption efficiency should not be adjusted if the toxicity values are based on administered doses (USEPA 1989a).

Thus, in conducting an assessment of risk of exposure to chemicals released from waste sites, several toxicity measures of importance may be identified:

- RfDs for oral exposure - acceptable intake values for subchronic and chronic exposure (noncarcinogenic effects)
- RfDs for inhalation exposure - acceptable intake values for sub-chronic and chronic exposure (noncarcinogenic effects)
- Carcinogenic slope factors for oral exposure
- Unit risk factors for evaluating cancer risk via inhalation exposure, or cancer slope factors for inhalation exposure in the absence of unit risk measures.

The primary sources of information for these data is the IRIS data base. IRIS is a computer-housed catalog of EPA risk assessment and risk management information for chemical substances. Data in the IRIS system are regularly reviewed and updated monthly. If toxicity measures are not available on IRIS, EPA recommends use of the EPA ORD Health Effects Assessment Summary Tables (HEAST: FY 1991. USEPA 1991d) as the second most current source of information. Science Applications International Corporation (SAIC) has on-line access to the IRIS data base and receives the quarterly HEAST publications from EPA ORD. Therefore, the risk assessment is based on the most up-to-date EPA-approved toxicity measures available for waste site evaluation.

A summary of the toxicity measures used in the evaluation of the waste sites at is presented in Section 4.

G.2.4 Risk Characterization

The last step in the human health risk assessment is risk characterization. This is the process of integrating the results of the exposure and hazard (toxicity) assessment (i.e., of comparing estimates of dose with appropriate toxicological endpoints to determine the likelihood of adverse effects in exposed populations). It is common practice to consider risk characterization separately for carcinogenic and noncarcinogenic effects. This is due to a fundamental difference in the way organisms typically respond following exposure to carcinogenic or noncarcinogenic agents. For noncarcinogenic effects, toxicologists recognize the existence of a threshold of exposure below which there is only a very small likelihood of adverse health impacts in an exposed individual. Exposure to carcinogenic compounds, however, is not thought to be characterized by the existence of a threshold. Rather, all levels of exposure are considered to carry a risk of adverse effect.

The procedure for calculating risk associated with exposure to carcinogenic compounds has been established by EPA (USEPA 1986b,c; USEPA 1989a). A non-threshold, dose-response model is used to calculate a cancer slope (potency) factor (which mathematically is the slope of the dose-response curve) for each chemical. To derive an estimate of risk, the cancer slope factor (CSF - defined below) is then multiplied by the estimated chronic daily dose experienced by the exposed individual:

$$\text{Risk} = \text{CDI} \times \text{CSF}$$

where:

Risk = Upper-bound estimate of the excess lifetime cancer risk to an individual (unitless probability)

CDI = Chronic daily dose averaged over a 70-year period (mg/kg body weight/day)

CSF = 95% upper-bound estimate of the slope of the dose-response curve (mg/kg body weight/day)$^{-1}$.

The slope factor CSF is used to convert estimates of daily intake or dose averaged over a lifetime, to incremental excess risk of an individual developing cancer. EPA notes that use of this equation assumes that the dose-response relationship is linear in the low-dose portion of the multistage model dose-response curve (USEPA 1989a: A linearized multistage dose response model is most commonly used by EPA in deriving the slope estimates.) Given this assumption, the slope factor is a constant and risk is directly proportional to intake.

EPA indicates that use of the linear equation (above) for risk estimation is valid only at risk levels $< 1 \times 10^{-2}$. The Agency recommends use of the following equation (based on the "one-hit" model of carcinogenesis) as an alternative at sites where exposure and intakes are projected to be quite high, and risk levels may exceed 1×10^{-2}.

$$Risk = 1 - \exp(-CDI \times CSF)$$

In evaluating risk of exposure to more than one carcinogen, the risk measure for each compound may be summed (in the absence of information on antagonistic or synergistic effects) to provide an overall estimate of total carcinogenic risk (USEPA 1989a).

$$Risk_T = \sum_{i=1}^{n} Risk_i$$

where:

$Risk_T$ = The combined excess lifetime cancer risk across chemical carcinogens
$Risk_i$ = The risk estimate for the i^{th} chemical of n chemicals under evaluation.

This is conducted for each source of environmental release, associated exposure pathway, and receptor group at risk of exposure. Population risks are derived by multiplying the overall risk level (summed for all subject chemicals) by the number of people exposed. This would yield a measure of the additional incidence of developing cancer (i.e., additional number of new cases) in the exposed population over a lifetime (i.e., 70 years) of exposure.

The traditionally accepted practice of evaluating exposure to noncarcinogenic compounds has been to experimentally determine a NOAEL and to divide this by a safety factor to establish an acceptable human dose, for example, acceptable daily intake or RfD (NRC 1983). The RfD is then compared to the average daily dose experienced by the exposed population to obtain a measure of concern for adverse noncarcinogenic effects:

$$HQ = \frac{Dose}{RfD}$$

where:

HQ	=	Hazard Quotient: potential for adverse noncarcinogenic effects
Dose	=	Average daily dose for subchronic or chronic exposure (mg/kg body weight/day)
RfD	=	Acceptable intake for subchronic or chronic exposure (mg/kg body weight/day).

Dose and the RfD are expressed in the same units and are based upon common exposure periods (i.e., chronic, subchronic, or shorter-term). If the HQ is > 1, there may be potential for adverse noncarcinogenic effects at the given exposure/dose level. Guidelines for evaluating exposure to mixtures of noncarcinogens is presented by EPA (USEPA 1986b, 1989a). Essentially, this involves summing the HQ (ratios of daily dose/RfD) for all chemicals under evaluation. If the sum of these ratios, called the Hazard Index (HI), is > 1, there is the potential for adverse noncarcinogenic effects. Under these circumstances, EPA recommends segregating the compounds into groups of like or common toxicological effects, and again evaluating the potential for manifestation of the various adverse health effects identified.

G.2.5 Evaluation of Uncertainty

It is important to emphasize that the preliminary risk evaluation is primarily a decision making tool for use in assessing the need for remedial action. The results of risk evaluations are presented in terms of the **potential** for adverse effects based upon a number of very conservative assumptions.

Some discussion of the uncertainties associated with each step in the risk assessment has been provided in the body of the report (Section 4). The uncertainties in each component of the risk evaluation process are compounded in the overall calculation to yield final estimates with wide uncertainty ranges. For example, if an estimate of the average daily dose for a compound has an uncertainty range a factor of 10 above and below the point estimate used in the exposure assessment, the uncertainty range for the final estimated health effect must be at least that large.

The sources of uncertainty may be site-related (i.e., limited data are available), or may be associated with the assumptions and procedures used during the risk evaluation. If limited data are available, one sample with an extreme concentration (high or low) may bias the exposure estimates. With a small data set that cannot meaningfully be evaluated statistically, it is very difficult to identify and eliminate anomalous results.

The final quantitative measures of the potential for adverse affects must be recognized as point estimates within a distribution of potential outcomes. The estimates of the potential for human health effects at the Indiana ANGB are necessarily uncertain. However, the use RME assumptions (as recommended by EPA: USEPA 1989a) in this study, ensures a conservative estimate of risk that is protective of human health.

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APPENDIX H
GEOTECHNICAL ANALYTICAL RESULTS

Table H-1. Geotechnical Testing Results of Soil at 122nd Tactical Fighter Wing, Indiana Air National Guard, Fort Wayne, Indiana

Site	Sample ID	Sample Depth (feet BLS)	Depth of Water During Drilling (feet BLS)	% Sand	% Silt	% Clay	Textural Classification
Background	BG1	34 - 35	37	25	22	53	Clay
Site 1	SB1-1-6	14.5 - 16.0	34	35	30	35	Clay Loam
Site 4	SB4-1-4	24 - 25.5	34	19	30	51	Clay
Site 4	SB4-1-5	19 - 21.5	34	93	2	5	Sand
Site 3	SB3-1-8	34.5 - 36	38	23	26	51	Clay

Site	Sample ID	Sample Depth (feet BLS)	Depth of Water During Drilling (feet BLS)	% pH	% Organic Matter*	% Moisture **
Background	BG1	34 - 35	37	8.2	2.31	15.0
Site 1	SB1-1-6	30 - 31.5	34	8.3	1.48	7.7
Site 4	SB4-1-4	14.5 - 16.0	34	8.2	1.98	14.8
Site 4	SB4-1-5	19 - 21.5	34	7.7	0.55	7.3
Site 3	SB3-1-8	34.5 - 36	38	8.2	2.09	17.0

* By Walkley-Black Titration

** @ 100 degrees Celsius

Note: Samples for Geotechnical Analyses were collected just above the water table, except for samples from Site 4. At Site 4, borings were not drilled to the water table. Two samples were submitted from Site 4 to represent two distinct lithologies observed during drilling.