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SITE CLOSURE REPORT for SITE 4301.0 - LITTLE MOUNTAIN TEXT ANNEX DRAFT

Hill Air Force Base
Ogden, Utah

Prepared For:

Air Force Center for Environmental Excellence
Brooks Air Force Base
San Antonio, Texas

and

Hill Air Force Base
Directorate of Environmental Management
Ogden, Utah

February, 1997

AQ M01-02-0286

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SITE CLOSURE REPORT

SITE 4301.0 - LITTLE MOUNTAIN TEST ANNEX

HILL AIR FORCE BASE, UTAH

Prepared for:

Air Force Center for Environmental Excellence
Brooks AFB, Texas

and

Hill Air Force Base
Directorate of Environmental Management
Ogden, Utah

February 1997

Parsons Engineering Science, Inc.
406 West South Jordan Parkway, Suite 300
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SECTION 1
INTRODUCTION

1.1 Purpose and Scope

The purpose of this report is to present the results of closure activities at Site 4301.0 (former gasoline tank) located at the Little Mountain Test Annex (LMTA), Hill Air Force Base (AFB), Utah, and to recommend site closure. The site is identified with facility identification number 1200268 by the Utah Department of Environmental Quality (UDEQ), Division of Environmental Response and Remediation (DERR), and was designated as Leaking underground storage tank (UST) Site EHDL after a release was reported subsequent to tank removal. The site is also referenced as ST66 in the U.S. Air Force Installation Restoration Program Information System.

The DERR requires that a post-remedial verification report be prepared after corrective action at a site is completed, but specific requirements have not been established. The courses of action taken for the closure subsurface investigation at Site 4301.0 were developed after consultation with the DERR project manager. Analytical results of this site closure investigation are herein compared to the Risk-Based Corrective Action (RBCA) Tier 1 screening levels outlined in *Draft Guidelines for Utah's Tier 1 Risk-Based Corrective Action: Utah's Guide for Screening Petroleum-Contaminated Sites (1995).* These levels are presented in Table 1.1.

From May 1992 until February 1995, Hill AFB has participated in the Air Force Bioventing Pilot Test Initiative Project. The project, sponsored by the Air Force Center for Environmental Excellence (AFCEE) at Brooks AFB, Texas, included conducting more than 135 *in situ* bioventing pilot tests at 48 Air Force installations throughout the country. These tests were designed to collect data on the effectiveness of bioventing for the remediation of soil contaminated with fuel hydrocarbons (e.g., JP-4 jet fuel, diesel fuel, gasoline, heating oil, etc.). Because of the success of bioventing under the AFCEE initiative, Hill AFB retained Dames & Moore, Inc. (non-AFCEE funded) to install a bioventing system at Site 4301.0 as described in *Corrective Action Plan for UST Site 4301 (ST66;EHDL) Little Mountain Test Annex* prepared by Dames & Moore (1994). The bioventing system began operating on 30 September 1994, and operated continuously for approximately two years.

The closure subsurface investigation for this site was performed in October 1996, by Parsons Engineering Science, Inc. (Parsons ES) under the AFCEE Extended Bioventing Project (Contract F41624-92-R-8036, Delivery Order 17). This closure report for Site 4301.0 has been prepared by Parsons ES to support a no-further-action recommendation

TABLE 1.1
RBCA TIER 1 SCREENING LEVELS

Constituent	Analytical Method (USEPA, 1984)	Tier 1 Screening Level Groundwater (mg/L)	Tier 1 Screening Level Soil (mg/kg)
Benzene*	602/8020	0.3	0.9
Toluene*	602/8020	7	61
Ethylbenzene*	602/8020	4	23
Xylenes*	602/8020	73	235
Naphthalene*	602/8020	0.1	10
Total Petroleum Hydrocarbons (TPH) as gasoline**	8015 mod.	10	1500
Total Petroleum Hydrocarbons (TPH) as diesel**	8015 mod.	10	5000
Oil and Grease or Total Recoverable Petroleum Hydrocarbons (TRPH) **	413.1 or 418.1	10	10000

Source: DERR, 1995
* risk-based
** non-risk-based
mg/L milligrams per liter
mg/kg milligrams per kilogram

for vadose zone soils that is based on analytical results and other site-specific data obtained through implementation of a site-specific closure sampling and analysis plan [(SAP) Parsons ES, 1996]. The SAP is provided as Appendix A of this closure report and contains detailed information about the site, summaries of previous investigation activities and results, evaluation of the effectiveness of the bioventing system operation based on respiration tests and monthly soil gas monitoring, and the proposed confirmation sampling activities. This information is only briefly summarized in the following subsection to minimize repetition and redundancy. For greater detail, the SAP (Parsons ES, 1996) in Appendix A should be referenced.

1.2 Background Information

The LMTA is remotely located approximately 20 miles northwest of Hill AFB near the Great Salt Lake (Figure 1.1). Land use within the boundary of LMTA is specific to testing and training and there is no access for the general public. Site 4301.0 is situated 4,260 feet above mean sea level (MSL). Groundwater is encountered at approximately 4,210 feet MSL. Heterogeneous, stratified sediments are present at the site. Clay is predominant between the level of soil contamination and the first water-bearing zone (ES, 1992). The geological characteristics beneath Site 4301.0 are shown on cross-sections contained in Appendix B (ES, 1992).

The former UST contained gasoline and was removed in September 1991. A subsurface investigation was conducted in 1992, by Engineering-Science, Inc. (ES, 1992). Additional subsurface investigations were conducted in 1993 and 1994 to delineate the soil contamination directly beneath the former tank (Dames and Moore, 1994). Data obtained from these investigations were used to guide the design of the bioventing system. The respiration and soil gas data obtained during the 2-year bioventing program indicated that biodegredation of the petroleum contamination was occurring. Total volatile hydrocarbon (TVH) concentrations dropped from levels as high as 10,000 parts per million- volume per volume (ppmv) in December 1994, to non-detect levels in March 1996 (Parsons ES, 1996). Sampling of the downgradient monitoring well, previously installed by Parson ES (ES, 1992), was also performed as part of the bioventing program. The sampling results indicated that groundwater had not been impacted by the petroleum release.

The post-remediation confirmational sampling program outlined in the SAP was designed to determine the effectiveness of the 2-year bioventing program. The drilling, sampling, and decontamination procedures outlined in Section 4 of the SAP were followed. Conventional hollow-stem augers equipped with split-spoon samplers and brass sleeves were employed for the confirmational soil sampling. A confirmational groundwater sample was collected from the existing monitoring well installed at the site (ES, 1992). Investigation-derived waste was collected and disposed in accordance with the *Final Hill AFB Basewide Investigation-Derived Waste Work Plan* (Radian, 1995).

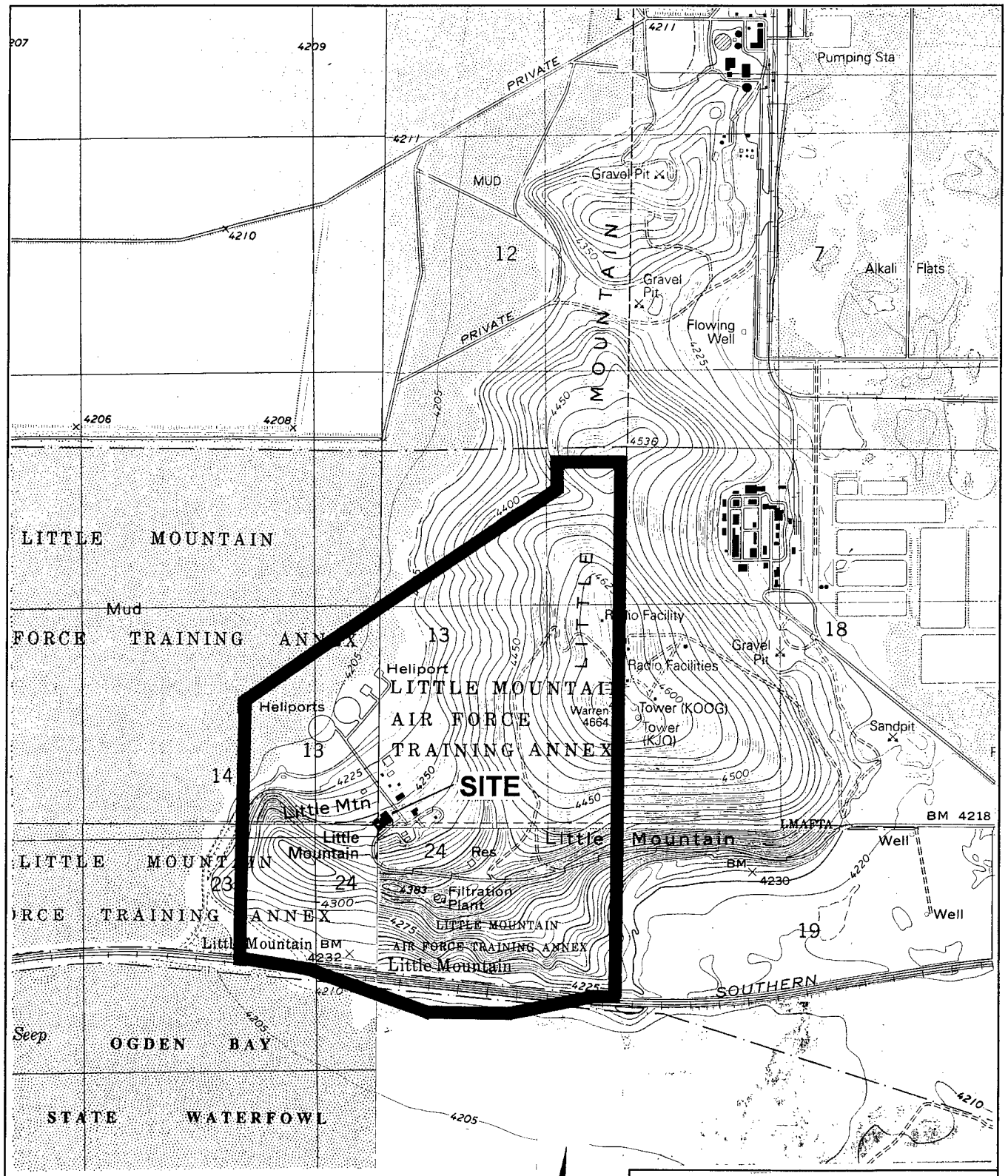

FIGURE 1.1

LOCATION MAP
SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX
HILL AIR FORCE BASE, UTAH

PARSONS ENGINEERING SCIENCE, INC.
406 W. SOUTH JORDAN PARKWAY, #300
SOUTH JORDAN, UT 84095 (801) 572-5999

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The containerized waste was properly labeled and transported by a subcontractor (TW Company) to the Hazardous Waste Control Facility located at Building 514, Hill AFB.

SECTION 2
CONFIRMATION SAMPLING ACTIVITIES AND RESULTS

The locations, depths, and analytical results of the confirmatory soil and groundwater sampling conducted at Site 4301 are presented and discussed in this section. In addition, environmental sensitivity criteria are reviewed, and exposure assessment and the potential for contaminant migration, as they relate to the site findings, are addressed.

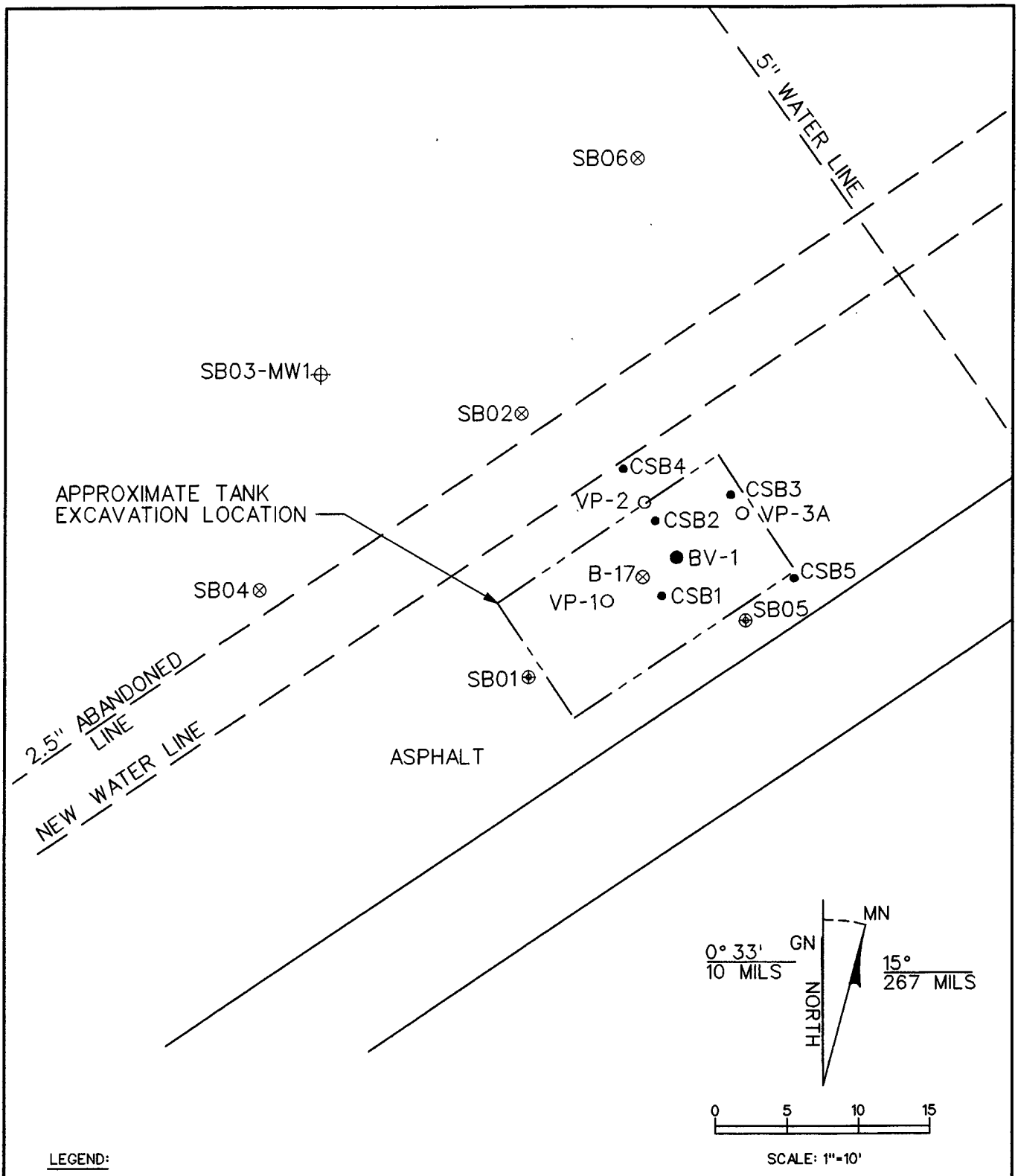
2.1 Site Closure Borehole Locations and Sampling Depths

Five confirmational soil borings were advanced in October 1996, within the previously delineated area of soil contamination at the locations shown in Figure 2.1 [refer to Figure 4.1 of the SAP (Appendix A) for the area of contamination prior to bioventing]. The borehole locations deviated slightly from those proposed in the SAP because the bioventing blower shed and protective posts had not been removed. Soil Borings CSB1, CSB2, and CSB3 were located as close to the blower shed as possible (the shed and protective posts are not shown in Figure 2.1). The soil boring logs are provided in Appendix C.

A total of 19 soil samples, including two field replicates, were collected at depths ranging from 14.5 feet to 31 feet below ground surface (bgs). The 14.5- to 16-foot, 19.5- to 21-foot, and 24.5- to 26-foot intervals were sampled in all five soil borings. Deeper samples at approximately 30 feet bgs were collected from CSB1 and CSB2. As outlined in the SAP, samples were to be retained and analyzed from intervals exhibiting volatile hydrocarbon concentrations by photoionization detector (PID) field screening. These screening results are shown on the soil boring logs. Elevated volatile hydrocarbons, where detected, were generally present at the 19.5- to 21-foot sample intervals. At this same time, groundwater measured 48.78 feet below top of casing in the existing flush-mount monitoring well, SB03-MW1 (Figure 2.1). Therefore, groundwater was approximately 18 feet below the lowest depth of soil sampling, and generally, 28 feet below the soil sample intervals exhibiting elevated volatile hydrocarbons in soil gas.

2.2 Soil Analytical Results

All samples were analyzed by Inchcape Testing Services, an AFCEE and Utah Division of Laboratory Services-approved laboratory. Soil samples were analyzed by EPA Method SW8020 for benzene, toluene, ethylbenzene, xylenes, and naphthalene (BTEXN), and EPA Method SW8015M for gasoline range total volatile hydrocarbons (TVH) which includes BTEXN and the lighter purgable hydrocarbons associated with method SW8015M.



LEGEND:

- ● CONFIRMATIONAL SOIL BORING
- ⊗ ES SOIL BORING
- ⊕ ES SOIL BORING WITH GAS MONITORING POINT
- ⊕ ES MONITORING WELL
- ● DAMES & MOORE (D&M) BIOVENT WELL
- ○ D&M VAPOR MONITORING WELL (3 PROBES PER BORING)
- ⊗ D&M SOIL BORING

FIGURE 2.1

CONFIRMATIONAL SOIL BORING LOCATIONS SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX
HILL AIR FORCE BASE, UTAH

PARSONS ENGINEERING SCIENCE, INC.
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SOUTH JORDAN, UT 84095 (801) 572-5999

C:\HAFB\LMFIG2-1R03 02.10.97

TABLE 2.1
Confirmatory Soil Analytical Results (mg/kg)
Site 4301 - Little Mountain Test Annex
Hill AFB, Utah

Sample ID	TVH	Benzene	Toluene	Ethyl-Benzene	m,p,o-Xylene	Naphthalene
RBCA Tier 1 Level	1,500	0.9	61	23	235	10
CSB1 (14.5-16')	<0.050	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
CSB1 (19.5-21')	1280	<0.50	5.62	11.4	143.1	**13.9**
CSB1 (24.5-26')	0.242	<0.0010	<0.0020	0.0012J	0.0030	0.0033J
CSB1 (28-29.5')	0.139	<0.0010	<0.0020	0.0013J	<0.0020	0.0035J
CSB2 (14.5-16')	0.0849	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
CSB2 (19.5-21')	**8,490**	<10	**145**	**195**	**2586**	**70**
CSB2 (24.5-26')	0.0386J	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
CSB2 (29.5-31')	0.0458J	0.0006J	<0.0020	<0.0020	0.0013J	<0.0050
CSB3 (14.5-16')	0.0291J	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
CSB3 (19.5-21')	34.3	<0.025	<0.050	0.111	4.00	0.372
CSB3 (24.5-26')	<0.050	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
*CSB3 (29.5-31')	0.0295J	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
CSB4 (14.5-16')	0.0313J	<0.0010	<0.0020	<0.0020	<0.0011J	<0.0050
CSB4 (19.5-21')	**4,210**	<5.0	**79.9**	**63.1**	**862**	**28.6**
CSB4 (24.5-26')	<0.050	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
CSB5 (14.5-16')	<0.050	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
CSB5 (19.5-21')	0.0347J	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
CSB5 (24.5-26')	<0.050	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050
*CSB5 (29.5-31')	<0.050	<0.0010	<0.0020	<0.0020	<0.0020	<0.0050

TVH Total Volatile Hydrocarbons
J estimated value below reporting limit
* Replicate of preceding sample interval
Note: Concentrations exceeding RBCA Tier 1 levels are bolded.

Soil analytical results are summarized in Table 2.1 and the laboratory data are contained in Appendix D. Replicate samples were collected from borings CSB3 and CSB5. Target analytes were not detected in an associated trip blank and equipment rinse blank (Appendix D). BTEXN and TVH constituents were almost exclusively detected at the 19.5- to 21-foot interval of the borings. The concentrations of all target analytes, except benzene, exceeded RBCA Tier 1 levels at this interval in soil borings CSB2 and CSB4 (Table 2.1). Although benzene was not detected above the reporting limits shown in Table 2.1, the limit of detection was higher than the RBCA Tier 1 level due to dilution. The TVH in CSB2 and CSB4 at this interval were 8,490 milligrams per kilogram (mg/kg) and 4,210 mg/kg, respectively. At CSB1, only naphthalene (13.9 mg/kg) exceeded its RBCA Tier 1 level (10 mg/kg) at this interval. The soil at the 19.5- to 21-feet depth is primarily an olive to greenish gray silt. The estimated areal extent of soils containing TVH at concentrations exceeding the RBCA Tier 1 level for soil is depicted in Figure 2.2. The vertical extent of TVH exceeding the RBCA Tier 1 level in soil is shown in geologic cross-section A-A' (Figure 2.3). Sand layers are present above and below the olive to greenish gray silt layer (Figure 2.3). Soil samples collected from these sand layers at the 14.5- to 16-feet and 24.5- to 26-feet intervals indicated the general absence of petroleum contamination (Figure 2.3 and Table 2.1). Based on the estimated dimensions of the remaining post-remediation soil contamination, approximately 4 cubic yards exceed RBCA Tier 1 levels. This volume is calculated assuming a cylindrical geometry for the contamination zone:

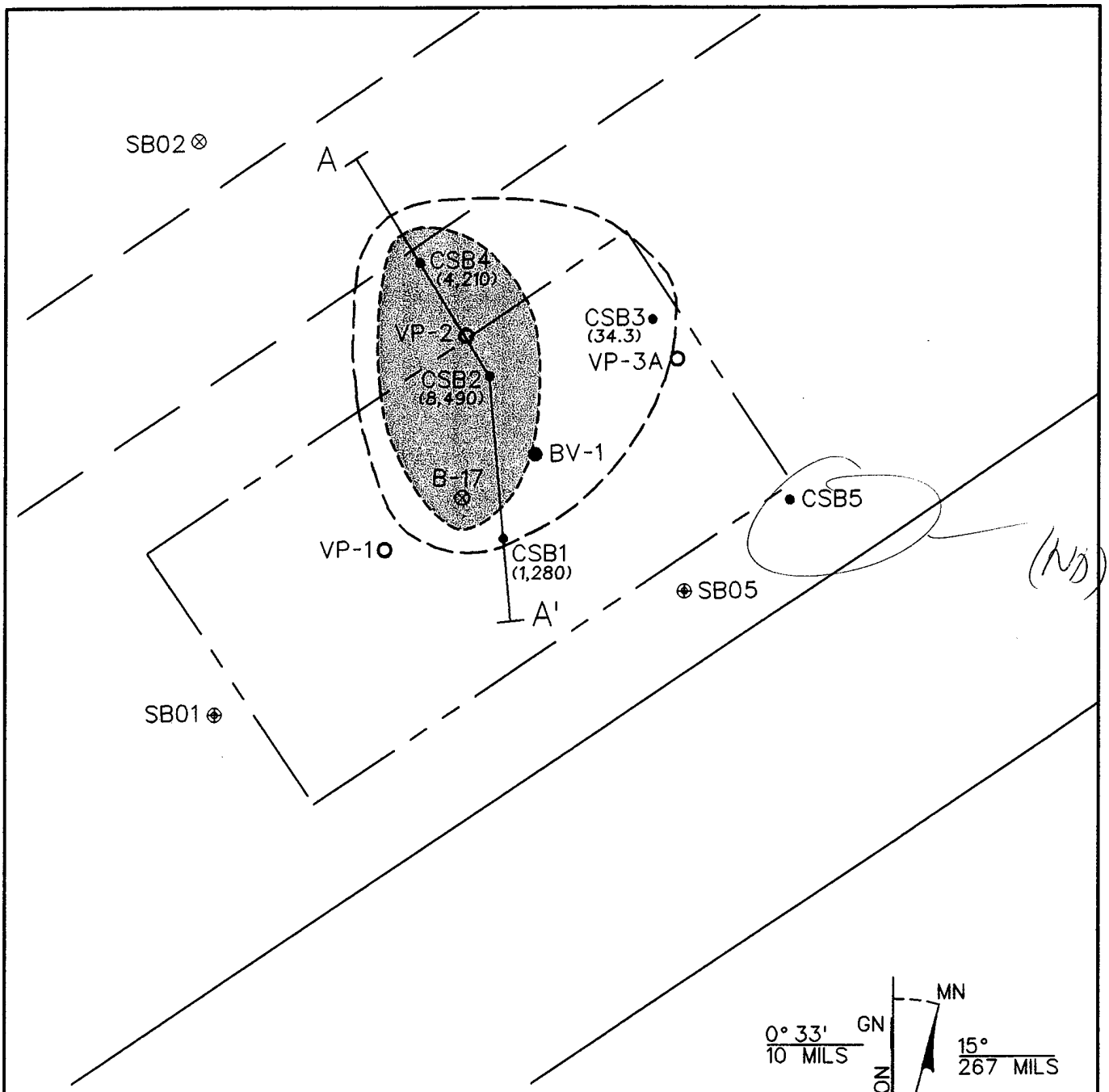
where the volume of a cylinder = $\pi r^2 h$,

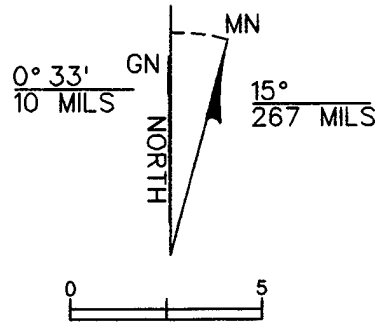
the average radius r is 3.75 feet, and height h is 2.5 feet (Figures 2.2 and 2.3).

The area of high total petroleum hydrocarbons (TPH) concentrations (7,500 to 30,000 mg/kg), based on the pre-remediation subsurface investigations, were within a five-foot-radius of the biovent well (Dames and Moore, 1994). Assuming a cylindrical zone of contamination and a height of five feet, approximately 15 cubic yards of soil were in excess of RBCA Tier 1 levels for the TPH gasoline range (1,500 mg/kg) at that time. Prior to bioventing, the total volume of soil impacted by the release was estimated to be 90 cubic yards (Dames and Moore, 1994). The post-remediation confirmational results indicate that the total volume of contaminated soil is significantly less, estimated to be as low as 11 cubic yards (cylindrical geometry with a 5.5-foot-radius and 3-foot-height). Therefore, the two years of bioventing were effective, particularly in the sand units adjacent to the silt layer.

2.3 Groundwater Analytical Results

Groundwater samples were analyzed by EPA Method SW8020 for BTEXN, and EPA Method SW8015M for gasoline range total volatile hydrocarbons (TVH), which includes BTEXN and the lighter purgable hydrocarbons associated with method SW8015M. The samples were analyzed by Inchcape Testing Services.





SCALE: 1"=5'

LEGEND:

APPROXIMATE EXTENT OF TVH ABOVE RBCA TIER 1 LEVELS

APPROXIMATE TOTAL EXTENT OF TVH

CSB1 ● (1,280) CONFIRMATIONAL SOIL BORING WITH TVH CONCENTRATION (mg/kg)

NOTE:

TVH SHOWN ARE DETECTED AT THE 19.5-21 FEET INTERVAL

FIGURE 2.2

EXTENT OF TVH IN SOIL SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX
HILL AIR FORCE BASE, UTAH

PARSONS ENGINEERING SCIENCE, INC.
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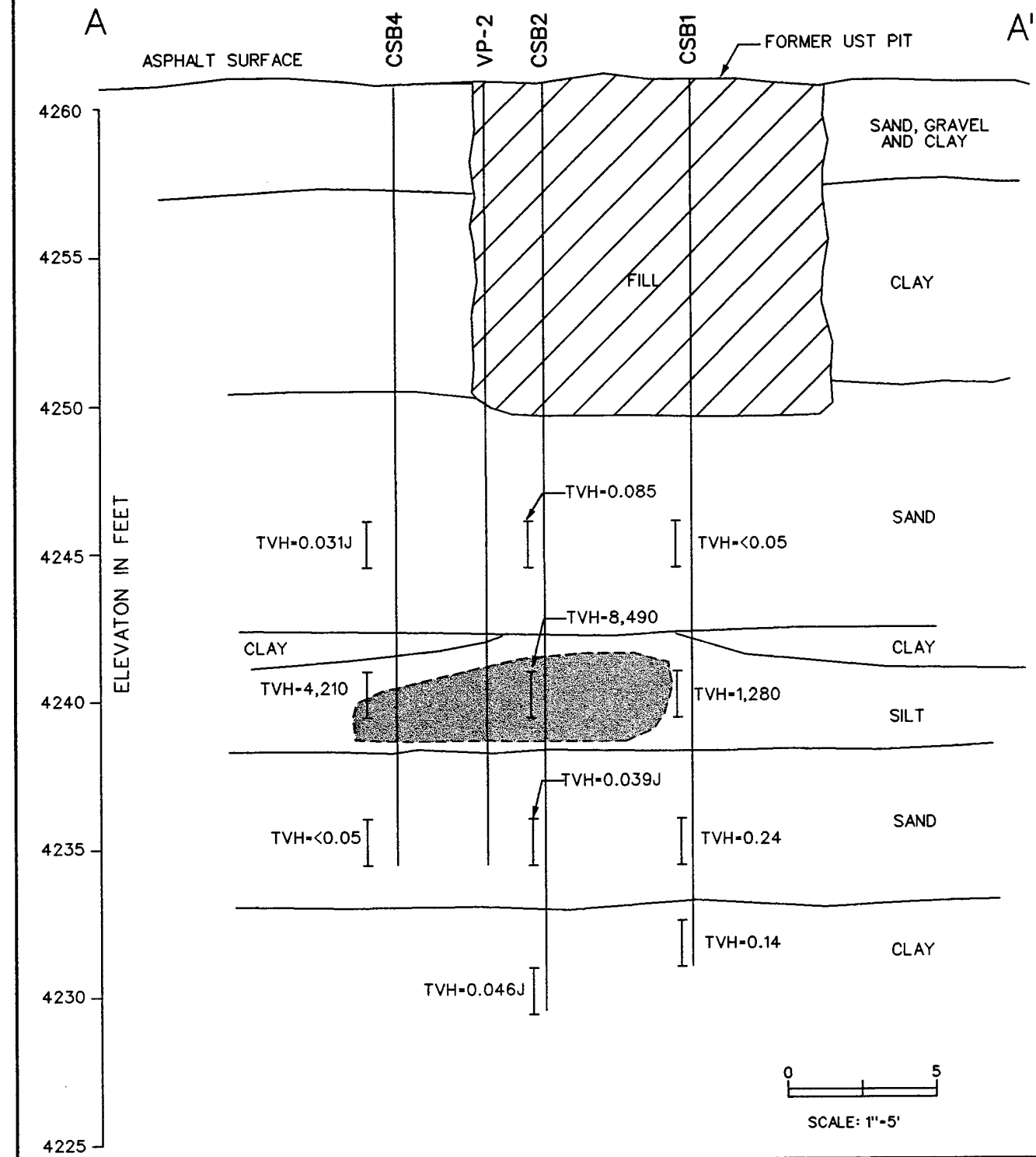
C:\HAFB\LMFIG2-2 R02 02.10.97



LEGEND:

APPROXIMATE EXTENT OF TVH ABOVE RBCA TIER 1 LEVELS (mg/kg)

TVH=0.14 SAMPLE INTERVAL WITH TVH CONCENTRATIONS (mg/kg)

J ESTIMATED VALUE BELOW REPORTING LIMIT

NOTE:

SEDIMENTS ARE PRIMARILY CLAY TO A DEPTH OF 4,205 FT
GROUNDWATER IS ENCOUNTERED AT APPROXIMATELY 4,210 FT.

C:\HAFB\LMFIG2-3 R03 02.18.97

FIGURE 2.3

CROSS-SECTION A-A'
SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX
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One groundwater sample was collected from the single monitoring well, SB03-MW1, installed at the site in 1992. A duplicate sample designated as MW2 also was collected. TVH and BTEXN were not detected above the reporting limits in the primary sample and duplicate. Analytical results are summarized in Table 2.2 and the laboratory data are contained in Appendix D. A trip blank and equipment rinse blank were also analyzed and target analytes were not detected in these associated QA/QC samples (Appendix D).

2.4 Environmental Sensitivity, Exposure Assessment, and the Potential for Contaminant Migration

Information obtained through the various site activities indicates that the environmental sensitivity, potential for exposure, and potential for contaminant migration in soil or groundwater are low (ES, 1992; Dames and Moore, 1994). Post-remedial soil contamination is isolated and is limited to a silt zone approximately 20 feet bgs and 30 feet above the water table. Except for a 5-foot-thick sand zone beneath this silt layer, soils to the depth of groundwater are primarily clay (CL as classified by ASTM D-2487). There are no groundwater wells located within a one-mile-radius of the site and the nearest surface water is the Great Salt Lake, approximately 1,000 feet north. The closest residential population is rural and approximately 5 miles east of the site. Utility conduits (water lines) are limited to the near-surface. Due to the depth and limited extent of the remaining soil contamination and asphalt surface paving, the shallow utility trenches are not considered to be exposure pathways for vapors. No apparent air, soil, or water pathways are present that would place the workers at LMTA (approximately 50 during normal operations) at risk.

Physical and chemical data obtained through site activities suggest that the post-remedial residual soil contamination in the vadose zone probably will never migrate to groundwater. This conclusion is supported by the following factors: 1) impermeable soils (10^{-7} centimeters per second range vertical hydraulic conductivity) are present below the depth of contamination to groundwater (ES, 1992), 2) surface infiltration rates are low, probably less than 5% of the annual precipitation because of asphalt paving, 3) the groundwater flux to the water table from seepage in the vadose zone probably is low, perhaps even non-existent due to the clays, 4) organic carbon (1.8% to 5.4% as total organic carbon) is present in the underlying clays (ES, 1992), thereby enhancing retardation, and 5) intrinsic biodegradation is likely to occur in the vadose zone between the residual soil contamination and the groundwater table. Also, the delineated contamination apparently did not migrate below its resident silty layer in the interim time between the subsurface investigation in 1992 and the onset of bioventing in 1994. Since the gasoline tank was in operation for 30 years, petroleum conceivably could have been released to the subsurface for several years. If so, the release did not migrate substantially below the bottom of the silt layer at 22 feet bgs, and has never reached groundwater. EPA models such as VLEACH may be used to evaluate contaminant transport in the vadose zone. However, governing assumptions inherent with the models

TABLE 2.2
Confirmatory Groundwater Analytical Results (ug/L)
Site 4301 - Little Mountain Test Annex
Hill AFB, Utah

Sample ID	TVH	Benzene	Toluene	Ethyl-Benzene	m,p,o-Xylene	Naphthalene
RBCA Tier 1 Levels	10,000	300	7,000	4,000	73,000	100
MW1	<50	<2.0	<2.0	<2.0	<2.0	<2.0
*MW2	<50	<2.0	<2.0	<2.0	<2.0	<2.0

TVH Total Volatile Hydrocarbons
* Duplicate of MW1

such as homogeneous soil and moisture conditions throughout the entire vadose zone, plug flow without dispersion, and no biological decay may cause the models to predict faster travel times than the actual and overestimate impacts to groundwater. The models are most sensitive to infiltration and organic carbon content. As stated above, the infiltration rate is low and the organic carbon content is relatively high at Site 4301.0.

SECTION 3
CONCLUSIONS AND RECOMMENDATIONS

The two years of active remediation (bioventing) have been successful for source removal of the residual petroleum contamination in vadose zone soils, and there have been no impacts to groundwater ~~since subsurface investigation activities began in 1992~~ at this site. Bioventing has reduced the total volume of contaminated soil from approximately 90 cubic yards to as low as 11 cubic yards. Soils contaminated with TVH and BTEX in excess of RBCA Tier 1 Levels have been reduced from about 15 cubic yards to 4 cubic yards; however, the volume of naphthalene exceeding its RBCA Tier 1 level may be slightly higher than 4 cubic yards. Although a small volume of contamination in excess of Tier 1 is still present, the remaining contamination is located and isolated in a low permeability fine-grained sediment. The contamination appears to be strongly adsorbed to the sediment in this zone. Because of the remote location and limited access of the site area, low environmental sensitivity, lack of exposure pathways, and low potential for contaminant migration, less conservative alternate threshold values could be calculated using site-specific data and applied to this site.

Physical, chemical, and historical data suggest that the residual contamination will not migrate another 30 feet to groundwater, and may not migrate much below the current depth of 21 to 22 feet bgs. The first water-bearing zone is a mixture of clay and sand. Poor recovery of the water column during groundwater sampling indicates that the hydraulic conductivity of this unit is low, and therefore, may not appreciably transmit water laterally or vertically.

Based on the assessment above, it is recommended that the UDEQ DERR close Site 4301.0 (EHDL) without further risk assessment, site investigation and active remediation. Additional benefits from further bioventing do not appear to be feasible, and it is unlikely that additional bioventing would significantly reduce the soil contamination remaining in the silt layer due to the apparent contrasting air permeability of this fine-grained layer and the sands above and below this layer (i.e., preferential air flow will occur in the more permeable sands).

Once closure of the site has been granted, the bioventing system will be dismantled and removed from the site and monitoring points will be abandoned in accordance with procedures outlined in the State of Utah Administrative Rules for Water Well Drillers, 1995 (R655-4-11.4 and R655-4-12.1 through 12.12).

SECTION 4
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APPENDIX A
CLOSURE SAMPLING AND ANALYSIS PLAN

Final
Closure Sampling and Analysis Plan for UST Site 4301.0 (EHDL), Little Mountain Test Annex, Hill AFB, Utah

Prepared For

Air Force Center for Environmental Excellence
Brooks Air Force Base, Texas

and

Directorate of Environmental Management
Hill Air Force Base, Utah

Parsons Engineering Science, Inc.

406 West South Jordan Parkway, Suite 300

South Jordan, Utah 84095

August 1996

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FINAL

Closure Sampling and Analysis Plan
for
UST Site 4301.0 (EHDL), Little Mountain Test Annex
Hill Air Force Base, Utah

Prepared for:

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Directorate of Environmental Management
Hill Air Force Base, Utah

August 1996

Parsons Engineering Science, Inc.
406 West South Jordan Parkway, Suite 300
South Jordan, Utah 84095

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SECTION 1

INTRODUCTION

This site closure sampling and analysis plan (SAP) for former underground storage tank (UST) site 4301.0 at the Hill Air Force Base (Hill AFB) Little Mountain Test Annex (LMTA) has been prepared by Parsons Engineering Science, Inc. (Parsons ES) for submittal to the Utah Department of Environmental Quality, Division of Environmental Response and Remediation (DERR). The site is referenced as ST66 under the US Air Force Installation Restoration Program Information System. The DERR identifies site 4301.0 with UST Facility Identification Number 1200268. The site was designated as Leaking UST Site EHDL (DERR identification) after the release was reported.

The objective of the site closure sampling is to document the effectiveness of soil remediation at this site and to demonstrate compliance with regulatory requirements for closure. It is anticipated that the post-remedial verification analytical results will support a no-further-action recommendation, and that the DERR will grant site closure.

During the past 4 years, Hill AFB has participated in the Air Force Bioventing Pilot Test Initiative Project. The project, sponsored by the Air Force Center for Environmental Excellence (AFCEE) at Brooks AFB, Texas, included conducting more than 135 *in situ* bioventing pilot tests at 48 Air Force installations throughout the country. These tests were designed to collect data on the effectiveness of bioventing for the remediation of soil contaminated with fuel hydrocarbons (e.g., JP-4 jet fuel, diesel fuel, gasoline, heating oil, etc.). Because of the success of bioventing at other similar sites, Hill AFB retained Dames & Moore, Inc. to install a bioventing system at site 4301.0 as described in *Corrective Action Plan for UST Site 4301 (ST66;EHDL) Little Mountain Test Annex* prepared by Dames & Moore (1994). The bioventing system began operating on 30 September 1994. A 2-year-long bioventing program was recently concluded at the site. Based on the results of this two-year program, *in situ* bioventing may have been effective enough to support closure of site 4301.0.

This SAP consists of 7 sections, including this introduction. Section 2 includes a site description, history, and summary of previous investigations and remediation activities. Section 3 summarizes applicable site closure requirements. A detailed site closure SAP is presented in Section 4. Analytical results will be presented in a site closure report as described in Section 5. Section 6 provides a proposed schedule for the completion of the described scope. Section 7 provides references cited in this SAP.

SECTION 2

SITE DESCRIPTION AND HISTORY

The LMTA is located at the southwest side of Little Mountain, in Weber County, Utah, approximately 20 miles northwest of Hill AFB. The location of the LMTA at Little Mountain is shown in Figure 2.1. Approximately 50 people are employed by the LMTA facility. Most of the facilities at LMTA are testing buildings with some offices, warehouses, and maintenance shops. Site 4301.0 is located at an elevation of approximately 4,260 feet above mean sea level (MSL). In the immediate vicinity of the LMTA are Great Salt Lake mudflats and the Ogden Bay State Waterfowl Management Area. Western Zirconium and Great Salt Lake Minerals salt extraction facilities, and small farming communities are located several miles east, northeast, and southeast of the LMTA. The mudflats adjacent to Little Mountain are at an elevation of approximately 4,205 feet MSL.

2.1 FORMER UST SITE 4301.0

Site 4301.0 is located approximately 80 feet east of building 4301, an active, electronic testing laboratory. The site location and nearby utilities are shown on Figure 2.2. A 2,000-gallon single-walled steel UST was located at site 4301.0 (Figure 2.2) and was used to store leaded and unleaded gasoline. The tank is thought to have been installed in the early 1960s. The tank was last used on 15 July 1991, and inventory and tank-tightness records indicated that the tank had not leaked. The tank had tested tight in 1990, and had a certificate of compliance at the time of the removal. The tank was removed on 30 September 1991, by D&W Construction (D&W). As the tank was uncovered, evidence for leakage was observed at the connection between the product line and the top of the tank. Soils surrounding pipe connection area contained visible petroleum product. Upon removal of the tank, a 0.25-inch-diameter hole was reportedly present on one side, and the bottom of the tank was pitted and rusted. A release was reported to the DERR by Andrew Gemperline of Hill AFB on 1 October 1991. The release is most likely the cumulative result of spills and overfills, leakage from the product line connection, and leakage from the side and possibly the bottom of the tank. Approximately 30 cubic yards of contaminated soil were excavated from the tank pit, temporarily stored at the facility, and appropriately disposed of by Hill AFB. The excavation was backfilled with clean fill material and later paved with asphalt. The area surrounding the site is paved with concrete and asphalt.

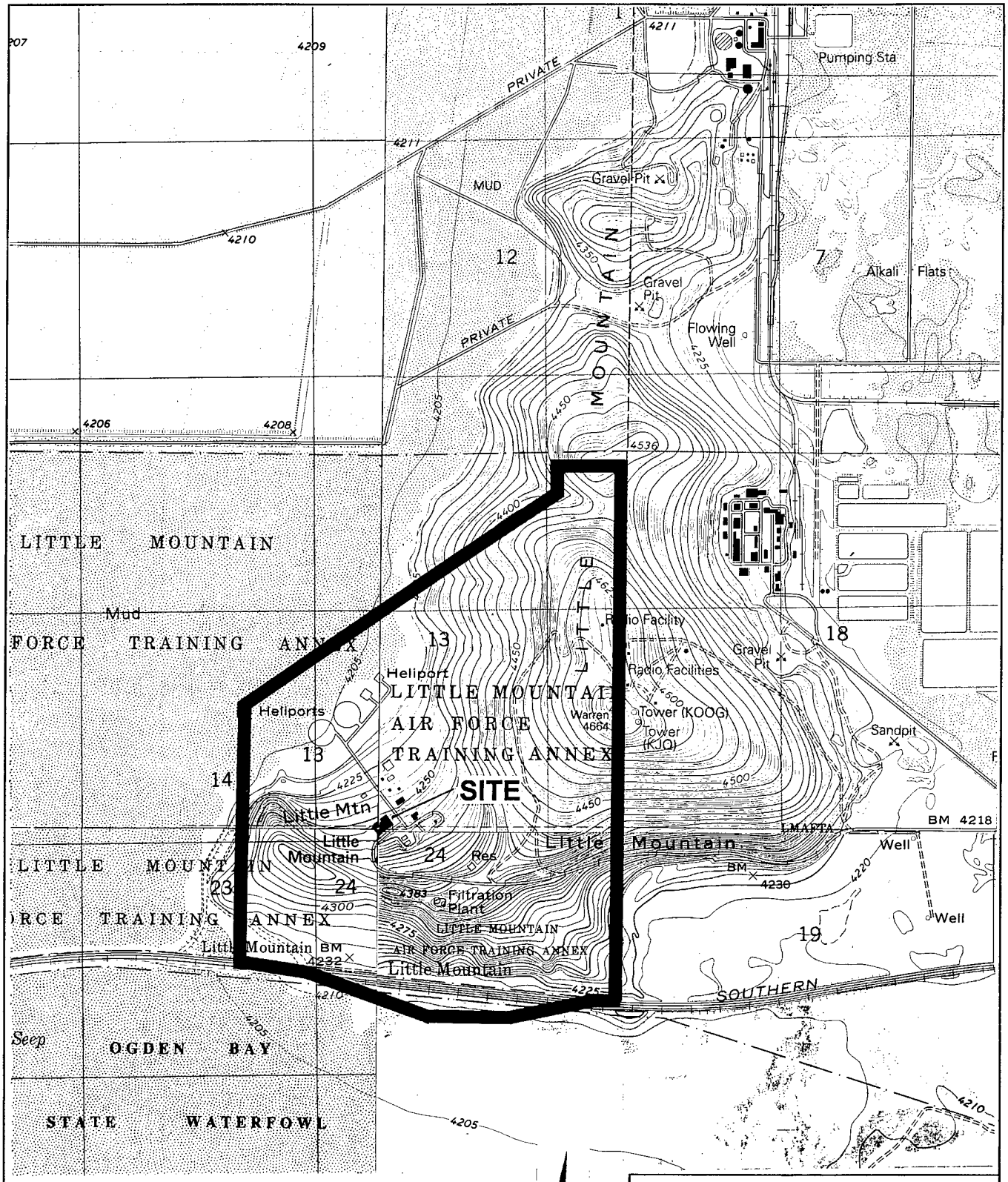

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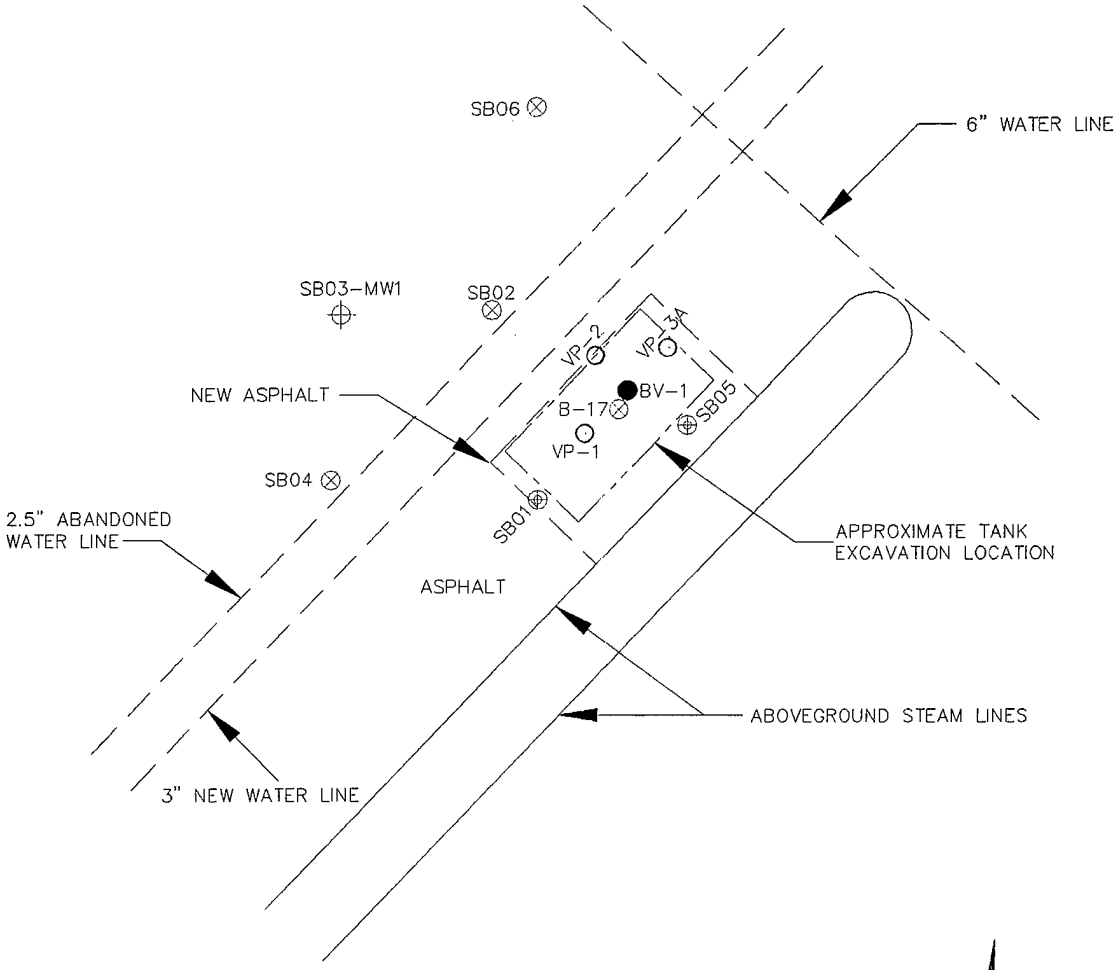
FIGURE 2.1

LOCATION MAP
SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX
HILL AIR FORCE BASE, UTAH

PARSONS ENGINEERING SCIENCE, INC.
406 W. SOUTH JORDAN PARKWAY, #300
SOUTH JORDAN, UT 84095 (801) 572-5999



LEGEND:

- ⊗ ES SOIL BORING
- ⊕ ES SOIL BORING WITH GAS MONITORING POINT
- ⊕ ES MONITORING WELL
- ● DAMES & MOORE (D&M) BIOVENT WELL
- ○ D&M VAPOR MONITORING WELL (3 PROBES PER BORING)
- ⊗ D&M SOIL BORING

NOTES:

1. SOURCE – DAMES & MOORE, 1994

0 10 20 30

SCALE: 1"=20'

FIGURE 2.2

BORING LOCATION MAP SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX
HILL AIR FORCE BASE, UTAH

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ENGINEERING SCIENCE, INC.
406 W. SOUTH JORDAN PARKWAY, #300
SOUTH JORDAN, UT 84095 (801) 572-5999

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2.2 SITE GEOLOGY

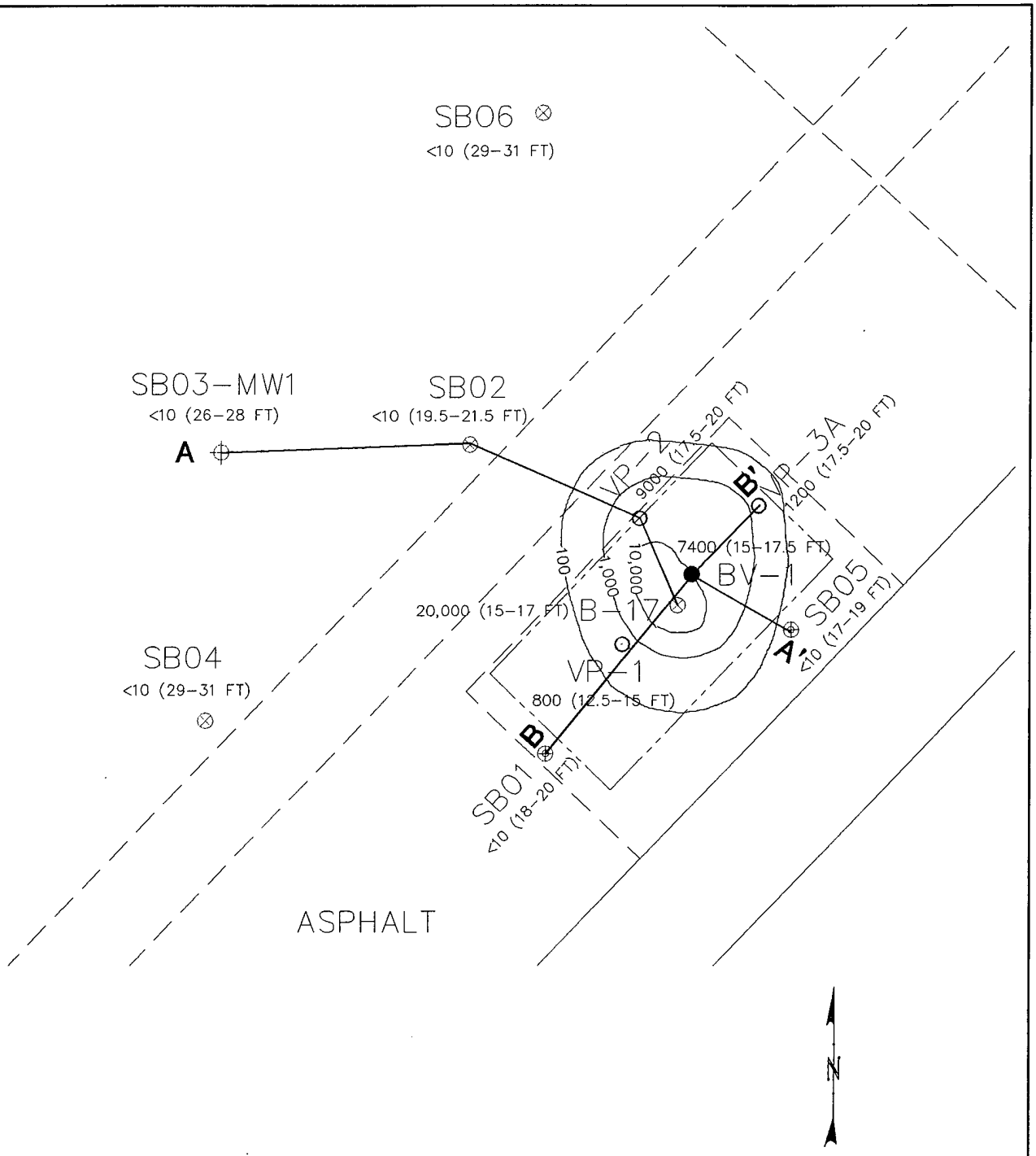
The LMTA is located at the southwest side of Little Mountain, a bedrock outlier that protrudes approximately 460 feet above the Great Salt Lake mudflats. Little Mountain consists mostly of dense Precambrian phyllite. The geologic map prepared by Davis (1983) shows that site 4301.0 is located within an embayment in Little Mountain that is covered with sands, gravels, and clays deposited by ancient Lake Bonneville.

Previous site investigation activities have encountered distinct sediment units within the first 57 feet below ground surface (bgs) as described by Engineering-Science, Inc. (ES (1992b) and Dames & Moore (1994). Figure 2.3 illustrates the locations of hydrogeologic cross section A-A' (Figure 2.4) and cross section B-B' (Figure 2.5) through site 4301.0. From just below paved surfaces to 5 feet bgs, a brown sand, gravel, and clay unit is present. From 5 feet to 10 feet bgs, the sediment is mostly olive gray clay with some silt and sand. From 10 feet to approximately 18 feet bgs, the sediment is mostly coarse dark olive sand with interbedded fine to medium sand. From 18 feet to 22 feet bgs, discontinuous lenses of mottled olive gray and white clay overlie olive gray silt. From 22 feet to 27 feet bgs, a dark olive, fine to coarse sand is present. From 27 to 29 feet bgs, a layer of brown clay is present. From 29 to 55 feet bgs, the sediments are primarily brown clay with minor thin zones of dark olive sand and dark olive phyllitic rock fragments. From 55 feet to 57 feet bgs, the clay has significant interspersed sand. This unit contains minor amounts of fine sand. Sediment permeabilities have been determined to range from 9.0×10^{-3} centimeter per second (cm/s) for fine sand to 1.4×10^{-7} cm/s for silty clayey sand, based on laboratory-conducted falling head permeability tests (ES, 1992b)

2.3 SITE HYDROGEOLOGY

One monitoring well (MW-1) was installed (ES, 1992b) to investigate the groundwater conditions at the site. Groundwater was measured at 49.39 feet bgs (elevation 4210.17 feet above MSL) on 23 June 1992 by ES (ES, 1992B) and at 49.07 feet bgs (elevation 4210.49 feet above MSL) on 9 August 1994 by Dames & Moore (1994). As part of the Dames & Moore bioventing program, the water level in MW-1 was measured monthly from March 1995 through October 1995. During this period, the water levels ranged from a low of 48.06 feet bgs (elevation 4211.52 feet above MSL) on 10 March 1995 to a high of 47.19 feet bgs (elevation 4212.39 feet above MSL) on 21 June 1995 (Dames and Moore, 1995).

Groundwater flow direction is estimated to be to the northwest beneath the facility based on slope of surface topography. Updated groundwater depth and elevation data will be included in the site closure report.



LEGEND:

<10 (18–20 FT)

DEPTH SAMPLED

MAXIMUM TPH CONCENTRATION **(MG/KG)**

100 ISO CONCENTRATION LINE **(MG/KG)**

(SEE FIGURES 2.4 & 2.5 FOR CROSS SECTIONS)

NOTES:

1. SOURCE – DAMES & MOORE, 1994

FIGURE 2.3

CROSS SECTION LOCATIONS AND MAXIMUM TPH SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX HILL AIR FORCE BASE, UTAH

PARSONS ENGINEERING SCIENCE, INC.
406 W. SOUTH JORDAN PARKWAY, #300
SOUTH JORDAN, UT 84095 (801) 572–5999

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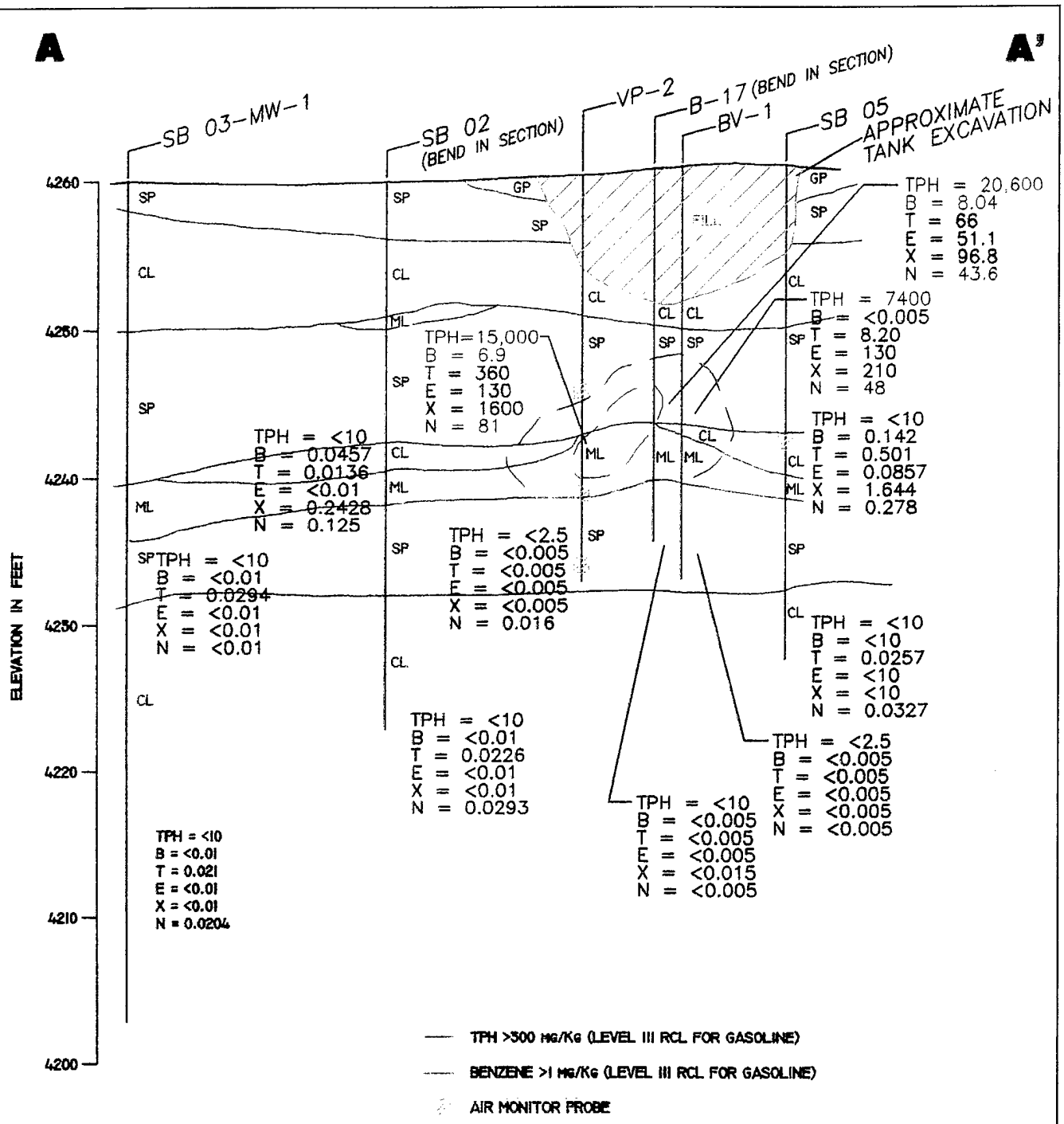

0 4 8 12

HORIZONTAL SCALE IN FEET

VERTICAL EXAGGERATION: 1.2x (APPROX)

BV-1 IS SCREENED FROM 7 FEET TO 27 FEET BGS
GROUNDWATER ELEVATION - 4211.67 FEET MSL (10/19/95)

NOTE:

1. SOURCE – DAMES & MOORE, 1994

FIGURE 2.4

CROSS SECTION A-A' SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX
HILL AIR FORCE BASE, UTAH

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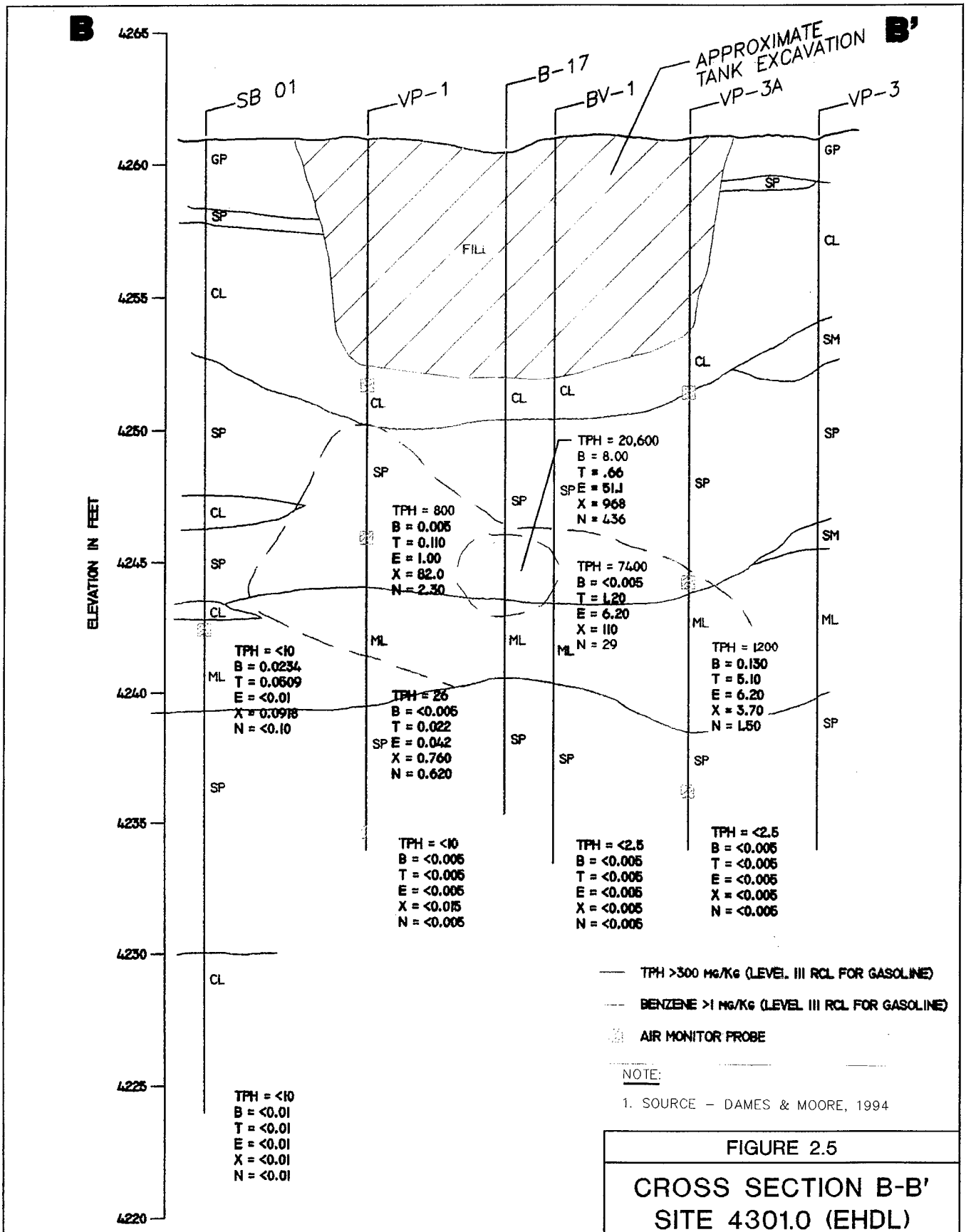

NOTE:

1. SOURCE – DAMES & MOORE, 1994

BV-1 IS SCREENED FROM 7 FEET TO 27 FEET BGS
GROUNDWATER ELEVATION - 4211.67 FEET MSL (10/19/95)

FIGURE 2.5

CROSS SECTION B-B'
SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX
HILL AIR FORCE BASE, UTAH

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2.4 PREVIOUS INVESTIGATIONS AT SITE 4301.0

2.4.1 UST REMOVAL: 1991

The 2,000-gallon fuel tank was excavated and removed in 30 September 1991 by D&W Construction (D&W) and the required UST Closure Notice (US Air Force, 1991) was submitted to the DERR. Four soil samples were collected from the tank excavation at the time of the removal (Dames and Moore, 1994). Two samples were collected by D&W personnel on 30 September 1991 and two additional samples were collected by Hill AFB personnel on 1 October 1991 (Dames & Moore, 1994). The two D&W soil samples (#1 from the northeast end of the tank and #2 from the southwest end of the tank) were collected from each end of the tank pit and from depths of 2 feet below the tank pit fill material and native soil interface (Dames & Moore, 1994). The two samples collected from the tank pit by Hill AFB personnel were labeled NWC (northwest corner) and SWC (southwest corner). The samples were analyzed for total petroleum hydrocarbons (TPH) by US Environmental Protection Agency (USEPA) Method 8015 Modified and benzene, toluene, ethylbenzene, and xylenes (BTEX) by Method SW8020. The Hill AFB samples also were analyzed for total lead. The sample collected by D&W from the northeast end of the tank pit contained no contamination. The sample collected by D&W from the southwest end of the tank pit had a TPH concentration of 4,800 milligrams per kilogram (mg/kg) and BTEX concentrations of 5.16 mg/kg benzene, 171 mg/kg toluene. 51 mg/kg ethylbenzene, and 723 mg/kg xylenes. Hill AFB sample SWC had a TPH concentration of 1,173.34 mg/kg and BTEX and total lead concentrations of <0.2 mg/kg benzene, 2.9 mg/kg toluene, 1.1 mg/kg ethylbenzene, 82.2 mg/kg xylenes, and 50 mg/kg total lead (Dames & Moore, 1994). Hill AFB sample NWC had a TPH concentration of 604.49 mg/kg and BTEX and total lead concentrations of 0.8 mg/kg benzene, 76.4 mg/kg toluene, 40.2 mg/kg ethylbenzene, 254.5 mg/kg xylenes, and 12 mg/kg total lead (Dames & Moore, 1994). The excavation was filled with clean fill material and later paved with asphalt.

2.4.2 ABATEMENT AND INITIAL SITE CHARACTERIZATION REPORT: 1992

An abatement and initial site characterization report was prepared by ES (1992a) in response to the Phase I reporting schedule issued to Hill AFB by the DERR. The document provides a site description, environmental sensitivity information, a description of the nature of the release, initial abatement measures performed, contamination removal, a discussion on sample quality assurance and quality control (QA/QC), conclusions, and recommendations that a subsurface investigation be performed. Refer to the ES (1992a) report for detailed abatement and initial site characterization information.

2.4.3 SUBSURFACE INVESTIGATION: 1992

A subsurface investigation was performed and subsequent report prepared in 1992 by ES (1992b). Six soil borings were drilled around the former UST excavation to investigate the horizontal and vertical extent of potential petroleum contamination in the tank pit area, as shown on Figure 2.3. One soil boring was deepened and converted to monitoring well MW-1. Soil vapor monitoring probes were placed in two soil borings (SB01 and SB05). A total of 11 soil samples were collected from the six soil borings and analyzed for TPH, BTEX, naphthalene (N), and lead. TPH concentrations were less than the detection limit of 10 mg/kg in all 11 soil samples. The greatest concentrations of BTEXN were reported in the soil sample from SB05 from the interval at 17.0 feet to 19.0 feet bgs. Boring SB05 is located near the center of the southeastern side of the UST excavation. Sample SB05 (17-19 feet bgs) contained 0.142 mg/kg benzene, 0.5010 mg/kg toluene, 0.0857 mg/kg ethylbenzene, 1.644 mg/kg total xylenes, and 0.278 mg/kg naphthalene. The greatest concentration of total lead was 12.1 mg/kg in SB01 (35-37 feet bgs). The groundwater sample from MW-1 had concentrations of less that 1 mg/L TPH and less than 0.001 milligrams per liter (mg/L) for each BTEXN constituent. Because of potential sparking and explosion hazards from steel drill augers grinding against hard gravel and igniting gasoline vapors, ES (1992b) did not drill directly in the suspected area of highest probable gasoline contamination, but drilled approximately 5 feet away based on knowledge of the site at that time.

2.4.4 SUBSURFACE INVESTIGATION: 1993

Dames & Moore (1994) drilled one boring (B-17) in the center of the former tank pit excavation (Figure 2.3) in October 1993 as part of an aboveground storage tank and UST investigation conducted at the LMTA and Hill AFB. Two soil samples were collected from depths of 15 feet to 17 feet bgs and 23 feet to 25 feet bgs. Sample B-17 (15-17 feet bgs) had the following contaminant concentrations: 20,600 mg/kg TPH, 8.04 mg/kg benzene, 66.0 mg/kg toluene, 51.1 mg/kg ethylbenzene, 968.0 mg/kg total xylenes, and 43.6 mg/kg naphthalene. The deeper sample, B-17 (23-25 feet bgs) did not have detectable concentrations of TPH or BTEXN. The samples were not analyzed for lead. Additional information about this investigation is provided in the Dames & Moore, (1994) report.

2.4.5 CORRECTIVE ACTION PLAN AND SUBSURFACE INVESTIGATION REPORT: 1994

In 1994, five soil borings (Figure 2.2) were drilled by Dames & Moore (1994) within and adjacent to boundaries of the former tank pit. One of the five borings was abandoned (4301-VP-3), one soil boring (4301-BV-1) was converted to an air injection well, and the remaining three soil borings (4301-VP-1, VP-2, and VP-3A) were converted to soil vapor monitoring points. Soil samples from four of the five soil borings were analyzed for

TPH, BTEXN, total lead, and total organic carbon (TOC). A total of 10 soil samples were collected from the four borings. The greatest concentrations of TPH and BTEXN were from 4301-VP-2 (17.5-20 feet bgs dup), which included 19,000 mg/kg TPH (gasoline), 22 mg/kg benzene, 470 mg/kg toluene, 190 mg/kg ethylbenzene, 1,900 mg/ kg xylenes, and 96 mg/kg naphthalene. The greatest concentration of TOC was 30.5 mg/kg from 4301-BV-1 (15-17.5 feet bgs). Lead concentrations ranged from 9.g mg/kg in 4301-VP-3A (25-27 feet bgs) to 30 mg/kg in 4301-VP-2 (17.5-20 feet bgs). The toxicity characteristic leaching procedure leachate from sample 4301-BV-1 (15-17.5 feet bgs) was analyzed for metals, semivolatiles, and volatiles. All constituents were below method detection limits. Petroleum hydrocarbons were not detected in a groundwater sample collected from monitoring well MW-1. The above information and initial bioventing respiration test data were reported in the *Corrective Action Plan for UST Site 4301 (ST66;EHDL) Little Mountain Test Annex* (Dames & Moore, 1994). Figure 2.3 shows the locations of geologic cross sections A-A' (Figure 2.4) and B-B' (Figure 2.5) through the tank pit area. These cross sections illustrate the distribution of the petroleum contamination.

2.4.6 BIOVENTING: 1994-1996

Petroleum hydrocarbons were found in subsurface soils within and adjacent to the former tank pit. The hydrocarbons were present as vapor in pore spaces and as liquid adsorbed to soil particles. The extent of hydrocarbons adsorbed to soils was defined both vertically and horizontally by the above investigations. The vertical extent of detectable hydrocarbons was from the bottom of the former tank pit excavation at about 10 feet bgs, to about 22 feet bgs, based on the elevated concentrations of total volatile hydrocarbon (TVH) detected during field screening with a photoionization detector (PID) and laboratory analysis, as shown in cross sections A-A' and B-B' (Figures 2.4 and 2.5). The horizontal extent was approximately 16 feet in diameter, centered beneath the former UST, at a depth of about 10 feet to 25 feet bgs. Dames & Moore (1994) calculated the volume of impacted soils to be about 90 cubic yards and the volume of soils exceeding the DERR recommended clean-up level (RCL) goals established by the DERR (1990) for soils to be about 1.6 cubic yards. The RCLs for gasoline-contaminated soils at an environmental sensitivity Level III site were 300 mg/kg TPH, 1.00 mg/kg benzene, 900 mg/kg toluene, 600 mg/kg ethylbenzene, 10,000 mg/kg total xylenes, and 1,000 mg/kg lead (DERR, 1990).

As stated above, Dames & Moore (1994) installed one air injection well (4301-BV-1) and three soil vapor monitoring wells (4301-VP-1, VP-2, and VP-3A). The locations of these wells are shown in Figure 2.3. The 2-inch diameter air injection well was completed at a depth of 27.5 feet bgs and screened between 7 feet and 27 feet bgs. The soil vapor monitoring wells were each completed at the depth of 27 feet bgs. Three vapor monitoring probes were installed in each vapor monitoring well. The bioventing system design criteria and construction details for the blower and ancillary equipment are provided by Dames & Moore (1994).

The bioventing system operated continuously from 30 September 1994 to March 1996. Air was injected continuously at a flow rate of 20 to 30 cubic feet per minute (cfm) into the vent well (4301-BV-1). Respiration tests were conducted semi-annually to determine oxygen utilization rates and to assess the performance of the bioventing system. Also, soil gas sampling was conducted using portable field instruments on a monthly basis during system operation to determine the long-term extent of oxygen influence in soils at site 4301.0. No laboratory analytical soil or soil gas sampling was conducted following system startup.

Initial respiration tests were conducted in July 1994. Oxygen utilization rates of 0.73 to 1 percent oxygen per day were observed, which correspond to hydrocarbon biodegradation rates of 0.58 to 0.80 mg of TPH per kg of soil per day. These rates are very low compared to rates typically observed at gasoline spill sites, which may be attributed to the small volume of contaminated soil at the site. Oxygen may be diffusing in from nearby unimpacted soils, masking higher biodegradation rates occurring in contaminated soils. In a respiration test performed at site 4301.0 in September 1995, oxygen utilization rates ranged from 0.13 to 0.65 percent per day. In general, oxygen utilization rates are decreasing over time. Available respiration data is included in Appendix A.

Monthly soil gas monitoring conducted by Dames and Moore demonstrated that full-scale treatment has been achieved by the bioventing system. Soil gas samples collected during these monthly efforts were analyzed in the field for oxygen and carbon dioxide using a portable oxygen/carbon dioxide meter, and for TVH using a hydrocarbon analyzer. The samples were collected during active venting. Oxygen concentrations exceeded 18 percent in all montoring points during almost every sampling event, indicating that the entire volume of contaminated soil was being oxygenated. Although no monitoring point screens were installed discretely in the clay and silt layers, these layers are thought to be thin enough (1.5 to 5 feet) to be entirely oxygenated via diffusion from the sand layers. TVH concentrations dropped from levels as high as 10,000 parts per million, volume per volume (ppmv) in December 1994 to non-detect levels in March 1996.

The downgradient groundwater monitoring well installed by ES (1992b) was also sampled during the semi-annual respiration testing. A summary table of the groundwater analytical results is provided in Appendix A. The sampling results indicate that groundwater has not been impacted by the petroleum release.

Because of the relatively small volume of petroleum-contaminated soil, the relatively high permeabilities of the sandy sediments, and apparent biological activity and decreases in TVH indicated by the respiration test results, it is expected that the former gasoline UST site has been remediated to within DERR risk-based corrective action Tier 1 screening levels. Therefore, it is anticipated that the results of the site post-remedial verification soil sampling described in Section 4 will support site closure.

SECTION 3

SITE CLOSURE REQUIREMENTS

The Utah Department of Environmental Quality, Division of Environmental Response and Remediation (DERR) requires that a post-remedial verification report be prepared after corrective action at a site has been completed. This verification report documents the effectiveness of the corrective action, which at site 4301.0 was bioventing. The DERR (1995) has released *Draft Guidelines for Utah's Tier 1 Risk-Based Corrective Action: Utah's Guide for Screening Petroleum-Contaminated Sites* to assist owners/operators and the DERR in closing UST sites that do not pose a significant risk to public health and the environment. Parsons ES and Hill AFB request that the draft Tier 1 petroleum constituent screening levels for TPH-gasoline and BTEXN in soil and groundwater be applied to close site 4301.0. Lead is not a constituent of concern in the draft guidelines.

3.1 POST-REMEDIAL VERIFICATION REQUIREMENTS

Specific post-remedial verification requirements have not been established by the DERR and are proposed to the agency on a case-by-case basis. Therefore, the DERR project manager for site 4301.0 was contacted in July 1996 to determine the appropriate course of action. The extent and findings of the work performed to dated were briefly described and a proposed subsurface investigation plan for closure sampling was explained to the DERR project manager. The proposed subsurface investigation sampling activities are focused in the immediate area of the former tank pit, and are designed to verify the concentrations of petroleum constituents, if any, remaining in the previously identified area of soil contamination and to verify the absence of petroleum constituents in MW-1. The DERR project manager gave tentative approval of the proposed investigative approach, pending review and approval of this closure SAP. The proposed post-removal verification activities are described in Section 4.

3.2 TIER 1 SOIL SCREENING LEVELS

Tier 1 soil and groundwater screening levels for petroleum-impacted UST sites are presented in Section II of *Draft Guidelines for Utah's Tier 1 Risk-Based Corrective Action: Utah's Guide for Screening Petroleum-Contaminated Sites (1995)* and are summarized in Table 3.1.

TABLE 3.1

DERR TIER 1 SCREENING LEVELS

Constituent	Analytical Method (USEPA, 1984)	Tier 1 Screening Level Groundwater (mg/L)	Tier 1 Screening Level Soil (mg/kg)
Benzene*	602/8020	0.3	0.9
Toluene*	602/8020	7	61
Ethylbenzene*	602/8020	4	23
Xylenes*	602/8020	73	235
Naphthalene*	602/8020	0.1	10
Total Petroleum Hydrocarbons (TPH) as gasoline**	8015, mod.	10	1500
Total Petroleum Hydrocarbons (TPH) as diesel**	8015, mod.	10	5000
Oil and Grease or Total Recoverable Petroleum Hydrocarbons (TRPH) **	413.1 or 418.1	10	10000

Source: DERR,1995
Note: Lead is not a constituent of concern in Tier I screening.
* risk-based
** non-risk-based
mg/L milligrams per liter
mg/kg milligrams per kilogram

SECTION 4

SITE CLOSURE SAMPLING AND ANALYSIS PLAN

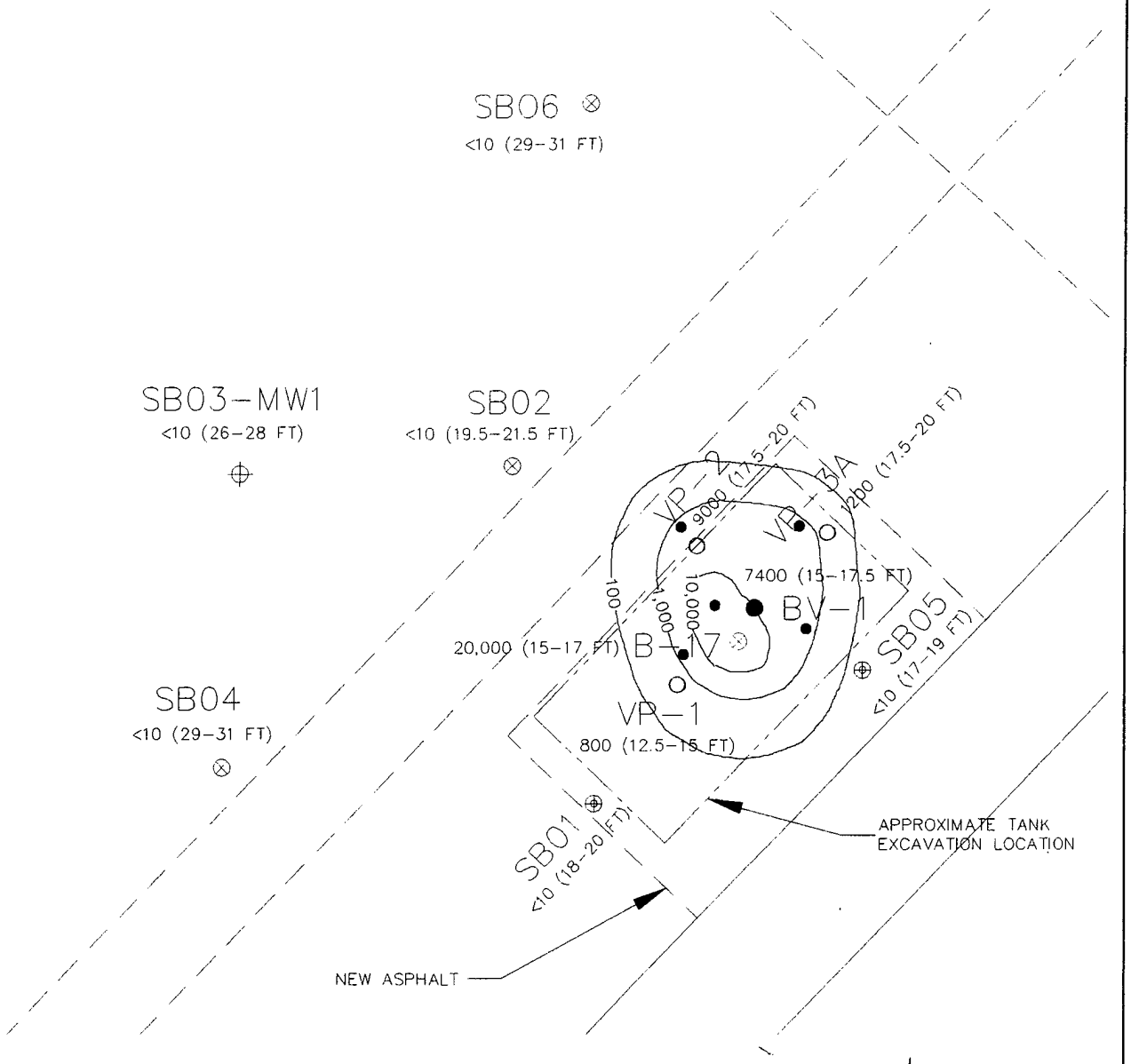
The following SAP describes the borehole locations and sampling depths, soil sampling procedures, and analytical methods proposed to collect sufficient data to support closure of site 4301.0. The verification activities will be conducted using sampling protocols established by *Sampling Procedures and Requirements for UST Sites* (DERR, 1996). This plan has been prepared and will be implemented by, or under the direct supervision of, a Utah certified UST consultant as required under Utah Rule 311-201-2. Soil and groundwater sampling also will be performed by a Utah-certified groundwater and soil sampler as required under Utah Rule 311-201-2.

4.1 SITE CLOSURE BOREHOLE LOCATIONS AND SAMPLING DEPTHS

As described in Section 2, this site has been adequately characterized during previous investigations (ES, 1992a, 1992b; Dames & Moore, 1994). Soil contamination was limited to the immediate vicinity of the former tank in a circular zone, approximately 16 feet in diameter, that extends from about 10 feet bgs to 25 feet bgs. Groundwater is present at approximately 49 feet bgs at the site.

To confirm that the petroleum contamination has been remediated to within acceptable Tier 1 screening levels, Parsons ES proposes to drill and sample five additional boreholes at site 4301.0. Proposed borehole locations are shown on Figure 4.1. One borehole will be drilled through the center of the former tank bed, approximately half way between B-17 and VP-2 and 5 feet from the vent well BV-1 (see Figure 4.1). This location corresponds to the approximate center of the highest benzene concentrations identified during the 1994 investigation. The other four borings will be located as shown in Figure 4.1. The maximum depth of the borings is estimated to 30 feet bgs.

The boreholes will be sampled at 5-foot intervals from a depth of 10 feet bgs (approximate bottom of former tank pit) to 30 feet bgs. All samples will be logged and field screened for evidence of contamination (e.g., odor or staining), and total volatile hydrocarbons using a PID. Samples for chemical analysis typically will be collected at 10 feet, 15 feet, and 25 feet bgs. Additional samples will be collected through these intervals if contamination is suspected or detected. If contamination is detected (by field



LEGEND:

- ● PROPOSED LOCATION
- <10 (18-20 FT) — DEPTH SAMPLED
- MAXIMUM TPH CONCENTRATION (MG/KG)
- 100 — ISO CONCENTRATION LINE (MG/KG)

NOTES:

1. SOURCE – DAMES & MOORE, 1994

FIGURE 4.1

PROPOSED VERIFICATION BORING LOCATIONS SITE 4301.0 (EHDL)

LITTLE MOUNTAIN TEST ANNEX HILL AIR FORCE BASE, UTAH

PARSONS ENGINEERING SCIENCE, INC.
406 W. SOUTH JORDAN PARKWAY, #300
SOUTH JORDAN, UT 84095 (801) 572-5999

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screening) at the 30-foot depth, a sample will be collected, and the boring advanced to the depth of 35 feet to confirm non-detect field screening results. The three most contaminated samples will be selected for laboratory chemical analysis from each boring based on PID field screening results. Boreholes will be logged by a Parsons ES geologist. Soil types will be classified according to the Unified Soil Classification System (USCS) and described in accordance with the standard Parsons ES soil description format. The new soil borings will be located by taping from existing soil borings.

The existing monitoring well MW-1 will be sampled to confirm the absence of petroleum in the groundwater beneath the site.

Soil and groundwater samples will be collected and analyzed as described in Subsections 4.2, 4.3, and 4.4.

4.2 DRILLING, SAMPLING, AND EQUIPMENT DECONTAMINATION

Investigation-derived waste (IDW) will be managed in accordance with the *Final Hill AFB Basewide Investigation-Derived Waste Work Plan* (Radian, 1995). Potentially contaminated soil cuttings generated during drilling will be placed in US Department of Transportation-approved 55-gallon drums. An appropriate Hill AFB Environmental Management (EM) Identification Number and EM label will be obtained. The drums will be labeled with the site name, drilling date, borehole number, and depth intervals. To minimize cuttings disposal costs, cuttings showing no field evidence of contamination will not be drummed with contaminated cuttings (i.e., soil with above-background PID readings, petroleum odor, or discoloration). The cuttings showing no field evidence of contamination will remain at LMTA and be spread out as close to the borehole locations as possible. The drummed soil cuttings will be transported to Hill AFB and temporarily stored in an area designated by Hill AFB environmental management personnel. Hill AFB will be responsible for disposal of the soil cuttings. The five soil borings will be backfilled with bentonite grout from the bottom of the boreholes to within 0.5 foot of ground surface. A concrete surface seal will be placed from 0.5 foot to ground surface.

Before use and between boreholes, augers and other downhole equipment will be cleaned to prevent cross-contamination. Cleaning will be accomplished using a high-pressure hot-water wash, followed by a potable water rinse. Decontamination fluids will be collected and contained in labeled 55-gallon drums. A temporary decontamination pad will be constructed using 20 mil plastic sheeting that is bermed to prevent run-off. Decontamination fluids will be transported to Hill AFB for disposal according to the IDW work plan (Radian, 1995).

Boreholes will be advanced using a drill rig equipped with 6-inch outside-diameter (OD) hollow-stem augers. Relatively undisturbed soil samples, suitable for chemical analysis, will be collected in a 2-inch inside-diameter (ID) split-barrel sampler that will

be lowered through the hollow stem of the augers and driven approximately 1.5 feet into undisturbed soil, ahead of the augers. Between sampling events, the split-barrel sampler will be decontaminated with a phosphate-free detergent and potable water solution, followed by successive potable and distilled water rinses.

The split-barrel sampler will be fitted with three precleaned, 2-inch-OD by 6-inch-long, thin-walled, brass sleeves. Before samples are collected, sample sleeves will be decontaminated using the same procedure as that for the split-barrel sampler. After collection of a sample, the sampler will be retrieved, split apart, and the sleeves will be removed. The ends of the bottom sleeve that contains the sample for chemical analysis will be covered with Teflon™ sheets and plastic end caps.

The upper sample sleeves will be used for logging purposes, and will be screened in the field for organic vapors using a PID. The data obtained from the logging and screening will be recorded on the borehole logs.

Each sample will be assigned a unique identifying number. Duplicate soil samples also will be collected for QA/QC purposes and assigned a unique identifying number different from the original sample but in series. The sleeves for chemical analysis will be labeled with the site name and borehole number, sample depth, date of collection, project name, and other pertinent data. These sleeves will be placed immediately in an insulated shipping container with ice, and will be maintained in a chilled condition (4 degrees centigrade) until delivered to the analytical laboratory. An equipment rinseate blank will be collected for analysis. Trip blanks will be obtained from the laboratory and will accompany the samples from the field to the laboratory. Chain-of-custody records will be prepared in the field and also will accompany the samples to the analytical laboratory.

4.3 GROUNDWATER SAMPLING

Groundwater sampling will be performed immediately after purging the static water in the monitoring well. The well will be purged of at least one borehole volume of water before sampling until temperature, pH, and specific conductance stabilize within 10 percent for three consecutive bailer volumes or until the well is purged dry. Groundwater samples will be collected from the monitoring well using a new Teflon™ bailer. The bailer will be decontaminated prior to taking the samples. Each sample will be assigned a unique identifying number. A duplicate water sample from the well also will be collected for QA/QC purposes and assigned a unique identifying number different from the original sample but in series. Samples will be transferred from the bailer into clean sample bottles containing necessary preservatives as prepared by the laboratory (hydrochloric acid for volatile organics). Samples will be labeled, packed on ice, and transported to the laboratory under standard chain-of-custody procedures. A trip blank, prepared by the laboratory, will accompany the sample containers to the site, handled as a sample, and then be returned to the laboratory with the water samples. In addition, a bailer rinseate blank will also be submitted for analysis. Purge water will be contained in a 55-gallon

drum. Purge and decontamination water will be transported to Hill AFB for storage pending receipt of the analytical results. Hill AFB will be responsible for disposal of the water. Disposal of water will be a the in accordance with the IDW work plan (Radian, 1995)

4.4 SOIL SAMPLE AND GROUNDWATER ANALYSIS

Proposed sample analytical methods and detection limits are presented in Table 4.1. Parsons ES will analyze soil and groundwater samples from site 4301.0 by USEPA Method SW8015 modified for TPH-gasoline and by USEPA Method SW8020 for BTEXN. All samples will be analyzed by a Utah-certified and AFCEE-approved laboratory.

TABLE 4.1

PROPOSED SOIL AND GROUNDWATER ANALYTICAL METHODS AND PRACTICAL QUANTITATION LIMITS

Analytical Method	Soil PQL (mg/kg)	Water PQL (ug/L)
EPA SW8015 Modified for Gasoline	10	0.5
EPA SW8020		
Benzene	0.005	0.002
Toluene	0.005	0.002
Ethylbenzene	0.005	0.002
Xylenes	0.005	0.002
Naphthalene	0.005	0.002

PQL = practical quantitation limit

mg/kg = milligrams per kilogram

ug/L = micrograms per liter

SECTION 5

SITE CLOSURE REPORT FORMAT

Following receipt of the laboratory analytical results, the results will be compared to the DERR (1995) Tier 1 screening levels listed in Table 3.1. If all analytical results are equal to or less than the respective Tier 1 criteria, a site closure report will be prepared and submitted to the Utah DERR, Hill AFB, and AFCEE.

The report will contain the following information for each site:

- Plot plans showing final borehole locations;
- Summary of field activities;
- Assessment of analytical results in comparison to state cleanup criteria;
- Laboratory analytical reports and chain-of-custody forms;
- Borehole logs; and
- Conclusions and recommendations for site closure.

The report will be prepared and signed by a Utah certified UST consultant.

In the unlikely event that analytical results from post-remediation sampling exceed the Tier 1 screening levels, the bioventing system should be operated by Hill AFB for a period of time sufficient to reduce soil contamination to the Tier 1 levels. The duration of this operating period will be calculated based on the rate and degree of contaminant mass removal achieved during the past 2-year bioventing period.

SECTION 6

SCHEDULE

A proposed schedule for field activities and report deliverables discussed in this closure SAP is presented in Table 6.1. Parsons ES will submit a draft and final for this closure SAP and the site post-remedial verification report.

TABLE 6.1

PROPOSED SCHEDULE

SITE 4301.0

SITE CLOSURE INVESTIGATION

ACTIVITY	START DATE	END DATE
Submit Draft Closure SAP to Air Force		5 Aug 96
Air Force Review	5 Aug 96	19 Aug 96
Prepare Draft Final Closure SAP	20 Aug 96	27 Aug 96
Submit Draft Final Closure SAP to Air Force		28 Aug 96
Air Force Review	28 Aug 96	4 Sep 96
Submit Final Closure SAP to DERR and Air Force		6 Sep 96
DERR Review and Response	6 Sep 96	4 Oct 96
Field Investigation (soil and groundwater)	14 Oct 96	18 Oct 96
Prepare Post-Remedial Verification Report	19 Oct 96	8 Nov 96
Submit Draft Verification Report to Air Force		9 Nov 96
Air Force Review	9 Nov 96	22 Nov 96
Prepare Final Verification Report	23 Nov 96	6 Dec 96
Submit Final Verification Report to Air Force		7 Dec 96
Submit Final Verification Report to DERR		13 Dec 96

SECTION 7

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SOIL-GAS DATA

HILL AIR FORCE BASE, UTAH
FIRST SEMI-ANNUAL RESPIRATION TEST RESULTS
Site 4301

Time (Hours:Minutes)	VP-1-10'			VP-1-15'			VP-1-25'		
	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
0:00	21.00	2.00	0.50	21.00	0.25	4.00	21.00	0.00	6.40
2:00	21.00	0.00	3.50	21.00	0.25	10.50	21.00	0.00	9.30
3:50	21.00	0.00	4.60	20.50	0.25	23.40	21.00	0.00	21.00
5:45	20.50	0.00	3.50	20.50	0.25	10.50	20.50	0.00	14.00
27:45	20.50	0.00	3.50	19.50	0.25	21.00	20.00	0.00	45.60
244:31	15.00	0.50	1.10	13.00	1.00	5.80	13.00	0.75	12.80
312:30	18.00	0.75	1.10	14.00	1.25	7.00	12.50	0.75	14.00

Time (Hours:Minutes)	VP-2-14'			VP-2-21'			VP-2-26'		
	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
0:00	21.00	0.00	0.50	18.00	0.75	1000.00	21.00	0.00	43.20
2:00	21.00	0.00	3.50	17.00	2.00	1000.00	20.50	0.00	30.40
3:50	21.00	0.00	4.60	17.50	2.00	920.00	20.50	0.00	57.30
5:45	20.50	0.00	4.60	18.00	1.50	767.00	20.50	0.00	70.20
27:45	20.00	0.00	4.60	16.50	2.00	610.00	20.50	0.00	33.90
244:31	18.50	0.50	0.50	9.00	2.50	5.75	13.00	0.25	17.50
312:30	18.50	0.50	1.10	10.00	2.50	5.50	13.00	0.50	8.10

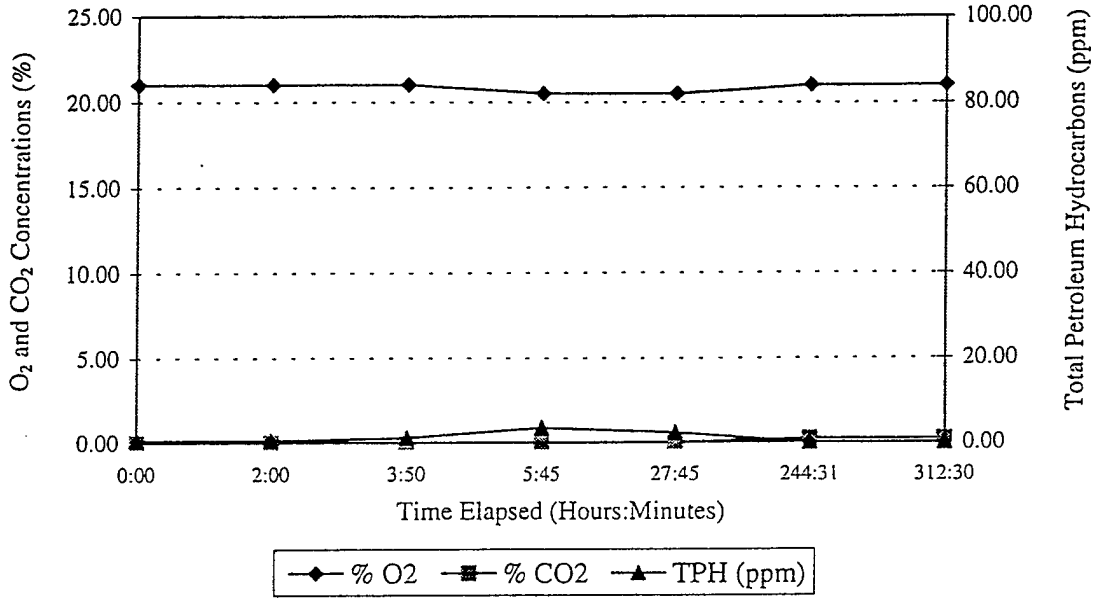
Time (Hours:Minutes)	VP-3-9'			VP-3-16'			VP-3-24'		
	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
0:00	20.50	0.00	5.80	20.50	0.00	3.50	19.50	0.75	16.70
2:00	20.50	0.00	70.20	20.50	0.00	14.00	19.00	0.75	22.20
3:50	20.50	0.00	10.50	20.50	0.00	15.20	19.00	0.75	18.70
5:45	20.50	0.00	4.60	20.50	0.00	21.00	19.00	0.75	12.80
27:45	20.50	0.00	5.80	20.00	0.00	9.30	19.00	0.75	12.80
244:31	19.50	0.25	7.00	15.00	0.25	4.60	13.50	1.25	8.10
312:30	19.50	0.25	1.10	15.00	0.25	3.50	15.50	1.00	8.10

HILL AIR FORCE BASE
Site 4301 (LMTA)
In-Situ Respiration Test Data
September 1994

HILL AIR FORCE BASE, UTAH
FIRST SEMI-ANNUAL RESPIRATION TEST RESULTS
Site 4301

Time (Hours:Minutes)	BV		
	% O_2	% CO_2	TPH (ppm)
0:00	21.00	0.00	0.50
2:00	21.00	0.00	0.50
3:50	21.00	0.00	1.10
5:45	20.50	0.00	3.50
27:45	20.50	0.00	2.30
244:31	21.00	0.25	0.00
312:30	21.00	0.25	0.00

4301-AI



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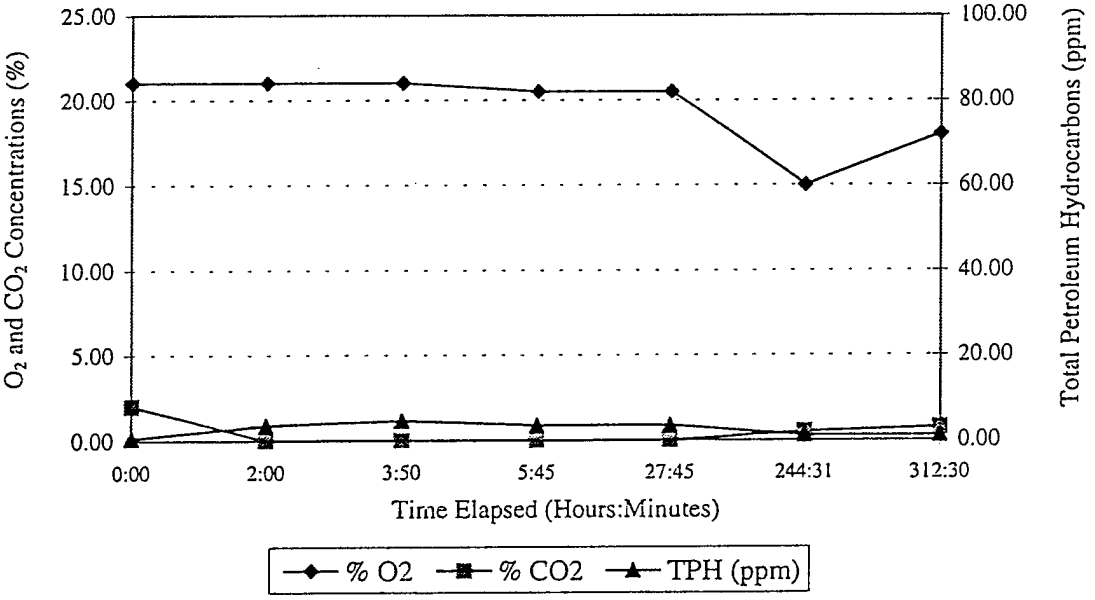

HILL AIR FORCE BASE
Site 4301
IN-SITU RESPIRATION TEST RESULTS

September 1994

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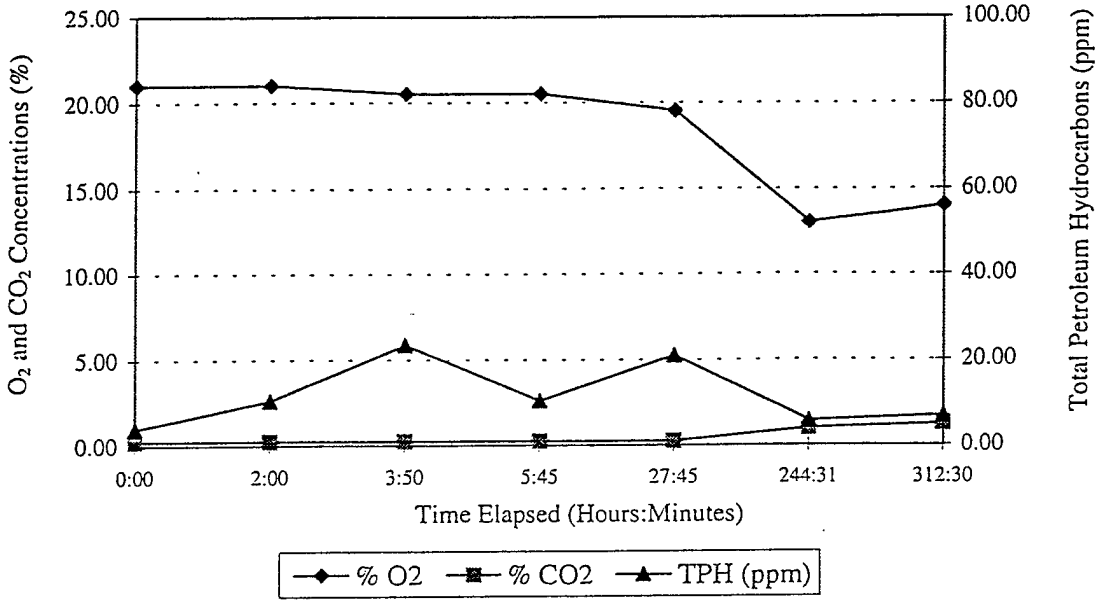
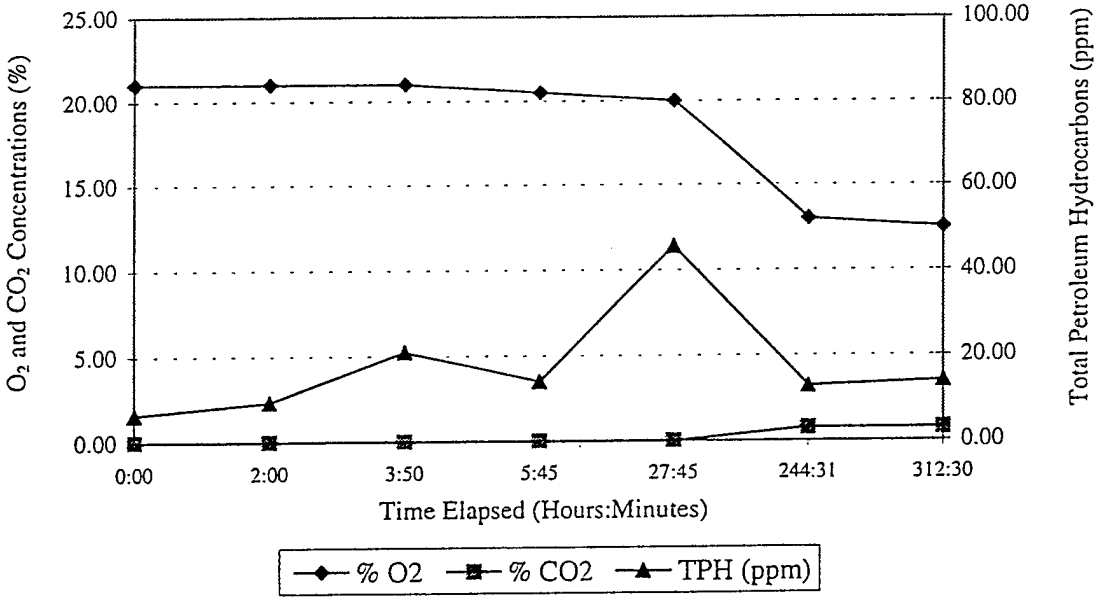


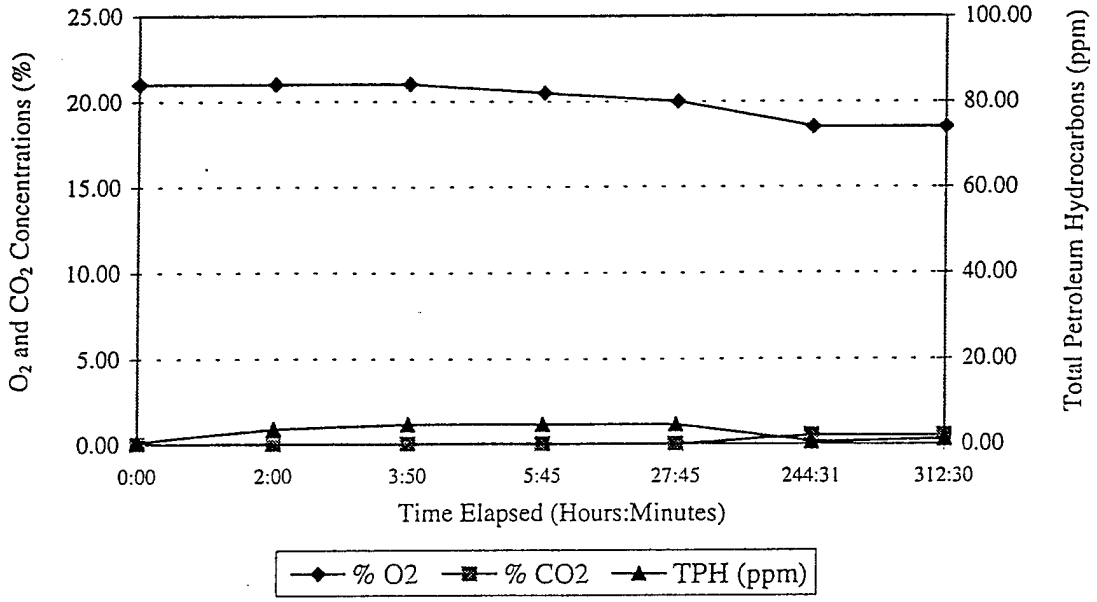
4301-VP-1-25'



HILL AIR FORCE BASE
Site 4301
IN-SITU RESPIRATION TEST RESULTS

September 1994

4301-VP-2-14'



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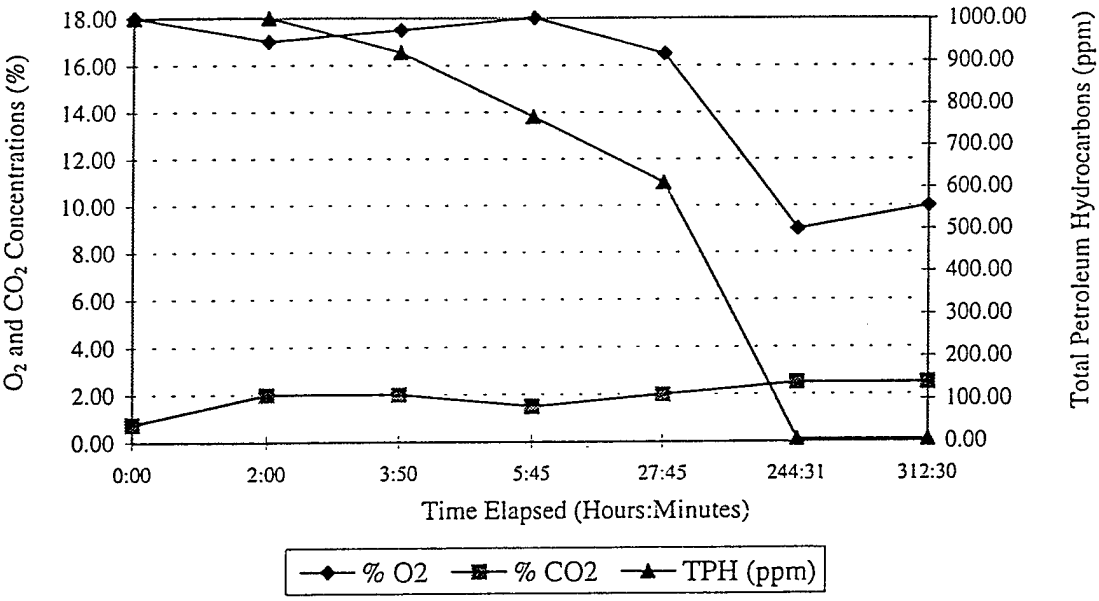
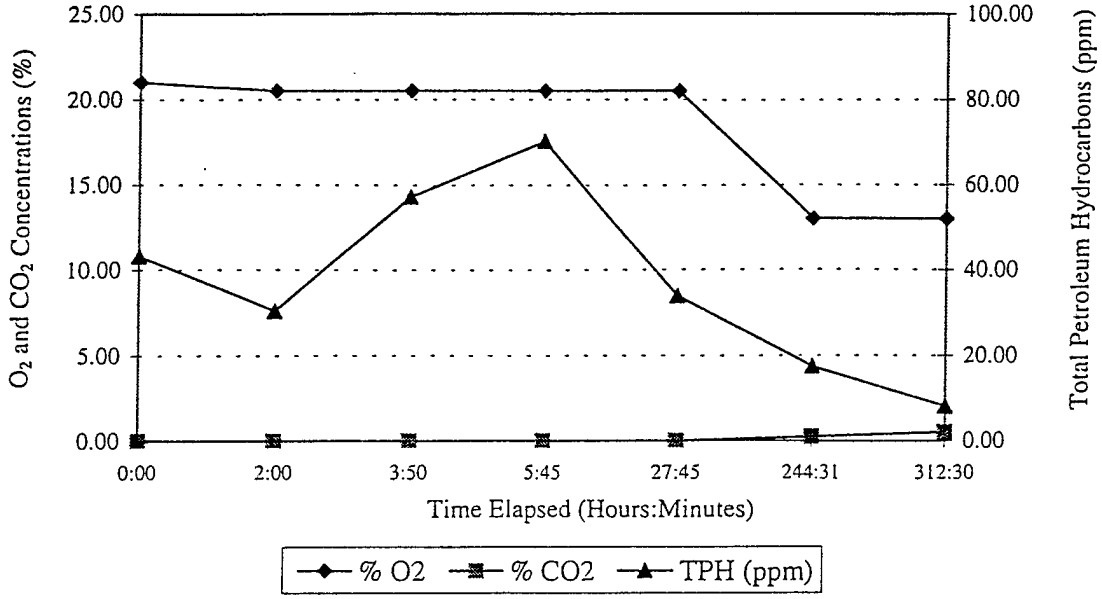


HILL AIR FORCE BASE
Site 4301
IN-SITU RESPIRATION TEST RESULTS
September 1994

4301-VP-2-26'



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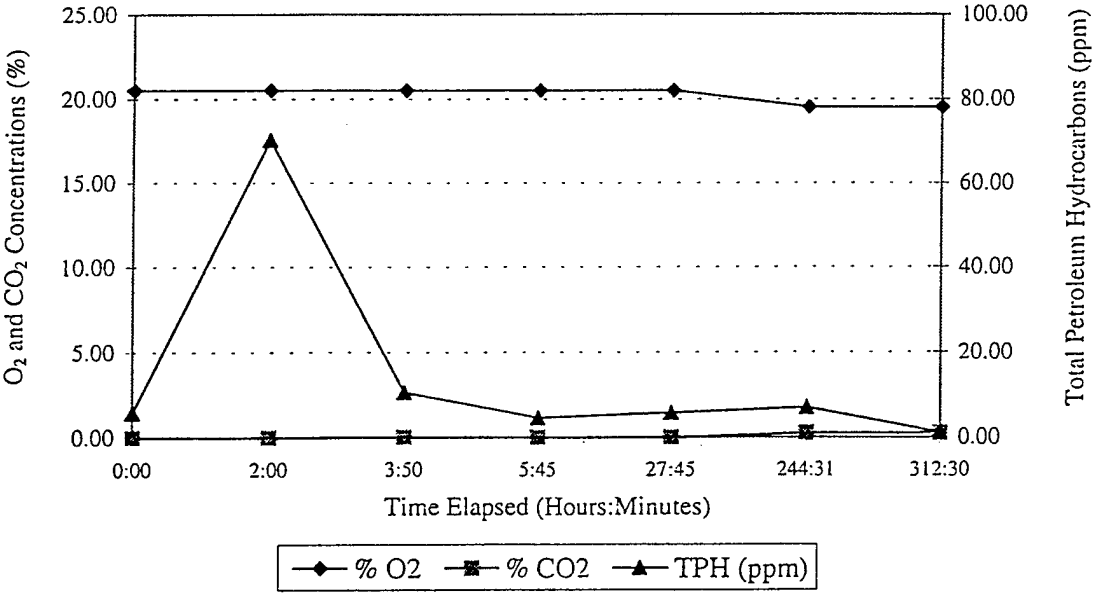

HILL AIR FORCE BASE
Site 4301
IN-SITU RESPIRATION TEST RESULTS
September 1994

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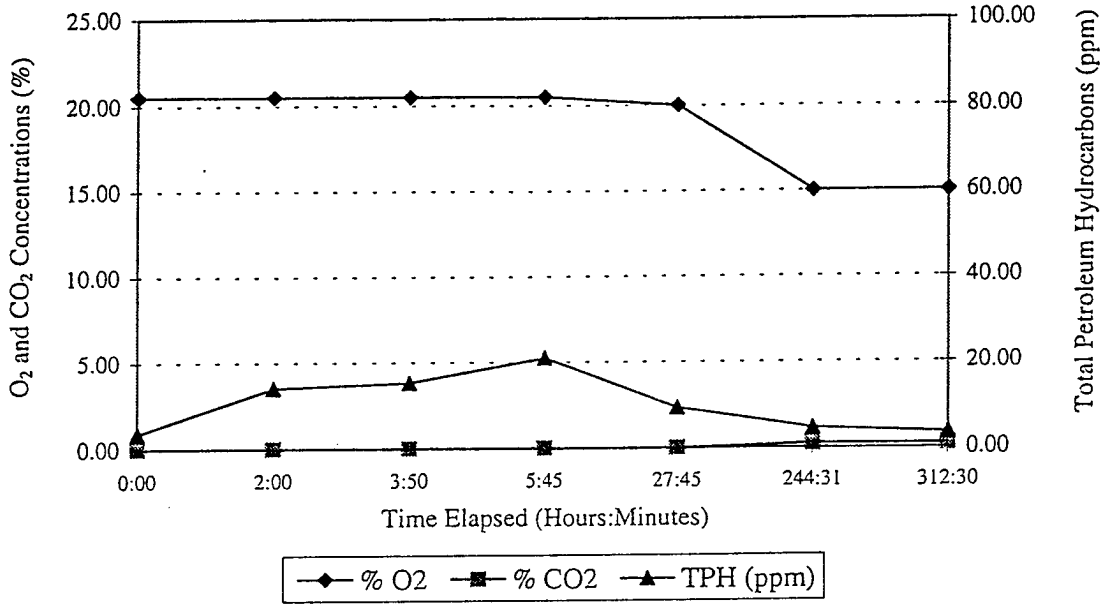

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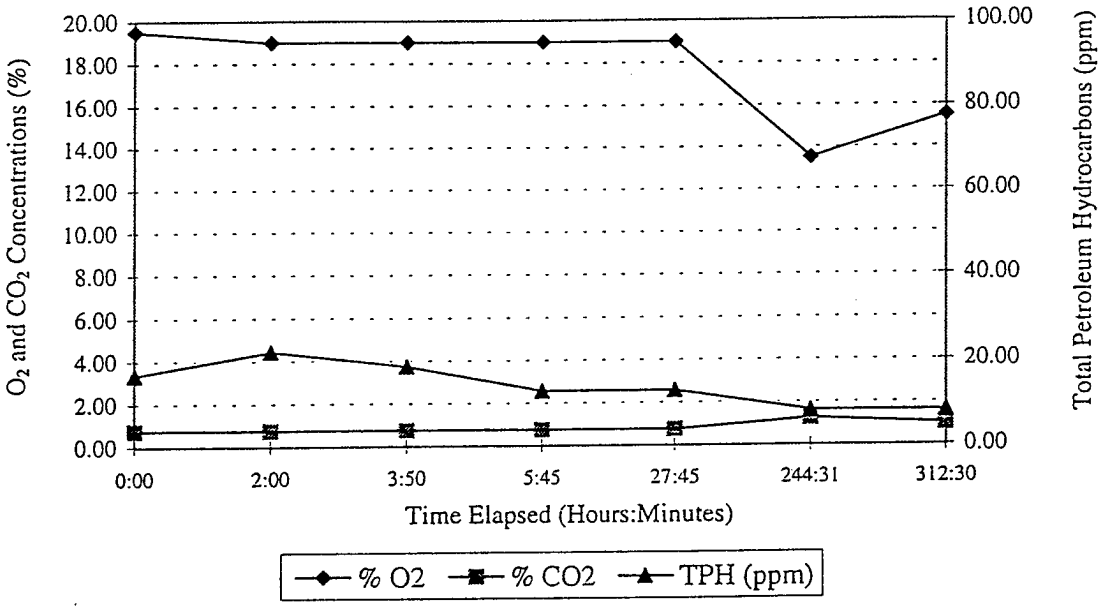


HILL AIR FORCE BASE
Site 4301
IN-SITU RESPIRATION TEST RESULTS
September 1994

HILL AIR FORCE BASE, UTAH
SECOND SEMI-ANNUAL RESPIRATION TEST RESULTS
Site 4301

Date	Time (Real)	Time (Hours)	BV-1			VP-1-10'		
			% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
9/26/95	12:00 PM	0				21.00	0.00	17.2
9/27/95	12:05 PM	24				20.50	0.25	14.1
9/28/95	3:45 PM	52	Soil gas concentrations in the air injection			20.00	0.25	13.8
10/2/95	12:40 PM	145	well (BV-1) were not measured.			19.50	0.50	4.3
10/4/95	10:15 AM	191				19.00	0.50	2.7
10/13/95	12:45 PM	408				18.00	0.75	1.2
10/19/95	12:00 PM	552				17.50	0.75	1.6

Date	Time (Real)	Time (Hours)	VP-1-22'			VP-1-26'		
			% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
9/26/95	12:00 PM	0	21.00	0.25	11.3	21.00	0.00	11.3
9/27/95	12:05 PM	24	20.50	0.25	8.2	20.00	0.25	18.8
9/28/95	3:45 PM	52	19.00	0.25	8.8	18.50	0.25	18.5
10/2/95	12:40 PM	145	17.50	0.50	4.2	15.00	0.75	6.4
10/4/95	10:15 AM	191	17.00	0.75	3.3	14.50	0.75	4.4
10/13/95	12:45 PM	408	15.00	1.00	2.4	7.50	2.00	6.1
10/19/95	12:00 PM	552	14.00	1.50	1.4	6.00	2.00	5.7

HILL AIR FORCE BASE
Site 4301 (LMTA)
In-Situ Respiration Test Data
September 1995

Date	Time (Real)	Time (Hours)	VP-2-10'			VP-2-22'		
			% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
9/26/95	12:00 PM	0	21.00	0.00	17.2	14.00	4.50	498.0
9/27/95	12:05 PM	24	20.50	0.00	8.8	12.00	5.00	369.0
9/28/95	3:45 PM	52	20.00	0.00	18.5	12.00	4.00	198.2
10/2/95	12:40 PM	145	19.50	0.25	8.2	8.50	5.50	279.0
10/4/95	10:15 AM	191	19.00	0.25	2.7	8.00	5.50	147.0
10/13/95	12:45 PM	408	17.50	0.50	2.4	8.00	5.00	203.0
10/19/95	12:00 PM	552	12.00	0.75	1.4	7.00	4.00	25.0

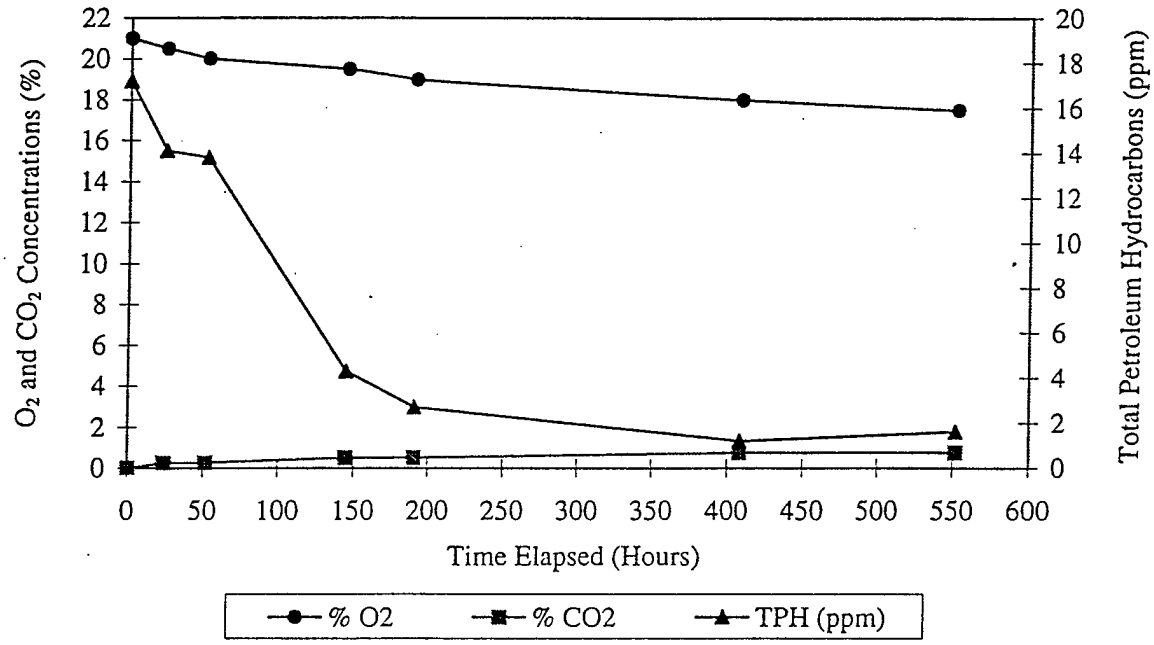
Date	Time (Real)	Time (Hours)	VP-2-26'			VP-3-10'		
			% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
9/26/95	12:00 PM	0	21.00	0.00	7.6	21.00	0.00	19.4
9/27/95	12:05 PM	24	20.50	0.00	8.2	20.50	0.00	21.3
9/28/95	3:45 PM	52	19.00	0.00	11.9	20.50	0.00	18.8
10/2/95	12:40 PM	145	16.00	0.25	4.2	20.50	0.25	8.2
10/4/95	10:15 AM	191	16.00	0.25	2.8	20.00	0.25	1.9
10/13/95	12:45 PM	408	11.00	0.75	2.7	19.50	0.50	
10/19/95	12:00 PM	552	11.00	1.25	1.4	18.00	0.75	3.1

HILL AIR FORCE BASE
Site 4301 (LMTA)
In-Situ Respiration Test Data
September 1995

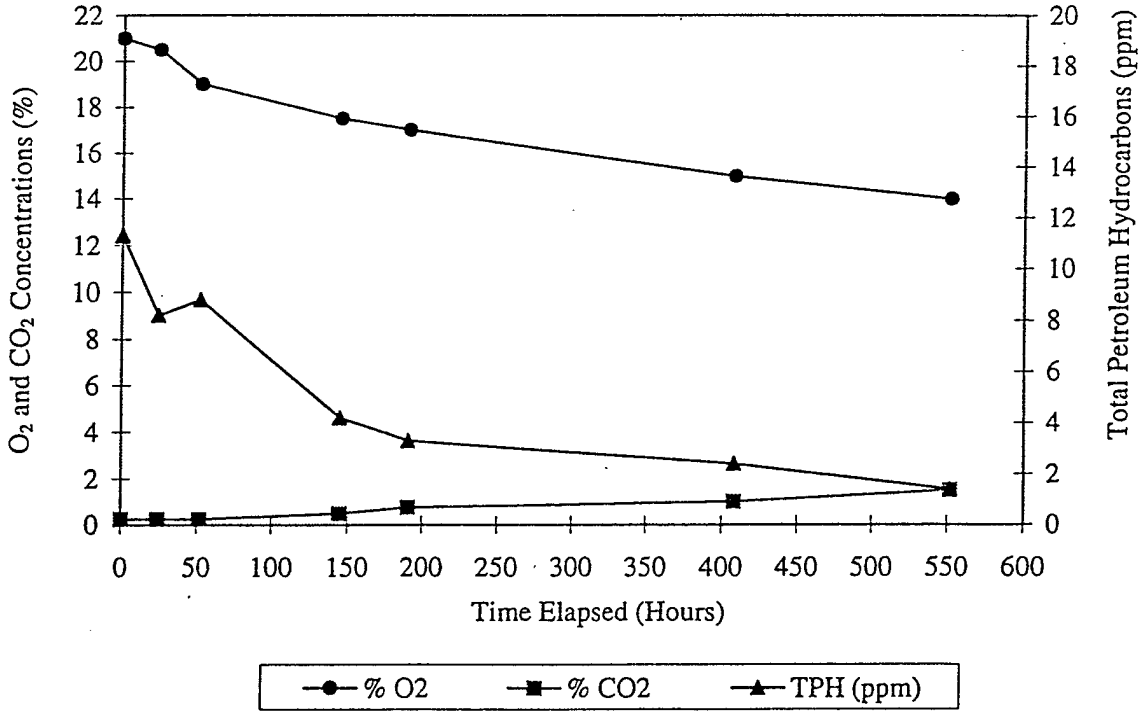
Date	Time (Real)	Time (Hours)	VP-3-22'			VP-3-26'		
			% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
9/26/95	12:00 PM	0	21.00	0.00	15.3	19.50	1.25	7.6
9/27/95	12:05 PM	24	20.50	0.00	13.8	18.50	1.25	7.6
9/28/95	3:45 PM	52	19.00	0.00	8.5	17.00	1.50	10.7
10/2/95	12:40 PM	145	17.50	0.25	3.0	15.50	2.00	3.9
10/4/95	10:15 AM	191	16.50	0.25	1.6	15.00	2.50	4.4
10/13/95	12:45 PM	408	15.00	0.75	1.6	14.00	2.50	3.9
10/19/95	12:00 PM	552	15.00	0.75	4.8	13.00	1.00	1.4

HILL AIR FORCE BASE
Site 4301 (LMTA)
In-Situ Respiration Test Data
September 1995

VP-1-10'

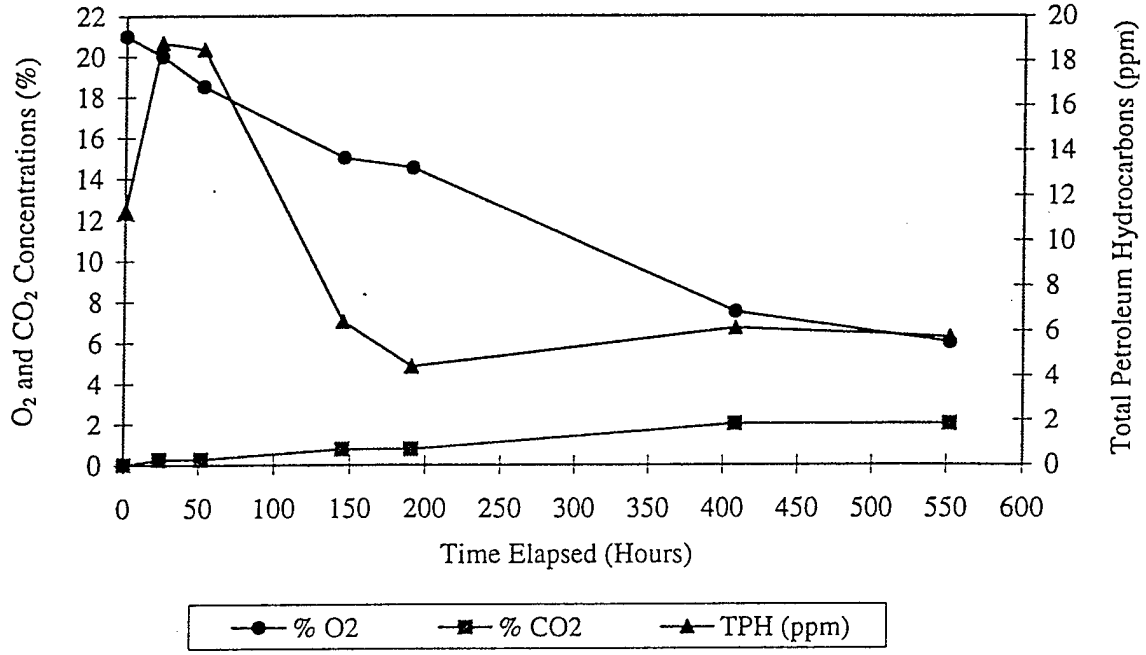


VP-1-22'

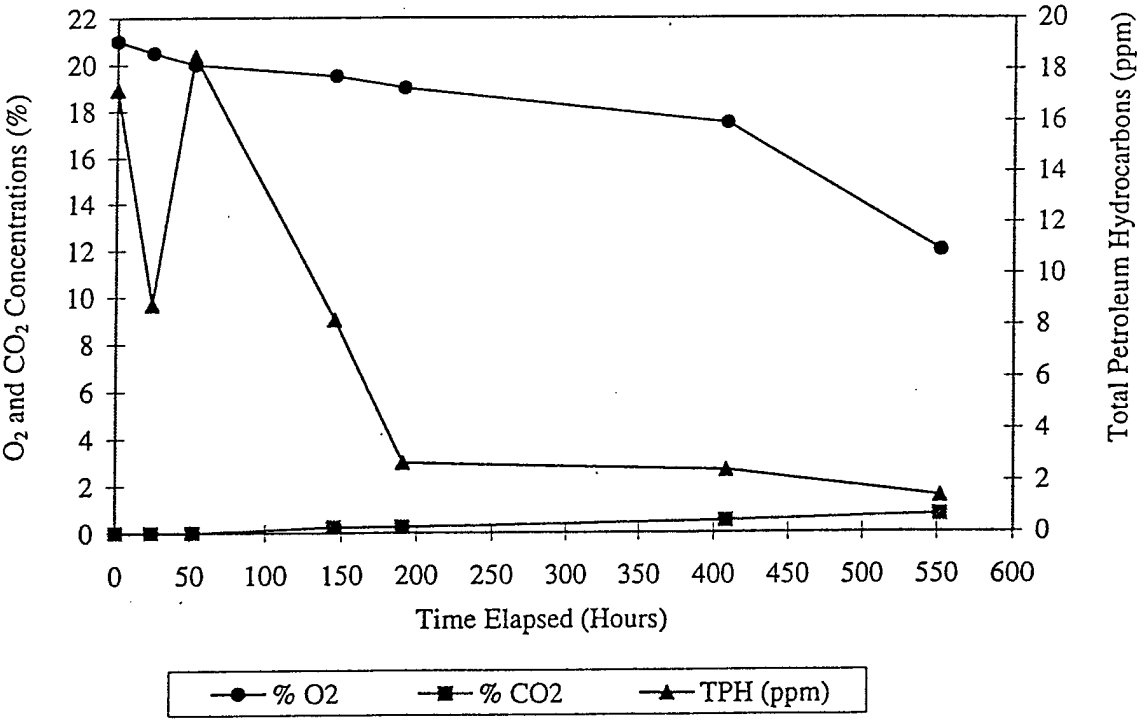


HILL AIR FORCE BASE
Site 4301 (LMTA)
IN-SITU RESPIRATION TEST
September 1995

VP-1-26'

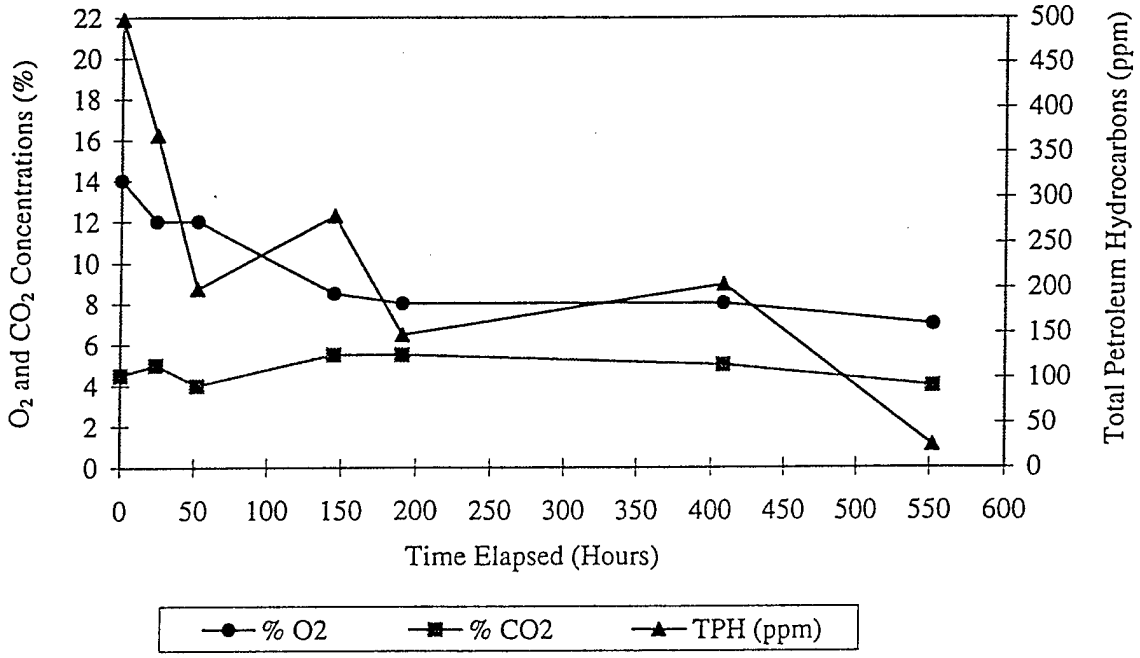


VP-2-10'

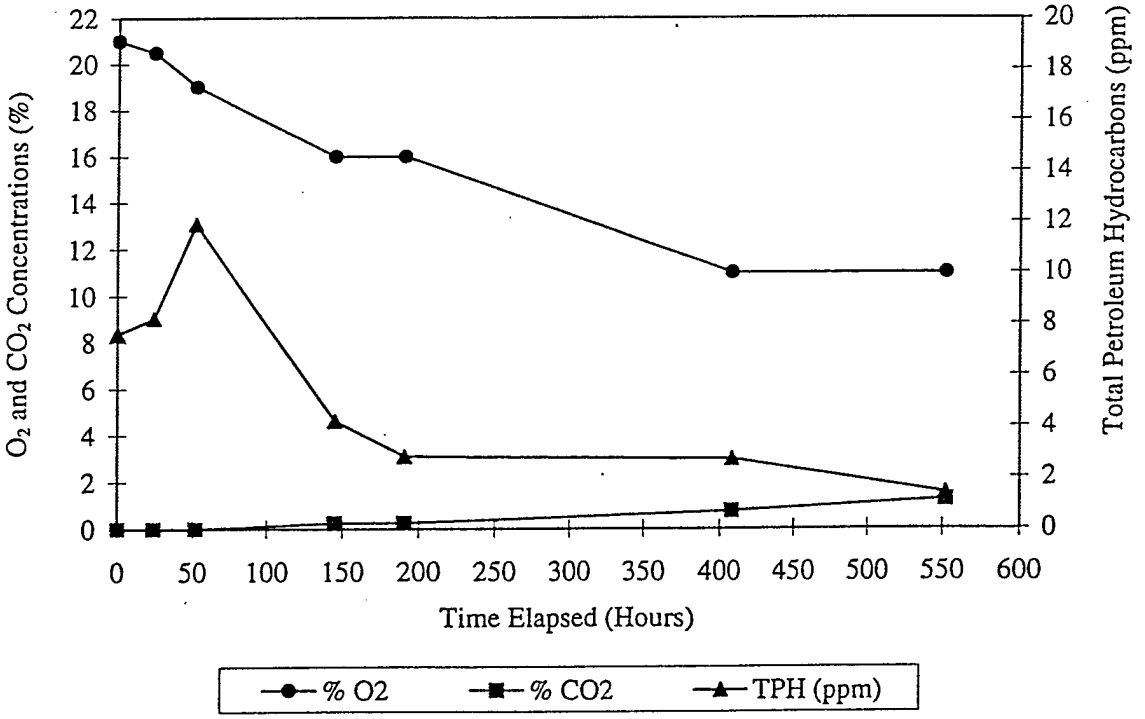


HILL AIR FORCE BASE
Site 4301 (LMTA)
IN-SITU RESPIRATION TEST
September 1995

VP-2-22'

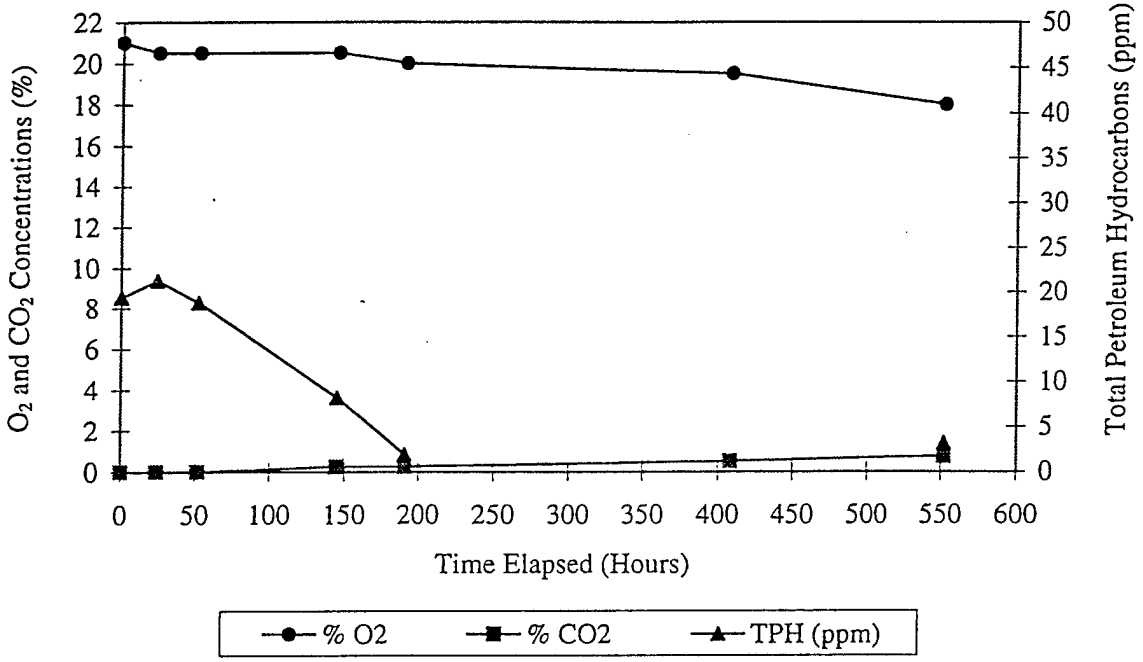


VP-2-26'

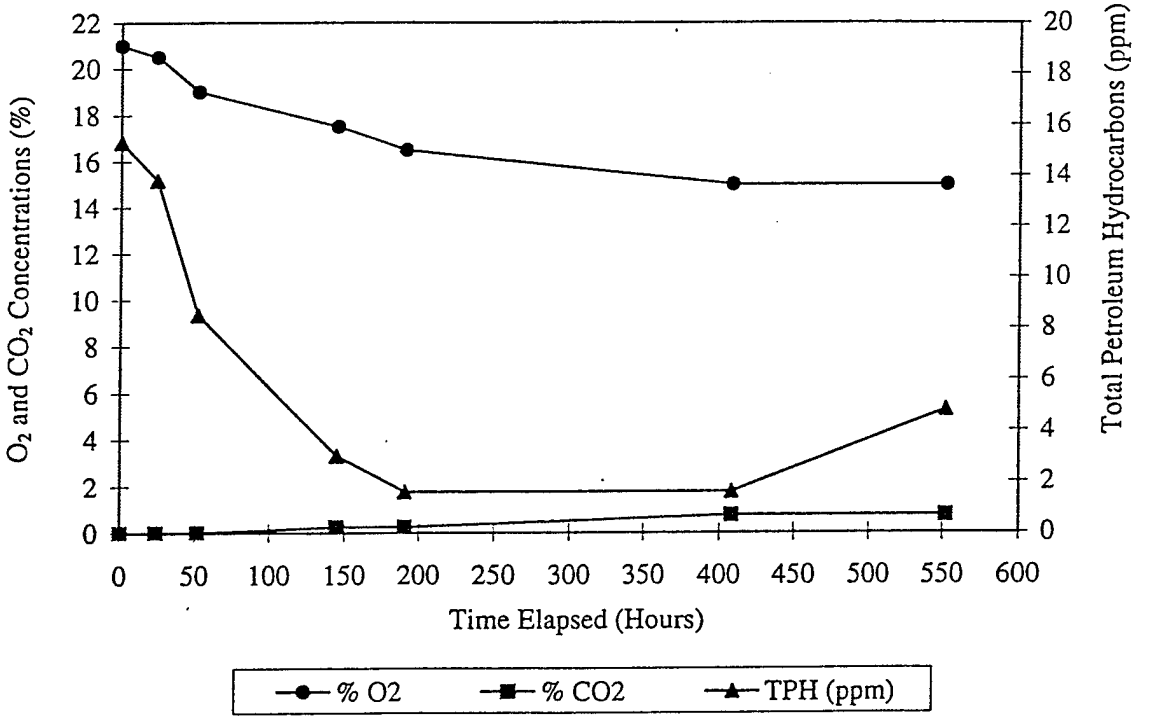


HILL AIR FORCE BASE
Site 4301 (LMTA)
IN-SITU RESPIRATION TEST
September 1995

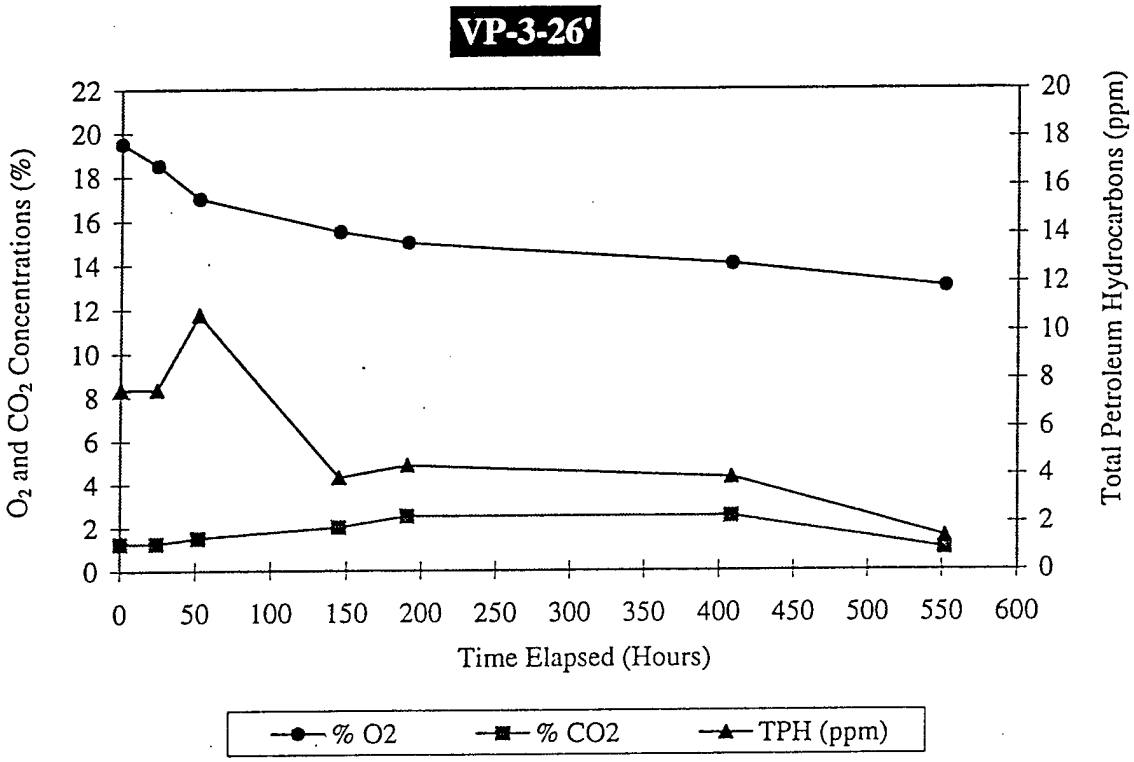
VP-3-10'



VP-3-22'



HILL AIR FORCE BASE
Site 4301 (LMTA)
IN-SITU RESPIRATION TEST
September 1995



HILL AIR FORCE BASE
Site 4301 (LMTA)
IN-SITU RESPIRATION TEST
September 1995

HILL AIR FORCE BASE, UTAH
ESTIMATED TOTAL PETROLEUM HYDROCARBONS (TPH) DEGRADATION RATES
SEMI-ANNUAL RESPIRATION TEST RESULTS
Site 4301 (LMTA)

Monitoring Point	Ko (% O_2/hour) [1]	Ko (% O_2/day) [1]	C (mg Hexane/ mg O_2) [2]	Soil Porosity (%) [3]	Soil Bulk Density (kg/m^3) [4]	A (L air/ kg soil) [5]	Do (mg O_2/ L O_2) [6]	Kb (mg Hexane/ kg soil. day) [7]
4301-VP-1-10'	0.012	0.2880	0.2857	30	1440	0.208	1330	0.23
4301-VP-1-22'	0.021	0.5112	0.2857	30	1440	0.208	1331	0.41
4301-VP-1-26'	0.029	0.6840	0.2857	30	1440	0.208	1332	0.54
4301-VP-2-10'	0.018	0.4320	0.2857	30	1440	0.208	1333	0.34
4301-VP-2-22'	0.004	0.1032	0.2857	30	1440	0.208	1334	0.08
4301-VP-2-26'	0.014	0.3360	0.2857	30	1440	0.208	1335	0.27
4301-VP-3-10'	0.005	0.1176	0.2857	30	1440	0.208	1336	0.09
4301-VP-3-22'	0.006	0.1512	0.2857	30	1440	0.208	1337	0.12
4301-VP-3-26'	0.006	0.1536	0.2857	30	1440	0.208	1338	0.12

1. Ko = oxygen utilization rate (from regression analysis of respiration data)
2. C = mass ratio of hydrocarbon to oxygen required for degradation from the following relationship

$$C_6H_{14} + 9.5\ O_2 \text{ -----> } 6\ CO_2 + H_2O$$

3. Typical for sandy/silty soils.
4. Typical for sandy/silty soils.
5. A = volume of air/kg of soil (= porosity/bulk density) (l/kg)
6. Do = density of oxygen gas (mg/l)
7. Kb = TPH degradaion rate= -Ko A Do C/100 (Equation 1 from "Test Plan and Technical Protocol for a Field Treatability Test for Bioventing", Environmental Services Office, Air Force Center for Environmental Excellence (AFCEE), May 1992).

HILL AIR FORCE BASE, UTAH

SOIL-GAS MONITORING RESULTS

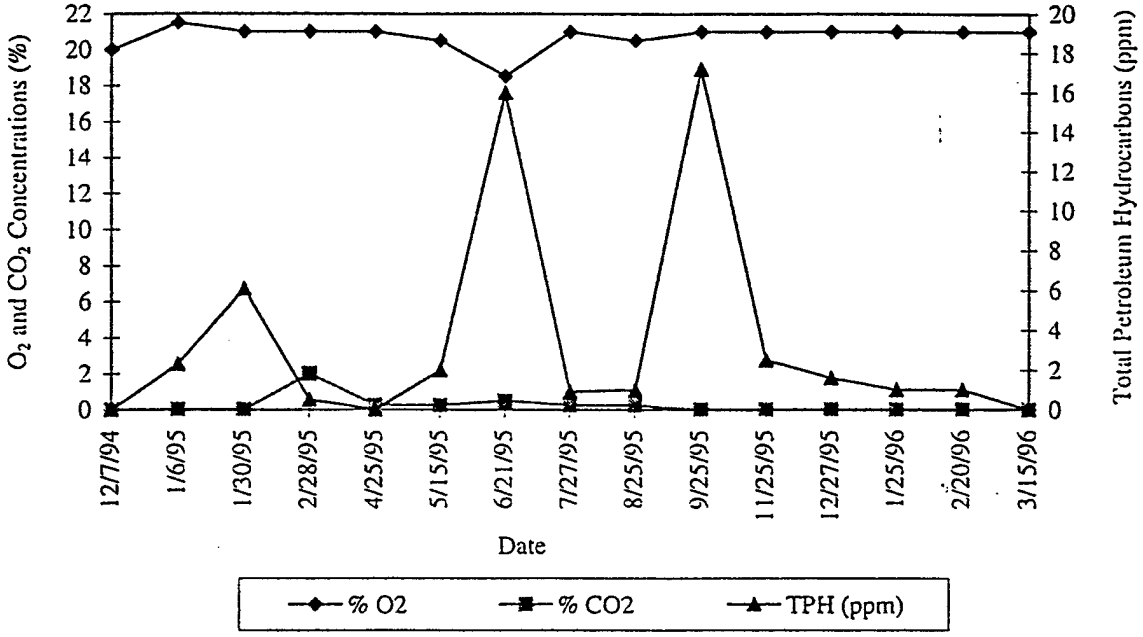
Site 4301 (Continued-2)

Date	VP-2-10'			VP-2-22'			VP-2-26'		
	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
12/7/94	20.00	0.00	40.00	16.00	1.50	10000.00	20.00	0.00	40.00
1/6/95	21.00	0.50	1.50	16.50	1.50	610.00	21.50	0.00	19.30
1/30/95	21.00	0.50	0.00	17.50	2.50	609.00	21.00	0.50	1.50
2/28/95	21.00	0.00	0.50	18.00	0.75	1000.00	21.00	0.00	43.20
4/25/95	20.50	0.25	7.10	14.50	3.00	2000.00	21.00	0.00	20.90
5/15/95	21.00	0.00	29.00	14.50	3.25	518.00	21.00	0.00	24.90
6/21/95	19.00	0.25	9.50	9.50	3.50	500.00	17.00	0.50	10.60
7/27/95	20.50	0.25	2.70	11.00	4.00	420.00	20.50	0.25	1.00
8/25/95	21.00	0.25	2.50	13.00	4.50	282.00	21.00	0.25	0.60
9/25/95	21.00	0.00	17.20	14.00	4.50	498.00	21.00	0.00	7.60
11/25/95	21.00	0.00	1.20	17.50	2.50	158.40	21.00	0.00	12.50
12/27/95	21.00	0.00	4.80	18.00	2.00	97.50	21.00	0.00	15.80
1/25/96	21.00	0.00	8.00	17.50	1.75	100.00	21.00	0.00	9.40
2/20/96	20.50	0.00	26.30	18.00	1.75	121.00	20.50	0.00	5.20
3/15/96	20.00	0.00	0.00	17.00	1.00	0.00	21.00	0.00	0.00

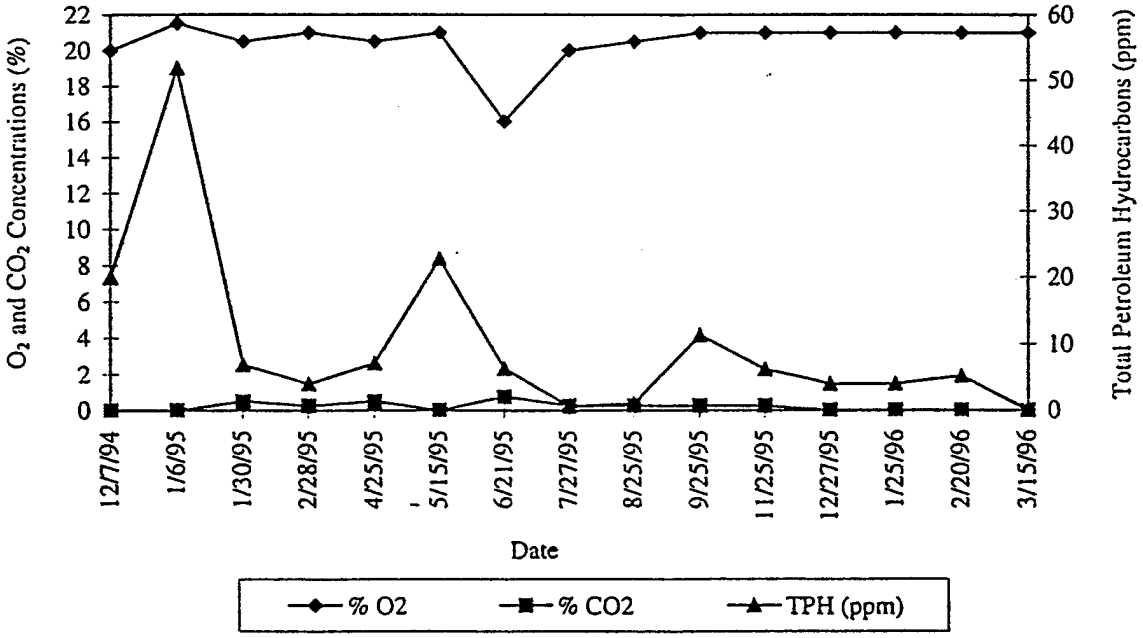
HILL AIR FORCE BASE, UTAH
SOIL-GAS MONITORING RESULTS
Site 4301 (Continued-3)

Date	VP-3-10'			VP-3-22'			VP-3-26'		
	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)	% O_2	% CO_2	TPH (ppm)
12/7/94	20.00	0.00	0.00	20.00	0.00	10.00	20.00	0.50	1800.00
1/6/95	21.00	0.00	11.60	21.00	0.00	13.90	20.00	0.50	24.70
1/30/95	20.50	0.50	0.00	20.50	0.25	23.20	19.50	0.75	29.40
2/28/95	20.50	0.00	5.80	20.50	0.00	3.50	19.50	0.75	16.70
4/25/95	20.50	0.25	0.00	20.50	0.00	9.40	19.00	1.00	59.90
5/15/95	20.00	0.00	0.00	21.00	0.00	6.20	19.50	1.00	66.40
6/21/95	20.00	0.25	2.80	17.00	0.25	4.10	16.00	1.25	46.10
7/27/95	20..5	0.25	1.50	20.50	0.25	4.00	18.00	1.25	2.00
8/25/95	20.50	0.25	1.00	20.50	0.25	3.20	19.00	1.50	1.40
9/25/95	21.00	0.00	19.40	21.00	0.00	15.30	19.50	1.25	7.60
11/25/95	21.00	0.00	3.10	21.00	0.00	1.20	20.50	0.75	2.50
12/27/95	21.00	0.00	1.00	21.00	0.00	7.70	21.00	0.50	4.80
1/25/96	21.00	0.00	1.00	21.00	0.00	6.00	21.00	0.75	4.00
2/20/96	20.50	0.00	1.00	20.50	0.25	13.60	20.00	0.75	3.10
3/15/96	20.00	0.00	0.00	20.00	0.00	0.00	21.00	0.00	0.00

4103-VP-1-10'

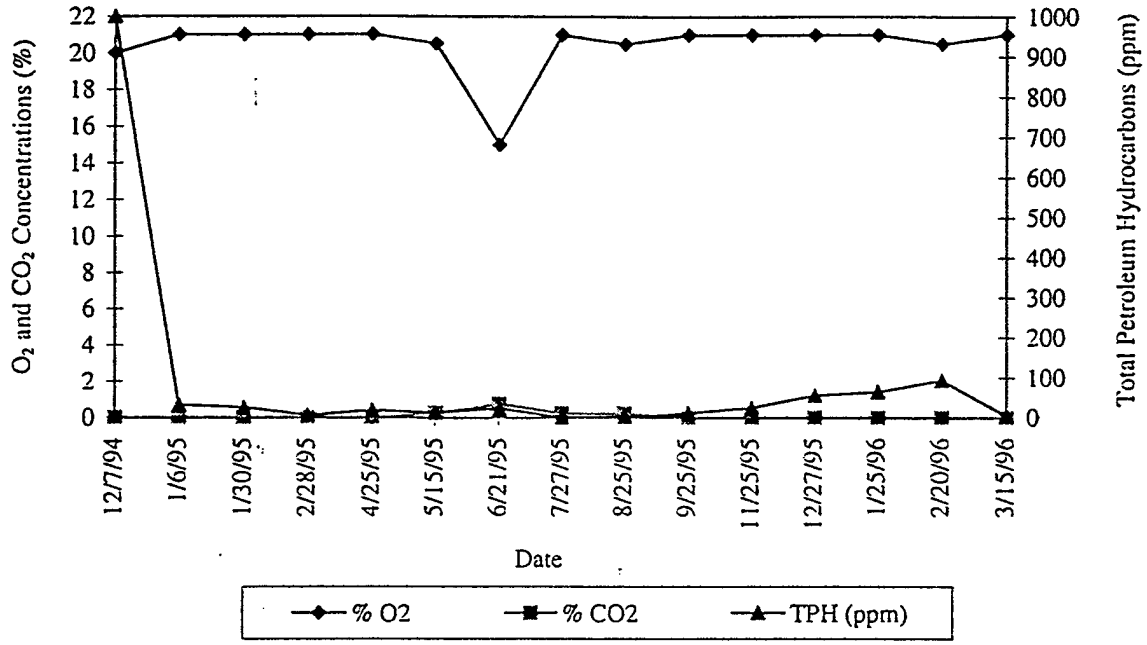


4103-VP-1-22'

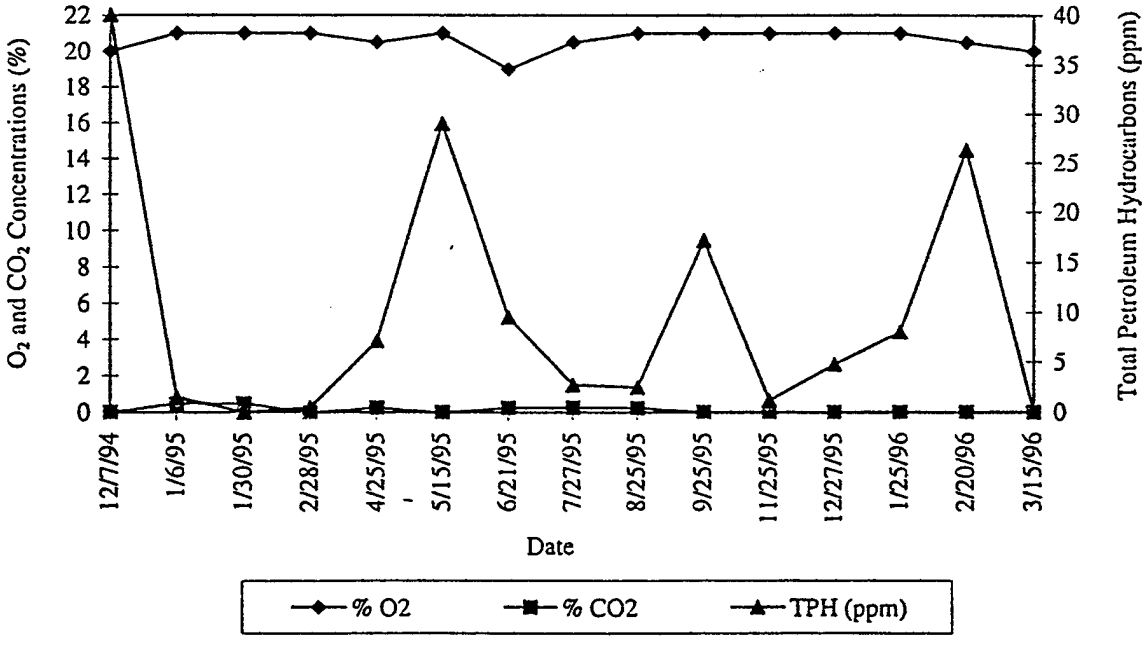


HILL AIR FORCE BASE
Site 4301
SOIL GAS MONITORING RESULTS

4103-VP-1-26'

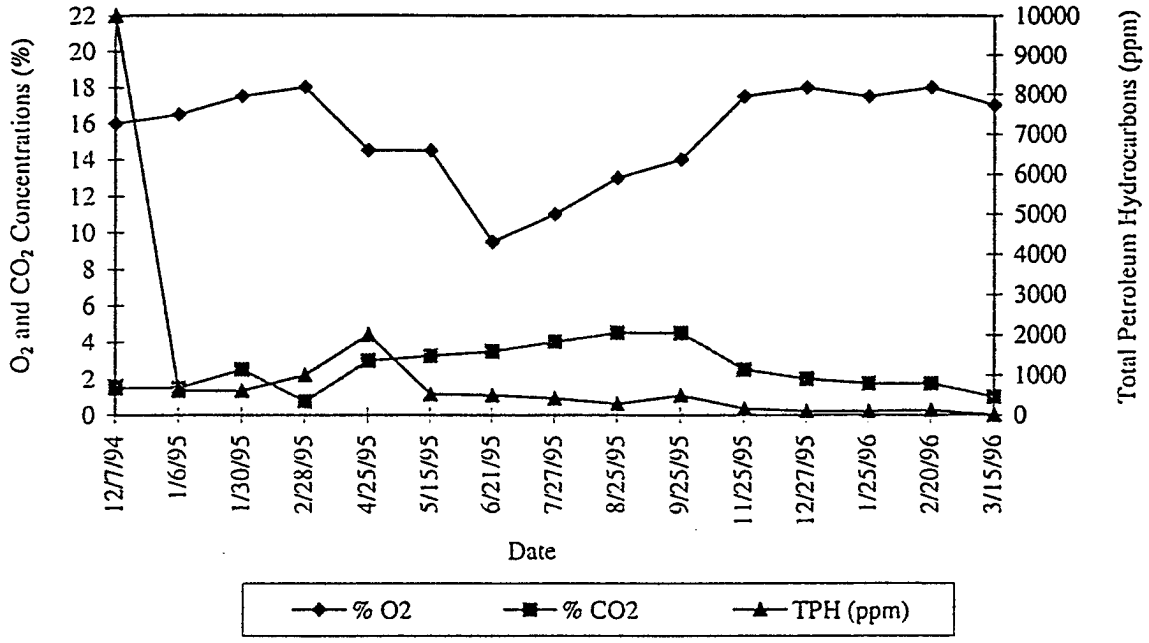


4103-VP-2-10'



HILL AIR FORCE BASE
Site 4301
SOIL GAS MONITORING RESULTS

4103-VP-2-22'



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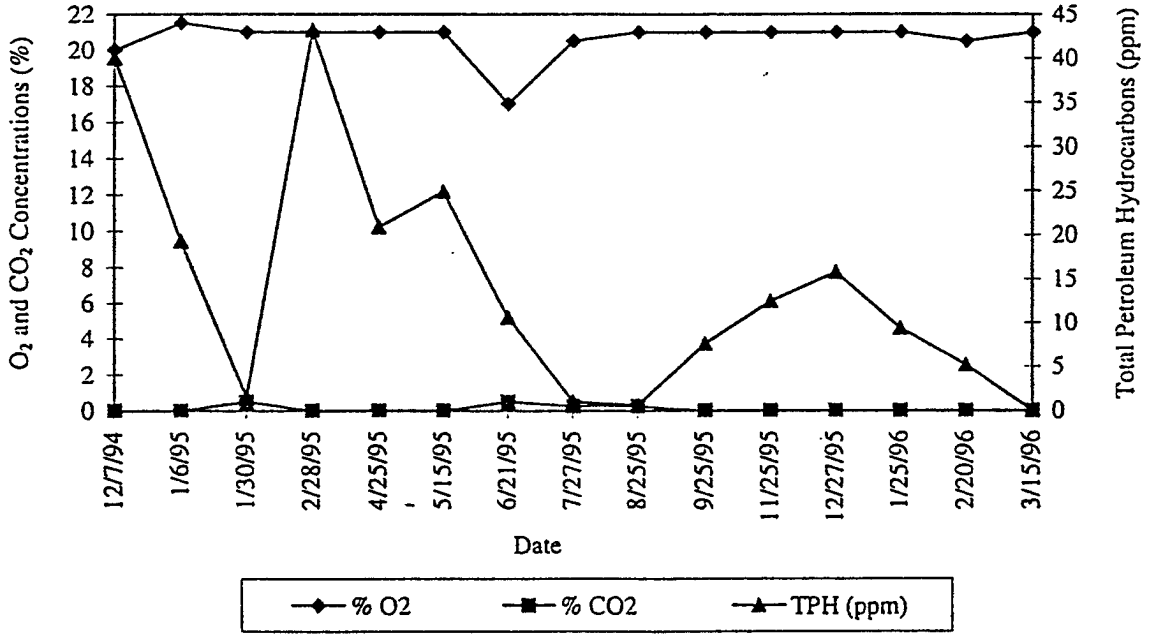
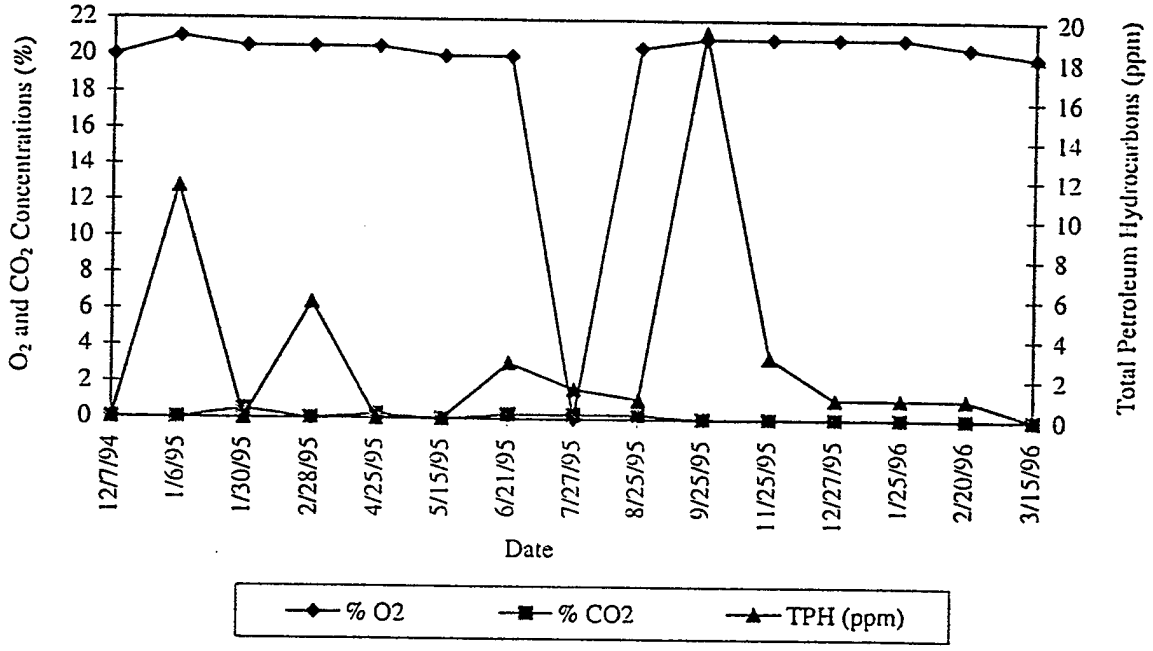


HILL AIR FORCE BASE
Site 4301
SOIL GAS MONITORING RESULTS

4103-VP-3-10'



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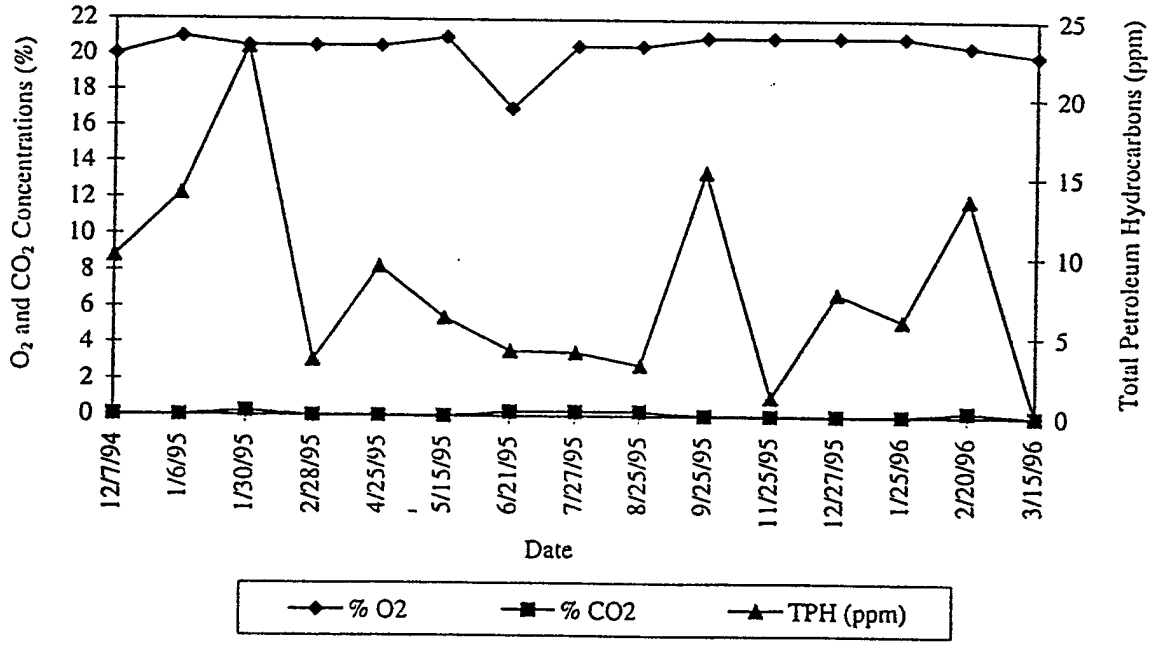
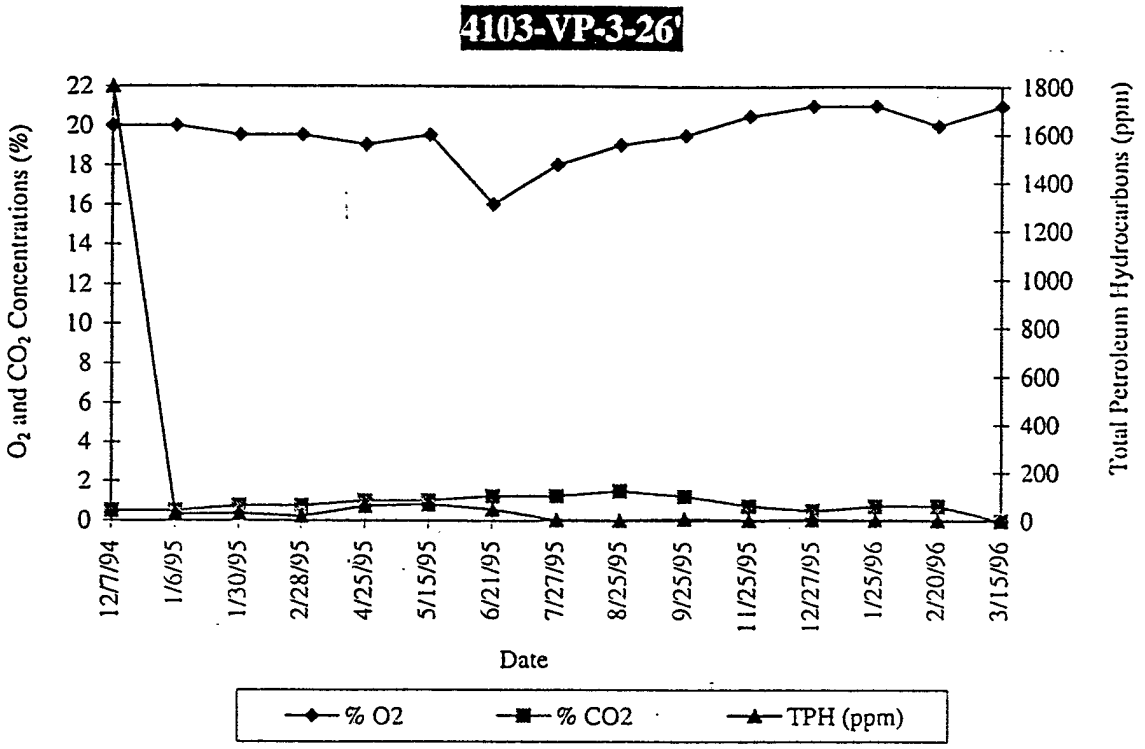


HILL AIR FORCE BASE
Site 4301
SOIL GAS MONITORING RESULTS



HILL AIR FORCE BASE
Site 4301
SOIL GAS MONITORING RESULTS

GROUND-WATER
ANALYTICAL DATA

Hill Air Force Base
Little Mountain Test Annex
Site 4301
March 1995

WELL COMPLETION DATA FOR SITE 4301

BORING	WELL TYPE	COMPLETION DATE	TOTAL DEPTH	SCREEN INTERVAL(S) ft bgs	SAND PACK INTERVAL(S) ft bgs	BENTONITE INTERVAL(S) ft bgs	CEMENT SEAL ft bgs	NUMBER OF AIR PROBES
4301-MW1* (SB03)	water monitoring	6/2/95	57.0	46.0-56.0	43.5-57.0	41.5-43.5	41.5-0.0	-
4301-BV-1	air injection	6/15/95	27.5	7.0-27.0	5.0-27.5	3.0-5.0	0.0-3.0	-
4301-VP-1	air monitor	6/8/94	27.0	25.5-26.0 15.0-15.5 10.0-10.5	25.0-27.0 14.5-16.0 9.5-11.0	25.0-16.0 14.0-11.0 9.5-2.0	0.0-2.0	3
4301-VP-2	air monitor	6/09/94	27.0	26.5-27.0 21.5-22.0 14.5-15.0	26.0-27.0 21.0-22.5 14.0-15.5	26.0-22.5 21.0-15.5 14.0-2.0	0.0-2.0	3
4301-VP-3	air monitor	6/10/94	27.0	24.5-25.0 16.5-17.0 9.5-10.0	20.5-27.0 16.0-17.5 9.0-10.5	24.0-17.5 16.0-10.5 9.0-2.0	0.0-2.0	3

* = Monitor well installed by Engineering-Science. Inc.

SUMMARY OF ANALYTICAL RESULTS FOR WATER SAMPLES SITE 4301

SAMPLE LABEL	DATE SAMPLED	TPH EXTRACTION (mg/L)	TPH PURGE AND TRAP (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYLBEN ZENE (mg/L)	TOTAL XYLENE (mg/L)	NAPH- THALENE (mg/L)
4301 MW1*	9/8/94	<1	<1	<0.001	<0.001	<0.001	<0.001	<0.001
	3/10/65	C16-C22 0.31	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001
	8/25/95	<0.5	<0.50	<0.002	<0.002	<0.002	<0.006	<0.002

C6-C14 = H-C Range

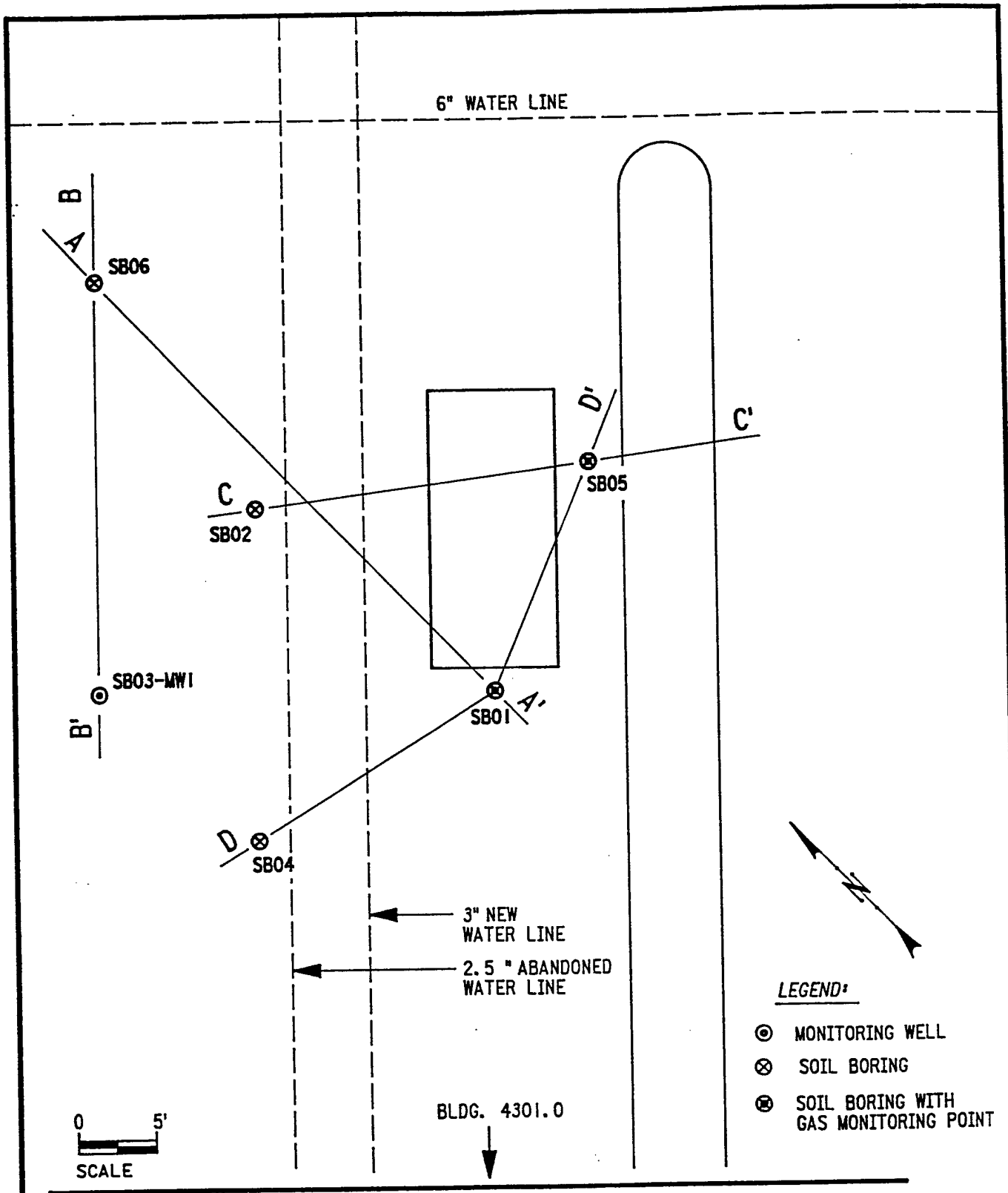
* = Monitor well Installed by Engineering-Science, Inc.

STATIC WATER LEVEL DATA SITE 4301

MONITORING WELL	REFERENCE POINT	DATE	DEPTH TO WATER FROM MEASURING POINT (feet)	WATER LEVEL ELEVATION (feet)
4301-MW1*	North side, top of PVC casing, 4259.58 feet	9/9/94	49.07	4210.51
		3/10/95	48.06	4211.52
		4/27/95	47.41	4212.17
		5/18/95	47.25	4212.33
		6/21/95	47.19	4212.39
		7/25/95	47.43	4212.15
		8/25/95	47.53	4212.05
		9/20/95	47.56	4212.02
		10/19/95	47.91	4211.67

* = Monitor well installed by Engineering Science, Inc.

APPENDIX B
GEOLOGICAL CROSS-SECTIONS (ES, 1992)



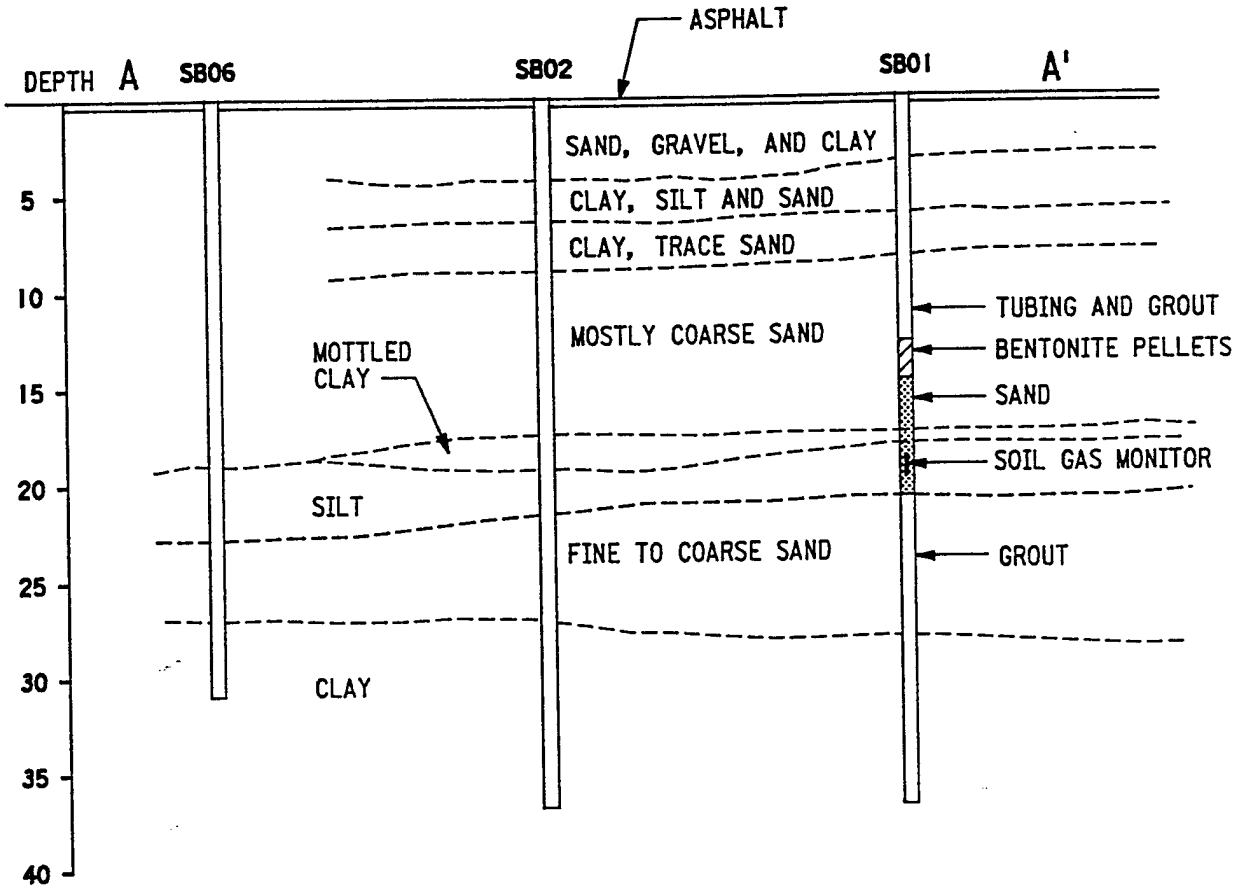
SOIL BORINGS CROSS-SECTION LOCATION MAP

HILL AIR FORCE BASE
LITTLE MOUNTAIN TEST ANNEX
UNDERGROUND STORAGE TANK
SUBSURFACE INVESTIGATION,
SITE 4301.0 (EHDL)

UT061SL.DGN

ES ENGINEERING-SCIENCE

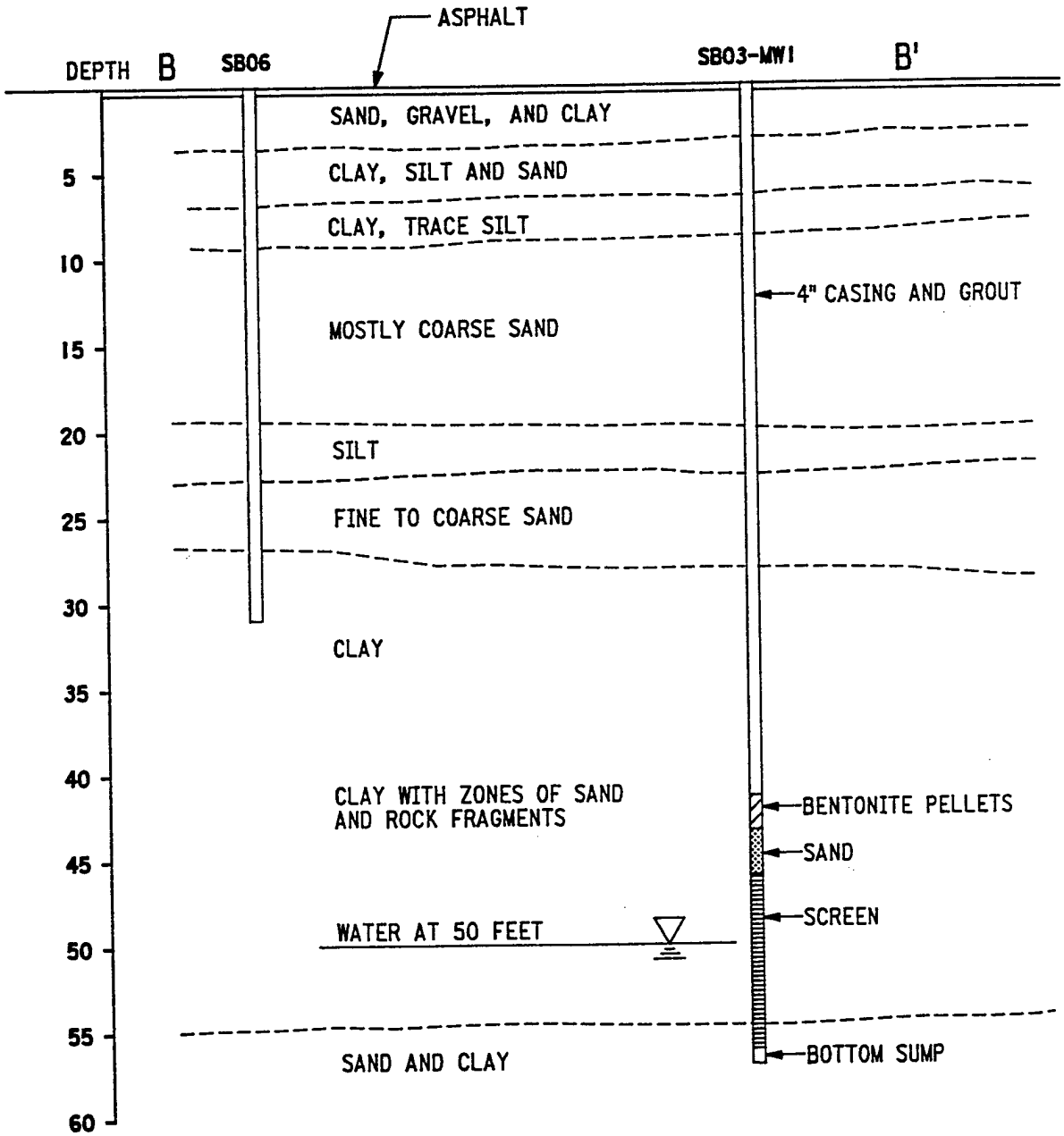
CROSS-SECTION A - A'
OF SOIL BORINGS AND STRATIGRAPHY



UT061SL.DGN

ES ENGINEERING-SCIENCE

CROSS-SECTION B - B'
OF SOIL BORINGS AND STRATIGRAPHY



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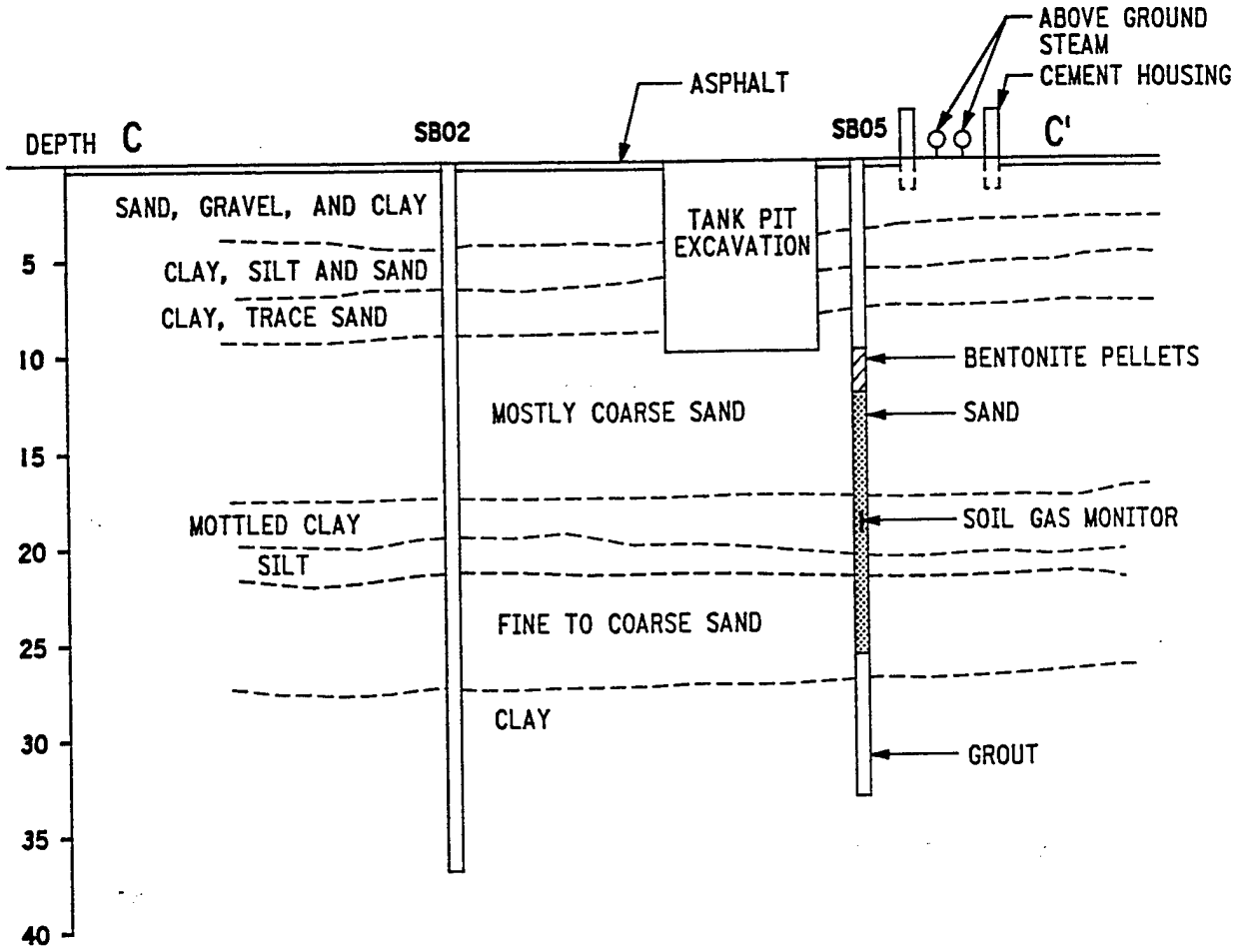
ES ENGINEERING-SCIENCE

CROSS-SECTION C - C'
OF SOIL BORINGS AND STRATIGRAPHY



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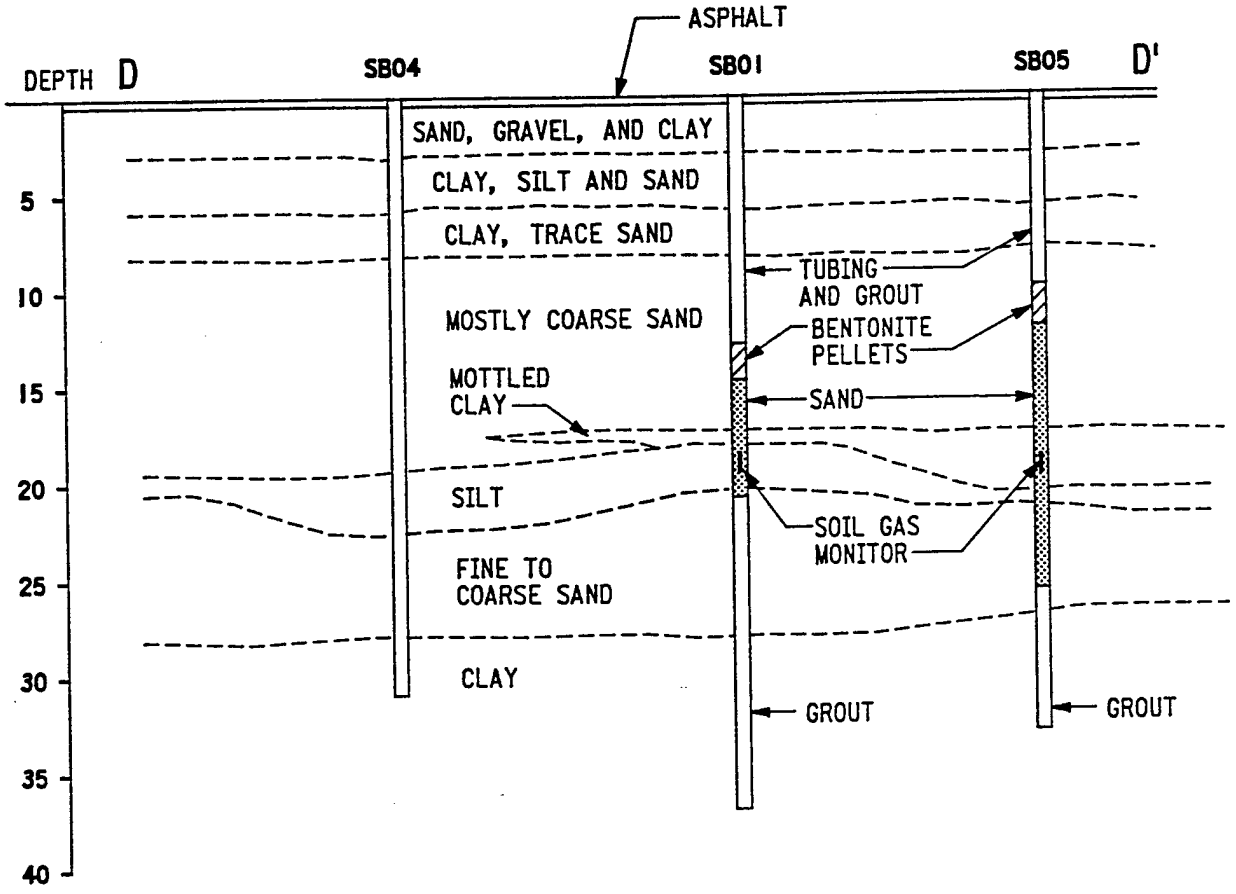
ES ENGINEERING-SCIENCE

CROSS-SECTION D - D'
OF SOIL BORINGS AND STRATIGRAPHY



UT061SL.DGN

ES ENGINEERING-SCIENCE

APPENDIX C
CLOSURE SOIL BORING LOGS

PARSONS ENGINEERING SCIENCE, INC.-DRILLING LOG

SITE LOCATION: Little Mtn Test Annex	WELL OR BORING NO: ESB HI-4301-CSB1
CLIENT/PROJECT: HAEB site 4301	GEN. ORDER NO.: USAF 41624-92-D-8036, DO 17
CONTRACTOR: AFCEE	DRILLING CONTRACTOR: Earth core
DRILLING METHOD: 3 1/4 in. ID HSA	DRILLING RIG: Acker Soil Sentry
SAMPLING METHOD: 2.5 in OD Split Spoon	DRILLER/HELPER: Brian Nathan - Tom Lee
BOREHOLE DIAMETER: 6 1/4 inches	LOGGED BY: TM Jansen
WATER DETECTED (FT BGS): NA	TOTAL DEPTH (FT BGS): 29.5
DRILLING START: 1300 15 Oct 96	DRILLING END: 1700
ABANDONMENT METHOD: bentonite grout	LOGBOOK REF./PAGE:

DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	RECOVERY	LITHOLOGIC DESCRIPTION	USCS CLASS.	STD. PENETRATION	PID SCAN	PID HEADSPACE	COMMENTS
				0-~~3~~ 9.5 Cuttings: backfill					
5									
10		9.5		9.5 - 11.0 Sand & gravel, 5Y 4/3 olive, loose, soft, native? dry soil	SP-GP	NA	0.0	0.0	looked clean, did not sample, may be backfill
		11.0		11.0 - 14.5 cuttings: fine gravel, and sand subround,	SP				
15		14.5		14.5-16.0 Sand, little clay, 5Y 4/3, soft, loose, slightly moist,	SP	NA	0.0	0.0	Sample ID: HI-4301-CSB1 (14.5-16)
		16.0		16-19.5 cuttings: silt and sand, hand backfill dry					
20		19.5		19.5-21, Silt and fine sand, 5Y 5/3, olive, moist, soft,	ML		73.9	37.4	ID: HI-4301-CSB1 (19.5-21)
		21		21-24.5 cuttings: Sand silty little clay, moist					
25		24.5		24.5-26 Sand, little gravel, little ~~silt~~, 5Y 4/3 olive, ~~soft~~ firm, loose, moist	SP		47.6	10.6	ID: HI-4301-CSB1 (24.5-26)
		26							
		26.5		26.5-28, Clay, ~~DRY~~, some sand, some gravel,	CL		88	0.0	
		28		28-29.5 2.5Y 4/4 olive brn, moist, cohesive, Clay, SAA, but 2.5Y 6/3 ~~from~~ lt. yellow brown			~~88~~ 13.3	0.0	ID: HI-4301-CSB1 (28-29.5)
30		29.5							
				TD- 29.5					

PARSONS ENGINEERING SCIENCE, INC.-DRILLING LOG

SITE LOCATION: Little Mtn. Tex Annex	WELL OR BORING NO: HI-4301-CSB2
CLIENT/PROJECT: NAEB 4301	GEN. ORDER NO.:
CONTRACTOR: AFCEE	DRILLING CONTRACTOR: Earthcore
DRILLING METHOD: 3¼" ID HSA	DRILLING RIG: Mobil B-80
SAMPLING METHOD: 2.5" OD Split Spoon	DRILLER/HELPER: Robert Westbrook
BOREHOLE DIAMETER: 6¼"	LOGGED BY: JM Jones
WATER DETECTED (FT BGS): NA	TOTAL DEPTH (FT BGS): 31
DRILLING START: 0935	DRILLING END: 1025
ABANDONMENT METHOD: Bentonite Grout	LOGBOOK REF./PAGE:

DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	RECOVERY	LITHOLOGIC DESCRIPTION	USCS CLASS.	STD. PENETRATION	PID SCAN	PID HEADSPACE	COMMENTS
				0-9.5 Cuttings: backfill					
5									
10		MS 11		9.5-11.0 Sand, coarse SY 4/3 slug tight, loose	SP		4.4	0.0	did not retain sample, poor recovery, no apparent contamination
15		MS 16		14.5-16. Sand, coarse some silt, 5Y 4/3,	SP		3.3	1.8 (BG)	ID: HI-4301-CSB2 14.5-16
20		19.5 21		19.5-21.0, Silt, 5Y 5/3, moist to wet,	ML		492	68.2	HI-4301-CSB2-19.5-21
25		24.5 26		24.5-26.0 Sand, medium 5Y 4/3, loose,	SP		8.3	4.1	HI-4301-CSB2-24.5-26
30		29.5 31		29.5-31, Clay, some sand, some Gravel 2.5Y 5/3, lt olive brn, firm slightly moist	CL		133	2.1	HI-4301-CSB2-29.5-31
				TD = 31 ft					

PARSONS ENGINEERING SCIENCE, INC.-DRILLING LOG

SITE LOCATION: Lake Mtn. Test Annex	WELL OR BORING NO: HI-4301-CSB3
CLIENT/PROJECT: HAER site 4301	GEN. ORDER NO.:
CONTRACTOR: AFCEE	DRILLING CONTRACTOR: Earthcore
DRILLING METHOD: 3 1/4" ID HSA	DRILLING RIG: Mobil B-80
SAMPLING METHOD: 2.5" OD Split Spoon	DRILLER/HELPER: Robert Westbrook
BOREHOLE DIAMETER: 6 1/4"	LOGGED BY: TM Jensen
WATER DETECTED (FT BGS): NA	TOTAL DEPTH (FT BGS): 24
DRILLING START: 1130	DRILLING END: 1200
ABANDONMENT METHOD: bentonite grout	LOGBOOK REF./PAGE:

DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	RECOVERY	LITHOLOGIC DESCRIPTION	USCS CLASS.	STD. PENETRATION	PID SCAN	PID HEADSPACE	COMMENTS
				0-9.5 cuttings: backfill					
5									
10		10 11		10-11 Sand, med to coarse, 5Y5/3, loose,	SP		BG		no sample
15		15 16		15-16, Sand, some gravel, some clay 5Y5/3, moist	SC		BG	BG	HI-4301-CSB3 (14.5-16)
20		19.5 21		19.5-21 Silt, 5GY5/1, greenish gray, moist to wet soft	ML		55.8	6.8	HI-4301-CSB3 (19.5-21)
25		24.5 25.5	28 24	24-24 24.5-25.5 Clay, some gravel, 2.5Y5/3,	CL		BG	NA	HI-4301-CSB3 (24.5-24) collected duplicate HI-4301-CSB3 (24.5-25)
				TD ~~25.5~~ 24.0					

PARSONS ENGINEERING SCIENCE, INC.-DRILLING LOG

SITE LOCATION: Little Mtn. Test Annex	WELL OR BORING NO: HI-4301-CSB4
CLIENT/PROJECT: HAFB Site 4301	GEN. ORDER NO.:
CONTRACTOR: AFCEE	DRILLING CONTRACTOR: Earth core
DRILLING METHOD: 3 1/4" ID HSA	DRILLING RIG: Mobile B-80
SAMPLING METHOD: 2.5" OD Split Spoon	DRILLER/HELPER: Westbrook
BOREHOLE DIAMETER: 6 5/8"	LOGGED BY: TM Jensen
WATER DETECTED (FT BGS): NA	TOTAL DEPTH (FT BGS): 26
DRILLING START: 1255 16 Oct 96	DRILLING END: 1325
ABANDONMENT METHOD: Bentonite Grout	LOGBOOK REF./PAGE:

DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	RECOVERY	LITHOLOGIC DESCRIPTION	USCS CLASS.	STD. PENETRATION	PID SCAN	PID HEADSPACE	COMMENTS
				0-9.5 cuttings: backfill			1		
5									
10		10 11		10-11 Sand, med to coarse, some gravel, 5Y 4/3, olive, loose	SP		BG		
15		14.5 16		14.5-16.0 Sand, some clay, some gravel 5Y 4/3, non-cohesive	SC	BG	BG	BG	HI-4301-CSB4 (14.5-16)
20		19.5 21		19.5-21 Silt, 5GY 5/1 greenish gray, odor, loose	ML		460.	45.4	HI-4301-CSB4 (19.5-21)
25		24.5 26		24.5-26 Sand, med-coarse, 5Y 5/3, loose	SP		6.8	9.3	HI-4301-CSB4 (24.5-26)
				TD = 26.0					

PARSONS ENGINEERING SCIENCE, INC.-DRILLING LOG

SITE LOCATION: Luffa Mtn Test Range	WELL OR BORING NO: HI-4301-CSB5
CLIENT/PROJECT: HAPB Site 4301	GEN. ORDER NO.:
CONTRACTOR: AFCEE	DRILLING CONTRACTOR: Earth Core
DRILLING METHOD: 3 1/4" ID HSA	DRILLING RIG: Mobile B-80
SAMPLING METHOD: 2.5" OD Split Spoon	DRILLER/HELPER: Robert Westbrook
BOREHOLE DIAMETER: 6 1/4"	LOGGED BY: TM Jones
WATER DETECTED (FT BGS): NA	TOTAL DEPTH (FT BGS): 26
DRILLING START: 1350 16 Oct 96	DRILLING END: 1430
ABANDONMENT METHOD: bentonite Grout	LOGBOOK REF./PAGE:

DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	RECOVERY	LITHOLOGIC DESCRIPTION	USCS CLASS.	STD. PENETRATION	PID SCAN	PID HEADSPACE	COMMENTS
				0-9.5 cuttings back fill					
5									
10		25	2	9.5-11.0 Sand, coarse 5Y 4/3 olive, loose,	SP		BG	NA	Did not sample
		11							
			14.5	14.5-16.0 Sand, some clay, some gravel 5Y 4/3, moist	SC		BG	BG	HI-4301-CSB5 (14.5-16)
15			16						
			19.5	19.5-21 Silt, 5Y 5/3, olive, wet, soft	ML		BG	BG	HI-4301-CSB5 (19.5-21)
20			21						
			24.5	24.5-26 Sand, medium, 5Y 4/3, olive loose, moist	SP		BG	BG	HI-4301-CSB5 (24.5-26) collected duplicate HI-4301-CSB5 (24.5-31)
25			26						
				TD = 26					

APPENDIX D
LABORATORY ANALYTICAL DATA

Inchcape Testing Services
Environmental Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

CASE NARRATIVE

Inchcape Testing Services
Environmental Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

DATE RECEIVED: 18-OCT-1996

REPORT NUMBER: D96-11845
REPORT DATE: 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

PROJECT : 726876-09222 HAFB Site 4301

DATE SAMPLED : 21-OCT-1996

CASE NARRATIVE

This is a ITS Level III data package containing results for the analysis of volatile organics by EPA methodologies.

EPA Method 8020 Volatile Aromatics Analysis

Calibrations

The mid-run and ending calibrations associated with samples D96-11845-20, -21, -22, -23, -24 and -25 reported results above QC limits. The associated matrix spike and matrix spike duplicate analyses also reported this high bias. Since these samples were non-detected for all target analytes, the calibrations were accepted.

Sample Dilutions

Samples D96-11845-2, -6, -10 and -14 were analyzed at dilutions of 1:500, 1:10,000, 1:25 and 1:5000, respectively, due to high levels of target analytes.

Second Column Confirmations

For the analysis of sample D96-11845-3, the results for o-xylene did not agree within 50% from the primary and confirmation columns. Therefore, the lower result from the confirmation column is being reported.

For the analysis of sample D96-11845-10, the results for ethylbenzene did not agree within 50% from the primary and confirmation columns. Therefore, the lower result from the primary column is being reported.

Matrix Spike Analysis

The matrix spike and matrix spike duplicate analyses for sample D96-11845-22 reported spiking compounds above QC limits. Since the laboratory control spike analysis was within QC limits, the results were accepted.

Inchcape Testing Services
Environmental Laboratories

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EPA Method 8015M Total Volatile Petroleum Hydrocarbons Analysis

Sample Dilutions

Samples D96-11845-2, -6, -10 and -14 were analyzed at dilutions of 1:2500, 1:10,000, 1:25 and 1:5000, respectively, due to high levels of target analytes.

No further observations were documented during the sample analysis for this task.

Please refer to the attached Case Narrative Summary for sample identifications and analytical requests.

If there are any questions, feel free to contact Ms. Jacqueline Mayhew, at (972) 238-5591.

Alan Humason
QA Coordinator

JOB ID : D96-11845
CUSTOMER : Parsons Engineering Science
PROJECT : 726876-09222 HAFB Site 4301

SAMPLE ID : D96-11845-1 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB1# N1#(14.5-16')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-2 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB1# N1#(19.5-21')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
RBNEBTXSC1 /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
RBNEBTXSC2 /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024801501

SAMPLE ID : D96-11845-3 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB1# N1#(24.5-26')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
RBNEBTXSC1 /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
RBNEBTXSC2 /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-4 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB1# N1#(28-29.5')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001

SAMPLE ID : D96-11845-4 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB1# N1#(28-29.5')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	24-OCT-1996	MKS	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-5 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB2# N1#(14.5-16')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-6 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB2# N1#(19.5-21')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
RBNEBTXSC1 /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
RBNEBTXSC2 /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024801501

SAMPLE ID : D96-11845-7 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB2# N1#(24.5-26')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024801501

JOB ID : D96-11845
CUSTOMER : Parsons Engineering Science
PROJECT : 726876-09222 HAFB Site 4301

SAMPLE ID : D96-11845-8 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB2# N1#(29.5-31')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-9 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB3# N1#(14.5-16')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	24-OCT-1996	MKS	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-10 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB3# N1#(19.5-21')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
RBNEBTXSC1 /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
RBNEBTXSC2 /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221603
TVH_8015US /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024801501

SAMPLE ID : D96-11845-11 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB3# N1#(24.5-26')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221604

SAMPLE ID : D96-11845-11 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB3# N1#(24.5-26')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-12 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB3# N1#(29.5-31')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221604
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-13 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB4# N1#(14.5-16')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221604
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-14 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB4# N1#(19.5-21')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
RBNEBTXSC1 /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
RBNEBTXSC2 /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
RBNEBTXSC2 /2	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221604
TVH_8015US /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024801501

JOB ID : D96-11845
CUSTOMER : Parsons Engineering Science
PROJECT : 726876-09222 HAFB Site 4301

SAMPLE ID : D96-11845-15 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB4# N1#(24.5-26')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221604
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-16 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB5# N1#(14.5-16')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221604
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-17 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB5# N1#(19.5-21')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221604
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-18 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB5# N1#(24.5-26')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221604
TVH_8015US /1	RFG	25-OCT-1996	RFG	25-OCT-1996	1024801501

JOB ID : D96-11845
CUSTOMER : Parsons Engineering Science
PROJECT : 726876-09222 HAFB Site 4301

SAMPLE ID : D96-11845-19 DATE SAMPLED : 21-OCT-1996
ID MARKS : 4301-CSB5# N1#(29.5-31')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
SOLID_TPER /1			SAB	24-OCT-1996	1024221604
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-20 DATE SAMPLED : 21-OCT-1996
ID MARKS : FIELDQC# EB1#(0-0')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	34-102696
TVH_8015UL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	33-102696

SAMPLE ID : D96-11845-21 DATE SAMPLED : 7-OCT-1996
ID MARKS : FIELDQC# TB1#(0-0')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	34-102696
TVH_8015UL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	33-102696

SAMPLE ID : D96-11845-22 DATE SAMPLED : 17-OCT-1996
ID MARKS : 4301-MW1# N1#(0-0')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	34-102696
TVH_8015UL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	33-102696

SAMPLE ID : D96-11845-23 DATE SAMPLED : 17-OCT-1996
ID MARKS : 4301-MW2# N1#(0-0')

ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	34-102696

SAMPLE ID : D96-11845-23 DATE SAMPLED : 17-OCT-1996 ID MARKS : 4301-MW2# N1#(0-0')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
TVH_8015UL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	33-102696

SAMPLE ID : D96-11845-24 DATE SAMPLED : 17-OCT-1996 ID MARKS : FIELDQC# EB1#(0-0')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	34-102696
TVH_8015UL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	33-102696

SAMPLE ID : D96-11845-25 DATE SAMPLED : 7-OCT-1996 ID MARKS : FIELDQC# TB2#(0-0')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	34-102696
TVH_8015UL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	33-102696

SAMPLE ID : D96-11845-26 DATE SAMPLED : 21-OCT-1996 ID MARKS : LABQC# LB1#(0-0')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-27 DATE SAMPLED : 21-OCT-1996 ID MARKS : LABQC# BS1#(0-0')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-28 DATE SAMPLED : 21-OCT-1996 ID MARKS : 4301-CS82# MS1#(19.5-21')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001

SAMPLE ID : D96-11845-28 DATE SAMPLED : 21-OCT-1996 ID MARKS : 4301-CSB2# MS1#(19.5-21')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-29 DATE SAMPLED : 21-OCT-1996 ID MARKS : 4301-CSB2# SD1#(19.5-21')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXS /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024802001
TVH_8015US /1	RFG	24-OCT-1996	RFG	24-OCT-1996	1024801501

SAMPLE ID : D96-11845-30 DATE SAMPLED : 21-OCT-1996 ID MARKS : LABQC# LB1#(0-0')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	34-102696
TVH_8015UL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	33-102696

SAMPLE ID : D96-11845-31 DATE SAMPLED : 21-OCT-1996 ID MARKS : LABQC# BS1#(0-0')					
ANALYSIS	PRP	PRP DATE	ANL	ANL DATE	QC BATCH NUMBER
RBNEBTXL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	34-102696
TVH_8015UL /1	CNA	26-OCT-1996	VHT	26-OCT-1996	33-102696

ANALYSIS	DESCRIPTION
RBNEBTXS	IRPIMS BTEX/Naphthalene, Bioventing, Solid
SOLID_TPER	Total Solids, Soil/Sludge, %
TVH_8015US	Total Volatile HC, Solid, µg/Kg
RBNEBTXSC1	IRPIMS BTEX/Naphthalene, Bioventing, Solid
RBNEBTXSC2	IRPIMS BTEX/Naphthalene, Bioventing, Solid
RBNEBTXL	IRPIMS BTEX/Naphthalene, Bioventing, Liquid
TVH_8015UL	Total Volatile HC, Liquid, µg/L

VOLATILES ANALYSIS, WATER

Formulas used for calculations

$$\text{Concentration } (\mu g/L) = \frac{(A_x)(I_s)(Df)}{(A_{is})(RRF)(V_o)}$$

Where:

A_x = Area of the characteristic ion for the compound to be measured.
A_{is} = Area of the characteristic ion for the internal standard.
I_s = Amount of internal standard added in nanograms (ng).
V_o = Volume of water purged in milliliters (mL).
Df = Dilution factor. (see below)
RRF = Relative response factor from the ambient temperature purge of the calibration standard. (see below)

Dilution factor =

$$\frac{\text{number of milliliters of water purged}}{\text{number of mL of the original water sample used for purging}}$$

If no dilution is performed, Df = 1.0

$$\text{Relative Response Factor} = \frac{A_x}{A_{is}} \times \frac{C_{is}}{C_x}$$

A_x = Area of the characteristic ion for the compound to be measured.
A_{is} = Area of the characteristic ion for the specific internal standard.
C_{is} = Concentration of the internal standard ($\mu g/mL$).
C_x = Concentration of the compound to be measured ($\mu g/mL$).

VOLATILES ANALYSIS, SOIL

Formulas used for calculations

$$\text{Concentration } (\mu g/L) = \frac{(A_x)(I_s)(Df)}{(A_{is})(RRF)(W_s)(D)}$$

Where:

A_x = Area of the characteristic ion for the compound to be measured.
A_{is} = Area of the characteristic ion for the internal standard.
I_s = Amount of internal standard added in nanograms (ng).
Df = Dilution factor. (see below)
RRF = Relative response factor from the ambient temperature purge of the calibration standard. (see below)
D = $\frac{100 - \%\ \text{moisture}}{100}$
W_s = Weight of sample extracted in grams (g).

Dilution factor =

$$\frac{\text{number of milliliters of water purged}}{\text{number of mL of the original water sample used for purging}}$$

If no dilution is performed, Df = 1.0

$$\text{Relative Response Factor} = \frac{A_x}{A_{is}} \times \frac{C_{is}}{C_x}$$

A_x = Area of the characteristic ion for the compound to be measured.
A_{is} = Area of the characteristic ion for the specific internal standard.
C_{is} = Concentration of the internal standard ($\mu g/mL$).
C_x = Concentration of the compound to be measured ($\mu g/mL$).

Inchcape Testing Services
Environmental Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

CHAIN OF CUSTODY

Inchcape Testing Services Environmental Laboratories 1089 East Collins Blvd., #100 Richardson, TX 75081 (214) 238-5591 CHAIN OF CUSTODY RECORD

Report to:	Invoice to
Company: Parsons Engineering Scie	Company: Parsons Engineering Scie
Address: 406 W. South Jordan Pkwy #300 South Jordan, Ut 84095	Address: 1700 Broadway Denver CO. 80290
Contact: Gene A. Wright	Contact: John Ratz
Phone: (801) 572-5999	Phone: (303) 831-8100
Fax: (801) 572-9069	PO/SO #: 726876-09222

ANALYSIS REQUESTED: 8015 TPH - gasoline; 8020 - BTEX

Lab use only
Due Date: 10-17

Temp. of coolers when received (C°): 1 | 2 | 3 | 4 | 5

Custody Seal N Y
Intact N Y

Screened For Radioactivity ☐

Sampler's Name: Thomas M. Jensen

Sampler's Signature: Thomas M. Jensen

Proj. No.

Project Name: HAFB STK 4301

No./Type of Containers[2]

Matrix[1]	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	VOA	A/G 1 Lt.	250 ml	P/O	Lab Sample ID (Lab Use Only)
S	10/15/96	1350		X	HI-4301-CSB1 (14.5-16.0)					11845-1
S	10/15/96	1456		X	HI-4301-CSB1 (19.5-21)					2
S	10/15/96	1520		X	HI-4301-CSB1 (24.5-26)					3
S	10/15/96	1655		X	HI-4301-CSB1 (28-29.5)					4
S	10/16/96	0955		X	HI-4301-CSB2 (14.5-16)					5
S	10/16/96	1005		X	HI-4301-CSB2 (19.5-21)					6
S	10/16/96	1016		X	HI-4301-CSB2 (24.5-26)					7
S	10/16/96	1020		X	HI-4301-CSB2 (29.5-31)					8
S	10/16/96	1135		X	HI-4301-CSB3 (14.5-16)					9
S	10/16/96	1143		X	HI-4301-CSB3 (19.5-21)					10

Turn around time: ☒ Priority 1 or Standard ☐ Priority 2 or 50% ☐ Priority 3 or 100% ☐ Priority 4 ERS *

* BTEX (602/8020), TPH (418.1 or 8015), VOLATILES (624/8240), IGNITABILITY, TOTAL LEAD (6010)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Thomas M. Jensen	10/17/96	0900	B. Wilson	10/18/96	1010
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Remarks: Use State of Utah Option 2

1 of 3

Client's delivery of samples constitutes acceptance of Inchcape/ITS-Dallas terms and conditions contained in the Price Schedule.

[1] Matrix: WW - Wastewater; W - Water; S - Soil; SD - Solid; L - Liquid; A - Air Bag; C - Charcoal tube; SL - Sludge; O - Oil

[2] Container: VOA - 40 ml vial; A/G - Amber / Or Glass 1 Liter; 250 ml - Glass wide mouth; P/O - Plastic or other brass sleeve

Inchcape cannot accept verbal changes. Please Fax written changes to 214-238-5592

OFFICE USE ONLY

ORIGINAL

Inchcape Testing Services Environmental Laboratories 1089 East Collins Blvd., #100 Richardson, TX 75081 (214) 238-5591 CHAIN OF CUSTODY RECORD

Report to:	Invoice to
Company: Parsons Engineering Science	Company: Parsons ES
Address: 406 W. South Jordan Pkwy South Jordan, Utah 84095	Address: 1700 Broadway Denver CO. 80290
Contact: Gene N. Wright	Contact: John Rotz
Phone: (801) 572-5999	Phone: (303) 831-8100
Fax: (801) 572-9069	PO/SO #: 726876-09222

Sampler's Name: Thomas M. Jensen

Sampler's Signature: Thomas M Jensen

Proj. No.

Project Name: HAFB Site 4301

No./Type of Containers[2]

ANALYSIS REQUESTED: 8015 TPH - gasoline; 8020 - BTEX

Lab use only
Due Date: CC

Temp. of coolers when received (C°): 1 2 3 4 5

Custody Seal N Y
Intact N Y

Screened For Radioactivity ☐

	Matrix[1]	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	VOA	A/G 1 Lt.	250 ml	P/O	Lab Sample ID (Lab Use Only)
✓	S	10/16/96	1165		✓	HI-4301-CSB3 (24.5-26)				✓	11845-11
✓	S	10/16/96	1200			HI-4301-CSB3 (29.5-31)					12
✓	S	10/16/96	1310			HI-4301-CSB4 (14.5-16)					13
✓	S	10/16/96	1315			HI-4301-CSB4 (19.5-21)					14
✓	S	10/16/96	1325			HI-4301-CSB4 (24.5-26)					15
✓	S	10/16/96	1400			HI-4301-CSB5 (14.5-16)					16
✓	S	10/16/96	1405			HI-4301-CSB5 (19.5-21)					17
✓	S	10/16/96	1415			HI-4301-CSB5 (24.5-26)					18
✓	S	10/16/96	1425			HI-4301-CSB5 (29.5-31)					19
	W	10/16/96	1520		✓	HI-4301-RB1	✓		✗	✗ NO TMS	20

Turn around time ☒ Priority 1 or Standard ☐ Priority 2 or 50% ☐ Priority 3 or 100% ☐ Priority 4 ERS *

* BTEX (602/8020), TPH (418.1 or 8015), VOLATILES (624/8240), IGNITABILITY, TOTAL LEAD (6010)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date	Time:
Thomas M. Jensen	10/17/96	0900	B. Wilson	10/18/96	1010
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Remarks: Use State of Utah Option 2

2 of 3

Client's delivery of samples constitutes acceptance of Inchcape/ITS-Dallas terms and conditions contained in the Price Schedule.

[1] Matrix WW - Wastewater W - Water S - Soil SD - Solid L - Liquid A - Air Bag C - Charcoal tube SL - Sludge O - Oil

[2] Container VOA - 40 ml vial A/G - Amber / Or Glass 1 Liter 250 ml - Glass wide mouth P/O - Plastic or other _____

Inchcape cannot accept verbal changes. Please Fax written changes to 214-238-5592

OFFICE USE ONLY

Inchcape Testing Services Environmental Laboratories 1089 East Collins Blvd., #100 Richardson, TX 75081 (214) 238-5591

CHAIN OF CUSTODY RECORD

Report to:	Invoice to
Company: Parsons ES	Company: Parsons ES
Address: 406 W. South Jordan Pkwy South Jordan UT 84095	Address: 1700 Broadway Denver CO. 80290
Contact: Gene A. Wright	Contact: John Ratz
Phone: (801) 572-5999	Phone: (303) 831-8100
Fax: (801) 572-9069	PO/SO #: 726876-09222

Lab use only
Due Date: 10-14

Temp. of coolers when received (C°): 1 2 3 4 5

Custody Seal N / Y
Intact N / Y

Screened For Radioactivity ☐

Sampler's Name: Thomas M. Jensen
Sampler's Signature: Thomas M. Jensen

Proj. No.
Project Name: HAFB Site 4301
No./Type of Containers[2]

ANALYSIS REQUESTED: BTEX - 8020; TPH - Gasoline - 8015

Matrix[1]	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	VOA	A/G 1 Lt.	250 ml	P/O	Lab Sample ID (Lab Use Only)
W	10/9/96				HI-4301-TB1	✓				11845-21

Note: The Trip blank has the lab labeling: call the Trip blank as noted above

Turn around time: ☒ Priority 1 or Standard ☐ Priority 2 or 50% ☐ Priority 3 or 100% ☐ Priority 4 ERS *

* BTEX (602/8020), TPH (418.1 or 8015), VOLATILES (624/8240), IGNITABILITY, TOTAL LEAD (6010)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Thomas M. Jensen	10/17/96	0900	B. Wilson	10/18/96	1010
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Remarks: Use State of Utah Option 2
303

Client's delivery of samples constitutes acceptance of Inchcape/ITS-Dallas terms and conditions contained in the Price Schedule.

[1] Matrix: WW - Wastewater; W - Water; S - Soil; SD - Solid; L - Liquid; A - Air Bag; C - Charcoal tube; SL - Sludge; O - Oil
[2] Container: VOA - 40 ml vial; A/G - Amber / Or Glass 1 Liter; 250 ml - Glass wide mouth; P/O - Plastic or other _____

Inchcape cannot accept verbal changes. Please Fax written changes to 214-238-5592

OFFICE USE ONLY

Inchcape Testing Services Environmental Laboratories 1089 East Collins Blvd., #100 Richardson, TX 75081 (214) 238-5591 CHAIN OF CUSTODY RECORD

Report to:
Company: Parsons Engineering Science
Address: 406 W. South Jordan Pkwy
South Jordan, Utah 84095
Contact: Gene A. Wright
Phone: (801) 572-5999
Fax: (801) 572-9069

Invoice to
Company: Parsons ES
Address: 1700 Broadway
Denver CO 80290
Contact: John Peltz
Phone: (303) 831-8100
PO/SO #: 726876-09222

ANALYSIS REQUESTED

Lab use only
Due Date: 10-1

Temp. of coolers when received (C°): 1 4 | 2 | 3 | 4 | 5

Custody Seal Intact: N / Y

Screened For Radioactivity: ☐

Sampler's Name: Thomas M. Jensen
Sampler's Signature: Thomas M. Jensen

Proj. No.
Project Name: HAFB Site 4301
No./Type of Containers[2]

Matrix[1]	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	VOA	A/G 1 Lt.	250 ml	P/O	8015 - TPH - gasoline	8020 - BTEXN	Lab Sample ID (Lab Use Only)
W	10/17	1430		X	HI-4301-MW1	X						11845-22
W	10/17	1435		X	HI-4301-MW2	X						23
W	10/17	1500			HI-4301-RBZ	X						24
W	10/7				HI-4301-TBZ	X						25

Note: The trip blank was original lab labeling. Called it HI-4301-TBZ

Turn around time: ☒ Priority 1 or Standard ☐ Priority 2 or 50% ☐ Priority 3 or 100% ☐ Priority 4 ERS *

* BTEX (602/8020), TPH (418.1 or 8015), VOLATILES (624/8240), IGNITABILITY, TOTAL LEAD (6010)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Thomas M. Jensen	10/17/96	1430	Laura Gregg	10/18/96	1015
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Remarks: Use State of Utah Option 2

Client's delivery of samples constitutes acceptance of Inchcape/ITS-Dallas terms and conditions contained in the Price Schedule.

[1] Matrix: WW - Wastewater; W - Water; S - Soil; SD - Solid; L - Liquid; A - Air Bag; C - Charcoal tube; SL - Sludge; O - Oil
[2] Container: VOA - 40 ml vial; A/G - Amber / Or Glass 1 Liter; 250 ml - Glass wide mouth; P/O - Plastic or other

Inchcape cannot accept verbal changes. Please Fax written changes to 214-238-5592

OFFICE USE ONLY

Inchcape Testing Services Environmental Laboratories 1089 East Collins Blvd., #100 Richardson, TX 75081 (214) 238-5591 CHAIN OF CUSTODY RECORD

Report to:	Invoice to
Company: Parsons	Company: Jordon
Address: 406 W. South	Address:
Contact: Gene Wright	Contact:
Phone:	Phone:
Fax:	PO/SO #:

Lab use only
Due Date: 19

Temp. of coolers when received (C°): 1 2 3 4 5

Custody Seal N / Y
Intact N / Y

Screened For Radioactivity ☐

Sampler's Name | Sampler's Signature

Proj. No. | Project Name | No./Type of Containers[2]

ANALYSIS REQUESTED: 8015 TPH Gasoline; 8020 BT EX N

Matrix[1]	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	VOA	A/G 1 Lt.	250 ml	P/O	Lab Sample ID (Lab Use Only)
SQ					LB1					11845-26-22
SQ					BS1					27 23
SQ	10/15	1520			~~BD~~ MS1 4301-CSB1					28 24
SQ	↓	1520			SD1 ↓					29 25
WQ					LB1					30 26
WQ					BS1					31 27

Turn around time ☐ Priority 1 or Standard ☐ Priority 2 or 50% ☐ Priority 3 or 100% ☐ Priority 4 ERS *

* BTEX (602/8020), TPH (418.1 or 8015), VOLATILES (624/8240), IGNITABILITY, TOTAL LEAD (6010)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Remarks

Client's delivery of samples constitutes acceptance of Inchcape/ITS-Dallas terms and conditions contained in the Price Schedule.

[1] Matrix: WW - Wastewater; W - Water; S - Soil; SD - Solid; L - Liquid; A - Air Bag; C - Charcoal tube; SL - Sludge; O - Oil
[2] Container: VOA - 40 ml vial; A/G - Amber / Or Glass 1 Liter; 250 ml - Glass wide mouth; P/O - Plastic or other _____

Inchcape cannot accept verbal changes. Please Fax written changes to 214-238-5592

OFFICE USE ONLY

COOLER RECEIPT FORM

Date Received: 10-18-96 Project: HAFB

Date Logged-in: 10-18-96 Received by: B. Wilson

Cooler # N/A

1	Shipping slip. If yes, carrier and bill number: Fed-Ex #127094731	Yes	No
2	Custody seals on cooler. If yes, how many and where: One on front	Yes	No
3	Custody seals intact.	Yes	No
4	Chain of Custody in plastic.	Yes	No
5	Chain of Custody filled out properly.	Yes	No
6	Client signed Chain of Custody.	Yes	No
7	Samples shipped on ice. If no, temperature of cooler:	Yes	No
8	All bottles sealed.	Yes	No
9	All bottles received intact.	Yes	No
10	Labels in good condition and complete.	Yes	No
11	Sample labels agree with Chain of Custody.	Yes	No
12	Correct containers used.	Yes	No
13	Correct preservative used.	Yes	No
14	Sufficient sample provided.	Yes	No
15	Bubbles absent from VOA.	Yes	No
16	Comments (use corrective action form if necessary):		

COOLER RECEIPT FORM

726876-09222

Date Received: 10/18/96 Project: AFB Site 4301

Date Logged-in: 10/18/96 Received by: [signature]

Cooler #

1	Shipping slip. If yes, carrier and bill number: FED EX 127094796	Yes	No
2	Custody seals on cooler. If yes, how many and where:	Yes	No
3	Custody seals intact.	Yes	No
4	Chain of Custody in plastic.	Yes	No
5	Chain of Custody filled out properly.	Yes	No
6	Client signed Chain of Custody.	Yes	No
7	Samples shipped on ice. If no, temperature of cooler:	Yes	No
8	All bottles sealed.	Yes	No
9	All bottles received intact.	Yes	No
10	Labels in good condition and complete.	Yes	No
11	Sample labels agree with Chain of Custody.	Yes	No
12	Correct containers used.	Yes	No
13	Correct preservative used.	Yes	No
14	Sufficient sample provided.	Yes	No
15	Bubbles absent from VOA.	Yes	No
16	Comments (use corrective action form if necessary):		

Inchcape Testing Services
Environmental Laboratories

FedEx USA Airbill

Tracking Number 1270947296

FedEx Retrieval Copy

33 200 15163285 6179M

1 From

Date 10/17/96 Sender's FedEx Account Number 1082-3321-4

Sender's Name Thomas M. Jensen Phone (801+572-5999

Dept/Floor/Suite/Room

Company PARSONS ENGINEERING SCIENCE

Address 406 W SOUTH JORDAN PKY STE 300

City S JORDAN State UT Zip 84095

2 Your Internal Billing Reference Information 776876-09222

3 To

Recipient's Name Jackie Mayhew Phone (972) 238-5591

Dept/Floor/Suite/Room

Company Inchcape Testing Services

Address 1089 East Collins Blvd.

City Richardson State Tx Zip 75081

For HOLD at FedEx Location check here

1 ☐ Hold Weekday 3 ☐ Hold Saturday (Not available to all locations)

For Saturday Delivery check here

3 ☐ (Extra Charge. Not available to all locations)

4a Service

4b Packaging

5 Special Handling

Does this shipment contain dangerous goods?

6 Dry Ice

7 Cargo Aircraft Only

8 Payment

Bill to: Sender

Obtain Recipient FedEx Account No

Total Packages 1 Total Weight 7lbs Total Charges $

Credit Card Auth.

9 Release Signature

1270947296

232

WCSL 0496
Rev. Date 10/95 • PART #147381

Inchcape Testing Services
Environmental Laboratories

23

FedEx USA Airbill

Tracking Number 1270947311

FedEx Retrieval Copy

35 200 15163285 6179M

1 From

Date Oct 17, 1996 Sender's FedEx Account Number 1082-3321-4

Sender's Name Thomas M. Jenson Phone (801+572-5999

Dept/Floor/Suite/Room

Company PARSONS ENGINEERING SCIENCE

Address 406 W SOUTH JORDAN PKY STE 300

City S JORDAN State UT Zip 8 4 0 9 5

2 Your Internal Billing Reference Information 726876-09222

3 To

Recipient's Name Jackie Mayhew Phone (972) 238-5591

Dept/Floor/Suite/Room

Company Inchcape Testing Services

Address 1089 East Collins Blvd.

City Richardson State Tx Zip 75081

For HOLD at FedEx Location check here

1 [ ] Hold Weekday 31 [ ] Hold Saturday (Not available at all locations) (Not available with FedEx First Overnight or FedEx Standard Overnight)

For Saturday Delivery check here

3 [ ] (Extra Charge. Not available to all locations) (Not available with FedEx First Overnight or FedEx Standard Overnight)

4 Service

1 [X] FedEx Priority Overnight 5 [ ] FedEx Standard Overnight 3 [ ] FedEx 2Day*

2 [ ] FedEx Govt. Overnight

7 [ ] FedEx Overnight Freight 8 [ ] FedEx 2Day Freight

6 [ ] NEW FedEx First Overnight

5 Packaging

6 [ ] FedEx Letter 2 [ ] FedEx Pak 3 [ ] FedEx Box 4 [ ] FedEx Tube 1 [X] Other Packaging

6 Special Handling

Does this shipment contain dangerous goods? 4 [ ] Yes [ ] Yes

6 [ ] Dry Ice CA [ ] Cargo Aircraft Only

7 Payment

[ ] Obtain Recipient FedEx Account No

Bill to: 1 [X] Sender 2 [ ] Recipient 3 [ ] Third Party 4 [ ] Credit Card 5 [ ] Cash/Check

FedEx Account No

Credit Card No Exp Date

Total Packages 1 Total Weight 4 1 Total Charges $

Credit Card Auth.

CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY

8 Release Signature

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

232

WCSL 0496
Rev. Date 10/95 • PART #147381
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1 2 7 0 9 4 7 3 1 1

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

ANALYTICAL RESULTS

Inchcape Testing Services
Environmental Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

ANALYTICAL REPORT

DATE RECEIVED : 18-OCT-1996
REPORT NUMBER : D96-11845
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright
PROJECT : 726876-09222 HAFB Site 4301

Included in this data package are the analytical results for the sample group which you have submitted to Inchcape Testing Services for analysis. These results are representative of the samples as received by the laboratory.

The information contained herein has undergone extensive review and is deemed accurate and complete. Sample analysis and quality control were performed in accordance with all applicable protocols. Any deviations from these protocols or observations of interest are detailed in an accompanying Case Narrative. Please refrain from reproducing this report except in its entirety.

If you have any questions regarding this report and its associated materials please call your Project Manager at (214) 238-5591.

We appreciate the opportunity to serve you and look forward to providing continued service in the future.

Martin Jeffus
General Manager

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-1
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.054 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-1
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	< 50.0 µg/Kg	U
Fluorobenzene (SS)		45.4 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-1
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	95.0 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221603

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-2
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 500
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	0.50 mg/Kg	< 0.50 mg/Kg	DU
Toluene	1.00 mg/Kg	5.62 mg/Kg	D
Ethyl benzene	1.00 mg/Kg	11.4 mg/Kg	D
m,p-Xylene	1.00 mg/Kg	95.8 mg/Kg	D
o-Xylene	1.00 mg/Kg	47.3 mg/Kg	D
Naphthalene	2.50 mg/Kg	13.9 mg/Kg	D
Bromofluorobenzene (SS)		32.2 mg/Kg	D

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-2
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 C1 /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 500
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	0.50 mg/Kg	< 0.50 mg/Kg	DU
Toluene	1.00 mg/Kg	5.62 mg/Kg	D
Ethyl benzene	1.00 mg/Kg	11.4 mg/Kg	D
m,p-Xylene	1.00 mg/Kg	95.8 mg/Kg	D
o-Xylene	1.00 mg/Kg	47.3 mg/Kg	D
Naphthalene	2.50 mg/Kg	13.9 mg/Kg	D
Bromofluorobenzene (SS)		32.2 mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-2
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 C2 /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1000
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Toluene	2.0 mg/Kg	4.9 mg/Kg	D
Ethyl benzene	2.0 mg/Kg	11.2 mg/Kg	D
m,p-Xylene	2.0 mg/Kg	84.4 mg/Kg	D
o-Xylene	2.0 mg/Kg	37.7 mg/Kg	D
Naphthalene	5.0 mg/Kg	18.4 mg/Kg	D
3-Chlorofluorobenzene (SS)		12 mg/Kg	D

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-2
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 2500
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	FLAG
Total Volatile Hydrocarbons	125000	µg/Kg	1280000 µg/Kg	D
Fluorobenzene (SS)			99700 µg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-2
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Solids /1	0.01 %	78.0 %	
Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB QC Batch No : 1024221603			

DATE RECEIVED : 18-OCT-1996
REPORT NUMBER : D96-11845-3
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg		0.0012 mg/Kg	J
m,p-Xylene	0.0020 mg/Kg		0.0030 mg/Kg	
o-Xylene	0.0020 mg/Kg		0.0014 mg/Kg	J
Naphthalene	0.0050 mg/Kg		0.0033 mg/Kg	J
Bromofluorobenzene (SS)			0.059 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-3
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 C1 /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg		0.0012 mg/Kg	J
m,p-Xylene	0.0020 mg/Kg		0.0030 mg/Kg	
o-Xylene	0.0020 mg/Kg		0.0026 mg/Kg	
Naphthalene	0.0050 mg/Kg		0.0033 mg/Kg	J
Bromofluorobenzene (SS)			0.059 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-3
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 C2 /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 5
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
m,p-Xylene	0.0100 mg/Kg	0.0020 mg/Kg	DJ
o-Xylene	0.0100 mg/Kg	0.0014 mg/Kg	DJ
Naphthalene	0.0250 mg/Kg	< 0.0250 mg/Kg	DU
3-Chlorofluorobenzene (SS)		0.052 mg/Kg	D

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-3
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	242 µg/Kg	
Fluorobenzene (SS)		39.9 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-3
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	94.8 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221603

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-4
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(28-29.5')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg		0.0013 mg/Kg	J
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg		0.0035 mg/Kg	J
Bromofluorobenzene (SS)			0.054 mg/Kg	

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-4
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(28-29.5')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : MKS
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	139 µg/Kg	
Fluorobenzene (SS)		46.1 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-4
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB1#
: N1#(28-29.5')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	80.3 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221603

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-5
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.057 mg/Kg	

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-5
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	84.9 µg/Kg	
Fluorobenzene (SS)		43.8 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-5
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Solids /1	0.01 %	94.6 %	
Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB QC Batch No : 1024221603			

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-6
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 10000
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		FLAG
Benzene	10	mg/Kg	< 10	mg/Kg	DU
Toluene	20	mg/Kg	145	mg/Kg	D
Ethyl benzene	20	mg/Kg	195	mg/Kg	D
m,p-Xylene	20	mg/Kg	1910	mg/Kg	D
o-Xylene	20	mg/Kg	676	mg/Kg	D
Naphthalene	50	mg/Kg	70	mg/Kg	D
Bromofluorobenzene (SS)			640	mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-6
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 C1 /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 10000
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	FLAG
Benzene	10	mg/Kg	< 10 mg/Kg	DU
Toluene	20	mg/Kg	145 mg/Kg	D
Ethyl benzene	20	mg/Kg	195 mg/Kg	D
m,p-Xylene	20	mg/Kg	1910 mg/Kg	D
o-Xylene	20	mg/Kg	676 mg/Kg	D
Naphthalene	50	mg/Kg	70 mg/Kg	D
Bromofluorobenzene (SS)			640 mg/Kg	D

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-6
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 C2 /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 25000
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		FLAG
Toluene	50	mg/Kg	164	mg/Kg	D
Ethyl benzene	50	mg/Kg	210	mg/Kg	D
m,p-Xylene	50	mg/Kg	1590	mg/Kg	D
o-Xylene	50	mg/Kg	582	mg/Kg	D
Naphthalene	125	mg/Kg	113	mg/Kg	DJ
3-Chlorofluorobenzene (SS)			260	mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-6
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 10000
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		FLAG
Total Volatile Hydrocarbons	500000	µg/Kg	8490000	µg/Kg	D
Fluorobenzene (SS)			377000	µg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-6
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Solids /1	0.01 %	76.4 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221603

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-7
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.060 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-7
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	38.6 µg/Kg	J
Fluorobenzene (SS)		45.6 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-7
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Solids /1	0.01 %	93.9 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221603

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-8
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(29.5-31')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg		0.0006 mg/Kg	J
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg		0.0013 mg/Kg	J
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.054 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-8
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(29.5-31')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	45.8 µg/Kg	J
Fluorobenzene (SS)		45.6 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-8
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: N1#(29.5-31')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	87.9 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221603

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-9
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.057 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-9
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : MKS
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	29.1 µg/Kg	J
Fluorobenzene (SS)		43.2 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-9
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Solids /1	0.01 %	93.6 %	
Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB QC Batch No : 1024221603			

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-10
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 25
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	0.025 mg/Kg	< 0.025 mg/Kg	DU
Toluene	0.050 mg/Kg	< 0.050 mg/Kg	DU
Ethyl benzene	0.050 mg/Kg	0.111 mg/Kg	D
m,p-Xylene	0.050 mg/Kg	2.71 mg/Kg	D
o-Xylene	0.050 mg/Kg	1.29 mg/Kg	D
Naphthalene	0.125 mg/Kg	0.372 mg/Kg	D
Bromofluorobenzene (SS)		1.60 mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-10
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 C1 /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 25
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	0.025 mg/Kg	< 0.025 mg/Kg	DU
Toluene	0.050 mg/Kg	< 0.050 mg/Kg	DU
Ethyl benzene	0.050 mg/Kg	0.111 mg/Kg	D
m,p-Xylene	0.050 mg/Kg	2.71 mg/Kg	D
o-Xylene	0.050 mg/Kg	1.29 mg/Kg	D
Naphthalene	0.125 mg/Kg	0.372 mg/Kg	D
Bromofluorobenzene (SS)		1.60 mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-10
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 C2 /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 25
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Ethyl benzene	0.050 mg/Kg	0.208 mg/Kg	D
m,p-Xylene	0.050 mg/Kg	2.47 mg/Kg	D
o-Xylene	0.050 mg/Kg	1.03 mg/Kg	D
Naphthalene	0.125 mg/Kg	0.351 mg/Kg	D
4-Chlorofluorobenzne (SS)		0.31 mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-10
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 25
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	FLAG
Total Volatile Hydrocarbons	1250	µg/Kg	34300 µg/Kg	D
Fluorobenzene (SS)			1120 µg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-10
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Solids /1	0.01 %	76.0 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221603

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-11
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.056 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-11
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	< 50.0 µg/Kg	U
Fluorobenzene (SS)		44.2 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-11
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	92.7 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221604

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-12
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(29.5-31')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.055 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-12
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(29.5-31')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	29.5 µg/Kg	J
Fluorobenzene (SS)		44.4 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-12
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB3#
: N1#(29.5-31')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	83.4 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221604

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-13
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg		0.0011 mg/Kg	J
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.056 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-13
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	31.3 µg/Kg	J
Fluorobenzene (SS)		44.8 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-13
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Solids /1	0.01 %	92.9 %	
Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB QC Batch No : 1024221604			

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-14
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 5000
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	5.0 mg/Kg	< 5.0 mg/Kg	DU
Toluene	10.0 mg/Kg	79.9 mg/Kg	D
Ethyl benzene	10.0 mg/Kg	63.1 mg/Kg	D
m,p-Xylene	10.0 mg/Kg	636 mg/Kg	D
o-Xylene	10.0 mg/Kg	226 mg/Kg	D
Naphthalene	25.0 mg/Kg	28.6 mg/Kg	D
Bromofluorobenzene (SS)		314 mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-14
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 C1 /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 5000
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	5.0 mg/Kg	< 5.0 mg/Kg	DU
Toluene	10.0 mg/Kg	79.9 mg/Kg	D
Ethyl benzene	10.0 mg/Kg	63.1 mg/Kg	D
m,p-Xylene	10.0 mg/Kg	636 mg/Kg	D
o-Xylene	10.0 mg/Kg	226 mg/Kg	D
Naphthalene	25.0 mg/Kg	28.6 mg/Kg	D
Bromofluorobenzene (SS)		314 mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-14
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 C2 /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 5000
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Toluene	10.0 mg/Kg	88.0 mg/Kg	D
Ethyl benzene	10.0 mg/Kg	71.0 mg/Kg	D
o-Xylene	10.0 mg/Kg	192 mg/Kg	D
Naphthalene	25.0 mg/Kg	42.3 mg/Kg	D
4-Chlorofluorobenzne (SS)		63 mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-14
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 C2 /2
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 25000
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
m,p-Xylene	50 mg/Kg	553 mg/Kg	D
3-Chlorofluorobenzene (SS)		260 mg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-14
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 5000
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		FLAG
Total Volatile Hydrocarbons	250000	µg/Kg	4210000	µg/Kg	D
Fluorobenzene (SS)			219000	µg/Kg	D

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-14
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	77.7 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221604

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-15
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.055 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-15
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	< 50.0 µg/Kg	U
Fluorobenzene (SS)		44.2 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-15
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB4#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	95.3 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221604

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-16
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.057 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-16
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	< 50.0 µg/Kg	U
Fluorobenzene (SS)		44.2 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-16
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(14.5-16')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	94.2 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221604

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-17
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.057 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-17
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	34.7 µg/Kg	J
Fluorobenzene (SS)		45.8 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-17
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	75.4 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221604

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-18
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.059 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-18
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 25-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 25-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	< 50.0 µg/Kg	U
Fluorobenzene (SS)		42.3 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-18
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(24.5-26')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES

TEST REQUESTED		DETECTION LIMIT	RESULTS	FLAG
Total Solids	/1	0.01 %	91.3 %	

Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB
QC Batch No : 1024221604

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-19
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(29.5-31')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.056 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-19
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(29.5-31')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	< 50.0 µg/Kg	U
Fluorobenzene (SS)		45.4 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-19
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB5#
: N1#(29.5-31')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996

MISCELLANEOUS ANALYSES			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Solids /1	0.01 %	94.9 %	
Analyzed using ASTM D2216 mod. on 24-OCT-1996 by SAB QC Batch No : 1024221604			

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-20
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : FIELDQC#
: EB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 34-102696

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	2.0 µg/L	< 2.0 µg/L	U
Toluene	2.0 µg/L	< 2.0 µg/L	U
Ethyl benzene	2.0 µg/L	< 2.0 µg/L	U
m,p-Xylene	2.0 µg/L	< 2.0 µg/L	U
o-Xylene	2.0 µg/L	< 2.0 µg/L	U
Naphthalene	2.0 µg/L	< 2.0 µg/L	U
Bromofluorobenzene (SS)		46.4 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-20
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : FIELDQC#
: EB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 33-102696

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/L	< 50.0 µg/L	U
Fluorobenzene (SS)		52.6 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-21
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : FIELDQC#
: TB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 7-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 34-102696

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	2.0 µg/L	< 2.0 µg/L	U
Toluene	2.0 µg/L	< 2.0 µg/L	U
Ethyl benzene	2.0 µg/L	< 2.0 µg/L	U
m,p-Xylene	2.0 µg/L	< 2.0 µg/L	U
o-Xylene	2.0 µg/L	< 2.0 µg/L	U
Naphthalene	2.0 µg/L	< 2.0 µg/L	U
Bromofluorobenzene (SS)		46.2 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-21
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : FIELDQC#
: TB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 7-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 33-102696

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/L	< 50.0 µg/L	U
Fluorobenzene (SS)		53.5 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-22
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Ground Water for IRPIMS
ID MARKS : 4301-MW1#
: N1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 17-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 34-102696

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	2.0 µg/L	< 2.0 µg/L	U
Toluene	2.0 µg/L	< 2.0 µg/L	U
Ethyl benzene	2.0 µg/L	< 2.0 µg/L	U
m,p-Xylene	2.0 µg/L	< 2.0 µg/L	U
o-Xylene	2.0 µg/L	< 2.0 µg/L	U
Naphthalene	2.0 µg/L	< 2.0 µg/L	U
Bromofluorobenzene (SS)		47.3 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-22
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Ground Water for IRPIMS
ID MARKS : 4301-MW1#
: N1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 17-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 33-102696

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/L	< 50.0 µg/L	U
Fluorobenzene (SS)		52.1 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-23
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Ground Water for IRPIMS
ID MARKS : 4301-MW2#
: N1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 17-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 34-102696

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	2.0 µg/L	<	2.0 µg/L	U
Toluene	2.0 µg/L	<	2.0 µg/L	U
Ethyl benzene	2.0 µg/L	<	2.0 µg/L	U
m,p-Xylene	2.0 µg/L	<	2.0 µg/L	U
o-Xylene	2.0 µg/L	<	2.0 µg/L	U
Naphthalene	2.0 µg/L	<	2.0 µg/L	U
Bromofluorobenzene (SS)			47.0 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-23
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Ground Water for IRPIMS
ID MARKS : 4301-MW2#
: N1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 17-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 33-102696

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/L	< 50.0 µg/L	U
Fluorobenzene (SS)		52.3 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-24
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : FIELDQC#
: EB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 17-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 34-102696

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	2.0 µg/L	< 2.0 µg/L	U
Toluene	2.0 µg/L	< 2.0 µg/L	U
Ethyl benzene	2.0 µg/L	< 2.0 µg/L	U
m,p-Xylene	2.0 µg/L	< 2.0 µg/L	U
o-Xylene	2.0 µg/L	< 2.0 µg/L	U
Naphthalene	2.0 µg/L	< 2.0 µg/L	U
Bromofluorobenzene (SS)		47.3 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-24
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : FIELDQC#
: EB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 17-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 33-102696

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/L	< 50.0 µg/L	U
Fluorobenzene (SS)		51.9 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-25
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : FIELDQC#
: TB2#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 7-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 34-102696

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	2.0 µg/L	< 2.0 µg/L	U
Toluene	2.0 µg/L	< 2.0 µg/L	U
Ethyl benzene	2.0 µg/L	< 2.0 µg/L	U
m,p-Xylene	2.0 µg/L	< 2.0 µg/L	U
o-Xylene	2.0 µg/L	< 2.0 µg/L	U
Naphthalene	2.0 µg/L	< 2.0 µg/L	U
Bromofluorobenzene (SS)		47.6 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-25
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : FIELDQC#
: TB2#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 7-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 33-102696

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/L	< 50.0 µg/L	U
Fluorobenzene (SS)		51.6 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 21-OCT-1996

REPORT NUMBER : D96-11845-26
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil/Solid Quality Control for IRPIMS
ID MARKS : LABQC#
: LB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		FLAG
Benzene	0.0010 mg/Kg	<	0.0010 mg/Kg	U
Toluene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Ethyl benzene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
m,p-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
o-Xylene	0.0020 mg/Kg	<	0.0020 mg/Kg	U
Naphthalene	0.0050 mg/Kg	<	0.0050 mg/Kg	U
Bromofluorobenzene (SS)			0.052 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 21-OCT-1996

REPORT NUMBER : D96-11845-26
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil/Solid Quality Control for IRPIMS
ID MARKS : LABQC#
: LB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	< 50.0 µg/Kg	U
Fluorobenzene (SS)		46.2 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 21-OCT-1996

REPORT NUMBER : D96-11845-27
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil/Solid Quality Control for IRPIMS
ID MARKS : LABQC#
: BS1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	0.0010 mg/Kg	0.0430 mg/Kg	
Toluene	0.0020 mg/Kg	0.0430 mg/Kg	
Ethyl benzene	0.0020 mg/Kg	0.0420 mg/Kg	
m,p-Xylene	0.0020 mg/Kg	0.0880 mg/Kg	
o-Xylene	0.0020 mg/Kg	0.0400 mg/Kg	
Naphthalene	0.0050 mg/Kg	0.0400 mg/Kg	
Bromofluorobenzene (SS)		0.052 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 21-OCT-1996

REPORT NUMBER : D96-11845-27
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil/Solid Quality Control for IRPIMS
ID MARKS : LABQC#
: BS1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	478 µg/Kg	
Fluorobenzene (SS)		47.7 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-28
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: MS1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	0.0010 mg/Kg	0.0510 mg/Kg	
Toluene	0.0020 mg/Kg	0.0500 mg/Kg	
Ethyl benzene	0.0020 mg/Kg	0.0480 mg/Kg	
m,p-Xylene	0.0020 mg/Kg	0.100 mg/Kg	
o-Xylene	0.0020 mg/Kg	0.0480 mg/Kg	
Naphthalene	0.0050 mg/Kg	0.0490 mg/Kg	
Bromofluorobenzene (SS)		0.054 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-28
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: MS1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	506 µg/Kg	
Fluorobenzene (SS)		46.1 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-29
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: SD1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024802001

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	0.0010 mg/Kg	0.0500 mg/Kg	
Toluene	0.0020 mg/Kg	0.0470 mg/Kg	
Ethyl benzene	0.0020 mg/Kg	0.0460 mg/Kg	
m,p-Xylene	0.0020 mg/Kg	0.0960 mg/Kg	
o-Xylene	0.0020 mg/Kg	0.0460 mg/Kg	
Naphthalene	0.0050 mg/Kg	0.0450 mg/Kg	
Bromofluorobenzene (SS)		0.052 mg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 18-OCT-1996

REPORT NUMBER : D96-11845-29
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Soil for IRPIMS
ID MARKS : 4301-CSB2#
: SD1#(19.5-21')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : RFG
PREPARED ON : 24-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : RFG
ANALYZED ON : 24-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 1024801501

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/Kg	483 µg/Kg	
Fluorobenzene (SS)		47.2 µg/Kg	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 21-OCT-1996

REPORT NUMBER : D96-11845-30
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : LABQC#
: LB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 34-102696

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	2.0 µg/L	< 2.0 µg/L	U
Toluene	2.0 µg/L	< 2.0 µg/L	U
Ethyl benzene	2.0 µg/L	< 2.0 µg/L	U
m,p-Xylene	2.0 µg/L	< 2.0 µg/L	U
o-Xylene	2.0 µg/L	< 2.0 µg/L	U
Naphthalene	2.0 µg/L	< 2.0 µg/L	U
Bromofluorobenzene (SS)		50.8 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 21-OCT-1996

REPORT NUMBER : D96-11845-30
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : LABQC#
: LB1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 33-102696

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/L	< 50.0 µg/L	U
Fluorobenzene (SS)		48.4 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 21-OCT-1996

REPORT NUMBER : D96-11845-31
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : LABQC#
: BS1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 8020 PR /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 34-102696

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Benzene	2.0 µg/L	57.2 µg/L	
Toluene	2.0 µg/L	56.7 µg/L	
Ethyl benzene	2.0 µg/L	55.7 µg/L	
m,p-Xylene	2.0 µg/L	123 µg/L	
o-Xylene	2.0 µg/L	55.8 µg/L	
Naphthalene	2.0 µg/L	51.5 µg/L	
Bromofluorobenzene (SS)		49.7 µg/L	

Inchcape Testing Services
Environmental Laboratories

DATE RECEIVED : 21-OCT-1996

REPORT NUMBER : D96-11845-31
REPORT DATE : 29-OCT-1996

SAMPLE SUBMITTED BY : Parsons Engineering Science
ADDRESS : 406 W. South Jordon
: South Jordon, UT 84095
ATTENTION : Mr. Gene Wright

SAMPLE MATRIX : Water Quality Control for IRPIMS
ID MARKS : LABQC#
: BS1#(0-0')
PROJECT : 726876-09222 HAFB Site 4301
DATE SAMPLED : 21-OCT-1996
PREPARATION METHOD : EPA 5030
PREPARED BY : CNA
PREPARED ON : 26-OCT-1996
ANALYSIS METHOD : EPA 5030/8015M /1
ANALYZED BY : VHT
ANALYZED ON : 26-OCT-1996
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 33-102696

TOTAL VOLATILE HYDROCARBONS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	FLAG
Total Volatile Hydrocarbons	50.0 µg/L	426 µg/L	
Fluorobenzene (SS)		50.0 µg/L	

DESCRIPTION OF REPORTING FLAGS

U - Indicates compound was analyzed for but not detected.

J - Indicates an estimated value. This flag is used if the compound is detected but is below the Reporting Limit.

D - Indicates all compounds in an analysis at a secondary dilution.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds where the identification is based on a mass spectral library search.

E - Indicates the compounds whose concentration exceed the limit of the instrument or the Laboratory Information Management System. The concentration will be greater than the concentration listed.

Q - Indicates the surrogate recovery is outside the defined QC limits.

M - Indicates the matrix has interfered with the recovery of the surrogates.

O - Indicates the surrogate was lost because of dilution.

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QC SUMMARY

Inchcape Testing Services
Environmental Laboratories

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REPORT DATE : 31-OCT-1996 REPORT NUMBER : D96-11845

SAMPLE SUBMITTED BY : Parsons Engineering Science
ATTENTION : Mr. Gene Wright

LABORATORY QUALITY CONTROL REPORT

ANALYTE	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene
BATCH NO.	34-102696	34-102696	34-102696	34-102696	34-102696
LCS LOT NO.	AB709-51C	AB709-51C	AB709-51C	AB709-51C	AB709-51C
PREP METHOD	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030
PREPARED BY	CNA	CNA	CNA	CNA	CNA
ANALYSIS METHOD	EPA 8020 PR	EPA 8020 PR	EPA 8020 PR	EPA 8020 PR	EPA 8020 PR
ANALYZED BY	VHT	VHT	VHT	VHT	VHT
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L
METHOD BLANK	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00
SPIKE LEVEL	500	500	500	1000	500
SPK REC LIMITS	75.0 - 125	75.0 - 125	75.0 - 125	75.0 - 125	75.0 - 125
SPK RPD LIMITS	25.0	25.0	25.0	25.0	25.0
MS RESULT	663	674	675	1480	672
MS RECOVERY %	133 C	135 C	135 C	148 C	134 C
MSD RESULT	605	612	613	1350	611
MSD RECOVERY %	121 C	122 C	123 C	135 C	122 C
MS/MSD RPD %	9.15 C	9.64 C	9.63 C	9.19 C	9.51 C
BS RESULT	NA	NA	NA	NA	NA
BS RECOVERY %	NA	NA	NA	NA	NA
BSD RESULT	NA	NA	NA	NA	NA
BSD RECOVERY %	NA	NA	NA	NA	NA
BS/BSD RPD %	NA	NA	NA	NA	NA
DUP RPD LIMITS	---	---	---	---	---
DUPLICATE RPD %	NA	NA	NA	NA	NA
LCS LEVEL	50.0	50.0	50.0	100	50.0
LCS REC LIMITS	75.0 - 125	75.0 - 125	75.0 - 125	75.0 - 125	75.0 - 125
LCS RESULT	57.2	55.7	55.7	123	55.8
LCS RECOVERY %	114	111	111	123	112
SPIKE SAMPLE ID	11845-22	11845-22	11845-22	11845-22	11845-22
SAMPLE VALUE	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00
DUP SAMPLE ID	---	---	---	---	---
DUP SAMPLE VAL/1	---	---	---	---	---
DUP SAMPLE VAL/2	---	---	---	---	---

C Refer to Case Narrative for further information.
NA Not applicable

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REPORT DATE : 31-OCT-1996 REPORT NUMBER : D96-11845

SAMPLE SUBMITTED BY : Parsons Engineering Science
ATTENTION : Mr. Gene Wright

LABORATORY QUALITY CONTROL REPORT

ANALYTE	Napthalene	Benzene	Toluene	Ethylbenzene	m,p-Xylenes
BATCH NO.	34-102696	1024802001	1024802001	1024802001	1024802001
LCS LOT NO.	AB709-51C	AB709-51C	AB709-51C	AB709-51C	AB709-51C
PREP METHOD	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030
PREPARED BY	CNA	RFG	RFG	RFG	RFG
ANALYSIS METHOD	EPA 8020 PR	EPA 8020 PR	EPA 8020 PR	EPA 8020 PR	EPA 8020 PR
ANALYZED BY	VHT	RFG	RFG	RFG	RFG
UNITS	µg/L	mg/Kg	mg/Kg	mg/Kg	mg/Kg
METHOD BLANK	< 2.00	< 0.001	< 0.002	< 0.002	< 0.002
SPIKE LEVEL	500	0.0500	0.0500	0.0500	0.100
SPK REC LIMITS	75.0 - 125	70.0 - 130	70.0 - 130	70.0 - 130	70.0 - 130
SPK RPD LIMITS	25.0	25.0	25.0	25.0	25.0
MS RESULT	666	0.0510	0.0500	0.0480	0.100
MS RECOVERY %	133 C	102	100	96.0	98.9
MSD RESULT	616	0.0500	0.0470	0.0460	0.0960
MSD RECOVERY %	123 C	100	94.0	92.0	94.9
MS/MSD RPD %	7.80 C	1.98	6.19	4.26	4.13
BS RESULT	NA	NA	NA	NA	NA
BS RECOVERY %	NA	NA	NA	NA	NA
BSD RESULT	NA	NA	NA	NA	NA
BSD RECOVERY %	NA	NA	NA	NA	NA
BS/BSD RPD %	NA	NA	NA	NA	NA
DUP RPD LIMITS	---	---	---	---	---
DUPLICATE RPD %	NA	NA	NA	NA	NA
LCS LEVEL	50.0	0.0500	0.0500	0.0500	0.100
LCS REC LIMITS	75.0 - 125	70.0 - 130	70.0 - 130	70.0 - 130	70.0 - 130
LCS RESULT	51.5	0.0430	0.0430	0.0430	0.0880
LCS RECOVERY %	103	86.0	86.0	86.0	88.0
SPIKE SAMPLE ID	11845-22	11845-13	11845-13	11845-13	11845-13
SAMPLE VALUE	< 2.00	< 0.00100	< 0.00200	< 0.00200	0.00106
DUP SAMPLE ID	---	---	---	---	---
DUP SAMPLE VAL/1	---	---	---	---	---
DUP SAMPLE VAL/2	---	---	---	---	---

C Refer to Case Narrative for further information.
NA Not applicable

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REPORT DATE : 31-OCT-1996 REPORT NUMBER : D96-11845

SAMPLE SUBMITTED BY : Parsons Engineering Science
ATTENTION : Mr. Gene Wright

LABORATORY QUALITY CONTROL REPORT

ANALYTE	o-Xylene	Napthalene	Total Petroleum Hydrocarbon	Total Petroleum Hydrocarbon
BATCH NO.	1024802001	1024802001	33-102696	1024801501
LCS LOT NO.	AB709-51C	AB709-51C	AB709-51C	AB709-51C
PREP METHOD	EPA 5030	EPA 5030	EPA 5030	EPA 5030
PREPARED BY	RFG	RFG	CNA	RFG
ANALYSIS METHOD	EPA 8020 PR	EPA 8020 PR	EPA 5030/8015M	EPA 5030/8015M
ANALYZED BY	RFG	RFG	VHT	RFG
UNITS	mg/Kg	mg/Kg	µg/L	µg/Kg
METHOD BLANK	< 0.002	< 0.005	< 50.0	< 50.0
SPIKE LEVEL	0.0500	0.0500	5000	500
SPK REC LIMITS	70.0 - 130	70.0 - 130	75.0 - 125	70.0 - 130
SPK RPD LIMITS	25.0	25.0	25.0	25.0
MS RESULT	0.0480	0.0490	5110	506
MS RECOVERY %	96.0	98.0	102	101
MSD RESULT	0.0460	0.0450	4610	483
MSD RECOVERY %	92.0	90.0	92.2	96.6
MS/MSD RPD %	4.26	8.51	10.3	4.65
BS RESULT	NA	NA	NA	NA
BS RECOVERY %	NA	NA	NA	NA
BSD RESULT	NA	NA	NA	NA
BSD RECOVERY %	NA	NA	NA	NA
BS/BSD RPD %	NA	NA	NA	NA
DUP RPD LIMITS	---	---	---	---
DUPLICATE RPD %	NA	NA	NA	NA
LCS LEVEL	0.0500	0.0500	500	500
LCS REC LIMITS	70.0 - 130	70.0 - 130	75.0 - 125	70.0 - 130
LCS RESULT	0.0400	0.0400	426	478
LCS RECOVERY %	80.0	80.0	85.2	95.6
SPIKE SAMPLE ID	11845-13	11845-13	11845-22	11845-13
SAMPLE VALUE	< 0.00200	< 0.00500	< 50.0	< 50.0
DUP SAMPLE ID	---	---	---	---
DUP SAMPLE VAL/1	---	---	---	---
DUP SAMPLE VAL/2	---	---	---	---

NA Not applicable