KELLY AFB
TEXAS

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 3923

Addendum to
IRP Site SS009 Closure Report
Dated 1997

Section 1.4.1 last paragraph:

1. "One area contained 8 rows of approximately 400 drums of liquid Herbicide Blue (i.e. sodium cacodylate and dimethylarsenic acid); the other area contained 3 groups of approximately 600 drums of liquid Herbicide Orange (i.e. 2, 4-dichlorophenoxy acetic acid [2, 4-D] and 2, 4, 5-trichlorophenoxy acetic acid [2,4,5-T])."

Update with:

2. "One area contained 8 rows of approximately 400 drums of liquid Herbicide Blue (i.e. sodium cacodylate and dimethylarsenic acid); the other area contained 3 groups of approximately 600 drums of liquid Herbicide (i.e. 2, 4-dichlorophenoxy acetic acid [2, 4-D] and 2, 4, 5-trichlorophenoxy acetic acid [2,4,5-T])."

Kelly AR # 3923 Page 3 of 880
File: AR 795
S.T. KAR 777
DOC # 4400
KAR # 777

UNITED STATES AIR FORCE
KELLY AIR FORCE BASE
SAN ANTONIO, TEXAS

795 L

IRP Site SS009 Closure Report

Final

SAN ANTONIO AIR LOGISTICS CENTER
PARTNERS WITH THE ENVIRONMENT
ENVIRONMENTAL MANAGEMENT

Kelly Air Force Base, Texas

F41650-95-D-2005-5016

September 1997

795 2

Contents

EXECUTIVE SUMMARY **ES-1**

1.0 INTRODUCTION **1-1**

1.1 Objective 1-1
1.2 Overview of the Installation Restoration Program (IRP) 1-1
1.3 Site Status 1-2
1.4 Site Background 1-2
1.4.1 Location, History, and Description 1-2
1.4.2 Previous Investigations 1-3
1.5 Organization of this Report 1-4

2.0 ENVIRONMENTAL SETTING **2-1**

2.1 Physical Features 2-1
2.2 Climate 2-1
2.3 Surface Water Hydrology 2-1
2.4 Geology and Hydrogeology 2-2
2.5 Regional Geology 2-2
2.6 Local Geology 2-3
2.7 Regional Hydrogeology 2-3
2.8 Local Hydrogeology 2-4
2.9 Local Land Use 2-5

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS **3-1**

3.1 Phase I/II Site Investigations 3-1
3.2 1990-1992 Site Investigations 3-1
3.3 1994 Supplemental Sampling 3-5
3.4 Site-Specific Environmental Baseline Survey 3-7

4.0 1996 SITE INVESTIGATION **4-1**

4.1 Field Investigation 4-4
4.1.1 Equipment Decontamination 4-4
4.1.2 Field Preparation and Sampling Activities 4-4
4.2 Results 4-4

5.0 EVALUATION OF RESULTS **5-1**

5.1 Summary of Risk-Reduction Standards 5-1

Contents cont.

5.1.1 Risk Reduction Standard No. 1 5-1
5.1.2 Risk-Reduction Standard No. 2 5-1
5.1.3 Risk-Reduction Standard No. 3 5-5
5.2 Evaluation of Data 5-6
5.2.1 Comparison to Background (RRS No. 1 Evaluation) 5-6
5.2.2 RRS No. 2 Evaluation 5-8
5.3 Nature and Extent of Contamination 5-15
5.3.1 Surface Soil Contamination 5-15
5.3.2 Subsurface Soil Contamination 5-17
5.4 Conclusion of RRS Evaluation 5-17

6.0 SUMMARY OF REMOVAL ACTION 6-1

6.1 Excavation Activities 6-1
6.2 Confirmatory Sampling 6-1
6.3 Evaluation of Post-Excavation Conditions 6-2

7.0 CONCLUSIONS AND RECOMMENDATIONS 7-1

APPENDICES

A Supplemental Sampling at Site S-7 (CH2M HILL, 1994)
B Boring Log and Well Completion Diagrams
C Summary of Halliburton NUS Metal & PCDD/PCDF Data (1992)
D Work Plan for 1996 Sampling at SS009 (Kelly AFB 29 Sept 1996, Revised; 4 Oct 1996)
E Summary of October 1996 Sampling Results
F Photographs of October 1996 Sampling Event
G Results of 1994 and 1996 Groundwater Sampling
H Data Quality Evaluation and Chain-of-Custody Forms
I Calculation of Reasonable Maximum Exposure Concentrations
J Development of Risk Reduction Standard No. 2 Soil/Air Inhalation and Ingestion Standard—Industrial
K TNRCC and EPA Correspondence
L Manifests for Disposal of Excavated Soil
M Chain-of-Custody Forms and Analytical Data for Confirmatory Sampling
N Baseline Risk Assessment
O Deed Recordation

Contents cont.

795 4

Tables **Page**

1.1 Texas Risk Reduction Standard Requirements (30 TAC 335) 1-6

2.1 Monthly Prevailing Wind Directions and Mean Velocities 2-2
2.2 Hydraulic Conductivity Results from Wells Near Site SS009 2-4

3.1 Summary of Historical Analyses from Halliburton NUS Investigation (1992) 3-2
3.2 Comparison of Metals Concentrations in Soil During the 1990-92 Sampling with Background and Medium-Specific Concentrations 3-4
3.3 Summary of Historical Analyses from CH2M HILL 1994 Supplemental Sampling 3-6

4.1 Summary of Analyses from CH2M HILL 1996 Closure Investigation 4-2
4.2 Summary of 1996 Data 4-5
4.3 Results of Sampling to Delineate Vertical Extent of Contamination 4-6

5.1 Summary of Soil Data Used in Evaluation (Totals Analyses) 5-2
5.2 Summary of Surface-Soil SPLP Data Used in Evaluation 5-4
5.3 Comparison to Background 5-7
5.4 Comparison of PCDD/PCDF Data to Background 5-9
5.5 Toxicity Equivalent Factors for Dioxin COPCs 5-10
5.6 Toxicity Values for Chemicals of Potential Concern 5-11
5.7 Risk Reduction Standard No. 2 SAI-Ind Criteria 5-12
5.8 Comparison of PCDD/PCDF Results to RRS No. 2 Criteria for Surface Soil 5-13
5.9 Comparison of SPLP Results to RRS No. 2 Criteria for Soil-Groundwater Protection 5-14

5.10 Comparison of Pre-Excavation Arsenic Results from Affected Area to RRS No. 2 Criteria 5-18

6.1 Confirmatory Sampling Results 6-2
6.2 Comparison of Post-Excavation Arsenic Results to RRS No. 2 Criteria for SAI-Ind 6-2

Figures

1.1 Site Location Map
1.2 SS009 Site Layout
1.3 Photographs taken in 1971 showing drum storage at IRP Site SS009

2.1 Typical Lithologic Units of the Quaternary Alluvial Deposits, Kelly AFB, San Antonio, Texas (from HNUS, 1989)
2.2 Potentiometric Surface Map of Site SS009 Area
2.3 Existing Land Use Map as of 1994

Contents cont.

3.1 Historic Soil Sample Locations

4.1 Locations of October 1996 Samples

5.1 Locations of Soil Samples Used in Data Evaluation
5.2 Antimony Concentrations in Surface Soil (Less than 2 feet deep)
5.3 Arsenic Concentrations in Surface Soil (Less than 2 feet deep)
5.4 Beryllium Concentrations in Surface Soil (Less than 2 feet deep)
5.5 Beryllium Concentrations in Subsurface Soil (Greater than 2 feet deep)
5-6 Cadmium Concentrations in Surface Soil (Less than 2 feet deep)
5.7 Cadmium Concentrations in Subsurface Soil (Greater than 2 feet deep)
5.8 Chromium Concentrations in Surface Soil (Less than 2 feet deep)
5.9 Lead Concentrations in Surface Soil (Less than 2 feet deep)
5.10 Lead Concentrations in Subsurface Soil (Greater than 2 feet deep)
5.11 Manganese Concentrations in Surface Soil (Less than 2 feet deep)
5.12 Manganese Concentrations in Subsurface Soil (Greater than 2 feet deep)
5.13 Dioxin TEQs for Samples Collected in Surface Soil (Less than 2 feet deep)
5.14 Dioxin TEQs for Samples Collected in Subsurface Soil (Greater than 2 feet deep)
5.15 Concentrations of OCDD in Surface Soil (Less than 2 feet deep)
5.16 Concentrations of OCDD in Subsurface Soil (Greater than 2 feet deep)
5.17 Concentrations of 1,2,3,7,8-PCDF in Surface Soil (Less than 2 feet deep)
5.18 Concentrations of 1,2,3,7,8-PCDF in Subsurface Soil (Greater than 2 feet deep)
5.19 Concentrations of 1,2,3,4,6,7,8-HPCDD in Surface Soil (Less than 2 feet deep)
5.20 Concentrations of 1,2,3,4,6,7,8-HPCDD in Subsurface Soil (Greater than 2 feet deep)
5.21 Arsenic SPLP Concentrations in Surface Soil (Less than 2 feet deep)
5.22 Concentrations Contours of Arsenic in Surface Soil

6.1 Area of Excavation
6.2 Locations of Confirmatory Samples

List of Acronyms and Abbreviations

795

AFB	Air Force Base
bgs	below ground surface
BHA	*Basewide Hydrogeologic Assessment*
CERCLA	Comprehensive Environmental Response, Conservation, and Liability Act of 1980
CLP	Contract Laboratory Program
cm/sec	centimeters per second
CMS	corrective measures study
COPC	contaminant of potential concern
2,4-D	2,4-dichlorophenoxy acetic acid
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
EPA	U.S. Environmental Protection Agency
EBS	Environmental Baseline Survey
ft/day	feet per day
ft/ft	feet per foot
FS	feasibility study
GWP	groundwater protection
GWP-Ind	groundwater protection standard for industrial use
IRP	Installation Restoration Program
MCL	maximum contaminant level
mg/kg	milligram per kilogram
MSC	medium-specific concentration
µg/l	microgram per liter
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NFAR	no further action required
NPL	National Priorities List
NGVD	National Geodetic Vertical Datum
OCDD	octachlorodibenzo-p-dioxin

OCDF	octachlorinated dibenzofuran
PCBs	polychlorinated biphenyls
PCDD	polychlorinated dibenzodioxin (commonly referred to as "dioxins")
PCDF	polychlorinated dibenzofuran (commonly referred to as "furans")
pg/g	picogram per gram
pg/l	picogram per liter
ppt	parts per trillion
PQL	practical quantitation limit
RI	remedial investigation
RME	reasonable maximum exposure
RRS	risk-reduction standard
SAI	soil/air inhalation and ingestion standard
SAI-Ind	soil/air inhalation and ingestion standard for industrial use
SARA	Superfund Amendments and Reauthorization Act of 1986
SCS	Soil Conservation Service
SI	site investigation
SPLP	synthetic precipitation leaching procedure
SVOCs	semivolatile organic compounds
2,4,5-T	2,4,5-trichlorophenoxy acetic acid
TAC	Texas Administrative Code
TAL	Target Analyte List
2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCL	Target Compound List
TEQ	toxicity equivalency quotient
TNRCC	Texas Natural Resource Conservation Commission
2,4,5-TP	Silvex
UCL	upper confidence limit
VOCs	volatile organic compounds

795 8

TAB

Executive Summary

795 9

Executive Summary

Installation Restoration Program (IRP) Site SS009 (referred to in previous reports as Site S-7) is an area surrounding and including a former outdoor container storage area. IRP Site SS009, measuring approximately 1.2 acres in size, is located in the southwest corner of the East Kelly area of Kelly Air Force Base (AFB) in San Antonio, Texas. From 1971 until 1974, this area was used to store 55-gallon drums of herbicides used in Southeast Asia from 1968 until 1971. In 1971, use of these herbicides was discontinued in Southeast Asia, and herbicides that had been on order at that time were brought to East Kelly for storage awaiting disposal. Records indicate that the drums of herbicides at the site were removed and incinerated in late 1974. According to interviews with base personnel, some of the drums leaked from temperature-induced expansion and contraction.

This Closure Report presents the findings of field sampling and data evaluations for IRP Site SS009. The purpose of this report is to demonstrate that current environmental conditions at the site meet the requirements for closure under the Texas Natural Resource Conservation Commission (TNRCC) Risk Reduction Standards (RRSs).

Previous IRP Site Investigations

The purpose of the IRP is to identify and remediate, if necessary, all sites that pose an unacceptable risk to human health and/or the environment. The IRP was started in 1980 as part of the Defense Environmental Restoration Program (DERP). The DERP was created and funded as part of the Comprehensive Environmental Response, Conservation, and Liability Act (CERCLA) of 1980 and was reauthorized under the Superfund Amendments and Reauthorization Act (SARA) of 1986. The IRP is required to:

> *"be consistent with the guidelines, rules, regulations, and criteria established by the EPA [Environmental Protection Agency] for the Comprehensive Environmental Response, Conservation, and Liability Act (CERCLA). If the Resource Conservation and Recovery Act (RCRA) or specific state laws apply to...[the] IRP site, those additional requirements must also be satisfied."* [1]

Five formal IRP studies and/or investigations were either conducted on or included Site SS009 before this closure investigation. Information from these efforts is contained in the following documents:

- *Installation Restoration Program Phase 1 Records Search* (Engineering Science, 1982)
- *Installation Restoration Program Phase II, Stage 2* (Radian Corporation, 1985)
- *Site Investigation Report, East Kelly, Site S-7* (Halliburton NUS, 1992)

[1] U S. Air Force Installation Restoration Program Remedial Project Manager's Handbook (December 1993), page 3-1

- *Supplemental Sampling at Site S-7* (CH2M HILL, 1994)
- *Site-Specific Environmental Baseline Survey Southwest Corners of East Kelly* (CH2M HILL, 1996)

The Phase I records search was a basewide investigation that included file reviews and interviews, but did not include field sampling. Its purpose was to list and rank sites that could potentially pose a threat to human health or the environment. The results of Phase I identified Site SS009 as an IRP site that might require further investigation.

The Phase II study was conducted at several sites on Kelly AFB, including Site SS009. The purpose of this study was to evaluate whether a release of chemicals had occurred, but not to evaluate the nature and extent of any releases present. During Phase II, soil samples were collected and analyzed for the specific herbicides that were stored at Site SS009. The herbicides were not detected, and the study recommended no further action at the site.

In 1989, Kelly AFB started a more extensive investigation at Site SS009 because of concerns that the Phase II sampling had occurred too far east of the actual herbicide storage area. More soil samples were collected over a broad area and analyzed primarily for chemicals known as dioxins and furans. The rationale for these analyses was that dioxins and furans are impurities in the herbicides that were stored at the site. Dioxins and furans degrade slowly and, therefore, it was expected that these chemicals would still be present if herbicide releases had occurred at the site. Some soil samples were also analyzed for metals and other organic chemicals. The risk assessment conducted as part of this site investigation concluded that Site SS009 did not pose a threat to human health or the environment.

In 1993, Kelly AFB started investigating the groundwater over all of East Kelly, including Site SS009. This effort is referred to as the Zone 4 Remedial Investigation (RI). As part of this RI, groundwater samples and additional soil samples were collected near Site SS009. The results of this investigation, reported in *Supplemental Sampling of Site S-7*, document that activities at the site have not effected groundwater quality.

In 1996, CH2M HILL conducted a Site-Specific Environmental Baseline Survey of an area that included Site SS009. No additional environmental concerns were identified as a result of this survey. In 1993, the TNRCC enacted the RRSs, which further regulate the closure of industrial and hazardous waste sites. This report documents the process used to show that Site SS009 meets the requirements of closure under these standards.

Closure Investigation Results

The TNRCC closure rules require the owner to show that a site meets one of the following standards:

- RRS No. 1: Closure to Background
- RRS No. 2: Closure to Health-Based Standards and Criteria
- RRS No. 3: Closure with Controls

All relevant data collected at the site were compiled to determine which standard applies to Site SS009. To evaluate the site against RRS No. 1, chemical data initially were compared to background values specific to Kelly AFB. Dioxins/furans were found in the surface soil at concentrations that exceeded background levels. Several metals exceeded background

concentrations. In general, analytical results indicate that metals were present in the surface soil at higher concentrations than those in the deeper soil.

Chemical data also were compared to RRS No. 2 criteria. These criteria determine whether residual contamination after closure poses a threat to human health, assuming the site remains in industrial use. Chemical data were compared to the direct contact criteria for surface soil, referred to as the Soil/Air Inhalation and Ingestion standard for soil, or SAI. None of the chemicals were found at concentrations that exceed the criteria. The data also were analyzed to evaluate whether the soils presented a future threat to the shallow groundwater. The soil was analyzed by a leaching test known as the Synthetic Precipitation Leaching Procedure (SPLP). Again, none of the chemicals were found at statistically significant concentrations higher than the groundwater protection criteria. Groundwater data for the site substantiate these results.

The results of the closure investigation soil sampling indicated the presence of a localized area of arsenic contamination. Arsenic data from this localized area were evaluated, and the area was determined to exceed the SAI and the groundwater protection criteria. Remediation was, therefore, required to attain closure under RRS No. 2. Soil contaminated with arsenic was removed from an area of approximately 1.2 acres to a depth of 1 foot. Confirmatory sampling showed that the arsenic contamination was successfully removed.

The extent of contamination of other metals exceeding background concentrations was not determined. These contaminants are not demonstrably associated with the herbicide storage activities at Site SS009, and are therefore not included under the closure of Site SS009. Although the concentrations of these contaminants meet RRS No. 2, these contaminants will be further evaluated separately.

Based on protocols established in the regulations and cleanup criteria developed according to the regulations, post-excavation site conditions at Site SS009 meet the requirements for RRS No. 2 closure. Therefore, RRS No. 3 does not apply, and neither post-closure care nor further remedial action is necessary for site closure. To fulfill the requirements of the regulations, documentation that Kelly AFB intends to fulfill the deed recordation requirements of 30 TAC 335.560 is included as an Appendix O of this report. Kelly AFB will submit separately proof of deed recordation to the TNRCC.

795 12

TAB

Section 1.0

SECTION 1.0

795 13

Introduction

This closure report presents the findings of field sampling and data evaluations for the Installation Restoration Program (IRP) Site SS009, which has been referred to as IRP Site S-7 in previous investigation (the site was named S-7 during the initial investigation in 1981). Several years later, all of the sites also were given codes for tracking the information in the databases more easily. This site code also serves as the identification number for the Defense Environmental Restoration Program Management Information System, which is used by the Department of Defense (DoD) and the U.S. Congress to track the status of all IRP sites. The policy of the Restoration Branch at Kelly Air Force Base (AFB) is to use the site code as the site name. Therefore, the site code, SS009, was given to Site S-7. In this report, S-7 and SS009 will be used interchangeably. When referencing older documents or reports, S-7 will be used because that is the term that was used. In other instances, the site will be called by its proper name, Site SS009.

1.1 Objective

The objective of the report is to demonstrate that the environmental condition of IRP Site SS009 meets the requirements for closure under the Texas Natural Resource Conservation Commission (TNRCC) Risk Reduction Standards (RRSs), as promulgated in Chapter 30 of the Texas Administrative Code, Part 335, Subparts 551 through 569.

1.2 Overview of the Installation Restoration Program (IRP)

The purpose of the IRP is to identify and remedy, if necessary, all sites that pose an unacceptable risk to human health or the environment. The IRP was started in 1980 as a subcomponent of the Defense Environmental Restoration Program (DERP). The DERP was created and funded as part of the Comprehensive Environmental Response, Conservation, and Liability Act of 1980 (CERCLA), and was reauthorized under the Superfund Amendments and Reauthorization Act of 1986 (SARA). The IRP is required to

> *"be consistent with the guidelines, rules, regulations, and criteria established by the U.S. Environmental Protection Agency (EPA) for CERCLA. If the Resource Conservation and Recovery Act or specific state laws apply to . . [the] IRP site, those additional requirements must also be satisfied*[2]

The Air Force is the lead agency and final authority for cleanup of all IRP sites that are not listed on the National Priority List (NPL). The Air Force selects cleanup remedies in conjunction with EPA for all NPL sites, with the cleanup alternatives being subject to EPA approval.

---

[2] U S Air Force Installation Restoration Program Remedial Project Manager's Handbook (December 1993), page 3-1

1.3 Site Status

The IRP is required to follow the cleanup guidelines for CERCLA and SARA, which were established by EPA in the National Contingency Plan (NCP). The *Site Investigation Report, East Kelly, Site S-7,* (Halliburton NUS, June 1992) demonstrated that no unacceptable risk to human health or the environment existed. Under the guidelines established in the NCP, the site was eligible for closure. Therefore, a "no further action required" (NFAR) decision document was submitted to Headquarters Air Force Material Command, the EPA, and the TNRCC in September 1992. The submission of the NFAR document completed the NCP requirements for the site. EPA did not respond to the NFAR because the site was not listed on the NPL.

At the time that the NFAR was submitted to the TNRCC, the State of Texas did not have regulations in place that would allow the closure of a site using risk-based standards. The risk assessment is the key tool used in the CERCLA closure process. The TNRCC did not have any rules that could be used to approve of the closure of IRP Site S-7. The TNRCC responded to the NFAR decision on May 24, 1993. The TNRCC disagreed with the premise that the site investigation for S-7 was complete, and stated that additional information needed to be collected and evaluated before the site closure could be approved.

The data collected for this report are being submitted to fulfill TNRCC closure requirements. In addition, the data are being compared to the TNRCC RRSs so that all state requirements can be met for closing the site.

1.4 Site Background

1.4.1 Location, History, and Description

IRP Site SS009 is a 1.2-acre rectangular area measuring approximately 200 feet by 250 feet, that was affected by operations at a former outdoor container-storage area within SS009. Site SS009 is located in the southwest corner of East Kelly, in San Antonio, Texas. Kelly AFB is divided in half by a state highway. Site SS009 is on the portion of Kelly AFB east of the highway; this portion of Kelly AFB is commonly referred to as East Kelly. Figure 1.1[3] shows the location of Site SS009. Fifty-five gallon drums of herbicides were stored in the area from 1971 until 1974.[4] The herbicides, which were used in Southeast Asia from 1968 to 1971, were brought to East Kelly to fulfill a contract. The use of herbicides in Asia was discontinued in 1971; herbicides that were still on order were brought to East Kelly AFB for storage awaiting disposal. Records indicate that the drums were removed and incinerated in late 1974.

Because the herbicides were brought on the base for storing until they could be disposed of, and not moved in and out daily, aerial photographs taken from 1971 to 1974 were examined to determine exactly where the drums were stored. The resolution of the aerial photographs is not good enough to see individual drums, but patterns of stored material can be seen clearly. The extent of the drum storage can be determined from the aerial photos when viewed in conjunction with ground-level photographs of the stored herbicides. The drums

---

[3] All figures are at the end of each section in which they appear

[4] Site SS009 has been used for storage since it was incorporated into Kelly AFB in the 1940s. Before that, it was farmland

appear in aerial photos taken in 1971, 1972, 1973, and 1974. Aerial photographs taken from 1971 to 1974 indicate that the herbicide storage area was approximately one-half of an acre. The SS009 boundary represents the area contaminated by the storage activity, as defined during this closure investigation. The location and orientation of Site SS009 is shown in Figure 1.2. Ground-level photographs of the storage area taken in 1971 are shown in Figure 1.3.

Photographs taken in October 1971 show two storage areas for drums. One area contained 8 rows of approximately 400 drums of liquid Herbicide Blue (i.e., sodium cacodylate and dimethylarsenic acid); the other area contained 3 groups of approximately 600 drums of liquid Herbicide Orange (i.e., 2,4-dichlorophenoxy acetic acid [2,4-D] and 2,4,5-trichlorophenoxy acetic acid [2,4,5-T]). If all drums in the rows and groups contained herbicides, approximately 5,000 individual 55-gallon drums contained herbicides. The site is partially covered with a weathered layer of asphalt varying in thickness to 2 inches. Vegetation (mostly grass) has grown through the asphalt in several areas.

This site is not listed on the NPL.

1.4.2 Previous Investigations

Five formal studies or investigations either have been conducted of or included Site S-7. The documents that present the information from the previous studies are the following:

- *Installation Restoration Program Phase I Records Search* (Engineering Science, February 1982)
- *Installation Restoration Program Phase II, Stage 2* (Radian Corporation, October 1985)
- *Site Investigation Report, East Kelly, Site S-7* (Halliburton NUS, June 1992)
- *Supplemental Sampling at Site S-7* (CH2M HILL, 1994)
- *Site-Specific Environmental Baseline Survey/Southwest Corner of East Kelly* (CH2M HILL, 1996)

1.4.2.1 Phase I Study

In 1981, Kelly AFB started a Phase I records search to identify all sites that could adversely affect human health or the environment. Site S-7, along with 26 other sites on Kelly AFB, was identified as an IRP site during the investigation. The Phase I study was the initial step in investigating and remediating IRP sites. The study was roughly equivalent to a CERCLA preliminary assessment. The purpose of the Phase I study was to identify potential sites, but not verify that the sites were contaminated.

According to the Phase I study, Site S-7 was an area of approximately 2 acres that was used to store drums of herbicides on wooden pallets. Base personnel interviewed during the Phase I study stated that some of the drums leaked because of temperature-induced expansion and contraction. Because Site S-7 was a container storage area and the containers probably had leaked, Site S-7 was retained in the IRP for further investigation.[5]

---

[5] *Installation Restoration Program Phase I Records Search*, Engineering Science (February 1982), page 4-23

1.4.2.2 Phase II Study 795 16

A Phase II study of several sites on Kelly AFB was started in 1984. Site S-7 was included in the study. The Phase II study was designed to collect a limited number of samples at each site to determine if contamination had occurred because of past practices. The Phase II study is approximately equivalent to a CERCLA site inspection. Four surface-soil samples were collected at Site S-7 and analyzed for the herbicides 2,4-D, 2,4,5-T, and Silvex (2,4,5-trichlorophenoxypropionic acid, or 2,4,5-TP), which were stored at the site. The compounds were not detected in any of the samples, and, as a result, no additional study or investigation of Site S-7 was recommended.

1.4.2.3 Site Investigation

In 1989, Kelly AFB started a more extensive investigation at Site S-7 because of concerns that the sampling conducted during the Phase II study was performed too far to the east of the actual herbicide-storage area. In 1990, Halliburton NUS collected 25 samples of shallow surface soil using hand augers. The samples were analyzed primarily for polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). (Throughout this report, the terms PCDDs/PCDFs, polychlorinated dibenzodioxins/polychlorinated dibenzofurans, and dioxin/furans are used interchangeably.) The rationale for the analyses was that PCDDs and PCDFs are common impurities that are found in the herbicides 2,4-D, 2,4,5-T, and 2,4,5-TP. PCDDs and PCDFs degrade very slowly, and the expectation was that these chemicals might be found on the site. Six hand-auger samples also were analyzed for metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs). The data from these analyses was originally for informational purposes only and was not considered to be the primary focus of the investigation. In 1991, eight soil borings were installed to a depth of five feet in Reinmaker Park to the east of Site S-7. Surface samples and deeper subsurface samples were collected for analyses from the borings.

1.4.2.4 Supplemental Sampling at Site

As part of the Zone 4 remedial investigation and feasibility study (RI/FS), CH2M HILL conducted supplemental sampling at SS009 in 1994. The supplemental sampling included installing a downgradient monitoring well and 12 hand-auger borings. Soil and groundwater samples were analyzed for organic and inorganic parameters to evaluate the lateral and vertical extent of effected soils. Groundwater was analyzed to evaluate whether constituents of concern had leached to the uppermost aquifer. The results of the supplemental sampling are attached as Appendix A.

1.4.2.5 Site-Specific Environmental Baseline Survey

In 1996, CH2M HILL conducted a site-specific Environmental Baseline Survey (EBS) of the southwest corner of East Kelly, which includes Site SS009. Files were reviewed, facility personnel were interviewed, and a site visit was conducted. No sampling was conducted as a part of this study. The EBS report summarized the status of the site in the closure process and identified no new issues of concern.

1.5 Organization of this Report

This report presents the results of the October 1996 sampling conducted to fulfill the TNRCC requirements for closure under the RRSs. The report also presents an evaluation of the site using data reported in 1992 and 1994, and the data collected in 1996.

The remainder of the document is organized as follows:

- Environmental Setting
- Previous Investigations
- October 1996 Investigation
- Evaluation of Results
- Removal Action
- Conclusions and Recommendations

Table 1.1 provides a summary of the requirements for closure under the Risk Reduction Standards. The requirements are specific to Standard No. 2 and provide a reference to where the information is located in this report.

TABLE 1.1
Texas Risk Reduction Standard Requirements (30 TAC 335) Risk Reduction Standard No. 2

	Category	Requirement	Regulatory Citation	Location In Report	Comments
1	Final Report	Description of procedures and conclusions of the investigation to characterize the nature, extent, direction, rate of movement, volume, composition, and concentration of contaminants in environmental media.	30 TAC 335.553(a) and 335 555(f)	3.0: Previous Investigations 4.0. 1996 Site Investigation 5.0: Evaluation of Results	
2	Final Report	Basis for selecting environmental media of concern.	30 TAC 335.553(a) and 335.555(f)	3.0 and 5.1	Selection of media occurred in conjunction with TNRCC over the course of the multiple investigations at the site. There are no surface water drainage features at the site. Air was not considered a media of concern due to the nature of the contaminants (i.e., no volatile contaminants). Groundwater is evaluated in the context of soil-to-groundwater cross-media effects. Soil is a medium of concern.
3	Final Report	Documentation supporting selection of exposure factors.	30 TAC 335.553(a) and 335.555(f)	1.3 and 5.2.1.1 Appendix J	Future use is industrial. Dermal exposure factors are presented in Appendix J. All other exposure factors are taken from the TNRCC RRSs.
4	Final Report	Descriptions of removal or decontamination procedures performed in closure or remediation.	30 TAC 335.553(a) and 335.555(f)	6.0: Summary of Removal Action	
5	Final Report	Summaries of sampling methodology and analytical results which demonstrate that contaminants have been removed or decontaminated to applicable levels.	30 TAC 335.553(a) and 335.555(f)	4.1, 4.2, 6.0 Appendix A	

795 18

TABLE 1.1
Texas Risk Reduction Standard Requirements (30 TAC 335) Risk Reduction Standard No 2

	Category	Requirement	Regulatory Citation	Location In Report	Comments
6	Deed Certification	Signed certification showing the name/ title/ stating that closure/remediation was carried out in accordance with a plan designed to meet 335 555, which mandates that the remedy be designed to eliminate substantial present and future risk such that no post-closure care or engineering or institutional control measures are required to protect human health and the environment.	30 TAC 335.553(a), 335 560(b)(1), and 335.555(e)	Appendix O	
7	Deed Certification	Metes and bounds description of the portion of the tract of land on which closure or remediation was achieved	30 TAC 335.553(a), 335.560(b)(2), and 335.555(e)	Appendix O	A 1.2-acre area was remediated. Kelly AFB is voluntarily deed-recording the 33-acre parcel which contains Site SS009.
8	Deed Certification	For facilities using nonresidential soil standards, a statement that current or future owners of the facility must undertake actions as necessary to protect human health and the environment in accordance with the rules of the commission.	30 TAC 335.553(a), 335 560(b)(3), and 335.555(e)	Appendix O	
9	Deed Certification	Statement that information/ documents concerning the closure or remediation of the area are available for inspection upon request at the Texas Water Commission. The statement shall further describe the jurisdiction of the TWC to review the establishment of the final cleanup criteria.	30 TAC 335.553(a) and 335.560(b)(4)	Appendix O	

TABLE 1.1
Texas Risk Reduction Standard Requirements (30 TAC 335) Risk Reduction Standard No 2

	Category	Requirement	Regulatory Citation	Location in Report	Comments
10	Treatment Process Justification	Demonstration that the treatment process permanently alters all contaminants to levels that will not pose a substantial present or future threat to human health and the environment	30 TAC 335.553(c)	6.0	Soil was disposed of offsite in accordance with applicable regulations.
11	Treatment Process Justification	Demonstration that any residue remaining in place from the treatment does not pose the threat of any future release that would increase the concentrations of contaminants in environmental media above the cleanup levels.	30 TAC 335.553(c)	6.0	Not applicable. Onsite treatment was not necessary.
12	Sampling and Analysis Requirements	Demonstration that samples were collected and analyzed from the media of concern, utilizing SW 846 methods or other available guidance in developing a sampling and analysis plan appropriate for the distribution, composition, and heterogeneity of contaminants and environmental media. Demonstration that a sufficient number of samples were collected and analyzed to demonstrate the attainment of cleanup levels.	30 TAC 335.553(d) and 30 TAC 335.555(d)(2)	4.0	The sampling and analysis plan for the October 1996 was designed to fill data gaps for closure in response to TNRCC comments.
13	Results Comparison to Standards	Comparison of results by direct comparison, or by using the 95% confidence limit of the mean concentration, or by other approved statistical methods.	30 TAC 335.553(d)(1), (2), and (3)	5.0 Tables 5.3, 5.4, 5.8, and 5.9 Appendix I	

TABLE 1.1
Texas Risk Reduction Standard Requirements (30 TAC 335) Risk Reduction Standard No 2

	Category	Requirement	Regulatory Citation	Location in Report	Comments
14	Derivation of MSCs	Utilization of toxicity information from the following sources in this order. IRIS, HEAST, U S. EPA Criteria Documents, ATSDR Toxicological Profiles, and other scientifically valid published sources.	30 TAC 335.553(e)	Table 5.6 Appendix N	
15	Derivation of MSCs	Where RRS 2 MSCs are derived using more current toxicological data, inclusion of substantiating information in the final report to the executive director.	30 TAC 335.553(e)	Table 5 6	
16	Derivation of MSCs	For contaminated media characterized by non compound-specific analytical techniques (e.g., TPH, TOC), and for which individual compounds, such as hazardous constituents, are not present as individual compounds, consideration of other scientifically valid published numeric criteria to address adverse impacts on environmental quality and on public welfare and safety; conditions that present objectionable characteristics (e g., taste, odor,), or conditions that make a natural resource unfit for use.	30 TAC 335.553(f)	Not Applicable.	Not applicable. Compound-specific analytical techniques were used to characterize the site contamination.
17	Closure Standards	Removal of all waste and waste residues; contaminated design and operating system components, such as liners, leachate collection systems, and dikes; and contaminated media to cleanup levels specified in the regulations	30 TAC 35.555(c)	6 0	The source of the environmental contamination was removed in the 1970s. Soil contaminated with arsenic at concentrations exceeding the RRS No. 2 criterion was removed as described in Section 6.0.

TABLE 1.1
Texas Risk Reduction Standard Requirements (30 TAC 335) Risk Reduction Standard No 2

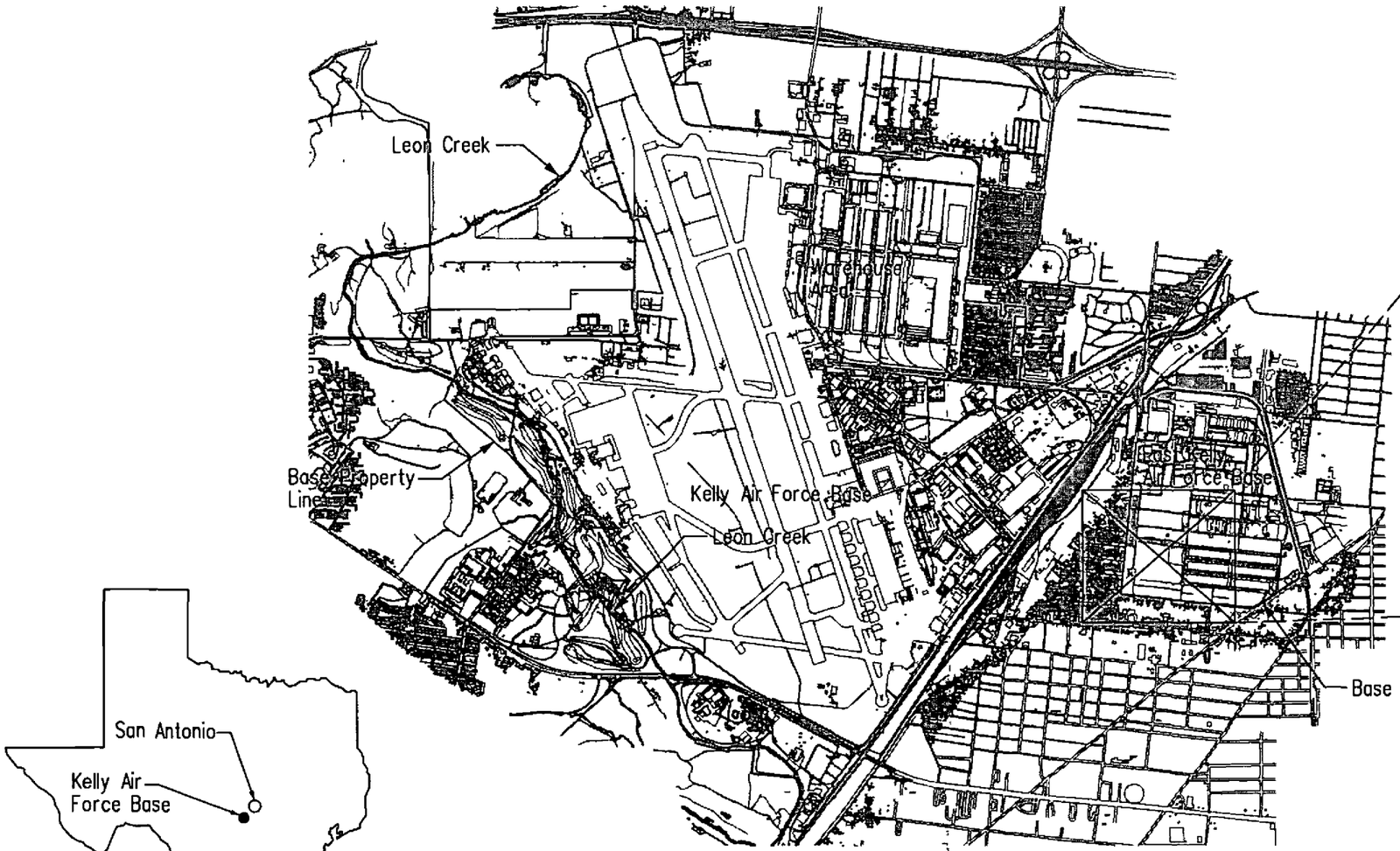
	Category	Requirement	Regulatory Citation	Location in Report	Comments
18	Cleanup Criteria	Contaminant concentrations in media of concern do not exceed the greater of the practical quantitation limit (PQL), the background concentration, or the RRS No. 2 cleanup risk-based cleanup level.	30 TAC 335.555(d)(1)	5.0 Tables 5.3, 5.4, 5.8, and 5.9 Appendix I	
19	Derivation of MSCs	Determine any appropriate exposure pathways needed in addition to those defined in the regulations, calculate additional cleanup criteria, and evaluate the need for additional remediation.	30 TAC 335.556(b)	5.2 Appendix J	Because the primary constituents of concern—arsenic and dioxins/furans—have relatively high dermal absorption factors, a dermal exposure pathway was added to the development of the RRS No. 2 SAI criteria.
20	Selection of residential vs nonresidential MSCs	For use of nonresidential soil requirements, documentation that (1) the property is zoned for commercial or industrial use; or (2) documentation that activities conducted on the property satisfy the definition for nonresidential property (by SIC code); or (3) for government-owned property which does not satisfy either of the above conditions, but does have nonresidential activities occurring on the property, the person may provide documentation that access will be restricted such that the exposure assumptions remain valid for the duration of government control.	30 TAC 335.557 and 335.552	1.3 and Appendix O	The property is government owned and will remain in industrial use. Access is restricted and the exposure assumptions will be valid for the duration of government control. The Findings of Suitability to Lease or Transfer the site will include restrictions in accordance with non-residential use.
21	Derivation of MSCs	Use appropriate equations to calculate MSCs.	30 TAC 335.556(d)	5.0 Table 5.5	

795 22

TABLE 1.1
Texas Risk Reduction Standard Requirements (30 TAC 335) Risk Reduction Standard No. 2

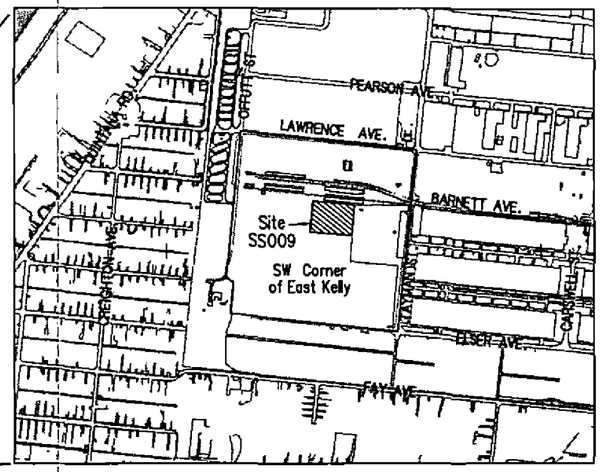
	Category	Requirement	Regulatory Citation	Location In Report	Comments
22	Results Comparison to Standards	Determine compliance with MSCs for surface water.	30 TAC 335.559(b)	Not Applicable	There are no surface water drainage features at the site; the site is relatively flat (<1 foot of relief); there are no signs of surface water runoff at the site. Most if not all the catch basins on the site are filled with sediment and are nonfunctional. The storm drainage for all of East Kelly discharges through NPDES Outfall No. 4, which is monitored regularly
23	Results Comparison to Standards	Determine compliance with MSCs for air.	30 TAC 335.559(c)	Not Applicable.	Air was not considered an environmental media of concern due to the nature of the contaminants of concern (i.e., no volatile contaminants of concern).
24	Results Comparison to Standards	Determine compliance with MSCs for groundwater	30 TAC 335.559(d)	5.2.1 and Table. 5.9 Appendix G	Compliance with the groundwater MSCs is demonstrated through the use of SPLP data, and through prior groundwater data
25	Results Comparison to Standards	Determine compliance with MSCs for soil based on worker ingestion and inhalation of soil/particulates.	30 TAC 335.556(d) and 335.559(g)(1)	Table 5 8	
26	Results Comparison to Standards	Determine compliance with soil MSCs based on soil-to-groundwater cross-media protection.	30 TAC 335.559(g)(2)	Table 5.9	Compliance demonstrated using 335.559(g)(2)(B), SPLP results.

795 24A



Regional Map

Site Map



Location Map

SAN ANTONIO AIR LOGISTICS CENTER
PARTNERS WITH THE ENVIRONMENT
ENVIRONMENTAL MANAGEMENT

FIGURE 1.1
Site Location Map

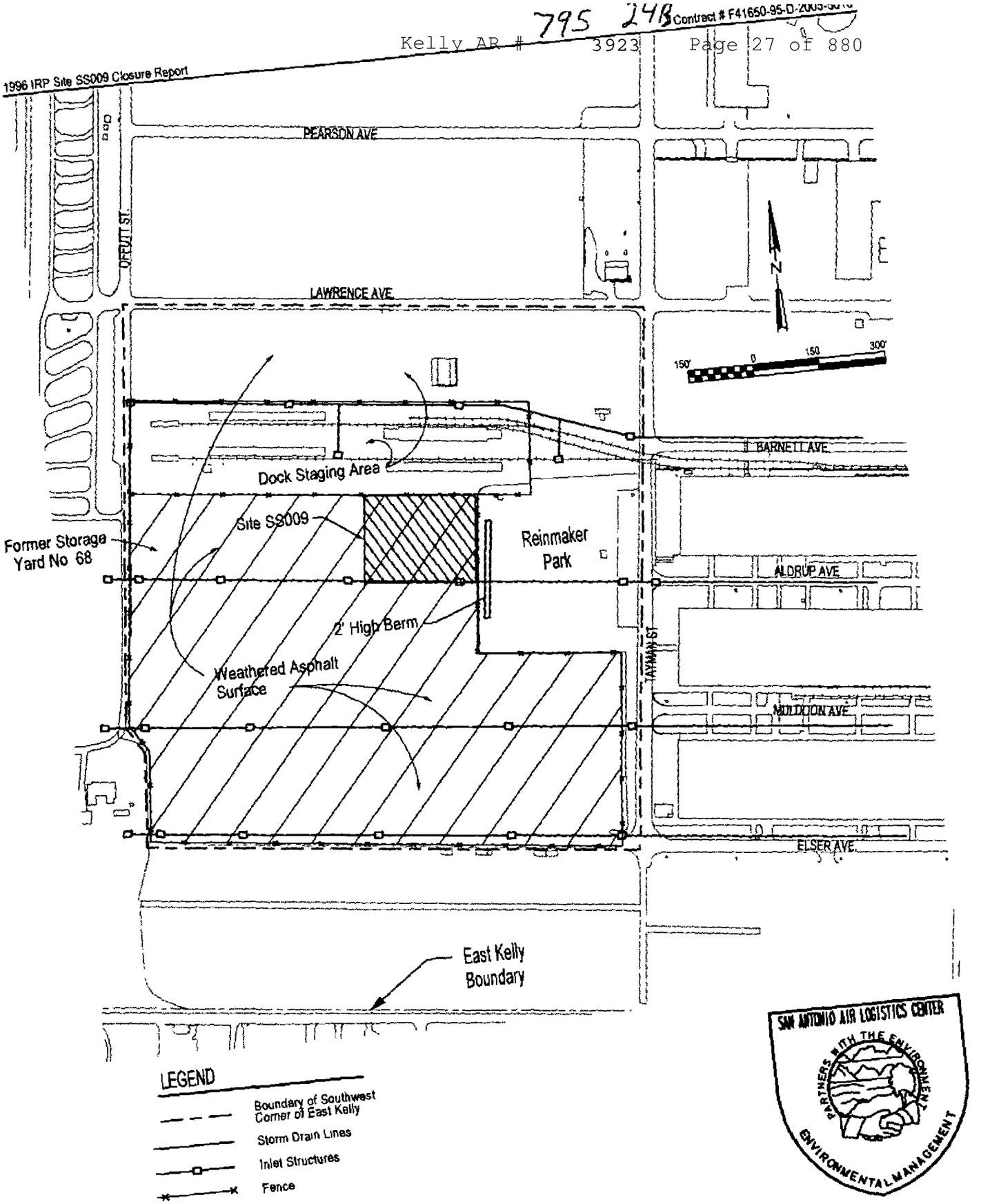
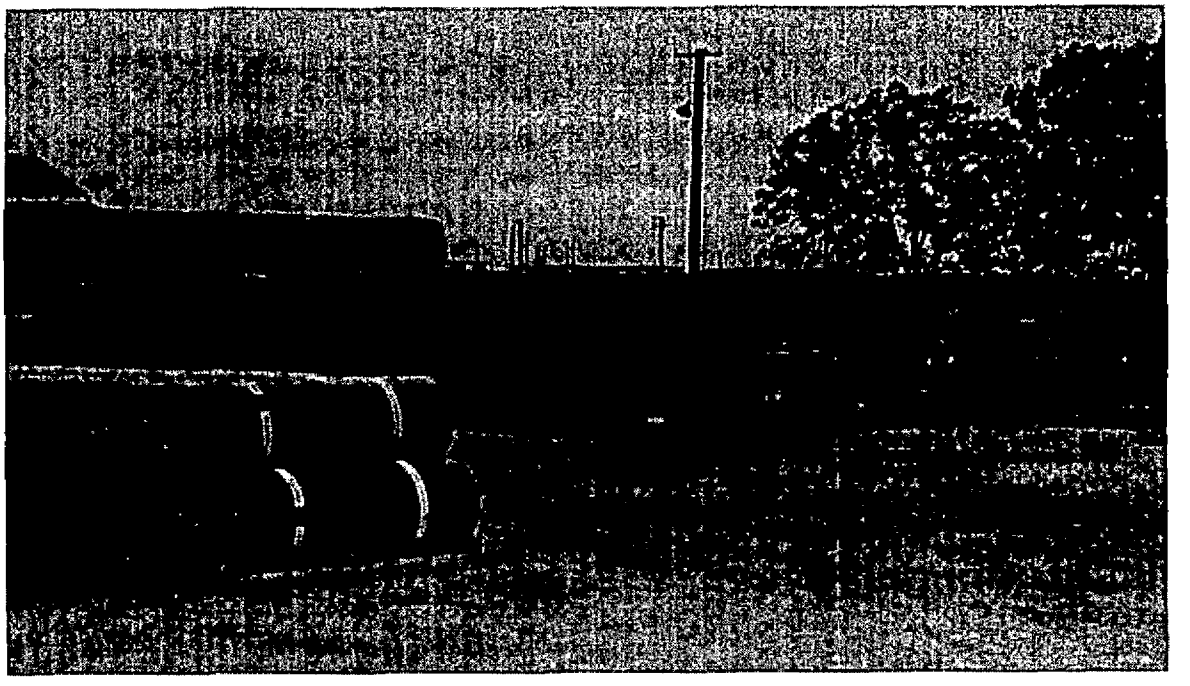


FIGURE 1.2
SS009 Site Layout

CH2MHILL

RDD//EBSEK06 DLV
24 SEPT 1997



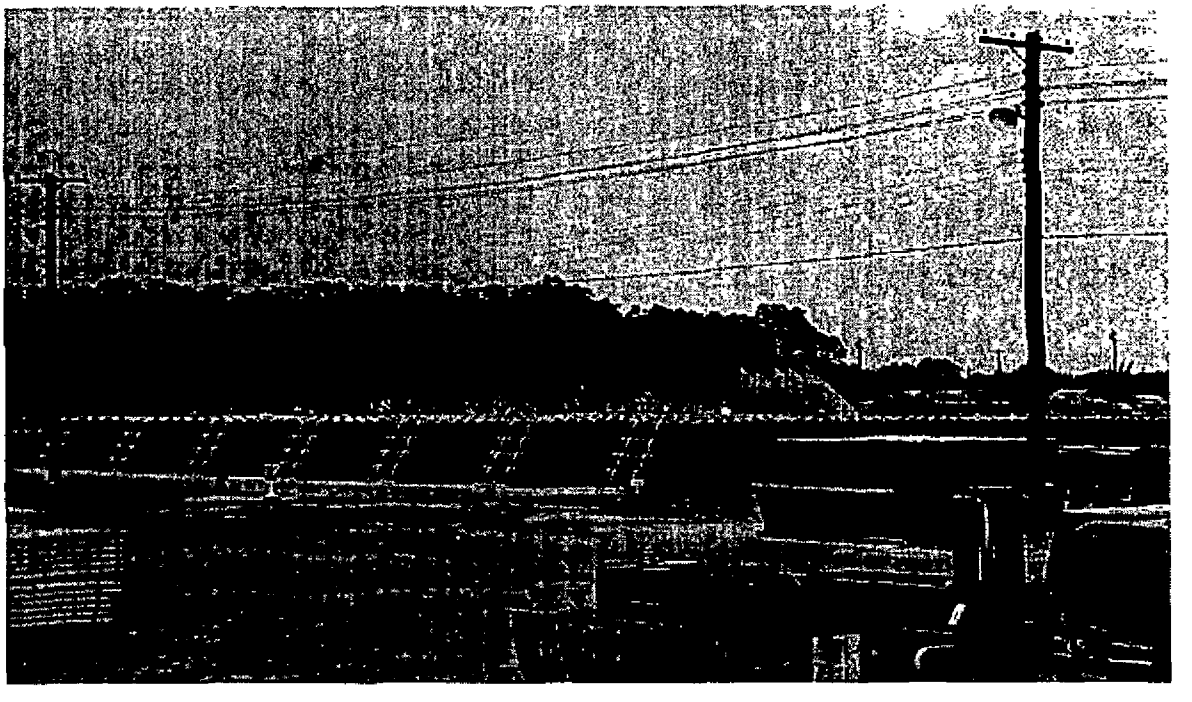


Figure 1.3
Photographs taken in 1971 showing drum storage at IRP Site SS009

TAB

Section 2.0

SECTION 2.0

Environmental Setting

2.1 Physical Features

Site SS009 is on East Kelly. Kelly AFB is in the western part of the Gulf Coastal Plain, an undulating prairie that gently slopes toward the Gulf of Mexico (Halliburton NUS, 1992). East Kelly is on relatively flat land that slopes toward the southeast. Elevations at the facility range between 670 and 650 feet above the National Geodetic Vertical Datum (NGVD). The land has been developed and contains buildings, paved roads, paved and unpaved lots, and grassy fields.

Site SS009 is believed to have been contaminated by activities in a smaller, former herbicide-storage area. Site SS009, a rectangular area measuring approximately 1.2 acres, is located within a parcel of property referred to as "the southwest corner of East Kelly AFB." The site is an open lot with a weathered asphalt and gravel surface overgrown by grass in some areas. Change in elevation across the site is estimated to be less than one foot. The southwest corner of East Kelly is separated by two sets of east-west trending railroad tracks and four concrete ramps formerly used to offload materials from railcars. Physical features around the perimeter of the southwest corner of East Kelly include a fence, paved roads to the north and south, a grassy field and RV campground to the west, and Reinmaker Park to the east.

2.2 Climate

Kelly AFB is in Bexar County, Texas. The climate in Bexar County is characterized by warm, humid summers and mild winters. Conditions during the spring, summer, and fall generally are determined by the Gulf of Mexico. However, winter weather is influenced by polar air masses as well as the gulf. Mean annual temperature is 69°F. January has the lowest monthly mean temperature, 50°F, and July and August have the highest monthly mean temperature, 85°F (Natural Fibers Information Center, 1987).

Average annual rainfall for the San Antonio area is approximately 29.1 inches. Two relatively equal wet seasons exist in late spring and early fall. Precipitation during the months of April, May, and June contributes 9.4 inches (32 percent) of the total rainfall and precipitation during the months of August, September, and October contributes another 9.4 inches (32 percent). Average annual lake evaporation for the San Antonio area is estimated to be 57 inches (Hjelmfelt and Cassidy, 1975). Monthly prevailing wind directions and velocities are shown in Table 2.1.

2.3 Surface Water Hydrology

No significant surface water features are near East Kelly AFB. Six Mile Creek is shown on the Terrell Wells, Texas, topographic map as an intermittent stream that begins south of the

base. Surface expressions of the creek extend along the railroad tracks immediately east of the installation's boundary.

TABLE 2.1
Monthly Prevailing Wind Directions and Mean Velocities
IRP Site SS009 Closure Investigation

Month	Direction	Mean Velocity (knots)
January	N	6
February	N	6
March	SSE	7
April	SE	7
May	SSE	6
June	SSE	6
July	SSE	6
August	SSE	5
September	S	5
October	S	5
November	N	6
December	N	5

N = North
S = South
SE = Southeast
SSE = South/southeast

Site SS009 contains no distinguishable surface water features. Surface drainage features consist of storm sewer drains that cross the storage yard. Storm drainage for East Kelly AFB is discharged to Six Mile Creek through National Pollutant Discharge Elimination System (NPDES) Outfall 004.

2.4 Geology and Hydrogeology

The regional geologic and hydrogeologic conditions near Kelly AFB have been well documented by previous investigations. The *Basewide Hydrogeologic Assessment* (*BHA*) (Halliburton NUS, 1989), *Site Investigation (SI) Report* (Halliburton NUS, 1992), and *Zone 4 RI* (CH2M HILL, in progress) comprehensively review the area's geologic and hydrogeologic conditions. The significant aspects of the regional geology and hydrogeology have been summarized for this report.

2.5 Regional Geology

Kelly AFB is located atop Quaternary-age alluvial deposits derived from the Edwards Plateau. Underlying the deposits is a thick stratigraphic sequence of Cretaceous-age sediment. Previous investigations indicate that Tertiary-age sediment appears to be absent immediately nearby. The following units (in descending order) are significant to this study:

- Quaternary alluvial sediment

- Cretaceous Gulf Series (includes Navarro Group and Taylor Group clay and marl)
- Cretaceous Comanche Series (includes the Edwards Limestone)

Kelly AFB overlies a large area of Navarro Group sediment.

The Quaternary alluvial sediment, which overlie the Navarro Group, were deposited by braided streams. The alluvial deposits are typically 10- to 35-feet thick (Halliburton NUS, 1992). The deposits range in composition from clays to gravels and typically are intermixed and discontinuous laterally as well as vertically. The *BHA* (Halliburton NUS, 1989) presents the alluvial stratigraphy subdivided into several typical lithofacies or material type, including black clay, brown clay, silt, sand, clayey gravel, gravel, and lower clay. The stratigraphic units reported in the *BHA* are shown in Figure 2.1.

The lithofacies interpreted from the *BHA* (Halliburton NUS, 1989) correlate fairly well with Soil Conservation Service (SCS) classifications. The black clay lithofacies correspond with the Houston black clay. The brown clay and silt lithofacies correspond with the Lewisville silty clay and the gravely clays correspond with the Leona Gravel.

The *BHA* (Halliburton NUS, 1989) states that the Navarro Group underlying the alluvial deposits near Kelly AFB is about 450-feet thick and consists mainly of calcareous clays and marls. Two lithostratigraphic facies of the Navarro Group also were identified during the assessment. The Navarro Group, Taylor Marl, and other formations in the Gulf Series form a fine-grained sequence that is approximately 1,200-feet thick. The Comanche Series, which includes the Edwards Limestone, underlies the Gulf Series.

2.6 Local Geology

Geologic conditions at Site SS009 generally consist of 30 to 35 feet of alluvial deposits overlying clays of the Navarro Group. A boring log and well-completion diagram are presented in Appendix B. Most alluvial deposits have a fine-grained matrix of silt or clay. Beds of clayey gravel, gravel, and sand occur approximately 25 to 30 feet below ground surface (bgs). The beds are discontinuous and interbedded with clay and silt. The thickness and lateral extent of the coarse materials is variable. The surface of the Navarro Group has been subjected to subaerial weathering and consists of intermixed chert gravel, sand, silt, and clay. The thickness of the weathered zone is variable, but generally less than 5 feet.

2.7 Regional Hydrogeology

Information presented in the *BHA* (Halliburton NUS, 1989) indicates that two aquifer systems exist near Kelly AFB. The systems are the surficial aquifer and the Edwards aquifer.

The uppermost aquifer is the surficial aquifer, which occurs in the permeable zones of the Quaternary-age alluvial deposits. These saturated permeable zones are generally the gravel, clayey gravel, and sand lithofacies that occur near the base of the alluvial deposits. The shallow aquifer is under water table conditions in most areas. However, locally confined conditions do occur. The Navarro Group forms the lower boundary of the surficial aquifer (Halliburton NUS, 1989).

In general, groundwater flows to the east and southeast. Local heterogeneity and anisotropy of the aquifer will cause variation from the estimated groundwater flow directions.

2.8 Local Hydrogeology

Shallow groundwater is measured at approximately 18.5 feet bgs in the well at Site SS009. Groundwater moves across the site mainly in the saturated parts of the gravely clay and other permeable materials. Because the thickness and extent of the saturated permeable deposits is variable, preferential pathways of flow are believed to exist.

The *SI Report* (Halliburton NUS, 1992) and the *Zone 4 RI* (CH2M HILL, in progress) provide hydraulic conductivity values for the surficial aquifer. The values (from slug tests in monitoring wells adjacent to Site SS009) are presented in Table 2.2 and range from 11 to 132 feet per day (ft/day). The magnitude of the values indicates that the permeable materials have good water-bearing properties. The ability of the surficial aquifer to transmit water across the site also is dependent on the thickness and extent of the coarse-grained deposits. Additional data gathered from aquifer pumping tests at Kelly AFB suggests that the slug test measurements may underestimate the actual hydraulic conductivity value.

Table 2.2
Hydraulic Conductivity Results from Wells Near Site SS009

Well Number	Hydraulic Conductivity (ft/day)
SS052MW121	11
SS052MW126	38
SS052MW154	18
SS052MW161	132

Figure 2.2 shows the potentiometric surface of the surficial aquifer in the area of Site SS009. The potentiometric surface is relatively flat. Groundwater flow is east to southeast across the site with a hydraulic gradient that ranges between 0.0027 and 0.0020 feet per foot (ft/ft). A review of previous studies indicates that vertical gradients are negligible across the shallow aquifer. Therefore, groundwater flow is expected to be predominantly horizontal across the site. The base of the shallow groundwater system is the unweathered clays of the Navarro Group. The clay can be characterized as highly plastic with a low permeability. Laboratory permeability testing of the clay during the IRP Zone 4 RI resulted in a permeability value of 1.9×10^{-9} centimeters per second (cm/sec). Previous investigations (Halliburton NUS, 1989) have reported similar characteristics of the Navarro clays.

Groundwater infiltration at Site SS009 is controlled by climatic conditions and local geologic conditions. Climatic conditions include a pan evaporation value of 57 inches per year, which is significantly higher than the annual precipitation value of 29.1 inches. Actual evaporation is estimated to be 70 to 80 percent of pan evaporation. An evaporation value greater than precipitation indicates a high potential for evaporation of excess rainfall. Because the surface of Site SS009 is weathered asphalt and gravel with sparse grass growth, significant transpiration is not expected. Geologic conditions consist of 15 to 20 feet of clay and silt overlying the shallow aquifer. Laboratory permeability testing of the upper 10 feet of sediments during the IRP Zone 4 RI showed permeability values ranging from 6.1×10^{-9} to 1.1×10^{-6} cm/sec. These values indicate that the upper clay and silt restrict infiltration to

the shallow groundwater. Some localized zones of higher permeability may exist in the upper 2 to 3 feet of sediment where seasonal dry periods may result in desiccation fractures in the clay.

The available information indicates that the potential for significant recharge to the shallow groundwater at Site SS009 is low. The actual recharge value cannot be determined with the available information. However, the value is estimated to range between 1 and 3 inches per year.

2.9 Local Land Use

The current land use of the area surrounding Kelly AFB is shown in Figure 2.3. Northwest of the base is relatively flat land, which is densely populated residential and commercial buildings. Various housing areas are south of East Kelly AFB. On the east side of East Kelly is Normoyle Park, a public recreation area. Adjacent to Site SS009, on the Kelly AFB property, is a small park, Reinmaker Park, which is used for picnicking[6]. Railcar-loading platforms, north of the site, no longer are in use. South and west of the site, the weathered asphalt and gravel surface have been overgrown by grass. This area is enclosed by a fence with a paved road in the south of the fenced area. An RV campground is situated west of the fenced area of East Kelly. Construction of a railcar refurbishment facility has commenced adjacent to the site.

[6] Reinmaker Park is located within a 33-acre parcel that will be leased or transferred for industrial use only

111490.A0 06 6/97 GNV

795 32

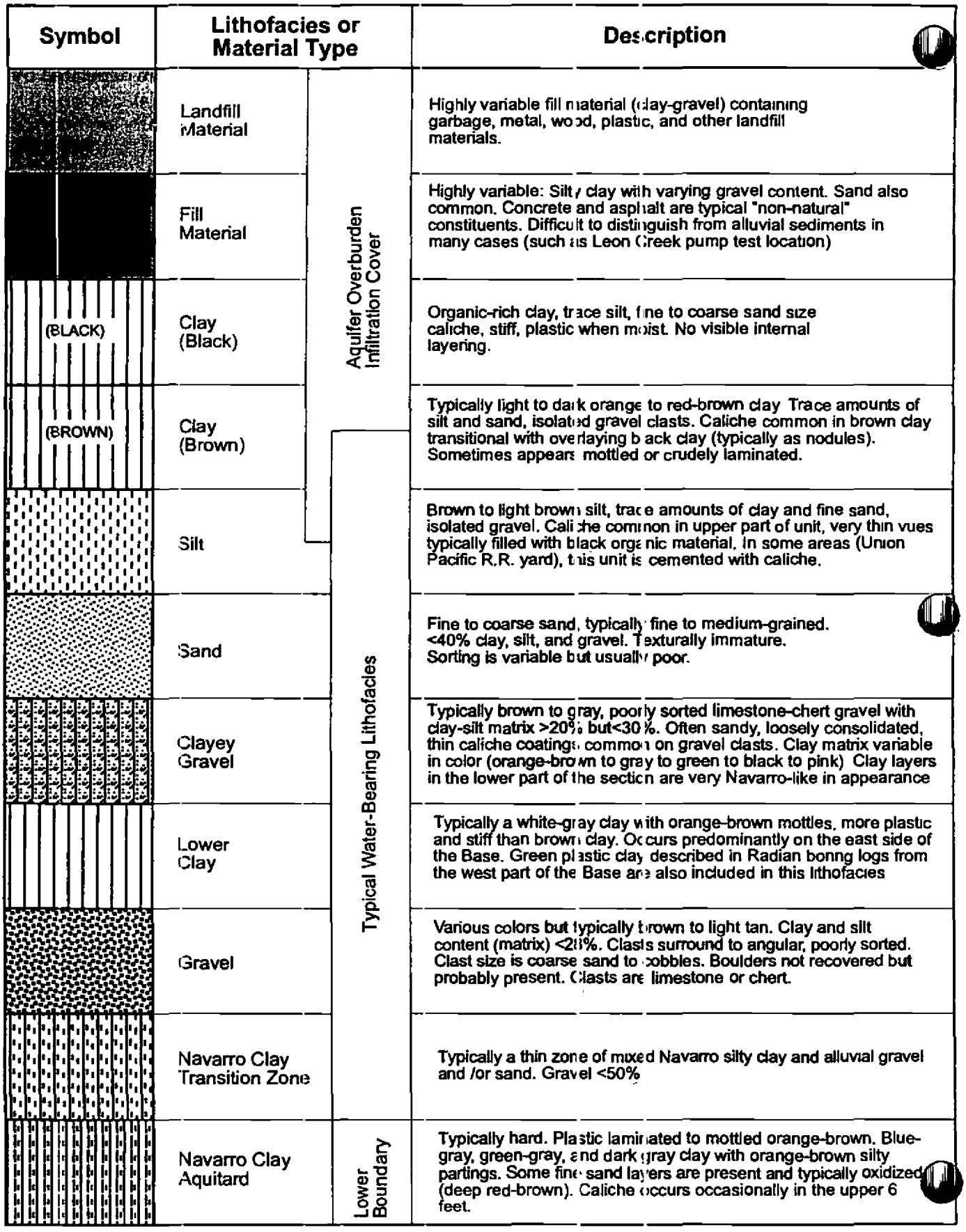
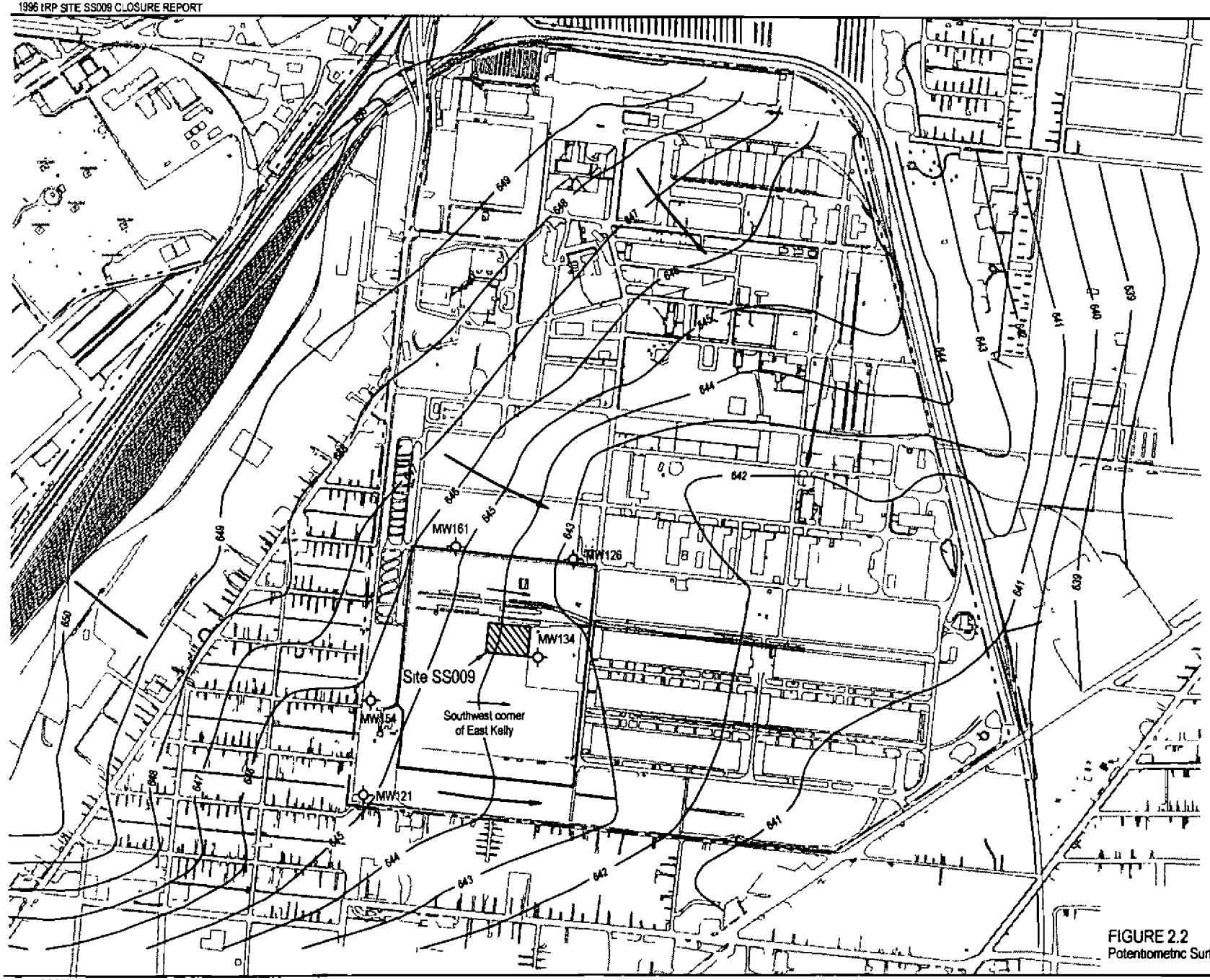


Figure 2.1. Typical Lithologic Units of the Quaternary Alluvial Deposits, Kelly Air Force Base, San Antonio, Texas (from HNUS, 1989)

CH2MHILL



LEGEND:

Groundwater Elevation Contour (feet NGVD) — 650

Estimated Groundwater Flow Direction →

NOTES:

1. Elevations are in feet above National Geodetic Vertical Datum (NGVD)
2. Contour interval is 1 foot.
3. Contours indicate approximate average NGVD elevations and are estimates of spatial variations throughout the site. Actual levels may vary point to point due to changes in hydraulic or other influences.
4. Contours based on groundwater levels measured in September 1996.

N

0 300 600 900

SAN ANTONIO AIR LOGISTICS CENTER
PARTNERS WITH THE ENVIRONMENT
ENVIRONMENTAL MANAGEMENT

FIGURE 2.2
Potentiometric Surface Map of Site SS009 Area

CH2MHILL

RDD//SSO092 2 DLV
24-SEPT 1997

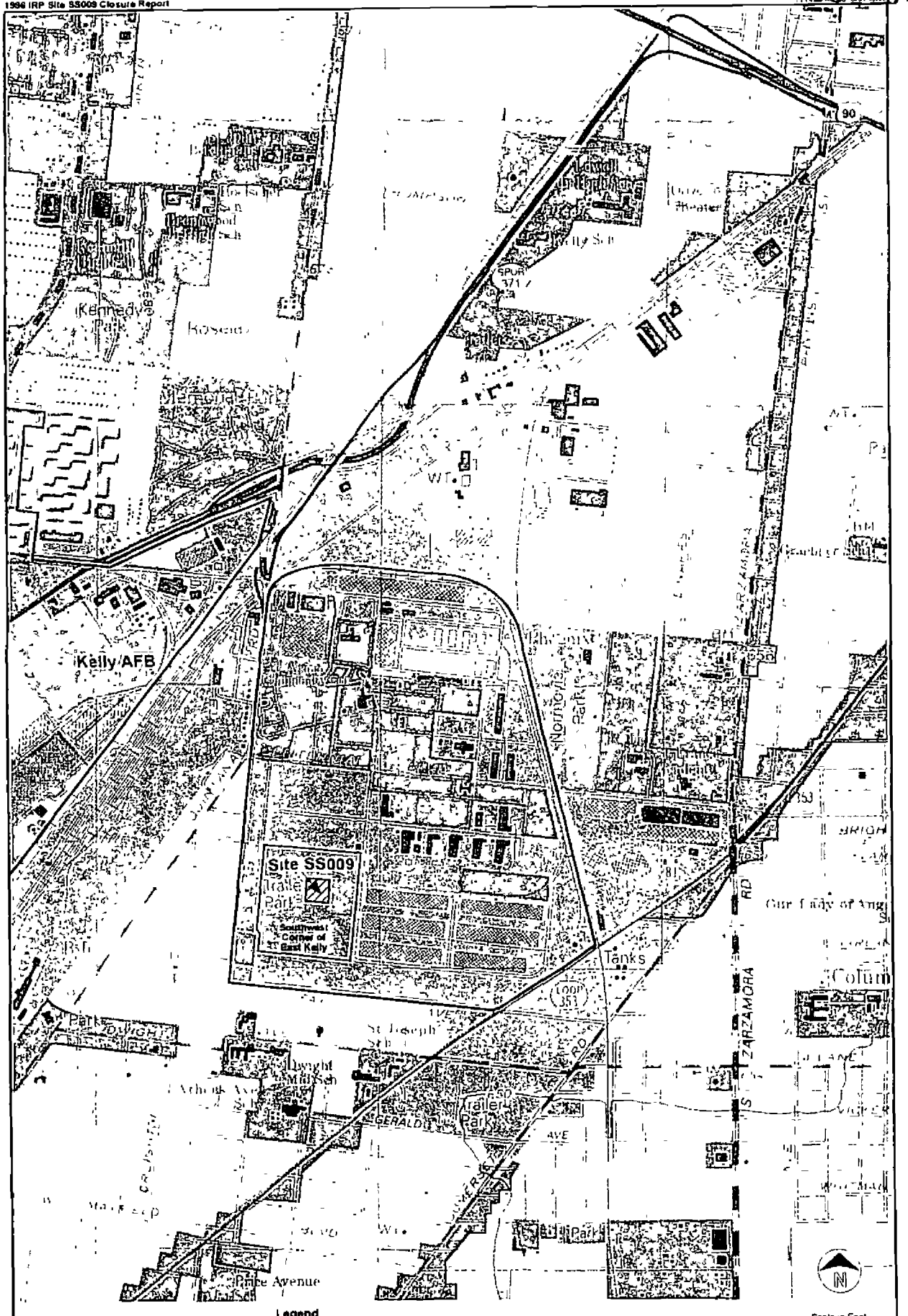


FIGURE 2 3
Existing Land Use Map
as of 1994

CH2MHILL

795 35

TAB

Section 3.0

SECTION 3.0

795 36

Summary of Previous Investigations

Investigations began at Site SS009 in 1982, with sampling commencing in 1986. The following paragraphs summarize the SI activities. The locations sampled during the previous investigations are shown in Figure 3.1.

3.1 Phase I/II Site Investigations

In 1982, investigation activities commenced at the site when a basewide Phase I investigation was conducted (Engineering Science, 1982). The Phase I investigation consisted of file reviews, literature reviews, and interviews and did not include sampling and analysis.

In 1986, Radian Corporation conducted a Phase II field investigation, drilling four shallow soil borings and analyzing for the herbicides 2,4-D, 2,4,5-T, and 2,4,5-TP. The results of the Phase II analysis showed no detectable concentrations of herbicides in the soil at the site. Information available after the 1986 sampling indicated that the 1986 Phase II sampling was not conducted in the herbicide storage area.

3.2 1990-1992 Site Investigations

Halliburton NUS conducted additional site investigations in 1990. Table 3.1 summarizes the analytical methods used by sampling location. In August 1990, Halliburton NUS collected 25 surface and shallow subsurface soil samples (0.7 to 1.5 feet) at Site SS009. Seven samples were collected in an area north of the railroad tracks, and 18 samples were collected in the area south of the railroad tracks. The 25 samples were analyzed for PCDDs and PCDFs by using Method 8280. Six samples were analyzed by the EPA Contract Laboratory Program (CLP) methods, as described in the 1988 *Statement of Work* for the following parameters:

- Target Compound List (TCL) VOCs
- TCL SVOCs
- Target Analyte List (TAL) metals
- TCL polychlorinated biphenyls (PCBs) and pesticides
- Total organic carbon
- Cation exchange capacity (Method SW 9081)

In December 1991, eight additional soil samples (0 to 1 foot) and seven shallow subsurface samples (2 to 5 feet) were collected off site in Reinmaker Park, adjacent to the eastern boundary of Site SS009. Of the eight surface-soil samples collected, five were analyzed for TAL metals, including cyanide, and five were analyzed for PCDDs/PCDFs (Method 8280).

795 37

TABLE 3.1
Summary of Historical Analyses from Halliburton NUS Investigation (1992)

Analytical Groups							
Station	Metals	Dioxin/Furan	TCL Organics	Station	Metals	Dioxin/Furan	TCL Organics
HA01		•		HA017	•	•	•
HA02		•		HA018		•	
HA03		•		HA019		•	
HA04		•		HA020		•	
HA05	•	•	•	HA021		•	
HA06		•		HA022	•	•	•
HA07	•	•		HA023		•	
HA08	•	•	•	HA024		•	
HA09	•	•		HA025		•	
HA010		•		S7B01	••		•
HA011		•		S7B02	••		•
HA012		•		S7B03	•		•
HA013		•		S7B04	••	•	
HA014		•		S7B05	••		•
HA015		•		S7B06	••	•	
HA016		•		S7B07		•	
				S7B08		•	

indicates multiple analyses at one location

Compound List and Methods for Analyses

Metals	Method
Silver	EPA Method 200 7
Aluminum	EPA Method 200 7
Arsenic	EPA Method 206 2
Barium	EPA Method 200 7
Beryllium	EPA Method 200 7
Calcium	EPA Method 200 7
Cadmium	EPA Method 200 7
Cyanide	EPA Method C335 2
Cobalt	EPA Method 200 7
Chromium	EPA Method 200 7
Copper	EPA Method 200 7
Iron	EPA Method 200 7
Mercury	EPA Method 245 2
Potassium	EPA Method 200.7
Magnesium	EPA Method 200.7
Manganese	EPA Method 200 7
Sodium	EPA Method 200 7
Nickel	EPA Method 200 7
Lead	EPA Method 239 2
Antimony	EPA Method 204 2
Selenium	EPA Method 270.2
Thallium	EPA Method 279 2
Vanadium	EPA Method 200 7
Zinc	EPA Method 200 7

Dioxins/Furans	Method
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	SW846-8280
1,2,3,4,8,7,8-Heptachlorodibenzofuran	SW846-8280
1,2,3,4,7,8,9-Heptachlorodibenzofuran	SW846-8280
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	SW846-8280
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	SW846-8280
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	SW846-8280
1,2,3,4,7,8-Hexachlorodibenzofuran	SW846-8280
1,2,3,6,7,8-Hexachlorodibenzofuran	SW846-8280
1,2,3,7,8,9-Hexachlorodibenzofuran	SW846-8280
2,3,4,6,7,8-Hexachlorodibenzofuran	SW846-8280
Octachlorodibenzo-p-dioxin	SW846-8280
Octachlorodibenzofuran	SW846-8280
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	SW846-8280
1,2,3,7,8-Pentachlorodibenzofuran	SW846-8280
2,3,4,7,8-Pentachlorodibenzofuran	SW846-8280
2,3,7,8-Tetrachlorodibenzo-p-dioxin	SW846-8280
2,3,7,8-Tetrachlorodibenzofuran	SW846-8280

TCL Organics	Method
Volatile Organics	CLP*
Semivolatile Organics	CLP*
Pesticides/PCBs	CLP*

*OLM01 was the CLP method used in data analyzed in 1990 OLM02 was the CLP method for 1992

The seven shallow subsurface samples were analyzed for TAL metals, including cyanide, by the methods described above. The results of the analyses of these samples are provided in Appendix C.

The results of the 1990 to 1992 investigations have been evaluated according to the TNRCC RRSs. The soil medium-specific concentrations (MSCs) identified as applicable to Site SS009 are the Groundwater Protection Standard for Industrial Use (GWP-Ind) and the Soil/Air Inhalation and Ingestion Standard for Industrial Use (SAI-Ind).

The MSCs for dioxins and furans were calculated as a 2,3,7,8-TCDD toxicity equivalency quotient (TEQ); the dioxin/furan MSCs are 3 parts per trillion (ppt) GWP-Ind and 38 ppt SAI-Ind. Kelly AFB is using the national average of 8 ppt for 2,3,7,8-TCDD TEQ as the background level for Site SS009 rather than determining a site-specific background level. Because the background level is greater than the GWP-Ind, the background level is used as the MSC instead of the calculated GWP-Ind value [30 Texas Administrative Code (TAC) 335.555(d)(1)]. The 2,3,7,8-TCDD TEQ exceeded the background value of 8 ppt at 2 of the 40 hand-auger locations. The exceedances occurred at HA05 and HA06. The SAI-Ind value was exceeded at only one location, HA06.

Six surface-soil samples collected during the site investigation of SS009 were analyzed for 23 inorganic analytes from the TAL of the EPA CLP. The regulatory limits for the analytes and the analytical results for the six locations are shown in **Table 3.2**. The samples that were collected for analyses were composited from the compacted base material and the upper few inches of the black clay normally found on the surface at East Kelly.

Of the 23 inorganic analytes, 17 were below either the MSCs or the background levels of the black clay. The analytes that are within acceptable levels and do not need further delineation are described below:

- Six analytes (aluminum, calcium, iron, magnesium, potassium, and sodium) were not evaluated for additional sampling because they do not adversely affect health.
- Four analytes (mercury, selenium, silver, and thallium) were not detected in any of the samples.
- Six analytes (chromium, cobalt, copper, nickel, vanadium, and zinc) did not exceed background level.
- One analyte (manganese) was detected in the black clay at levels above background levels, but no MSCs for manganese are published.

Six metals in the black clay (antimony, arsenic, barium, beryllium, cadmium, and lead) exceeded background concentrations. Three analytes (selenium, silver, and thallium) had detection limits that were greater than the background levels.

No pesticides or PCBs were detected in the six surface-soil samples collected in 1990. No other compounds were detected at concentrations of concern. The risk assessment for the site indicated that no further action was needed.

TABLE 3.2
Comparison of Metals Concentrations in Soil During the 1990-92 Sampling with Background and Medium-Specific Concentrations

			MSC		Background	Analytical Results						Do samples exceed	
Analyte	units	CRDL	GWP-Ind	SAI-Ind	Black Clay	HA05	HA07	HA08	HA09	HA17	HA22	Background	Any MSCs
Aluminum	mg/kg	20				32,700	29,500	21,700	34,600	29,500	29,200	NA	NA
Antimony	mg/kg	6	0 6	818	0 98		1.9 J			0.3 J		YES	YES
Arsenic	mg/kg	1	5 0	3 27	8 5	5 4	226	9 8	6 5	9.1	5	YES	YES
Barium	mg/kg	20	200 0	13,700	210	230	99	90.7	139	162	93.7	YES	YES
Beryllium	mg/kg	0 5	0 4	1 33	2	12 J	8 2 J	6.6 J	10 J	8.8 J	9.3 J	YES	YES
Cadmium	mg/kg	0 5	0.5	1,020	0 43		3 2	1		1.9		YES	YES
Calcium	mg/kg	500				49,900	46,800	14,300	54,000	76,900	28,800	NA	NA
Chromium	mg/kg	1	10 0	5,110	43 6	26	24 5	17.6	28	24.5	24.5	NO	NA
Cobalt	mg/kg	5			10 8	10 4	7.3	6.2	9 1	7.3	7.4	NO	NA
Copper	mg/kg	2 5			18	8 2	15	8	8.7	9 6	11.6	NO	NA
Iron	mg/kg	10				18,400 J	16,500 J	12,600 J	20,000 J	17,800 J	16,500 J	NA	NA
Lead	mg/kg	0.5	1.5	1,000	23 6	14.4	27.3	17.6	17 8	28.3	17 1	YES	YES
Magnesium	mg/kg	500				4,500	4,000	3,830	4,580	4,070	4,890	NA	NA
Manganese	mg/kg	1.5			593	824 J	288 J	194 J	464 J	337 J	323	YES	NA
Mercury	mg/kg	0.02	0 2	613	0 12							NO	NA
Nickel	mg/kg	4	10.0	20,400	26 8	22 6	16.9	14.9	20.5	17 9	18 4	NO	NA
Potassium	mg/kg	500				5,000	4,620	4,110	5,880	5,220	7,000	NA	NA
Selenium	mg/kg	0.5	5 0	10,200	0 24							NA	NA
Silver	mg/kg	1	51 1	10,200	0 25							NA	NA
Sodium	mg/kg	500										NA	NA
Thallium	mg/kg	1	0 2		0 61							NA	NA
Vanadium	mg/kg	5			64.8	38.9 J	33.7 J	30.2 J	49.6 J	65 5 J	27 J	YES	NA
Zinc	mg/kg	2			89.4	65.5 J	67 1 J	53 3 J	84.2 J	67.9 J	62 6 J	NO	NA

Notes: MSC = medium-specific concentration
GWP = groundwater cross-media protection standard for soil
SAI = soil/air inhalation and ingestion cross-media protection standard for soil
NA = not applicable
CRDL = EPA Contract Laboratory Program Contract Required Detection Limit
Blank cells indicate analyte not detected or values do not exist

WDC972060007 XLS

795 39

795 40

3.3 1994 Supplemental Sampling

CH2M HILL collected additional samples at Site SS009 in January and February 1994 to obtain additional information needed to close the site under the risk-reduction rules. The additional sampling was conducted in response to TNRCC comments on the previous HNUS reports. Following were objectives of the additional sampling:

- Determine if PCDDs, PCDFs, or arsenic are present in surface-soil samples in the southeast part of Site SS009.
- Determine if VOCs, SVOCs, pesticides, PCBs, PCDDs, PCDFs, or metals are present in the soil at lower depths at monitoring well MW134.
- Evaluate the presence of PCDDs, PCDFs, VOCs, SVOCs, pesticides, PCBs, and metals in the groundwater downgradient of Site SS009.

One soil boring was advanced near the southeast corner of Site SS009 and in Reinmaker Park. Soil samples were collected at three depth intervals (3 to 5, 10 to 13, and 15 to 17 feet bgs). The soil boring was converted into a monitoring well (SS052MW134) and a groundwater sample was collected. The subsurface soil and groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, PCDDs, PCDFs, and selected metals. Thirteen surface samples (0 to 18 inches) were collected using hand augers and analyzed for PCDDs, PCDFs, and arsenic. Table 3.3 summarizes the analyses by sampling location.

Arsenic was detected in 12 of the 12 surface soil samples at concentrations ranging from 3.1 to 16.3 mg/kg. Of these 12 samples, 8 had arsenic concentrations above the background for the Houston Black Clay (8.5 mg/kg). Subsurface soils collected from SS052MW134 had arsenic concentrations ranging from 3.3 to 6.3 mg/kg. None of the subsurface soil samples exceeded the Brown Clay background concentration of 9.5 mg/kg.

Seven of the 17 PCDD and PCDF congeners[7] were found in shallow soil. The most frequently occurring congeners were octachlorodibenzo-p-dioxin (detected in 13 of 13 samples) and 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin (detected in 10 of 13 samples) with concentrations ranging from 12.5 to 899 pg/g and 3.02 to 116 pg/g, respectively. Other congeners were detected less frequently and at low concentrations. Only two of the seven congeners were detected in subsurface soil samples from SS052MW134. Octachlordibenzo-p-dioxin and octa chlorodibenzofuran were detected in one sample each at concentrations less than 5 pg/g.

Target VOCs, SVOCs and chlorinated pesticides/PCBs were not detected in the three subsurface soils from SS052MW134.

For the groundwater sample collected from SS052MW134, detected VOCs included trichloroethylene (5 µg/L), tetrachloroethylene (140 µg/L), and toluene (2 µg/L).

---

[7] PCDDs and PCDFs are a family of 217 structurally related compounds Each arrangement of chlorine atoms constitutes a different congener of the family of PCDDs and PCDFs Congeners are "named" by the arrangement of the chlorine atoms and the number of chlorine atoms attached to the parent compound Toxicity has been identified for the congeners with chlorine atoms in the 2,3,7,8 "positions" on the parent compound Seventeen congeners of PCDDs and PCDFs have chlorine atoms in the 2,3,7,8 positions These congeners contain 4,5,6,7, or 8 chlorine atoms and are named tetra-, penta-, hepta-, and octa-chlorinated dibenzo-p-dioxins (and furans), respectively For example, the PCDD congener with a total of four chlorine atoms in the 2,3,7,8 positions is named 2,3,7,8-tetrachlorodibenzo-p-dioxin

TABLE 3.3
Summary of Historical Analyses from CH2M HILL 1994 Supplemental Sampling

Analytical Groups

Station	Metals	Arsenic	Dioxin/ Furan	Organics
HA038		•	•	
HA039		•	•	
HA040		•	•	
HA041		•	•	
HA042		•	•	
HA043		•	•	
HA044		•	•	
HA045		•	•	
HA046		•	•	
HA047		•	•	
HA048		•	•	
HA049		•	•	
HA050		•	•	
SS052 MW134	•••		•••	•••

••• indicates multiple analyses for one station

Compound List and Methods for Analyses

Metals	Method
Silver	EPA Method 200 7
Antimony	EPA Method 204.2
Arsenic	EPA Method 206.2
Beryllium	EPA Method 200 7
Cadmium	EPA Method 200 7
Cyanide	EPA Method C335.2
Chromium	EPA Method 200.7
Copper	EPA Method 200.7
Mercury	EPA Method 245.2
Nickel	EPA Method 200 7
Lead	EPA Method 239 2
Selenium	EPA Method 270.2
Thallium	EPA Method 279 2
Zinc	EPA Method 200 7

Arsenic	Method
Arsenic	EPA Method 206.2

Dioxin/Furan	Method
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	SW846-8290
1,2,3,4,6,7,8-Heptachlorodibenzofuran	SW846-8290
1,2,3,4,7,8,9-Heptachlorodibenzofuran	SW846-8290
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	SW846-8290
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	SW846-8290
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	SW846-8290
1,2,3,4,7,8-Hexachlorodibenzofuran	SW846-8290
1,2,3,6,7,8-Hexachlorodibenzofuran	SW846-8290
1,2,3,7,8,9-Hexachlorodibenzofuran	SW846-8290
2,3,4,6,7,8-Hexachlorodibenzofuran	SW846-8290
Octachlorodibenzo-p-dioxin	SW846-8290
Octachlorodibenzofuran	SW846-8290
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	SW846-8290
1,2,3,7,8-Pentachlorodibenzofuran	SW846-8290
2,3,4,7,8-Pentachlorodibenzofuran	SW846-8290
2,3,7,8-Tetrachlorodibenzo-p-dioxin	SW846-8290
2,3,7,8-Tetrachlorodibenzofuran	SW846-8290

Organics	Method
Volatile Organics	SW846-8240
Semivolatile Organics	SW846-8270
Pesticides/PCBs	CLP 1990 SOW

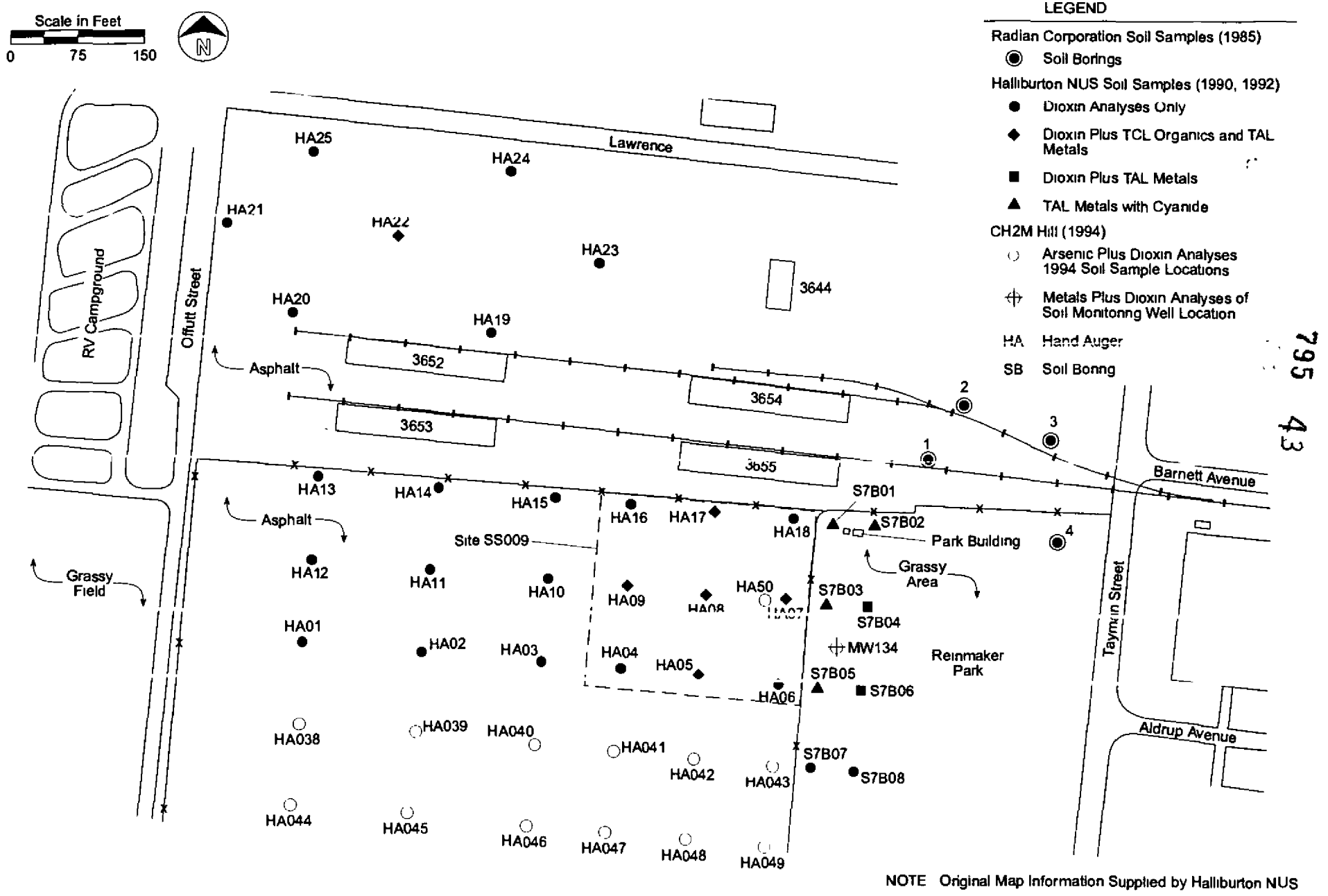
WDC972060007 XLS

Detected metal analytes were limited to nickel at 78.2 µg/L and arsenic at 1 µg/L. Chlorinated pesticides/PCBs, SVOCs and PCDDs/PCDFs were not detected in groundwater.

Appendix A contains the results of the supplemental sampling conducted at Site SS009 in 1994. These results are used in the Site SS009 closure evaluation described in Section 5 of this report.

3.4 Site-Specific Environmental Baseline Survey

In 1996, CH2M HILL conducted a Site-Specific EBS of the southwest corner of East Kelly, which includes Site SS009. Files were reviewed, facility personnel were interviewed, and a site visit was conducted. No sampling was conducted as a part of this study. The EBS report summarized the status of the site in the closure process and identified no new issues of environmental concern.



NOTE Original Map Information Supplied by Halliburton NUS

795

43

FIGURE 3.1
Historic Soil Sample Locations

795 44

TAB

Section 4.0

SECTION 4.0

795 45

1996 Site Investigation

The data collected on Site SS009 were reviewed to determine the approach needed to close the site in accordance with TNRCC RRSs. Additional data was determined to be needed for the following reasons:

1) Background was exceeded for dioxin in four locations. Sampling was determined to be needed to confirm these concentrations and to delineate the contamination around these locations (HA05, HA06, HA50, and HA45).

2) Detection limits for certain PCDD/PCDF congeners were higher than the dioxin background at eight sample locations. These locations were included for resampling and analysis by SW8290 to achieve the required detection limits (HA01, HA02, HA03, HA05, HA07, HA09, HA10, and HA17).

3) Antimony, arsenic, barium, beryllium, cadmium, and lead were found to exceed background levels. Additional samples were required to confirm the concentrations.

4) Concentrations of arsenic, cadmium, and lead were present at sufficiently high levels at three locations to warrant resampling to confirm the previous high concentration and to delineate contamination around the sample location (HA07, HA08, and HA17).

5) Selenium, silver, and thallium were not detected. However the detection limits may have exceeded the background concentrations for these contaminants. For this reason, sampling was planned to assess whether these contaminants exceed background.

Rather than collect samples for specific metals analyses on a location-specific basis, all samples requiring resampling for metals were analyzed for the metals mentioned above.

To further assess the potential for soil to affect groundwater in accordance with RRS No. 2, sample locations with the highest total concentrations exceeding GWP-Ind were selected for analysis using synthetic precipitation leaching procedure (SPLP). The sample locations selected for SPLP extraction were the following:

- The 4 highest dioxin/furan-concentration locations for SPLP dioxin/furan analysis
- The 5 highest metals-concentration locations for SPLP metals analysis
- The 19 highest arsenic-concentration locations for SPLP arsenic analysis
- SPLP samples, collected from surface soil only

A work plan containing a detailed sampling rationale was prepared and presented to TNRCC (Correspondence to Gordon Banner/TNRCC, September 27, 1996). The work plan was revised to incorporate comments received from TNRCC. The revised work plan is contained in Appendix D.

The samples and associated analyses are presented in Table 4.1 Sample locations are shown in Figure 4.1. The field sampling activities and analytical results are summarized below.

795 46

TABLE 4.1
Summary of Analyses from CH2M HILL 1996 Closure Investigation

Analytical Groups					
Station	Metals	SPLP Metals	SPLP Arsenic	Dioxin/ Furan	SPLP Dioxin/Furan
HA01	•		•	•	
HA02	•		•	•	
HA03	•		•	•	
HA04	•		•		
HA05	•	•			
HA05A				•	•
HA05B				•	
HA05C				•	
HA06	••	•	•	••	•
HA06A				•	
HA06B				•	
HA06C				•	
HA07	•	•		•	
HA07A	•		•		
HA07B	•		•		
HA07C	•		•		
HA08	•	•			
HA08A	•		•		
HA08B	•		•		
HA08C	•		•		
HA09	•		•	•	
HA010	•		•	•	
HA016	•		•		
HA017	•	•		•	
HA017A	•		•		
HA017B	•		•		
HA017C	•		•		
HA018	•		•		
HA022	•		•		
HA040				•	•
HA040A				•	
HA040B				•	
HA040C				•	
HA045A				•	
HA045B				•	
HA045C				•	•
S7B01	•				

indicates multiple analyses

WDC972060007.XLS

TABLE 4.1

Summary of Analyses from CH2M HILL 1996 Closure Investigation, Continued

Compound List and Methods for Analyses

Metals	Method
Silver	EPA Method 200 7
Arsenic	EPA Method 200.7
Barium	EPA Method 200.7
Beryllium	EPA Method 200 7
Cadmium	EPA Method 200.7
Chromium	EPA Method 200.7
Lead	EPA Method 200.7
Antimony	EPA Method 204.2
Selenium	EPA Method 270.2
Thallium	EPA Method 279.2

SPLP Metals	
Silver	SW846-6010
Arsenic	SW846-6010
Barium	SW846-6010
Beryllium	SW846-6010
Cadmium	SW846-6010
Chromium	SW846-6010
Lead	SW846-7421
Antimony	SW846-7040
Selenium	SW846-7740
Thallium	SW846-7841

Arsenic	Method
Arsenic	EPA Method 206.2

SPLP Arsenic	Method
Arsenic	SW846-6010

Dioxin/Furan and SPLP Dioxin/Furan	Method
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	SW846-8290
1,2,3,4,6,7,8-Heptachlorodibenzofuran	SW846-8290
1,2,3,4,7,8,9-Heptachlorodibenzofuran	SW846-8290
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	SW846-8290
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	SW846-8290
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	SW846-8290
1,2,3,4,7,8-Hexachlorodibenzofuran	SW846-8290
1,2,3,6,7,8-Hexachlorodibenzofuran	SW846-8290
1,2,3,7,8,9-Hexachlorodibenzofuran	SW846-8290
2,3,4,6,7,8-Hexachlorodibenzofuran	SW846-8290
Octachlorodibenzo-p-dioxin	SW846-8290
Octachlorodibenzofuran	SW846-8290
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	SW846-8290
1,2,3,7,8-Pentachlorodibenzofuran	SW846-8290
2,3,4,7,8-Pentachlorodibenzofuran	SW846-8290
2,3,7,8-Tetrachlorodibenzo-p-dioxin	SW846-8290
2,3,7,8-Tetrachlorodibenzofuran	SW846-8290

WDC972060007 XLS

795 48

4.1 Field Investigation

Field sampling was conducted on October 10 and 12, 1996. The following subsections describe the equipment decontamination procedures and the field preparation and sampling activities.

4.1.1 Equipment Decontamination

Before samples were taken, new stainless-steel spoons were decontaminated using two-stage deionized water, allowed to air dry, and wrapped in aluminum foil. A new stainless-steel spoon was used at each sample location to minimize the risk of cross-contamination because of the low concentrations of interest (ppt for PCDDs and PCDFs).

4.1.2 Field Preparation and Sampling Activities

The sampling locations were located in the field by a licensed surveyor and tagged with a nail and ribbon. Figure 4.1 shows the locations sampled at Site SS009 and identifies the types of analyses at each location.

Quality control samples consisted of an equipment rinsate blank (from the rinse of the new stainless-steel spoons), a field duplicate for metals, a field duplicate for PCDDs and PCDFs, and a matrix spike/matrix spike duplicate.

Surface-soil samples were collected at 37 locations: 13 locations for PCDD/PCDF analysis only, 15 locations for metals analysis only, and 9 locations for both PCDD/PCDF and metals analysis. Four PCDD/PCDF samples were analyzed by using the SPLP, and five metals samples also were analyzed using SPLP. In addition to the five metals samples analyzed for all metals using SPLP, 19 of the metals samples were analyzed for arsenic using SPLP.

Thirty-five of the samples were collected at a depth of 0 to 3 inches. To obtain data on the leachability of contaminants in the clay beneath the surface soil, two samples were collected at a deeper interval. Stations HA06 and HA040 were arbitrarily selected for sampling in the clay encountered beneath the surface soil (i.e , at a depth of 0.8 to 1 foot). The samples were analyzed using the SPLP extraction procedure.

Samples were packed and shipped according to EPA method requirements for shipping and preserving samples. The chain of custody was maintained and sample locations and analytical results were input into an Access® database.

4.2 Results

The results of the sampling and analyses are presented in detail in Appendix E. The results are summarized in Table 4.2. Additional sampling was conducted to delineate depth of arsenic contamination. These results are presented in Table 4.3. Appendix F contains photographs of the sampling event. Appendix H contains the chain-of-custody forms and the data-quality evaluation packages. The nature and extent of contamination were evaluated using data from both the October 1996 sampling event and prior sampling events. The evaluation of the data to determine the appropriate closure approach are presented in Section 5.0.

795 49

TABLE 4.2
Summary of 1996 Data

Parameter	Units	Total Analyzed	Number of Detects	Minimum Concentration Detected	Mean Maximum Concentration Detected	Mean of Concentrations Detected
SOIL						
ANTIMONY	mg/kg	25	18	0 43	53	5 99
ARSENIC	mg/kg	25	17	4 6	180	56 02
BARIUM	mg/kg	25	25	33.8	113	60 02
BERYLLIUM	mg/kg	25	25	0 1	1	0 32
CADMIUM	mg/kg	25	24	1 1	52.6	11 14
CHROMIUM, TOTAL	mg/kg	25	25	18 3	141	46 52
LEAD	mg/kg	25	25	21 2	401	194 87
SELENIUM	mg/kg	25	2	0 14	0 15	0 145
SILVER	mg/kg	25	5	0 59	1 6	0 94
THALLIUM	mg/kg	25	1	0.28	0 28	0.28
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	pg/g	22	22	7 47	449	144 46
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	pg/g	22	18	23 3	197	73 07
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	pg/g	22	2	2 5	2 7	2 6
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	pg/g	22	2	4 1	6 47	5.29
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	pg/g	22	7	5	21 8	8 78
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	pg/g	22	7	7 9	19 3	11 73
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	pg/g	22	8	6 48	26 9	11 83
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	pg/g	22	8	6 8	23 4	12 73
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	pg/g	22	0			
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	pg/g	22	4	2.2	5 62	3.23
1,2,3,7,8-PENTACHLORODIBENZOFURAN	pg/g	22	1	2	2	2
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	pg/g	22	10	6 48	64 5	20 78
2,3,4,7,8-PENTACHLORODIBENZOFURAN	pg/g	22	8	2 6	10 7	5 86
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	pg/g	22	0			
2,3,7,8-TETRACHLORODIBENZOFURAN	pg/g	22	0			
OCTACHLORODIBENZO-p-DIOXIN	pg/g	22	22	8 84	2576	917 65
OCTACHLORODIBENZOFURAN	pg/g	22	18	11 6	171	72 86
WATER						
ANTIMONY	mg/l	5	0			
ARSENIC	mg/l	24	6	0 0455	0 617	0.23
BARIUM	mg/l	5	5	0.28	0 49	0 36
BERYLLIUM	mg/l	5	2	0 0005	0 0007	0 0006
CADMIUM	mg/l	5	2	0 0012	0 0015	0 00135
CHROMIUM	mg/l	5	1	0 013	0 013	0 013
LEAD	mg/l	5	5	0 0007	0 0039	0 00276
SELENIUM	mg/l	5	1	0 0009	0 0009	0 0009
SILVER	mg/l	5	0			
THALLIUM	mg/l	5	0			
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	pg/l	4	0			
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	pg/l	4	0			
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	pg/l	4	0			
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	pg/l	4	0			
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	pg/l	4	1	11 4	11 4	11 4
1,2,3,7,8-PENTACHLORODIBENZOFURAN	pg/l	4	1	11 7	11 7	11 7
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	pg/l	4	0			
2,3,4,7,8-PENTACHLORODIBENZOFURAN	pg/l	4	0			
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	pg/l	4	0			
2,3,7,8-TETRACHLORODIBENZOFURAN	pg/l	4	0			
OCTACHLORODIBENZO-p-DIOXIN	pg/l	4	1	54 7	54 7	54 7
OCTACHLORODIBENZOFURAN	pg/l	4	0			

mg/kg = milligrams per kilogram
mg/l = milligrams per liter
pg/g = picograms per gram
pg/l = picograms per liter

WDC972060007 XLS

795 50

TABLE 4.3
Results of Sampling to Delineate Vertical Extent of Contamination

Sample Location	Depth (feet)	Arsenic Concentration (mg/kg)	
HA05	0-1		5.0
HA05	1-2	Less than	4.0
HA05	2-3	Less than	4.0
HA08	0-1		41
HA08	1-2	Less than	4.0
HA08	2-3	Less than	4.0
HA07	0-1		36
HA07	1-2	Less than	4.0
HA07	2-3	Less than	4.0

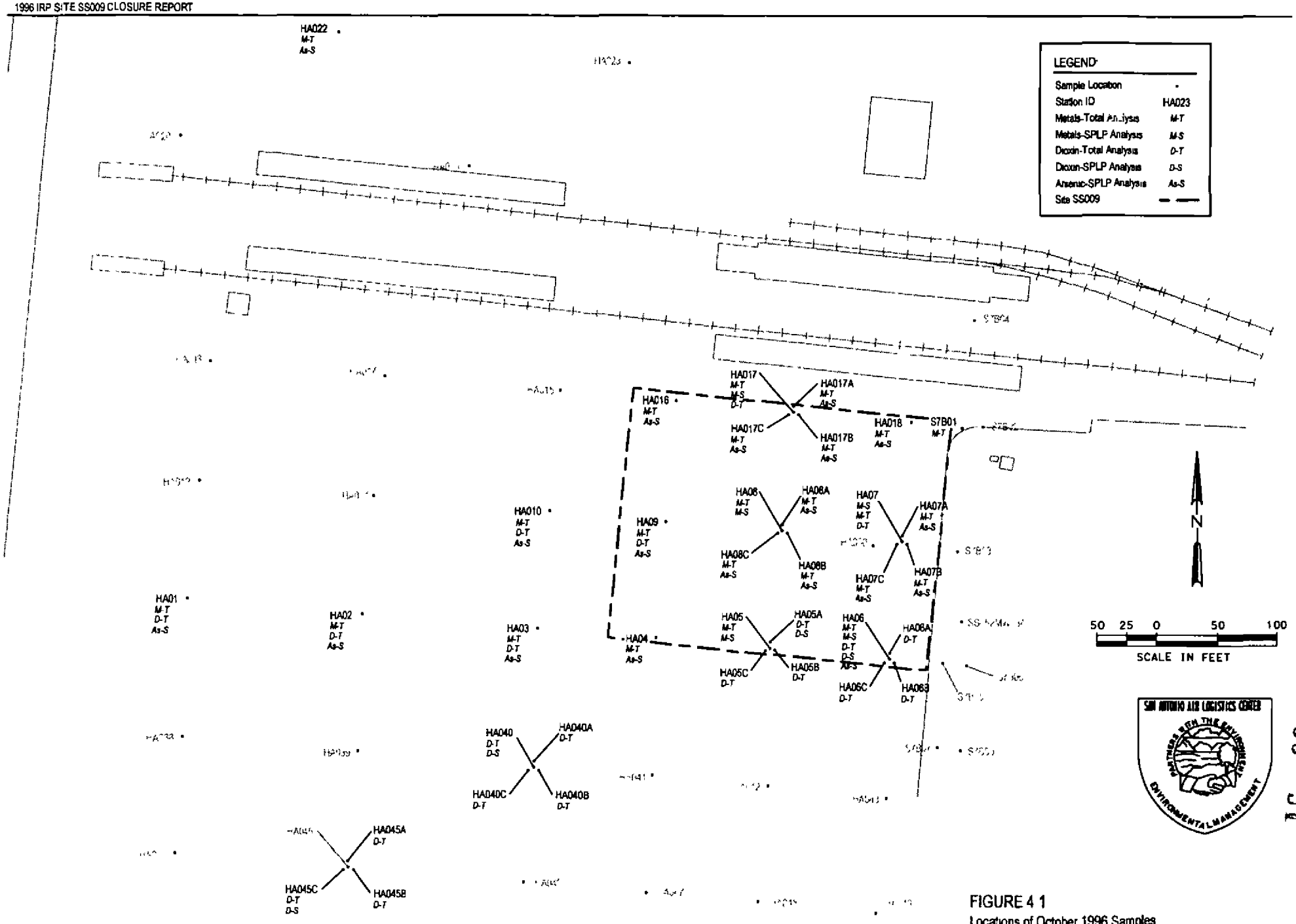


FIGURE 4-1
Locations of October 1996 Samples

795 52

TAB

Section 5.0

SECTION 5.0

Evaluation of Results

795 53

The following evaluation of results is based on soil data from the Halliburton NUS study reported in 1992 and the CH2M HILL studies in 1994 and 1996. A summary of the data set used for the evaluation of Site SS009 is presented in Tables 5.1 and 5.2. Figure 5.1 shows the locations of soil samples used in the data evaluation.

5.1 Summary of Risk-Reduction Standards

The TNRCC RRSs for closure/remediation of contaminated sites are set forth in 30 Texas Administrative Code (TAC) Subchapter S. The three RRSs are described as follows:

- RRS No. 1: Closure to Background—Residual contamination after closure does not exceed background concentrations. If the background concentration is less than the practical quantitation limit (PQL), the PQL may be used as the cleanup criterion if lower detection limits cannot be achieved (30 TAC 335.554).
- RRS No. 2: Closure to Health-Based Standards and Criteria—Residual contamination after closure does not exceed default concentration criteria selected on the basis of site use (e.g., residential vs. industrial) (30 TAC 335.555).
- RRS No. 3: Closure with Controls—Residual contamination after closure exceeds the concentrations established for RRSs Nos. 1 and 2. Post-closure care may be required if residual contamination exceeds site-specific cleanup criteria or if the cumulative risk posed by the residual contamination exceeds an acceptable level (30 TAC 335.561).

The following is an overview of the requirements for each of the RRSs.

5.1.1 Risk Reduction Standard No. 1

To demonstrate attainment of RRS No. 1, the site-specific contamination concentrations are compared to the higher of either the background values or PQLs (where lower detection limits cannot be achieved). The maximum detected concentration for each analyte is compared to the background concentration to determine if RRS No. 1 is attained. Remediation may be performed to achieve RRS No. 1.

A notice of intent to commence closure/remediation must be submitted, and a closure/remediation verification report must be submitted to the TNRCC to fulfill the administrative requirements of attaining RRS No. 1. Pre-approval from the TNRCC is not required for beginning closure/remediation. The TNRCC reviews the closure verification report and determines if the RRS is attained.

5.1.2 Risk-Reduction Standard No. 2

Applicable exposure pathways are identified to demonstrate attainment of RRS No. 2. RRS No. 2 exposure pathways are: 1) water ingestion and 2) soil ingestion with inhalation of

TABLE 5.1

Summary of Soil Data Usec in Evaluation (Totals Analyses)

Parameter	Units	Total Analyzed	Number of Detects	Minimum Concentration Detected	Maximum Concentration Detected	Mean of Concentrations Detected
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G	64	40	3.02	3100	167.1
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G	64	29	2	570	69.3
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G	64	4	2.5	23	9.6
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G	64	3	4 1	30	13.5
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G	64	18	4	70	13.8
1,2,3,6,7,8 HEXACHLORODIBENZO-P-DIOXIN	PG/G	64	11	3.49	50	14 6
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	64	13	2	26.9	10 7
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G	64	10	6.8	80	19.2
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G	64	1	10	10	10.0
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G	64	5	2.2	26	7.8
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G	64	9	2	410	104 1
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	64	16	1 35	64.5	15 9
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G	64	9	2 6	18	7 2
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G	64	5	2	6	3.4
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G	64	6	1	10	4 0
OCTACHLORODIBENZO-p-DIOXIN	PG/G	64	43	8 84	23700	1083 7
OCTACHLORODIBENZOFURAN	PG/G	64	32	3 45	171	51
ALUMINUM	MG/KG	12	12	6330	34600	25702 5
ANTIMONY	MG/KG	37	20	0 3	53	6
ARSENIC	MG/KG	60	42	2 6	226	34.0
BARIUM	MG/KG	37	37	33 8	230	78 5
BERYLLIUM	MG/KG	37	37	0 1	12	1.8
CADMIUM	MG/KG	37	27	1	52 6	10 1
CALCIUM	MG/KG	12	12	14300	117000	55592
CHROMIUM, TOTAL	MG/KG	37	37	17 6	141	38 9
COBALT	MG/KG	12	11	6	10 4	7.5
COPPER	MG/KG	12	12	7 7	15	10 9
CYANIDE	MG/KG	11	0			
IRON	MG/KG	12	11	7770	20000	16370 0
LEAD	MG/KG	37	37	11 2	401	138 6
MANGANESE	MG/KG	12	12	105	824	368
MERCURY	MG/KG	12	0			
NICKEL	MG/KG	12	11	11 6	22.6	16 1
POTASSIUM	MG/KG	12	12	1760	7180	5484 2
SELENIUM	MG/KG	37	2	0 14	0.15	0 1
SILVER	MG/KG	37	5	0 59	1.6	0 9
SODIUM	MG/KG	12	0			
THALLIUM	MG/KG	37	5	0 22	0 28	0.3
VANADIUM	MG/KG	12	12	18 4	65 5	35 3
ZINC	MG/KG	12	12	38 7	84.2	58 4

TABLE 5.1 Cont.

Summary of Soil Data Used in Evaluation (Totals Analyses)

Parameter	Units	Total Analyzed	Number of Detects	Minimum Concentration Detected	Maximum Concentration Detected	Mean of Concentrations Detected
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G	3	0			
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G	3	0			
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G	3	0			
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G	3	0			
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G	3	0			
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G	3	0			
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	3	0			
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G	3	0			
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G	3	0			
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G	3	0			
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G	3	0			
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	3	0			
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G	3	0			
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G	3	0			
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G	3	0			
OCTACHLORODIBENZO-p-DIOXIN	PG/G	3	1	4.13	4.13	4.1
OCTACHLORODIBENZOFURAN	PG/G	3	1	3.34	3 34	3 3
ALUMINUM	MG/KG	6	6	19000	29600	23883 33
ANTIMONY	MG/KG	9	0			
ARSENIC	MG/KG	9	8	2 9	6 3	4.4
BARIUM	MG/KG	6	6	51.8	139	84.6
BERYLLIUM	MG/KG	9	9	0.54	1.2	0.8
CADMIUM	MG/KG	9	3	0.31	0 57	0 4
CALCIUM	MG/KG	6	6	72200	130000	110700.0
CHROMIUM, TOTAL	MG/KG	9	9	9.3	22.6	15.8
COBALT	MG/KG	6	4	5 2	8 7	6.5
COPPER	MG/KG	9	9	6	11 6	9 6
CYANIDE	MG/KG	9	0			
IRON	MG/KG	6	6	12400	18700	15583 3
LEAD	MG/KG	9	9	6.4	20.8	11.4
MANGANESE	MG/KG	6	6	147	411	248.7
MERCURY	MG/KG	9	0			
NICKEL	MG/KG	9	9	7	14.4	9.8
POTASSIUM	MG/KG	6	6	4610	7010	5616 67
SELENIUM	MG/KG	9	0			
SILVER	MG/KG	9	0			
SODIUM	MG/KG	6	1	540	540	540 0
THALLIUM	MG/KG	9	4	0.16	0.25	0.2
VANADIUM	MG/KG	6	6	17 9	35 5	29
ZINC	MG/KG	9	9	19 3	40 3	31

Notes:

[a] Surface soil data represents results from the following field efforts Soil borings collected by HNUS (1992) and hand auger samples collected by CH2M Hill (1994, 1996).

[b] Subsurface soil data represent results from the following field efforts: soil borings installed by HNUS (1992) and a monitoring well installed by CH2M Hill (1994) Sample locations are shown in Figure 5 1

TABLE 5.2 795 56
Summary of Surface-Soil SPLP Data Used in Evaluation

Parameter	Units	Total Analyzed	Number of Detects	Minimum Concentration Detected	Maximum Concentration Detected	Mean of Concentrations Detected
ANTIMONY	mg/l	5	0			
ARSENIC	mg/l	24	6	0 0455	0 617	0 23
BARIUM	mg/l	5	5	0 28	0 49	0 36
BERYLLIUM	mg/l	5	2	0 0005	0 0007	0 0006
CADMIUM	mg/l	5	2	0.0012	0 0015	0 00135
CHROMIUM	mg/l	5	1	0 013	0.013	0 013
LEAD	mg/l	5	5	0 0007	0 0039	0 00276
SELENIUM	mg/l	5	1	0 0009	0 0009	0 0009
SILVER	mg/l	5	0			
THALLIUM	mg/l	5	0			
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	pg/l	4	0			
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	pg/l	4	0			
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	pg/l	4	0			
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	pg/l	4	0			
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	pg/l	4	0			
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	pg/l	4	1	11 4	11.4	11 4
1,2,3,7,8-PENTACHLORODIBENZOFURAN	pg/l	4	1	11 7	11 7	11 7
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	pg/l	4	0			
2,3,4,7,8-PENTACHLORODIBENZOFURAN	pg/l	4	0			
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	pg/l	4	0			
2,3,7,8-TETRACHLORODIBENZOFURAN	pg/l	4	0			
OCTACHLORODIBENZO-p-DIOXIN	pg/l	4	1	54 7	54 7	54 7
OCTACHLORODIBENZOFURAN	pg/l	4	0			

mg/l = milligrams per liter
pg/l = picograms per liter

WDC972060007 XLS

volatiles and particulates. Also, cross-media contamination from soil to groundwater is considered. Following is the nomenclature for the criteria:

- Criteria for exposure through water ingestion: water MSC or groundwater criteria (MCL)
- Criteria for exposure through soil ingestion with inhalation of volatiles and particulates: soil MSC or soil/air inhalation and ingestion standard (SAI)
- Criteria for cross-media contamination from soil to groundwater: soil groundwater protection (GWP) standard

Other exposure pathways must be considered if human or environmental receptors are likely to be exposed through other pathways.

Standard exposure factors given in the regulations are used for residential land use or nonresidential land use. The criteria for selecting nonresidential soil requirements are presented in 30 TAC 335.557.

The MSC values are calculated using current toxicological information. The cleanup criteria then are determined for the site. The RRS identifies other regulations and standards that take precedence over the calculated risk-based MSCs. For cross-media contamination from soil to groundwater, a default assumption of 100 multiplied by the MCL is used as the soil GWP standard. Alternatively, to evaluate cross-media contamination, the soil can be analyzed by using SPLP and comparing the result to the MCL.

In addition to administrative requirements for RRS No. 1 (i.e., preliminary notification of intent to perform closure and the closure verification report), closure under RRS No. 2 requires deed recordation.

5.1.3 Risk-Reduction Standard No. 3

Where RRSs Nos. 1 and 2 cannot be attained RRS No. 3 applies. As with RRS No. 2, applicable exposure pathways and appropriate exposure criteria are identified. Unlike RRS No. 2, exposure is not necessarily assumed to occur at the current location of the affected media. Pathways for contaminant migration from the current source to possible future receptors are identified. RRS No. 3 permits adjusting standard exposure factors to account for site-specific data that affect exposure scenarios. In addition to requiring that site-specific cleanup criteria (as in RRS No. 2) be developed, RRS No. 3 requires a site-specific risk assessment and a corrective measures study (CMS).

The administrative and agency approval requirements for RRS No. 3 are as follows:

- TNRCC must pre-approve closure activities under RRS No. 3 before they can begin.
- A remedial investigation, baseline risk assessment, and CMS must be submitted to TNRCC.
- TNRCC must determine if the proposed closure/remediation method complies with RRS No. 3.
- A closure implementation report must be submitted to TNRCC.

- TNRCC determines if the closure/remediation was completed in accordance with the approved plan
- A completed deed recordation with proof of deed record must be submitted to TNRCC within 90 days after TNRCC accepts the final report.
- TNRCC must determine if post-closure care or controls are required.
- Implement post-closure care.

5.2 Evaluation of Data

For Site SS009, soil data were compared to criteria for RRS No 1 to determine the constituents exceeding background concentrations. Soil data for those constituents exceeding RRS No 1 are compared to RRS No. 2. In accordance with the RRS regulations (30 TAC 335.553[d]), the 95 percent upper confidence limit (95 UCL) was calculated as the RME[8], and used to compare to the RRS values for data sets with 10 or more samples. The methodology for calculating the RME depends on the number of positive detections and the distribution of the data set. The methodology used for Site SS009 for determining the RMEs is in Appendix I. Statistical analyses were performed using query tools developed in Microsoft Access®.

5.2.1 Comparison to Background (RRS No. 1 Evaluation)

5.2.1.1 Development of RRS No. 1 Criteria

Background values for metals in surface soil and subsurface soil have been established for Kelly AFB (Halliburton NUS, 1994). Surface-soil values correspond to data collected from the Houston black clay layer, and subsurface soil values correspond to data collected from the brown clay layer. These background values were used as RRS No. 1 values for metals.

For PCDDs and PCDFs, site data were compared to the background value of 8 ppt TEQ (See Correspondence from Gordon Banner/TNRCC to Ed Roberson/Kelly AFB dated September 13, 1996 in Appendix K). The background value is based on 95 soil samples collected from areas in the U.S. that represent background conditions (*Estimating Exposure to Dioxin-Like Compounds*, EPA, 1994).

5.2.1.2 Comparison of Results to RRS No. 1 Criteria

The maximum concentration of each metal in soil samples collected from surface soil (i.e., 0- to 2-foot depth) and subsurface soil (i.e., greater than 2 feet bgs) at SS009 were compared to the Kelly AFB background values (Table 5.3). In the surface soil, the following metals exceeded background values: antimony, arsenic, barium, beryllium, cadmium, chromium, lead, manganese, silver, and vanadium. In the subsurface soil, the following metals exceeded background concentrations: barium, beryllium, cadmium, cobalt, copper, and thallium. All metals that exceeded background concentrations were retained as contaminants of potential concern (COPCs). In general, analytical results indicated that metals were found in the surface soil more frequently and at higher concentrations than in

[8] Reasonable maximum exposure concentration also is referred to as "representative concentration" in this document

795 59

Table 5.3
Comparison to Background

Parameter	UNITS	NoAnalysis	Detects	MinDet	MeanDet	MaxDet	Background Concentration*	Max Exceeds Background
[illegible]								
ANTIMONY	mg/kg	30	19	0 3	5.77	53	0 98	Yes
ARSENIC	mg/kg	48	41	2.6	34.71	226	8.50	Yes
BARIUM	mg/kg	35	35	33.8	77 91	230	210.00	Yes
BERYLLIUM	mg/kg	35	35	0 1	1.88	12	2 00	Yes
CADMIUM	mg/kg	32	27	1	10 13	52.6	0.43	Yes
CHROMIUM, TOTAL	mg/kg	35	35	17 6	39 98	141	43.60	Yes
COBALT	mg/kg	11	10	6.2	7 68	10.4	10.80	No
COPPER	mg/kg	11	11	7.7	10 85	15	18.00	No
LEAD	mg/kg	37	37	11.2	139	401	23.60	Yes
MANGANESE	mg/kg	11	11	105	375.27	824	593 00	Yes
NICKEL	mg/kg	11	10	12	16.54	22 6	26 80	No
SELENIUM	mg/kg	30	2	0.14	0 15	0 15	0.24	No
SILVER	mg/kg	35	5	0 59	0 94	1.6	0 25	Yes
THALLIUM	mg/kg	35	4	0 22	0.24	0 28	0 61	No
VANADIUM	mg/kg	11	11	18.4	35.72	65 5	64 80	Yes
ZINC	mg/kg	11	11	38.7	60 11	84 2	89.40	No
[illegible]								
ARSENIC	mg/kg	9	8	2.9	4 44	6 3	9 90	No
BARIUM	mg/kg	6	6	51.8	84 62	139	112 00	Yes
BERYLLIUM	mg/kg	9	9	0 54	0.83	1.2	1.10	Yes
CADMIUM	mg/kg	9	3	0.31	0 43	0.57	0.49	Yes
CHROMIUM, TOTAL	mg/kg	9	9	9 3	15.82	22.6	33.20	No
COBALT	mg/kg	6	4	5.2	6 53	8 7	8 40	Yes
COPPER	mg/kg	9	9	6	9.59	11.6	11.30	Yes
LEAD	mg/kg	9	9	6.4	11 40	20.8	14 80	Yes
MANGANESE	mg/kg	6	6	147	248 67	411	987.00	No
NICKEL	mg/kg	9	9	7	9.84	14 4	17.10	No
THALLIUM	mg/kg	9	4	0 16	0 21	0.25	0.24	Yes
VANADIUM	mg/kg	6	6	17.9	28.67	35 5	56.10	No
ZINC	mg/kg	9	9	19 3	30 53	40 3	61 60	No

Notes

*Surface soil concentrations are compared to Black Clay background values. Subsurface soil concentrations are compared to Brown Clay background values

NoAnalysis - Number of samples analyzed

MinDet - Minimum detected concentration

MaxDet - Maximum detected concentration

the subsurface soil. Figures 5.2 through 5.12 are plots of the concentrations by location of selected metals that exceeded background.

For PCDDs and PCDFs, the TEQs calculated for each sample location were compared to the 8 ppt background value (Table 5.4). The toxicity equivalent factors used for the comparison are presented in Table 5.5. Eleven sample locations have TEQ concentrations that exceed the background value The TEQ concentrations for the sample locations range from 8.1 to 117 ppt. Figures 5.13 and 5.14 show the TEQ concentrations for samples collected in surface soil (less than 2 feet bgs) and subsurface soil (greater than 2 feet bgs). Figures 5.15 through 5.20 show the concentrations of PCDD and PCDF congeners considered most significant from the perspective of risk to human health.

5.2.2 RRS No. 2 Evaluation

5.2.2.1 Development of RRS No. 2 Criteria

Because the current and future land use at Site SS009 is and will continue to be industrial, site data for surface soil (0- to 2-foot depth) were compared to the RRS No. 2 values that apply to surface soil in an industrial setting (SAI-Ind). In developing the RRS No. 2 criteria, the dermal absorption route of exposure was considered in addition to soil ingestion and inhalation of volatiles and particulates. RRS No. 2 SAI-Ind values were calculated according to the methodology in 30 TAC 335.559(g) with the addition of a dermal exposure route. The development of the SAI-Ind criteria is presented in Appendix J. The toxicity values of the COPCs are presented in Table 5 6. The reduced equations and the resulting RRS No. 2 SAI-Ind criteria are shown in Table 5.7. The arsenic SAI-Ind criterion for Site SS009 was determined by TNRCC to be 20 mg/kg, as documented in correspondence from TNRCC to Kelly AFB, transmitted February 27, 1997 (see Appendix K).

The SPLP results for soil samples were used to evaluate the potential for soil-to-groundwater cross-media effects. Leachate concentrations of the SPLP samples were compared to RRS No. 2 groundwater protection criteria for SPLP data (i.e., MCLs).

5.2.2.2 Comparison to RRS No. 2 Criteria

The RME concentration of each analyte that exceeded the RRS No. 1 criteria in surface soil was compared to the RRS No. 2 values (Table 5.8). None of the metals, or PCDD, or PCDF congeners, had RMEs that exceeded the RRS No. 2 SAI-Ind values.

SPLP data were collected to evaluate the potential for soil-to-groundwater cross-media effects. SPLP sample locations were selected to collect data in the areas of highest concentrations for the family of analytes. The leachate concentrations for all analytes are compared to the RRS No. 2 criteria (MCLs) in Table 5.9. The arsenic SPLP results are shown by sample location in Figure 5.21. The SPLP concentrations for each PCDD/PCDF congener are expressed in terms of 2,3,7,8-TCDD-equivalents and are compared to the 2,3,7,8-TCDD MCL. None of the metals or PCDD/PCDF congeners exceeded the RRS No. 2 criteria for soil-to-groundwater cross-media effects. This result is substantiated by groundwater data from the monitoring well located on the site (Appendix G) which indicated no contamination to groundwater from the site COPCs.

795 61

Table 5.4
Comparison of PCDD/PCDF Data to Background

Alias	Depth Interval (ft)	TEQ Concentration
1992 Data		
HA01	0.7-1.5	0
HA02	0.7-1.5	0
HA03	0.7-1.5	0.4
HA04	0.7-1.5	4.7
HA05	0.7-1.5	**8.9**
HA06	0.7-1 5	**117**
HA07	0.7-1.5	0.99
HA08	0.7-1.5	0.81
HA09	0.7-1 5	0
HA10	0.7-1.5	0.61
HA11	0 7-1.5	3.1
HA12	0.7-1.5	1.2
HA13	0 7-1.5	0.02
HA14	0.7-1 5	0 03
HA15	0.7-1.5	0.63
HA16	0.7-1.5	0
HA17	0.7-1 5	3.25
HA18	0.7-1.5	0.86
HA19	0 7-1.5	2.1
HA20	0.7-1.5	3
HA21	0.7-1.5	0.7
HA22	0.7-1.5	0
HA23	0.7-1.5	0
HA24	0 7-1.5	0
HA25	0.7-1.5	2
S7B04	0-1	0.28
S7B06	0-1	0
S7B07	0-1	0 25
S7B08	0-1	0.11
1994 Data		
HA038	0-1.5	0.14
HA039	0-1 5	0.22
HA040	0-1 5	**20.5**
HA041	0-1.5	6.8
HA042	0-1.5	2.4
HA043	0-1.5	0.31
HA044	0-1.5	0.075
HA045	0-1.5	**9.0**
HA046	0-1.5	8.0
HA047	0-1.5	0.17
HA048	0-1.5	3.5
HA049	0-1.5	0.82
HA050	0-1.5	3.3
MW134	3-5	0
MW134	10-13	0
MW134	15-17	0
1996 Data		
HA01	0-.2	**12.3**
HA02	0-.2	**15.3**
HA03	0-.2	3.4
HA040	.8-1	0 13
HA040A	0-.2	1.6
HA040B	0-.2	1.4
HA040C	0-.2	2.1
HA045A	0-.2	**27.6**
HA045B	0-.2	1.2
HA045C	0-.2	0.66
HA05A	0-.2	6.6
HA05B	0-.2	5.1
HA05C	0-.2	8.0
HA06	0-.2	**14.9**
HA06	.8-1	0.16
HA06A	0-.2	**14.7**
HA06B	0-.2	**13.7**
HA06C	0-.2	5 2
HA07	0-.2	**8.1**
HA09	0-.2	2.1
HA10	0-.2	4 0
HA17	0-.2	4.2

Notes:
TEQ = 2,3,7,8-tetrachlorodibenzo-p-dioxin toxicity equivalent quotient in pg/g
Results shown to 2 significant figures.
Detected congeners were used to calculate TEQs
Bold entries exceed the background TEQ level of 8 pg/g.
Parentheses indicate depth interval for locations with more than one result

WDC972060007.XLS

795 62

Table 5.5
Toxicity Equivalent Factors for Dioxin COPCs

Parameter	Toxicity Equivalent Factor
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	1
2,3,7,8-TETRACHLORODIBENZOFURAN	0.1
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	0.5
1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.05
2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.5
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	0.1
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.1
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.1
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.1
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.1
2,3,4,6 7,8-HEXACHLORODIBENZOFURAN	0.1
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.1
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	0.01
1,2,3,4 6,7,8-HEPTACHLORODIBENZOFURAN	0.01
1,2,3,4 7,8,9-HEPTACHLORODIBENZOFURAN	0.01
OCTACHLORODIBENZO-p-DIOXIN	0.001
OCTACHLORODIBENZOFURAN	0.001

WDC972060007.XLS

TABLE 5.6

Toxicity Values for Chemicals of Potential Concern

795 63

Parameter	TEF	WOE	Slope Factor Oral	Source	Slope Factor Inhalation	Source	Reference Dose Oral	Source	Reference Dose Inhalation	Source
ALUMINUM			NA	NA	NA	NA	1 00E+00	E	NA	NA
ANTIMONY		D	NA	NA	NA	NA	4 00E-04	I	NA	NA
BARIUM		D	NA	NA	NA	NA	7 00E-02	I	1 43E-04	HA
BERYLLIUM		B2	4 30E+00	I	8 40E+00	I	5 00E-03	I	NA	NA
CADMIUM		B1	NA	NA	6 30E+00	I	5 00E-04	I	5 71E-05	W
CHROMIUM, TOTAL		A	NA	NA	4.20E+01	IC	5 00E-03	IC	5 71E-07	WC
COBALT			NA	NA	6 00E-02	E	NA	NA	NA	NA
COPPER		D	NA	NA	NA	NA	4 00E-02	E	NA	NA
LEAD		B2	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE			NA	NA	NA	NA	4.20E-01	IM	1 43E-05	I
NICKEL		D	NA	NA	NA	NA	2 00E-02	I	NA	NA
SELENIUM		D	NA	NA	NA	NA	5 00E-03	I	NA	NA
SILVER		D	NA	NA	NA	NA	5 00E-03	I	NA	NA
THALLIUM		D	NA	NA	NA	NA	6 00E-05	I	NA	NA
VANADIUM		NA	NA	NA	NA	NA	7 00E-03	H	NA	NA
ZINC		D	NA	NA	NA	NA	3 00E-01	I	NA	NA
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	1	B2	1 56E+05	H	1 16E+05	H	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	0 1	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	0 5	B2	7 80E+04	TEF	5 80E+04	TEF	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	0 05	B2	7 80E+03	TEF	5 80E+03	TEF	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	0 5	B2	7 80E+04	TEF	5 80E+04	TEF	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	0 1	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0 1	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0 1	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0 1	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0 1	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0 1	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0 1	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	0 01	B2	1 56E+03	TEF	1 16E+03	TEF	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0 01	B2	1 56E+03	TEF	1 16E+03	TEF	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0 01	B2	1 56E+03	TEF	1 16E+03	TEF	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	0 001	B2	1 56E+02	TEF	1 16E+02	TEF	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	0 001	B2	1 56E+02	TEF	1 16E+02	TEF	NA	NA	NA	NA

Notes.

E = EPA-NCEA Regional Support provisional value (from EPA Region III Risk-Based Concentration Table)
I = Integrated Risk Information System (IRIS 1996)
IC = IRIS value for Chromium VI used
IM = IRIS value for Manganese based on modifying factor of 3 for nondietary exposures.
H = Health Effects Assessment Tables Alternate (HEAST, 1995)
NA = Not Available
TEF = Slope factor adjusted using the toxicity equivalent factors for TCDD
W = Withdrawn from IRIS Value listed in HEAST is used
WC = Value for Chromium III was withdrawn from IRIS The Chromium III value listed in HEAST is used.
WOE = Weight of evidence

WDC972060007.XLS

795 64

TABLE 5.7

Risk Reduction Standard No. 2 SAI-Ind Criteria

Parameter	Units	SAI-Ind Criteria *
[redacted]		
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	mg/kg	2.91E-03
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	2.91E-03
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	2.91E-03
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	mg/kg	2.91E-04
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	2.91E-04
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	2.91E-04
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	2.91E-04
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	2.91E-04
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg	2.91E-04
1,2,3,7,8 PENTACHLORODIBENZO-p-DIOXIN	mg/kg	5.83E-05
1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg	5.83E-04
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	2.91E-04
2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg	5.83E-05
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	mg/kg	2.91E-05
2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	2.91E-04
OCTACHLORODIBENZO-p-DIOXIN	mg/kg	2.91E-02
OCTACHLORODIBENZOFURAN	mg/kg	2.91E-02
[redacted]		
ALUMINUM	mg/kg	1.88E+06
ANTIMONY	mg/kg	7.53E+02
ARSENIC	mg/kg	2.00E+01
BARIUM	mg/kg	1.32E+05
BERYLLIUM	mg/kg	1.23E+00
CADMIUM	mg/kg	9.41E+02
CHROMIUM, TOTAL	mg/kg	9.41E+03
LEAD	mg/kg	1.00E+03
MANGANESE	mg/kg	7.90E+05
SILVER	mg/kg	9.41E+03
VANADIUM	mg/kg	1.32E+04

Notes: See Appendix J for definitions of parameters in equation below

SAI-Ind criteria include a dermal exposure component

$$MSC(carcinogens) = \frac{TR \times 286.6}{\left[\left((5\times10^{-5})\times SF_o\right)+\left((4.32\times10^{-4})\times SF_o\times ABS\right)+\left(SF_i\times\left(20/VF\right)+(4.3\times10^{-9})\right)\right]}$$

$$MSC(noncarcinogens) = \frac{102.2}{\left[\left(5\times10^{-5}/RfD_o\right)+\left(\left(4.32\times10^{-4}/RfD_o\right)\times ABS\right)+\left(\left(1/Rfl_i\right)\times\left(20/VF\right)+(4.3\times10^{-9})\right)\right]}$$

WDC972060007.XLS

TABLE 5.8

Comparison of PCDD/PCDF and Metals Results to RRS No 2 Criteria for Surface Soil

Parameter	Units	Frequency of Nondetects	RME Concentration	RME Basis	SAI-Ind	RME Exceeds SAI-Ind
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	pg/g	38%	2 82E-04	ADJLOGNORM	2 91E-03	No
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	pg/g	55%	1 67E-05	NONPARA	2.91E-03	No
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	pg/g	94%	2 30E-05	MAXDET	2.91E-03	No
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	pg/g	95%	3 00E-05	MAXDET	2 91E-04	No
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	pg/g	72%	7 00E-05	MAXDET	2 91E-04	No
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	pg/g	83%	5 00E-05	MAXDET	2 91E-04	No
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	pg/g	80%	2 69E-05	MAXDET	2 91E-04	No
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	pg/g	84%	8 00E-05	MAXDET	2 91E-04	No
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	pg/g	98%	1 00E-05	MAXDET	2 91E-04	No
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	pg/g	92%	2 60E-05	MAXDET	5 83E-05	No
1,2,3,7,8-PENTACHLORODIBENZOFURAN	pg/g	86%	4 10E-04	MAXDET	5 83E-04	No
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	pg/g	75%	6 45E-05	MAXDET	2 91E-04	No
2,3,4,7,8-PENTACHLORODIBENZOFURAN	pg/g	86%	1 80E-05	MAXDET	5 83E-05	No
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	pg/g	92%	6 00E-06	MAXDET	2 91E-05	No
2,3,7,8-TETRACHLORODIBENZOFURAN	pg/g	91%	1 00E-05	MAXDET	2 91E-04	No
OCTACHLORODIBENZO-p-DIOXIN	pg/g	33%	2 37E-02	MAXDET	2 91E-02	No
OCTACHLORODIBENZOFURAN	pg/g	50%	2 36E-05	NONPARA	2 91E-02	No
ALUMINUM	mg/kg		3.27E+04	NONPARA	1 88E+06	No
ANTIMONY	mg/kg	35%	5 30E+01	MAXDET	7 53E+02	No
ARSENIC	mg/kg	9%	7 59E+00*	LOGNORM	2 00E+01	No
BARIUM	mg/kg		9 14E+01	LOGNORM	1 32E+05	No
BERYLLIUM	mg/kg		6 30E-01	NONPARA	1.23E+00	No
CALCIUM	mg/kg		5 99E+04	NORM	Not Calculated	No
CADMIUM	mg/kg	18%	1 79E+01	ADJLOGNORM	9 41E+02	No
CHROMIUM, TOTAL	mg/kg		3 69E+01	NONPARA	9 41E+03	No
COBALT	mg/kg	9%	9 10E+00	NONPARA	1 13E+05	No
COPPER	mg/kg		1.26E+01	LOGNORM	7 53E+04	No
IRON	mg/kg	9%	1 85E+04	NONPARA	5 64E+05	No
LEAD	mg/kg		1 72E+02	NONPARA	1 00E+03	No
MAGNESIUM	mg/kg		4 78E+03	NONPARA	Not Calculated	No
MANGANESE	mg/kg		5 53E+02	LOGNORM	7 90E+05	No
NICKEL	mg/kg	9%	1 81E+01	NORM	3 76E+04	No
POTASSIUM	mg/kg		8 18E+03	NORM	Not Calculated	No
SELENIUM	mg/kg	94%	1 50E-01	MAXDET	9 41E+03	No
SILVER	mg/kg	86%	1 60E+00	MAXDET	9 41E+03	No
THALLIUM	mg/kg	86%	2 80E-01	MAXDET	1 51E+02	No
VANADIUM	mg/kg		4 40E+01	LOGNORM	1 32E+04	No
ZINC	mg/kg		6 81E+01	NORM	5 64E+05	No

Notes

* Arsenic RME presented in this table is based on pre-excavation conditions using data collected from the entire site

RME—Reasonable Maximum Exposure Concentration

SAI-Ind—Risk Reduction Standard 2 for Soil (Industrial Setting, including dermal exposure)

mg/kg = milligrams per kilogram

pg/g = picograms per gram

TABLE 5.9

Comparison of SPLP Results to RRS No 2 Criteria for Soil - Groundwater Protection

Parameter	Units	Frequency of Nondetects	SPLP RME	Basis of RME	SPLP RME TEQ Concentration	MCL	RME Exceeds GWP-Ind
2,3,7,3-TETRACHLORODIBENZO-p-DIOXIN	mg/l	5 of 5	ND	—	NE	3 00E-08	no
2,3,7,3-TETRACHLORODIBENZOFURAN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/l	4 of 5	1 14E-08	Max	5 70E-10	3 00E-08	no a
2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/l	4 of 5	1 17E-08	Max	5 85E-09	3 00E-08	no a
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,3,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
OCTACHLORODIBENZO-p-DIOXIN	mg/l	4 of 5	5 47E-08	Max	5 47E-11	3 00E-08	no a
OCTACHLORODIBENZOFURAN	mg/l	5 of 5	ND	—	NE	3 00E-08	no a
ANTIMONY	mg/l	5 of 5	ND	—	not applicable	6 00E-03	no
ARSENIC	mg/l	18 of 24	4 55E-02[c]	UCL	not applicable	5 00E-02	no
BARIUM	mg/l	0 of 5	4 90E-01	Max	not applicable	2.00E+00	no
BERYLLIUM	mg/l	3 of 5	7 00E-04	Max	not applicable	4 00E-03	no
CADMIUM	mg/l	3 of 5	1 50E-03	Max	not applicable	5 00E-03	no
CHROMIUM	mg/l	4 of 5	1 30E-02	Max	not applicable	1 00E-01	no
LEAD	mg/l	5 of 5	3 90E-03	Max	not applicable	1 50E-02	no
SELENIUM	mg/l	4 of 5	9 00E-04	—	not applicable	5 00E-02	no
SILVER	mg/l	5 of 5	ND	—	not applicable	5 11E-01	no
THALLIUM	mg/l	5 of 5	ND	—	not applicable	2 00E-03	no

Notes

[a] TEQ of RME used in comparison

[b] Where no MCL is available, the RRS2 GW-Ind MSC was used

[c] The arsenic RME presented in this was calculated using pre-excavation SPLP data from the entire site

GWP-Ind = Ground Water Protection Standard for Industrial Use

Max = Maximum value

MCL = Maximum Contaminant Level

ND = Not detected

RME = Reasonable Maximum Exposure

TEQ = Concentration expressed as equivalent concentration of 2,3,7,8-TCDD based on toxicity

UCL = Upper Confidence Limit

5.3 Nature and Extent of Contamination

Data for contaminants exceeding background levels are presented in Figures 5.2 through 5.14. Following is a discussion of the distribution of the data for these contaminants.

5.3.1 Surface Soil Contamination

5.3.1.1 Metals

The following paragraphs describe the nature and extent of contamination in surface soil for each of the metals determined to be a COPC.

Arsenic. Arsenic was detected in 41 of 48 sample results in surface soils. Twenty-seven samples exceeded the background concentration of 8.5 mg/kg in black clay. The maximum detected concentration was 226 mg/kg. Arsenic is the only contaminant with a distinct pattern to the contamination. The distribution of the arsenic contamination is shown in the concentration contour plot shown in Figure 5.22.

Arsenic was detected in 6 of 23 SPLP sample results in surface soil. The detected values ranged from 45 to 617 ug/L. Five of the results exceeded the MCL for arsenic of 50 ug/L.

Antimony. Antimony was detected in 19 of 30 sample results. All of the detected values were estimated. Seventeen of the results exceeded the background concentration of 0.98. The highest concentration—53 mg/kg—was found at location S7B01. The elevated concentrations of antimony are generally found in the area of the former herbicide storage.

Antimony was not detected in the 5 SPLP surface soil samples analyzed.

Barium. Barium was detected in 35 of 35 samples results. Only one of the detected values exceeded the background concentration. The concentrations of barium are not indicative of contamination.

Barium was detected in 5 of 5 SPLP sample results in surface soil. The detected values ranged from 280 to 490 ug/L. All detected values were less than the MCL for barium of 2,000 ug/L.

Beryllium. Beryllium was detected in 35 of 35 sample results. Six sample results exceeded the background concentration of 2 mg/kg. All of the concentrations above background were estimated concentrations. The locations exceeding background are HA05, HA09, HA022, HA017, HA07, and HA08. These samples were collected in an area that has since been remediated. (See Section 6).

Beryllium was detected in 2 of 5 SPLP sample results in surface soil. The detected values were 0.5 and 0 7 ug/L. All detected values were less than the MCL for beryllium of 4 ug/L.

Cadmium. Cadmium was detected in 27 of 32 sample results. All detects exceed the background concentration of 0.43 mg/kg. The concentrations range from 1 mg/kg to 52.6 mg/kg with an average of 10.1 mg/kg. The detection limit for the method was 0.24 mg/kg.

Cadmium was detected in 2 of 5 SPLP sample results in surface soil. The detected values were 1.5 and 1.2 ug/L. All detected values were less than the cadmium MCL of 5 ug/L.

Chromium. Chromium was detected in 35 of 35 sample results. Ten sample results exceeded the background concentration of 43.6 mg/kg. These results ranged in concentration from 46.4 mg/kg to 141 mg/kg.

Chromium was detected in 1 of 5 SPLP sample results in surface soil. The detected value was 13 ug/L, which is below the chromium MCL of 100 ug/L.

Lead. Lead was detected in 24 of 24 sample results. All of the detected values were above the background value of 23.6 mg/kg. The mean detected concentration was 202 with a maximum of 401 mg/kg. Lead is present at uniformly elevated concentrations at the site.

Lead was detected in 5 of 5 SPLP sample results in surface soil. The detected values ranged from 0.7 to 3.9 ug/L, which is below the action level for lead in drinking water of 15 ug/L.

Manganese. Manganese was detected in 11 of 11 sample results. Only one of samples exceeded the background concentration. The concentrations of manganese do not appear to indicate contamination at the site

Silver. Silver was detected infrequently—in 5 of 35 sample results. All detected values were above the background concentration of 0.25 mg/kg. The maximum detected concentration was 1.6 mg/kg.

Silver was not detected in any of the 5 SPLP results in surface soil.

Vanadium. Vanadium was detected in 11 of 11 sample results. One value—65 mg/kg—exceeded the background concentration of 64.8 mg/kg. The concentrations of vanadium do not indicate contamination at the site.

5.3.1.2 Dioxins/Furans

Dioxins/furans were selected as contaminants of concern at Site SS009 because of their presence in low concentrations in herbicides as byproducts of production.

Dioxin/furan contamination was detected in 11 of 64 sample results at concentrations above the background concentration of 8 pg/g 2,3,7,8-TCDD TEQ. The highest concentration was at sample location HA06 (117 pg/g 2,3,7,8-TCDD TEQ); the second highest concentration was 28 pg/g at HA045A; and the third highest was 21 pg/g at HA040.

Sample location HA045A (28 pg/g 2,3,7,8-TCDD TEQ) is located along the perimeter of the sampling grid. However, the elevated concentration appears to be localized. The dioxin/furan congener-specific concentrations at HA045A were an order of magnitude higher than at the other sample locations at HA045, approximately 5 to 12 feet from HA045A. Dioxin concentrations at locations HA044 and HA046, are 2 orders of magnitude lower in concentration than HA045; these locations are approximately 50 feet from HA045.

OCDD was the dioxin congener most frequently detected. The following congeners were also detected at a frequency of greater than 20 percent of the time:

- OCDD detected in 43 of 64 results
- 1,2,3,4,6,7,8-HPCDD detected in 40 of 64 results
- 1,2,3,4,6,7,8-HPCDF detected in 29 of 64 results
- OCDF detected in 32 of 64 results
- 1,2,4,5,6,7,8-HXCDF detected in 18 of 64 results
- 2,3,4,6,7,8-HXCDF detected in 16 of 64 results

The most toxic dioxin congener—2,3,7,8-TCDD—was detected in 5 of 64 samples. All detected values were estimated maximum probable concentrations.

SPLP results for dioxin/furan congeners were obtained for four sample locations. Three of the 17 dioxin/furan congeners were detected in SPLP soil extracts from two locations. OCDD was detected at HA05A at a concentration of 54.7 pg/L. 1,2,3,7,8-PeCDD was detected at HA06 at a concentration of 11.4 pg/L. 1,2,3,7,8-PeCDF was detected at HA06 at a concentration of 11.7 pg/L. On a TEQ basis, detected concentrations of dioxins and furans were less than the MCL for 2, 3, 7, 8 TCDD.

A review of the areal distribution of the dioxin data indicates diffuse contamination with no distinct pattern. Concentrations exceeded background at the edge of the sampling grid. However, the highest concentrations of dioxin contamination are highly localized[9].

5.3.2 Subsurface Soil Contamination

Nine samples were collected and analyzed for metals in the greater-than-2-foot depth interval. Barium, beryllium, cadmium, cobalt, cadmium, and thallium were identified as exceeding background. Only the maximum detected concentration exceeded background for all of these constituents. There is no indication of widespread contamination of metals in the subsurface soils.

Three samples were collected and analyzed for dioxin/furans in the greater-than-2-foot depth interval. OCDD and OCDF were each detected only at SS052MW134 at low, estimated concentrations.

5.4 Conclusion of RRS Evaluation

The arsenic concentrations in soil indicate a localized area of contamination at and surrounding the former storage area. This 1.2-acre area of contamination is considered the area affected by the herbicide storage operations and has, therefore, been used as the basis for the boundaries of Site SS009. The RMEs for arsenic were recalculated using data from samples collected in this contaminated area. The RMEs are compared to the appropriate RRSs in Table 5.10. Because the arsenic RME for the affected area exceeds both the RRS No. 2 GWP-Ind and SAI-Ind values, corrective action was needed to attain closure under RRS No. 2.

TNRCC determined that a 20 mg/kg arsenic RRS No. 2 criterion is applicable to Site SS009, as documented in correspondence from TNRCC to Kelly AFB, transmitted February 27, 1997 (see Appendix K). Based on this criterion, Kelly AFB elected to remove contamination above this concentration in the 1.2-acre area affected by herbicide storage. The removal action was conducted with the intent of closing Site SS009 under RRS No. 2.

---

[9] Kelly AFB is deed recording an area much larger than the sampling grid to accommodate the fact that the dioxin contamination was not bounded

Table 5.10

Comparison of Pre-Excavation Arsenic Results From Affected Area to RRS No 2 Criteria

Parameter	Units	Number Analyzed	Frequency of Nondetects	RME Concentration	RME Basis	Criterion	Criterion Value	RME Exceeds Criterion?
Total Analysis Results for Surface Soil Compared to SAI-Ind								
Arsenic	mg/kg	25	16%	6.80E+01	UCLNORM	SAI-Ind	2.00E+01	Yes
SPLP Analysis Results Compared to GWP-Ind								
Arsenic	mg/l	17	56%	1.51E-01	NONPARA	GWP-Ind	5.00E-02	Yes

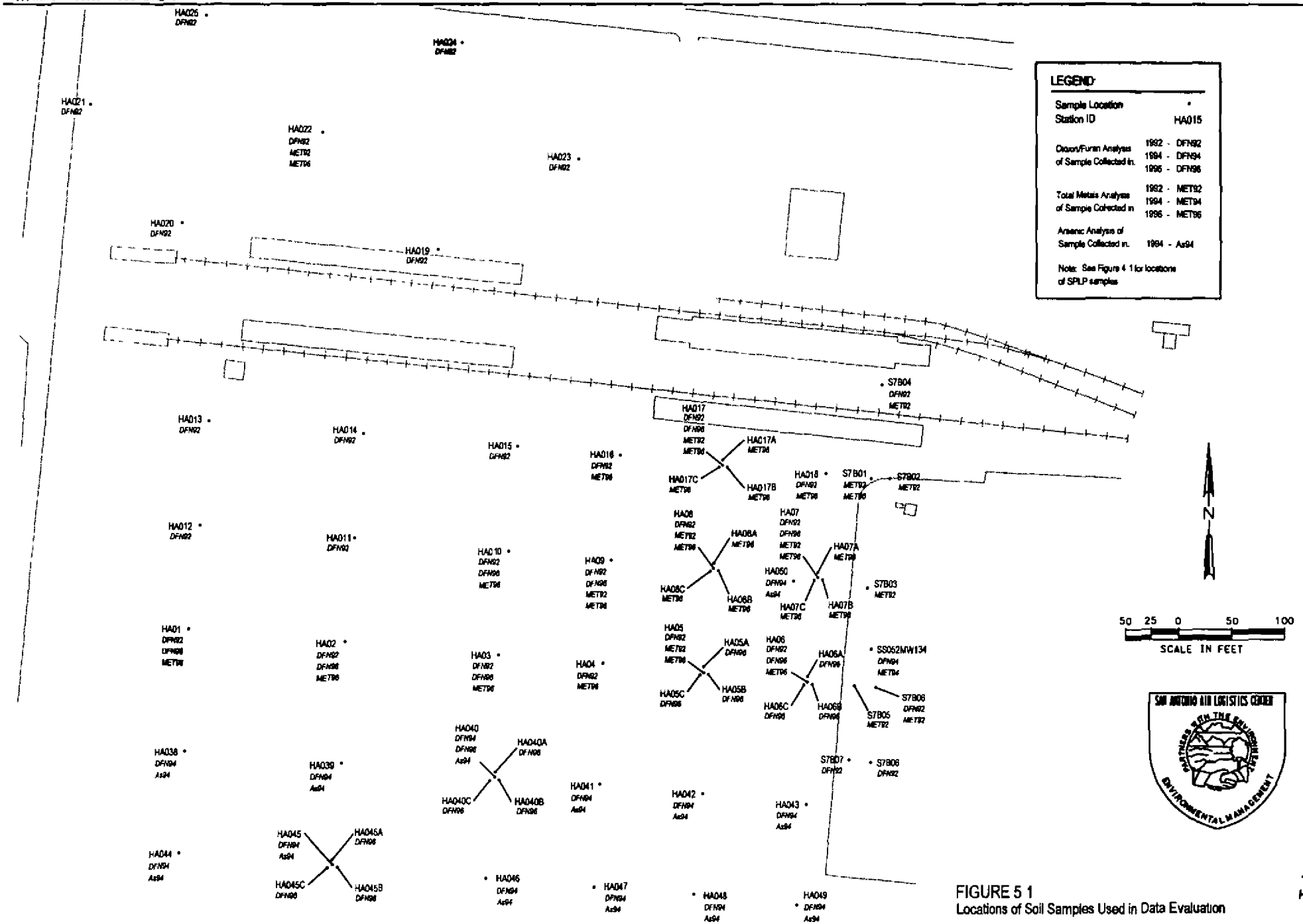


FIGURE 5 1
Locations of Soil Samples Used in Data Evaluation

CH2MHILL

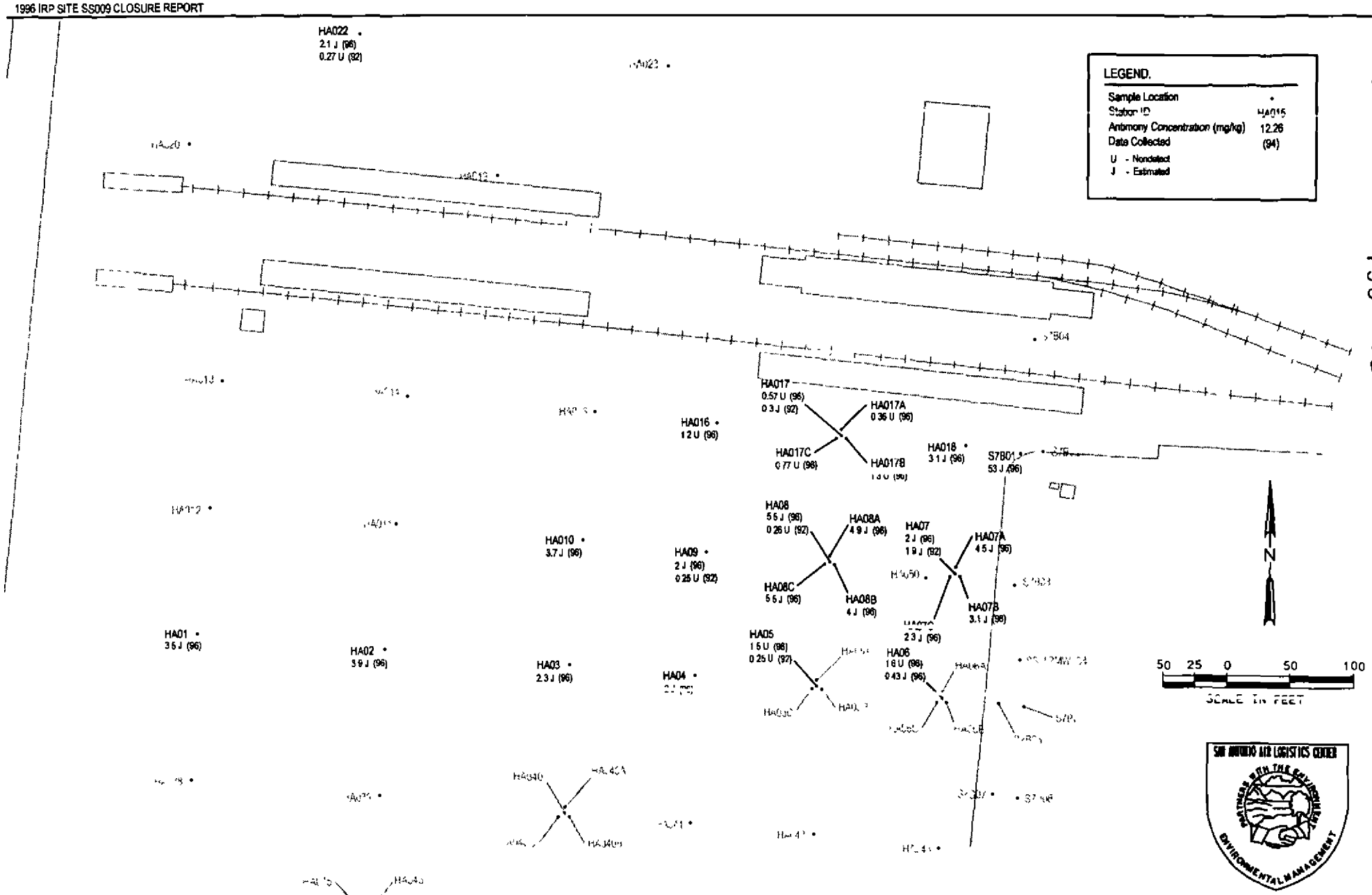


FIGURE 5.2
Antimony Concentrations in Surface Soil
(Less Than 2 Feet Deep)

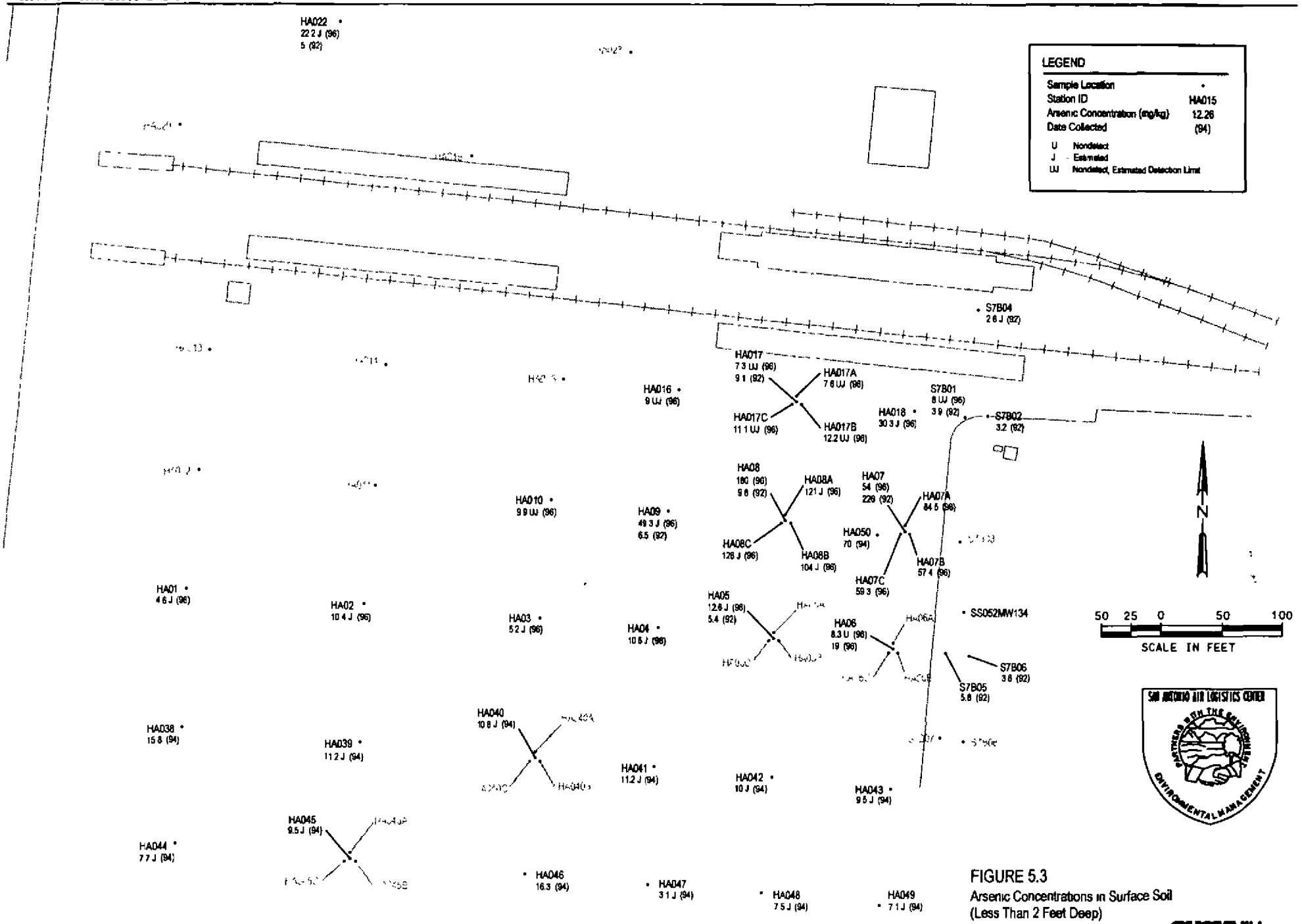


FIGURE 5.3
Arsenic Concentrations in Surface Soil
(Less Than 2 Feet Deep)

CH2MHILL

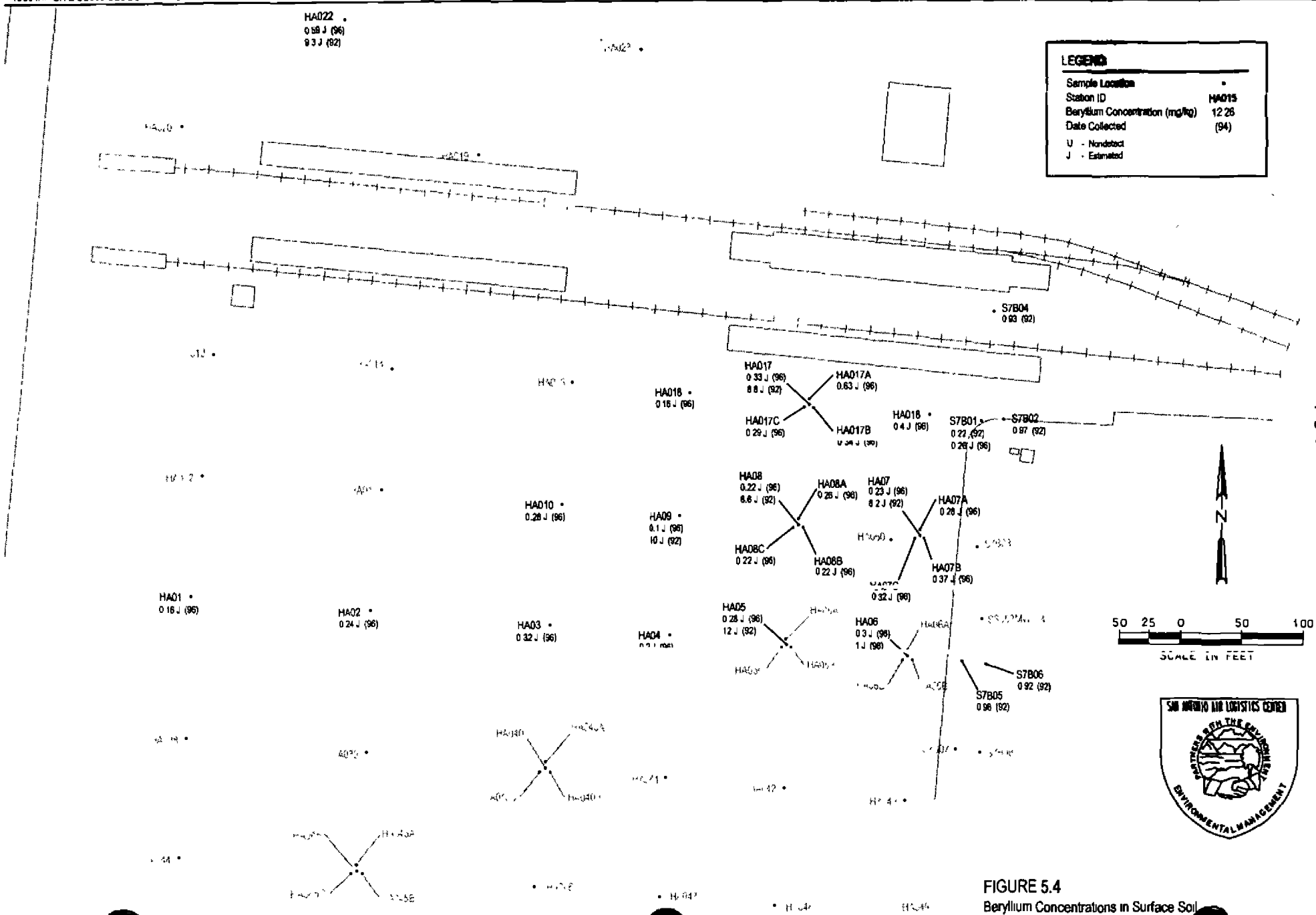


FIGURE 5.4
Beryllium Concentrations in Surface Soil
(Less Than 2 Feet Deep)

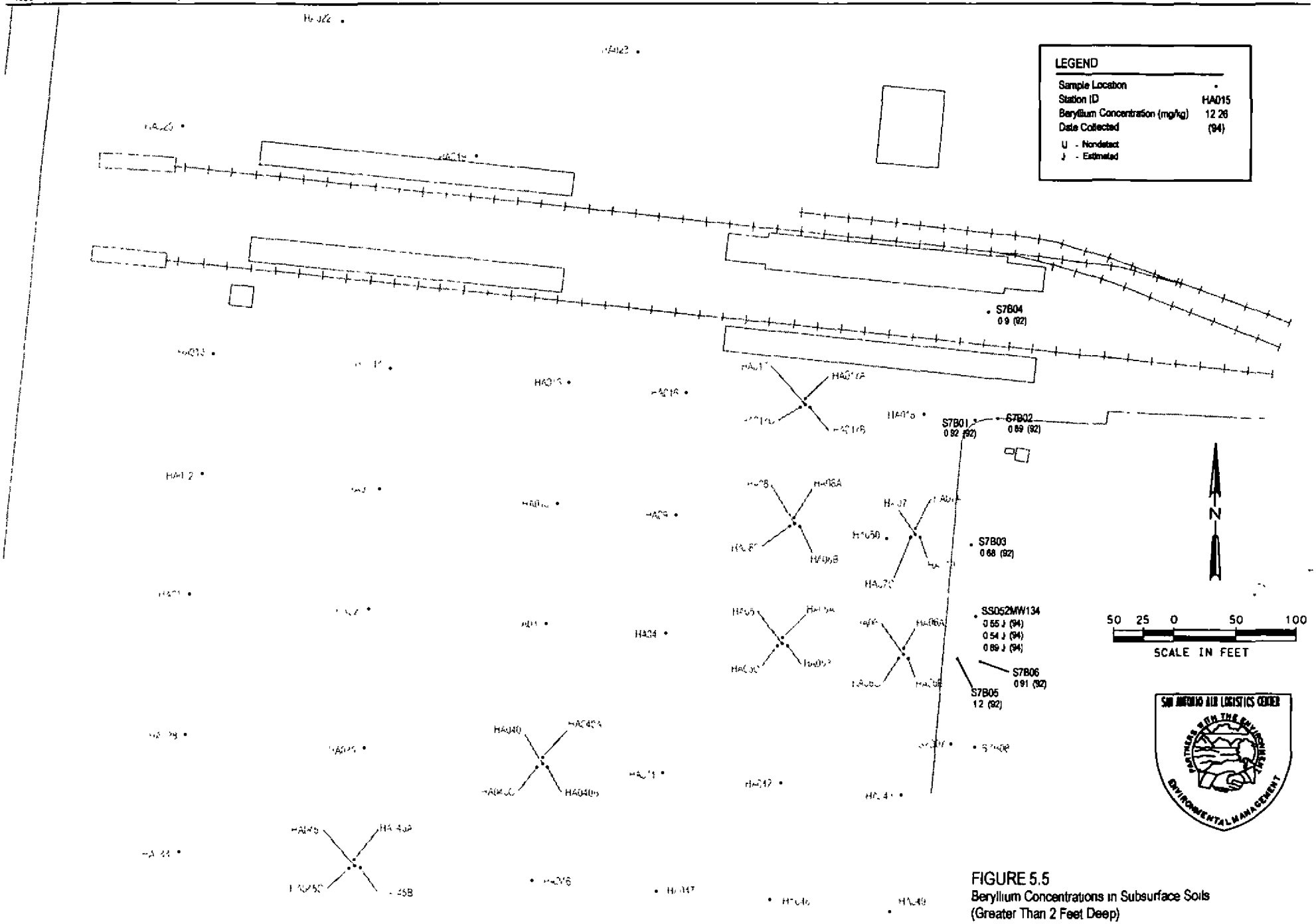


FIGURE 5.5
Beryllium Concentrations in Subsurface Soils
(Greater Than 2 Feet Deep)

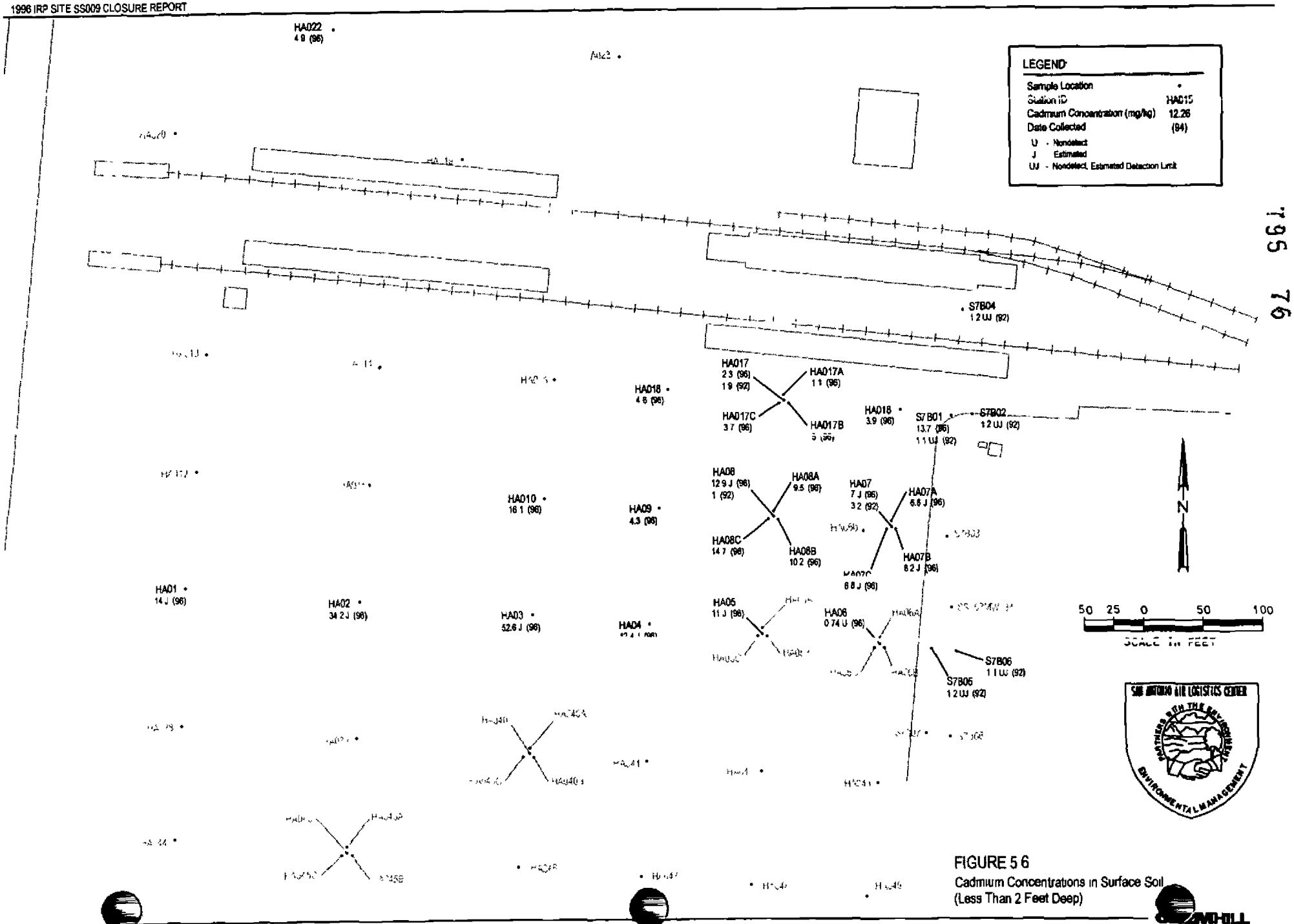


FIGURE 5.6
Cadmium Concentrations in Surface Soil
(Less Than 2 Feet Deep)

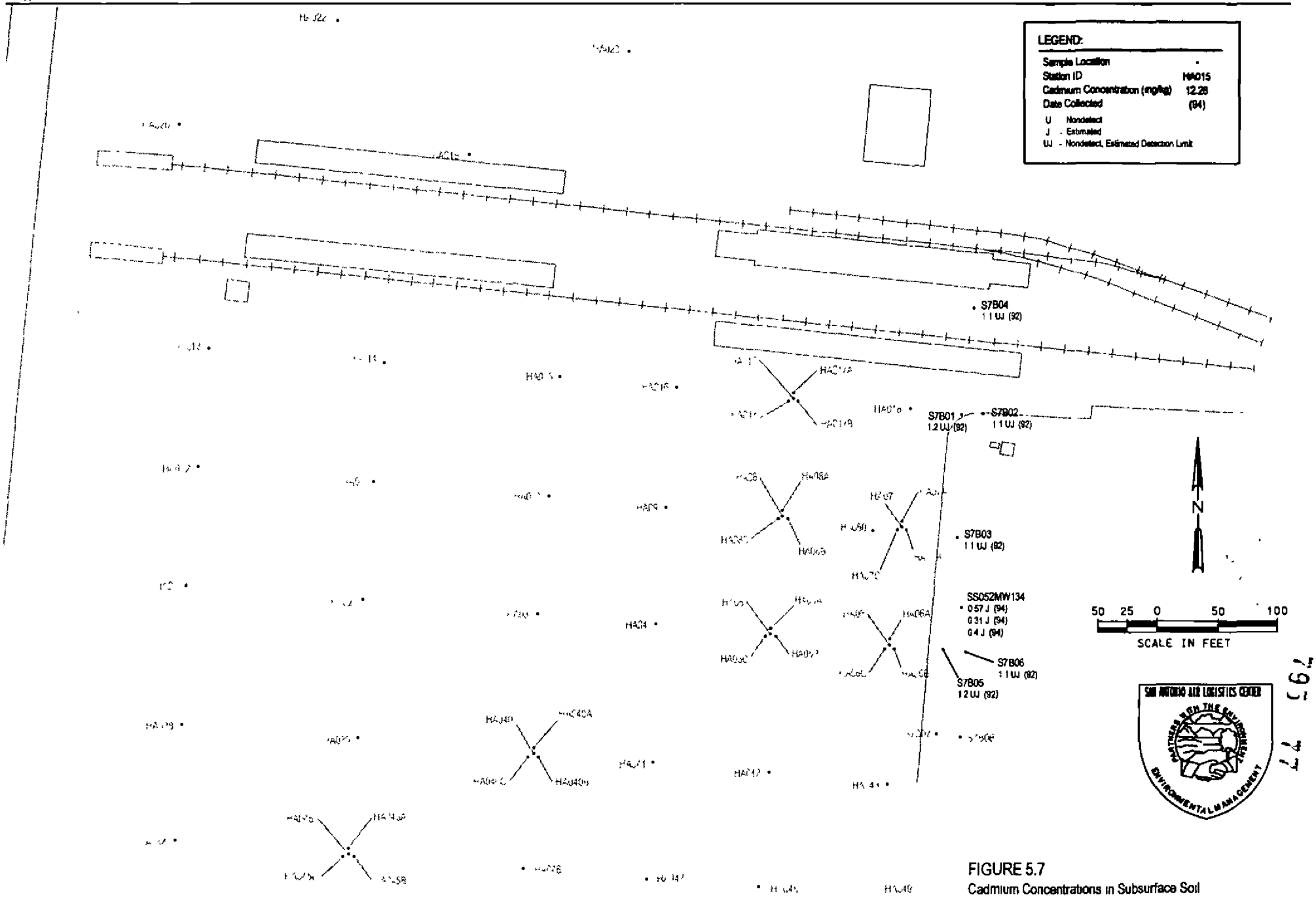


FIGURE 5.7
Cadmium Concentrations in Subsurface Soil
(Greater Than 2 Feet Deep)

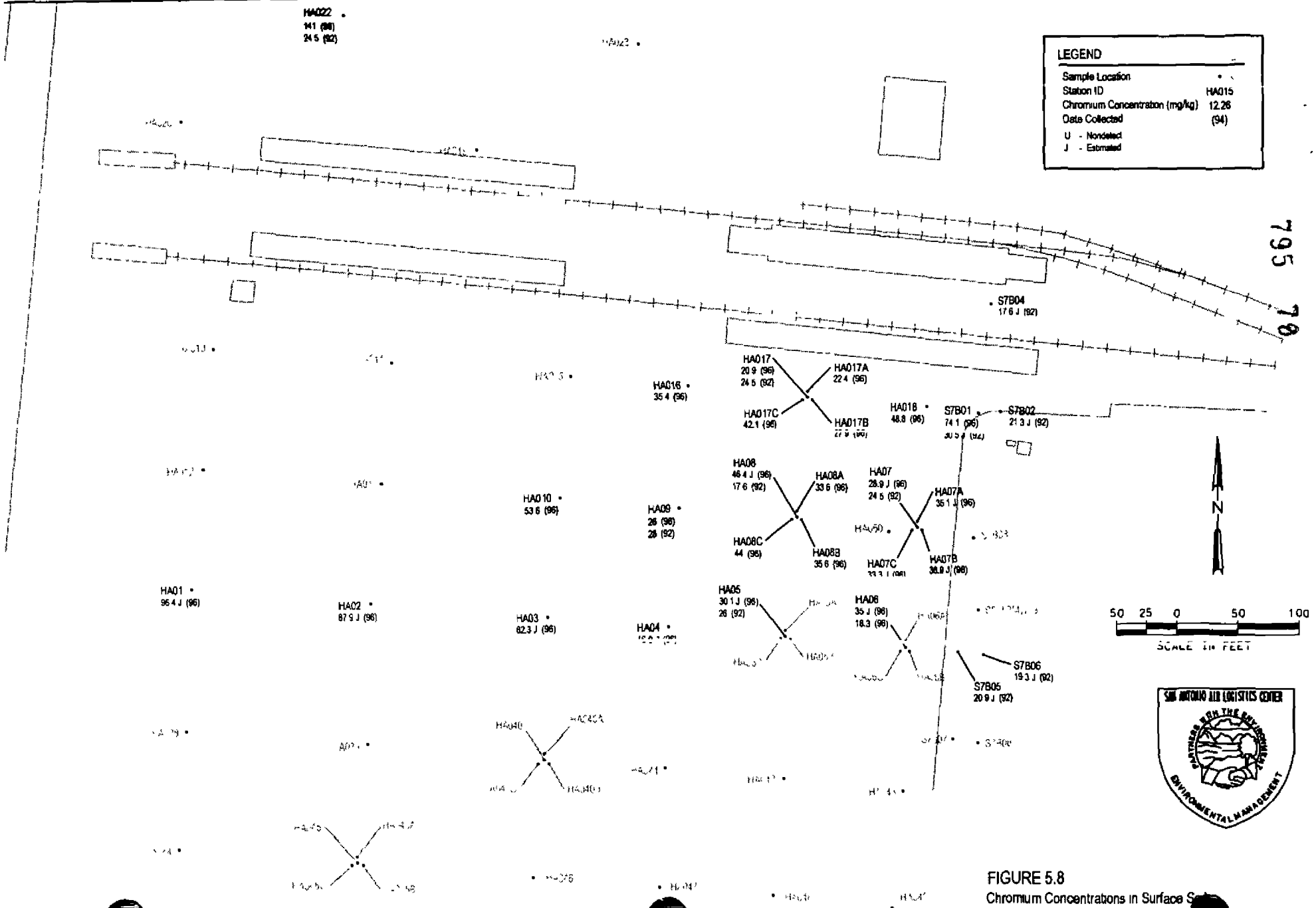


FIGURE 5.8
Chromium Concentrations in Surface S
(Less Than 2 Feet Deep)

795 78

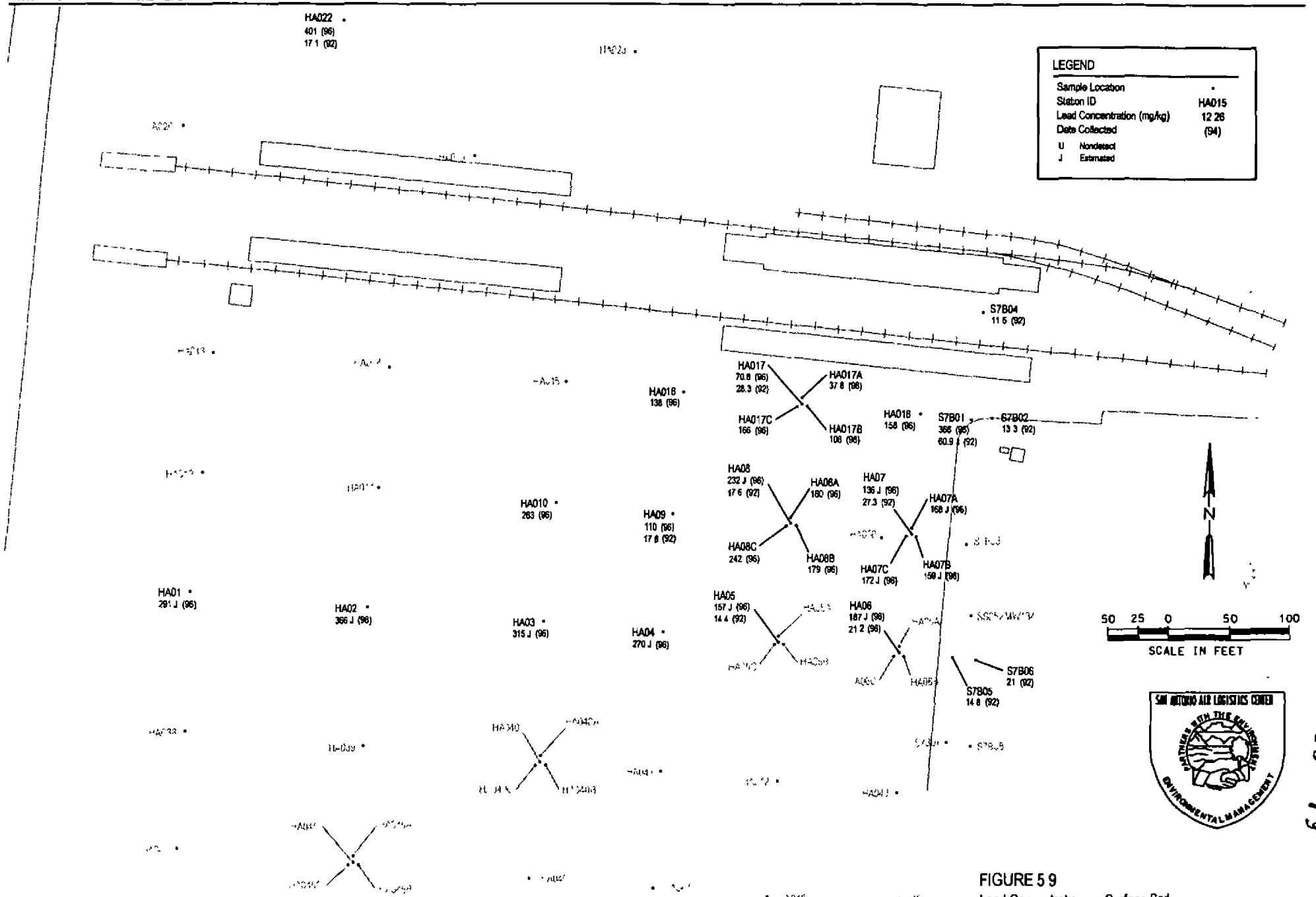


FIGURE 5 9
Lead Concentrations in Surface Soil
(Less Than 2 Feet Deep)

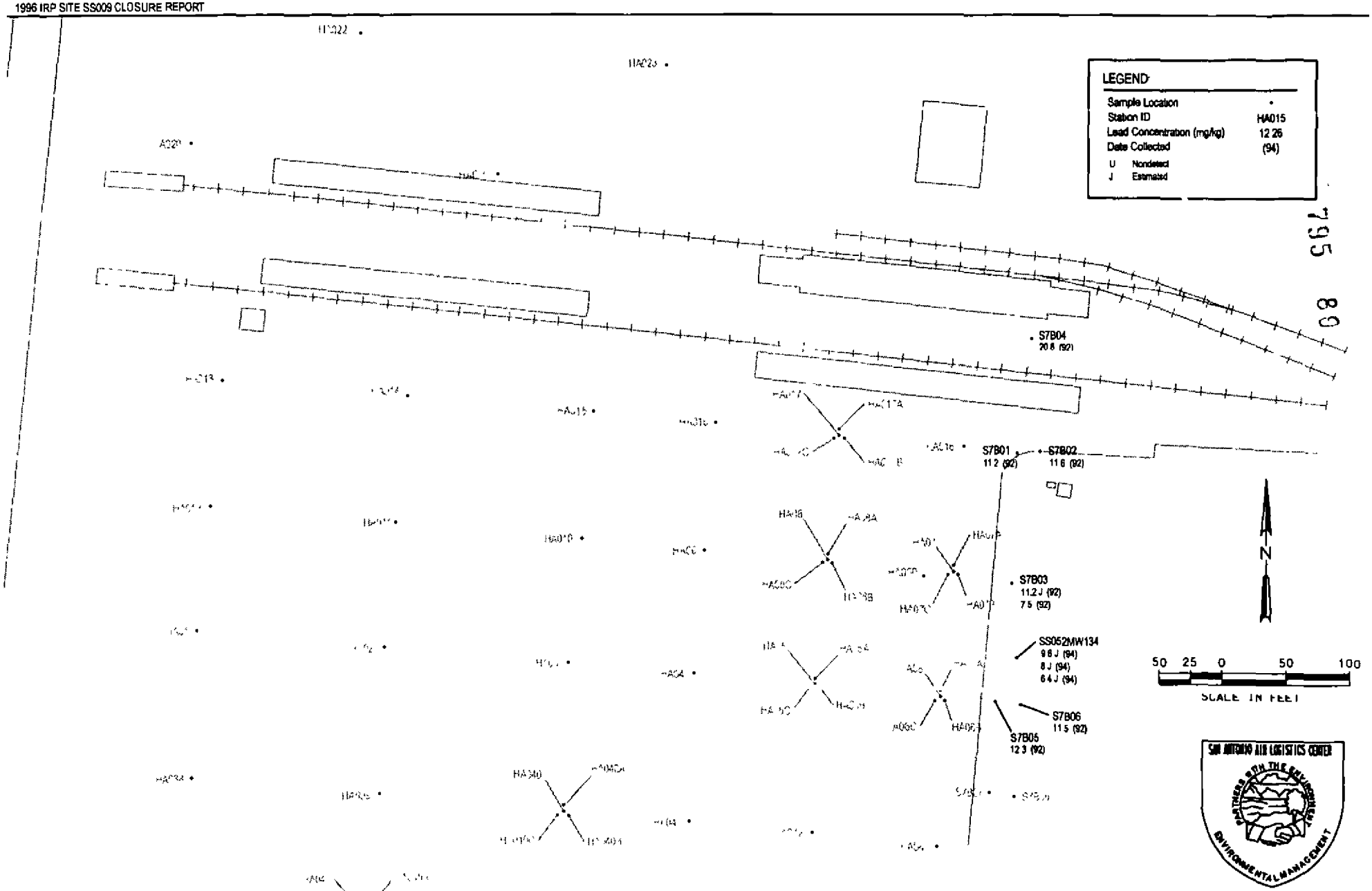


FIGURE 5.10
Lead Concentrations in Subsurface Soil
(Greater Than 2 Feet Deep)

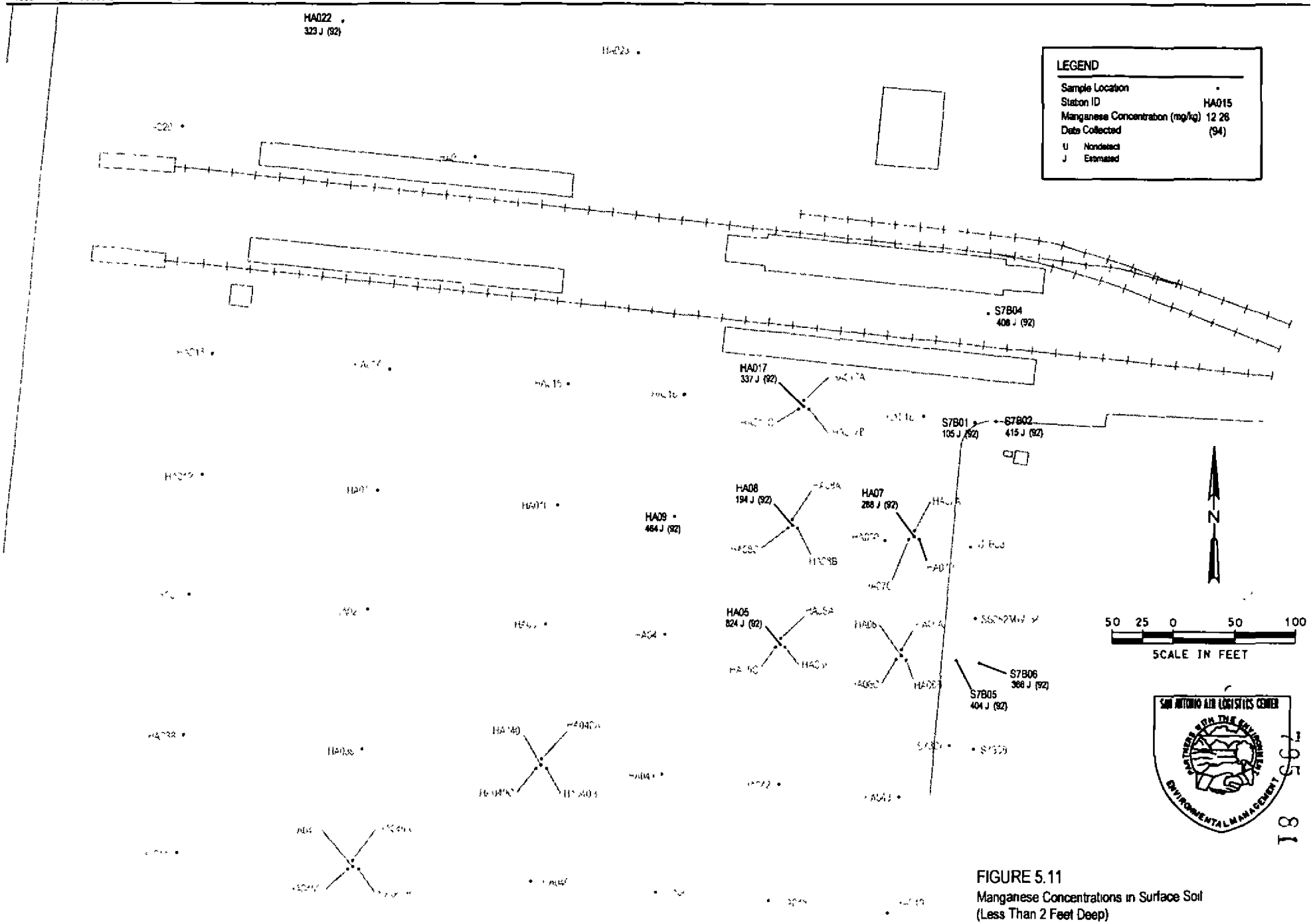


FIGURE 5.11
Manganese Concentrations in Surface Soil
(Less Than 2 Feet Deep)

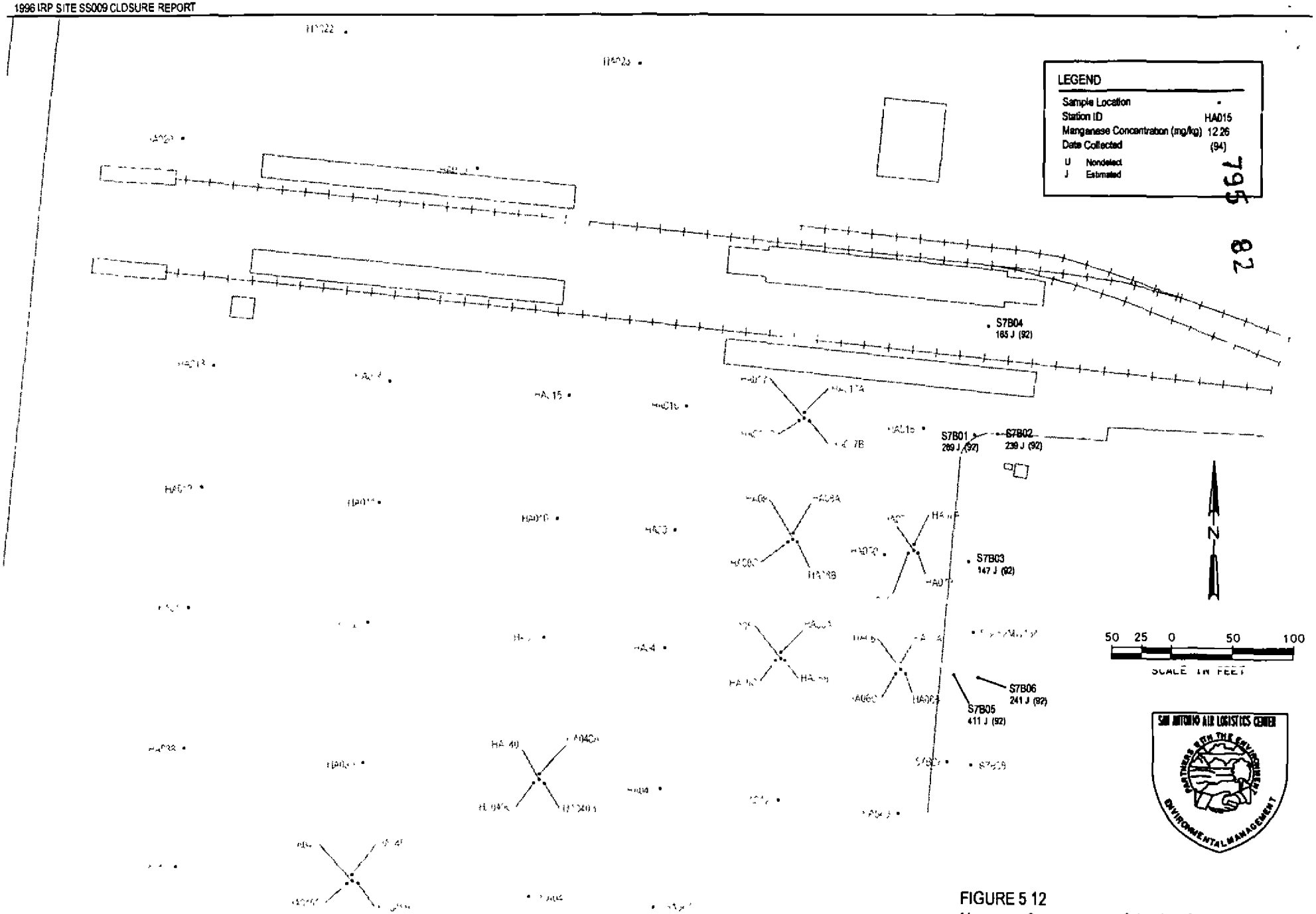


FIGURE 5 12
Manganese Concentrations in Subsurface S
(Greater Than 2 Feet Deep)

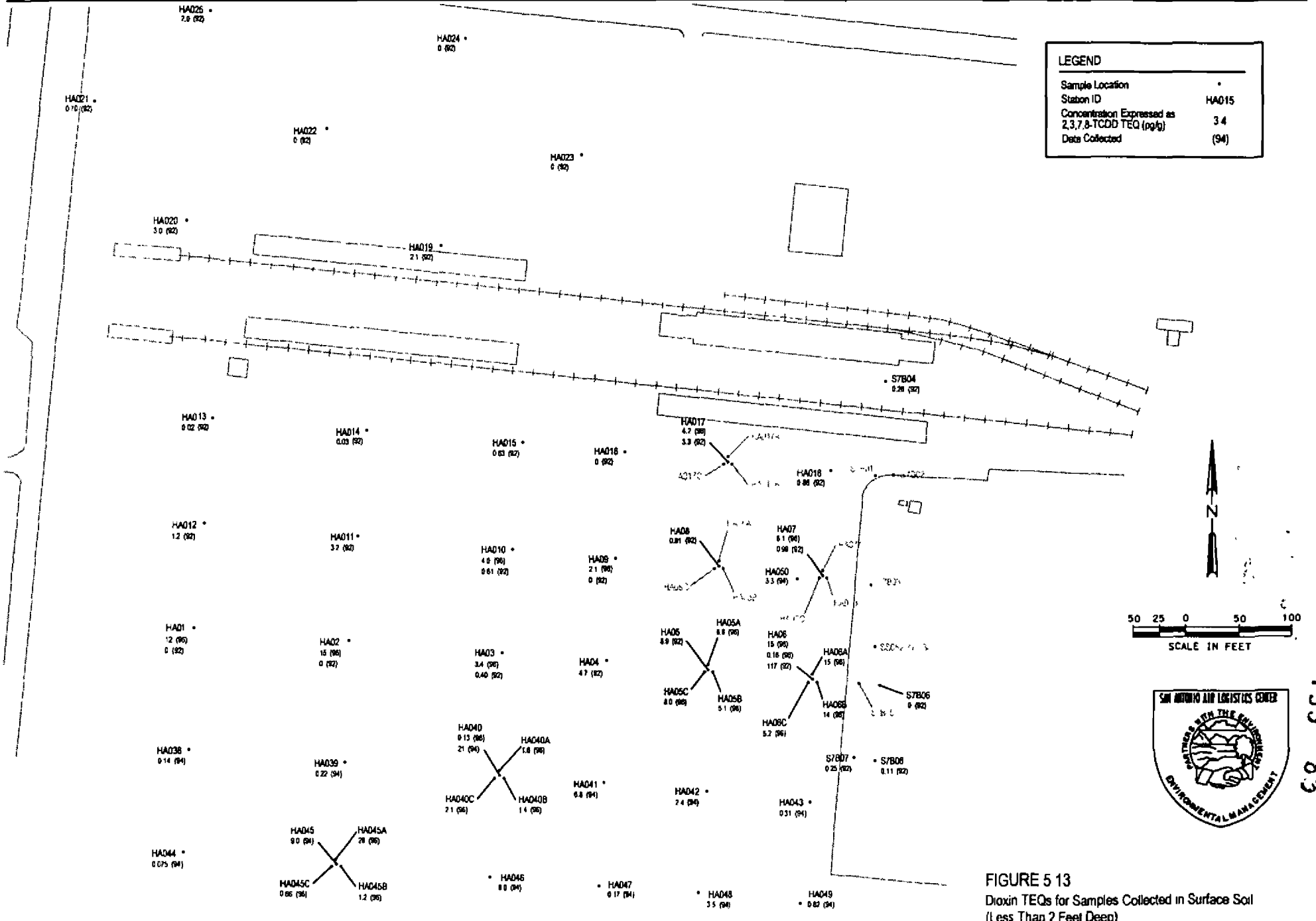


FIGURE 5 13
Dioxin TEQs for Samples Collected in Surface Soil
(Less Than 2 Feet Deep)

CH2MHILL

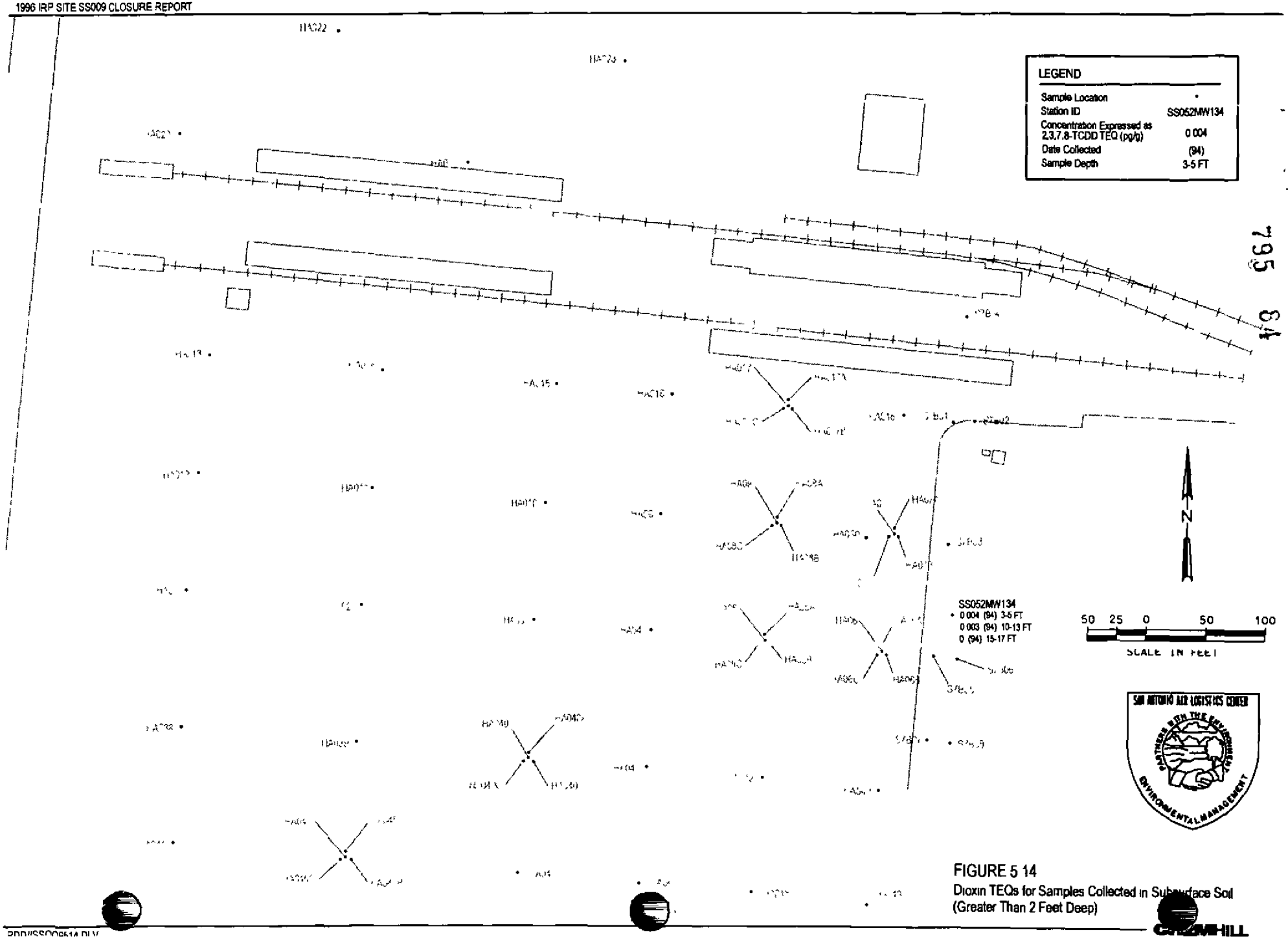


FIGURE 5 14
Dioxin TEQs for Samples Collected in Subsurface Soil (Greater Than 2 Feet Deep)

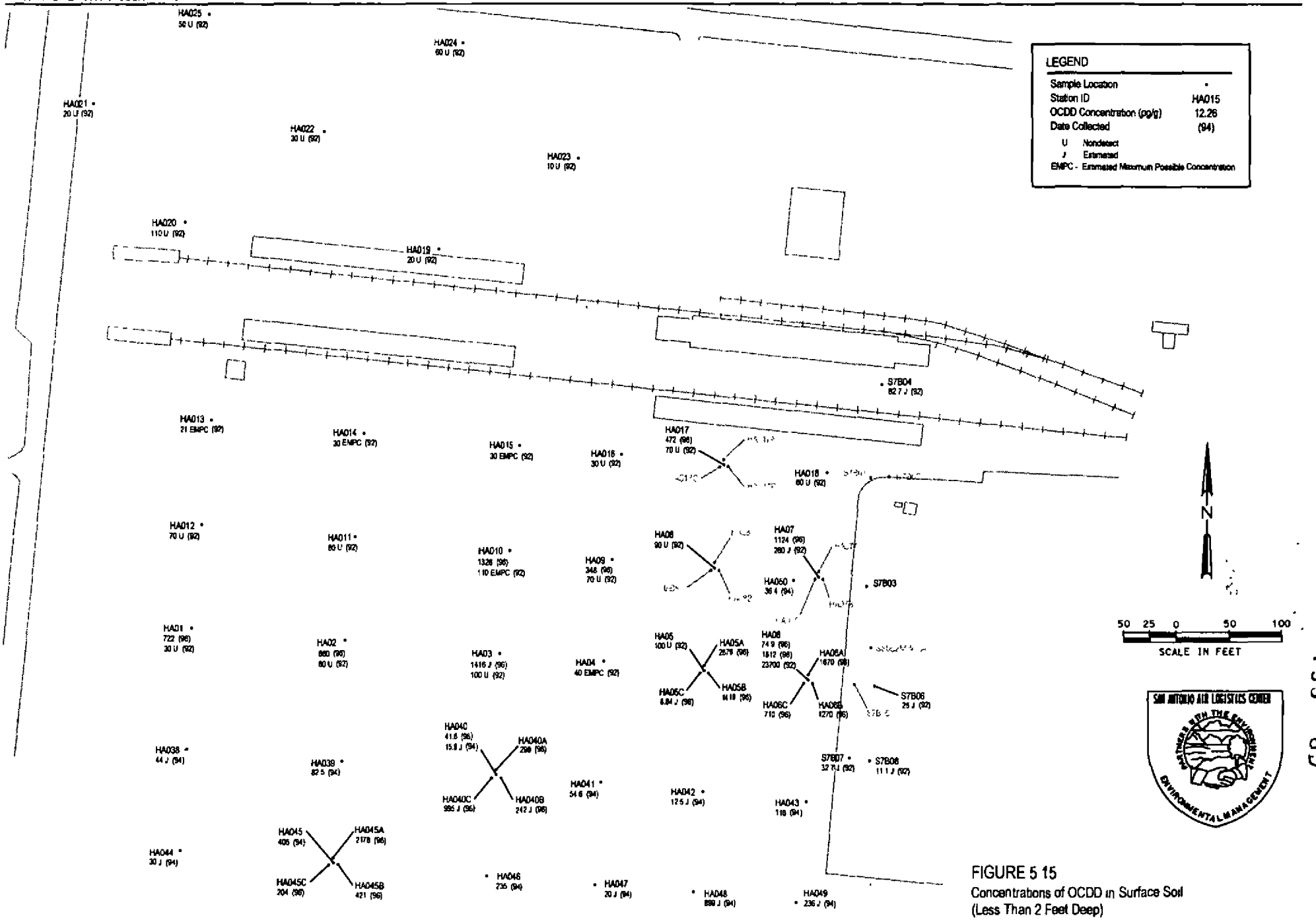


FIGURE 5 15
Concentrations of OCDD in Surface Soil
(Less Than 2 Feet Deep)

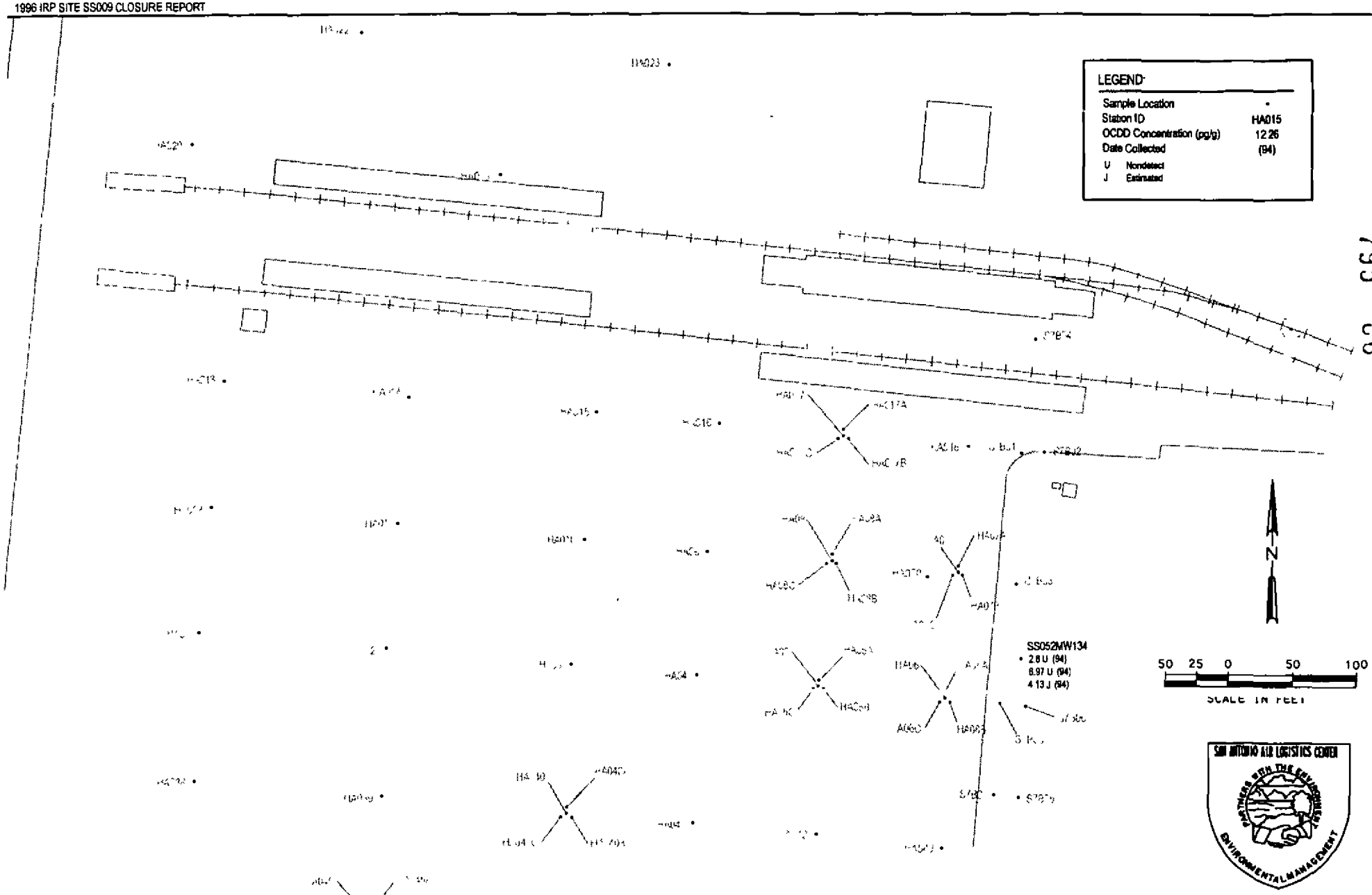


FIGURE 5 16
Concentrations of OCDD in Subsurface Soil
(Greater Than 2 Feet Deep)

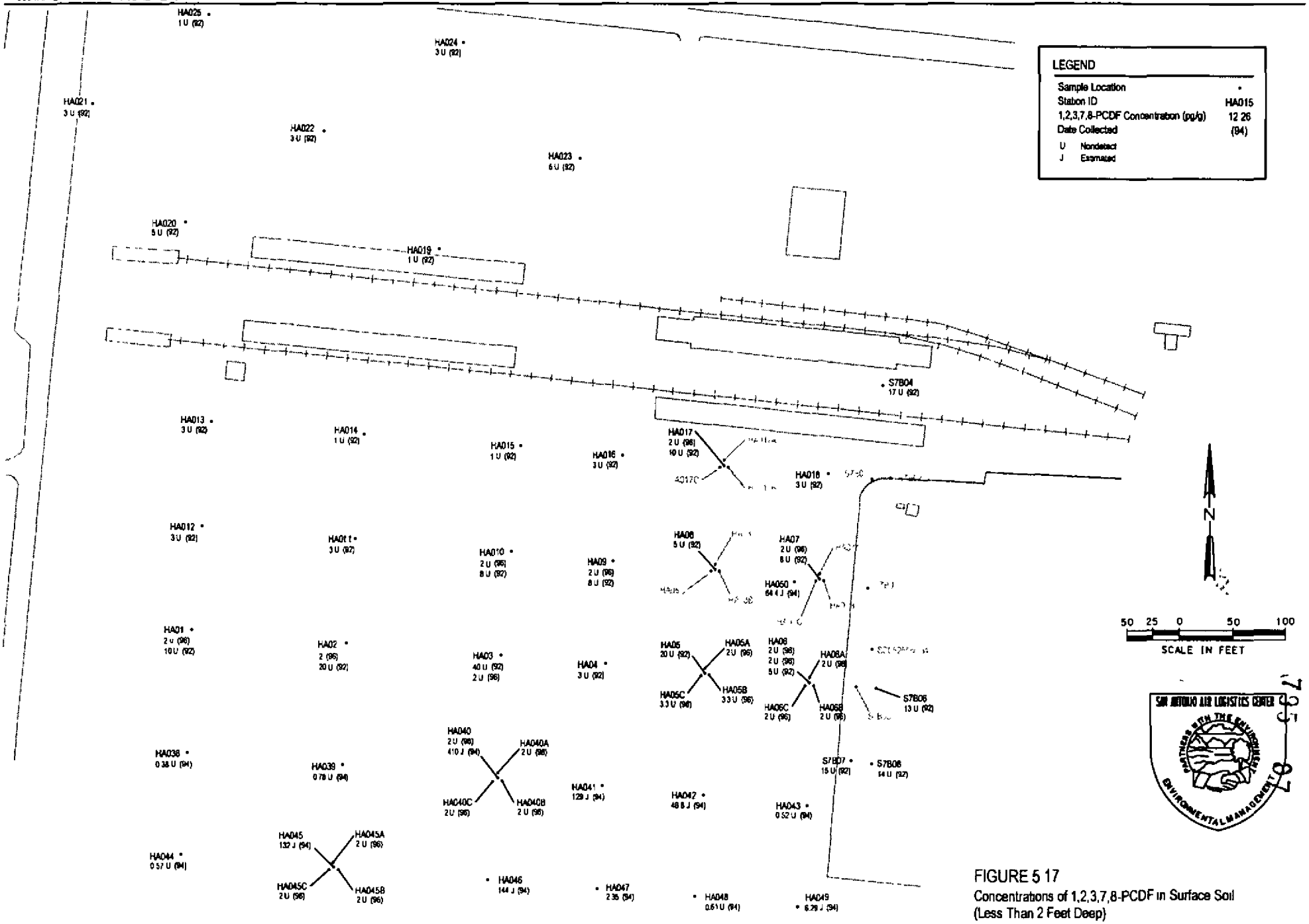


FIGURE 5 17
Concentrations of 1,2,3,7,8-PCDF in Surface Soil (Less Than 2 Feet Deep)

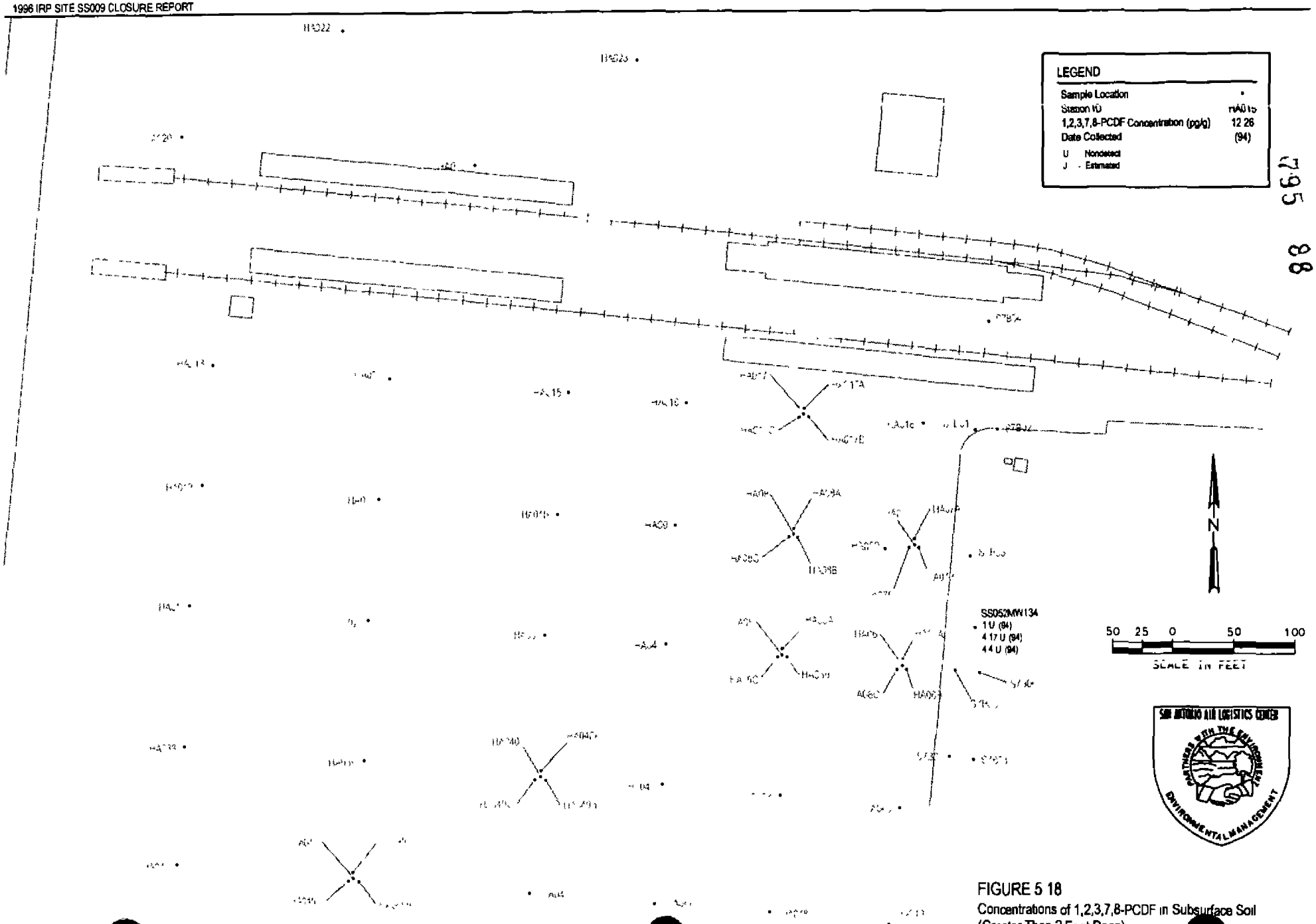


FIGURE 5 18
Concentrations of 1,2,3,7,8-PCDF in Subsurface Soil
(Greater Than 2 Feet Deep)

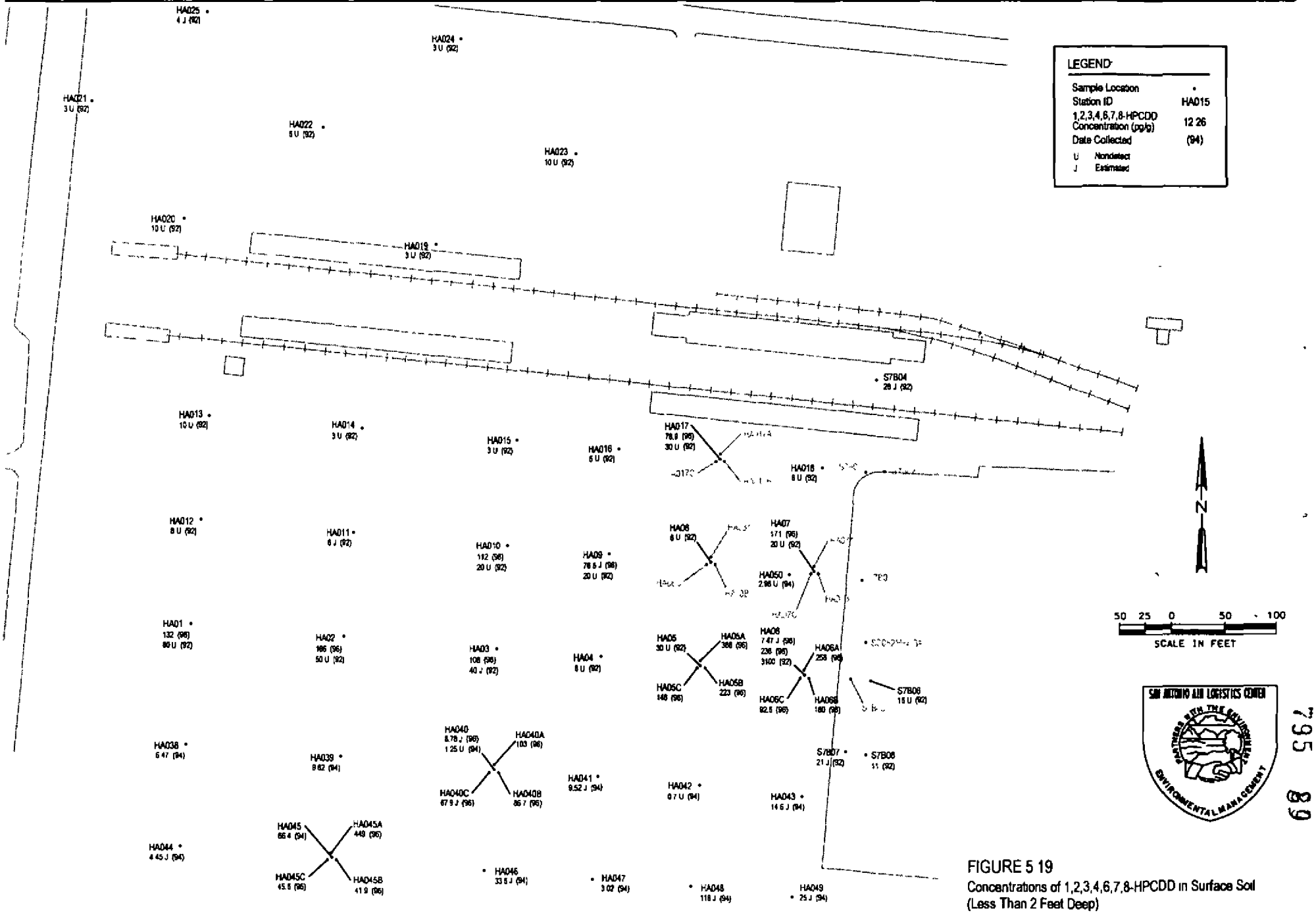


FIGURE 5 19
Concentrations of 1,2,3,4,6,7,8-HPCDD in Surface Soil (Less Than 2 Feet Deep)

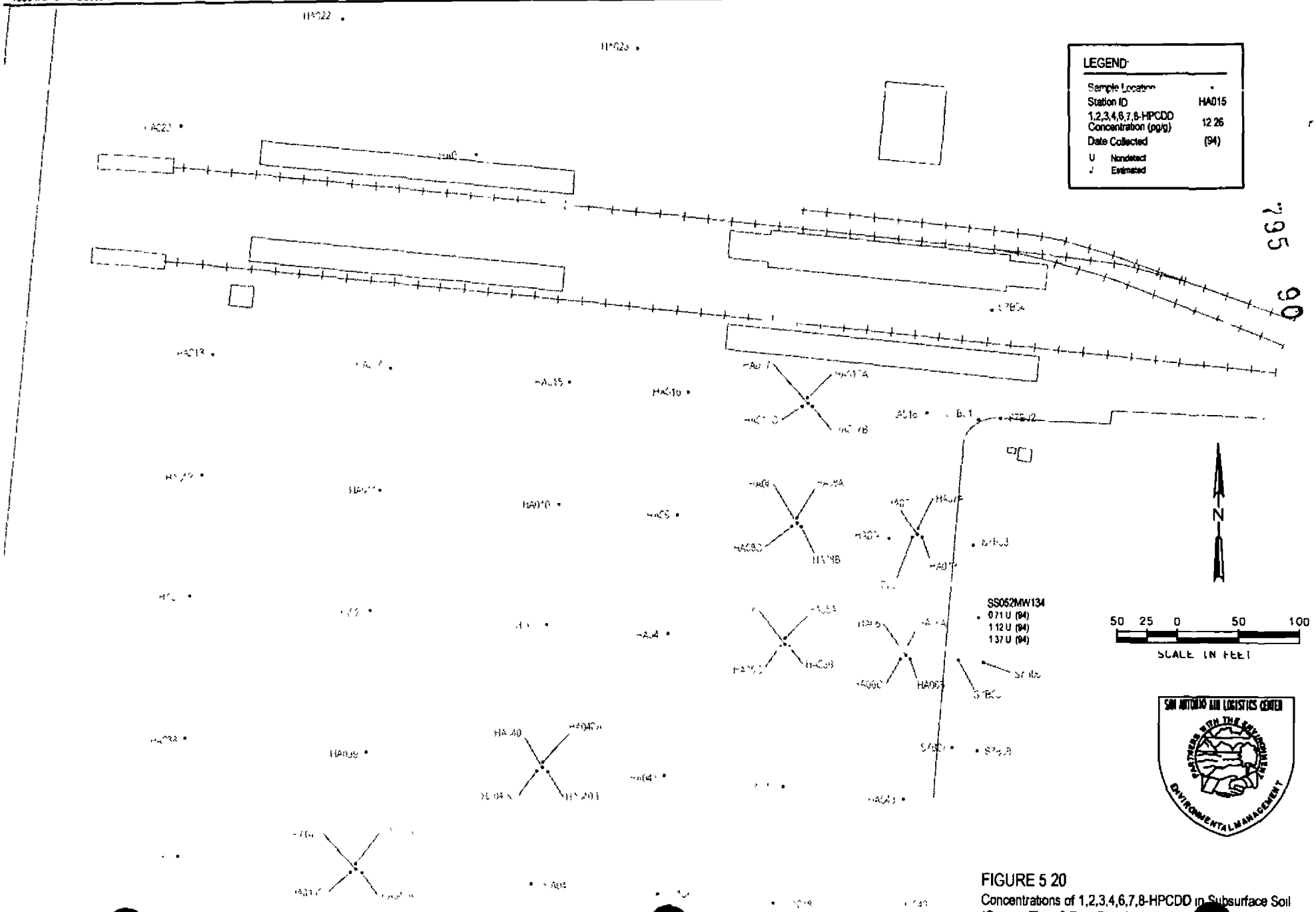


FIGURE 5 20
Concentrations of 1,2,3,4,6,7,8-HPCDD in Subsurface Soil (Greater Than 2 Feet Deep)

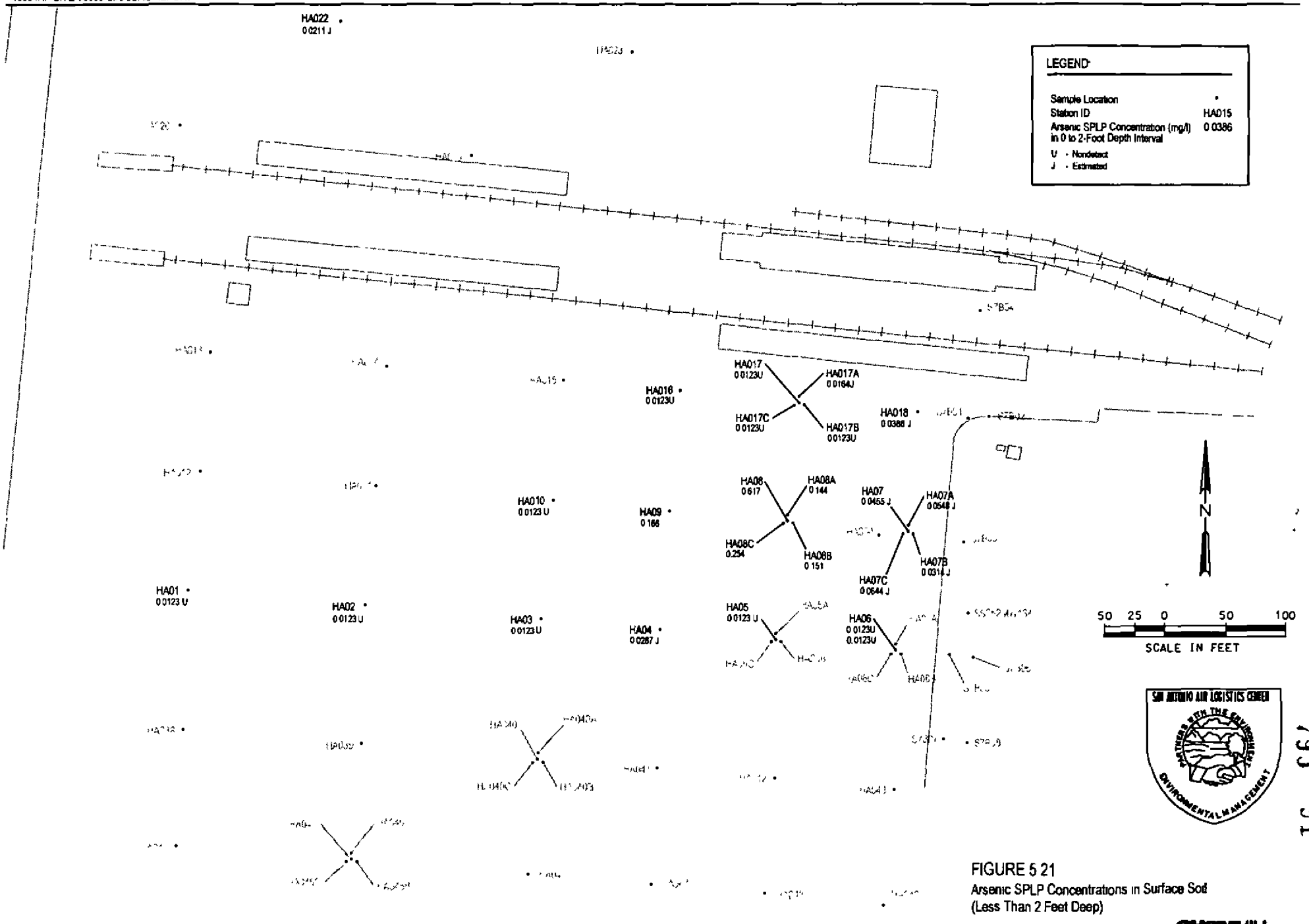


FIGURE 5 21
Arsenic SPLP Concentrations in Surface Soil
(Less Than 2 Feet Deep)

CH2MHILL

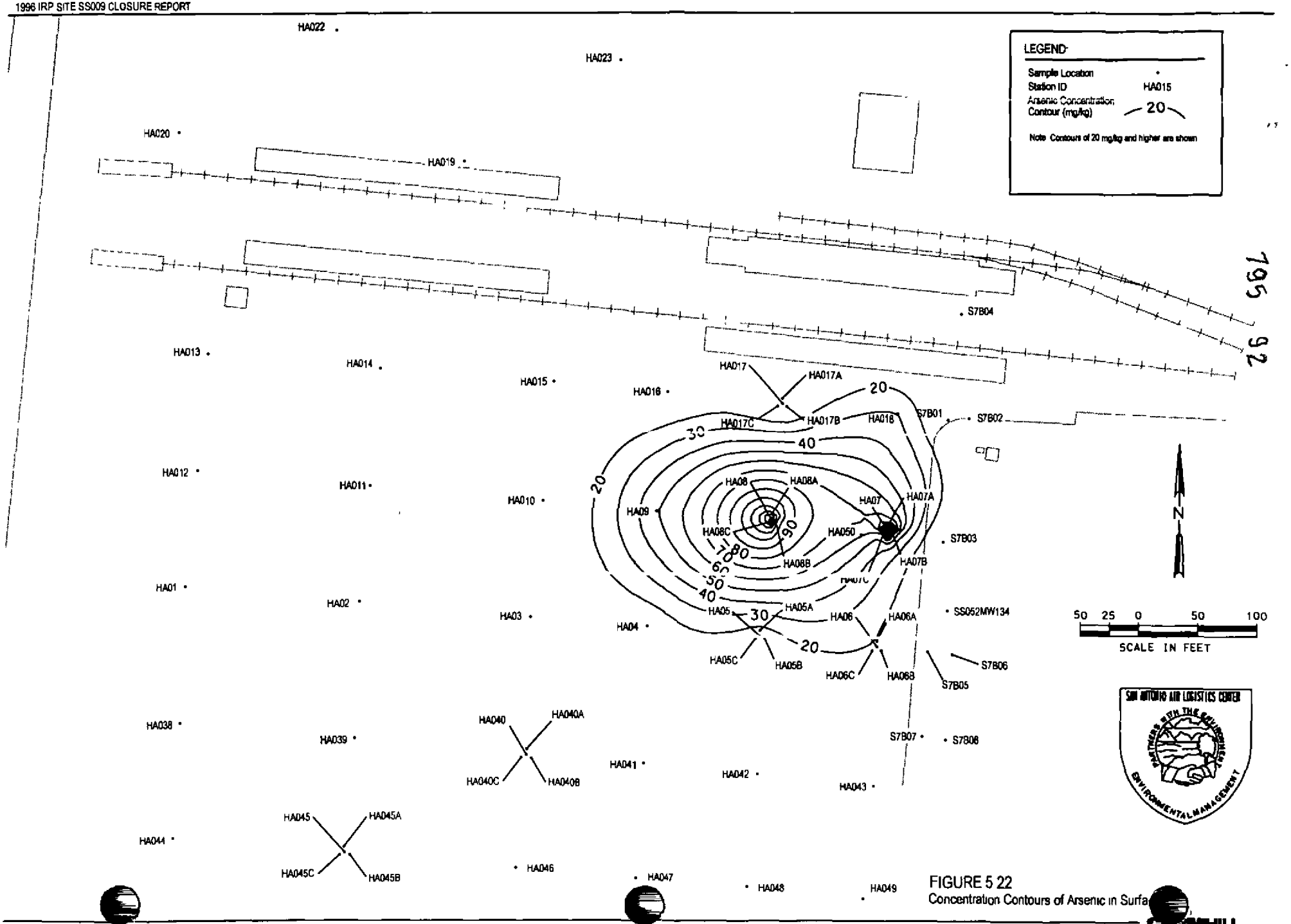


FIGURE 5 22
Concentration Contours of Arsenic in Surfa

795 93

TAB

Section 6.0

SECTION 6.0

Summary of Removal Action

795 94

In May and June 1997, the area at Site SS009 that was contaminated with arsenic at concentrations above the RRS No. 2 criterion was excavated and removed. The remainder of this section describes the excavation activities, confirmatory sampling, and evaluation of post-excavation conditions.

6.1 Excavation Activities

The excavation was conducted by removing the top one foot of soil in the area that had been identified as contaminated with arsenic above the cleanup criteria. Olmos Environmental (San Antonio, Texas) began work on May 22, 1997, by constructing plastic-lined, bermed cells for staging of the excavated soil. Excavation began on May 27, 1997, and was completed on June 3, 1997. An area 250 feet by 200 feet was excavated to a depth of 1 foot. Excavated material was covered with plastic after placement in the staging cells. The bounds of the excavation are shown in Figure 6.1. A total of 3,000 cubic yards of contaminated soil was removed from an area of approximately 1.2 acres.

The excavated material was disposed of in accordance with TNRCC regulations. The manifests for disposal are contained in Appendix L.

6.2 Confirmatory Sampling

Confirmatory sampling was conducted on June 3, 1997, by Kelly AFB personnel. Ten grab samples were collected from the top 3 inches of the excavation floor. These grab samples were collected from the bottom of the excavation using stainless steel spoons. The sampling equipment was decontaminated by washing with pesticide-grade[10] water, then a rinse with hydrochloric acid, followed by pesticide-grade water, followed by methanol, followed by pesticide-grade water. The samples were analyzed for arsenic using EPA Method No. SW-7060 by Anacon Laboratories (Houston, Texas). The chain-of-custody form and laboratory analytical data are provided in Appendix M.

The approximate locations of the samples are shown in Figure 6.2. The results of the analysis of these samples is presented in Table 6.1.

[10] Pesticide-grade – Meets or exceeds the standards required for the analysis of pesticide residue analysis

795 95

TABLE 6.1
Confirmatory Sampling Results

Sample ID	Sample Location	Parameter	Concentration	Units
C9708102	SS009SS001	AS	0 88	mg/kg
C9708103	SS009SS002	AS	1 35	mg/kg
C9708104	SS009SS003	AS	2.68	mg/kg
C9708105	SS009SS004	AS	0.89	mg/kg
C9708106	SS009SS005	AS	1 58	mg/kg
C9708107	SS009SS010	AS	0 83	mg/kg
C9708108	SS009SS006	AS	1 8	mg/kg
C9708109	SS009SS009	AS	0.67	mg/kg
C9708110	SS009SS008	AS	1.8	mg/kg
C9708111	SS009SS007	AS	3 06	mg/kg

AS· Arsenic

6.3 Evaluation of Post-Excavation Conditions

Arsenic was detected in all 10 confirmatory samples at concentrations ranging from 0.88 to 3.06 mg/kg, with a mean concentration of 1.55 mg/kg. These concentrations are below the background concentration established for arsenic in surface soil of 8.50 mg/kg, indicating that the arsenic contamination was removed.

The site data was re-evaluated statistically to assess whether the site as a whole meets the RRS No. 2 criterion. The data set was updated by removing the analytical results from the shallow soil samples collected in the area of the excavation (collected prior to excavation) and inserting the results from the confirmatory sampling. Table 6.2 shows that the post-excavation arsenic concentrations meet the RRS No. 2 criteria for arsenic in surface soil.

There are other metals at the site present at concentrations above background. The presence of these metals is not attributed to herbicide storage activities at Site SS009. Delineation of the extent of these contaminants is not within the scope of the SS009 investigation. These contaminants will be evaluated separately.

TABLE 6.2
Comparison of Post-Excavation Arsenic Results to RRS No 2 Criteria

Parameter	Units	Number Analyzed	Number of Detects	Frequency of Nondetects	RME	RME Basis	Type of Criterion	Criterion	RME Exceeds Criterion
ARSENIC	mg/kg	35	35	9%	7 59	LOGNORM	SAI-Ind	20	No
ARSENIC	mg/L	5	1	80%	0 0211	MAX	GWP-Ind	0 050	No

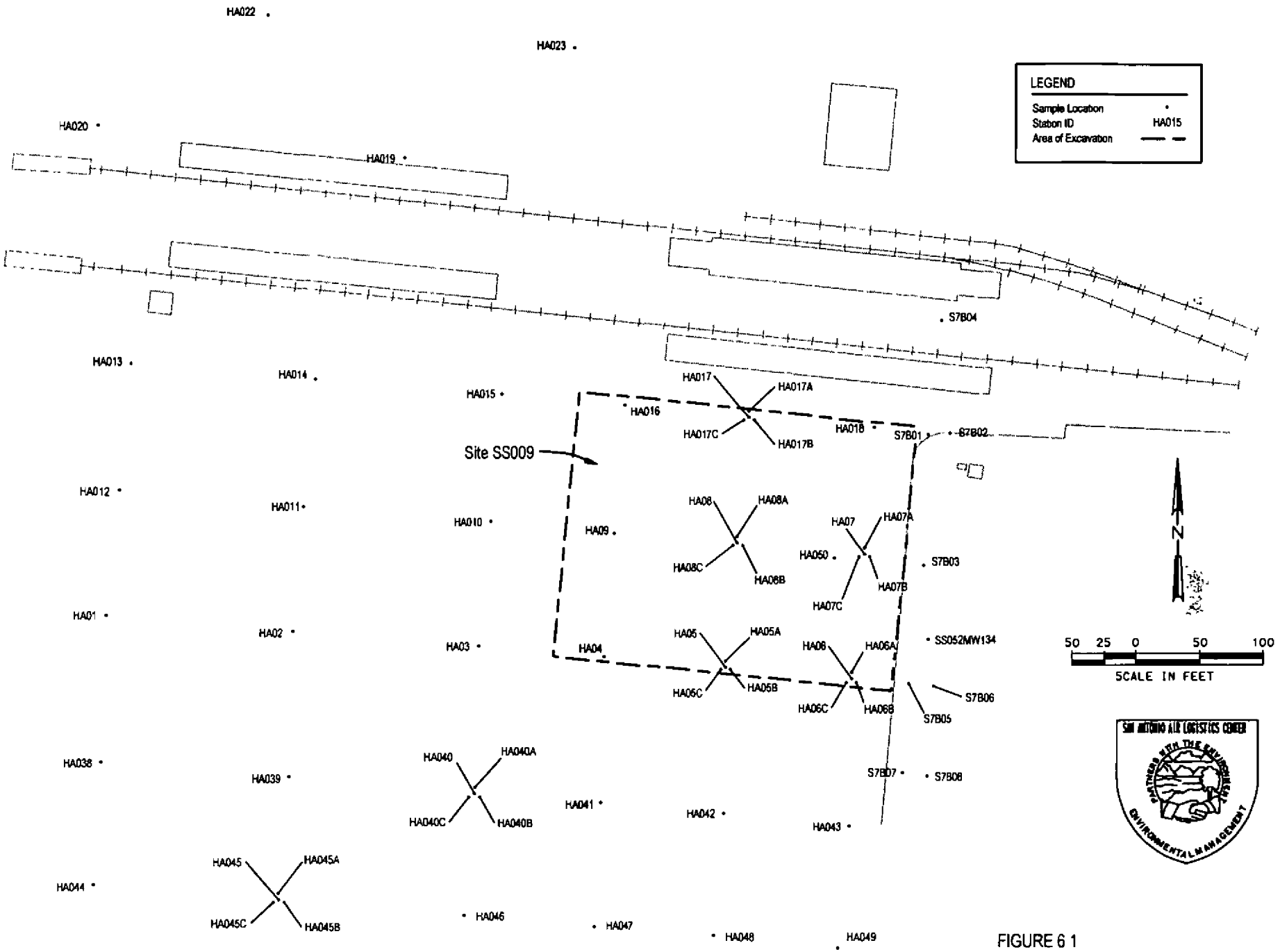


FIGURE 6 1
Area of Excavation

CH2MHILL

795 97

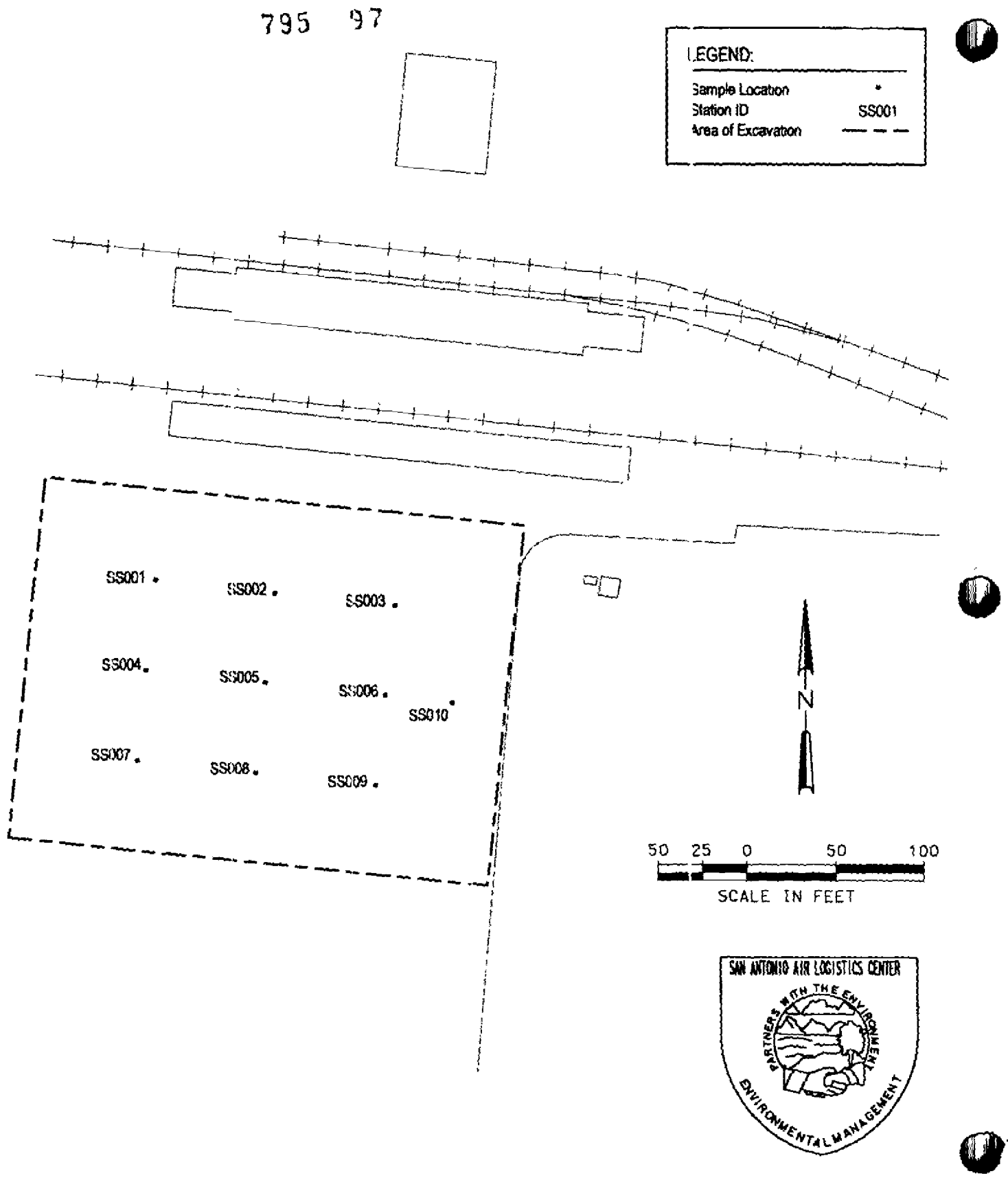


FIGURE 6-2
Locations of Confirmatory Samples

795 98

TAB

Section 7.0

SECTION 7.0

Conclusions and Recommendations

Using the statistical protocols established in the regulations, EPA statistical guidance documents, and other recognized environmental statistical resource documents; and on the basis of the site-specific cleanup criteria developed according to 30 TAC 335.558 and .559, post-excavation site conditions attain RRS No. 2. Because of the presence of dioxin, and to respond to the request of EPA Region VI, a risk assessment has been performed on the post-excavation site conditions. The risk assessment is included in Appendix N.

To fulfill the requirements of 30 TAC 335.555(e) for closure under RRS No. 2, Appendix O documents the intended deed recordation language of Kelly AFB. The area exceeding RRS No. 1 for the contaminants associated with Site SS009 was defined by the investigations which covered an area of approximately 15 acres. However, a 33-acre tract, coinciding with the area covered by storage yard No. 68 and the Dock Staging Area, is deed recorded for convenience and for an additional level of protection of human health and the environment. The deed-recorded property includes the remediated area and is shown on Figures 1.1 and 1.2 as "Southwest Corner of East Kelly.". Proof of deed recordation will be submitted to the TNRCC within 90 days of receipt of approval of closure, separate from this report.

795 100

TAB

Appendix A

795 101

APPENDIX A

Supplemental Sampling at Site S-7 (CH2M HILL, 1994)

795 102

Contents

Section	Page
Introduction	1
Data Quality Evaluation	1
Potential Field Sampling and Laboratory Contamination	4
Matrix Effects	6
Metal Results Near the IDL	8
Dioxin Data Quality Evaluation Overview	8
Conclusions	8

Appendixes

A	Soil Boring Log and Monitoring Well Construction Log	A-1
B	Analytical Data Summary Tables	B-1
C	Data Quality Evaluation Results for Groundwater Sample VOCs, SVOCs, Pesticides/PCBs, and Metals	C-1
D	Data Quality Evaluation Results for Dioxin Data	

Tables

Number		Page
1	Comparison of Field and Laboratory Sample Identifiers	3
2	Summary of IDL and Reporting Limits for Metals	9

Figure

Number		
1	Sample Location Map	2

795 103

Supplemental Sampling at Site S-7

Introduction

The Texas Natural Resource Conservation Commission (TNRCC) has requested that additional samples be collected from Site S-7 before a final decision document for no further action is approved. The additional sampling had the following objectives:

- Evaluate the presence of volatile organic chemicals (VOCs), semi-volatile organic chemicals (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and metals in the groundwater beneath Site S-7.
- Evaluate if VOCs, SVOCs, pesticides, PCBs, dioxins, furans, or metals are present in the soil at lower depths.
- Evaluate if dioxins, furans, or arsenic are present in surface soil samples in the southeast portion of Site S-7.

As illustrated in Figure 1, one soil boring was advanced in the southeast corner of Site S-7 (see Appendix A). Soil samples were collected at three depths (3 to 5, 10 to 13, and 15 to 17 feet below ground surface [bgs]). The soil boring was converted into a monitoring well, and a single groundwater sample was collected. The subsurface soil and groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, dioxins, furans, and selected metals.

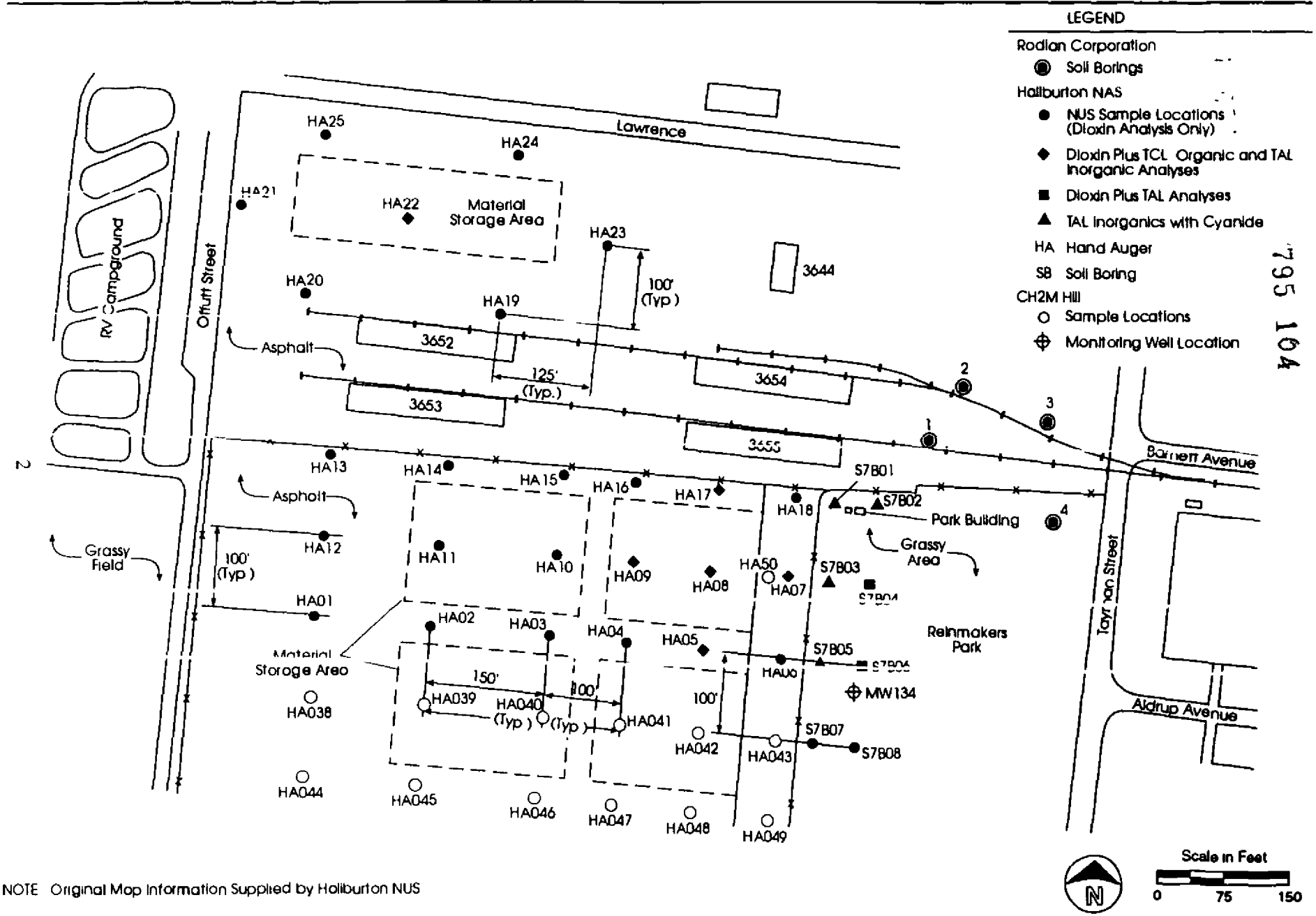
Thirteen surface soil samples (0 to 18 inches) were collected using hand augers, and these samples were analyzed for dioxins, furans, and arsenic (see Appendix B). Table 1 compares the field station and sample to laboratory identifier.

Data Quality Evaluation

Before the analytical results were released by the laboratory, both the sample and quality control (QC) data were carefully reviewed to verify sample identity, instrument calibration, detection limits, dilution factors, numerical computations, accuracy of transcriptions, and chemical interpretations. Additionally, the QC data were reduced and the resulting data were reviewed to ascertain whether they were within the laboratory-defined limits for accuracy and precision. Non-conforming data were discussed in the data package cover letter and case narrative.

The data packages were reviewed by the project chemists using the process outlined in the Environmental Protection Agency (EPA) guidance document, *Functional Guidelines for Evaluating Data*. The data review and validation process is independent of the

TXE70207 A009 10/94



NOTE Original Map Information Supplied by Halliburton NUS

Fig Sample Location Map, East Kelly Air Force Base, San Anto as.

CH2M HILL

795 164

Table 1
Comparison of Field and Laboratory Sample Identifiers

Field Station ID	Sample Matrix	Field Sample ID	Laboratory ID
MW134	groundwater	C9401330	37469025
MW134	soil boring (3-5 ft BGS)	C9400903	37442003
MW134	soil boring (10-13 ft BGS)	C9400904	37442004
MW134	soil boring (15-17 ft BGS)	C9400906	37442006
HA038	surface soil (HA)	C9401504	37504994
HA039	surface soil (HA)	C9401505	37504005
HA040	surface soil (HA)	C9401506	37504006
HA041	surface soil (HA)	C9401507	37504007
HA042	surface soil (HA)	C9401508	37504008
HA043	surface soil (HA)	C9401509	37504009
HA044	surface soil (HA)	C9401510	37504010
HA045	surface soil (HA)	C9401511	37504011
HA046	surface soil (HA)	C9401512	37504012
HA047	surface soil (HA)	C9401513	37504013
HA048	surface soil (HA)	C9401514	37504014
HA049	surface soil (HA)	C9401515	37504015
HA050	surface soil (HA)	C9401516	37504016

laboratory's checks, and focuses on the usability of the data to support the project data interpretation and decisionmaking processes. Areas of review included holding time compliance, initial and continuing calibration, spiked sample results, method blank results, and duplicate sample results. A data review worksheet was completed for each data package (see Appendix C).

Samples outside the acceptance limits were indicated with a qualifying flag, which consists of a single-letter abbreviation indicating a problem with the data. Although the qualifying flags originate during the data review and validation process, they are included in the data summary tables so that the data will not be used indiscriminately. The following flags were used during our review:

- U **Undetected.** Parameter was analyzed for, but not detected above the method detection limit (MDL).

- UJ **Detection Limit Estimated.** Parameter was analyzed for, but qualified as not detected. The result is estimated.

- J **Estimated.** The analyte was present but the reported value may not be accurate or precise.

As required by *Functional Guidelines to Evaluating Data Quality*, numerical sample results greater than the MDL for organics (or the instrument detection limit [IDL] for inorganics), but less than the contract required detection limit (CRDL), are qualified with a J for estimated.

Once the data review and validation process were completed, the entire data set was reviewed for chemical compound frequencies of detection, dilution factors that might affect data usability, and patterns of target compounds distribution. The data set also was evaluated to identify potential data limitations, uncertainties, or both in the analytical results.

Potential Field Sampling and Laboratory Contamination

The following three types of field blank samples were used to monitor potential contamination introduced during field sampling, sample handling, and shipping activities:

- **Trip Blank.** A trip blank is a sample of ASTM Type II water that is prepared in the laboratory prior to the sampling event. The water is stored in VOC sample containers and is not opened in the field, and travels back to the laboratory with the other samples for VOC analysis. This blank is used to monitor the potential for sample contamination during the sample container trip. One trip blank was included in each sample cooler that contained samples for VOC analysis.

- **Equipment Rinseate Blank**. An equipment rinseate blank is a sample of the organic-free water used for the final rinse during equipment decontamination. This blank sample is collected by rinsing a piece of equipment after decontamination and is analyzed for the same analytical parameters as the corresponding samples. This blank monitors potential contamination caused by incomplete equipment decontamination. One equipment rinseate blank was analyzed for every ten samples collected in the field.

- **Field Blank**. A field blank, which is a sample of the water used to decontaminate equipment, is collected directly from the decontamination water source. This blank monitors contamination that may be introduced from the water used for decontamination. One field blank sample was collected from each source of decontamination water and was analyzed for the same parameters as the corresponding samples.

In addition to the field blank samples, laboratory method blanks were also analyzed. A laboratory method blank is ASTM type II water that is treated as a sample in that it undergoes the same analytical process as the corresponding field samples. Method blanks are used to monitor laboratory performance and contamination introduced during the analytical procedure. One method blank was analyzed for every ten samples, or one per analytical batch, whichever was more frequent.

Common field sampling and laboratory contaminants detected in the blanks included acetone, methylene chloride, and phthalates. Acetone and methylene chloride are used to extract samples in the laboratory and hence are common laboratory contaminants. Phthalates are used as plasticizers, the most common of which is bis(2-ethylhexyl)phthalate (BEHP).

Acetone was detected in two of the three soil samples, but not in the corresponding laboratory method blank at 5 and 17 micrograms per kilogram (µg/kg). Using a conservative interpretation of EPA's Functional Guidelines, these concentrations of acetone were not qualified as laboratory contaminants. Also according to EPA's Functional Guidelines, concentrations of these common contaminants detected in samples at less than 10 times the maximum concentration in the blanks can be attributed to field sampling and laboratory contamination, rather than environmental contamination from site activities.

BEHP was detected in many of the soil samples. The field samplers, who were wearing latex gloves, physically transferred the soil samples from the split-spoon liners to the sample containers. The latex gloves are coated with plasticizers such as BEHP to facilitate release of the gloves from the skin; therefore, the BEHP can be attributed to field sampling and laboratory contamination.

N-nitrosodiphenylamine was detected in selected field and laboratory blanks and field samples. N-nitrosodiphenylamine is a common laboratory contaminant originating from

septum bleed and column breakdown in instruments. The concentrations in the field samples were less than five times the concentrations in the corresponding field and laboratory blank; therefore, concentrations of n-nitrosodiphenylamine can be attributed to laboratory and not environmental contamination.

Matrix Effects

QC evaluation of matrix effects consisted of the following three types of information:

- Surrogate spike recoveries
- Matrix spike recoveries
- PARCCS (precision, accuracy, representativeness, completeness, comparability)

Surrogate Spike Recoveries

Surrogate spike were added to every sample analyzed for VOCs, SVOCs, and pesticides/PCBS, including field and laboratory blanks and field environmental samples. Surrogate spike compounds are the structural homologs of target compounds, often with deuterium substituted for hydrogen, and are therefore expected to behave in a similar manner during analysis.

Surrogate spike recoveries were used to monitor both laboratory performance and matrix interferences. Surrogate spike recoveries from field and laboratory blanks were used to evaluate laboratory performance because the field blanks represent an "ideal" sample matrix. Surrogate spike recoveries for field samples were used to evaluate the potential for matrix interferences. For field samples, when the surrogate spike recoveries fall outside the method target acceptance windows, the samples were re-analyzed. If the surrogate spike is still outside the acceptance window for the re-analysis, then the sample results are qualified as affected by matrix interferences.

The VOC surrogate recoveries for both water and soil samples (both QC and field) were clustered within a window of about 85 to 115 percent, which is within the method target acceptance limits. A greater variation (and hence broader range of recoveries) in surrogate spike recovery was observed for SVOC and pesticide/PCB analysis, but this is typical of these analyses and is reflected by the broader method target acceptance limits. Surrogate recoveries of zero were due to sample dilution (samples were diluted and surrogate compounds were not added to the diluted sample). In general, the surrogate spike recoveries were within the method target acceptance limits, indicating that the matrix did not influence the overall analytical process or the final numerical sample result.

Matrix Spike Recoveries

For this QC measure, three aliquots of a single sample were analyzed; one native and two spiked with matrix spike compounds. Unlike the surrogate spike compounds, matrix spike

compounds are found on the method target compound list. Spike recovery is used to evaluate potential matrix interferences as well as accuracy. Duplicate spike results are compared to evaluate precision.

Like the surrogate spike recoveries, the matrix spike recoveries were generally within the method target acceptance ranges, indicating that the specific sample matrix did not influence the overall analytical process or the final numerical sample result. In general, the MS/MSD results are within the method target acceptance ranges, indicating that the sample matrix did not interfere with the overall analytical process.

PARCCS

The PARCCS parameters are defined as follows:

- **Precision** is the agreement between duplicate results, which is estimated by comparing duplicate matrix spike recoveries and field duplicate sample results. Agreement between matrix spike recoveries was less than 20 percent RPD. In general, the RPDs between duplicate field sample results were less than 20 percent for water and 35 percent for soil samples, indicating that the sample matrix did not interfere with the overall analytical process.

- **Accuracy** is a measure of the agreement between an experimental determination and the true value of the parameter being measured. For the organic analyses, each of the samples was spiked with a surrogate compound; for inorganic analyses, each sample as spiked with a known reference material before digestion. Each of these approaches provides a measure of the matrix effects on analytical accuracy. Accuracy can be estimated from the analytical data and was not measured directly. More than 95 percent of the spike recoveries were within the method acceptance limits; therefore, there was no evidence of matrix interferences.

- **Representativeness** is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition. Representativeness is a subjective parameter used to evaluate the efficacy of the sampling plan design. Representativeness was demonstrated by providing full descriptions in the project scoping documents of the sampling techniques and the rationale used for selecting sampling locations.

- **Completeness** is defined as the percentage of measurements that are judged to be valid compared with the total number of measurements made. A goal of 95 percent usable data was established in the project scoping document. and more than 95 percent of the data was determined to be valid.

- **Comparability** is another qualitative measure designed to express the confidence with which one data set may be compared to another Factors

affecting comparability are: sample collection and handling techniques, sample matrix type, and analytical method. Comparability is limited by the other PARCC parameters because data sets can be compared with confidence only when precision and accuracy are known. Data from this investigation are comparable with other data collected at the site because only EPA methods were used to analyze the sample and because Level 2 QC data is available to support the quality of the data.

Metals Results Near the IDL

Concentrations of metals at, or near, the IDL were reported for many of the target metals. The IDL is the constituent concentration that produces a signal greater than five times the signal/noise ratio of the instrument. Because the IDL is a calculated value rather than an experimentally demonstrated value, sample results at or near the IDL might be caused by instrument noise or low-level background shifts rather than an analyte signal.

The sample results were reported in terms of the Contract Laboratory Program (CLP) Statement of Work (SOW) CRDL because CLP methods were used to analyze the samples. Sample results above the IDL but less than the CRDL were qualified with a J for estimated. Summarized in Table 2 are the laboratory-specific IDL and method reporting limit for each of the target metals. The reporting limit, or CRDL, is typically 5 to 10 times the concentration of the IDL. Results at or near the CRDL are more "viable" sample results and are not suspect in the same way as results reported at or near the IDL. Concentrations of metals near the IDL were reported in the field and laboratory blanks at the same concentrations as the field samples.

Dioxin Data Quality Evaluation Overview

The samples were analyzed for dioxins and furans (see Appendix D). In summary, the results of the data quality evaluation indicate that:

- The groundwater and soil boring samples were analyzed successfully and there was no evidence of matrix interference.
- There was evidence of matrix interferences (internal standards outside method acceptance limits) for the surface soil samples collected with the hand auger, which may increase the potential for false positives. Therefore, these data have been qualified as J for estimated.

Conclusions

Based on the data quality evaluation, the following conclusions can be made:

- The laboratory analyzed the samples according to the EPA methods stated in the work plan, as demonstrated by acceptable instrument calibration and blank spike recoveries.

Table 2
Summary of IDL and Reporting Limits for Metals

Metal	Method	Laboratory IDL (µg/L)	Method Reporting Limit (µg/L)
Antimony	ICP	12.8	60
Arsenic	F	0.7	10
Beryllium	ICP	0.5	5
Cadmium	ICP	1.3	5
Chromium	ICP	2.2	10
Copper	ICP	1.3	25
Lead	F	0.3	3
Mercury	CVAA	0.1	0.2
Nickel	ICP	9.1	40
Selenium	F	0.6	5
Silver	ICP	1.8	10
Thallium	F	0.8	10
Zinc	ICP	3.9	20
Cyanide	C	2.7	10

Abbreviations:

ICP = Inductively coupled plasma spectrometry.
F = Graphite furnace atomic absorption spectrometry.
CVAA = Cold vapor atomic absorption spectrometry.
C = Manual spectrophotometry.

795 112

- Concentrations of acetone, methylene chloride, bis(2-ethylhexyl)phthalate, and n-nitrosodiphenylamine can be attributed to field sampling and laboratory contamination, rather than environmental contamination.

- Sample results for metals above the IDL but less than the CRDL should be attributed to instrument noise and not site-related activities.

- Sample results for organics above the MDL but less than the CRDL should be considered uncertain, but indicative of the presence of that compound at an estimated concentration.

- Spike recoveries and duplicate sample results indicate that the specific sample matrix did not interfere with the analytical process.

None of the analytical data were rejected during the data review and validation process; therefore, the data can be used without further qualification.

795 113

Appendix A

Soil Boring Log and Monitoring Well Construction Log

795 114

PROJECT NUMBER	BORING NUMBER		
TXE70207.A0.09	MW134	H23 SHEET	1 OF 2

SOIL BORING LOG

PROJECT East Kelly, Zone 4 RI LOCATION Zone 4

ELEVATION ± DRILLING CONTRACTOR Jedi

DRILLING METHOD AND EQUIPMENT HSA/SPT P61

WATER LEVEL AND DATE START 1/24/94-0830 FINISH 1/24/94-1300 LOGGER K. Kimble

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST - RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	0-1				Clay (CH), Black, Dry to Moist, Very Stiff, Plastic, Grass and Roots	Clay (CH), Black
	1-5		4.7/5'		Clay (CH), Brown, Dry to Moist, Very Stiff, Plastic, Caliche Nodules, Roots	*Shelby Tube 1-3' Clay (CH), Brown
5	5-6				Same as Above, Clay (CH)	CO400903 OVM < 0 1 O2 21% LEL 0%
	6-10		5'/5'		Clay (CL), Light Brown, Dry to Moist, Stiff, Plastic, Abundant Caliche Nodules (1-2"), Roots	Clay (CL), Light Brown Abundant Calcite
10						OVM < 0 1
	10-15		5'/5'		Clay (CL), Light Brown, Moist, Stiff, Plastic, Grey Mottling	Clay (CL), Light Brown Mottling
15						D2 21% LEL 0% C9400904 C9400909
	15-15 5		3 5'/5'		Same as Above, Clay (CL)	
	15 5-16				Silty Clay (CL), Light Brown, Moist, Mottling	Silty Clay (CL)
	16-16 5				Clayey Sand (SC), Brown, Medium to Coarse	Clayey Sand (SC)
	16 5-18 3				Clay (CH), Light Brown, Moist, Very Stiff, Plastic, Clayey Mottling, Amount of Gravel Increasing with Depth	Clay (CH)
	18 3-18 5				Clayey Sand (SC), Light Brown, Medium to Coarse, Gravelly, Loose	Clayey Sand (SC) OVM < 0 1 O2 91%
20	20-22		2'/2'	5-11-17-32	Fat Clay (CH), Red-Brown, Moist, Hard, Plastic, Trace Coarse Sand	Clay (CH) LEL 0%
	22-24		2'/2'	32-36-50 for 5"	Silty Clay (CL) Red-Brown and Grey, Dry to Moist, Hard, Plastic, Trace Coarse Sand, Mottled	Silty Clay (CL)
25	24-26		2'/2'	19-25-24-48	Clayey Silt (ML) with Fine Sand, Light Brown and Grey (Mottled), Moist, Hard, Plastic, Mottled	
			1 5'/2'	30-29-50 for 6"	26-26.2 Clayey Sand (SC), Brown, Fine 26 2-26 5 Clayey Silt (ML), Mottled Brown and Grey 26 5-26 7 Clayey Sand (SC), Brown, Fine, Medium Grained 26 7-27 2 Clayey Silt (ML), Brown and Grey, Mottled 27 2-27 5 Clayey Sand (SC), Brown, Fine Grained	(Navarro Transition)
			1 7'/2'	37-50 for 6"	Sand (SW) with Clay, Brown, Fine-Medium Grained, Well Sorted, Loose 28 2-28 4 Clayey-Silt (ML), Brown and Grey Mottled	Sand (SW)

CH2M HILL

PROJECT NUMBER	BORING NUMBER		
TXE70207.A0.09	MW134	H23 SHEET	2 OF 2

SOIL BORING LOG

PROJECT East Kelly, Zone 4 RI LOCATION Zone 4

ELEVATION ± DRILLING CONTRACTOR Jedi

DRILLING METHOD AND EQUIPMENT HSA/SPT P61

WATER LEVEL AND DATE START 1/24/94-0830 FINISH 1/24/94-1300 LOGGER K. Kimble

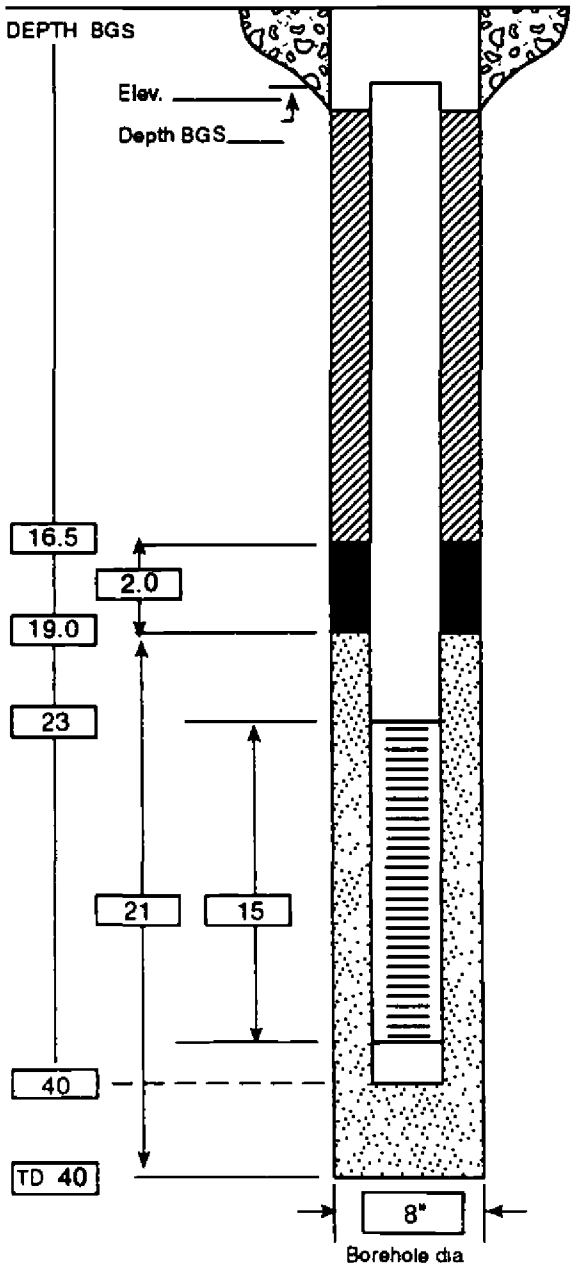
DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
			0.1/2'	50 for 3"	Clayey Gravel (GC), Brown, Loose, Poorly Sorted	Clayey Gravel (GC)
					No Sample (Gravelly)	
					No Sample (Gravelly)	
35			2'/2'	16-19-44-30	35-35.4 Clayey Sand (SC), Brown, Fine-Medium Grained 35.4-37 Clay (CH) with Silt, Orange Brown and Grey Silt, Same Coarse Sand in Grey Silt, Hard Mottled	Clayey Sand (SC) Clay (CH) with Silt
			/2'	30-32-30	Clay (CH) Grey and Orange-Brown, Hard, Moist, Mottled	Navarro Clay
40					End of Boring 40'	
45						
50						
55						

795 11 b

MONITORING WELL CONSTRUCTION LOG
Standard Flush Mount

Client: Kelly Air Force Base
Location: East Kelly
Zone 4 RI
Installed by: JEDI (Jones Environmental Drilling Inc.)
Installation Method: HSA
Field Engineer: K Kimble

Well No.: MW-134 (H23)
Project No.: TXE 70207 A0.04
Date:
Start: 1-14-94 1445 (m)
End: 1-14-94 (m)



PROTECTIVE CSG
Material/Type: N/A
Diameter: N/A
Depth BGS: N/A
Water Tight Seal (Y/N)
Weep Hole (Y/N)

SURFACE PAD
Composition & Size: 4.5 x 4.5 Concrete

RISER PIPE
Type: PVC
Diameter: 2"
Total Length (TOC to (TOS) KK 23 Feet

GROUT
Composition and Proportions: 3-94 lb bags Type I Cement, 1/2-50 lb bag bentonite quickgel, ~30 gals H2O
Tremied (Y/N)
Interval: 0-16.5

CENTRALIZERS (Y/N)
Depth (s): N/A

SEAL
Type: KK ~~PC~~ Bentonite Pellets
Source:

FILTER PACK
Type: 20-40 Texsan
Amt Used: 6 1/2- 100 lb bags
Tremied (Y/N)
Source: Vulcan Materials Co.
Gr Size & Type: 20-40

SCREEN
Type: SS Wirewound
Diameter: 2 Inch
Slot Size & Type: .010 Wirewound
Interval BGS:

DEVELOPMENT
Time:
Method Used:
Comments:

Appendix B

Analytical Data Summary Tables

795 118

Analytical Data Summary Tables For the Groundwater Sample

Table
Data Summary for S7 Area
Kelly AFB, Texas

	SampleID	C9401330
	Sampling Depth, ft	
	StationID	SS052MW134
	DateCollected	1/28/94
CHLOROMETHANE, UG/L		10 U
BROMOMETHANE, UG/L		10 U
VINYL CHLORIDE, UG/L		10 U
CHLOROETHANE, UG/L		10 U
METHYLENE CHLORIDE, UG/L		5 U
ACETONE, UG/L		10 U
CARBON DISULFIDE, UG/L		10 U
1,1-DICHLOROETHENE, UG/L		7 U
1,1-DICHLOROETHANE, UG/L		10 U
TOTAL 1,2-DICHLOROETHENE, UG/L		10 U
CHLOROFORM, UG/L		10 U
1,2-DICHLOROETHANE, UG/L		5 U
METHYL ETHYL KETONE (2-BUTANONE), UG/L		10 U
1,1,1-TRICHLOROETHANE, UG/L		10 U
CARBON TETRACHLORIDE, UG/L		10 U
BROMODICHLOROMETHANE, UG/L		10 U
1,2-DICHLOROPROPANE, UG/L		10 U
cis-1,3-DICHLOROPROPENE, UG/L		10 U
TRICHLOROETHYLENE (TCE), UG/L		5
DIBROMOCHLOROMETHANE, UG/L		10 U
1,1,2-TRICHLOROETHANE, UG/L		5 U
BENZENE, UG/L		5 U
trans-1,3-DICHLOROPROPENE, UG/L		10 U
BROMOFORM, UG/L		10 U
2-HEXANONE, UG/L		10 UJ
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE), UG/L		10 U
TETRACHLOROETHYLENE(PCE), UG/L		140
1,1,2,2-TETRACHLOROETHANE, UG/L		10 U
TOLUENE, UG/L		2 J
CHLOROBENZENE, UG/L		10 U
ETHYLBENZENE, UG/L		10 U
STYRENE, UG/L		10 U
XYLENES, TOTAL, UG/L		10 U

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9401330
Sampling Depth, ft	
StationID	SS052MW134
DateCollected	1/28/94
PHENOL, UG/L	10 U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER), UG/L	10 U
2-CHLOROPHENOL, UG/L	10 U
1,3-DICHLOROBENZENE, UG/L	10 U
1,4-DICHLOROBENZENE, UG/L	10 U
1,2-DICHLOROBENZENE, UG/L	10 U
2-METHYLPHENOL (o-CRESOL), UG/L	10 U
2,2'-OXYBIS(1-CHLORO)PROPANE, UG/L	10 U
4-METHYLPHENOL (p-CRESOL), UG/L	10 U
N-NITROSODI-n-PROPYLAMINE, UG/L	10 U
HEXACHLOROETHANE, UG/L	10 U
NITROBENZENE, UG/L	10 U
ISOPHORONE, UG/L	10 U
2-NITROPHENOL, UG/L	10 U
2,4-DIMETHYLPHENOL, UG/L	10 U
bis(2-CHLOROETHOXY) METHANE, UG/L	10 U
2,4-DICHLOROPHENOL, UG/L	10 U
1,2,4-TRICHLOROBENZENE, UG/L	10 U
NAPHTHALENE, UG/L	10 U
4-CHLOROANILINE, UG/L	10 U
HEXACHLOROBUTADIENE, UG/L	10 U
4-CHLORO-3-METHYLPHENOL, UG/L	10 U
2-METHYLNAPHTHALENE, UG/L	10 U
HEXACHLOROCYCLOPENTADIENE, UG/L	10 U
2,4,6-TRICHLOROPHENOL, UG/L	10 U
2,4,5-TRICHLOROPHENOL, UG/L	25 U
2-CHLORONAPHTHALENE, UG/L	10 U
2-NITROANILINE, UG/L	25 U
DIMETHYL PHTHALATE, UG/L	10 U
ACENAPHTHYLENE, UG/L	10 U
2,6-DINITROTOLUENE, UG/L	10 U
3-NITROANILINE, UG/L	25 U
ACENAPHTHENE, UG/L	10 U

Table
Data Summary for S7 Area
Kelly AFB, Texas

	SampleID	C9401330
	Sampling Depth, ft	
	StationID	SS052MW134
	DateCollected	1/28/94
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE), UG/L		0 052 UJ
BETA BHC (BETA HEXACHLOROCYCLOHEXANE), UG/L		0 052 UJ
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE), UG/L		0 052 UJ
GAMMA BHC (LINDANE), UG/L		0 052 UJ
HEPTACHLOR, UG/L		0 052 UJ
ALDRIN, UG/L		0 052 UJ
HEPTACHLOR EPOXIDE, UG/L		0 052 UJ
ALPHA ENDOSULFAN, UG/L		0 052 UJ
DIELDRIN, UG/L		0 1 UJ
DDE (1,1-bis(CHLOROPHENYL)-2,2-DICHLOROETHENE), UG/L		0 1 UJ
ENDRIN, UG/L		0 1 UJ
BETA ENDOSULFAN, UG/L		0 1 UJ
DDD (1,1-bis(CHLOROPHENYL)-2,2-DICHLOROETHANE), UG/L		0 1 UJ
ENDOSULFAN SULFATE, UG/L		0.1 UJ
DDT (1,1-bis(CHLOROPHENYL)-2,2,2-TRICHLOROETHANE), UG/L		0 1 UJ
METHOXYCHLOR, UG/L		0 52 UJ
ENDRIN KETONE, UG/L		0.1 UJ
ENDRIN ALDEHYDE, UG/L		0 1 UJ
ALPHA-CHLORDANE, UG/L		0 052 UJ
GAMMA-CHLORDANE, UG/L		0 052 UJ
TOXAPHENE, UG/L		5.2 UJ
PCB-1016 (AROCHLOR 1016), UG/L		1 UJ
PCB-1221 (AROCHLOR 1221), UG/L		2 1 UJ
PCB-1232 (AROCHLOR 1232), UG/L		1 UJ
PCB-1242 (AROCHLOR 1242), UG/L		1 UJ
PCB-1248 (AROCHLOR 1248), UG/L		1 UJ
PCB-1254 (AROCHLOR 1254), UG/L		1 UJ
PCB-1260 (AROCHLOR 1260), UG/L		1 UJ

Table
Data Summary for S7 Area
Kelly AFB, Texas

	SampleID	C9401330
	Sampling Depth, ft	
	StationID	SS052MW134
	DateCollected	1/28/94
2,4-DINITROPHENOL, UG/L		25 U
4-NITROPHENOL, UG/L		25 U
DIBENZOFURAN, UG/L		10 U
2,4-DINITROTOLUENE, UG/L		10 U
DIETHYL PHTHALATE, UG/L		10 U
4-CHLOROPHENYL PHENYL ETHER, UG/L		10 U
FLUORENE, UG/L		10 U
4-NITROANILINE, UG/L		25 U
4,6-DINITRO-2-METHYLPHENOL, UG/L		25 U
N-NITROSODIPHENYLAMINE, UG/L		10 U
4-BROMOPHENYL PHENYL ETHER, UG/L		10 U
HEXACHLOROBENZENE, UG/L		10 U
PENTACHLOROPHENOL, UG/L		5 U
PHENANTHRENE, UG/L		10 U
ANTHRACENE, UG/L		10 U
CARBAZOLE, UG/L		10 U
DI-n-BUTYL PHTHALATE, UG/L		10 U
FLUORANTHENE, UG/L		10 U
PYRENE, UG/L		10 U
BENZYL BUTYL PHTHALATE, UG/L		10 U
3,3'-DICHLOROBENZIDINE, UG/L		10 U
BENZO(a)ANTHRACENE, UG/L		10 U
CHRYSENE, UG/L		10 U
bis(2-ETHYLHEXYL) PHTHALATE, UG/L		10 U
DI-n-OCTYLPHTHALATE, UG/L		10 U
BENZO(b)FLUORANTHENE, UG/L		10 U
BENZO(k)FLUORANTHENE, UG/L		10 U
BENZO(a)PYRENE, UG/L		10 U
INDENO(1,2,3-c,d)PYRENE, UG/L		10 U
DIBENZ(a,h)ANTHRACENE, UG/L		10 U
BENZO(g,h,i)PERYLENE, UG/L		10 U

195 122

Table
Data Summary for S7 Area
Kelly AFB, Texas

Parameters/Units	SampleID / StationID / Date Collected	C9401330 / SS052MW134 / 1/28/94 18 20
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	PG/L	8 98 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/L	8 98 U
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	PG/L	10 2 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/L	10 2 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/L	7 14 U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	PG/L	4 5 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/L	4 5 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/L	7 4 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/L	7 55 U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	PG/L	4 98 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/L	4 98 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/L	4 43 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/L	9 52 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/L	4 04 U
OCTACHLORODIBENZO-p-DIOXIN	PG/L	12 8 U
OCTACHLORODIBENZOFURAN	PG/L	10 8 U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	PG/L	3 05 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/L	3 05 U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	PG/L	1 12 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/L	1 12 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/L	2 96 U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	PG/L	12 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/L	12 U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	PG/L	8 27 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/L	8 27 U
POLYCHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	PG/L	ND
POLYCHLORINATED DIBENZOFURANS, (TOTAL)	PG/L	ND

PG/L - picogram / liter
ND - not detected

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9401330
Sampling Depth, ft	
StationID	SS052MW134
DateCollected	1/28/94
ANTIMONY, UG/L	12 8 U
ARSENIC, UG/L	1 J
BERYLLIUM, UG/L	0 5 U
CADMIUM, UG/L	1 3 U
CHROMIUM, TOTAL, UG/L	2 2 U
COPPER, UG/L	1 3 U
LEAD, UG/L	0 3 U
MERCURY, UG/L	0 16 UJ
NICKEL, UG/L	78 2
SELENIUM, UG/L	1 5 UJ
SILVER, UG/L	1 8 U
THALLIUM, UG/L	0 8 U
ZINC, UG/L	3 9 U
CYANIDE, UG/L	2 7 U

795 124

795 125

Analytical Data Summary Tables for Subsurface Soil Samples

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9400903	C9400904	C9400906
Sampling Depth, ft	3 - 5	10 - 13	15 - 17
StationID	SS052MW134	SS052MW134	SS052MW134
DateCollected	1/24/94 10.15	1/24/94 11 15	1/24/94 12:00
CHLOROMETHANE, UG/KG	11 U	12 U	12 U
BROMOMETHANE, UG/KG	11 U	12 U	12 U
VINYL CHLORIDE, UG/KG	11 U	12 U	12 U
CHLOROETHANE, UG/KG	11 U	12 U	12 U
METHYLENE CHLORIDE, UG/KG	11 U	12 U	12 U
ACETONE, UG/KG	5 J	12 U	17
CARBON DISULFIDE, UG/KG	11 U	12 U	12 U
1,1-DICHLOROETHENE, UG/KG	11 U	12 U	12 U
1,1-DICHLOROETHANE, UG/KG	11 U	12 U	12 U
TOTAL 1,2-DICHLOROETHENE, UG/KG	11 U	12 U	12 U
CHLOROFORM, UG/KG	11 U	12 U	12 U
1,2-DICHLOROETHANE, UG/KG	11 U	12 U	12 U
METHYL ETHYL KETONE (2-BUTANONE), UG/KG	11 U	12 U	12 U
1,1,1-TRICHLOROETHANE, UG/KG	11 U	12 U	12 U
CARBON TETRACHLORIDE, UG/KG	11 U	12 U	12 U
BROMODICHLOROMETHANE, UG/KG	11 U	12 U	12 U
1,2-DICHLOROPROPANE, UG/KG	11 U	12 U	12 U
cis-1,3-DICHLOROPROPENE, UG/KG	11 U	12 U	12 U
TRICHLOROETHYLENE (TCE), UG/KG	11 U	12 U	12 U
DIBROMOCHLOROMETHANE, UG/KG	11 U	12 U	12 U
1,1,2-TRICHLOROETHANE, UG/KG	11 U	12 U	12 U
BENZENE, UG/KG	11 U	12 U	12 U
trans-1,3-DICHLOROPROPENE, UG/KG	11 U	12 U	12 U
BROMOFORM, UG/KG	11 U	12 U	12 U
2-HEXANONE, UG/KG	11 U	12 U	12 U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE), UG/KG	11 U	12 U	12 U
TETRACHLOROETHYLENE(PCE), UG/KG	11 U	12 U	12 U
1,1,2,2-TETRACHLOROETHANE, UG/KG	11 U	12 U	12 U
TOLUENE, UG/KG	11 U	12 U	12 U
CHLOROBENZENE, UG/KG	11 U	12 U	12 U
ETHYLBENZENE, UG/KG	11 U	12 U	12 U
STYRENE, UG/KG	11 U	12 U	12 U
XYLENES, TOTAL, UG/KG	11 U	12 U	12 U

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9400903	C9400904	C9400906
Sampling Depth, ft	3 - 5	10 - 13	15 - 17
StationID	SS052MW134	SS052MW134	SS052MW134
DateCollected	1/24/94 10 15	1/24/94 11 15	1/24/94 12 00
PHENOL, UG/KG	370 U	390 U	370 U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER), UG/KG	370 U	390 U	370 U
2-CHLOROPHENOL, UG/KG	370 U	390 U	370 U
1,3-DICHLOROBENZENE, UG/KG	370 U	390 U	370 U
1,4-DICHLOROBENZENE, UG/KG	370 U	390 U	370 U
1,2-DICHLOROBENZENE, UG/KG	370 U	390 U	370 U
2-METHYLPHENOL (o-CRESOL), UG/KG	370 U	390 U	370 U
2,2'-OXYBIS(1-CHLORO)PROPANE, UG/KG	370 U	390 U	370 U
4-METHYLPHENOL (p-CRESOL), UG/KG	370 U	390 U	370 U
N-NITROSODI-n-PROPYLAMINE, UG/KG	370 U	390 U	370 U
HEXACHLOROETHANE, UG/KG	370 U	390 U	370 U
NITROBENZENE, UG/KG	370 U	390 U	370 U
ISOPHORONE, UG/KG	370 U	390 U	370 U
2-NITROPHENOL, UG/KG	370 U	390 U	370 U
2,4-DIMETHYLPHENOL, UG/KG	370 U	390 U	370 U
bis(2-CHLOROETHOXY) METHANE, UG/KG	370 U	390 U	370 U
2,4-DICHLOROPHENOL, UG/KG	370 U	390 U	370 U
1,2,4-TRICHLOROBENZENE, UG/KG	370 U	390 U	370 U
NAPHTHALENE, UG/KG	370 U	390 U	370 U
4-CHLOROANILINE, UG/KG	370 U	390 U	370 U
HEXACHLOROBUTADIENE, UG/KG	370 U	390 U	370 U
4-CHLORO-3-METHYLPHENOL, UG/KG	370 U	390 U	370 U
2-METHYLNAPHTHALENE, UG/KG	370 U	390 U	370 U
HEXACHLOROCYCLOPENTADIENE, UG/KG	370 U	390 U	370 U
2,4,6-TRICHLOROPHENOL, UG/KG	370 U	390 U	370 U
2,4,5-TRICHLOROPHENOL, UG/KG	910 U	940 U	910 U
2-CHLORONAPHTHALENE, UG/KG	370 U	390 U	370 U
2-NITROANILINE, UG/KG	910 U	940 U	910 U
DIMETHYL PHTHALATE, UG/KG	370 U	390 U	370 U
ACENAPHTHYLENE, UG/KG	370 U	390 U	370 U
2,6-DINITROTOLUENE, UG/KG	370 U	390 U	370 U
3-NITROANILINE, UG/KG	910 U	940 U	910 U
ACENAPHTHENE, UG/KG	370 U	390 U	370 U
2,4-DINITROPHENOL, UG/KG	910 U	940 U	910 U
4-NITROPHENOL, UG/KG	910 U	940 U	910 U
DIBENZOFURAN, UG/KG	370 U	390 U	370 U
2,4-DINITROTOLUENE, UG/KG	370 U	390 U	370 U

195 127

Table
Data Summary for S7 Area
Kelly AFB, Texas

	SampleID	C9400903	C9400904	C9400906
	Sampling Depth, ft	3 - 5	10 - 13	15 - 17
	StationID	SS052MW134	SS052MW134	SS052MW134
	DateCollected	1/24/94 10 15	1/24/94 11 15	1/24/94 12 00
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE), UG/KG		1 9 U	2 U	2 U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE), UG/KG		1 9 U	2 U	2 U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE), UG/KG		1 9 U	2 U	2 U
GAMMA BHC (LINDANE), UG/KG		1 9 U	2 U	2 U
HEPTACHLOR, UG/KG		1 9 U	2 U	2 U
ALDRIN, UG/KG		1 9 U	2 U	2 U
HEPTACHLOR EPOXIDE, UG/KG		1 9 U	2 U	2 U
ALPHA ENDOSULFAN, UG/KG		1.9 U	2 U	2 U
DIELDRIN, UG/KG		3 7 U	3 9 U	3 8 U
DDE (1,1-bis(CHLOROPHENYL)-2,2-DICHLOROETHENE), UG/KG		3 7 U	3 9 U	3 8 U
ENDRIN, UG/KG		3 7 U	3 9 U	3 8 U
BETA ENDOSULFAN, UG/KG		3.7 U	3 9 U	3 8 U
DDD (1,1-bis(CHLOROPHENYL)-2,2-DICHLOROETHANE), UG/KG		3 7 U	3 9 U	3 8 U
ENDOSULFAN SULFATE, UG/KG		3 7 U	3 9 U	3 8 U
DDT (1,1-bis(CHLOROPHENYL)-2,2,2-TRICHLOROETHANE), UG/KG		3 7 U	3.9 U	3.8 U
METHOXYCHLOR, UG/KG		19 U	20 U	20 U
ENDRIN KETONE, UG/KG		3.7 U	3.9 U	3.8 U
ENDRIN ALDEHYDE, UG/KG		3.7 U	3.9 U	3 8 U
ALPHA-CHLORDANE, UG/KG		1.9 U	2 U	2 U
GAMMA-CHLORDANE, UG/KG		1 9 U	2 U	2 U
TOXAPHENE, UG/KG		190 U	200 U	200 U
PCB-1016 (AROCHLOR 1016), UG/KG		37 U	39 U	38 U
PCB-1221 (AROCHLOR 1221), UG/KG		76 U	80 U	77 U
PCB-1232 (AROCHLOR 1232), UG/KG		37 U	39 U	38 U
PCB-1242 (AROCHLOR 1242), UG/KG		37 U	39 U	38 U
PCB-1248 (AROCHLOR 1248), UG/KG		37 U	39 U	38 U
PCB-1254 (AROCHLOR 1254), UG/KG		37 U	39 U	38 U
PCB-1260 (AROCHLOR 1260), UG/KG		37 U	39 U	38 U

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9400903	C9400904	C9400906
Sampling Depth, ft	3 - 5	10 - 13	15 - 17
StationID	SS052MW134	SS052MW134	SS052MW134
DateCollected	1/24/94 10 15	1/24/94 11 15	1/24/94 12 00
DIETHYL PHTHALATE, UG/KG	370 U	390 U	370 U
4-CHLOROPHENYL PHENYL ETHER, UG/KG	370 U	390 U	370 U
FLUORENE, UG/KG	370 U	390 U	370 U
4-NITROANILINE, UG/KG	910 U	940 U	910 U
4,6-DINITRO-2-METHYLPHENOL, UG/KG	910 U	940 U	910 U
N-NITROSODIPHENYLAMINE, UG/KG	370 U	390 U	370 U
4-BROMOPHENYL PHENYL ETHER, UG/KG	370 U	390 U	370 U
HEXACHLOROBENZENE, UG/KG	370 U	390 U	370 U
PENTACHLOROPHENOL, UG/KG	910 U	940 U	910 U
PHENANTHRENE, UG/KG	370 U	390 U	370 U
ANTHRACENE, UG/KG	370 U	390 U	370 U
CARBAZOLE, UG/KG	370 U	390 U	370 U
DI-n-BUTYL PHTHALATE, UG/KG	370 U	390 U	370 U
FLUORANTHENE, UG/KG	370 U	390 U	370 U
PYRENE, UG/KG	370 U	390 U	370 U
BENZYL BUTYL PHTHALATE, UG/KG	370 U	390 U	370 U
3,3'-DICHLOROBENZIDINE, UG/KG	370 U	390 U	370 U
BENZO(a)ANTHRACENE, UG/KG	370 U	390 U	370 U
CHRYSENE, UG/KG	370 U	390 U	370 U
bis(2-ETHYLHEXYL) PHTHALATE, UG/KG	370 U	190 J	330 J
DI-n-OCTYLPHTHALATE, UG/KG	370 U	390 U	370 U
BENZO(b)FLUORANTHENE, UG/KG	370 U	390 U	370 U
BENZO(k)FLUORANTHENE, UG/KG	370 U	390 U	370 U
BENZO(a)PYRENE, UG/KG	370 U	390 U	370 U
INDENO(1,2,3-c,d)PYRENE, UG/KG	370 U	390 U	370 U
DIBENZ(a,h)ANTHRACENE, UG/KG	370 U	390 U	370 U
BENZO(g,h,i)PERYLENE, UG/KG	370 U	390 U	370 U

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9400903	C9400904	C9400906
Sampleing Depth, ft	3 - 5	10 - 13	15 - 17
StationID	SS052MW134	SS052MW134	SS052MW134
DateCollected	1/24/94 10 15	1/24/94 11 15	1/24/94 12 00
ANTIMONY, MG/KG	3 U	3 U	3 U
ARSENIC, MG/KG	4 7 J	3 3 U	6.3 J
BERYLLIUM, MG/KG	0 89 J	0 54 J	0 55 J
CADMIUM, MG/KG	0 4 J	0 31 J	0 57 J
CHROMIUM, TOTAL, MG/KG	14	9 3	9 5
COPPER, MG/KG	10 7	6	6 5
LEAD, MG/KG	9 6 J	8 J	6 4 J
MERCURY, MG/KG	0 03 U	0 03 U	0 03 U
NICKEL, MG/KG	10 3	7 5 J	7 4 J
SELENIUM, MG/KG	10 3 U	10 5 U	10 4 U
SILVER, MG/KG	0 42 U	0 43 U	0 42 U
THALLIUM, MG/KG	5 5 U	5 6 U	5 5 U
ZINC, MG/KG	33	23 4	23 3
CYANIDE, MG/KG	0 16 U	0 22 U	0 16 U

795 130

Analytical Data Summary Tables for the Surface Soil Samples Dioxins and Arsenic

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9401504	C9401505	C9401506	C9401507	C9401508
Sampling Depth, ft					
StationID	SS009HA038	SS009HA039	SS009HA040	SS009HA041	SS009HA042
DateCollected	2/3/94	2/3/94	2/3/94	2/3/94	2/3/94
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	12 8	19.9 J	3.54	18.1	0 7 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN, PG/G	6 47	9 62	1.25 U	5 52 J	0.7 U
HEPTACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	7 21 J	6 84 J	0 64 U	7.65 J	0 5 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN, PG/G	3 15	3 71 J	0 64 U	4 68	0.5 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN, PG/G	0.9 U	0.97 U	1.11 U	0.74 U	1 39 U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	0 88 U	1 05 U	2 44 U	0 86 U	0 88 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN, PG/G	0 88 U	1.05 U	2.44 U	0 86 U	0 88 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN, PG/G	0 79 U	0 63 U	2 46 U	0 54 U	1 02 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN, PG/G	0 8 U	0 64 U	2 5 U	1 09 U	1 04 U
HEXACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	190 J	65 3 J	198 J	60.9 J	9 99 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN, PG/G	0 93 U	0.63 U	2.75 U	1.1 U	1 15 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN, PG/G	0.71 U	0 29 U	2.44 U	0.33 U	1.06 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN, PG/G	1 09 U	0 65 U	4.13 U	0 6 U	1.42 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN, PG/G	0.94 U	0 54 U	4 26 U	1.35 J	1.2 U
OCTACHLORODIBENZO-p-DIOXIN, PG/G	44 J	82.5	15.9 J	54.6	12.5 J
OCTACHLORODIBENZOFURAN, PG/G	1.16 U	7 29	2 29 U	7 27	1 93 U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	0 76 U	0.86 U	0 83 U	0 42 U	0.56 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN, PG/G	0 76 U	0.86 U	0 83 U	0 42 U	0 56 U
PENTACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	880 J	284 J	728 J	272 J	81.5 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN, PG/G	0 38 U	0 78 U	410 J	129 J	46.8 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN, PG/G	0 45 U	1 09 U	1 18 U	1.23 U	0.26 U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	0 52 U	0.87 U	1.72 U	3.92 U	0.42 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN, PG/G	0.52 U	0 87 U	1.72 U	3.92 U	0.42 U
TETRACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	2366 J	473 J	904 J	127 J	149 J
2,3,7,8-TETRACHLORODIBENZOFURAN, PG/G	1 07 U	1 49 U	1 17 U	2.29 U	0.47 U
POLYCHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	56.8 J	102 J	19.4	72.7	12.5 J
POLYCHLORINATED DIBENZOFURANS, (TOTAL), PG/G	3443 J	836 J	1830 J	475	240 J
ARSENIC, MG/KG	15 8	11.2 J	10.8 J	11 2 J	10 J

PG/G - picogram / gram
ND - not detected

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9401509	C9401510	C9401511	C9401512	C9401513
Sampling Depth, ft					
StationID	SS009HA043	SS009HA044	SS009HA045	SS009HA046	SS009HA047
DateCollected	2/3/94	2/3/94	2/3/94	2/3/94	2/3/94
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	27.7 J	8.29 J	137	71.6 J	5.8 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN, PG/G	14.6 J	4.45 J	66.4	33.5 J	3.02
HEPTACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	6.07 J	0.5 U	45 J	34.8 J	0.83 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN, PG/G	4.17	0.5 U	23.5	16.7	0.83 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN, PG/G	0.84 U	1.2 U	1.06 U	2.02 U	1.27 U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	7.51 J	0.92 U	59.5 J	35.2 J	1.58 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN, PG/G	0.94 U	0.92 U	2.58 U	1.88 U	1.58 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN, PG/G	0.77 U	0.81 U	3.49 J	0.81 U	0.58 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN, PG/G	0.78 U	0.83 U	1.11 U	1.45 U	0.59 U
HEXACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	23.1 J	149 J	111 J	68.7 J	1.02 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN, PG/G	0.9 U	0.69 U	2.09 U	1.76 U	1.02 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN, PG/G	0.62 U	0.36 U	1.1 U	0.78 U	0.79 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN, PG/G	1.33 U	0.92 U	0.88 U	1.73 U	1.1 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN, PG/G	1.7 U	1.08 U	6.75	1.24 U	0.93 U
OCTACHLORODIBENZO-p-DIOXIN, PG/G	116	30 J	405	235	20 J
OCTACHLORODIBENZOFURAN, PG/G	3.45 J	1.9 U	35.3	23.6	3.66 J
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	0.37 U	0.81 U	1.66 U	1.64 U	0.7 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN, PG/G	0.37 U	0.81 U	1.66 U	1.64 U	0.7 U
PENTACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	120 J	473 J	401 J	298 J	4.21 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN, PG/G	0.52 U	0.57 U	132 J	144 J	2.35
2,3,4,7,8-PENTACHLORODIBENZOFURAN, PG/G	0.42 U	0.68 U	0.85 U	1.04 U	0.46 U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	1 U	0.8 U	0.8 U	2.11 U	2.33 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN, PG/G	1 U	0.8 U	0.8 U	2.11 U	2.33 U
TETRACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	151 J	325 J	432 J	345 J	7.98
2,3,7,8-TETRACHLORODIBENZOFURAN, PG/G	0.48 U	0.52 U	1.98 U	1.63 U	0.76 U
POLYCHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	151 J	38.3 J	602 J	342 J	25.8 J
POLYCHLORINATED DIBENZOFURANS, (TOTAL), PG/G	304 J	947 J	1024 J	770 J	15.9 J
ARSENIC, MG/KG	9.5 J	7.7 J	9.5 J	16.3	3.1 J

PG/G - picogram / gram
ND - not detected

195 133

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9401514	C9401515	C9401516	C9400903	C9400904
Sampling Depth, ft				3 - 5	10 - 13
StationID	SS009HA048	SS009HA049	SS009HA050	SS052MW134	SS052MW134
DateCollected	2/3/94	2/3/94	2/3/94	1/24/94	1/24/94
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	224 J	52 4	2 98 U	1.37 U	1.12 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN, PG/G	116 J	25 J	2 98 U	1.37 U	1 12 U
HEPTACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	104 J	22 5 J	3.05 U	1 22 U	0 83 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN, PG/G	42.7 J	1 15 U	3 05 U	1 22 U	0 83 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN, PG/G	1 6 U	1 75 U	3 74 U	1 05 U	1 27 U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	130 J	2 23 U	4 08 U	1 01 U	1 89 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN, PG/G	2.13 U	2 23 U	4 08 U	1 01 U	1 89 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN, PG/G	5 18 J	2 38 U	2 09 U	1 07 U	2 76 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN, PG/G	0 67 U	2 46 U	2 12 U	1 09 U	2 81 U
HEXACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	121 J	72.3 J	20 3 J	1.31 U	1 6 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN, PG/G	1 65 U	4 88 U	2 32 U	1 31 U	1 6 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN, PG/G	0 9 U	5 24 U	2.41 U	1.03 U	1 43 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN, PG/G	0.85 U	3 42 U	2 79 U	1.59 U	2 37 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN, PG/G	5.11 J	3 9 U	1 94 U	1.76 U	2 58 U
OCTACHLORODIBENZO-p-DIOXIN, PG/G	899 J	236 J	36 4	4.13 J	6.97 U
OCTACHLORODIBENZOFURAN, PG/G	3 59 J	23 1 J	5 15 U	1 22 U	3 34 J
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	1 2 U	1 08 U	1 77 U	1 45 U	0 67 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN, PG/G	1 2 U	1 08 U	1 77 U	1.45 U	0 67 U
PENTACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	257 J	280 J	117 J	4.4 U	4 17 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN, PG/G	0 61 U	6 29 J	64 4 J	4 4 U	4 17 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN, PG/G	0.34 U	0 65 U	2 58 U	1.53 U	1.13 U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	0 54 U	2 64 U	5 69 U	2 82 U	2 72 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN, PG/G	0 54 U	2.64 U	5 69 U	2 82 U	2 72 U
TETRACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	238 J	146 J	168 J	3 38 U	1.07 U
2,3,7,8-TETRACHLORODIBENZOFURAN, PG/G	0.5 U	3 08 U	1 64 U	3.38 U	1 07 U
POLYCHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	1253 J	288 J	36 4 J	4 13 J	6 97 J
POLYCHLORINATED DIBENZOFURANS, (TOTAL), PG/G	798 J	544 J	305 J	ND	3 34 J
ARSENIC, MG/KG	7.5 J	7 1 J	70	4 7 J	3.3 U

PG/G - picogram / gram
ND - not detected

795 134

Table
Data Summary for S7 Area
Kelly AFB, Texas

SampleID	C9400906
Sampling Depth, ft	15 - 17
StationID	SS052MW134
DateCollected	1/24/94
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	0.71 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN, PG/G	0.71 U
HEPTACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	0.29 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN, PG/G	0.29 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN, PG/G	0.38 U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	0.85 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN, PG/G	0.85 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN, PG/G	0.82 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN, PG/G	0.83 U
HEXACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	0.49 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN, PG/G	0.49 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN, PG/G	0.34 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN, PG/G	0.6 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN, PG/G	0.57 U
OCTACHLORODIBENZO-p-DIOXIN, PG/G	2.8 U
OCTACHLORODIBENZOFURAN, PG/G	0.51 U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	0.5 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN, PG/G	0.5 U
PENTACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	1 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN, PG/G	1 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN, PG/G	0.71 U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	0.78 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN, PG/G	0.78 U
TETRACHLORINATED DIBENZOFURANS, (TOTAL), PG/G	0.42 U
2,3,7,8-TETRACHLORODIBENZOFURAN, PG/G	0.42 U
POLYCHLORINATED DIBENZO-p-DIOXINS, (TOTAL), PG/G	2.80 U
POLYCHLORINATED DIBENZOFURANS, (TOTAL), PG/G	ND
ARSENIC, MG/KG	6.3 J

PG/G - picogram / gram
ND - not detected

195 135

795 136

Appendix C

Data Quality Evaluation Results for Groundwater Sample VOCs, SVOCs, Pesticides/PCBs, and Metals

795 137

Data Quality Evaluation Results
for Subsurface Soil Samples
VOCs, SVOCs, Pesticides, PCBs & Metals

LEVEL C DATA REVIEW AND VALIDATION
Kelly AFB

CASE 37469 ANALYSIS VOC MATRIX Water + Soil

REVIEWED BY J. Coffey DATE 4/7/94

DATA PACKAGE COMPLETE: YES NO ok.

NUMBER of SAMPLES 9 Soil; 7 Water FIELD QC SAMPLES 9

CASE NARRATIVE SUMMARY C9401319 was diluted prior to analysis

HOLDING TIMES MET: YES NO ok

GC/MS TUNE OK

INITIAL CALIBRATION 2 Hexanone 102.3% RSD (UJ)

CONTINUING CALIBRATION OK

BLANKS.

METHOD ~~C9401301EB~~ VBLKW1-0209/VBLKS1-0208/VBLKS1-0210

EQUIPMENT RINSE C9401301EB1, EB2

FIELD. w/SDG 37452

TRIP (VOC) C9401304TB1

SURROGATES OK

DUPLICATES

LAB N/A

FIELD C9401315FD1 (Nondetects) /C9401324FD2 Good agreement

MS/MSD Water Results w/ SDG 37496 | C9401316 MS1, 17 SD1 C9401325 MS2, 26 SD2

INTERNAL STD SUMMARY OK

COMMENTS Field sample results qualified based on blank Negative results for 2-Hexanone qualified "UJ"

CH2M HILL SP 5 APR 13 '94

795 139 ORGANIC BLANK SUMMARY

SDG 37469

Blank Number	Compound				Refers to Sample Number(s)
	MeCl2	Acetone			
C9401303EB1	1B	11			ALL
C9401303EB2	1J	H			
C9401304TB1	2J	—			
VBLKW1-0209	1J	—			1, 3, 4, 18 - 25, 20 MS/MSD
VBLKS2-0208	4J	—			5, 7, 8, 9, 10, 12, 13, 15, 16
VBLKS1-0210	1J	—			14, 14 MS/MSD

ORGBLK.XLS

795 140

DV WORKSHEET

SDG 37469

Analysis _____

Compound	Initial Calib. RRF	Initial Calib. %RSD	Cont. Calib. %D	Cont. Calib. %D	Comments

795 141

LEVEL C DATA REVIEW AND VALIDATION
Kelly AFB

CASE 37469 ANALYSIS. SVOC MATRIX Water : Soil

REVIEWED BY J. Coffey DATE 4/8/94

DATA PACKAGE COMPLETE: (YES) NO ✓

NUMBER of SAMPLES 8 Soil ; 3 Water FIELD QC SAMPLES 5

✓

CASE NARRATIVE SUMMARY N-Nitrosodiphenylamine was detected in water method blank

HOLDING TIMES MET: (YES) NO ✓

GC/MS TUNE OK

INITIAL CALIBRATION OK

CONTINUING CALIBRATION OK

BLANKS: See Attached sheet →

METHOD SBLKW1-0202 / SBLKS1-0208 / SBLKS2-0208

EQUIPMENT RINSE C9401301EB1 / C9401301EB2

FIELD w/ SDG 37457 - ND's ✓

TRIP (VOC) N/A

SURROGATES. Phenol d5 high for SBLKW1-0202 also C9401329

DUPLICATES.

LAB N/A

FIELD C9401315FD1 ✓

MS/MSD Water results reported w/ 37496 / C9401316MS1 PCP (114%)

INTERNAL STD SUMMARY OK

COMMENTS Field Samples qualified based on blank results. No action necessary on single surrogate non conformance

795 142

ORGANIC BLANK SUMMARY

SDG 37469

Blank Number	Compound				Refers to Sample Number(s)
	BEHP	N-Nitroso-diphenyl amine			
EB1	—	—			ALL
EB2	68	—			ALL
SBLKW1	—	3J			
SBLKS1	—	—			
SBLKS2	—	—			

795 143

DV WORKSHEET

SDG 37469

Analysis 8000

Compound	Initial Calib. RRF	Initial Calib. %RSD	Cont. Calib. %D	Cont. Calib. %D	Comments

LEVEL C DATA REVIEW AND VALIDATION
Kelly AFB

CASE 37469 ANALYSIS: OC-PESTICIDES and PCB'S MATRIX Soil + Water

REVIEWED BY J. Coffey DATE 4/8/94

DATA PACKAGE COMPLETE: (YES) NO ✓

NUMBER of SAMPLES Soil 9 ; Water 3 FIELD QC SAMPLES 5

CASE NARR. SUMMARY 930 ml for C9401328, 960 ml for C9401329 C9401330

HOLDING TIMES MET: (YES) NO ✓

SURROGATES Low Recoveries for EB1, EB2, C9401329

INITIAL CALIBRATION OK

CONTINUING CALIBRATION OK ✓

BLANKS.

METHOD PBLKW1-02-01, PBLKS1-02-OB = ND's C9401301EB1, C9401302EB2 = ND's

EQUIPMENT RINSE ↓

FIELD W/SDG 37452 : OK ✓

DUPLICATES.

LAB N/A

FIELD C9401315FD1 = All ND's

PESTICIDE DEGRADATION STUDY OK ✓

PEST ANALYTICAL SEQUENCE OK

MS/MSD Soil w/ 37469 | C9401316MS1, 17SD1

COMMENTS Field sample w/ low DCB recoveries qualified "UJ."

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.: C9401330

Lab Name: QAL/LRD Contract: 37469

Lab Code: _____ Case No.: 37469 SAS No.: _____ SDG No.: 37469

Matrix: (soil/water) WATER Lab Sample ID: 37469025

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 94M2VO1537

Level: (low/med) LOW Date Received: 01/29/94

% Moisture: not dec. _____ Date Analyzed: 02/09/94

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene chloride	5	U
67-64-1	Acetone	10 ~~8~~	~~J~~ U
75-15-0	Carbon disulfide	10	U
75-35-4	1,1-Dichloroethene	7	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	5	
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
591-78-6	2-Hexanone	10	~~U~~ UJ
108-10-1	4-Methyl-2-pentanone	10	U
127-18-4	Tetrachloroethene	140	
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylenes (total)	10	U

4/8/94

FORM I VOA 1/87 Rev.

APR 13 '94

4/4/18

4/4

795146

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

C9401330

Lab Name: QAL/LRD Contract: 37469

Lab Code: _____ Case No.: 37469 SAS No.: _____ SDG No.: 37469

Matrix: (soil/water) WATER Lab Sample ID: 37469025

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 94M1BN1228

Level: (low/med) LOW Date Received: 01/29/94

% Moisture: not dec. ____ dec. ____ Date Extracted: 02/02/94

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 02/07/94

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10 ~~3~~	~~J~~ U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

FORM I SV-1 4/8/94 1/87 Rev.

JC 4/18

CH2M HILL APR 13 '94

4/11

795 147

EPA SAMPLE NO.
C9401330

Lab Name: QAL/LRD Contract: 37469

Lab Code: _____ Case No.: 37469 SAS No.: _____ SDG No.: 37469

Matrix: (soil/water) WATER Lab Sample ID: 37469025

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 94M1BN1228

Level: (low/med) LOW Date Received: 01/29/94

% Moisture: not dec. ____ dec. ____ Date Extracted: 02/02/94

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 02/07/94

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	5	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 ~~5~~	~~U~~ 4
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

AC 4/8/94

APR 13'94

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9401330

Lab Name: QAL/LRD Contract: KELLY_AFB

Lab Code: Case No.: 37469 SAS No.: SDG No.: 37469

Matrix: (soil/water) WATER Lab Sample ID: 37469025

Sample wt/vol: 960.0 (g/mL) ML Lab File ID:

% Moisture: decanted: (Y/N) Date Received: 01/29/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 02/01/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 02/17/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.052	U UJ
319-85-7	beta-BHC	0.052	U
319-86-8	delta-BHC	0.052	U
58-89-9	gamma-BHC (Lindane)	0.052	U
76-44-8	Heptachlor	0.052	U
309-00-2	Aldrin	0.052	U
1024-57-3	Heptachlor epoxide	0.052	U
959-98-8	Endosulfan I	0.052	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.52	U
53494-70-5	Endrin ketone	0.10	U
7421-36-3	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.052	U
5103-74-2	gamma-Chlordane	0.052	U
8001-35-2	Toxaphene	5.2	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.1	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U UJ
11096-82-5	Aroclor-1260	1.0	U

4/8/97

000213

LEVEL C DATA REVIEW AND VALIDATION
Kelly AFB

collected 1/28

795 149

SOILS +

CASE 37469 ANALYSIS: METALS/CN MATRIX GROUNDWATER

REVIEWED BY K.A. SANDERS DATE 3APR94

DATA PACKAGE COMPLETE: (YES) NO OK —

NUMBER of SAMPLES 20 FIELD QC SAMPLES 001 S ERB PL ; 003 ERB GW ; 37382 GLOVE BLK ; 37452 FLD BLK ; 014 F. DUP ; 015 SOIL ; 020 FLD DUP GW's —

CASE NARRARATIVE SUMMARY 6TH Hg CCB OUT - DID NOT AFFECT ANY SAMPLES - OK ; WATER Hg MS OUT ; SOIL Sb MS OUT ; GFAA POSTSPK FOR Se OUT ON 19, 22-25. SEE COMMENTS pp 2

HOLDING TIMES MET (YES) NO all HT criteria met - OK —

INITIAL CALIBRATION all ICV requirements met - OK

CONTINUING CALIBRATION all CCV results within limits - OK

BLANKS: (UNUSUAL OCCURRENCES)

INTITIAL CALIBRATION see "BLANKS"

CONT. CALIBRATION worksheet

PREP. (attached)

FIELD

ERB

SPIKES:

PREDIGESTION SOIL Sb @ 68% J/UJ ; GW Hg @ 36% J/UJ

POSTDIGESTION Sb @ 94%, Hg @ 95%

795 150

LEVEL C DATA VALIDATION 37469

METALS/CN (Page 2)

DUPLICATES:

LAB Zn DUP @ 37 RPD - "J" / Cr @ 29 RPD. OK)

all others OK —

FIELD Soil - Cr + Zn outside criteria

WATER F. DUPS OK —

LCS/CONTROL CHARTS all LCS's within criteria - OK

ICSAB all - AB requirements met - OK

ICP SERIAL DILUTION all serial dilution requirements met - OK

GFAA QC REQUIREMENTS GFAA POSTSPIKES OUT FOR Se on 19, 22, 24, 23, 25 - J/UJ

COMMENTS ① Cr + Zn SOIL DUPS OUT (BY CASE NARRATIVE), BUT Cr < 35 RPD ∴ OK; Zn 13 > 35 - OUT. ② SOILS BY ICP, IDL > CRDL FOR As, Se, Tl, + Pb, ∴ 4 × IDL = REVISED CRDL. ③ 37496 IS GW QC FOR CEN; 37465 IS CEN SOIL QC FOR SAMPLES 5, 7, 8-10, 12, 13

④ SAMPLE 37469-20 (WATER) FORM I HAD Pb - BY GFAA @ 3.4 B ; SHOULD NOT HAVE A "B", SHOULD BE 3.4 W/ NO LAB OR VAL QUALIFIER.

795 151

INORGANIC BLANKS

SDG 37469 VALIDATOR K.A. SAUDERS

ELEMENT	ICB / CCB	H2O PB	SOIL PB	ERB	FB	X5 ug/l	X5 mg/kg
Antimony			clean ↓		clean ↓		
Arsenic							
Barium							
Beryllium							
Cadmium							
Chromium							
Cobalt							
Copper	2.0			0.36 [S]	<1.6 [W]	10.0	2.0
Nickel							
Silver							
Tin							
Vanadium							
Zinc		4.33		5.5 [W]	1.06*	27.5	5.3
Cyanide							
Sulfide							
GFAA Lead	0.3	0.4		0.4 [W]		2.0	~~0.3~~ — KB
Mercury	0.2			0.0196 [S]		1.0	0.098
GFAA Selenium	0.9					4.5	
Thallium							

Comments: * Zn @ 1.06 - GLOVE BLK FOR ALL SDG'S -

(1) -0.8 ~~mg/l~~ Tl + -0.5 ~~mg/l~~ Pb DISREGARDED

(2) 0.3 ~~mg/l~~ CCB Hg DISREGARDED - DID NOT AFFECT SAMPLES -

[S] = SOIL
[W] = WATER

corrected 1/28

LEVEL C DATA REVIEW AND VALIDATION
KELLY AFB

CASE 37469 MATRIX _____ ANALYSIS: WET CHEM PARAMETERS TOC TPH

REVIEWED BY K.A. SANDERS DATE 4/3/94

DATA PACKAGE COMPLETE: (YES) NO OK —

NUMBER of SAMPLES TOC 4 / TPH 12 FIELD QC SAMPLES TOC 001 ERB;

TPH - CASE NARRATIVE - all criteria met - OK -

CASE NARRATIVE SUMMARY TOC - all criteria met - OK;
IPH 001 SOIL ERB; 002 GW ERB; 37452 FLD, 011 SOIL BLK; 018 F. DUP'S } FIELD QC TPH

HOLDING TIMES MET (YES) NO TOC OK — TPH'S HT'S OK —

INITIAL CALIBRATION TOC ICV ICB OK; TPH ICV/ICB OK —

BLANKS:

METHOD TOC OK (ND) — TPH'S OK (ND) —

FIELD TOC ERB OK (ND) — TPH'S OK (ND) —

CONT. CALIBRATION TOC CCV CCB'S OK; TPH CCV/CCB'S OK —

DUPLICATES:

LAB TOC OK — TPH'S OK —

FIELD TOC N/A — TPH'S OK —

MS/MSD TOC - OK — TPH'S OK —

LCS/CONTROL CHARTS TOC OK — TPH'S OK —

COMMENTS ① CANNOT VALIDATE CEC'S. ② VALIDATOR DID NOT CHANGE "<" VALUES TO "U"'S FOR GEN CHEM - LEFT TO DISCRETION OF DATA BASE MGR.

795 153

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401330

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37469_

Matrix (soil/water): WATER Lab Sample ID: 37469025__

Level (low/med): LOW__ Date Received: 01/29/94

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	12.3	U		P_
7440-38-2	Arsenic__	1.0	~~B~~	J	F_
7440-41-7	Beryllium	0.50	U		P_
7440-43-9	Cadmium__	1.3	U		P_
7440-47-3	Chromium_	2.2	U		P_
7440-50-8	Copper___	1.3	U		P_
7439-92-1	Lead____	0.30	U		F_
7439-97-6	Mercury__	0.16	~~B~~	~~N~~UJ	CV
7440-02-0	Nickel___	78.2			P_
7782-49-2	Selenium_	1.5	~~B~~	~~N~~UJ	F_
7440-22-4	Silver___	1.8	U		P_
7440-28-0	Thallium_	0.80	U		F_
7440-66-6	Zinc____	3.9	U		P_
	Cyanide__	2.7	U		C_

KAD 4/3

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

WJ 4/20 4/11

795 154

LEVEL C DATA REVIEW AND VALIDATION
Kelly AFB

CASE 37472 ANALYSIS. VOC MATRIX Water/Soil

REVIEWED BY J. Coffey DATE 3/30/94

DATA PACKAGE COMPLETE: (YES) NO

NUMBER of SAMPLES 17 FIELD QC SAMPLES 4

CASE NARRATIVE SUMMARY C9400919 and C9400920 Required dilutions

HOLDING TIMES MET. (YES) NO

GC/MS TUNE OK

INITIAL CALIBRATION OK

CONTINUING CALIBRATION OK

BLANKS. See Attached Sheet

METHOD

EQUIPMENT RINSE C9400901 EB1, C9400918 EB2

FIELD. w/ 37421 $MeCl_2$ = 2J

TRIP (VOC) C9400902 TB1

SURROGATES OK

DUPLICATES

LAB N/A

FIELD C9400905 FD1

MS/MSD With SDG 37436 : OK For Water w/SDG 37469

INTERNAL STD SUMMARY OK

COMMENTS Field Sample Data qualified to report values w/ lowest associated Detection Limits.

795 155

ORGANIC BLANK SUMMARY

SDG 37442

Blank Number	Compound				Refers to Sample Number(s)
	$MeCl_2$	CS_2			
EB1	2 J	4 J			ALL.
EB2	3 J	—			↓
TB1	3 J	—			
VBLKW1 0203	1 J	—			
0206	—	—			
VBLKS1_0204	—	—			
AB	2	—			ALL.

DV WORKSHEET

SDG _____

Analysis _____

Compound	Initial Calib. RRF	Initial Calib. %RSD	Cont. Calib. %D	Cont. Calib. %D	Comments

795 157

37442

LEVEL C DATA REVIEW AND VALIDATION
Kelly AFB

CASE 3/31/94 ANALYSIS: SVOC MATRIX Soil & Water

REVIEWED BY J. Coffey DATE 3/31/94

DATA PACKAGE COMPLETE (YES) NO ok ✓

NUMBER of SAMPLES 17 ✓ FIELD QC SAMPLES 3

CASE NARRATIVE SUMMARY All ok. ✓ ✓

HOLDING TIMES MET: (YES) NO ok. ✓

GC/MS TUNE All w/in limits. ✓

INITIAL CALIBRATION All < 30% RSD ✓

CONTINUING CALIBRATION All < 25% D. ✓

BLANKS:

METHOD PBLkw1_01-28 / PBLkS1_02-02

EQUIPMENT RINSE EB ——→

FIELD AB ——→

TRIP (VOC) NA

SURROGATES. All w/in limits ✓

DUPLICATES

LAB N/A ✓

FIELD C9400905FD1

MS/MSD Soil w/ SDG 37436 Water PLCSW1-01-28 MS/MSD : ok ✓

INTERNAL STD SUMMARY All w/in limits. ✓

COMMENTS ok ✓

795 158

ORGANIC BLANK SUMMARY

SDG 37442

Blank Number	Compound				Refers to Sample Number(s)
	N-Nitroso-diphenyl-amine	Benzo-k-fluoranthene			
C940090 1EB1	2 J				
C940091BEB2	–				
SBLKS1-0201	53 J	38 J			03 – 11, 13, 14
SBLKS2-0201	40 J	–			15, 16

795 159

DV WORKSHEET

SDG _____

Analysis _____

Compound	Initial Calib. RRF	Initial Calib. %RSD	Cont. Calib. %D	Cont. Calib. %D	Comments

795 180

LEVEL C DATA REVIEW AND VALIDATION
Kelly AFB

CASE 37442 ANALYSIS: OC-PESTICIDES and PCB'S MATRIX Water + Soil

REVIEWED BY J. Coffey DATE 3/31/94

DATA PACKAGE COMPLETE: (YES) NO ✓

NUMBER of SAMPLES 17 FIELD QC SAMPLES 3

✓

CASE NARR. SUMMARY Low DCB recoveries noted for C9400918EB2, C9400919, C9400922, C9400923, C9400920 Also CAR GC-9400 7

HOLDING TIMES MET: (YES) NO

SURROGATES See Case Narrative Summary ✓

INITIAL CALIBRATION OK

CONTINUING CALIBRATION OK ✓

BLANKS:

METHOD PBLKW1_01-28 / PBLKS1_02:02 = ND's

EQUIPMENT RINSE →

FIELD w/ SDG 37421 = ND's ✓

DUPLICATES.

LAB N/A

FIELD C9400905FD1/C9400904 = ND's

PESTICIDE DEGRADATION STUDY ok ✓

PEST ANALYTICAL SEQUENCE ok ✓

MS/MSD Soil w/ 37436 / PLCSW1_01-28MS/MSD

COMMENTS ok ✓

✓

LEVEL C DATA REVIEW AND VALIDATION collected

Kelly AFB

795 161

1/24

CASE 37442 ANALYSIS: METALS/CN MATRIX SOILS / GROUND WATERS

REVIEWED BY K.A. SANDERS DATE 19 MAR 94

DATA PACKAGE COMPLETE: (YES) NO ✓

NUMBER of SAMPLES 20 FIELD QC SAMPLES 001 018 ERB'S; 004 005 SOIL FLD DUPS; 37421-1 FLD BLK; 37392-1 GLOVE BLK; 37469 -20/21 GW F. DUPS

CASE NARRARATIVE SUMMARY -22 SE "A" OUT; 37452 SDG IS QC FOR SOIL METALS; 37436-1 ERB AS H_2O CEN QC; . SEE "COMMENTS", PP2

HOLDING TIMES MET: (YES) NO all HT's met - OK

INITIAL CALIBRATION all ICV requirements met - OK ✓

CONTINUING CALIBRATION all CCV criteria met - OK

BLANKS: (UNUSUAL OCCURRENCES)

INTITIAL CALIBRATION see "BLANKS"

CONT. CALIBRATION worksheet ✓

PREP. (attached)

FIELD ✓

ERB ✓

SPIKES:

PREDIGESTION all prepikes met criteria - OK

ICP POSTDIGESTION N/A for this SDG ↑ ✓

LEVEL C DATA VALIDATION

37442

795 162

METALS/CN (Page 2)

DUPLICATES:

LAB all LAB DUPS MET CRITERIA — -OK-

FIELD SOIL FIELD DUPS MET CRITERIA -OK-

WATER FDUPS -OK-

LCS/CONTROL CHARTS all LCS's within established criteria -OK

ICSAB all -AB criteria met -OK-

ICP SERIAL DILUTION all met requirements -OK-

GFAA QC REQUIREMENTS SR POST SPIKE OUT ON -022 (J). all other parameters within criteria -OK-

COMMENTS ① As, Se, Tl, + Pb BY ICP FOR SOILS; IDL > CRDL, ∴ 4 × IDL = REVISED CRDL. ② ALTHOUGH ERB USED FOR QC ON WATER CEN FOR 018 → 022 001, 023; USED ANYWAY — 018, 001 ALSO ERB

795 163

INORGANIC BLANKS

SDG 37442 VALIDATOR K.A. SANDERS

ELEMENT	ICB CCB	H2O PB	*SOIL* PB*	ERB	FB	X5 ug/l	X5 * mg/kg *
Antimony							
Arsenic	0.7 ±					3.5	
Barium							
Beryllium							
Cadmium							
Chromium			0.488		3.2	16	3.2
Cobalt							
Copper	2.5				1.3	12.5	2.5
Nickel							
Silver							
Tin							
Vanadium							
Zinc	12.4			~~*~~ 5.3		62	12.4
Cyanide					4.0	20.0	1.0
Sulfide							
Lead				0.7 ±		3.5	
Mercury	0.1					0.5	0.07
Selenium							
Thallium							

Comments: ** values as mg/kg, all others ug/l

* 5.3 ug/l Zn - GLOVE BLK USED FOR ALL PACKAGES.

± GFAA ONLY - WATERS BY "F" ONLY

- 0.5 ug/l Be + - 3.4 ug/l Cu DISREGARDED

collected 1/24

LEVEL C DATA REVIEW AND VALIDATION
KELLY AFB

CASE 37442 MATRIX SOIL ANALYSIS: WET CHEM PARAMETERS CEC TOC TPH

REVIEWED BY K.A. SANDERS DATE 19 MAR 94

DATA PACKAGE COMPLETE: YES NO -OK-

NUMBER of SAMPLES TOC 2 / TPH 14 FIELD QC SAMPLES TOC ERB. 37469-1) TPH 001 ERB, LMG 003/004 FLD DUPS; 37382 GLOVE BLK, 37421-1 FLD BLK

CASE NARRATIVE SUMMARY TOC- all criteria met. OK-
TPH- all criteria met -OK-

HOLDING TIMES MET: YES NO all TOC/TPH HT's met -OK-

INITIAL CALIBRATION all TOC ICV/ICB's OK. TPH ICV/ICB's OK-

BLANKS:

METHOD TOC MBLK OK(ND); TPH MBLK'S (ND) OK-

FIELD TOC ERB OK(ND); TPH FBLK'S + ERB OK(ND)-

CONT. CALIBRATION all TOC CCV/CCB's OK. TPH CCV/CCB's OK-

DUPLICATES:

LAB TOC OK- TPH's OK-

FIELD TOC- N/A. TPH's OK-

MS/MSD TOC OK- TPH's OK-

LCS/CONTROL CHARTS TOC's OK- TPH's OK-

COMMENTS (1) CANNOT VALIDATE THE CEC DATA.
(2) VALIDATOR DID NOT CHANGE GEN CHEM "<"'s to "U"'s - left to discretion of data base MGR.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9400903

Lab Name: QAL/LRD Contract: 37442

Lab Code: _____ Case No.: 37442 SAS No.: _____ SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442003

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 94M2VO1305

Level: (low/med) LOW Date Received: 01/25/94

% Moisture: not dec. 13 Date Analyzed: 01/27/94

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene chloride	11 ~~3~~ 4	~~J~~ U
67-64-1	Acetone	5	J
75-15-0	Carbon disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
591-78-6	2-Hexanone	11	U
108-10-1	4-Methyl-2-pentanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylenes (total)	11	U

FORM I VOA 1/87 Rev

JC 3/31/94

CHEM HILL DP KJ APR 13 '94

4/4/94

4/4

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET 735 166

EPA SAMPLE NO.

C9400904

Lab Name: QAL/LRD Contract: 37442

Lab Code: _____ Case No.: 37442 SAS No.: _____ SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442004

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 94M2VO1306

Level: (low/med) LOW Date Received: 01/25/94

Moisture: not dec. 15 Date Analyzed: 01/28/94

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene chloride	12	U
67-64-1	Acetone	12	U
75-15-0	Carbon disulfide	12	U
75-35-4	1,1-Dichloroethene	12	U
75-34-3	1,1-Dichloroethane	12	U
540-59-0	1,2-Dichloroethene (total)	12	U
67-66-3	Chloroform	12	U
107-06-2	1,2-Dichloroethane	12	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon tetrachloride	12	U
75-27-4	Bromodichloromethane	12	U
78-87-5	1,2-Dichloropropane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
79-01-6	Trichloroethene	12	U
124-48-1	Dibromochloromethane	12	U
79-00-5	1,1,2-Trichloroethane	12	U
71-43-2	Benzene	12	U
10061-02-6	trans-1,3-Dichloropropene	12	U
75-25-2	Bromoform	12	U
591-78-6	2-Hexanone	12	U
108-10-1	4-Methyl-2-pentanone	12	U
127-18-4	Tetrachloroethene	12	U
79-34-5	1,1,2,2-Tetrachloroethane	12	U
108-88-3	Toluene	12	U
108-90-7	Chlorobenzene	12	U
100-41-4	Ethylbenzene	12	U
100-42-5	Styrene	12	U
1330-20-7	Xylenes (total)	12	U

3/30/94

FORM I VOA 1/87 Rev.

CH2M Hill DP KJ APR 13 94 2/24/18

000009

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

795 167

EPA SAMPLE NO.

C9400906

Lab Name: QAL/LRD Contract: 37142

Lab Code: _____ Case No.: 37442 SAS No.: _____ SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442006

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 94M2V01492

Level: (low/med) LOW Date Received: 01/25/94

Moisture: not dec. 14 Date Analyzed: 02/04/94

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene chloride	12 ~~8~~	~~U~~ 4
67-64-1	Acetone	17	
75-15-0	Carbon disulfide	12	U
75-35-4	1,1-Dichloroethene	12	U
75-34-3	1,1-Dichloroethane	12	U
540-59-0	1,2-Dichloroethene (total)	12	U
67-66-3	Chloroform	12	U
107-06-2	1,2-Dichloroethane	12	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon tetrachloride	12	U
75-27-4	Bromodichloromethane	12	U
78-87-5	1,2-Dichloropropane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
79-01-6	Trichloroethene	12	U
124-48-1	Dibromochloromethane	12	U
79-00-5	1,1,2-Trichloroethane	12	U
71-43-2	Benzene	12	U
10061-02-6	trans-1,3-Dichloropropene	12	U
75-25-2	Bromoform	12	U
591-78-6	2-Hexanone	12	U
108-10-1	4-Methyl-2-pentanone	12	U
127-18-4	Tetrachloroethene	12	U
79-34-5	1,1,2,2-Tetrachloroethane	12	U
108-88-3	Toluene	12	U
108-90-7	Chlorobenzene	12	U
100-41-4	Ethylbenzene	12	U
100-42-5	Styrene	12	U
1330-20-7	Xylenes (total)	12	U

3/30/94

FORM I VOA 1/87 Rev.

3/14/94

APR 13 '94

000011

 795168

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9400903

Name: QAL/LRD Contract: 37442

Lab Code: Case No.: 37442 SAS No.: SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 94M1BN1295

Level: (low/med) LOW Date Received: 01/25/94

% Moisture: not dec. 12 dec. Date Extracted: 02/01/94

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/11/94

GPC Cleanup: (Y/N) N pH: 8.1 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	370	U
111-44-4	bis(2-Chloroethyl)ether	370	U
95-57-8	2-Chlorophenol	370	U
541-73-1	1,3-Dichlorobenzene	370	U
106-46-7	1,4-Dichlorobenzene	370	U
95-50-1	1,2-Dichlorobenzene	370	U
95-48-7	2-Methylphenol	370	U
108-60-1	2,2'-oxybis(1-Chloropropane)	370	U
106-44-5	4-Methylphenol	370	U
621-64-7	N-Nitroso-di-n-propylamine	370	U
67-72-1	Hexachloroethane	370	U
98-95-3	Nitrobenzene	370	U
78-59-1	Isophorone	370	U
88-75-5	2-Nitrophenol	370	U
105-67-9	2,4-Dimethylphenol	370	U
111-91-1	bis(2-Chloroethoxy)methane	370	U
120-83-2	2,4-Dichlorophenol	370	U
120-82-1	1,2,4-Trichlorobenzene	370	U
91-20-3	Naphthalene	370	U
106-47-8	4-Chloroaniline	370	U
87-68-3	Hexachlorobutadiene	370	U
59-50-7	4-Chloro-3-methylphenol	370	U
91-57-6	2-Methylnaphthalene	370	U
77-47-4	Hexachlorocyclopentadiene	370	U
88-06-2	2,4,6-Trichlorophenol	370	U
95-95-4	2,4,5-Trichlorophenol	910	U
91-58-7	2-Chloronaphthalene	370	U
88-74-4	2-Nitroaniline	910	U
131-11-3	Dimethylphthalate	370	U
208-96-8	Acenaphthylene	370	U
606-20-2	2,6-Dinitrotoluene	370	U

FORM I SV-1 1/87 Rev.

3/31/93 AC

CH2M Hill DP YJ APR 15 '94

000087

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9400903

Lab Name: QAL/LRD Contract: 37442

Lab Code: _____ Case No.: 37442 SAS No.: _____ SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 94M1BN1295

Level: (low/med) LOW Date Received: 01/25/94

% Moisture: not dec. 12 dec. ____ Date Extracted: 02/01/94

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/11/94

GPC Cleanup: (Y/N) N pH: 8.1 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	910	U
83-32-9	Acenaphthene	370	U
51-28-5	2,4-Dinitrophenol	910	U
100-02-7	4-Nitrophenol	910	U
132-64-9	Dibenzofuran	370	U
121-14-2	2,4-Dinitrotoluene	370	U
84-66-2	Diethylphthalate	370	U
7005-72-3	4-Chlorophenyl-phenylether	370	U
86-73-7	Fluorene	370	U
100-01-6	4-Nitroaniline	910	U
534-52-1	4,6-Dinitro-2-methylphenol	910	U
86-30-6	N-Nitrosodiphenylamine (1)	370 ~~41~~	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	370	U
118-74-1	Hexachlorobenzene	370	U
87-86-5	Pentachlorophenol	910	U
85-01-8	Phenanthrene	370	U
120-12-7	Anthracene	370	U
86-74-8	Carbazole	370	U
84-74-2	Di-n-butylphthalate	370	U
206-44-0	Fluoranthene	370	U
129-00-0	Pyrene	370	U
85-68-7	Butylbenzylphthalate	370	U
91-94-1	3,3'-Dichlorobenzidine	370	U
56-55-3	Benzo(a)anthracene	370	U
218-01-9	Chrysene	370	U
117-81-7	bis(2-Ethylhexyl)phthalate	370	U
117-84-0	Di-n-octylphthalate	370	U
205-99-2	Benzo(b)fluoranthene	370	U
207-08-9	Benzo(k)fluoranthene	370	U
50-32-8	Benzo(a)pyrene	370	U
193-39-5	Indeno(1,2,3-cd)pyrene	370	U
53-70-3	Dibenz(a,h)anthracene	370	U
191-24-2	Benzo(g,h,i)perylene	370	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2 3/3/94 1/87 Rev.

CH2M HILL OR KJ APR 13'94

000083

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9400904

Name: QAL/LRD Contract: 37442

Lab Code: _____ Case No.: 37442 SAS No.: _____ SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442004

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 94M1BN1296

Level: (low/med) LOW Date Received: 01/25/94

% Moisture: not dec. 15 dec. ____ Date Extracted: 02/01/94

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/11/94

GPC Cleanup: (Y/N) N pH: 8.9 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	390	U
111-44-4	bis(2-Chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
541-73-1	1,3-Dichlorobenzene	390	U
106-46-7	1,4-Dichlorobenzene	390	U
95-50-1	1,2-Dichlorobenzene	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-n-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	bis(2-Chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
120-82-1	1,2,4-Trichlorobenzene	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	940	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	940	U
131-11-3	Dimethylphthalate	390	U
208-96-8	Acenaphthylene	390	U
606-20-2	2,6-Dinitrotoluene	390	U

FORM I SV-1 1/87 Rev.

AC 3/31/94

CH2M HILL DP EJ APR 13 '94

W 4/18

000089

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

735 171

C9400904

Lab Name: QAL/LRD Contract: 37442

Lab Code: Case No.: 37442 SAS No.: SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442004

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 94M1BN1296

Level: (low/med) LOW Date Received: 01/25/94

% Moisture: not dec. 15 dec. Date Extracted: 02/01/94

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/11/94

GPC Cleanup: (Y/N) N pH: 8.9 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	940	U
83-32-9	Acenaphthene	390	U
51-28-5	2,4-Dinitrophenol	940	U
100-02-7	4-Nitrophenol	940	U
132-64-9	Dibenzofuran	390	U
121-14-2	2,4-Dinitrotoluene	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	940	U
534-52-1	4,6-Dinitro-2-methylphenol	940	U
86-30-6	N-Nitrosodiphenylamine (1)	390 ~~47~~	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
87-86-5	Pentachlorophenol	940	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-81-7	bis(2-Ethylhexyl)phthalate	190	J
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenz(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2 3/31/94 JC 1/87 Rev.

C-2M Hill DP KJ APR 13 '94

000030 MK

705 172

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9400906

Lab Name: QAL/LRD Contract: 37442

Lab Code: Case No.: 37442 SAS No.: SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442006

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 94M1BN1298

Level: (low/med) LOW Date Received: 01/25/94

% Moisture: not dec. 12 dec. Date Extracted: 02/01/94

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/11/94

GPC Cleanup: (Y/N) N pH: 8.8 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	370	U
111-44-4	bis(2-Chloroethyl)ether	370	U
95-57-8	2-Chlorophenol	370	U
541-73-1	1,3-Dichlorobenzene	370	U
106-46-7	1,4-Dichlorobenzene	370	U
95-50-1	1,2-Dichlorobenzene	370	U
95-48-7	2-Methylphenol	370	U
108-60-1	2,2'-oxybis(1-Chloropropane)	370	U
106-44-5	4-Methylphenol	370	U
621-64-7	N-Nitroso-di-n-propylamine	370	U
67-72-1	Hexachloroethane	370	U
98-95-3	Nitrobenzene	370	U
78-59-1	Isophorone	370	U
88-75-5	2-Nitrophenol	370	U
105-67-9	2,4-Dimethylphenol	370	U
111-91-1	bis(2-Chloroethoxy)methane	370	U
120-83-2	2,4-Dichlorophenol	370	U
120-82-1	1,2,4-Trichlorobenzene	370	U
91-20-3	Naphthalene	370	U
106-47-8	4-Chloroaniline	370	U
87-68-3	Hexachlorobutadiene	370	U
59-50-7	4-Chloro-3-methylphenol	370	U
91-57-6	2-Methylnaphthalene	370	U
77-47-4	Hexachlorocyclopentadiene	370	U
88-06-2	2,4,6-Trichlorophenol	370	U
95-95-4	2,4,5-Trichlorophenol	910	U
91-58-7	2-Chloronaphthalene	370	U
88-74-4	2-Nitroaniline	910	U
131-11-3	Dimethylphthalate	370	U
208-96-8	Acenaphthylene	370	U
606-20-2	2,6-Dinitrotoluene	370	U

3/31/94

FORM I SV-1 1/87 Rev.

WA 4/18

APR 13 '94

4/4

795 (73) 1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9400906

Lab Name: QAL/LRD Contract: 37442

Lab Code: _____ Case No.: 37442 SAS No.: _____ SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442006

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 94M1BN1298

Level: (low/med) LOW Date Received: 01/25/94

% Moisture: not dec. 12 dec. ____ Date Extracted: 02/01/94

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/11/94

GPC Cleanup: (Y/N) N pH: 8.8 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	910	U
83-32-9	Acenaphthene	370	U
51-28-5	2,4-Dinitrophenol	910	U
100-02-7	4-Nitrophenol	910	U
132-64-9	Dibenzofuran	370	U
121-14-2	2,4-Dinitrotoluene	370	U
84-66-2	Diethylphthalate	370	U
7005-72-3	4-Chlorophenyl-phenylether	370	U
86-73-7	Fluorene	370	U
100-01-6	4-Nitroaniline	910	U
534-52-1	4,6-Dinitro-2-methylphenol	910	U
86-30-6	N-Nitrosodiphenylamine (1)	370 ~~54~~	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	370	U
118-74-1	Hexachlorobenzene	370	U
87-86-5	Pentachlorophenol	910	U
85-01-8	Phenanthrene	370	U
120-12-7	Anthracene	370	U
86-74-8	Carbazole	370	U
84-74-2	Di-n-butylphthalate	370	U
206-44-0	Fluoranthene	370	U
129-00-0	Pyrene	370	U
85-68-7	Butylbenzylphthalate	370	U
91-94-1	3,3'-Dichlorobenzidine	370	U
56-55-3	Benzo(a)anthracene	370	U
218-01-9	Chrysene	370	U
117-81-7	bis(2-Ethylhexyl)phthalate	330	J
117-84-0	Di-n-octylphthalate	370	U
205-99-2	Benzo(b)fluoranthene	370	U
207-08-9	Benzo(k)fluoranthene	370	U
50-32-8	Benzo(a)pyrene	370	U
193-39-5	Indeno(1,2,3-cd)pyrene	370	U
53-70-3	Dibenz(a,h)anthracene	370	U
191-24-2	Benzo(g,h,i)perylene	370	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2 3/31/94 1/87 Rev

AC

CH2M HILL DE RO APR 13 94

000094

795 174

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9400903

Lab Name: QAL/LRD Contract: KELLY_AFB

Lab Code: Case No.: 37442 SAS No.: SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442003

Sample wt/vol: 30.0 (g/mL) G Lab File ID:

% Moisture: 12 decanted: (Y/N) N Date Received: 01/25/94

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 02/02/94

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 02/11/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GC Cleanup: (Y/N) Y pH: 8.2 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.9	U
319-85-7	beta-BHC	1.9	U
319-86-8	delta-BHC	1.9	U
58-89-9	gamma-BHC (Lindane)	1.9	U
76-44-8	Heptachlor	1.9	U
309-00-2	Aldrin	1.9	U
1024-57-3	Heptachlor epoxide	1.9	U
959-98-8	Endosulfan I	1.9	U
60-57-1	Dieldrin	3.7	U
72-55-9	4,4'-DDE	3.7	U
72-20-8	Endrin	3.7	U
33213-65-9	Endosulfan II	3.7	U
72-54-8	4,4'-DDD	3.7	U
1031-07-8	Endosulfan sulfate	3.7	U
50-29-3	4,4'-DDT	3.7	U
72-43-5	Methoxychlor	19	U
53494-70-5	Endrin ketone	3.7	U
7421-36-3	Endrin aldehyde	3.7	U
5103-71-9	alpha-Chlordane	1.9	U
5103-74-2	gamma-Chlordane	1.9	U
8001-35-2	Toxaphene	190	U
12674-11-2	Aroclor-1016	37	U
11104-28-2	Aroclor-1221	76	U
11141-16-5	Aroclor-1232	37	U
53469-21-9	Aroclor-1242	37	U
12672-29-6	Aroclor-1248	37	U
11097-69-1	Aroclor-1254	37	U
11096-82-5	Aroclor-1260	37	U

FORM I PEST 3/90

2/24/18/94 JC 3/31/94

CH2M HILL CP KC APR 13 '94

4/4

735 1175

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9400904

Lab Name: QAL/LRD Contract: KELLY_AFB

Lab Code: Case No.: 37442 SAS No.: SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442004

Sample wt/vol: 30.0 (g/mL) G Lab File ID:

% Moisture: 16 decanted: (Y/N) N Date Received: 01/25/94

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 02/02/94

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 02/11/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 8.9 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	2.0	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	2.0	U
58-89-9	gamma-BHC (Lindane)	2.0	U
76-44-8	Heptachlor	2.0	U
309-00-2	Aldrin	2.0	U
1024-57-3	Heptachlor epoxide	2.0	U
959-98-8	Endosulfan I	2.0	U
60-57-1	Dieldrin	3.9	U
72-55-9	4,4'-DDE	3.9	U
72-20-8	Endrin	3.9	U
33213-65-9	Endosulfan II	3.9	U
72-54-8	4,4'-DDD	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
50-29-3	4,4'-DDT	3.9	U
72-43-5	Methoxychlor	20	U
53494-70-5	Endrin ketone	3.9	U
7421-36-3	Endrin aldehyde	3.9	U
5103-71-9	alpha-Chlordane	2.0	U
5103-74-2	gamma-Chlordane	2.0	U
8001-35-2	Toxaphene	200	U
12674-11-2	Aroclor-1016	39	U
11104-28-2	Aroclor-1221	80	U
11141-16-5	Aroclor-1232	39	U
53469-21-9	Aroclor-1242	39	U
12672-29-6	Aroclor-1248	39	U
11097-69-1	Aroclor-1254	39	U
11096-82-5	Aroclor-1260	39	U

3/31/94

APR 13 '94

795 176

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

C9400906

Lab Name: QAL/LRD Contract: KELLY_AFB

Lab Code: Case No.: 37442 SAS No.: SDG No.: 37442

Matrix: (soil/water) SOIL Lab Sample ID: 37442006

Sample wt/vol: 30.0 (g/mL) G Lab File ID:

% Moisture: 13 decanted: (Y/N) N Date Received: 01/25/94

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 02/02/94

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 02/11/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 8.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	2.0	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	2.0	U
58-89-9	gamma-BHC (Lindane)	2.0	U
76-44-8	Heptachlor	2.0	U
309-00-2	Aldrin	2.0	U
1024-57-3	Heptachlor epoxide	2.0	U
959-98-8	Endosulfan I	2.0	U
60-57-1	Dieldrin	3.8	U
72-55-9	4,4'-DDE	3.8	U
72-20-8	Endrin	3.8	U
33213-65-9	Endosulfan II	3.8	U
72-54-8	4,4'-DDD	3.8	U
1031-07-8	Endosulfan sulfate	3.8	U
50-29-3	4,4'-DDT	3.8	U
72-43-5	Methoxychlor	20	U
53494-70-5	Endrin ketone	3.8	U
7421-36-3	Endrin aldehyde	3.8	U
5103-71-9	alpha-Chlordane	2.0	U
5103-74-2	gamma-Chlordane	2.0	U
8001-35-2	Toxaphene	200	U
12674-11-2	Aroclor-1016	38	U
11104-28-2	Aroclor-1221	77	U
11141-16-5	Aroclor-1232	38	U
53469-21-9	Aroclor-1242	38	U
12672-29-6	Aroclor-1248	38	U
11097-69-1	Aroclor-1254	38	U
11096-82-5	Aroclor-1260	38	U

FORM I PEST 3/90

3/31/94

CH2M Hill OP KJ APR 13 '94

795 177

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9400903

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37442_

Matrix (soil/water) SOIL_ Lab Sample ID: 37442003__

Level (low/med): LOW__ Date Received: 01/25/94

% Solids: _86.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	3.0	U		P_
7440-38-2	Arsenic__	4.7	~~B~~	J	P_
7440-41-7	Beryllium	0.89	~~B~~	J	P_
7440-43-9	Cadmium__	0.40	~~B~~	J	P_
7440-47-3	Chromium_	14.0			P_
7440-50-8	Copper___	10.7			P_
7439-92-1	Lead____	9.6	~~B~~	J	P_
7439-97-6	Mercury__	0.03	U		CV
7440-02-0	Nickel___	10.3			P_
7782-49-2	Selenium_	10.3	U		P_
7440-22-4	Silver___	0.42	U		P_
7440-28-0	Thallium_	5.5	U		P_
7440-66-6	Zinc____	33.0			P_
	Cyanide__	0.16	U		C_

3/19

Color Before: BLACK____ Clarity Before: _____ Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MO)

CH2M HILL OP KJ APR 11'94

4/19/94

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

C9400904

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD Case No.: _____ SAS No.: _____ SDG No.: 37442_

Matrix (soil/water): SOIL_ Lab Sample ID: 37442004__

Level (low/med): LOW__ Date Received: 01/25/94

% Solids: _84.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	3.0	U		P_
7440-38-2	Arsenic__	3.3	U		P_
7440-41-7	Beryllium	0.54	~~B~~	J	P_
7440-43-9	Cadmium__	0.31	~~B~~	J	P_
7440-47-3	Chromium_	9.3			P_
7440-50-8	Copper___	6.0			P_
7439-92-1	Lead____	8.0	~~B~~	J	P_
7439-97-6	Mercury__	0.03	U		CV
7440-02-0	Nickel___	7.5	~~B~~	J	P_
7782-49-2	Selenium_	10.5	U		P_
7440-22-4	Silver___	0.43	U		P_
7440-28-0	Thallium_	5.6	U		P_
7440-66-6	Zinc____	23.4			P_
	Cyanide__	0.22	~~B~~	U	C_

3/19

Color Before: LT_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-9a)

CH2M Hill DP KJ APR 11'94

4/19 4/11

795 179

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9400906

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37442_

Matrix (soil/water): SOIL_ Lab Sample ID: 37442006__

Level (low/med): LOW__ Date Received: 01/25/94

% Solids: _85.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	3.0	U		P_
7440-38-2	Arsenic__	6.3	~~B~~	J	P_
7440-41-7	Beryllium	0.55	~~B~~	J	P_
7440-43-9	Cadmium__	0.57	~~B~~	J	P_
7440-47-3	Chromium_	9.5			P_
7440-50-8	Copper___	6.5			P_
7439-92-1	Lead____	6.4	~~B~~	J	P_
7439-97-6	Mercury__	0.03	U		CV
7440-02-0	Nickel___	7.4	~~B~~	J	P_
7782-49-2	Selenium_	10.4	U		P_
7440-22-4	Silver___	0.42	U		P_
7440-28-0	Thallium_	5.5	U		P_
7440-66-6	Zinc____	23.3			P_
	Cyanide__	0.16	U		C_

KAB 3/19

Color Before: LT_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD

VJ 4/14 JA 4/14

C42H HILL DP KJ APR 11'94

Data Quality Evaluation Results
Surface Soil Samples
Arsenic Results

LEVEL C DATA REVIEW AND VALIDATION
Kelly AFB

corrected 2/3

CASE 37504 ANALYSIS: METALS/CN MATRIX 1 GROUNDWATER SOILS +

REVIEWED BY K.A. SAUDERS DATE 3 APR 94

DATA PACKAGE COMPLETE: (YES) NO OK — ✓

NUMBER of SAMPLES 15 FIELD QC SAMPLES 003 (ERB), 37496 FLD BLK; 37382, 37469 GLV BLK, SOIL + GW FIELD DUPS)

CASE NARRARATIVE SUMMARY GFAA POSTSPK OUT FOR SE ON 002;

37496 IS GW QC

HOLDING TIMES MET (YES) NO all HT's met — OK

INITIAL CALIBRATION all ICV requirements met - OK ✓

CONTINUING CALIBRATION all CCV criteria met - OK —

BLANKS: (UNUSUAL OCCURRENCES)

INTITIAL CALIBRATION see "BLANKS" worksheet

CONT. CALIBRATION

PREP. (attached) ✓

FIELD

ERB

SPIKES:

PREDIGESTION all MS's within limits - OK

POSTDIGESTION N/A

37504

LEVEL C DATA VALIDATION

795 182

METALS/CN (Page 2)

DUPLICATES:

LAB all lab dups meet requirements — ✓

FIELD all field dup criteria met - OK

LCS/CONTROL CHARTS all LCS's within criteria

ICSAB all - AB requirements met -

ICP SERIAL DILUTION all criteria met - OK - ✓

GFAA QC REQUIREMENTS GFAA spikes out for Se on 002 - J/UJ

COMMENTS ① SOIL As, Se, Tl, + Pb BY ICP ; IDL > CRDL, ∴ 4 x IDL = REVISED CRDL

② SOILS ARE ARSENIC ONLY IN THIS SDG —

INORGANIC BLANKS

SDG 37504 VALIDATOR K. A. SAUDERS

ELEMENT	ICB CCB	H2O PB	SOIL PB	ERB	FB	X5 ug/l	X5 mg/kg
Antimony	clean			clean			
Arsenic	↓	↓	↓	↓			
Barium							
Beryllium							
Cadmium							
Chromium							
Cobalt							
Copper							
Nickel							
Silver							
Tin							
Vanadium							
Zinc					4.6	23	~~23~~
Cyanide							
Sulfide							
Lead							
Mercury							
Selenium							
Thallium							

Comments: 2/2 ERB clean for all analytes (ND)

2/3 ERB clean for As (ND)

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401504

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504004__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _81.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	15.8	_		P
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__		_		NR
7440-47-3	Chromium_		_		NR
7440-50-8	Copper___		_		NR
7439-92-1	Lead____		_		NR
7439-97-6	Mercury__		_		NR
7440-02-0	Nickel___		_		NR
7782-49-2	Selenium_		_		NR
7440-22-4	Silver___		_		NR
7440-28-0	Thallium_		_		NR
7440-66-6	Zinc____		_		NR
	Cyanide__		_		NR
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		

KD 4/3

Color Before: DK_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

CH2M Hill DP KJ APR 12'94 7/24/00 4/4/1 000102

MODIFIED U.S. EPA - CLP

795 185

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401505

Lab Name: QAL_____ Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No. _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504005__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _77.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	11.2	B	J	P_
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-47-3	Chromium_				NR
7440-50-8	Copper___				NR
7439-92-1	Lead____				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-28-0	Thallium_				NR
7440-66-6	Zinc____				NR
	Cyanide__				NR

KB 4/3

Color Before: DK_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MO...Ba

CH2M Hill DP KJ APR 12'94 4/4

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401506

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504006__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _77.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	10.8	~~B~~	J	P_
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-47-3	Chromium_				NR
7440-50-8	Copper___				NR
7439-92-1	Lead____				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-28-0	Thallium_				NR
7440-66-6	Zinc____				NR
	Cyanide__				NR

4/3

Color Before: BLACK____ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-9a)

CH2M Hill DP KJ APR 12'94

4/20

4/4

000104

795 187

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401507

Lab Name: CAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No. _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504007__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _85.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	11.2	~~B~~	J	P_
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-47-3	Chromium_				NR
7440-50-8	Copper___				NR
7439-92-1	Lead____				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-28-0	Thallium_				NR
7440-66-6	Zinc____				NR
	Cyanide__				NR

4/3

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD 3a)

CH2M Hill OP KJ APR 12'94

000103

MODIFIED U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401508

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504008__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _78.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	10.0	B	J	P_
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-47-3	Chromium_				NR
7440-50-8	Copper___				NR
7439-92-1	Lead____				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-28-0	Thallium_				NR
7440-66-6	Zinc____				NR
	Cyanide__				NR

KDB 4/3

Color Before: BLACK____ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-9a

CH2M Hill GP KJ APR 12'94 4/11

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. C9401509

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504009__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: 76.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic	9.5	B	J	P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7440-50-8	Copper				NR
7439-92-1	Lead				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

CAB 4/3

Color Befcre: BLACK Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD 'a)

CH2M Hill DP KJ APR 12'94 2/14/20 4/11

000107

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401510

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504010__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _80.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	7.7	B	J	P_
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-47-3	Chromium_				NR
7440-50-8	Copper___				NR
7439-92-1	Lead____				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-28-0	Thallium_				NR
7440-66-6	Zinc____				NR
	Cyanide__				NR

KB 4/3

Color Before: BLACK____ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

CH2M Hill DP RJ APR 12'94

VA 4/20 4/6

795 191

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401511

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504011__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _82.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	9.5	~~B~~	J	P_
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-47-3	Chromium_				NR
7440-50-8	Copper___				NR
7439-92-1	Lead____				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-28-0	Thallium_				NR
7440-66-6	Zinc____				NR
	Cyanide__				NR

KAB 4/3

Color Before: DK_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD

CH2M HILL DP KC APR 12'94

4/20

4/11

000109

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401512

Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504012__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _78.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic	16.3			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7440-50-8	Copper				NR
7439-92-1	Lead				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

KAS 4/3

Color Before: DK_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-9a)

CH2M Hill CP KJ APR 12'94 2/7 4/20 4/

795 193

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401513

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504013__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _93.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	3.1	~~B~~	J	P_
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-47-3	Chromium_				NR
7440-50-8	Copper___				NR
7439-92-1	Lead_____				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-28-0	Thallium_				NR
7440-66-6	Zinc_____				NR
	Cyanide__				NR

4/3

Color Before: ORANGE___ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD 3)

CH2M HILL OP KC APR 12'94

4/20

4/1

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401514

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504014__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _91.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	7.5	B	J	P_
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-47-3	Chromium_				NR
7440-50-8	Copper___				NR
7439-92-1	Lead____				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-28-0	Thallium_				NR
7440-66-6	Zinc____				NR
	Cyanide__				NR

KB 4/3

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-9a

CH2M Hill OP KJ APR 12'94

WA 4/20
JA 4/11

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401516

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD___ Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504016__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _81.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	70.0			P_
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-47-3	Chromium_				NR
7440-50-8	Copper___				NR
7439-92-1	Lead____				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-28-0	Thallium_				NR
7440-66-6	Zinc____				NR
	Cyanide__				NR

KAD 4/3

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MO[illegible]a

CH2M Hill [illegible] APR 12'94 VA 4/20 JA 9/11 000114

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

C9401515

Lab Name: QAL Contract: KELLY_AFB_

Lab Code: LRD Case No.: _____ SAS No.: _____ SDG No.: 37504_

Matrix (soil/water): SOIL_ Lab Sample ID: 37504015__

Level (low/med): LOW__ Date Received: 02/04/94

% Solids: _89.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic	7.1	B	J	P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7440-50-8	Copper				NR
7439-92-1	Lead				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

4/3

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: LT_YELLOW Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-9a

CH2M Hill DP KJ APR 12'94

4/20 4/1

000110

795 197

Appendix D

Data Quality Evaluation Results for Dioxin Data

MEMORANDUM CH2MHILL

TO: Ann Castleberry/GNV

COPIES: Kelly AFB Project Files

FROM: Kishor Gala/DEN

DATE: October 6, 1994

SUBJECT: Kelly AFB-RI
Level 2 Data Validation for Zone 4 Samples
2,3,7,8-Specific Dibenzodioxins and Dibenzofurans Congeners

PROJECT: TXE70207.A0.06

Overview

This data validation memorandum discusses the quality of data generated for one (1) aqueous field blank sample (#37442-1/C94009-01EB1) and four soils samples (#37442-3 to 6/C94009-03 to -06), collected from Zone 4 on January 24, 1994. The samples were analyzed for 2,3,7,8-isomer specific congeners of individual polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). Table 1 lists pertinent information for the samples.

The PCDD/PCDF analysis was performed by the CH2M HILL's Quality Analytical Laboratory in Canada (Canviro Analytical Laboratories, Ltd., Waterloo, Ontario, Canada). The analysis followed the protocols of the isotope-dilution method SW846/8290 (high resolution gas chromatography/specific ion monitoring).

A Level 2 data package (sample results and QC summary) was provided for the samples. Raw data for the field and laboratory QC samples were not required.

Data validation guidelines were specifically developed using method-prescribed quality control criteria, since EPA-developed data validation guidelines do not exist for the isomer-specific PCDD/PCDF analyses.

Summary

The 2,3,7,8-PCDD/PCDF congeners were successfully analyzed in all samples. Minor quality control problems related to recovery of a few labeled internal standard (note: the term internal standard for the isotope dilution method is synonymous with surrogate

standard used in organic analysis) were observed for some samples, but there were no verifiable detections of corresponding native congeners (except for OctaCDD in some samples). A few ion abundance ratios for internal standards were outside the acceptance ranges, but these were not deemed to have any impact on the native PCDD/PCDF data.

In sample 37442-3/C94009-03, the internal standards for TetraCDD/CDF were not recovered. The native congeners did not appear to be present in the sample. The extract of the sample was reanalyzed on a different column with acceptable recovery of the labeled TetraCDD/CDF internal standards. Absence of the native congeners was confirmed on the second column.

The solid matrix (silica) method blank had a detection of OctaCDD at a concentration of 3.37 picograms/gram (parts per trillion, ppt). The solid matrix method blank yields more rigorous quality control information on the sample preparation/extraction/cleanup/analysis processes than an aqueous blank does. The solid matrix method blank data were used for validating the aqueous as well as the soil samples. The OctaCDD concentrations in samples were less than 5 times the blank concentration; therefore all OctaCDD values were qualified as undetected in the samples.

Sample 37442-4/C94009-04 contained OctaCDF at a concentration of 3.34 ppt, but the ion abundance ratio was not met (0.64 compared to the range of 0.76 to 1.02). This value should be considered as maximum possible concentration (MPC). The value has been flagged as "estimated, J" due to the quality control problem. This sample also had less than 40 percent recovery of the ^{13}C-1,2,3,7,8-PentaCDF internal standard. The native congener was not detected, but there is a potential that the detection limit may have been affected due to low recovery. Accordingly, the detection limit for the native congener has been qualified as "estimated, UJ."

Sample 37442-5/C94009-05FD1 also encountered less than 40 percent recovery of the two labeled PentaCDF congeners. The corresponding native congeners were not detected in the sample, but the detection limits have been qualified as "estimated, UJ." The reported detection limits already account for the low internal standard recoveries. Therefore, data qualification has no real impact on the usability of the reported detection limits.

Although qualified for minor quality control problems, the sample set presents fully usable data. Therefore, the data needs objectives are considered to be satisfied for the sample set.

The data quality assessment and problems are discussed in greater detail below.

795 200

Data Quality Assessment

The quality control criteria checked for the PCDD/PCDF data include the following:

- Holding Times--The samples were extracted within 30 days from the date of collection and analyzed within 45 days from the date of collection, as required. Therefore, the holding time criteria were satisfied.

- Mass spectrometer Tuning and Performance--Not applicable to Level 2 data package.

  The valley between 2,3,7,8-TetraCDD and closest eluting peak--Not applicable to Level 2 data package. The valley must be less than 10 percent at mass 304 with a mass resolution of 10,000 or better. (The high resolution method provides a parent resolution of over 10,000, which implies good separation characteristics. The valley between the two adjoining compounds is almost always better than 10 percent; hence, acceptable.)

  Signal to noise ratio (S/N)--Not applicable to Level 2 data package. The ratio should be greater than 10 for all native and labeled congeners. With respect to the required detection limits, the high resolution method almost never has any trouble achieving them. Detection limits of less than 10 picograms/liter (50 parts per quadrillion) for the aqueous sample and less than 6 ppt for soil samples were achieved for each native congener.

- Initial Calibration--A 5-point initial calibration was performed on February 9, 1994 and again on February 11, 1994. All response factors were better than 30 percent of the area of the internal standard. The relative standard deviation (RSD) among the five response factors was less than 20 for the native congeners and less than 30 for the labeled congeners; thus, acceptable.

  The ion ratios were within the acceptable ranges for all congeners in all standards.

  The acceptable recovery ranges for native congeners during the initial precision and recovery testing are compound-specific. These are not provided with the Level 2 data packages. Generally, a range of 40 to 200 percent is considered acceptable. The labeled congeners have the acceptance range of 40-135 percent.

795 201

- Continuing Calibration--For the continuing calibrations performed on February 10, 1994 (time 10:26) and February 11, 1994 (time 15:19), the difference between the initial calibration average response factor and the continuing calibration response factor below the acceptance limit of 30 percent. The field samples were analyzed within 12 hours of the second continuing calibration (February 11, 1994 @19:57 through February 12, 1994 @00:19).

  The acceptable recovery ranges for native congeners during the on-going precision and recovery testing are compound-specific. These are not provided with the Level 2 data packages. Generally, a range of 40 to 200 percent is considered acceptable. The labeled congeners have the acceptance range of 40-135 percent.

- Method Blank--A solid matrix (silica) method blank was extracted with the samples. OctaCDD was detected in the method blank at a concentration of 3.37 pg/g, ppt. OctaCDD was detected in all samples at concentrations ranging from 2.80 to 6.97 ppt. Since the sample concentrations were less than five times the method blank concentrations. these were qualified as "undetected, U."

- Blank Spike--A solid matrix (silica) blank spike was performed. The ion abundance ratios for four native compounds were slightly outside the acceptance ranges, but the recoveries were acceptable. No impact on the field data is evident from this.

- Sample Identification/Quantification--There were three verifiable and two unverifiable (ion abundance ratios were not met) detections of any OctaCDD, but these were attributed to laboratory contamination. One occurrence of OctaCDF at 3.34 ppt was unverifiable (ion abundance ratio was not met); hence, qualified as "estimated, J." There were no additional detections of PCDD/PCDFs in the samples.

  Internal standard recoveries must be between a range of 40 to 135 percent of the true amount in order for the reported concentrations or detection limits to be of acceptable accuracy. There were several high (higher than 135 percent) internal standard recoveries associated with nondetections of the native compounds. High recoveries do not adversely impact the detection limits; therefore, no data were qualified for high internal standard recoveries. One PentaCDF internal standard (1,2,3,7,8 congener) was recovered at below 40 percent in two samples, and another PentaCDF

795 202

(2,3,4,7,8 congener) was recovered below 40 percent in one sample. Low recoveries can have an impact on the ability to detect at low levels. Although the corrected detection limits were very low (~6 ppt), the detection limits have been qualified as "estimated, UJ," according to the adopted data validation protocol.

Validated or qualified data sheets for the samples are attached with this memorandum.

Table 1. Aqueous and Soil Field Samples for Isomer-specific Dioxin/Furan Analyses Kelly Air Force Base Zone 4 Investigation

Field Sample ID	Site	Station ID	Laboratory Sample ID	Sampling Date	Extraction Date	Analysis Date	Comments
37442-1 (C94009-01EB1)	S52	FieldQC	9401253-01	1/24/94	2/4/94	2/11/94	Verifiable OctaCDD (16.4 ppq) qualified as laboratory blank contamination.
37442-3 (C94009-03)	S52	SS052MW134 (depth 1)	94-01253-02	1/24/94	2/4/94	2/11/94	TetraCDD/CDF reanalyzed due to internal standard recovery problem, but not qualified. Unverifiable OctaCDD (4.13 ppt) qualified as laboratory blank contamination.
37442-4 (C94009-04)	S52	SS052MW134 (depth 2)	94-01253-03	1/24/94	2/4/94	2/11/94	Verifiable OctaCDD (6.97 ppt) qualified as laboratory blank contamination. Unverifiable OctaCDF (3.34 ppt) qualified as estimated. 1,2,3,7,8-PentaCDF detection limit qualified due to low internal standard recovery.
37442-5 (C94009-05FD1)	S52	SS052MW134 (Field Duplicate)	94-01253-04	1/24/94	2/4/94	2/11/94	Unverifiable OctaCDD (4.17 ppt) qualified as laboratory blank contamination. Two PentaCDF detection limits qualified due to low internal standard recoveries.

MEMORANDUM
Page 7
July 15, 1994
TXE70207.A0 06

37442-6 (C94009-06)	S52	SS052MW134 (depth 3)	94-01253-05	1/24/94	2/4/94	2/12/94	Verifiable OctaCDD (2.8 ppt) qualified as laboratory blank contamination.

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9400901EB1
METHOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE VOLUME (litres) = 0.295
ANALYSIS DATE: Feb. 11-94
ANALYSIS TIME: 19:57

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-01

FILE: K580_0032

APPROVED BY:

CONGENERS	CONC. pg/l	DL pg/l	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	6.01		(0.65-0.89)	
2,3,7,8-TCDF	ND	6.62		(0.65-0.89)	
1,2,3,7,8-PeCDD	ND	8.30		(1.32-1.78)	
1,2,3,7,8-PeCDF	ND	4.69		(1.32-1.78)	
2,3,4,7,8-PeCDF	ND	4.89		(1.32-1.78)	
1,2,3,4,7,8-HxCDD	ND	13.0		(1.05-1.43)	
1,2,3,6,7,8-HxCDD	ND	6.05		(1.05-1.43)	
1,2,3,7,8,9-HxCDD	ND	6.17		(1.05-1.43)	
1,2,3,4,7,8-HxCDF	ND	6.50		(1.05-1.43)	
1,2,3,6,7,8-HxCDF	ND	4.73		(1.05-1.43)	
2,3,4,6,7,8-HxCDF	ND	6.94		(1.05-1.43)	
1,2,3,7,8,9-HxCDF	ND	9.39		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	ND	6.53		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF	ND	5.28		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF	ND	6.34		(0.88-1.20)	
OCDD	16.4 U	4.68	0.98	(0.76-1.02)	3
OCDF	ND	5.32		(0.76-1.02)	
TE	0.016 U				

INTERNAL STANDARDS	% RECOVERY		ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	101		0.56	(0.65-0.89)	*
13C-2,3,7,8-TCDF	75.2		0.96	(0.65-0.89)	*
13C-1,2,3,7,8-PeCDD	73.4		1.65	(1.32-1.78)	
13C-1,2,3,7,8-PeCDF	83.5		1.60	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	81.8		1.78	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	62.4		1.39	(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD	131		1.39	(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF	106		0.49	(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF	112		0.43	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	118		0.50	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	102		0.47	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	142	**	1.01	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	114		0.45	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	129		0.47	(0.37-0.51)	
13C-OCDD	188	**	0.92	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	70.5

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

795 206

AMPLE DESCRIPTION: C9400901EB1
ETHOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE VOLUME (litres) = 0.295
ANALYSIS DATE: Feb. 11-94
ANALYSIS TIME: 19:57

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-01 FILE: K580_0032 APPROVED BY:

TOTAL HOMOLOGUES	pg/l	DL	# PEAKS
TOTAL TCDD	ND	6:01	
TOTAL PeCDD	ND	8.30	
TOTAL HxCDD	ND	13.0	
TOTAL HpCDD	ND	6.53	
TOTAL OCDD	16.4	4.68	1
TOTAL PCDDs	16.4		
TOTAL TCDF	ND	6.62	
TOTAL PeCDF	ND	4.69	
TOTAL HxCDF	ND	6.50	
TOTAL HpCDF	ND	5.28	
TOTAL OCDF	ND	5.32	
OTAL PCDFs	ND		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9400903
METHOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE DRY WEIGHT (grams) = 1.109
ANALYSIS DATE: Feb. 11-94
ANALYSIS TIME: 21:02

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-02

FILE: K580_0033

APPROVED BY:

CONGENERS		CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		CN	CN		(0.65-0.89)	
2,3,7,8-TCDF		CN	CN		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND	1.45		(1.32-1.78)	
1,2,3,7,8-PeCDF		ND	4.40		(1.32-1.78)	
2,3,4,7,8-PeCDF		ND	1.53		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND	1.01		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND	1.07		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND	1.09		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND	1.31		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND	1.03		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND	1.76		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND	1.59		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD		ND	1.37		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF		ND	1.22		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF		ND	1.05		(0.88-1.20)	
OCDD	(MPC)	4.13	0.91	0.69	(0.76-1.02)	2
OCDF		ND	1.22		(0.76-1.02)	
TE		0.004				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	CN	CN	(0.65-0.89)	
13C-2,3,7,8-TCDF	CN	CN	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	88.9	1.31	(1.32-1.78)	*
13C-1,2,3,7,8-PeCDF	43.3	1.52	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	74.1	1.37	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	125	1.20	(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD	114	1.35	(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF	91.1	0.50	(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF	117	0.56	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	55.2	0.52	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	96.4	0.44	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	101	1.22	(0.88-1.20)	*
13C-1,2,3,4,6,7,8-HpCDF	99.4	0.49	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	92.1	0.44	(0.37-0.51)	
13C-OCDD	128	0.94	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	CN

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

AMPLE DESCRIPTION: C9400903
METHOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE DRY WEIGHT (grams) = 1.109
ANALYSIS DATE: Feb. 11-94
ANALYSIS TIME: 21:02

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-02 FILE: K580_0033 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		CN	CN	
TOTAL PeCDD		ND	1.45	
TOTAL HxCDD		ND	1.01	
TOTAL HpCDD		ND	1.37	
TOTAL OCDD	(MPC)	4.13	0.91	1
TOTAL PCDDs		4.13		
TOTAL TCDF		CN	CN	
TOTAL PeCDF		ND	4.40	
TOTAL HxCDF		ND	1.31	
TOTAL HpCDF		ND	1.22	
TOTAL OCDF		ND	1.22	
TOTAL PCDFs		ND		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9400903
METHOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE DRY WEIGHT (grams) = 1.109
ANALYSIS DATE: Feb. 14-94
ANALYSIS TIME: 17:12

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-02

FILE: K581_0018

APPROVED BY:

CONGENERS	CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	2.82		(0.65-0.89)	
2,3,7,8-TCDF	ND	3.38		(0.65-0.89)	
TE	ND				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	63.4	0.70	(0.65-0.89)
13C-2,3,7,8-TCDF	75.0	0.87	(0.65-0.89)

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	127

CH2M HILL DP LH SEP 16 1994

795 210

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

MPLE DESCRIPTION: C9400903
_THOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE DRY WEIGHT (grams) = 1.109
ANALYSIS DATE: Feb. 14-94
ANALYSIS TIME: 17:12

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-02 FILE: K581_0018 APPROVED BY:

TOTAL HOMOLOGUES	pg/g	DL	# PEAKS
TOTAL TCDD	ND	2.82	
TOTAL PCDDs	ND		
TOTAL TCDF	ND	3.38	
TOTAL PCDFs	ND		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

795 211

SAMPLE DESCRIPTION: C9400904
METHOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE DRY WEIGHT (grams) = 1.003
ANALYSIS DATE: Feb. 11-94
ANALYSIS TIME: 22:08

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-03 FILE: K580_0034 APPROVED BY:

CONGENERS		CONC. pg/g		DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		ND		2.72		(0.65-0.89)	
2,3,7,8-TCDF		ND		1.07		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND		0.67		(1.32-1.78)	
1,2,3,7,8-PeCDF		ND		4.17		(1.32-1.78)	
2,3,4,7,8-PeCDF		ND		1.13		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND		1.89		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND		2.76		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND		2.81		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND		1.60		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND		1.43		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND		2.58		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND		2.37		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD		ND		1.12		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF		ND		0.83		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF		ND		1.27		(0.88-1.20)	
OCDD		6.97		0.77	0.86	(0.76-1.02)	1
OCDF	(MPC)	3.34		0.43	0.64	(0.76-1.02)	16
TE		0.010					

INTERNAL STANDARDS	% RECOVERY		ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	64.3		0.66	(0.65-0.89)
13C-2,3,7,8-TCDF	76.6		0.88	(0.65-0.89)
13C-1,2,3,7,8-PeCDD	69.7		1.43	(1.32-1.78)
13C-1,2,3,7,8-PeCDF	36.0		1.53	(1.32-1.78)
13C-2,3,4,7,8-PeCDF	40.2		1.49	(1.32-1.78)
13C-1,2,3,4,7,8-HxCDD	212	**	1.42	(1.05-1.43)
13C-1,2,3,6,7,8-HxCDD	106		1.36	(1.05-1.43)
13C-1,2,3,4,7,8-HxCDF	132		0.44	(0.43-0.59)
13C-1,2,3,6,7,8-HxCDF	160	**	0.53	(0.43-0.59)
13C-2,3,4,6,7,8-HxCDF	89.5		0.49	(0.43-0.59)
13C-1,2,3,7,8,9-HxCDF	104		0.48	(0.43-0.59)
13C-1,2,3,4,6,7,8-HpCDD	192	**	1.04	(0.88-1.20)
13C-1,2,3,4,6,7,8-HpCDF	161	**	0.44	(0.37-0.51)
13C-1,2,3,4,7,8,9-HpCDF	147	**	0.51	(0.37-0.51)
13C-OCDD	254	**	0.92	(0.76-1.02)

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	71.4

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

MPLE DESCRIPTION: C9400904
:HOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94
SAMPLE DRY WEIGHT (grams) = 1.003
ANALYSIS DATE: Feb. 11-94
ANALYSIS TIME: 22:08

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-03
FILE: K580_0034
APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	2.72	
TOTAL PeCDD		ND	0.67	
TOTAL HxCDD		ND	1.89	
TOTAL HpCDD		ND	1.12	
TOTAL OCDD		6.97	0.77	1
TOTAL PCDDs		6.97		
TOTAL TCDF		ND	1.07	
TOTAL PeCDF		ND	4.17	
TOTAL HxCDF		ND	1.60	
TOTAL HpCDF		ND	0.83	
TOTAL OCDF	(MPC)	3.34	0.43	1
TAL PCDFs		3.34		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9400905FD1 795 213
METHOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE DRY WEIGHT (grams) = 1.043
ANALYSIS DATE: Feb. 11-94
ANALYSIS TIME: 23:13

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-04 FILE: K580_0035 APPROVED BY:

CONGENERS		CONC. pg/g		DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		ND		1.67		(0.65-0.89)	
2,3,7,8-TCDF		ND		2.02		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND		1.28		(1.32-1.78)	
1,2,3,7,8-PeCDF		ND		5.80		(1.32-1.78)	
2,3,4,7,8-PeCDF		ND		1.26		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND		3.98		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND		3.76		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND		3.84		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND		4.14		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND		2.66		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND		4.61		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND		4.39		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD		ND		1.26		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF		ND		1.30		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF		ND		1.28		(0.88-1.20)	
OCDD	(MPC)	4.17		0.76	1.10	(0.76-1.02)	2
OCDF		ND		1.00		(0.76-1.02)	
TE		0.004					

INTERNAL STANDARDS	% RECOVERY		ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	107		0.81	(0.65-0.89)	
13C-2,3,7,8-TCDF	86.4		0.71	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	65.4		1.67	(1.32-1.78)	
13C-1,2,3,7,8-PeCDF	26.4	**	1.45	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	38.5	**	1.19	(1.32-1.78)	*
13C-1,2,3,4,7,8-HxCDD	99.3		1.18	(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD	140	**	1.41	(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF	88.7		0.54	(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF	137	**	0.56	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	113		0.46	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	93.2		0.44	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	223	**	1.20	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	181	**	0.42	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	197	**	0.40	(0.37-0.51)	
13C-OCDD	272	**	0.79	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	ND

CH2M HILL DP LH SEP 16 1994

795 214

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9400905FD1
METHOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE DRY WEIGHT (grams) = 1.043
ANALYSIS DATE: Feb. 11-94
ANALYSIS TIME: 23:13

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-04 FILE: K580_0035 APPROVED BY:

TOTAL HOMOLOGUES	pg/g	DL	# PEAKS
TOTAL TCDD	ND	1.67	
TOTAL PeCDD	ND	1.28	
TOTAL HxCDD	ND	3.98	
TOTAL HpCDD	ND	1.26	
TOTAL OCDD	4.17	0.76	1
TOTAL PCDDs	4.17		
TOTAL TCDF	ND	2.02	
TOTAL PeCDF	ND	5.80	
TOTAL HxCDF	ND	4.14	
TOTAL HpCDF	ND	1.30	
TOTAL OCDF	ND	1.00	
TOTAL PCDFs	ND		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks: these values should also be regarded as MPC.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9400906
METHOD: 8290

795 215

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94

SAMPLE DRY WEIGHT (grams) = 1.245
ANALYSIS DATE: Feb. 12-94
ANALYSIS TIME: 00:19

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-05 FILE: K580_0036 APPROVED BY:

CONGENERS	CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	0.78		(0.65-0.89)	
2,3,7,8-TCDF	ND	0.42		(0.65-0.89)	
1,2,3,7,8-PeCDD	ND	0.50		(1.32-1.78)	
1,2,3,7,8-PeCDF	ND	1.00		(1.32-1.78)	
2,3,4,7,8-PeCDF	ND	0.71		(1.32-1.78)	
1,2,3,4,7,8-HxCDD	ND	0.85		(1.05-1.43)	
1,2,3,6,7,8-HxCDD	ND	0.82		(1.05-1.43)	
1,2,3,7,8,9-HxCDD	ND	0.83		(1.05-1.43)	
1,2,3,4,7,8-HxCDF	ND	0.49		(1.05-1.43)	
1,2,3,6,7,8-HxCDF	ND	0.34		(1.05-1.43)	
2,3,4,6,7,8-HxCDF	ND	0.57		(1.05-1.43)	
1,2,3,7,8,9-HxCDF	ND	0.60		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	ND	0.71		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF	ND	0.29		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF	ND	0.38		(0.88-1.20)	
OCDD	2.80	0.46	1.00	(0.76-1.02)	2
OCDF	ND	0.51		(0.76-1.02)	
TE	0.003				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	123	0.70	(0.65-0.89)
13C-2,3,7,8-TCDF	83.5	0.86	(0.65-0.89)
13C-1,2,3,7,8-PeCDD	71.5	1.46	(1.32-1.78)
13C-1,2,3,7,8-PeCDF	63.5	1.43	(1.32-1.78)
13C-2,3,4,7,8-PeCDF	69.3	1.44	(1.32-1.78)
13C-1,2,3,4,7,8-HxCDD	88.1	1.12	(1.05-1.43)
13C-1,2,3,6,7,8-HxCDD	100	1.43	(1.05-1.43)
13C-1,2,3,4,7,8-HxCDF	102	0.53	(0.43-0.59)
13C-1,2,3,6,7,8-HxCDF	113	0.50	(0.43-0.59)
13C-2,3,4,6,7,8-HxCDF	86.2	0.50	(0.43-0.59)
13C-1,2,3,7,8,9-HxCDF	100	0.57	(0.43-0.59)
13C-1,2,3,4,6,7,8-HpCDD	113	1.03	(0.88-1.20)
13C-1,2,3,4,6,7,8-HpCDF	101	0.42	(0.37-0.51)
13C-1,2,3,4,7,8,9-HpCDF	110	0.43	(0.37-0.51)
13C-OCDD	123	0.79	(0.76-1.02)

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	75.4

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9400906
METHOD: 8290

SAMPLE DATE: Jan. 24-94
EXTRACTION DATE: Feb. 4-94
SAMPLE DRY WEIGHT (grams) = 1.245
ANALYSIS DATE: Feb. 12-94
ANALYSIS TIME: 00:19

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9401253-05
FILE: K580_0036
APPROVED BY:

TOTAL HOMOLOGUES	pg/g	DL	# PEAKS
TOTAL TCDD	ND	0.78	
TOTAL PeCDD	ND	0.50	
TOTAL HxCDD	ND	0.85	
TOTAL HpCDD	ND	0.71	
TOTAL OCDD	2.80	0.46	1
TOTAL PCDDs	2.80		
TOTAL TCDF	ND	0.42	
TOTAL PeCDF	ND	1.00	
TOTAL HxCDF	ND	0.49	
TOTAL HpCDF	ND	0.29	
TOTAL OCDF	ND	0.51	
TOTAL PCDFs	ND		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

CH2M HILL DP LH SEP 16 1994

MEMORANDUM 795 217 CH2MHILL

TO: Ann Castleberry/GNV

COPIES: Kelly AFB Project Files

FROM: Kishor Gala/DEN

DATE: October 6, 1994

SUBJECT: Kelly AFB-RI
Level 2 Data Validation for Zone 4 Samples
2,3,7,8-Specific Dibenzodioxins and Dibenzofurans Congeners

PROJECT: TXE70207.A0.06

Overview

This data validation memorandum discusses the quality of data generated for one (1) aqueous sample (#37469-25/C9401330-021M) collected from Zone 4 on January 28, 1994. The sample was analyzed for 2,3,7,8-isomer specific congeners of individual polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). Table 1 lists pertinent information for the field sample.

The PCDD/PCDF analysis was performed by the CH2M HILL's Quality Analytical Laboratory in Canada (Canviro Analytical Laboratories, Ltd., Waterloo, Ontario, Canada). The analysis followed the protocols of the isotope-dilution method SW846/8290 (high resolution gas chromatography/specific ion monitoring).

A Level 2 data package (sample results and QC summary) was provided for the sample. Raw data for the field and laboratory QC samples were not required.

Data validation guidelines were specifically developed using method-prescribed quality control criteria, since EPA-developed data validation guidelines do not exist for the isomer-specific PCDD/PCDF analyses.

Summary

All 2,3,7,8-PCDD/PCDF congeners were successfully analyzed. A quality control problem related to recovery of the labeled internal standard (note: the term internal standard for the isotope dilution method is synonymous with surrogate standard used in organic analysis) ^{13}C-2,3,7,8-tetrachlorodibenzodioxin (TetraCDD) was observed for the sample, but the native TetraCDD did not appear to be present. The extract of the sample

735 218

was reanalyzed on a different column with acceptable recovery of the labeled TetraCDD internal standard. Absence of the native TetraCDD was confirmed on the second column. No data were qualified since the recovery problem did not have any impact on the data. If necessary, the TetraCDD detection limit from the second column should be used.

Minor problems were noted with the ion abundance ratios for additional three labeled internal standards, but these were deemed not to have any impact on the identification of the related native PCDD/PCDFs.

There were no detections of PCDDs/PCDFs in the field sample. Considering no data were qualified, all data (detection limits) are usable as reported by the laboratory. Therefore, the data needs objectives for the current sampling event appear to be satisfied.

The data quality assessment and problems are discussed in greater detail below.

Data Quality Assessment

The quality control criteria checked for the PCDD/PCDF data include the following:

- Holding Times--The sample was extracted within 30 days from the date of collection and analyzed within 45 days from the date of collection, as required. Therefore, the holding time criteria were satisfied.

- Mass spectrometer Tuning and Performance--Not applicable to Level 2 data package.

  The valley between 2,3,7,8-TetraCDD and closest eluting peak--Not applicable to Level 2 data package. The valley must be less than 10 percent at mass 304 with a mass resolution of 10,000 or better. (The high resolution method provides a parent resolution of over 10,000, which implies good separation characteristics. The valley between the two adjoining compounds is almost always better than 10 percent; hence, acceptable.)

  Signal to noise ratio (S/N)--Not applicable to Level 2 data package. The ratio should be greater than 10 for all native and labeled congeners. With respect to the required detection limits, the high resolution method almost never has any trouble achieving them. Detection limits of less than 10 picograms/liter (50 parts per quadrillion) were achieved for each native congener.

795 219

Ion abundance ratios for the PCDD/PCDF congeners--Not applicable to native congeners, since none were detected in the sample. For the following three ^{13}C-labeled congeners (internal standards) in the sample, the ion abundance ratios were slightly outside the acceptance ranges: 1,2,3,7,8-PentaCDD (1.81, range 1.32-1.78), 1,2,3,7,8-PentaCDF (1.25, range 1.32-1.78), and 1,2,3,6,7,8-HexaCDD (1.5, range 1.05-1.43). These ratios are not expected to have any impact on identification of the native congeners; therefore, data were not qualified. Five internal standards in the method blank also had minor ion abundance ratio problems, but again data do not appear to have affected. Only OctaCDD was detected in the method blank, and the ion abundance ratios for native OctaCDD and its internal standard were acceptable. Blank spike had four native congeners slightly outside the ion abundance ranges. No impact on the blank spike nor the field sample is apparent.

- Initial Calibration--A 5-point initial calibration was performed on February 9, 1994 and again on February 11, 1994. All response factors were better than 30 percent of the area of the internal standard. The relative standard deviation (RSD) among the five response factors was less than 20 for the native congeners and less than 30 for the internal standards; thus, acceptable.

  The ion ratios were within the acceptable ranges for all congeners in all standards.

  The acceptable recovery ranges for native congeners during the initial precision and recovery testing are compound-specific. These are not provided with the Level 2 data packages. Generally, a range of 40 to 200 percent is considered acceptable. The labeled congeners have the acceptance range of 40-135 percent.

- Continuing Calibration--For the continuing calibrations performed on February 10, 1994 (time 10:26) and February 11, 1994 (time 15:19), the difference between the initial calibration average response factor and the continuing calibration response factor was below the acceptance limit of 30 percent. The field sample was analyzed within 12 hours of the second continuing calibration (February 12, 1994 @1:24). The method blank and the blank spike were analyzed following the first continuing calibration.

795 220

The acceptable recovery ranges for native congeners during the on-going precision and recovery testing are compound-specific. These are not provided with the Level 2 data packages. Generally, a range of 40 to 200 percent is considered acceptable. The labeled congeners have the acceptance range of 40-135 percent.

- Method Blank--A solid matrix (silica) method blank was extracted with the sample. OctaCDD was detected in the method blank at a concentration of 3.37 pg/g. Since OctaCDD was not detected in the sample, no data were qualified.

- Blank Spike--A solid matrix (silica) blank spike was performed. The ion abundance ratios for four native compounds were slightly outside the acceptance ranges, but the recoveries were acceptable. No impact on the field data is evident from this.

- Sample Identification/Quantification--There were no verifiable detections of any PCDD/PCDFs in the samples; therefore, the ion abundance ratio criterion is not applicable.

  Internal standard recoveries must be between a range of 40 to 135 percent of the true amount in order for the reported concentrations or detection limits to be of acceptable accuracy. The internal standard recoveries were within this range for the sample. There were no detections of native congeners in the sample.

  Native congener ion abundance ratios are not applicable to the sample since no native PCDD/PCDFs were detected. A minor problem in the ion abundance ratios for internal standards was addressed earlier. This was determined have no adverse impact on the usability of the native congener data.

A validated or qualified data sheet for the sample is attached with this memorandum.

MEMORANDUM
Page 5
July 15, 1994
TXE70207 A0 06

Table 1. Aqueous Field Samples for Isomer-specific Dioxin/Furan Analyses Kelly Air Force Base Zone 4 Investigation

Field Sample ID	Site	Station ID	Laboratory Sample ID	Sampling Date	Extraction Date	Analysis Date	Comments
37469-25 (C9401330-021M)	C9401339	SS052MW 134	9402043-01	1/28/94	2/4/94	2/12/94	No native PCDD/PCDFs detected. Minor problems with internal standard ion abundance ratios, but no impact on data.

795 221

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C94010330
METHOD: 8290

795 222

[redacted]MPLE DATE: Jan. 28-94
EXTRACTION DATE: Feb. 4-94

SAMPLE VOLUME (litres) = 0.300
ANALYSIS DATE: Feb. 12-94
ANALYSIS TIME: 1:24

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402043-01 FILE: K580_0037 APPROVED BY:

CONGENERS	CONC. pg/l	DL pg/l	ION RATIO	RATIO LIMITS	RRT (sec.)
~~2,3,7,8-TCDD~~	~~CN~~	~~CN~~		(0.65-0.89)	See Remarks
2,3,7,8-TCDF	ND	8.27		(0.65-0.89)	
1,2,3,7,8-PeCDD	ND	3.05		(1.32-1.78)	
1,2,3,7,8-PeCDF	ND	1.12		(1.32-1.78)	
2,3,4,7,8-PeCDF	ND	2.96		(1.32-1.78)	
1,2,3,4,7,8-HxCDD	ND	4.50		(1.05-1.43)	
1,2,3,6,7,8-HxCDD	ND	7.40		(1.05-1.43)	
1,2,3,7,8,9-HxCDD	ND	7.55		(1.05-1.43)	
1,2,3,4,7,8-HxCDF	ND	4.98		(1.05-1.43)	
1,2,3,6,7,8-HxCDF	ND	4.43		(1.05-1.43)	
2,3,4,6,7,8-HxCDF	ND	4.04		(1.05-1.43)	
1,2,3,7,8,9-HxCDF	ND	9.52		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	ND	8.98		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF	ND	10.2		(0.88-1.20)	
[redacted]2,3,4,7,8,9-HpCDF	ND	7.14		(0.88-1.20)	
[redacted]DD	ND	12.8		(0.76-1.02)	
OCDF	ND	10.8		(0.76-1.02)	
TE	---				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	CN	CN	(0.65-0.89)	
13C-2,3,7,8-TCDF	86.5	0.73	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	76.7	1.81	(1.32-1.78)	*
13C-1,2,3,7,8-PeCDF	53.2	1.25	(1.32-1.78)	*
13C-2,3,4,7,8-PeCDF	54.1	1.53	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	91.7	1.29	(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD	132	1.50	(1.05-1.43)	*
13C-1,2,3,4,7,8-HxCDF	130	0.52	(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF	109	0.57	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	102	0.52	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	100	0.56	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	79.5	1.10	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	83.2	0.38	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	88.4	0.43	(0.37-0.51)	
13C-OCDD	80.7	0.76	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
[redacted]7C14-2,3,7,8-TCDD	CN

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C94010330
METHOD: 8290

SAMPLE DATE: Jan. 28-94
EXTRACTION DATE: Feb. 4-94

SAMPLE VOLUME (litres) = 0.300
ANALYSIS DATE: Feb. 12-94
ANALYSIS TIME: 1:24

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402043-01 FILE: K580_0037 APPROVED BY:

TOTAL HOMOLOGUES	pg/l	DL	# PEAKS
TOTAL TCDD	CN	CN	
TOTAL PeCDD	ND	3.05	
TOTAL HxCDD	ND	4.50	
TOTAL HpCDD	ND	8.98	
TOTAL OCDD	ND	12.8	
TOTAL PCDDs	ND		
TOTAL TCDF	ND	8.27	
TOTAL PeCDF	ND	1.12	
TOTAL HxCDF	ND	4.98	
TOTAL HpCDF	ND	10.2	
TOTAL OCDF	ND	10.8	
TOTAL PCDFs	ND		

GENERAL NOTES:

pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

DB-Dioxin
795 224 CONFIRMATION

SAMPLE DESCRIPTION: C94010330
METHOD: 8290

SAMPLE DATE: Jan. 28-94
EXTRACTION DATE: Feb. 4-94

SAMPLE VOLUME (litres) = 0.300
ANALYSIS DATE: Feb. 14-94
ANALYSIS TIME: 18:31

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402043-01 FILE: K581_0020 APPROVED BY:

CONGENERS	CONC. pg/l	DL pg/l	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	12.0		(0.65-0.89)	
TE	---				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	89.9	0.84	(0.65-0.89)
CLEAN-UP STANDARD	% RECOVERY		
37Cl4-2,3,7,8-TCDD	87.2		

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C94010330
METHOD: 8290

SAMPLE DATE: Jan. 28-94
EXTRACTION DATE: Feb. 4-94

SAMPLE VOLUME (litres) = 0.300
ANALYSIS DATE: Feb. 14-94
ANALYSIS TIME: 18:31

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402043-01 FILE: K581_0020 APPROVED BY:

TOTAL HOMOLOGUES	pg/l	DL	# PEAKS
TOTAL TCDD	ND	12.0	
TOTAL PCDDs	ND		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, incorrect ion ratio. The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks these values should also be regarded as MPC.

MEMORANDUM CH2MHILL

TO: Ann Castleberry/GNV

COPIES: Kelly AFB Project Files

FROM: Kishor Gala/DEN

DATE: October 6, 1994

SUBJECT: Kelly AFB-RI
Level 2 Data Validation for Zone 4 Samples
2,3,7,8-Specific Dibenzodioxins and Dibenzofurans Congeners

PROJECT: TXE70207.A0.06

Overview

This data validation memorandum discusses the quality of data generated for one (1) aqueous field blank sample (#37504-3/C94015-03EB1) and thirteen (13) soils samples (#37504-4 to 16/C94015-02 to -14), collected from Zone 4 on February 3, 1994. The samples were analyzed for 2,3,7,8-isomer specific congeners of individual polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). Table 1 lists pertinent information for the samples.

The PCDD/PCDF analysis was performed by the CH2M HILL's Quality Analytical Laboratory in Canada (Canviro Analytical Laboratories, Ltd., Waterloo, Ontario, Canada). The analysis followed the protocols of the isotope-dilution method SW846/8290 (high resolution gas chromatography/specific ion monitoring).

A Level 2 data package (sample results and QC summary) was provided for the samples. Raw data for the field and laboratory QC samples were not required.

Data validation guidelines were specifically developed using method-prescribed quality control criteria, since EPA-developed data validation guidelines do not exist for the isomer-specific PCDD/PCDF analyses.

Summary

The laboratory had noticed severe interference from polychloronated diphenyl ethers in practically all samples. As a result, several PCDD/PCDFs were reported as potentially present in the samples. Since all identification criteria for PCDD/PCDFs were not, the

laboratory reported the detections as maximum possible concentrations. The reported PCDD/PCDFs are potential false positives. Their actual presence or absence cannot be inferred from the information provided in the Level 2 data package, since raw data were not required. A majority of the PCDD/PCDF data have been qualified as "estimated, J" based on the laboratory's reported finding on interference from diphenyl ethers.

Minor quality control problems related to recovery of a few labeled internal standard (note: the term internal standard for the isotope dilution method is synonymous with surrogate standard used in organic analysis) were observed for some samples. Practically all of the noncompliant recoveries were above the upper acceptance limit of 135 percent. When a corresponding native PCDD/PCDF was not detected in the sample, no adverse impact on the reported detection limits may be expected. When a corresponding native PCDD/PCDF was detected in the sample, the value is expected to be biased high (actual value may be lower than that reported). Accordingly, these detected values have been qualified as "estimated, J." A few ion abundance ratios for internal standards were outside the acceptance ranges, but these were not deemed to have any impact on the native PCDD/PCDF data.

In samples 37504-7/C94015-07 and 37504-16/C95105-16, the internal standards for TetraCDD was not recovered. The native congener did not appear to be present in the samples. The extracts of the samples were reanalyzed on a different column with acceptable recovery of the labeled TetraCDD internal standard. Absence of the native congener was confirmed on the second column.

An aqueous and a solid matrix (silica) method blanks were analyzed with the sample set. The aqueous blank contained OctaCDD at a concentration of 19.9 picograms/liter (parts per quadrillion, ppq). Corresponding aqueous field sample contained OctaCDD at a concentration of 15.9 ppq. This value was attributed to laboratory contamination; therefore, qualified as "undetected, U" in the field sample. The solid matrix method blank had detection of 1,2,3,4,6,7,8-HeptaCDD at a concentration of 0.26 picograms/gram (parts per trillion, ppt), OctaCDD at 1.48 ppt and OctaCDF at 0.58 ppt. All of the positive values for these congeners in the field samples were above five times the blank levels; therefore, data qualification for the associated samples was not necessary.

The data quality assessment and problems are discussed in greater detail below.

Data Quality Assessment

MEMORANDUM
Page 3
July 15, 1994
TXE70207.A0.06

The quality control criteria checked for the PCDD/PCDF data include the following:

- Holding Times--The samples were extracted within 30 days from the date of collection and analyzed within 45 days from the date of collection, as required. Therefore, the holding time criteria were satisfied.

- Mass spectrometer Tuning and Performance--Not applicable to Level 2 data package.

  The valley between 2,3,7,8-TetraCDD and closest eluting peak--Not applicable to Level 2 data package. The valley must be less than 10 percent at mass 304 with a mass resolution of 10,000 or better. (The high resolution method provides a parent resolution of over 10,000, which implies good separation characteristics. The valley between the two adjoining compounds is almost always better than 10 percent; hence, acceptable.)

  Signal to noise ratio (S/N)--Not applicable to Level 2 data package. The ratio should be greater than 10 for all native and labeled congeners. With respect to the required detection limits, the high resolution method almost never has any trouble achieving them. Detection limits of less than 10 picograms/liter (50 parts per quadrillion) for the aqueous sample and less than 6 ppt for soil samples were achieved for each native congener.

- Initial Calibration--A 5-point initial calibration was performed on February 23, 1994. All response factors were better than 30 percent of the area of the internal standard. The relative standard deviation (RSD) among the five response factors was less than 20 for the native congeners and less than 30 for the labeled congeners; thus, acceptable.

  The ion ratios were within the acceptable ranges for all congeners in all standards.

  The acceptable recovery ranges for native congeners during the initial precision and recovery testing are compound-specific. These are not provided with the Level 2 data packages. Generally, a range of 40 to 200 percent is considered acceptable. The labeled congeners have the acceptance range of 40-135 percent.

- Continuing Calibration--For the continuing calibrations performed on February 23, 1994 (time 09:01) and February 24, 1994 (time 15:36), the

difference between the initial calibration average response factor and the continuing calibration response factor below the acceptance limit of 30 percent. The field samples were analyzed within 12 hours of these continuing calibrations (February 23, 1994 @14:36 through February 25, 1994 @02:55).

The acceptable recovery ranges for native congeners during the on-going precision and recovery testing are compound-specific. These are not provided with the Level 2 data packages. Generally, a range of 40 to 200 percent is considered acceptable. The labeled congeners have the acceptance range of 40-135 percent.

- Method Blank--An aqueous and a solid matrix (silica) method blanks were analyzed with the sample set. The aqueous blank contained OctaCDD at a concentration of 19.9 picograms/liter (parts per quadrillion, ppq). Corresponding aqueous field sample contained OctaCDD at a concentration of 15.9 ppq. This value was attributed to laboratory contamination; therefore, qualified as "undetected, U" in the field sample.

  The solid matrix method blank had detection of 1,2,3,4,6,7,8-HeptaCDD at a concentration of 0.26 picograms/gram (parts per trillion, ppt), OctaCDD at 1.48 ppt and OctaCDF at 0.58 ppt. The positive sample values for the respective congener ranged from 3.02-116, 12.5-899, and 3.45-35.3 ppt. Since all of the positive values for these congeners in the field samples were above the five times the blank levels; therefore, no data were qualified for blank contamination.

- Blank Spike--An aqueous and a solid matrix (silica) blank spikes were performed with the data set. The ion abundance ratios for four internal standards were slightly outside the acceptance ranges in both spikes but the native congener recoveries were acceptable. No impact on the field data is evident from this.

- Sample Identification/Quantification--As stated earlier, numerous PCDD/PCDF congeners were reported as potentially present. This was primarily due to interference from polychlorinated diphenyl ether ions within the retention windows for the native congeners. These values are considered potential false positives, and qualified as estimated. .

  Internal standard recoveries must be between a range of 40 to 135 percent of

795 230

the true amount in order for the reported concentrations or detection limits to be of acceptable accuracy. There were several high (higher than 135 percent) internal standard recoveries associated with nondetections of the native compounds. High recoveries do not adversely impact the detection limits; therefore, no data were qualified for high internal standard recoveries. Occasionally, there were detections associated with high recoveries. These values are potentially biased high, and qualified as estimated. One low recovery for 1,2,3,7,8-PentaCDF (28.9%) internal standard was recorded for sample 37504-15/C94105-15. Native congener was not detected in the sample. Its detection limit has been qualified as estimated.

Validated or qualified data sheets for the samples are attached with this memorandum.

MEMORANDUM
Page 7
July 15, 1994
TXE70207.A0 06

Table 1. Aqueous and Soil Field Samples for Isomer-specific Dioxin/Furan Analyses Kelly Air Force Base Zone 4 Investigation

Field Sample ID	Site	Station ID	Laboratory Sample ID	Sampling Date	Extraction Date	Analysis Date	Comments
37504-8 (C94105-08)	S09	SS009HA042	9402079-06	2/3/94	2/15/94	2/24/94	Polychlorinated diphenyl ether interference observed for 1,2,3,7,8-PentaCDF. OctaCDD ion abundance ratio low. Both qualified as estimated.
37504-9 (C94105-09)	S09	SS009HA043	9402079-07	2/3/94	2/15/94	2/24/94	HeptaCDF ion abundance ratio high, OctaCDF ion abundance ratio low. Both qualified as estimated.
37504-10 (C94009-10)	S09	SS009HA044	9402079-08	2/3/94	2/15/94	2/24/94	HeptaCDD ion abundance ratio and internal standard recovery high. OctaCDD internal standard recovery high. Both qualified as estimated.
37504-11 (C94009-11)	S09	SS009HA045	9402079-09	2/3/94	2/15/94	2/24/94	Interference suspected for PentaCDF. HexaCDD ion abundance ratio low. Both qualified as estimated.
37504-12 (C94009-12)	S09	SS009HA046	9402079-10	2/3/94	2/15/94	2/24/94	Interference suspected for PentaCDF. HeptaCDD ion abundance ratio high. Both qualified as estimated.

195 231

Table 1. Aqueous and Soil Field Samples for Isomer-specific Dioxin/Furan Analyses Kelly Air Force Base Zone 4 Investigation

Field Sample ID	Site	Station ID	Laboratory Sample ID	Sampling Date	Extraction Date	Analysis Date	Comments
37504-13 (C94105-13)	S09	SS009HA047	9402079-11	2/3/94	2/15/94	2/24/94	OctaCDD internal standard recovery 138. Native OctaCDD/CDF qualified as estimated.
37504-14 (C94009-14)	S09	SS009HA048	9402079-12	2/3/94	2/15/94	2/25/94	Internal standard recoveries for Hexa-, Hepta-, and OctaCDD/CDFs high. All qualified as estimated.
37504-15 (C94009-15)	S09	SS009HA049	9402079-13	2/3/94	2/15/94	2/25/94	Hepta- and OctaCDD internal standard recoveries high. Both qualified as estimated. 1,2,3,7,8-PentaCDF internal standard recovery 28.9%, detection limit qualified as estimated.
37504-16 (C94009-16)	S09	SS009HA050	9402079-14	2/3/94	2/15/94	2/25/94	Interference suspected for PentaCDF, qualified as estimated. TetraCDD reanalyzed, absence confirmed.

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401503EB1
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 9-94

SAMPLE VOLUME (litres) = 0.375
ANALYSIS DATE: Feb. 23-94
ANALYSIS TIME: 14:36

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-01 FILE: K587_0027 APPROVED BY:

CONGENERS	CONC. pg/l	DL pg/l	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	2.63		(0.65-0.89)	
2,3,7,8-TCDF	ND	3.75		(0.65-0.89)	
1,2,3,7,8-PeCDD	ND	2.21		(1.32-1.78)	
1,2,3,7,8-PeCDF	ND	5.47		(1.32-1.78)	
2,3,4,7,8-PeCDF	ND	1.06		(1.32-1.78)	
1,2,3,4,7,8-HxCDD	ND	4.28		(1.05-1.43)	
1,2,3,6,7,8-HxCDD	ND	5.05		(1.05-1.43)	
1,2,3,7,8,9-HxCDD	ND	5.14		(1.05-1.43)	
1,2,3,4,7,8-HxCDF	ND	4.41		(1.05-1.43)	
1,2,3,6,7,8-HxCDF	ND	3.59		(1.05-1.43)	
2,3,4,6,7,8-HxCDF	ND	6.33		(1.05-1.43)	
1,2,3,7,8,9-HxCDF	ND	6.30		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	ND	2.48		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF	ND	1.86		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF	ND	2.86		(0.88-1.20)	
OCDD	15.9	2.98	0.81	(0.76-1.02)	0
OCDF	ND	3.99		(0.76-1.02)	
TE	0.016				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	131	0.82	(0.65-0.89)	
13C-2,3,7,8-TCDF	102	0.79	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	143 **	1.64	(1.32-1.78)	
13C-1,2,3,7,8-PeCDF	94.2	1.52	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	151 **	1.52	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	171 **	1.12	(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD	134	1.42	(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF	143 **	0.61	(0.43-0.59)	*
13C-1,2,3,6,7,8-HxCDF	153 **	0.51	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	124	0.57	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	145 **	0.45	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	143 **	1.05	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	161 **	0.50	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	142 **	0.49	(0.37-0.51)	
13C-OCDD	133 OK	0.9	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	65.4

DS 03/03/94

CH2M HILL DP LH SEP 16 1994

795 234

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401503EB1
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 9-94
SAMPLE VOLUME (litres) = 0.375
ANALYSIS DATE: Feb. 23-94
ANALYSIS TIME: 14:36

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-01
FILE: K587_0027
APPROVED BY:

TOTAL HOMOLOGUES	pg/l	DL	# PEAKS
TOTAL TCDD	ND	2.63	
TOTAL PeCDD	ND	2.21	
TOTAL HxCDD	ND	4.28	
TOTAL HpCDD	ND	2.48	
TOTAL OCDD	15.9	2.98	1
TOTAL PCDDs	15.9		
TOTAL TCDF	ND	3.75	
TOTAL PeCDF	ND	5.47	
TOTAL HxCDF	ND	4.41	
TOTAL HpCDF	ND	1.86	
TOTAL OCDF	ND	3.99	
TOTAL PCDFs	ND		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401504
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.909
ANALYSIS DATE: Feb. 23-94
ANALYSIS TIME: 17:57

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-02

FILE: K587_0030

APPROVED BY:

CONGENERS	CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	0.52		(0.65-0.89)	
2,3,7,8-TCDF	ND	1.07		(0.65-0.89)	
1,2,3,7,8-PeCDD	ND	0.76		(1.32-1.78)	
1,2,3,7,8-PeCDF	ND	0.38		(1.32-1.78)	
2,3,4,7,8-PeCDF	ND	0.45		(1.32-1.78)	
1,2,3,4,7,8-HxCDD	ND	0.88		(1.05-1.43)	
1,2,3,6,7,8-HxCDD	ND	0.79		(1.05-1.43)	
1,2,3,7,8,9-HxCDD	ND	0.80		(1.05-1.43)	
1,2,3,4,7,8-HxCDF	ND	0.93		(1.05-1.43)	
1,2,3,6,7,8-HxCDF	ND	0.71		(1.05-1.43)	
2,3,4,6,7,8-HxCDF	ND	0.94		(1.05-1.43)	
1,2,3,7,8,9-HxCDF	ND	1.09		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	6.47	0.55	1.04	(0.88-1.20)	2
1,2,3,4,6,7,8-HpCDF	3.15	0.36	1.02	(0.88-1.20)	1
1,2,3,4,7,8,9-HpCDF	ND	0.90		(0.88-1.20)	
OCDD	44.0	0.41	0.69	(0.76-1.02)	1
OCDF	ND	1.16		(0.76-1.02)	
TE	0.140				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	128	0.77	(0.65-0.89)
13C-2,3,7,8-TCDF	86.7	0.83	(0.65-0.89)
13C-1,2,3,7,8-PeCDD	160 **	1.46	(1.32-1.78)
13C-1,2,3,7,8-PeCDF	127	1.41	(1.32-1.78)
13C-2,3,4,7,8-PeCDF	126	1.70	(1.32-1.78)
13C-1,2,3,4,7,8-HxCDD	134	1.27	(1.05-1.43)
13C-1,2,3,6,7,8-HxCDD	129	1.18	(1.05-1.43)
13C-1,2,3,4,7,8-HxCDF	149 **	0.49	(0.43-0.59)
13C-1,2,3,6,7,8-HxCDF	116	0.52	(0.43-0.59)
13C-2,3,4,6,7,8-HxCDF	128	0.58	(0.43-0.59)
13C-1,2,3,7,8,9-HxCDF	126	0.56	(0.43-0.59)
13C-1,2,3,4,6,7,8-HpCDD	111	1.00	(0.88-1.20)
13C-1,2,3,4,6,7,8-HpCDF	99.0	0.42	(0.37-0.51)
13C-1,2,3,4,7,8,9-HpCDF	108	0.42	(0.37-0.51)
13C-OCDD	128	0.86	(0.76-1.02)

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	70.3

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

795 236

AMPLE DESCRIPTION: C9401504
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.909
ANALYSIS DATE: Feb. 23-94
ANALYSIS TIME: 17:57

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-02 FILE: K587_0030 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	0.52	
TOTAL PeCDD		ND	0.76	
TOTAL HxCDD		ND	0.88	
TOTAL HpCDD		12.8	0.55	2
TOTAL OCDD		44.0	0.41	1
TOTAL PCDDs		56.8		
TOTAL TCDF	(MPC)	2366	1.07	6
TOTAL PeCDF	(MPC)	880	0.38	5
TOTAL HxCDF	(MPC)	190	0.93	4
TOTAL HpCDF	(MPC)	7.21	0.36	3
TOTAL OCDF		ND	1.16	
TOTAL PCDFs		3443		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401505
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.873
ANALYSIS DATE: Feb. 23-94
ANALYSIS TIME: 19:02

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-03 FILE: K587_0031 APPROVED BY:

CONGENERS		CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		ND	0.87		(0.65-0.89)	
2,3,7,8-TCDF		ND	1.49		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND	0.86		(1.32-1.78)	
1,2,3,7,8-PeCDF		ND	0.78		(1.32-1.78)	
2,3,4,7,8-PeCDF		ND	1.09		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND	1.05		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND	0.63		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND	0.64		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND	0.63		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND	0.29		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND	0.54		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND	0.65		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD		9.62	0.58	1.09	(0.88-1.20)	2
1,2,3,4,6,7,8-HpCDF	(MPC)	3.71	0.50	0.69	(0.88-1.20)	1
1,2,3,4,7,8,9-HpCDF		ND	0.97		(0.88-1.20)	
OCDD		82.5	0.60	0.90	(0.76-1.02)	1
OCDF		7.29	0.96	0.85	(0.76-1.02)	7
TE		0.222				

INTERNAL STANDARDS	% RECOVERY		ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	84.9		0.72	(0.65-0.89)	
13C-2,3,7,8-TCDF	89.0		0.77	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	163	**	1.31	(1.32-1.78)	*
13C-1,2,3,7,8-PeCDF	133		1.58	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	155	**	1.56	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	87.1		1.40	(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD	131		1.28	(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF	126		0.51	(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF	117		0.56	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	130		0.52	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	125		0.57	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	124		1.03	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	114		0.47	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	125		0.44	(0.37-0.51)	
13C-OCDD	124		0.86	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	57.3

CH2M HILL DP LH SEP 16 1994

795 238

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

MPLE DESCRIPTION: C9401505
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.873
ANALYSIS DATE: Feb. 23-94
ANALYSIS TIME: 19:02

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-03

FILE: K587_0031

APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	0.87	
TOTAL PeCDD		ND	0.86	
TOTAL HxCDD		ND	1.05	
TOTAL HpCDD		19.9	0.58	2
TOTAL OCDD		82.5	0.60	1
TOTAL PCDDs		102		
TOTAL TCDF	(MPC)	473	1.49	5
TOTAL PeCDF	(MPC)	284	0.78	5
TOTAL HxCDF	(MPC)	65.3	0.63	5
TOTAL HpCDF	(MPC)	6.84	0.50	2
TOTAL OCDF		7.29	0.96	
TOTAL PCDFs		836		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401506
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.868
ANALYSIS DATE: Feb. 23-94
ANALYSIS TIME: 20:08

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-04 FILE: K587_0032 APPROVED BY:

CONGENERS		CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		ND	1.72		(0.65-0.89)	
2,3,7,8-TCDF		ND	1.17		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND	0.83		(1.32-1.78)	
1,2,3,7,8-PeCDF	(MPC)	410	1.15	1.60	(1.32-1.78)	2
2,3,4,7,8-PeCDF		ND	1.18		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND	2.44		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND	2.46		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND	2.50		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND	2.75		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND	2.44		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND	4.26		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND	4.13		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD		ND	1.25		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF		ND	0.64		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF		ND	1.11		(0.88-1.20)	
OCDD		15.9	2.98	0.96	(0.76-1.02)	3
OCDF		ND	2.29		(0.76-1.02)	
TE		20.5				

INTERNAL STANDARDS	% RECOVERY		ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	134		0.82	0.65-0.89)	
13C-2,3,7,8-TCDF	85.2		0.83	0.65-0.89)	
13C-1,2,3,7,8-PeCDD	131		1.39	(1.32-1.78)	
13C-1,2,3,7,8-PeCDF	71.4		1.58	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	107		1.48	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	128		1.33	(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD	155	**	1.34	(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF	98.7		0.62	(0.43-0.59)	*
13C-1,2,3,6,7,8-HxCDF	156	**	0.53	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	112		0.55	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	132		0.56	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	139	**	1.15	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	140	**	0.41	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	132		0.47	(0.37-0.51)	
13C-OCDD	155	**	0.89	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	60.3

CH2M HILL DP LH SEP 16 1994

795 240

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401506
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.868
ANALYSIS DATE: Feb. 23-94
ANALYSIS TIME: 20:08

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-04 FILE: K587_0032 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	1.72	
TOTAL PeCDD		ND	0.83	
TOTAL HxCDD		ND	2.44	
TOTAL HpCDD		3.54	1.25	1
TOTAL OCDD		15.9	2.98	1
TOTAL PCDDs		19.4		
TOTAL TCDF	(MPC)	904	1.17	4
TOTAL PeCDF	(MPC)	728	1.15	5
TOTAL HxCDF	(MPC)	198	2.75	4
TOTAL HpCDF		ND	0.64	
TOTAL OCDF		ND	2.29	
TOTAL PCDFs		1830		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401507
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.159
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 17:0?

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-05 FILE: K587_0054 APPROVED BY:

CONGENERS		CONC. pg/g		DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		CN		CN		(0.65-0.89)	
2,3,7,8-TCDF		ND		2.29		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND		0.42		(1.32-1.78)	
1,2,3,7,8-PeCDF	(MPC)	129		0.68	1.69	(1.32-1.78)	1
2,3,4,7,8-PeCDF		ND		1.23		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND		0.86		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND		0.54		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND		1.09		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND		1.10		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND		0.33		(1.05-1.43)	
2,3,4,6,7,8-HxCDF	(MPC)	1.35		0.48	0.95	(1.05-1.43)	1
1,2,3,7,8,9-HxCDF		ND		0.60		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD		9.52		0.72	0.92	(0.88-1.20)	3
1,2,3,4,6,7,8-HpCDF		4.68		0.76	1.05	(0.88-1.20)	0
1,2,3,4,7,8,9-HpCDF		ND		0.74		(0.88-1.20)	
OCDD		54.6		0.55	0.90	(0.76-1.02)	2
OCDF		7.27		1.10	1.02	(0.76-1.02)	18
TE		6.81					

INTERNAL STANDARDS	% RECOVERY		ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	CN		CN	(0.65-0.89)	
13C-2,3,7,8-TCDF	139	**	0.84	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	206	**	1.59	(1.32-1.78)	
13C-1,2,3,7,8-PeCDF	110		1.42	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	65.3		1.51	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	85.0		1.34	(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD	137	**	1.46	(1.05-1.43)	*
13C-1,2,3,4,7,8-HxCDF	169	**	0.51	(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF	151	**	0.49	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	124		0.53	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	134		0.5?	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	139	**	0.99	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	127		0.40	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	140	**	0.4?	(0.37-0.51)	
13C-OCDD	120		0.87	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	CN

CH2M HILL DP LH SEP 16 1994

795 242

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

AMPLE DESCRIPTION: C9401507
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.159
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 17:07

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-05 FILE: K587_0054 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		CN	CN	
TOTAL PeCDD		ND	0.42	
TOTAL HxCDD		ND	0.86	
TOTAL HpCDD		18.1	0.72	2
TOTAL OCDD		54.6	0.55	1
TOTAL PCDDs		72.7		
TOTAL TCDF	(MPC)	127	2.29	2
TOTAL PeCDF	(MPC)	272	0.68	4
TOTAL HxCDF	(MPC)	60.9	1.10	5
TOTAL HpCDF	(MPC)	7.65	0.76	2
TOTAL OCDF		7.27	1.10	1
TOTAL PCDFs		475		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C94015007
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.159
ANALYSIS DATE: Mar. ?-94
ANALYSIS TIME: 14:50

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-05 FILE: K590_0014 APPROVED BY:

CONGENERS	CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	3.92		(0.65-0.89)	
TE	---				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	107	0.80	(0.65-0.89)
CLEAN-UP STANDARD	% RECOVERY		
37Cl4-2,3,7,8-TCDD	117		

CH2M HILL DP LH SEP 16 1994

795 244

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C94015007
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.159
ANALYSIS DATE: Mar. 2-94
ANALYSIS TIME: 14:50

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-05 FILE: K590_0014 APPROVED BY:

TOTAL HOMOLOGUES	pg/g	DL	# PEAKS
TOTAL TCDD	ND	3.92	
TOTAL PCDDs	ND		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio. The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401508 795 245
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.841
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 18:13

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-06 FILE: K587_0055 APPROVED BY:

CONGENERS		CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		ND	0.42		(0.65-0.89)	
2,3,7,8-TCDF		ND	0.47		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND	0.56		(1.32-1.78)	
1,2,3,7,8-PeCDF	(MPC)	46.8 J	0.95	1.55	(1.32-1.78)	1
2,3,4,7,8-PeCDF		ND	0.26		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND	0.88		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND	1.02		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND	1.04		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND	1.15		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND	1.06		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND	1.20		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND	1.42		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD		ND	0.70		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF		ND	0.50		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF		ND	1.39		(0.88-1.20)	
OCDD	(MPC)	12.5	1.18	0.75	(0.76-1.02)	1
OCDF		ND	1.93		(0.76-1.02)	
TE		2.35				

INTERNAL STANDARDS	% RECOVERY		ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	115		0.77	(0.65-0.89)
13C-2,3,7,8-TCDF	107		0.77	(0.65-0.89)
13C-1,2,3,7,8-PeCDD	136	**	1.66	(1.32-1.78)
13C-1,2,3,7,8-PeCDF	97.3		1.64	(1.32-1.78)
13C-2,3,4,7,8-PeCDF	77.8		1.70	(1.32-1.78)
13C-1,2,3,4,7,8-HxCDD	183	**	1.24	(1.05-1.43)
13C-1,2,3,6,7,8-HxCDD	143	**	1.18	(1.05-1.43)
13C-1,2,3,4,7,8-HxCDF	168	**	0.59	(0.43-0.59)
13C-1,2,3,6,7,8-HxCDF	144	**	0.43	(0.43-0.59)
13C-2,3,4,6,7,8-HxCDF	77.4		0.59	(0.43-0.59)
13C-1,2,3,7,8,9-HxCDF	133		0.47	(0.43-0.59)
13C-1,2,3,4,6,7,8-HpCDD	155	**	1.08	(0.88-1.20)
13C-1,2,3,4,6,7,8-HpCDF	136	**	0.48	(0.37-0.51)
13C-1,2,3,4,7,8,9-HpCDF	151	**	0.43	(0.37-0.51)
13C-OCDD	124		0.87	(0.76-1.02)

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	69.9

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

795 246

\MPLE DESCRIPTION: C9401508
:THOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.841
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 18:13

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-06 FILE: K587_0055 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	0.42	
TOTAL PeCDD		ND	0.56	
TOTAL HxCDD		ND	0.88	
TOTAL HpCDD		ND	0.70	
TOTAL OCDD	(MPC)	12.5	1.18	1
TOTAL PCDDs		12.5		
TOTAL TCDF	(MPC)	149	0.47	5
TOTAL PeCDF	(MPC)	81.5	0.95	4
TOTAL HxCDF	(MPC)	9.99	1.15	1
TOTAL HpCDF		ND	0.50	
TOTAL OCDF		ND	1.93	
)TAL PCDFs		240		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

795 247

SAMPLE DESCRIPTION: C9401509
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.942
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 19:18

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-07 FILE: K587_0056 APPROVED BY:

CONGENERS		CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		ND	1.00		(0.65-0.89)	
2,3,7,8-TCDF		ND	0.48		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND	0.37		(1.32-1.78)	
1,2,3,7,8-PeCDF		ND	0.52		(1.32-1.78)	
2,3,4,7,8-PeCDF		ND	0.42		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND	0.94		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND	0.77		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND	0.78		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND	0.90		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND	0.62		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND	1.70		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND	1.33		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	(MPC)	14.6	0.92	1.26	(0.88-1.20)	1
1,2,3,4,6,7,8-HpCDF		4.17	0.62	0.95	(0.88-1.20)	0
1,2,3,4,7,8,9-HpCDF		ND	0.84		(0.88-1.20)	
OCDD		116	1.09	0.85	(0.76-1.02)	3
OCDF	(MPC)	3.45	1.05	0.59	(0.76-1.02)	17
TE		0.307				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	96.4	0.83	(0.65-0.89)
13C-2,3,7,8-TCDF	109	0.71	(0.65-0.89)
13C-1,2,3,7,8-PeCDD	122	1.35	(1.32-1.78)
13C-1,2,3,7,8-PeCDF	114	1.47	(1.32-1.78)
13C-2,3,4,7,8-PeCDF	128	1.42	(1.32-1.78)
13C-1,2,3,4,7,8-HxCDD	124	1.30	(1.05-1.43)
13C-1,2,3,6,7,8-HxCDD	144 **	1.34	(1.05-1.43)
13C-1,2,3,4,7,8-HxCDF	154 **	0.51	(0.43-0.59)
13C-1,2,3,6,7,8-HxCDF	129	0.51	(0.43-0.59)
13C-2,3,4,6,7,8-HxCDF	109	0.55	(0.43-0.59)
13C-1,2,3,7,8,9-HxCDF	122	0.57	(0.43-0.59)
13C-1,2,3,4,6,7,8-HpCDD	129	1.13	(0.88-1.20)
13C-1,2,3,4,6,7,8-HpCDF	127	0.47	(0.37-0.51)
13C-1,2,3,4,7,8,9-HpCDF	134	0.45	(0.37-0.51)
13C-OCDD	129	1.00	(0.76-1.02)

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	66.1

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401509
METHOD: 8290

795 248

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.942
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 19:18

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-07 FILE: K587_0056 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	1.00	
TOTAL PeCDD		ND	0.37	
TOTAL HxCDD	(MPC)	7.51	0.94	1
TOTAL HpCDD	(MPC)	27.7	0.92	2
TOTAL OCDD		116	1.09	1
TOTAL PCDDs		151		
TOTAL TCDF	(MPC)	151	0.48	5
TOTAL PeCDF	(MPC)	120	0.52	4
TOTAL HxCDF	(MPC)	23.1	0.90	3
TOTAL HpCDF	(MPC)	6.07	0.62	3
TOTAL OCDF	(MPC)	3.45	1.05	3
TOTAL PCDFs		304		

GENERAL NOTES:

pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401510
METHOD: 8290

795 249

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.848
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 20:23

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-08 FILE: K587_0057 APPROVED BY:

CONGENERS		CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		ND	0.80		(0.65-0.89)	
2,3,7,8-TCDF		ND	0.52		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND	0.81		(1.32-1.78)	
1,2,3,7,8-PeCDF		ND	0.57		(1.32-1.78)	
2,3,4,7,8-PeCDF		ND	0.68		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND	0.92		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND	0.81		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND	0.83		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND	0.69		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND	0.36		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND	1.08		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND	0.92		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	(MPC)	4.45	0.68	1.26	(0.88-1.20)	3
1,2,3,4,6,7,8-HpCDF		ND	0.50		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF		ND	1.20		(0.88-1.20)	
OCDD		30.0	1.24	0.86	(0.76-1.02)	1
OCDF		ND	1.90		(0.76-1.02)	
TE		5.11				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	185 **	0.84	(0.65-0.89)
13C-2,3,7,8-TCDF	133	0.71	(0.65-0.89)
13C-1,2,3,7,8-PeCDD	177 **	1.42	(1.32-1.78)
13C-1,2,3,7,8-PeCDF	115	1.57	(1.32-1.78)
13C-2,3,4,7,8-PeCDF	146 **	1.44	(1.32-1.78)
13C-1,2,3,4,7,8-HxCDD	174 **	1.24	(1.05-1.43)
13C-1,2,3,6,7,8-HxCDD	185 **	1.29	(1.05-1.43)
13C-1,2,3,4,7,8-HxCDF	149 **	0.54	(0.43-0.59)
13C-1,2,3,6,7,8-HxCDF	169 **	0.50	(0.43-0.59)
13C-2,3,4,6,7,8-HxCDF	121	0.59	(0.43-0.59)
13C-1,2,3,7,8,9-HxCDF	164 **	0.60	(0.43-0.59) *
13C-1,2,3,4,6,7,8-HpCDD	160 **	0.91	(0.88-1.20)
13C-1,2,3,4,6,7,8-HpCDF	161 **	0.51	(0.37-0.51)
13C-1,2,3,4,7,8,9-HpCDF	155 **	0.42	(0.37-0.51)
13C-OCDD	147 **	0.92	(0.76-1.02)

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	63.9

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT: 795 250

AMPLE DESCRIPTION: C9401510
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94
SAMPLE DRY WEIGHT (grams) = 0.848
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 20:23

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-08
FILE: K587_0057
APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	0.80	
TOTAL PeCDD		ND	0.81	
TOTAL HxCDD		ND	0.92	
TOTAL HpCDD	(MPC)	8.29	0.68	2
TOTAL OCDD		30.0	1.24	1
TOTAL PCDDs		38.3		
TOTAL TCDF	(MPC)	325	0.52	5
TOTAL PeCDF	(MPC)	473	0.57	5
TOTAL HxCDF	(MPC)	149	0.69	4
TOTAL HpCDF		ND	0.50	
TOTAL OCDF		ND	1.90	
TOTAL PCDFs		947		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401511
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.981
ANALYSIS DATE: Feb. 21-94
ANALYSIS TIME: 21:28

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-09 FILE: K587_0058 APPROVED BY:

CONGENERS		CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		ND	0.80		(0.65-0.89)	
2,3,7,8-TCDF		ND	1.98		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND	1.66		(1.32-1.78)	
1,2,3,7,8-PeCDF	(MPC)	132	0.99	1.53	(1.32-1.78)	2
2,3,4,7,8-PeCDF		ND	0.85		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND	2.58		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		3.49	1.19	0.88	(1.05-1.43)	1
1,2,3,7,8,9-HxCDD		ND	1.11		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND	2.09		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND	1.10		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		6.75	1.08	1.16	(1.05-1.43)	1
1,2,3,7,8,9-HxCDF		ND	0.88		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD		66.4	0.96	1.06	(0.88-1.20)	2
1,2,3,4,6,7,8-HpCDF		23.5	1.28	1.11	(0.88-1.20)	1
1,2,3,4,7,8,9-HpCDF		ND	1.06		(0.88-1.20)	
OCDD		405	1.33	0.88	(0.76-1.02)	2
OCDF		35.3	1.63	0.83	(0.76-1.02)	18
TE		5.65				

INTERNAL STANDARDS	% RECOVERY		ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	110		0.89	(0.65-0.89)	
13C-2,3,7,8-TCDF	106		0.78	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	95.7		1.44	(1.32-1.78)	
13C-1,2,3,7,8-PeCDF	131		1.53	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	136	**	1.37	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	67.8		1.67	(1.05-1.43)	*
13C-1,2,3,6,7,8-HxCDD	120		1.32	(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF	144	**	0.55	(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF	129		0.57	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	140	**	0.55	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	137	**	0.55	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	136	**	1.00	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	135		0.53	(0.37-0.51)	*
13C-1,2,3,4,7,8,9-HpCDF	132		0.41	(0.37-0.51)	
13C-OCDD	119		0.91	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	70.6

CH2M HILL DP LH SEP 16 1994

795 252

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401511
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.981
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 21:28

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-09 FILE: K587_0058 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	0.80	
TOTAL PeCDD		ND	1.66	
TOTAL HxCDD	(MPC)	59.5	2.58	3
TOTAL HpCDD		137	0.96	2
TOTAL OCDD		405	1.33	1
TOTAL PCDDs		602		
TOTAL TCDF	(MPC)	432	1.98	8
TOTAL PeCDF	(MPC)	401	0.99	7
TOTAL HxCDF	(MPC)	111	2.09	7
TOTAL HpCDF	(MPC)	45.0	1.28	3
TOTAL OCDF		35.3	1.63	1
TOTAL PCDFs		1024		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all identification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401512 795 253
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.966
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 22:34

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-10 FILE: K587_0059 APPROVED BY:

CONGENERS		CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		ND	2.11		(0.65-0.89)	
2,3,7,8-TCDF		ND	1.63		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND	1.64		(1.32-1.78)	
1,2,3,7,8-PeCDF	(MPC)	144	0.95	1.50	(1.32-1.78)	0
2,3,4,7,8-PeCDF		ND	1.04		(1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND	1.88		(1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND	0.81		(1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND	1.45		(1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND	1.76		(1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND	0.78		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND	1.24		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND	1.73		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	(MPC)	33.5	0.96	1.22	(0.88-1.20)	2
1,2,3,4,6,7,8-HpCDF		16.7	1.18	1.08	(0.88-1.20)	1
1,2,3,4,7,8,9-HpCDF		ND	2.02		(0.88-1.20)	
OCDD		235	1.68	0.88	(0.76-1.02)	0
OCDF		23.6	1.51	0.85	(0.76-1.02)	6
TE		7.95				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	51.8	0.84	(0.65-0.89)	
13C-2,3,7,8-TCDF	70.0	0.77	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	64.5	1.58	(1.32-1.78)	
13C-1,2,3,7,8-PeCDF	75.0	1.50	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	85.4	1.42	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	42.0	1.56	(1.05-1.43)	*
13C-1,2,3,6,7,8-HxCDD	67.4	1.21	(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF	106	0.58	(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF	85.7	0.54	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	98.8	0.55	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	88.7	0.54	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	89.2	1.03	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	87.6	0.50	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	95.8	0.44	(0.37-0.51)	
13C-OCDD	88.2	1.00	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	68.2

CH2M HILL DP LH SEP 16 1994

795 254

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

AMPLE DESCRIPTION: C9401512
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.966
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 22:34

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-10

FILE: K587_0059

APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	2.11	
TOTAL PeCDD		ND	1.64	
TOTAL HxCDD	(MPC)	35.2	1.88	2
TOTAL HpCDD		71.6	0.96	2
TOTAL OCDD		235	1.68	1
TOTAL PCDDs		342		
TOTAL TCDF	(MPC)	345	1.63	5
TOTAL PeCDF	(MPC)	298	0.95	6
TOTAL HxCDF	(MPC)	68.7	1.76	6
TOTAL HpCDF	(MPC)	34.8	1.18	3
TOTAL OCDF		23.6	1.51	1
TOTAL PCDFs		770		

GENERAL NOTES:

pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all identification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

795 255

SAMPLE DESCRIPTION: C9401513
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.054
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 23:39

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-11 FILE: K587_0060 APPROVED BY:

CONGENERS	CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	2.33		(0.65-0.89)	
2,3,7,8-TCDF	ND	0.76		(0.65-0.89)	
1,2,3,7,8-PeCDD	ND	0.70		(1.32-1.78)	
1,2,3,7,8-PeCDF	2.35	0.27	1.35	(1.32-1.78)	0
2,3,4,7,8-PeCDF	ND	0.46		(1.32-1.78)	
1,2,3,4,7,8-HxCDD	ND	1.58		(1.05-1.43)	
1,2,3,6,7,8-HxCDD	ND	0.58		(1.05-1.43)	
1,2,3,7,8,9-HxCDD	ND	0.59		(1.05-1.43)	
1,2,3,4,7,8-HxCDF	ND	1.02		(1.05-1.43)	
1,2,3,6,7,8-HxCDF	ND	0.79		(1.05-1.43)	
2,3,4,6,7,8-HxCDF	ND	0.93		(1.05-1.43)	
1,2,3,7,8,9-HxCDF	ND	1.10		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	3.02	0.45	1.13	(0.88-1.20)	2
1,2,3,4,6,7,8-HpCDF	ND	0.83		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF	ND	1.27		(0.88-1.20)	
OCDD	20.0 J	0.88	0.91	(0.76-1.02)	0
OCDF	3.66 J	0.86	0.86	(0.76-1.02)	17
TE	0.172				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	56.5	0.84	(0.65-0.89)	
13C-2,3,7,8-TCDF	90.4	0.74	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	146	1.60	(1.32-1.78)	
13C-1,2,3,7,8-PeCDF	111	1.63	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	114	1.45	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	54.5	1.32	(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD	161	1.44	(1.05-1.43)	*
13C-1,2,3,4,7,8-HxCDF	135	0.46	(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF	136	0.58	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	137	0.51	(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF	127	0.56	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	128	0.99	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	134	0.52	(0.37-0.51)	*
13C-1,2,3,4,7,8,9-HpCDF	125	0.44	(0.37-0.51)	
13C-OCDD	138	0.93	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	65.1

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

795 256

MPLE DESCRIPTION: C9401513
ETHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.054
ANALYSIS DATE: Feb. 24-94
ANALYSIS TIME: 23:39

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-11 FILE: K587_0060 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	2.33	
TOTAL PeCDD		ND	0.70	
TOTAL HxCDD		ND	1.58	
TOTAL HpCDD	(MPC)	5.80	0.45	2
TOTAL OCDD		20.0	0.88	1
TOTAL PCDDs		25.8		
TOTAL TCDF		7.98	0.76	3
TOTAL PeCDF	(MPC)	4.21	0.27	2
TOTAL HxCDF		ND	1.02	
TOTAL HpCDF		ND	0.83	
TOTAL OCDF		3.66	0.86	1
TOTAL PCDFs		15.9		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401514
METHOD: 8290

735 257

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.014
ANALYSIS DATE: Feb. 25-94
ANALYSIS TIME: 00:45

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-12 FILE: K587_0061 APPROVED BY:

CONGENERS	CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	0.54		(0.65-0.89)	
2,3,7,8-TCDF	ND	0.50		(0.65-0.89)	
1,2,3,7,8-PeCDD	ND	1.20		(1.32-1.78)	
1,2,3,7,8-PeCDF	ND	0.61		(1.32-1.78)	
2,3,4,7,8-PeCDF	ND	0.34		(1.32-1.78)	
1,2,3,4,7,8-HxCDD	ND	2.13		(1.05-1.43)	
1,2,3,6,7,8-HxCDD	5.18 J	0.66	1.21	(1.05-1.43)	1
1,2,3,7,8,9-HxCDD	ND	0.67		(1.05-1.43)	
1,2,3,4,7,8-HxCDF	ND	1.65		(1.05-1.43)	
1,2,3,6,7,8-HxCDF	ND	0.90		(1.05-1.43)	
2,3,4,6,7,8-HxCDF	5.11 J	0.99	1.39	(1.05-1.43)	1
1,2,3,7,8,9-HxCDF	ND	0.85		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	116 J	0.77	1.02	(0.88-1.20)	1
1,2,3,4,6,7,8-HpCDF	42.7 J	0.55	1.09	(0.88-1.20)	1
1,2,3,4,7,8,9-HpCDF	ND	1.60		(0.88-1.20)	
OCDD	899 J	1.13	0.88	(0.76-1.02)	1
OCDF	~~3.59~~ 77.8 J DS	1.27	0.89	(0.76-1.02)	18
TE	3.59				

10/6/94

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	134	0.86	(0.65-0.89)
13C-2,3,7,8-TCDF	124	0.74	(0.65-0.89)
13C-1,2,3,7,8-PeCDD	96.5	1.72	(1.32-1.78)
13C-1,2,3,7,8-PeCDF	120	1.54	(1.32-1.78)
13C-2,3,4,7,8-PeCDF	136 **	1.58	(1.32-1.78)
13C-1,2,3,4,7,8-HxCDD	52.2	1.41	(1.05-1.43)
13C-1,2,3,6,7,8-HxCDD	152 **	1.26	(1.05-1.43)
13C-1,2,3,4,7,8-HxCDF	160 **	0.52	(0.43-0.59)
13C-1,2,3,6,7,8-HxCDF	153 **	0.55	(0.43-0.59)
13C-2,3,4,6,7,8-HxCDF	150 **	0.52	(0.43-0.59)
13C-1,2,3,7,8,9-HxCDF	142 **	0.52	(0.43-0.59)
13C-1,2,3,4,6,7,8-HpCDD	170 **	1.00	(0.88-1.20)
13C-1,2,3,4,6,7,8-HpCDF	161 **	0.47	(0.37-0.51)
13C-1,2,3,4,7,8,9-HpCDF	153 **	0.42	(0.37-0.51)
13C-OCDD	166 **	0.88	(0.76-1.02)

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	72.9

CH2M HILL DP LH SEP 16 1994

795 258

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

AMPLE DESCRIPTION: C9401514
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.014
ANALYSIS DATE: Feb. 25-94
ANALYSIS TIME: 00:45

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-12 FILE: K587_0061 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	0.54	
TOTAL PeCDD		ND	1.20	
TOTAL HxCDD	(MPC)	130	2.13	3
TOTAL HpCDD		224	0.77	2
TOTAL OCDD		899	1.13	1
TOTAL PCDDs		1253		
TOTAL TCDF	(MPC)	238	0.50	8
TOTAL PeCDF	(MPC)	257	0.61	7
TOTAL HxCDF	(MPC)	121	1.65	6
TOTAL HpCDF	(MPC)	104	0.55	3
TOTAL OCDF		77.8	1.27	1
TOTAL PCDFs		798		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks: these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

795 259

SAMPLE DESCRIPTION: C9401515
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.130
ANALYSIS DATE: Feb. 15-94
ANALYSIS TIME: 1:50

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-13 FILE: K587_0062 APPROVED BY:

CONGENERS	CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	2.64		(0.65-0.89)	
2,3,7,8-TCDF	ND	3.08		(0.65-0.89)	
1,2,3,7,8-PeCDD	ND	1.08		(1.32-1.78)	
1,2,3,7,8-PeCDF	ND	6.29		(1.32-1.78)	
2,3,4,7,8-PeCDF	ND	0.65		(1.32-1.78)	
1,2,3,4,7,8-HxCDD	ND	2.23		(1.05-1.43)	
1,2,3,6,7,8-HxCDD	ND	2.38		(1.05-1.43)	
1,2,3,7,8,9-HxCDD	ND	2.46		(1.05-1.43)	
1,2,3,4,7,8-HxCDF	ND	4.88		(1.05-1.43)	
1,2,3,6,7,8-HxCDF	ND	5.24		(1.05-1.43)	
2,3,4,6,7,8-HxCDF	ND	3.90		(1.05-1.43)	
1,2,3,7,8,9-HxCDF	ND	3.42		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD	25.0	1.36	1.17	(0.88-1.20)	1
1,2,3,4,6,7,8-HpCDF	ND	1.15		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF	ND	1.75		(0.88-1.20)	
OCDD	236	1.42	0.88	(0.76-1.02)	2
OCDF	23.1	2.18	0.91	(0.76-1.02)	16
TE	3.63				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS	
13C-2,3,7,8-TCDD	75.3	0.89	(0.65-0.89)	
13C-2,3,7,8-TCDF	49.5	0.80	(0.65-0.89)	
13C-1,2,3,7,8-PeCDD	130	1.46	(1.32-1.78)	
13C-1,2,3,7,8-PeCDF	28.9 **	1.66	(1.32-1.78)	
13C-2,3,4,7,8-PeCDF	104	1.53	(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD	128	1.89	(1.05-1.43)	*
13C-1,2,3,6,7,8-HxCDD	129	1.71	(1.05-1.43)	*
13C-1,2,3,4,7,8-HxCDF	108	0.71	(0.43-0.59)	*
13C-1,2,3,6,7,8-HxCDF	172 **	0.58	(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF	95.1	0.63	(0.43-0.59)	*
13C-1,2,3,7,8,9-HxCDF	119	0.56	(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD	227 **	0.97	(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF	207 **	0.45	(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF	192 **	0.40	(0.37-0.51)	
13C-OCDD	276 **	0.89	(0.76-1.02)	

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	45.3

CH2M HILL DP LH SEP 16 1994

795 260

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

MPLE DESCRIPTION: C9401515
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 1.130
ANALYSIS DATE: Feb. 25-94
ANALYSIS TIME: 1:50

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-13 FILE: K587_0062 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	2.64	
TOTAL PeCDD		ND	1.08	
TOTAL HxCDD		ND	2.23	
TOTAL HpCDD		52.4	1.36	2
TOTAL OCDD		236	1.42	1
TOTAL PCDDs		288		
TOTAL TCDF	(MPC)	146	3.08	3
TOTAL PeCDF	(MPC)	280	6.29	4
TOTAL HxCDF	(MPC)	72.3	4.88	3
TOTAL HpCDF	(MPC)	22.5	1.15	2
TOTAL OCDF		23.1	2.18	1
TOTAL PCDFs		544		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all identification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401516 795 261
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.809
ANALYSIS DATE: Feb. 25-94
ANALYSIS TIME: 2:55

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-14 FILE: K587_0063 APPROVED BY:

CONGENERS		CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD		CN	CN		(0.65-0.89)	
2,3,7,8-TCDF		ND	1.64		(0.65-0.89)	
1,2,3,7,8-PeCDD		ND	1.77		(1.32-1.78)	
1,2,3,7,8-PeCDF	(MPC)	64.4	1.56	1.60	1.32-1.78)	1
2,3,4,7,8-PeCDF		ND	2.58		1.32-1.78)	
1,2,3,4,7,8-HxCDD		ND	4.08		1.05-1.43)	
1,2,3,6,7,8-HxCDD		ND	2.09		1.05-1.43)	
1,2,3,7,8,9-HxCDD		ND	2.12		1.05-1.43)	
1,2,3,4,7,8-HxCDF		ND	2.32		1.05-1.43)	
1,2,3,6,7,8-HxCDF		ND	2.41		(1.05-1.43)	
2,3,4,6,7,8-HxCDF		ND	1.94		(1.05-1.43)	
1,2,3,7,8,9-HxCDF		ND	2.79		(1.05-1.43)	
1,2,3,4,6,7,8-HpCDD		ND	2.98		(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF		ND	3.05		(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF		ND	3.74		(0.88-1.20)	
OCDD		36.4	2.26	0.95	(0.76-1.02)	1
OCDF		ND	5.15		(0.76-1.02)	
TE		3.25				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	CN	CN	(0.65-0.89)
13C-2,3,7,8-TCDF	98.5	0.81	(0.65-0.89)
13C-1,2,3,7,8-PeCDD	107	1.67	(1.32-1.78)
13C-1,2,3,7,8-PeCDF	84.6	1.36	(1.32-1.78)
13C-2,3,4,7,8-PeCDF	74.7	1.53	(1.32-1.78)
13C-1,2,3,4,7,8-HxCDD	79.5	1.26	(1.05-1.43)
13C-1,2,3,6,7,8-HxCDD	128	1.29	(1.05-1.43)
13C-1,2,3,4,7,8-HxCDF	121	0.57	(0.43-0.59)
13C-1,2,3,6,7,8-HxCDF	112	0.59	(0.43-0.59)
13C-2,3,4,6,7,8-HxCDF	122	0.50	(0.43-0.59)
13C-1,2,3,7,8,9-HxCDF	111	0.52	(0.43-0.59)
13C-1,2,3,4,6,7,8-HpCDD	95.8	1.14	(0.88-1.20)
13C-1,2,3,4,6,7,8-HpCDF	120	0.47	(0.37-0.51)
13C-1,2,3,4,7,8,9-HpCDF	134	0.51	(0.37-0.51)
13C-OCDD	109	0.89	(0.76-1.02)

CLEAN-UP STANDARD	% RECOVERY
37Cl4-2,3,7,8-TCDD	CN

CH2M HILL DP LH SEP 16 1994

795 262

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

SAMPLE DESCRIPTION: C9401516
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.809
ANALYSIS DATE: Feb. 25-94
ANALYSIS TIME: 2:55

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-14 FILE: K587_0063 APPROVED BY:

TOTAL HOMOLOGUES		pg/g	DL	# PEAKS
TOTAL TCDD		ND	CN	
TOTAL PeCDD		ND	1.77	
TOTAL HxCDD		ND	4.08	
TOTAL HpCDD		ND	2.98	
TOTAL OCDD		36.4	2.26	1
TOTAL PCDDs		36.4		
TOTAL TCDF	(MPC)	168	1.64	5
TOTAL PeCDF	(MPC)	117	1.56	4
TOTAL HxCDF	(MPC)	20.3	2.32	2
TOTAL HpCDF		ND	3.05	
TOTAL OCDF		ND	5.15	
TOTAL PCDFs		305		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all identification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.
The furan homologue groups show the presence of co-eluting chlorinated diphenyl ethers.

CH2M HILL DP LH SEP 16 1994

CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT:

795 263

SAMPLE DESCRIPTION: C94015016
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94

SAMPLE DRY WEIGHT (grams) = 0.890
ANALYSIS DATE: Mar. 2-94
ANALYSIS TIME: 15:43

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-14 FILE: K590_0016 APPROVED BY:

CONGENERS	CONC. pg/g	DL pg/g	ION RATIO	RATIO LIMITS	RRT (sec.)
2,3,7,8-TCDD	ND	5.69		(0.65-0.89)	
TE	---				

INTERNAL STANDARDS	% RECOVERY	ION RATIO	RATIO LIMITS
13C-2,3,7,8-TCDD	92.0	0.74	(0.65-0.89)
CLEAN-UP STANDARD	% RECOVERY		
37Cl4-2,3,7,8-TCDD	66.3		

CH2M HILL DP LH SEP 16 1994

- CANVIRO ANALYTICAL LABORATORIES LTD. - CONCENTRATION REPORT: 795 264

SAMPLE DESCRIPTION: C94015016
METHOD: 8290

SAMPLE DATE: Feb. 3-94
EXTRACTION DATE: Feb. 15-94
SAMPLE DRY WEIGHT (grams) = 0.890
ANALYSIS DATE: Mar. 2-94
ANALYSIS TIME: 15:43

GC COLUMN & MS: DB-5, 60 m, 0.25 mm ID, 0.25 um df - Kratos Concept HRMS

CANVIRO I.D. NO.: 9402079-14 FILE: K590_0016 APPROVED BY:

TOTAL HOMOLOGUES	pg/g	DL	# PEAKS
TOTAL TCDD	ND	5.69	
TOTAL PCDDs	ND		

GENERAL NOTES:
pg/L = ppq
pg/g = ppt
CN = Refer to Case Narrative
ND = Not Detected
MPC = Not all idenification criteria satisfied, Incorrect ion ratio.
The Maximum Possible Concentration is reported
* = Result is outside of Ratio Limit
** = Result is outside of limits set for internal precision and recovery.
DL = Sample specific detection limit.
Some RRT values are > 2 sec. due to the presence of other closely eluting peaks; these values should also be regarded as MPC.

795 265

TAB

Appendix B

795 266

APPENDIX B

Boring Log and Well Completion Diagrams

795 267

CH2M HILL

PROJECT NUMBER	BORING NUMBER
TXE70207.A0.04	MW-134 (H23) SHEET 1 OF 2

SOIL BORING LOG

PROJECT Kelly AFB - Zone 4 RI LOCATION Zone 4

ELEVATION 662.24 Ground DRILLING CONTRACTOR Jones Environmental Drilling Inc.

DRILLING METHOD AND EQUIPMENT 8" HSA/2" SS-SPT/3" SS-Samp. Int.=2'/4'Cont/Samp.

WATER LEVELS START 1-24-94 0830 FINISH 1-24-94 1300 LOGGER K. Kimble

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	1.0				Clay, (CH), black, dry to moist, very stiff, plastic, grass and roots	Clay (CH), black.
					Clay, (CH), brown, dry to moist, very stiff, plastic, caliche nodules, roots	Shelby Tube 1-3 fett.
			4.7/5			Clay (CH), brown.
	5.0					C9400903
6.0					Same as above, Clay, (CH)	OVM < 1 O_{221} % LEL 0%
	6.0					
					Clay, (CL), light brown, dry to moist, stiff, plastic, abundant caliche nodules, (1-2"), roots.	Clay (CL), light brown, abundant caliche
			5/5			
	10.0					
10.0					Clay, (CL), light brown, moist, stiff, plastic, gray mottling	OVM <.1
						Clay (CL), light brown, mottling. O_{21}% LEL 0%
			5/5			C9400904
						C9400905
	15.0					
15.0	15.5				Same as above, Clay (CL).	
	16.0				Silty Clay, (CL), light brown, moist, mottling.	Silty Clay (CL)
	16.5				Clayey Sand, (SC), brown, medium to coarse grained.	Clayey Sand (SC).
			3.5/5			Clay (CH).
	18.3				Clay, (CH), light brown, moist, very stiff, plastic, gray mottling, amount of gravel increasing with depth.	
	18.5					OVM < 1
						Clayey Sand (SC).
	20.0				Clayey Sand, (SC), light brown, medium to coarse, gravelly, loose.	O_{221}%
20.0						LEL 0%
			2/2	5-11-17-32	Fat Clay, (CH), red-brown and gray, dry to moist, hard, plastic, trace coarse sand, mottled.	Clay (CH)
	22.0					
			2/2	33-38-50 for 5"		Silty Clay (CL).
	24.0					
25.0			2/2	19-25-24-48	Clayey Silt, (ML), with fine sand, light brown, and gray mottled, moist, hard, plastic, mottled.	Navarro Transition.
	26.0					
			1.5/2	30-29-50 for 6"	26-26.2 Clayey Sand, (SC), brown, fien to medium grained. 26.2-26.5 Clayey Silt, (ML), mottled brown and gray. 26.5-26.7 Clayey Sand, (SC), brown, fine to medium grained.	
	28.0					
			1.7/2	37-50 for 6"	26.7-27.2 Clayey Silt, (ML), brown and gray, mottled.	Sand (SW).
	30.0					

795 268

CH2M HILL

PROJECT NUMBER	BORING NUMBER
TXE70207.A0.04	MW-134 (H23)

SHEET 2 OF 2

SOIL BORING LOG

PROJECT Kelly AFB - Zone 4 RI LOCATION Zone 4

ELEVATION 662 24 Ground DRILLING CONTRACTOR Jones Environmental Drilling Inc.

DRILLING METHOD AND EQUIPMENT 8" HSA/2" SS-SPT/3" SS-Samp. Int =2'/4'Cont/Samp

WATER LEVELS START 1-24-94 0830 FINISH 1-24-94 1300 LOGGER K. Kimble

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	COMMENTS
	30.0		.1/2	50 for 3"	Clayey Gravel (GC), brown, loose, poorly sorted.	Clayey Gravel (GC).
	32.0				No sample taken (gravelly	
	34.0					
	35.0					
36.0					35-35.4 Clayey Sand, (SC), brown, fine to medium grained	Clayey Sand (SC).
			2/2	16-19-44-30	35.4-37 Clay, (CH), with silt, orange brown, dry, gray silt, some coarse sand in gray silt, hard, mottled.	Clay (CH) with silt.
	37.0					Navarro clay
			/2	30-32-30	Clay, (CH), gray and orange brown, hard, moist, mottled	
	39.0					
					End of boring at 40 feet.	
40.0						
45.0						
50.0						
55.0						

795 269

SS052mw134

CH2M HILL

PROJECT NUMBER	BORING NUMBER
TXE70207.A0.04	MW-134 (H23) SHEET 1 OF

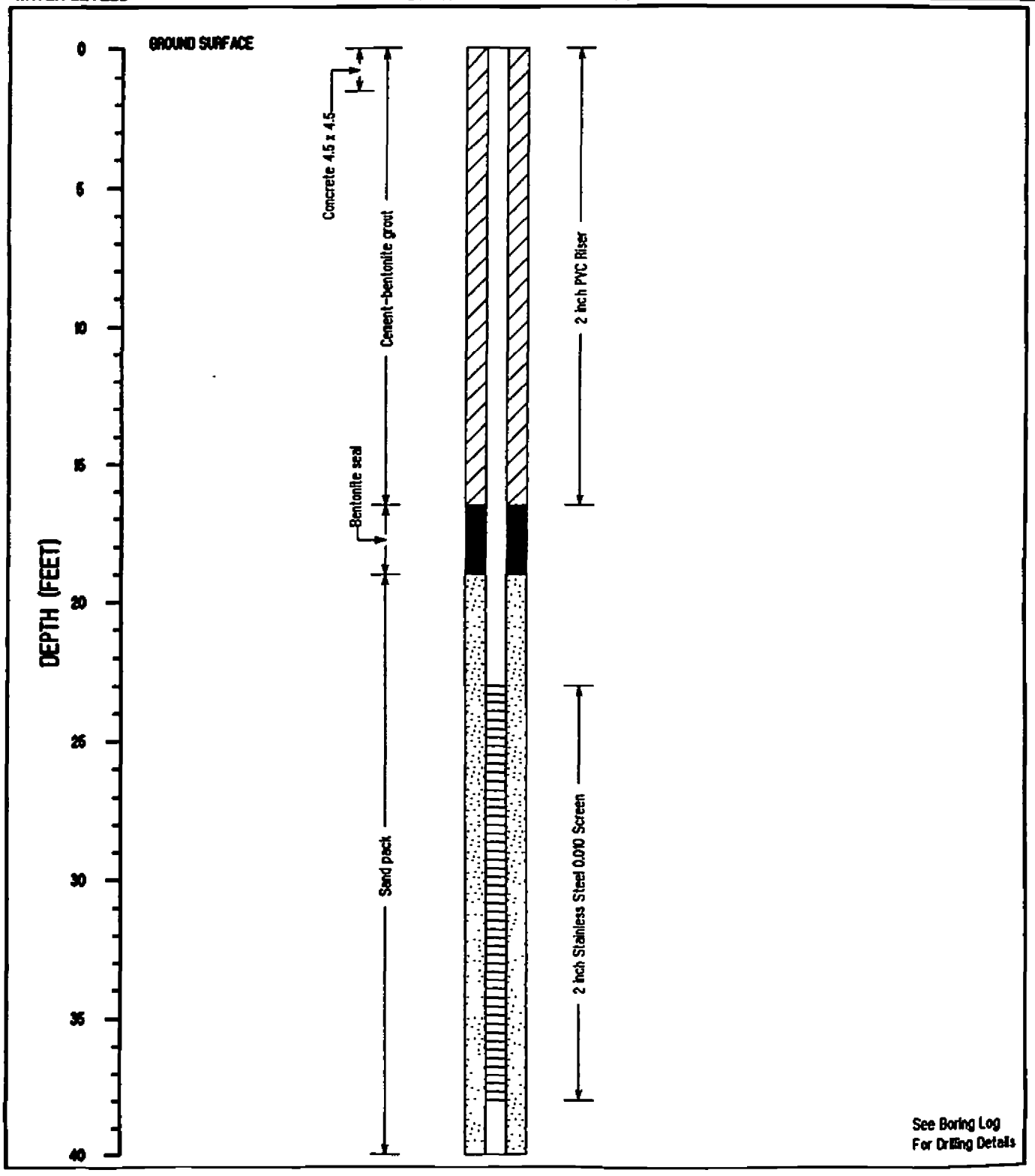
WELL COMPLETION LOG

PROJECT Kelly AFB - Zone 4 RI LOCATION Zone 4

ELEVATION 662.24 Ground DRILLING CONTRACTOR Jones Environmental Drilling Inc.

DRILLING METHOD AND EQUIPMENT 8" HSA/2" SS-SPT/3" SS-Samp. Int.=2'/4'Cont/Samp

WATER LEVELS START 1-24-94 0830 FINISH 1-24-94 1300 LOGGER K. Kimble



795 270

TAB

Appendix C

APPENDIX C

Summary of Halliburton NUS Metal and PCDD/PCDF Data (1992)

Table C-1
Kelly AFB IRP SITE SS009 Remedial investigation
Summary of Historic HNUS Analytical Data for Metals

		StationID	SS009HA009	SS009HA011	SS009HA012	SS009HA013	SS009HA021
		Alias	HA05	HA07	HA08	HA09	HA17
		SampleID	KS7HA05U0001	KS7HA07U0001	KS7HA08U0001	KS7HA09U0102	KS7HA17U0001
		Depth	.7-1 5	.7-1.5	.7-1 5	.7-1 5	7-1.5
Parameter							
LEAD	MG/KG		14.4 =	27 3 =	17 6 =	17.8 =	28 3 =
ANTIMONY	MG/KG		0 25 U	1.9 J	0 26 U	0 25 U	0 3 J
ARSENIC	MG/KG		5.4 =	226 =	9 8 =	6 5 =	9 1 =
BARIUM	MG/KG		230 =	99 =	90.7 =	139 =	162 =
BERYLLIUM	MG/KG		12 J	8.2 J	6.6 J	10 J	8 8 J
CADMIUM	MG/KG		3 R	3 2 =	1 =	2 2 R	1 9 =
CALCIUM	MG/KG		49900 =	46800 =	14300 =	54000 =	76900 =
CHROMIUM, TOTAL	MG/KG		26 =	24 5 =	17 6 =	28 =	24 5 =
COBALT	MG/KG		10.4 =	7 3 =	6.2 =	9.1 =	7 3 =
COPPER	MG/KG		8.2 =	15 =	8 =	8.7 =	9 6 =
IRON	MG/KG		18400 J	16500 J	12600 J	20000 J	17800 J
MANGANESE	MG/KG		824 J	288 J	194 J	464 J	337 J
MERCURY	MG/KG		0 02 U	0 02 U	0 02 U	0 02 U	0 02 U
NICKEL	MG/KG		22 6 =	16.9 =	14 9 =	20 5 =	17.9 =
SELENIUM	MG/KG		0.5 U	0 5 U	0 5 U	0 5 U	0.5 U
SILVER	MG/KG		1 U	1 U	1 U	1 U	1 U
SODIUM	MG/KG		500 U	500 U	500 U	500 U	500 U
THALLIUM	MG/KG		1 U	1 U	1 U	1 U	1 U
VANADIUM	MG/KG		38 9 J	33 7 J	30 2 J	49.6 J	65.5 J
ZINC	MG/KG		65.5 J	67.1 J	53 3 J	84 2 J	67 9 J

795 272

HNUSMETS.XLS
HNUSMETS_Final
11/22/963:54 PM

Table C-1
Kelly AFB IRP SITE SS009 Remedial Investigation
Summary of Historic HNUS Analytical Data for Metals

	StationID	SS009HA026	SS009SB030	SS009SB030	SS009SB031	SS009SB031
	Alias	HA22	S7B01	S7B01	S7B02	S7B02
	SampleID	KS7HA22U0001	KS7SB01U0001	KS7SB01U0203	KS7SB02U0001	KS7SB02U0405
	Depth	.7-1 5	0-1	2-3	0-1	4-5
Parameter						
LEAD	MG/KG	17 1 =	60 9 =	11 2 =	13 3 =	11 6 =
ANTIMONY	MG/KG	0 27 U	R	R	R	R
ARSENIC	MG/KG	5 =	3.9 =	4.5 =	3.2 =	4.2 =
BARIUM	MG/KG	83 7 =	35 J	65 4 J	170 J	80 6 J
BERYLLIUM	MG/KG	9.3 J	0 22 =	0 92 =	0 97 =	0 89 =
CADMIUM	MG/KG	2 2 R	1 1 UJ	1.2 UJ	1.2 UJ	1 1 UJ
CALCIUM	MG/KG	28800 =	64100 =	117000 =	61800 =	130000 =
CHROMIUM, TOTAL	MG/KG	24 5 =	30 5 J	21.3 J	21.3 J	16 1 J
COBALT	MG/KG	7.4 =	4 4 U	6 =	8 =	6 2 =
COPPER	MG/KG	11 6 =	7 7 =	10.9 =	13 3 =	10 5 =
IRON	MG/KG	18500 J	7770 =	16600 =	17800 =	14400 =
MANGANESE	MG/KG	323 J	105 J	289 J	415 J	239 J
MERCURY	MG/KG	0.02 U	0.1 UJ	0 1 UJ	0 1 UJ	0 1 UJ
NICKEL	MG/KG	18 4 =	6.6 U	11 6 =	14 8 =	9 4 =
SELENIUM	MG/KG	0.5 U	R	R	R	R
SILVER	MG/KG	1 U	3.3 U	3.5 U	3.6 U	3.3 U
SODIUM	MG/KG	500 U	52.4 U	153 U	98.3 U	187 U
THALLIUM	MG/KG	1 U	0 15 UJ	0 81 UJ	0 24 J	0 2 J
VANADIUM	MG/KG	27 J	18 4 =	31 2 =	34 4 =	26 3 =
ZINC	MG/KG	62 6 J	55 1 J	39 3 J	39 2 J	28 3 J

795 2.73

Table C-1
Kelly AFB IRP SITE SS009 Remedial Investigation
Summary of Historic HNUS Analytical Data for Metals

		StationID	SS009SB032	SS009SB033	SS009SB033	SS009SB034	SS009SB034
		Alias	S7B03	S7B04	S7B04	S7B05	S7B05
		SampleID	KS7SB03U0405	KS7SB04U0001	KS7SB04U0405	KS7SB05U0001	KS7SB05U0405
		Depth	4-5	0-1	4-5	0-1	4-5
Parameter							
LEAD	MG/KG		11.2 J	11.5 =	20 8 =	14 8 =	12 3 =
ANTIMONY	MG/KG		R	R	R	R	R
ARSENIC	MG/KG		5 9 =	2 6 J	2 9 =	5 8 =	3 =
BARIUM	MG/KG		56 9 J	102 J	51 8 J	116 J	114 J
BERYLLIUM	MG/KG		0 68 =	0.93 =	0 9 =	0 96 =	1 2 =
CADMIUM	MG/KG		1.1 UJ	1.2 UJ	1.1 UJ	1.2 UJ	1 2 UJ
CALCIUM	MG/KG		116000 =	34700 =	126000 =	64100 =	103000 =
CHROMIUM, TOTAL	MG/KG		13 1 J	17.6 J	15 5 J	20 9 J	22 6 J
COBALT	MG/KG		4.5 U	7 =	4 5 U	7 2 =	8 7 =
COPPER	MG/KG		10.6 =	10.7 =	8 1 =	13 4 =	11 6 =
IRON	MG/KG		13200 =	3 3 U	12400 =	17000 =	18700 =
MANGANESE	MG/KG		147 J	408 J	165 J	404 J	411 J
MERCURY	MG/KG		0 1 UJ	0 1 UJ	0 1 UJ	0 1 UJ	0 1 UJ
NICKEL	MG/KG		7 =	13 9 =	7 8 =	12 =	14 4 =
SELENIUM	MG/KG		R	R	R	R	R
SILVER	MG/KG		3 4 U	3 5 U	3 4 U	3 6 U	3 5 U
SODIUM	MG/KG		322 U	84 4 U	540 J	67 U	152 U
THALLIUM	MG/KG		0 16 UJ	0 23 J	0.16 J	0.22 J	0.21 J
VANADIUM	MG/KG		26 7 =	28.1 =	17 9 =	32 9 =	34 4 =
ZINC	MG/KG		19 3 J	38 7 J	33.2 J	78 J	40 3 J

HNUSMETS.XLS
HNUSMETS_Final
11/22/963 54 PM

795 274

Table C-1
Kelly AFB IRP SITE SS009 Remedial Investigation
Summary of Historic HNUS Analytical Data for Metals

		StationID	SS009SB035	SS009SB035
		Alias	S7B06	S7B06
		SampleID	KS7SB06U0001	KS7SB06U0405
		Depth	0-1	4-5
Parameter				
LEAD	MG/KG		21 =	11.5 =
ANTIMONY	MG/KG		R	R
ARSENIC	MG/KG		3 8 =	4 =
BARIUM	MG/KG		112 J	139 J
BERYLLIUM	MG/KG		0 92 =	0.91 =
CADMIUM	MG/KG		1 1 UJ	1 1 UJ
CALCIUM	MG/KG		54700 =	72200 =
CHROMIUM, TOTAL	MG/KG		19.3 J	21 J
COBALT	MG/KG		6 9 =	5 2 =
COPPER	MG/KG		13 1 =	11.4 =
IRON	MG/KG		17100 =	18200 =
MANGANESE	MG/KG		366 J	241 J
MERCURY	MG/KG		0.1 UJ	0.1 UJ
NICKEL	MG/KG		13 5 =	13 2 =
SELENIUM	MG/KG		R	R
SILVER	MG/KG		3.4 U	3.4 U
SODIUM	MG/KG		68 U	146 U
THALLIUM	MG/KG		0 28 J	0 25 J
VANADIUM	MG/KG		34 2 =	35 5 =
ZINC	MG/KG		49 6 J	34 7 J

795 275

Table C-2
Kelly AFB IRP Site SS009 Remedial Investigation
Summary of Historic HNUS Analytical Data for PCDDs/PCDFs

	StationID	SS009HA005	SS009HA006	SS009HA007	SS009HA008	SS009HA009
	Alias	HA01	HA02	HA03	HA04	HA05
	SampleID	KS7HA01U0102	KS7HA02U0001	KS7HA03U0001	KS7HA04U0001	KS7HA05U0001
	Depth	7-1.5	7-1 5	7-1 5	7-1 5	7-1 5
Parameter						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G	80 U	50 U	40 J	8 U	30 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G	40 U	30 U	60 U	3 EMPC	30 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G	60 U	40 U	80 U	5 U	10 J
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G	50 U	30 U	90 U	5 U	20 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G	40 U	30 U	80 U	3 U	20 EMPC
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G	50 U	30 U	80 U	3 U	10 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G	30 U	20 U	40 U	6 EMPC	20 J
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	30 U	20 U	40 U	3 U	10 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G	30 U	20 U	50 U	3 U	10 EMPC
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	20 U	20 U	40 U	3 U	10 J
OCTACHLORODIBENZO-p-DIOXIN	PG/G	30 U	80 U	100 U	40 EMPC	100 U
OCTACHLORODIBENZOFURAN	PG/G	200 U	50 U	80 U	3 U	40 J
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G	20 U	40 U	70 U	8 U	40 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G	10 U	20 U	40 U	3 U	20 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G	10 U	20 U	40 U	3 U	20 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G	8 U	10 U	60 U	4 EMPC	10 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G	5 U	8 U	40 U	3 U	8 J

795 216

Table C-2
Kelly AFB IRP Site SS009 Remedial Investigation
Summary of Historic HNUS Analytical Data for PCDDs/PCDFs

	StationID	SS009HA010	SS009HA011	SS009HA012	SS009HA013	SS009HA014
	Alias	HA06	HA07	HA08	HA09	HA10
	SampleID	KS7HA06U0001	KS7HA07U0001	KS7HA08U0001	KS7HA09U0102	KS7HA10U0001
	Depth	.7-1 5	7-1 5	7-1 5	7-1 5	.7-1 5
Parameter						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G	3100 =	20 U	8 U	20 U	20 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G	570 J	30 U	6 U	8 U	8 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G	23 EMPC	10 U	5 U	10 U	10 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G	30 J	10 U	5 U	10 U	10 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G	50 J	8 U	3 U	8 U	10 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G	80 J	8 U	5 U	8 U	10 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G	70 J	7 EMPC	3 U	5 U	5 EMPC
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	20 J	5 U	3 J	5 U	5 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G	3 U	5 U	3 U	5 U	8 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	20 J	5 U	3 EMPC	5 U	5 U
OCTACHLORODIBENZO-p-DIOXIN	PG/G	23700 =	260 J	90 U	70 U	110 EMPC
OCTACHLORODIBENZOFURAN	PG/G	85 J	30 J	10 EMPC	10 U	10 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G	26 EMPC	20 U	10 U	20 U	20 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G	5 U	8 U	5 U	8 U	8 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G	18 EMPC	8 U	5 U	8 U	8 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G	6 EMPC	5 U	3 U	5 U	5 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G	10 J	3 U	2 EMPC	3 U	3 U

795 L77

Table C-2
Kelly AFB IRP Site SS009 Remedial Investigation
Summary of Historic HNUS Analytical Data for PCDDs/PCDFs

	StationID	SS009HA015	SS009HA016	SS009HA017	SS009HA018	SS009HA019
	Alias	HA11	HA12	HA13	HA14	HA15
	SampleID	KS7HA11U0001	KS7HA12U0001	KS7HA13U0102	KS7HA14U0001	KS7HA15U0001
	Depth	7-1.5	7-1.5	7-1 5	7-1 5	.7-1 5
Parameter						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G	6 J	8 U	10 U	3 U	3 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G	2 EMPC	3 U	5 U	1 U	3 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G	3 U	5 U	8 U	1 U	3 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G	3 U	5 U	5 U	1 U	3 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G	3 U	3 U	5 U	1 U	3 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G	3 U	5 U	5 U	1 U	3 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G	30 J	10 J	3 U	1 U	4 EMPC
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	1 U	2 J	3 U	1 U	1 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G	3 U	3 U	3 U	1 U	3 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	1 U	3 U	3 U	1 U	1 U
OCTACHLORODIBENZO-p-DIOXIN	PG/G	80 U	70 U	21 EMPC	30 EMPC	30 EMPC
OCTACHLORODIBENZOFURAN	PG/G	3 U	5 U	5 U	3 U	3 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G	5 U	8 U	8 U	3 U	3 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G	3 U	3 U	3 U	1 U	1 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G	3 U	3 U	3 U	1 U	1 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G	3 U	3 U	3 U	1 U	1 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G	1 J	3 U	3 U	1 U	2 J

795 278

Table C-2
Kelly AFB IRP Site SS009 Remedial Investigation
Summary of Historic HNUS Analytical Data for PCDDs/PCDFs

	StationID	SS009HA020	SS009HA021	SS009HA022	SS009HA023	SS009HA024
	Alias	HA16	HA17	HA18	HA19	HA20
	SampleID	KS7HA16U0001	KS7HA17U0001	KS7HA18U0001	KS7HA19U0001	KS7HA20U0102
	Depth	.7-1 5	7-1 5	7-1 5	7-1 5	.7-1 5
Parameter						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G	5 U	30 U	6 J	3 U	10 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G	3 U	20 EMPC	3 U	3 U	5 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G	5 U	20 U	3 U	3 U	8 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G	5 U	10 U	3 U	3 U	5 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G	5 U	20 U	3 U	3 U	5 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G	5 U	10 U	3 U	3 U	5 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G	3 U	20 EMPC	8 J	1 U	3 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	3 U	10 EMPC	3 U	1 U	3 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G	3 U	8 U	3 U	3 U	3 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	3 U	5 U	3 U	1 U	3 U
OCTACHLORODIBENZO-p-DIOXIN	PG/G	30 U	70 U	60 U	20 U	110 U
OCTACHLORODIBENZOFURAN	PG/G	5 U	50 J	3 U	3 U	5 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G	5 U	30 U	3 U	3 U	10 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G	3 U	10 U	3 U	1 U	5 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G	3 U	10 U	3 U	1 U	5 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G	3 U	10 U	3 U	2 EMPC	3 EMPC
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G	3 U	5 U	3 U	1 J	3 U

795 279

Table C-2
Kelly AFB IRP Site SS009 Remedial Investigation
Summary of Historic HNUS Analytical Data for PCDDs/PCDFs

	StationID	SS009HA025	SS009HA026	SS009HA027	SS009HA028	SS009HA029
	Alias	HA21	HA22	HA23	HA24	HA25
	SampleID	KS7HA21U0102	KS7HA22U0001	KS7HA23U0102	KS7HA24U0001	KS7HA25U0001
	Depth	.7-1.5	7-1 5	.7-1 5	7-1 5	7-1 5
Parameter						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G	3 U	5 U	10 U	3 U	4 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G	3 U	3 U	5 U	3 U	3 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G	3 U	3 U	8 U	3 U	3 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G	3 U	5 U	10 U	3 U	3 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G	3 U	3 U	10 U	3 U	3 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G	3 U	5 U	10 U	3 U	3 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G	7 EMPC	3 U	5 U	3 U	1 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	3 U	3 U	5 U	3 U	1 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G	3 U	3 U	5 U	3 U	3 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	3 U	3 U	5 U	3 U	1 U
OCTACHLORODIBENZO-p-DIOXIN	PG/G	20 U	30 U	10 U	60 U	50 U
OCTACHLORODIBENZOFURAN	PG/G	3 U	3 U	8 U	5 U	3 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G	3 U	5 U	8 U	3 U	3 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G	3 U	3 U	5 U	3 U	1 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G	3 U	3 U	5 U	3 U	1 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G	3 U	3 U	5 U	3 U	2 EMPC
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G	1 U	3 U	3 U	1 U	1 U

Table C-2
Kelly AFB IRP Site SS009 Remedial Investigation
Summary of Historic HNUS Analytical Data for PCDDs/PCDFs

StationID		SS009SB033		SS009SB035		SS009SB036		SS009SB037
Alias		S7B04		S7B06		S7B07		S7B08
SampleID		KS7SB04U0001		KS7SB06U0001		KS7SB07U0001		KS7SB08U0001
Depth		0-1		0-1		0-1		0-1
Parameter								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G	28 J	15	U	21	J	11 =
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G	13 U	13	U	8	EMP	11 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G	17 U	17	U	8	U	14 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G	18 U	17	U	15	U	13 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G	15 U	14	U	13	U	11 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G	15 U	15	U	13	U	11 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G	9 U	8	U	6	U	7 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	8 U	7	U	5	U	7 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G	11 U	10	U	7	U	9 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G	9 U	9	U	6	U	8 U
OCTACHLORODIBENZO-p-DIOXIN	PG/G	82.7 BJ	25	BJ	32 7	J	11 1 BJ
OCTACHLORODIBENZOFURAN	PG/G	15 U	11	U	8	J	10 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G	28 U	22	U	22	U	24 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G	17 U	13	U	15	U	14 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G	17 U	13	U	15	U	14 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G	8 U	6	U	5	U	6 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G	6 U	5	U	3	U	5 U

795 281

795 282

TAB

Appendix D

795 283

APPENDIX D

Work Plan for 1996 Sampling at SS009 (Kelly AFB 29 SEP 1996, REVISED: 4 OCT 1996)

WORKPLAN FOR ADDITIONAL SAMPLING AT IRP SITE SS009, EAST KELLY AFB

1. DATA EVALUATION

1.1. Dioxins

The applicable soil media-specific concentrations (MSCs) for Site S-7 are the Ground-Water Protection Standard for industrial use (GWP-Ind) and the Soil/Air Inhalation and Ingestion Standard for Industrial use (SAI-Ind). The calculated values of these MSCs for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxicity equivalent quotient (TEQ) are 3 parts per trillion (ppt) and 38 ppt respectively. As mentioned previously, Kelly AFB will use the national average of 8 ppt for 2,3,7,8-TCDD TEQ as the background level for Site S-7 rather than calculate a site-specific background level. Since the background level is greater than the GWP-Ind MSC, it will be used as the clean-up level in place of the calculated GWP-Ind MSC value[1]. The TCDD TEQ exceeded the background value of 8 ppt at 4 of the 40 hand auger locations, which were HA05, HA06, HA040, and HA045. The SAI-Ind value was exceeded at only one location, which was HA06.

In addition to comparing the TCDD TEQ to regulatory limits, the detection limits of the data also were evaluated. The original samples collected by Halliburton NUS were analyzed using method SW 8280, which had higher detection limits than the method SW 8290 used for the second set of samples collected by CH2M HILL. In the TEQ calculations, non-detects are treated as a value of zero. To ensure that possible problem areas are not overlooked inadvertently due to high detection limits (and thus a zero value in the TEQ calculation), all samples that had detection limits for the congeners greater than the background value multiplied by the Toxicity Equivalents Factor (TEF) will be resampled and analyzed using SW 8290. For example, the detection limit for PeCDD from HA01 was 20 ppt, and the TEF for pentachlorodibenzo-p-dioxin (PeCDD) is 0.5. Therefore, if the actual value of PeCDD at this location was just below the detection limit, (i.e., 19 ppt) it would have an actual TEQ greater than the background limit (19 x 0.5 is 9.5), but would have had a value of 0.0 entered into the TEQ calculation because it was not detected. The samples collected from eight locations (HA01, HA02, HA03, HA05, HA07, HA09, HA10, and HA17) had detection limits for one of the congeners that has higher than the background multiplied by the TEF.

1.2. Inorganics

Six of the surface-soil samples collected during the Site Investigation for S-7 were analyzed for 23 inorganic analytes from the Target Analyte List (TAL) of the EPA Contract Laboratory Program (CLP). The regulatory limits for the analytes and the analytical results for the six locations are shown in Table 1.1. The samples that were collected for analyses were composited from the compacted base material and the

[1] As per 30 TAC 335.555(d)(1)

upper few inches of the black clay normally found on the surface at East Kelly. Since the samples were not just the black clay, it is more difficult to compare the analytical results to the TNRCC-approved background levels for Kelly AFB. In addition, because only six samples were collected statistical comparisons cannot be made. Therefore, the analytical results are directly compared to the MSCs, the approved background levels, and calculated preliminary remediation goals (PRGs) to aid in de ermining whether additional sampling is warranted.

The PRG values were determined by multiplying the TNRCC-approved Kd value of the analytes by the MCL for the analyte, if one exists. If an MCL is not published, or if a Kd value was not calculated (i.e., lead) then a PRG was not calculated. The PRG presents a more realistic method of determining whether or not the analyte would leach into the groundwater at a concentration exceeding the MCL. However, the PRG value is just used as another comparison tool, and is not used alone to exclude sampling for a particular analyte.

Of the 23 analytes, 17 were below either the MSCs or the background levels of the black clay. These analytes are within acceptable levels and do not need further delineation. The analytes are shown below:

- Six analytes (aluminum, calcium, iron, magnesium, potassium, and sodium) were not evaluated for additional sampling because there are no adverse health effects associated with them.

- Four analytes (mercury, selenium, silver, and thallium) were not detected in any of the samples.

- Five analytes (cobalt, copper, manganese, vanadium, and zinc) do not have MSCs or MCLs published for them, and were not detected at a level higher than the background level of the black clay.

- Two analytes (chromium and nickel) were detected at levels above the GWP-Ind MSCs, but were below the background levels for the black clay and the SAI-Ind MSCs.

The six remaining analytes (antimony, arsenic, barium, beryllium, cadmium, and lead) exceeded background levels and will need to be evaluated more closely. However, the methods used and the detection limits (DLs) achieved were not available for the metals shown in Bullet No. 2. Because selenium, silver, and thallium could have been run using either ICP or graphite furnace techniques, and ICP methods may have given a detection limit higher than the approved background value, these metals also should be reevaluated. It should not be necessary to reevaluate mercury because there is only one SW 846 method to use for mercury in each matrix. It is improbable that there would have been a significant difference between the DLs achieved during the original sampling event and the DLs achieved during the background study.

Antimony

Antimony was detected at two locations only, and both of these results were estimated values. The result from one of the locations (HA07) is above the background level of 0.98 milligrams per killograms (mg/kg) with a value of 1.9 J mg/kg. The GWP-Ind MSC is 0.6 mg/kg, and the SAI-Ind is 818 mg/kg. It is recommended that a sample from HA07 be analyzed for antimony for data confirmation.

Arsenic

Arsenic was detected above the background level in three of the six samples. These samples were collected from HA07, HA08, and HA17, and the values were 226 mg/kg, 9.8 mg/kg, and 9.1 mg/kg respectively. The background level for arsenic is 8.5 mg/kg, and the GWP-Ind MSC is 5.0 mg/kg. There are no data qualifiers associated with the analytical results of the arsenic. In addition, HA050 had an arsenic value of 70 mg/kg. HA050 was installed near HA07 in order to confirm the value of 226, which appeared to be a potential outlier. The calculated PRG for arsenic is 10.5 mg/kg; therefore, the arsenic levels at all three locations are relatively close to the level at which the arsenic could leach in excess of the MCL. Additional sampling at these locations should include arsenic analyses.

Barium

Barium was detected above the background level at one location, which was HA05. The background level is 210 mg/kg, and the GWP-Ind MSC is 200 mg/kg. The analytical result from HA05 was 230 mg/kg. HA05 should have a sample collected and analyzed for barium for confirmation purposes.

Beryllium

All six of the samples had levels of beryllium that were well above the background level and the MSCs. The analytical results ranged from 6.6 mg/kg to 12 mg/kg. The background level of beryllium is 2.0 mg/kg. The MSCs are 0.4 mg/kg for GWP-Ind and 1.33 mg/kg for SAI-Ind. However, the data validation package notes that the results of the Laboratory Control Samples (LCS) were not within EPA quality control parameters. Therefore, all of the beryllium results were flagged with a J qualifier. All of these six sample locations should be resampled and analyzed for beryllium.

Cadmium

Cadmium was detected in three of the six samples. These samples were collected from HA07, HA08, and HA17, and the values were 3.2 mg/kg, 1.0 mg/kg, and 1.9 mg/kg respectively. The background level for cadmium is 0.43 mg/kg, and the GWP-Ind MSC is 0.5 mg/kg. There are no data qualifiers associated with the analytical results of the cadmium. The calculated PRG for cadmium is 4.5 mg/kg, therefore the cadmium level

at HA07 is relatively close to the level at which the cadmium could leach in excess of the MCL. Additional sampling should include cadmium analyses.

Lead

The background level for lead in the black clay is 23.6 mg/kg. The samples collected from HA07 and HA17 had results that were 27.3 mg/kg and 28.3 mg/kg respectively. The values of lead at the site are just slightly above the background level for the black clay. Considering that there probably are some differences in background levels due to the presence of the base material, the detected levels may not be significantly higher than actual background levels. The MSCs for lead are 1.5 mg/kg for the GWP-Ind and 1,000 mg/kg for the SAI-Ind. Therefore, the levels of lead are above both the GWP-Ind MSC and the background level of the black clay, but below the SAI-Ind MSC. These two stations should have additional sampling for delineation of the lead at HA07 and HA17.

1.3. Organics

Six of the surface-soil samples collected during the Site Investigation for S-7 were analyzed for organic parameters in addition to the dioxin/furans a ready discussed in Subsection 1.1. The samples were analyzed for 129 constituents listed in the organic target compound list (TCL) of the EPA Contract Laboratory Program (CLP). Only three constituents–tetrachloroethene, toluene, and bis (2-ethylhexyl) phthalate–were detected in the environmental samples. The compound bis (2-ethylhexyl) phthalate most probably is a laboratory contaminant. The regulatory limits for the analytes and the analytical results for the six locations are shown in Table 1.2. None of the samples collected had levels of organic constituents above (or near) the MSCs. Therefore, additional sampling and testing for organics other than dioxins and furans is unnecessary.

TABLE 1.1 - INORGANIC CONCENTRATIONS AT SITE S-7

Analyte	MSC		PRG	Background Levels			Analytical Results					
	GWP-Ind	SAI-Ind		Black	Brown	Navarro	HA05	HA07	HA08	HA09	HA17	HA22
Antimony	0.6	818	0.6	0.98	0.92	0.99		1.9 J			0.3 J	
Arsenic	5	3.27	10.5	8.5	9.9	34.3	5.4	226	9.8	6.5	9.1	5
Barium	200	13700	300	210	112	163	230	99	90.7	139	162	93.7
Beryllium	0.4	1.33	4.6	2	1.1	2.9	12 J	8.2 J	6.6 J	10 J	8.8 J	9.3 J
Cadmium	0.5	1020	4.5	0.43	0.49	0.5		3.2	1		1.9	
Chromium	10	5110	10	43.6	33.2	83.9	26	24.5	17.6	28	24 5	24.5
Cobalt	NA	NA		10.8	8.4	23.7	10.4	7.3	6.2	9 1	7.3	7 4
Copper	NA	NA		18	11.3	13.7	8.2	15	8	8.7	9.6	11.6
Lead	1.5	1000		23.6	21.3	14.8	14 4	27 3	17 6	17.8	28.3	17.1
Manganese	NA	NA		593	987	700	284 J	288 J	194 J	464 J	337 J	323
Mercury	0.2	613	0.64	0.12	0.11	0.12						
Nickel	10	20400		26.8	17.1	35.4	22.6	16.9	14.9	20.5	17.9	18.4
Selenium	5	10200	0.055	0.24	0.28	0.51						
Silver	51.1	10200		0.25	0.24	0.25						
Thallium	NA	NA	0.2	0.61	0.24	0.25						
Vanadium	NA	NA		64.8	56.1	104.8	38.9 J	33.7 J	30.2 J	49.6 J	65.5 J	27 J
Zinc	NA	NA		89.4	61.6	88 2	65.5 J	67.1 J	53.3 J	84.2 J	67.9 J	62.6 J

Notes:

1. The MSCs were taken from 30 TAC 335.568 - Appendix II. "NA" indicates that MSCs are not currently published for these analytes.
2. The PRG values were determined by multiplying the TNRCC-approved Kd values for the analytes by the MCL for that analyte. The shaded cells indicates that MCLs are not currently published for that analyte.
3. All analytical values shown are in mg/kg.

795 288

TABLE 1.2 - ORGANIC CONCENTRATIONS AT SITE S-7

Constituent	MSCs		HA05	HA07	HA08	HA09	HA17	HA22
	GWP-Ind	SAI-Ind						
Tetrachloroethene	**0.5**	**207**	0.004 J		0.005 J			
Toluene	**100**	**3630**	0.13 J	0.17	0.077	0.019	0.32	0.38 J
Bis (2-ethylhexyl) phthalate	**2.04**	**409**			0.160 J			

Notes:

1 Only the detected constituents are shown in this table.
2 All analytical values shown are in mg/kg.

195 289

2. PROPOSED SAMPLING

All samples will be collected using dedicated, new stainless-steel spoons. The spoons will not be reused because of the extreme low-level analyses being performed, thereby minimizing the potential for cross contamination. The samples will be collected from within the top 3 inches of the surface. The samples will be analyzed as indicated in each section. Field quality assurance/quality control (QA/QC) samples will consist of duplicates. No other field QC samples are necessary because the sampling equipment is not being reused. Field duplicates, matrix spikes (MS), and matrix spike duplicates (MSDs) also will be collected. Field duplicates will be collected at a rate of 5 percent, as will the combination of MS/MSD samples. See Table 2.1 for a summary of analytes to be collected at each location.

2.1 Dioxin Sampling

Additional samples will be collected at the site for dioxin/furan analyses using method SW 8290. The number of samples collected will vary by location, depending on the intended purpose of the sampling. Additional samples will be collected for one of three reasons: (1) the TEQ of the original sample exceeded the background level of 8 ppt, (2) the TEQ of the original sample exceeded the SAI-Ind MSC of 38 ppt, or (3) the original sample had a high detection limit.

2.1.1 Sampling for Delineation

Four locations had TEQs above the background, HA05, HA06, HA040, and HA045. HA06 also had a TEQ that exceeded the SAI MSC. At the four locations, three samples will be collected approximately 5 feet from the original sampling location. The three samples will be collected at approximately 120 degree angles to each other, with the original sampling location acting as the origin of the angles. The purpose of this is to delineate the horizontal extent of the dioxins at each of these points. One of the samples will have a replicate collected, which will be extracted using method SW 1312 (Synthetic Precipitation Leaching Procedure [SPLP]) prior to analyses. This sample will be used to determine whether the levels of dioxins at the site are high enough to leach into the groundwater[2]. This will mean a total of four samples will be collected and analyzed from each location. In addition, a fifth sample will be collected at the original sampling location at HA06 for confirmation purposes. A total of 17 samples will be collected and analyzed for the purpose of delineation and/or confirmation.

2.1.2. Sampling for Detection Limits

Eight locations had detection limits that were high enough to have possibly had an actual TEQ above the background level without being identified. The eight location were HA01, HA02, HA03, HA05, HA07, HA09, HA10, and HA17. However, HA05 is being

[2] As provided in 30 TAC 335.559(g)(2)(b), the SPLP testing can be used instead of using the MCL x 100 method described in 335.559(g)(2)(a) to determine if the concentrations at the site are protective of groundwater.

sampled as outlined in Subsection 4.1.1. The other seven locations will have one sample collected and analyzed so that lower detection limits can be obtained.

2.1.3. Summary of Field Work

A total of 20 normal environmental samples will be collected for dioxin analyses. Thirteen samples will be collected for horizontal delineation and/or confirmation at four locations, and seven samples will be collected for reanalyses because of high detection limits during the original sampling event. One field duplicate sample, one MS sample, and one MSD sample will be collected for quality control purposes.

2.2. Inorganics

Additional samples will be collected at the site for metals analyses using method SW 6010. The number of samples that will be collected will vary by location, depending on the intended purpose of the sampling. The additional samples will be collected for one of these reasons: (1) the value of the analyte of the original sample exceeded the background levels and needs horizontal delineation, (2) the value of the analyte of the original sample exceeded the background levels, but only in concentrations or at locations that warrant that a confirmation sample be collected instead of delineation samples, (3) laboratory information is missing (such as method used and detection limit achieved) that warrants reevaluation, (4) laboratory quality controls were not within acceptable limits and additional data is required, or (5) a location was not sampled for metals previously, but such analytical data would be useful in delineation.

2.2.1. Sampling for Delineation.

Arsenic, cadmium, and lead were present at sufficient levels to warrant resampling at locations HA07, HA08, and HA17. Four samples plus one replicate will be collected from HA07, HA08, and HA17. Three of the samples will be collected 5 feet from the original sample location, while the fourth sample and the replicate will be collected at the original location. The replicate will be extracted using SW 1312 for SPLP purposes. All four soil samples and the SPLP extraction from each location will be analyzed for arsenic and cadmium using method SW 6010. The samples from HA17 and HA07 also will be analyzed for lead using SW 6010..

2.2.2. Sampling for Confirmation.

Barium exceeded the background concentration at location HA05, and antimony exceeded the background at location HA07. Barium was detected at a level only slightly higher than the background level, while antimony was an estimated value. In addition to any other metals analyses performed on samples collected from HA05 and HA07, they also will be analyzed for barium and antimony, respectively.

2.2.3. Resampling Due To Missing Laboratory Data.

The original laboratory worksheets for the six samples were not included in the Site S-7 Site Investigation Report. Therefore, it is not possible to determine the DL or the

methods used for the metals that were not detected. The summary sheets in the report were left blank for analytes that were not detected. Since selenium, silver, and thallium were all reported as non-detects, but the DLs are not known, all six original locations will be resampled for these metals.

2.2.4 Resampling Due To Improper Lab QC.

The laboratory controls for beryllium were outside of acceptable ranges during the original sampling event. Therefore, all of the six original samples will be reanalyzed for beryllium.

2.2.5. Sampling for Additional Site Information.

Samples will be collected from locations HA04, HA06, HA16, HA18, HA10, HA01, HA02, and HA03 and for metals analyses. These samples will be analyzed for arsenic, barium, cadmium, chromium, lead, selenium, and silver. These metals constitute what is referred to as the RCRA 8 metals, minus mercury. No analysis is proposed for mercury because it is highly mobile and volatile, and it is unlikely that it would be detected in surface samples after such a great length of time.

2.3. Organics

No additional samples will be collected for organic compound analyses, other than the dioxins and furans already discussed.

Table 2.1 Summary of Sampling for Site SS009

Location	Rationale for Analyses										Analytical Parameter												Notes
	1	2	3	4	5	6	7	8	9	10	Dioxin	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Thallium	SPLP for Arsenic only	
HA01	X		X							X	1	1	1	1	1	1	1	1		1	1	1	1	
HA02	X		X							X	1	1	1	1	1	1	1	1		1	1	1	1	
HA03	X		X							X	1	1	1	1	1	1	1	1		1	1	1	1	
HA04			X							X		1	1	1	1	1	1	1		1	1	1	1	
HA05				X	X	X				X		1	1	1	1	1	1	1		1	1	1		
HA05A		X									1													De ineation sample 5 ft from original
HA05B		X									1													De ineation sample 5 ft from original
HA05C		X									1													De ineation sample 5 ft from original
HA05S		X										1	1	1	1	1	1	1		1	1	1		Split sample for SPLP extraction
HA05AS											1													Split sample for SPLP extraction
HA06		X	X							X	1	1	1	1	1	1	1	1		1	1	1		
HA06A		X									1													De ineation sample 5 ft from original
HA06B		X									1													De ineation sample 5 ft from original
HA06C		X									1													De ineation sample 5 ft from original
HA06S		X									1	1	1	1	1	1	1	1		1	1	1		Split sample for SPLP extraction
HA07	X			X	X		X	X		X	1	1	1	1	1	1	1	1		1	1	1		
HA07A								X		X		1	1	1	1	1	1	1		1	1	1	1	De ineation sample 5 ft from original
HA07B								X		X		1	1	1	1	1	1	1		1	1	1	1	De ineation sample 5 ft from original
HA07C								X		X		1	1	1	1	1	1	1		1	1	1	1	De ineation sample 5 ft from original
HA07S								X				1	1	1	1	1	1	1		1	1	1		Split sample for SPLP extraction
HA08				X	X			X		X		1	1	1	1	1	1	1		1	1	1		
HA08A								X		X		1	1	1	1	1	1	1		1	1	1	1	De ineation sample 5 ft from original
HA08B								X		X		1	1	1	1	1	1	1		1	1	1	1	De ineation sample 5 ft from original
HA08C								X		X		1	1	1	1	1	1	1		1	1	1	1	De ineation sample 5 ft from original
HA08S								X				1	1	1	1	1	1	1		1	1	1		Split sample for SPLP extraction
HA09	X			X	X					X	1	1	1	1	1	1	1	1		1	1	1	1	
HA10	X		X							X	1	1	1	1	1	1	1	1		1	1	1	1	
HA11																								No additional sampling planned
HA12																								No additional sampling planned
HA13																								No additional sampling planned
HA14																								No additional sampling planned
HA15																								No additional sampling planned
HA16			X							X		1	1	1	1	1	1	1		1	1	1	1	
HA17	X			X	X			X		X	1	1	1	1	1	1	1	1		1	1	1		
HA17A								X		X		1	1	1	1	1	1	1		1	1	1	1	De ineation sample 5 ft from original
HA17B								X		X		1	1	1	1	1	1	1		1	1	1	1	De ineation sample 5 ft from original
HA17C								X		X		1	1	1	1	1	1	1		1	1	1	1	De ineation sample 5 ft from original
HA17S								X				1	1	1	1	1	1	1		1	1	1		Split sample for SPLP extraction
HA18			X							X		1	1	1	1	1	1	1		1	1	1	1	
HA22				X	X					X		1	1	1	1	1	1	1		1	1	1	1	
HA038																								No additional sampling planned
HA039																								No additional sampling planned
HA040											1													
HA040A		X									1													De ineation sample 5 ft from original
HA040B		X									1													De ineation sample 5 ft from original
HA040C		X									1													De ineation sample 5 ft from original
HA040S		X									1													Split sample for SPLP extraction
HA041																								No additional sampling planned
HA042																								No additional sampling planned
HA043																								No additional sampling planned
HA044																								No additional sampling planned

Table 2.1 Summary of Sampling for Site SS009

Location	Rationale for Analyses										Analytical Parameter												Notes
	1	2	3	4	5	6	7	8	9	10	Dioxin	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Thallium	SPLP for Arsenic only	
HA045																								No sample collection at original
HA045A		X									1													Delineation sample 5 ft from original
HA045B		X									1													Delineation sample 5 ft from original
HA045C		X									1													Delineation sample 5 ft from original
HA045CS		X									1													Split sample for SPLP extraction
HA046																								No additional sampling planned
HA047																								No additional sampling planned
HA048																								No additional sampling planned
HA049																								No additional sampling planned
S2B01									X	X		1	1	1	1	1	1	1		1	1	1		
S2B02																								No additional sampling planned
S2B03																								No additional sampling planned
S2B04																								No additional sampling planned
S2B05																								No additional sampling planned
S2B06																								No additional sampling planned
S2B07																								No additional sampling planned
S2B08																								No additional sampling planned
											25	29	29	29	29	29	29	29		29	29	29	18	Total Number of Samples
											4	5	5	5	5	5	5	5		5	5	5	18	Number of SPLP samples (water
											21	24	24	24	24	24	24	24		24	24	24		Number of field samples (soil matrix)
											1	1	1	1	1	1	1	1		1	1	1		Field Duplicate (soils)
											1	1	1	1	1	1	1	1		1	1	1		Matrix Spike (soils)
											1	1	1	1	1	1	1	1		1	1	1		Matrix Spike Duplicate (soils)
											1	1	1	1	1	1	1	1		1	1	1		Matrix Spike (SPLP extract)
											1	1	1	1	1	1	1	1		1	1	1		Matrix Spike Duplicate (SPLP extract)
											1	1	1	1	1	1	1	1		1	1	1		Rinsate Blank
											24	**27**	**27**	**27**	**27**	**27**	**27**	**27**		**27**	**27**	**27**		**Total number of soil matrix**
											7	**8**	**8**	**8**	**8**	**8**	**8**	**8**		**8**	**8**	**8**		**Total number of H20 matrix**

Notes:

1. **Detection limits for dioxins were too high on original samples. Resample and analyze with lower DL.**
2. **Dioxin TEQ above background levels. Collect samples for delineation purposes.**
3. **Location not previously sampled for metals, but within or near herbicide storage area. Sample for 8 RCRA metals.**
4. **Beryllium results were not within lab control limits. Sample for beryllium for confirmation of original data.**
5. **Selenium, silver, and thallium detection limits are not known. Resample for confirmation of original data**
6. **Barium results were above background levels. Resample for confirmation of original data.**
7. **Antimony results were above background levels, but values estimated. Resample for confirmation of original data.**
8. **Arsenic, Cadmium, and/or Lead result above background levels. Collect samples for delineation purposes.**
9. **Lead above background. Re-sample for confirmation.**
10. **Sample for all metals to obtain additional data on metals concentrations at the site.**

This table reflects modifications made to the plan after submittal to TNRCC Changes include the analysis for all metals rather than sample-specific metals, changes to the locations selected for collection of SPLP samples, and additional samples collected for SPLP arsenic analysis

TAB

Appendix E

795 296

APPENDIX E

Summary of October 1996 Sampling Results

Table 1
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for Metals

	StationID	SS009HA005	SS009HA006	SS009HA007	SS009HA008	SS009HA009
	Alias	HA01	HA02	HA03	HA04	HA05
	SampleID	DGA023	DGA024	DGA025	DGA026	DGA027
	Depth	0-.2	0-2	0-2	0-2	0-2
Parameter						
ANTIMONY	MG/KG	3 5 J	3.9 J	2 3 J	2 J	1.5 U
ARSENIC	MG/KG	4.6 J	10 4 J	5 2 J	10.5 J	12 6 J
BARIUM	MG/KG	40 9 =	70 =	67 8 =	39 2 J	49 5 =
BERYLLIUM	MG/KG	0 16 J	0 24 J	0 32 J	0 2 J	0 28 J
CADMIUM	MG/KG	14 J	34 2 J	52.6 J	12 4 J	11 J
CHROMIUM, TOTAL	MG/KG	96.4 J	87.9 J	62 3 J	46 9 J	30 1 J
LEAD	MG/KG	291 J	366 J	315 J	270 J	157 J
SELENIUM	MG/KG	0.12 UJ	0 12 UJ	0.12 UJ	0 12 UJ	0 12 UJ
SILVER	MG/KG	0 5 U	0 5 U	0 51 U	1 J	0 5 U
THALLIUM	MG/KG	0 26 U	0 12 U	0 12 U	0.12 U	0 16 U

793 298

Table 1
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for Metals

Parameter		StationID	SS009HA010	SS009HA010	SS009HA011	SS009HA012	SS009HA013
		Alias	HA06	HA06	HA07	HA08	HA09
		SampleID	DGA028	DGA060	DGA029	DGA033	DGA038
		Depth	0-.2	.8-1	0-.2	0-2	0-2
ANTIMONY	MG/KG		1 6 U	0 43 =	2 J	5.5 J	2 J
ARSENIC	MG/KG		19 =	8 3 J	54 =	180 =	49.3 J
BARIUM	MG/KG		46.9 =	113 =	72 4 =	50 =	33.8 J
BERYLLIUM	MG/KG		0 3 1	1 1	0 23 J	0 22 J	0 1 J
CADMIUM	MG/KG		7 7 J	0 74 J	7 J	12 9 J	4 3 =
CHROMIUM, TOTAL	MG/KG		35 J	18.3 =	28 9 J	46 4 J	26 =
LEAD	MG/KG		187 J	21 2 =	136 J	232 J	110 =
SELENIUM	MG/KG		0 12 UJ	0 15 U	0 13 UJ	0.12 UJ	0 12 UJ
SILVER	MG/KG		0 51 U	0.63 U	0.54 U	0 5 U	0 5 U
THALLIUM	MG/KG		0 12 U	0.28 J	0.13 U	0 2 U	0 16 U

Table 1
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for Metals

	StationID	SS009HA014	SS009HA020	SS009HA021	SS009HA022	SS009HA026
	Alias	HA10	HA16	HA17	HA18	HA22
	SampleID	DGA039	DGA040	DGA041	DGA045	DGA046
	Depth	0-2	0-2	0-2	0-2	0-2
Parameter						
ANTIMONY	MG/KG	3 7 J	1 2 U	0 57 U	3 1 J	2.1 J
ARSENIC	MG/KG	9 9 UJ	9 UJ	7 3 UJ	30.3 J	22 2 J
BARIUM	MG/KG	94.1 =	37 9 J	51 2 =	67 3 =	75 9 =
BERYLLIUM	MG/KG	0 28 J	0 16 J	0.33 J	0 4 J	0 59 J
CADMIUM	MG/KG	16 1 =	4 6 =	2 3 =	3 9 =	4 9 =
CHROMIUM, TOTAL	MG/KG	53 6 =	35.4 =	20 9 =	48.8 =	141 =
LEAD	MG/KG	263 =	138 =	70.8 =	158 =	401 =
SELENIUM	MG/KG	0 12 UJ	0 12 UJ	0 12 UJ	0 12 UJ	0 13 UJ
SILVER	MG/KG	0 65 J	0 51 U	0.51 U	0 59 J	0 54 U
THALLIUM	MG/KG	0.12 U	0.12 U	0 24 U	0 14 U	0.26 U

Table 1
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for Metals

	StationID	SS009HA051	SS009HA052	SS009HA053	SS009HA054	SS009HA055
	Alias	HA017A	HA017B	HA017C	HA08A	HA08B
	SampleID	DGA042	DGA043	DGA044	DGA035	DGA036
	Depth	0-2	0-2	0-2	0-2	0-2
Parameter						
ANTIMONY	MG/KG	0 36 U	1 3 U	0 77 U	4 9 J	4 J
ARSENIC	MG/KG	7 6 UJ	12 2 UJ	11.1 UJ	121 J	104 J
BARIUM	MG/KG	71 2 =	49 4 =	61.3 =	55.1 =	51 7 =
BERYLLIUM	MG/KG	0 63 J	0 34 J	0 29 J	0 26 J	0 22 J
CADMIUM	MG/KG	1.1 =	5 =	3 7 =	9.5 =	10 2 =
CHROMIUM, TOTAL	MG/KG	22.4 =	27 9 =	42 1 =	33 6 =	35 6 =
LEAD	MG/KG	37 8 =	106 =	166 =	160 =	179 =
SELENIUM	MG/KG	0 13 UJ	0 13 UJ	0 13 UJ	0 15 J	0 12 UJ
SILVER	MG/KG	0 53 U	0 53 U	0 86 J	0 52 U	0.5 U
THALLIUM	MG/KG	0 21 U	0.19 U	0 19 U	0.19 U	0 14 U

7915 300

Table 1
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for Metals

	StationID	SS009HA056	SS009HA057	SS009HA058	SS009HA059	SS009SB030
	Alias	HA08C	HA07A	HA07B	HA07C	S7B01
	SampleID	DGA037	DGA030	DGA031	DGA032	DGA047
	Depth	0-2	0-2	0-2	0-2	0-2
Parameter						
ANTIMONY	MG/KG	5 5 J	4 5 J	3 1 J	2 3 J	53 J
ARSENIC	MG/KG	128 J	84 5 =	57 4 =	59 3 =	8 UJ
BARIUM	MG/KG	55.4 =	50 =	52 7 =	46 1 =	97.7 =
BERYLLIUM	MG/KG	0 22 J	0 28 J	0 37 J	0.32 J	0 26 J
CADMIUM	MG/KG	14.7 =	6 6 J	8 2 J	6 8 J	13 7 =
CHROMIUM, TOTAL	MG/KG	44 =	35.1 J	36.9 J	33 3 J	74 1 =
LEAD	MG/KG	242 =	168 J	159 J	172 J	366 =
SELENIUM	MG/KG	0 12 UJ	0 14 J	0 13 UJ	0 12 UJ	0.12 UJ
SILVER	MG/KG	0.5 U	0 52 U	0 55 U	0.5 U	1 6 J
THALLIUM	MG/KG	0 18 U	0.15 U	0 15 U	0 2 U	0 18 U

Table 2
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for PCDDs/PCDFs

Parameter		StationID	SS009HA005	SS009HA006	SS009HA007	SS009HA010	SS009HA010
		Alias	HA01	HA02	HA03	HA06	HA06
		SampleID	DGA001	DGA002	DGA003	DGA007	DGA058
		Depth	0-.2	0-2	0-2	0-2	.8-1
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G		132 =	166 =	108 =	236 =	7 47 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G		88 5 =	123 =	78 =	78.4 =	5 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G		5 U	5 U	5 U	5 U	5 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G		5 U	5 U	5 U	6 47 =	5 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G		11 9 =	13 6 =	5 U	10 6 =	5 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G		14.9 =	13 9 =	5 U	9 22 =	5 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G		5 =	8.2 =	5 U	7.33 =	5 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		8 2 =	11 5 =	5 U	8 49 =	5 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G		5 U	5 U	5 U	5 U	5 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		16 7 =	28 =	5 U	5 U	5 U
OCTACHLORODIBENZO-p-DIOXIN	PG/G		722 =	860 =	1416 J	1812 =	74 9 =
OCTACHLORODIBENZOFURAN	PG/G		63 6 =	84.2 =	116 J	91.1 =	11 6 =
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G		2.2 =	2 U	2 U	5 62 =	2 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G		2 U	2 =	2 U	2 U	2 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G		5 1 =	7 7 =	2 U	5.59 =	2 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G		2 U	2 U	2 U	2 U	2 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G		2 U	2 U	2 U	2 U	2 U

Table 2
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for PCDDs/PCDFs

Parameter		StationID	SS009HA011	SS009HA013	SS009HA014	SS009HA021	SS009HA040
		Alias	HA07	HA09	HA10	HA17	HA040
		SampleID	DGA011	DGA012	DGA013	DGA014	DGA059
		Depth	0-2	0-.2	0-2	0-2	8-1
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G		171 =	76 5 J	112 =	78 9 =	8 78 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G		53 4 =	33 1 J	144 =	26 9 =	5 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G		5 U	5 U	5 U	5 U	5 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G		5 U	5 U	5 U	5 U	5 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G		8 6 =	5 U	5 U	5 U	5 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G		10 2 =	5 U	5 U	6 8 =	5 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G		6.26 =	5 U	5 U	5 U	5 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		6 48 =	5 U	5 U	5 U	5 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G		5 U	5 U	5 U	5 U	5 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		15.1 =	6 48 =	5 U	6 8 =	5 U
OCTACHLORODIBENZO-p-DIOXIN	PG/G		1124 =	348 =	1326 =	472 =	41 6 =
OCTACHLORODIBENZOFURAN	PG/G		66 3 =	27 3 =	93 2 =	28.2 =	10 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G		2 U	2 U	2 U	2 U	2 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G		2 U	2 U	2 U	2 U	2 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G		2 U	2 U	2 U	2.6 =	2 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G		2 U	2 U	2 U	2 U	2 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G		2 U	2 U	2 U	2 U	2 U

795 303

Table 2
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for PCDDs/PCDFs

Parameter		StationID	SS009HA060	SS009HA061	SS009HA062	SS009HA063	SS009HA064
		Alias	HA06A	HA06B	HA06C	HA05A	HA05B
		SampleID	DGA008	DGA009	DGA010	DGA004	DGA005
		Depth	0-2	0-2	0-2	0-2	0-2
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G		258 =	180 =	92 5 =	388 =	223 =
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G		79 4 =	64 4 =	33 =	5 U	140 =
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G		2.7 =	2 5 =	5 U	5 U	8.3 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G		5 U	4.1 =	5 U	5 U	8.3 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G		10 2 =	7.9 =	5 U	5 U	8 3 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G		11 9 =	11 5 =	5 U	5 U	8 3 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G		6 6 =	6 3 =	5 U	5 U	8 3 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		8 1 =	8 2 =	5 U	5 U	8.3 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G		5 U	5 U	5 U	5 U	8 3 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		19 2 =	18 6 =	12 2 =	5 U	8 3 U
OCTACHLORODIBENZO-p-DIOXIN	PG/G		1670 =	1270 =	710 =	2576 =	1419 =
OCTACHLORODIBENZOFURAN	PG/G		71 2 =	61 4 =	30.8 =	122 =	100 =
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G		2 5 =	2.6 =	2 U	2 U	3.3 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G		2 U	2 U	2 U	2 U	3 3 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G		5 5 =	5 8 =	3 92 =	2 U	3 3 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G		2 U	2 U	2 U	2 U	3 3 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G		2 U	2 U	2 U	2 U	3 3 U

Table 2
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for PCDDs/PCDFs

Parameter		StationID	SS009HA065	SS009HA066	SS009HA067	SS009HA068	SS009HA069
		Alias	HA05C	HA040A	HA040B	HA040C	HA045A
		SampleID	DGA006	DGA016	DGA017	DGA018	DGA019
		Depth	0-.2	0-2	0-.2	0-2	0-2
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G		146 =	103 =	86 7 =	67 9 J	449 =
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G		57 1 =	23.3 J	24 2 J	36 5 =	197 =
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G		8 3 U	5 U	5 U	5 U	5 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G		8.3 U	5 U	5 U	5 U	5 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G		8 3 U	5 U	5 U	5 U	19 3 =
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G		8 3 U	5 U	5 U	5 U	23 4 =
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G		21.8 =	5 U	5 U	5 U	5 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		16.8 =	5 U	5 U	5 U	26 9 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G		8 3 U	5 U	5 U	5 U	5 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		20.2 =	5 U	5 U	5 U	64.5 =
OCTACHLORODIBENZO-p-DIOXIN	PG/G		8 84 J	298 =	242 J	995 J	2178 =
OCTACHLORODIBENZOFURAN	PG/G		60 9 J	34.1 =	10 U	78 6 J	171 =
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G		3.3 U	2 U	2 U	2 U	2 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G		3.3 U	2 U	2 U	2 U	2 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G		3 3 U	2 U	2 U	2 U	10 7 =
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G		3 3 U	2 U	2 U	2 U	2 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G		3 3 U	2 U	2 U	2 U	2 U

195 305

Table 2
Kelly AFB IRP SITE SS009 1996 Remedial Investigation
Summary of Analytical Data for PCDDs/PCDFs

		StationID	SS009HA070	SS009HA071
		Alias	HA045B	HA045C
		SampleID	DGA020	DGA021
		Depth	0-2	0-2
Parameter				
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	PG/G		41 9 =	45.5 =
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	PG/G		35 J	5 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	PG/G		5 U	5 U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	PG/G		5 U	5 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	PG/G		5 U	5 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	PG/G		5 U	5 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	PG/G		5 U	5 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		5 U	5 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	PG/G		5 U	5 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	PG/G		5 U	5 U
OCTACHLORODIBENZO-p-DIOXIN	PG/G		421 J	204 J
OCTACHLORODIBENZOFURAN	PG/G		10 U	10 U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	PG/G		2 U	2 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	PG/G		2 U	2 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	PG/G		2 U	2 U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	PG/G		2 U	2 U
2,3,7,8-TETRACHLORODIBENZOFURAN	PG/G		2 U	2 U

Table 3
Kelly AFB IRP SS009 1996 Remedial Investigation
Summary of Metal SPLP Analytical Data

	StationID	SS009HA005	SS009HA006	SS009HA007	SS009HA008	SS009HA009
	Alias	HA01	HA02	HA03	HA04	HA05
	SampleID	DGA023A	DGA024A	DGA025A	DGA026A	DGA048
	Depth	0-2	0-2	0-2	0-2	0-2
Parameter						
ANTIMONY	MG/L					0 0019 UJ
ARSENIC	MG/L	0.0123 U	0.0123 U	0 0123 U	0 0287 J	0 0123 U
BARIUM	MG/L					0 309 =
BERYLLIUM	MG/L					0 0003 U
CADMIUM	MG/L					0.0012 U
CHROMIUM	MG/L					0 0033 U
LEAD	MG/L					0 0033 =
SELENIUM	MG/L					0 0006 UJ
SILVER	MG/L					0.0025 U
THALLIUM	MG/L					0 0006 U

Table 3
Kelly AFB IRP SS009 1996 Remedial Investigation
Summary of Metal SPLP Analytical Data

	StationID	SS009HA010	SS009HA010	SS009HA011	SS009HA012	SS009HA013
	Alias	HA06	HA06	HA07	HA08	HA09
	SampleID	DGA028A	DGA060	DGA052	DGA054	DGA038A
	Depth	0-2	8-1	0-2	0-2	0-2
Parameter						
ANTIMONY	MG/L		0.0007 U	0.0019 U	0.0082 U	
ARSENIC	MG/L	0.0123 U	0.0123 U	0.0455 J	0.617 =	0.166 =
BARIUM	MG/L		0.49 =	0.432 =	0.28 =	
BERYLLIUM	MG/L		0.0007 J	0.0005 J	0.0003 U	
CADMIUM	MG/L		0.0012 U	0.0012 =	0.0015 J	
CHROMIUM	MG/L		0.013 =	0.0061 U	0.0049 U	
LEAD	MG/L		0.0006 J	0.0027 J	0.0032 =	
SELENIUM	MG/L		0.0009 U	0.0006 UJ	0.0006 UJ	
SILVER	MG/L		0.0025 U	0.0025 U	0.0025 U	
THALLIUM	MG/L		0.0006 U	0.0006 U	0.0006 U	

195 308

Table 3
Kelly AFB IRP SS009 1996 Remedial Investigation
Summary of Metal SPLP Analytical Data

Parameter	StationID / Alias / SampleID / Depth					
	StationID	SS009HA014	SS009HA020	SS009HA021	SS009HA022	SS009HA026
	Alias	HA10	HA16	HA17	HA18	HA22
	SampleID	DGA039A	DGA040A	DGA055	DGA045A	DGA046A
	Depth	0-2	0-.2	0-.2	0-2	0-2
ANTIMONY	MG/L			0 001 U		
ARSENIC	MG/L	0 0123 U	0 0123 U	0 0123 U	0 0386 J	0 0211 J
BARIUM	MG/L			0 309 =		
BERYLLIUM	MG/L			0 0003 U		
CADMIUM	MG/L			0.0012 U		
CHROMIUM	MG/L			0 0023 U		
LEAD	MG/L			0 0007 J		
SELENIUM	MG/L			0 0006 UJ		
SILVER	MG/L			0.0025 U		
THALLIUM	MG/L			0 0006 U		

495 309

Table 3
Kelly AFB IRP SS009 1996 Remedial Investigation
Summary of Metal SPLP Analytical Data

	StationID	SS009HA051	SS009HA052	SS009HA053	SS009HA054	SS009HA055
	Alias	HA017A	HA017B	HA017C	HA08A	HA08B
	SampleID	DGA042A	DGA043A	DGA044A	DGA035A	DGA036A
	Depth	0-2	0-2	0-2	0-2	0-2
Parameter						
ANTIMONY	MG/L					
ARSENIC	MG/L	0.0164 J	0.0123 U	0.0123 U	0.144 =	0.151 =
BARIUM	MG/L					
BERYLLIUM	MG/L					
CADMIUM	MG/L					
CHROMIUM	MG/L					
LEAD	MG/L					
SELENIUM	MG/L					
SILVER	MG/L					
THALLIUM	MG/L					

295 310

Table 3
Kelly AFB IRP SS009 1996 Remedial Investigation
Summary of Metal SPLP Analytical Data

	StationID	SS009HA056	SS009HA057	SS009HA058	SS009HA059
	Alias	HA08C	HA07A	HA07B	HA07C
	SampleID	DGA037A	DGA030A	DGA031A	DGA032A
	Depth	0-2	0-.2	0-2	0-2
Parameter					
ANTIMONY	MG/L				
ARSENIC	MG/L	0 254 =	0 0548 J	0 0314 J	0 0644 J
BARIUM	MG/L				
BERYLLIUM	MG/L				
CADMIUM	MG/L				
CHROMIUM	MG/L				
LEAD	MG/L				
SELENIUM	MG/L				
SILVER	MG/L				
THALLIUM	MG/L				

795 311

795 312

TAB

Appendix F

APPENDIX F

Photographs of October 1996 Sampling Event

Photo F 1 View of Site SS009 looking south.

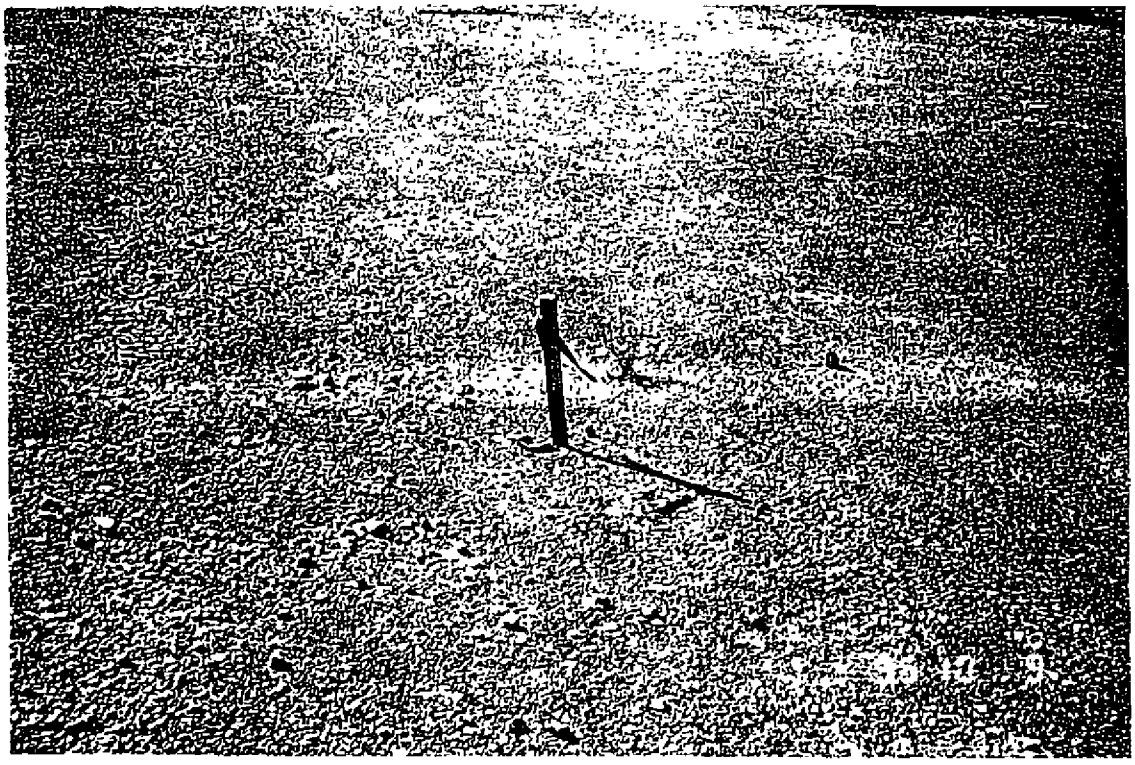


Photo F.2 Sample Location HA 22 in weathered asphalt and gravel area

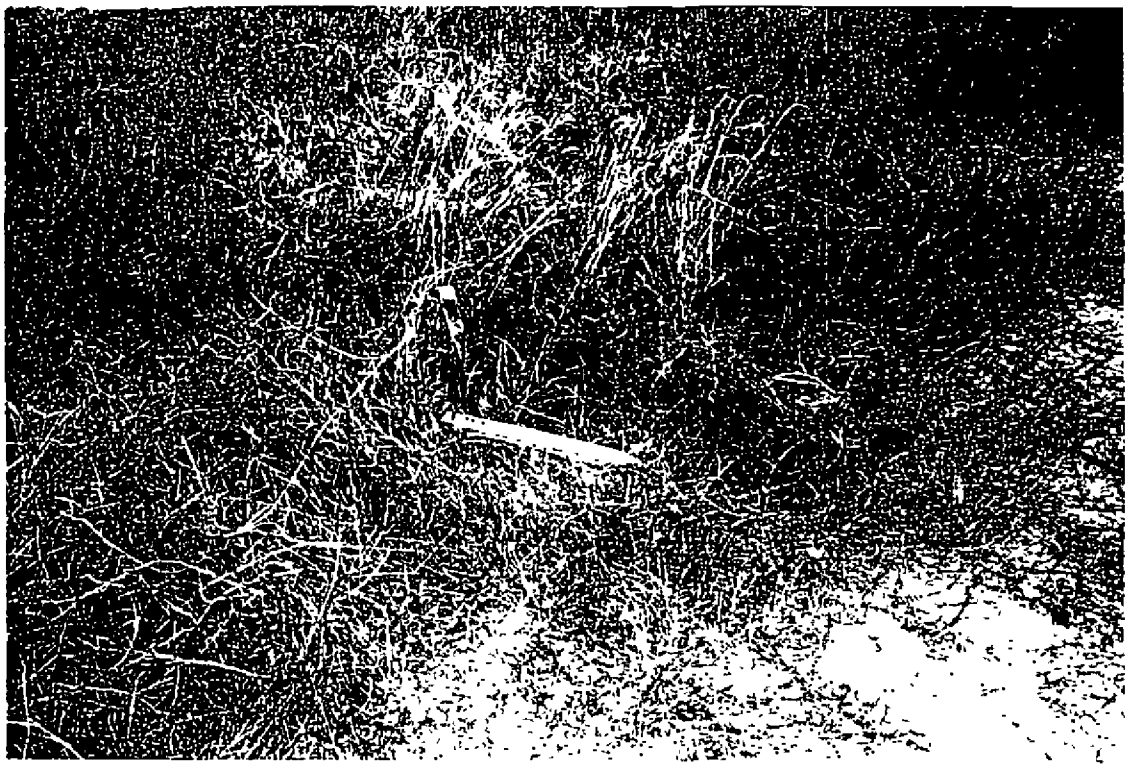


Photo F 3 Sample Location HA 07 in grassed area

Photo F 4 Sample Locations HA 040, HA 040A, HA 040B, and HA 040C in gravel, weathered asphalt, and grass.

705 316

TAB

Appendix G

795 317

APPENDIX G

Results of 1994 and 1996 Groundwater Sampling

Table 1
Groundwater Sampling Results From SS052MW134

Parameter	Supplemental Sampling at Site S-7 (CH2M HILL, 1994)		Zone 4 Remedial Investigation (CH2M HILL, in progress) Feb-97 Sampling Event		Basewide Remedial Assessment (CH2M HILL, in progress) Jun-97 Sampling Event	
	EPA Method No	Result	EPA Method No	Result	EPA Method No	Result
METALS (UG/L)						
ANTIMONY	E200 7	12 8 U		–	SW7041	2 0 U
BARIUM		–		–	SW6010	112
BERYLLIUM	E200 7	0 5 U		–	SW6010	0 50 U
CADMIUM	E200 7	1 3 U		–	SW6010	1 2 U
CHROMIUM, TOTAL	E200 7	2 2 U		--	SW6010	2 0 U
COBALT		--		–	SW6010	2 5 U
COPPER	E200 7	1 3 U		–	SW6010	1 5 U
MANGANESE		–		–	SW6010	1 5 U
NICKEL	E200 7	78 2		–	SW6010	8 0 U
SILVER	E200 7	1 8 U		–	SW6010	2 5 U
VANADIUM		–		–	SW6010	10 9
ZINC	E200 7	3 9 U		--	SW6010	22 4 U
ARSENIC	E206 2	1 J		–	SW7060	1 7 U
LEAD	E239 2	0 3 U		–	SW7421	2 0 U
MERCURY	E245 2	0 16 UJ		–	SW7470	0 10 U
SELENIUM	E270 2	1 5 UJ		–	SW7740	1 5 U
CYANIDE	SW9010	2 7 U		–	SW9010	10 U
THALLIUM	E279 2	0 8 U		–	SW7841	1 0 U
PESTICIDES (UG/L)						
ALDRIN	E608	0 052 UJ		–		--
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	E608	0 052 UJ		–		--
ALPHA ENDOSULFAN	E608	0 052 UJ		–		–
ALPHA-CHLORDANE	E608	0 052 UJ		--		–
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	E608	0 052 UJ		–		--
BETA ENDOSULFAN	E608	0 1 UJ		--		–
DDD (1,1-bis(CHLOROPHENYL)-2,2-DICHLOROETHANE)	E608	0 1 UJ		–		--
DDE (1,1-bis(CHLOROPHENYL)-2,2-DICHLOROETHENE)	E608	0 1 UJ		–		–
DDT (1,1-bis(CHLOROPHENYL)-2,2,2-TRICHLOROETHANE)	E608	0 1 UJ		–		–
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	E608	0 052 UJ		--		–
DIELDRIN	E608	0 1 UJ		–		--
ENDOSULFAN SULFATE	E608	0 1 UJ		–		--
ENDRIN	E608	0 1 UJ		–		--
ENDRIN ALDEHYDE	E608	0 1 UJ		--		–
ENDRIN KETONE	E608	0 1 UJ		–		--
GAMMA BHC (LINDANE)	E608	0 052 UJ		–		–
GAMMA-CHLORDANE	E608	0 052 UJ		–		–
HEPTACHLOR	E608	0 052 UJ		–		--
HEPTACHLOR EPOXIDE	E608	0 052 UJ		–		--
METHOXYCHLOR	E608	0 52 UJ		–		--
POLYCHLORINATED BIPHENYLS (UG/L)						
PCB-1016 (AROCHLOR 1016)	E608	1 UJ		–		--
PCB-1221 (AROCHLOR 1221)	E608	2 1 UJ		--		–
PCB-1232 (AROCHLOR 1232)	E608	1 UJ		--		–
PCB-1242 (AROCHLOR 1242)	E608	1 UJ		–		–
PCB-1248 (AROCHLOR 1248)	E608	1 UJ		–		--
PCB-1254 (AROCHLOR 1254)	E608	1 UJ		--		--
PCB-1260 (AROCHLOR 1260)	E608	1 UJ		–		–
TOXAPHENE	E608	5 2 UJ		–		–
VOLATILE ORGANIC COMPOUNDS (UG/L)						
1,1,1-TRICHLOROETHANE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
1,1,2,2-TETRACHLOROETHANE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
1,1,2-TRICHLOROETHANE	SW8240	5 U	SW-8260	1 U	SW-8260	2 U
1,1-DICHLOROETHANE	5W8240	10 U	SW-8260	1 U	SW-8260	2 U
1,1-DICHLOROETHENE	SW8240	7 U	SW-8260	1 U	SW-8260	2 U
1,2-DICHLOROETHANE	SW8240	5 U	SW-8260	1 U	SW-8260	2 U
1,2-DICHLOROPROPANE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U

795 319

Table 1
Groundwater Sampling Results From SS052MW134

Parameter	Supplemental Sampling at Site S-7 (CH2M HILL, 1994)		Zone 4 Remedial Investigation (CH2M HILL, in progress) Feb-97 Sampling Event		Basewide Remedial Assessment (CH2M HILL, in progress) Jun-97 Sampling Event	
	EPA Method No	Result	EPA Method No	Result	EPA Method No	Result
2-HEXANONE	SW8240	10 UJ	SW-8260	5 U	SW-8260	10 U
ACETONE	SW8240	10 U	SW-8260	5 U	SW-8260	10 U
BENZENE	SW8240	5 U	SW-8260	1 U	SW-8260	2 U
BROMODICHLOROMETHANE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
BROMOFORM	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
BROMOMETHANE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
CARBON DISULFIDE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
CARBON TETRACHLORIDE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
CHLOROBENZENE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
CHLOROETHANE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
CHLOROFORM	SW8240	10 U	SW-8260	1	SW-8260	2 U
CHLOROMETHANE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
cis-1,3-DICHLOROPROPENE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
DIBROMOCHLOROMETHANE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
ETHYLBENZENE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
METHYL ETHYL KETONE (2-BUTANONE)	SW8240	10 U	SW-8260	5 U	SW-8260	10 U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	SW8240	10 U	SW-8260	5 U	SW-8260	10 U
METHYLENE CHLORIDE	SW8240	5 U	SW-8260	2 U	SW-8260	4 U
STYRENE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
TETRACHLOROETHYLENE(PCE)	SW8240	140	SW-8260	18	SW-8260	30
TOLUENE	SW8240	2 J	SW-8260	1 U	SW-8260	2 U
TOTAL 1,2-DICHLOROETHENE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
trans-1,3-DICHLOROPROPENE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
TRICHLOROETHYLENE (TCE)	SW8240	5	SW-8260	6	SW-8260	5
VINYL ACETATE		–	SW-8260	5 U	SW-8260	10 U
VINYL CHLORIDE	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
XYLENES, TOTAL	SW8240	10 U	SW-8260	1 U	SW-8260	2 U
SEMIVOLATILE ORGANIC COMPOUNDS (UG/L)						
1,2,4-TRICHLOROBENZENE	SW8270	10 U		–	SW-8270	10 U
1,2-DICHLOROBENZENE	SW8270	10 U		–	SW-8270	10 U
1,3-DICHLOROBENZENE	SW8270	10 U		–	SW-8270	10 U
1,4-DICHLOROBENZENE	SW8270	10 U		–	SW-8270	10 U
2,2'-OXYBIS(1-CHLORO)PROPANE	SW8270	10 U		–	SW-8270	10 U
2,4,5-TRICHLOROPHENOL	SW8270	25 U		–	SW-8270	25 U
2,4,6-TRICHLOROPHENOL	SW8270	10 U		–	SW-8270	10 U
2,4-DICHLOROPHENOL	SW8270	10 U		–	SW-8270	10 U
2,4-DIMETHYLPHENOL	SW8270	10 U		–	SW-8270	10 U
2,4-DINITROPHENOL	SW8270	25 U		–	SW-8270	25 U
2,4-DINITROTOLUENE	SW8270	10 U		–	SW-8270	10 U
2,6-DINITROTOLUENE	SW8270	10 U		–	SW-8270	10 U
2-CHLORONAPHTHALENE	SW8270	10 U		–	SW-8270	10 U
2-CHLOROPHENOL	SW8270	10 U		–	SW-8270	10 U
2-METHYLNAPHTHALENE	SW8270	10 U		–	SW-8270	10 U
2-METHYLPHENOL (o-CRESOL)	SW8270	10 U		–	SW-8270	10 U
2-NITROANILINE	SW8270	25 U		–	SW-8270	25 U
2-NITROPHENOL	SW8270	10 U		–	SW-8270	10 U
3,3'-DICHLOROBENZIDINE	SW8270	10 U		–	SW-8270	10 U
3-NITROANILINE	SW8270	25 U		–	SW-8270	25 U
4,6-DINITRO-2 METHYLPHENOL	SW8270	25 U		–	SW-8270	25 U
4-BROMOPHENYL PHENYL ETHER	SW8270	10 U		–	SW-8270	10 U
4-CHLORO-3-METHYLPHENOL	SW8270	10 U		–	SW-8270	10 U
4-CHLOROANILINE	SW8270	10 U		–	SW-8270	10 U
4-CHLOROPHENYL PHENYL ETHER	SW8270	10 U		–	SW-8270	10 U
4-METHYLPHENOL (p-CRESOL)	SW8270	10 U		–	SW-8270	10 U
4-NITROANILINE	SW8270	25 U		–	SW-8270	25 U
4-NITROPHENOL	SW8270	25 U		–	SW-8270	25 U
ACENAPHTHENE	SW8270	10 U		–	SW-8270	10 U

795 320

Table 1
Groundwater Sampling Results From SS052MW134

Parameter	Supplemental Sampling at Site S-7 (CH2M HILL, 1994)		Zone 4 Remedial Investigation (CH2M HILL, in progress) Feb-97 Sampling Event		Basewide Remedial Assessment (CH2M HILL, in progress) Jun-97 Sampling Event	
	EPA Method No	Result	EPA Method No	Result	EPA Method No	Result
ACENAPHTHYLENE	SW8270	10 U		–	SW-8270	10 U
ANTHRACENE	SW8270	10 U		–	SW-8270	10 U
BENZO(a)ANTHRACENE	SW8270	10 U		–	SW-8270	10 U
BENZO(a)PYRENE	SW8270	10 U		–	SW-8270	10 U
BENZO(b)FLUORANTHENE	SW8270	10 U		–	SW-8270	10 U
BENZO(g,h,i)PERYLENE	SW8270	10 U		–	SW-8270	10 UJ
BENZO(k)FLUORANTHENE	SW8270	10 U		–	SW-8270	10 U
BENZYL BUTYL PHTHALATE	SW8270	10 U		–	SW-8270	10 U
bis(2-CHLOROETHOXY) METHANE	SW8270	10 U		–	SW-8270	10 U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	SW8270	10 U		–	SW-8270	10 U
bis(2-ETHYLHEXYL) PHTHALATE	SW8270	10 U		–	SW-8270	10 U
CARBAZOLE	SW8270	10 U		–	SW-8270	10 U
CHRYSENE	SW8270	10 U		–	SW-8270	10 U
DI-n-BUTYL PHTHALATE	SW8270	10 U		–	SW-8270	10 U
DI-n-OCTYLPHTHALATE	SW8270	10 U		–	SW-8270	10 U
DIBENZ(a,h)ANTHRACENE	SW8270	10 U		–	SW-8270	10 UJ
DIBENZOFURAN	SW8270	10 U		–	SW-8270	10 U
DIETHYL PHTHALATE	SW8270	10 U		–	SW-8270	10 U
DIMETHYL PHTHALATE	SW8270	10 U		–	SW-8270	10 U
FLUORANTHENE	SW8270	10 U		–	SW-8270	10 U
FLUORENE	SW8270	10 U		–	SW-8270	10 U
HEXACHLOROBENZENE	SW8270	10 U		–	SW-8270	10 U
HEXACHLOROBUTADIENE	SW8270	10 U		–	SW-8270	10 U
HEXACHLOROCYCLOPENTADIENE	SW8270	10 U		–	SW-8270	10 U
HEXACHLOROETHANE	SW8270	10 U		–	SW-8270	10 U
INDENO(1,2,3-c,d)PYRENE	SW8270	10 U		–	SW-8270	10 UJ
ISOPHORONE	SW8270	10 U		–	SW-8270	10 U
N-NITROSODI-n-PROPYLAMINE	SW8270	10 U		–	SW-8270	10 U
N-NITROSODIPHENYLAMINE	SW8270	10 U		–	SW-8270	10 U
NAPHTHALENE	SW8270	10 U		–	SW-8270	10 U
NITROBENZENE	SW8270	10 U		–	SW-8270	10 U
PENTACHLOROPHENOL	SW8270	5 U		–	SW-8270	10 U
PHENANTHRENE	SW8270	10 U		–	SW-8270	10 U
PHENOL	SW8270	10 U		–	SW-8270	10 U
PYRENE	SW8270	10 U		–	SW-8270	10 U
DIOXINS AND FURANS (PG/L)						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	SW8290	8 98 U		–		–
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	SW8290	10 2 U		–		–
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	SW8290	7 14 U		–		–
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	SW8290	4 5 U		–		–
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	SW8290	4 98 U		–		–
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	SW8290	7 4 U		–		–
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	SW8290	4 43 U		–		–
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	SW8290	7 55 U		–		–
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	SW8290	9 52 U		–		–
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	SW8290	3 05 U		–		–
1,2,3,7,8-PENTACHLORODIBENZOFURAN	SW8290	1 12 U		–		–
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	SW8290	4 04 U		–		–
2,3,4,7,8-PENTACHLORODIBENZOFURAN	SW8290	2 96 U		–		–
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	SW8290	12 U		–		–
2,3,7,8-TETRACHLORODIBENZOFURAN	SW8290	8 27 U		–		–
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	SW8290	8 98 U		–		–
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	SW8290	10 2 U		–		–
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	SW8290	4 5 U		–		–
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	SW8290	4 98 U		–		–
OCTACHLORODIBENZO-p-DIOXIN	SW8290	12 8 U		–		–
OCTACHLORODIBENZOFURAN	SW8290	10 8 U		–		–

735 321

Table 1
Groundwater Sampling Results From SS052MW134

Parameter	Supplemental Sampling at Site S-7 (CH2M HILL, 1994)		Zone 4 Remedial Investigation (CH2M HILL, in progress) Feb-97 Sampling Event		Basewide Remedial Assessment (CH2M HILL, in progress) Jun-97 Sampling Event	
	EPA Method No	Result	EPA Method No	Result	EPA Method No	Result
PENTACHLORINATED DIBENZO p-DIOXINS, (TOTAL)	SW8290	3 05 U		--		--
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	SW8290	1 12 U		--		--
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	SW8290	12 U		--		--
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	SW8290	8 27 U		--		--

J = ESTIMATED VALUE
U = NOT DETECTED
-- = NOT ANALYZED

795 322

TAB

Appendix H

APPENDIX H

Data-Quality Evaluation and Chain-of-Custody Forms

795 324

TAB

1996 Data Quality Evaluation Memorandums

MEMORANDUM CH2MHILL

Kelly Air Force Base - IRP Site SS009

Level C Data validation for total and 2,3,7,8-substituted Dioxins and Furans

CANVIRO Project #s 96-10158 and 96-10227

TO: John Coffey/SAN

FROM: Kishor Gala/DEN

DATE: November 13, 1996

Overview

This data validation memorandum discusses the quality of data generated for a total of eight (8) field samples collected from Kelly Air Force Base IRP Site SS009. The samples were collected on October 8 and 10, 1996. The samples included 8 field original samples (soils). This sample set is a subset of a total of 22 field samples collected from SS009. No field quality control samples were included with this set of samples; however, one field duplicate (soil) and extra volume for matrix spike/matrix spike duplicate (MS/MSD) analyses have been collected. The field quality control sample results will be included in the subsequent data sets. Table 1 presents the details of the samples included in this data evaluation memorandum.

The samples were analyzed for total and 2,3,7,8-substituted polychlorinated dibenzodioxins (PCDD) and polychlorinated dibenzofurans (PCDF) congeners using the high-resolution gas chromatography/mass spectrometric (GC/MS) method SW846/8290. Four total PCDDs and PCDFs (tetra- through hepta-chlorinated), seven 2,3,7,8-substituted PCDDs (tetra through octa) and 10 2,3,7,8-substituted PCDFs (tetra- through octa-) were reported for each sample. The samples were analyzed by the CANVIRO Analytical Laboratories, Ltd., of Waterloo, Ontario, Canada.

Comprehensive data packages (sample results, raw sample and calibration data raw QC data) were provided. Accordingly, comprehensive data validation was performed for the samples, including verifying at random the response factors, continuing calibration percent differences, sample calculations, etc.

Data were validated using method-specific quality control criteria, since EPA-developed data validation guidelines do not exist for the PCDD/PCDF analyses.

795 326

Overview of Analysis

A majority of the samples had significant asphaltic character. The initial sample extracts using the required 10-gram aliquot of the samples were extremely dark in color even after extract cleanup. The internal standards recoveries were significantly below the minimum advisory limit of 40 percent of the true values. After ascertaining that the required detection limits for the project (3 ng/kg or parts per trillion [ppt]) would not be compromised, the laboratory was instructed to reextract the samples using a 5-gram aliquot in a hope to obtain better recoveries for the internal standards. The quantities of the internal standards, fortified standards and the recovery standard were adjusted for the 5-gram sample aliquot. All sample data were provided using this modification of the SW846/8290 methodology.

Overview of Data Quality Evaluation

All samples were successfully analyzed. A majority of the soil samples had low level detections of total and specific detections of PCDDs/PCDFs, especially the hepta- and octa congeners. The internal standard recoveries were significantly below 40 percent, but in a majority of instances, the signal to noise (S/N) ratio was better than 10, indicating acceptable accuracy in quantification of target compounds. Diphenyl ether interference was evident in practically all samples. The peaks that were deemed as diphenyl ethers were not included in the total PCDD/PCDF amounts; therefore, barring other quality control problems, the total quantities are usable as reported.

Several reported values were qualified as estimated due either to the ion abundance ratios not falling within the acceptance ranges or the internal standard S/N ratios of less than 10. Overall, given the complexity of the sample matrix, the analyses were performed optimally.

Detailed Data Quality Evaluation

Holding Time. The extraction and analysis holding times were acceptable for all samples (criteria: extract within 30 days of collection and analyze within 45 days of extraction).

Mass Spectrometer Performance. The mass spectrometer resolving power was acceptable (criterion: a minimum resolution power of 10,000 at mass 304, or a mass difference of 0.0304 at 10% valley).

Gas Chromatography Column Performance. The retention time windows for the earliest and latest eluting congeners within each PCDD/PCDF homologue series was determined. Additionally, the valley separation between the 2,3,7,8-TCDD and 2,3,7,8-TCDF and closest eluting congeners was acceptable (criterion: valley height not to exceed 25% of the height of the 2,3,7,8 congeners).

Initial Calibration. A 5-point (nominal concentrations of 0.5, 2, 10, 40 and 200 ppt) initial calibration was performed on October 11, 1996. A number of ion abundance ratios were slightly outside the acceptance limits in one or more standard mixtures. According to the correction action outlined in SW846/8290, a continuing calibration and a second 5-point initial calibration were performed on October 17, 1996, right after the last sample analysis (within 2 hours). The relative standard deviation (RSD) among the response factors in the five standard mixtures were acceptable in the second 5-point calibration (criteria: RSD not exceeding 20 for native congeners and 30 for internal standards). Accordingly, the second 5-point calibration was used for sample calculations.

Continuing Calibration. A continuing calibration was run at the beginning and end of the 12-hour sequence of the sample analysis. The percent difference (%D) between the average response factors from the initial calibration and the response factors from the continuing calibration for all native congeners and standards was acceptable (criteria: %D not to exceed 20 for native congeners and 30 for standards).

Estimated Detection Limits. For most of the sample and congeners, the project required detection limit of 3 ppt was met. However, the baseline noise inherent in some samples, produced elevated detection limits for a limited number of congeners, although in all cases, the elevated detection limits were below the 3 ppt 2,3,7,8-TCDD toxicity equivalent (TEQ) concentration when multiplied by the appropriate toxicity equivalent factors (TEF). The data users are advised to keep this in mind when using the data. The elevated detection limits are as a result of the sample matrix and not due to inappropriate analysis. Attempts were made to reduce the interference by using a smaller sample aliquot (criterion: the estimated detection limit is calculated as a signal level that is 2.5 times the baseline noise level in the elution area of a congener).

Congener Identification. Congeners were positively identified (reported as detected) using the proper criteria of ion abundance ratios and the retention windows. In a few cases, the ion abundance ratios for the associated internal standard did not meet the method-specific criteria. In such events, the concentrations of the positively reported 2,3,7,8-substituted congeners and the total homologues were qualified as estimated, "J." The details of the qualification are presented in Table 1 for each sample (criteria: the ion abundance ratios specified in the method must be met for all congeners, and the congener retention time must fall within the retention window established under column performance determination).

Congener Quantification. The congener concentrations were calculated using the area and true concentrations of the internal standards, and the response factors for the native congeners. This method of quantification, automatically corrects for the recovery of the internal standards. In a few cases, the internal standard recovery fell below the limit of 40-135% and the S/N ratio was lower than 10. In these cases, the native congener concentrations were deemed not to meet the acceptable accuracy; hence, qualified as estimated, "J." Only the positive (detected) concentrations were so qualified. The detection limits for the nondetected congeners were not qualified as estimated, since these were determined specifically using the S/N ratio as described previously.

Method Blank. A soil blank was prepared and analyzed with the field samples. No congeners were reported for the soil blank.

795 328

Laboratory Control Spike. A controlled (clean) solid matrix sample was spiked a known concentration solution and analyzed. The recoveries of all native congeners and standards were acceptable (criteria: as an advisory, the recoveries must be within a range of 25-150%).

Matrix Spike and Matrix Spike Duplicate Analyses. A matrix spike/matrix spike duplicate sample was not included in the current sample set. However, an East Kelly AFB SS009 soil sample (DGA014) was analyzed in another sample set. The MS and MSD recoveries for this sample were acceptable, but the RPD between the MS recovery and MSD recovery did not meet the acceptance criteria for a few congeners. Since the MS/MSD performance data are specific to a sample, the nonconformance may not be extended to other samples unless an evaluation of other performance criteria indicates a trend or potential for nonconformance in other samples. Therefore, no data in this sample set were qualified for the MS/MSD results (criteria: the recoveries must be within a range of 40-135% and the RPD between MS and MSD recovery must be less than 20).

Field Duplicate Analysis. A field duplicate was not included the current sample set. However, sample DGA015 was submitted as a field duplicate for sample DGA014 in another sample set. A few low level detections of native congeners were reported for the original sample DGA014 as well as the field duplicate DGA015. The RPD between the replicate results, when the congeners were found in both samples were acceptable (criteria: an advisory limit of 50 RPD is used for relatively heterogeneous soil samples to encompass the sampling as well as the analytical precision errors).

Validated result sheets with appropriate data validation qualifiers and laboratory qualifiers are attached with this memorandum.

Data Usability

Although, some data were qualified as estimated, the types and magnitude of the most of the problems are not likely to affect the data usability significantly. In most instances, the bias in the reported data is not predictable. The bias. if any, is expected to be random. Overall, the quality of the Site SS009 sample data is equivalent to that expected for difficult matrix samples. In conclusion, the positive data are deemed usable at their reported values.

Table 1 - Kelly Air Force Base Zone 4 Samples - Dioxins/Furans Data Evaluation CANVIRO #s 96-10158 and 96-10227						
Sample No.	**Station ID**	**CANVIRO No.**	**Date Collected**	**Date Extracted**	**Date analyzed**	**Comments**
DGA005	SS009HA064	96-10158-05	10/08/96	10/13/96	10/16/96	All ISTD recoveries below 40%, but S/N better than 10. No data qualified.
DGA006	SS009HA065	96-10158-06	10/08/96	10/13/96	10/16/96	All ISTD recoveries below 40%. S/N for labeled OCDD less than 10. Qualify positive values of OCDD and OCDF as estimated, "J."
DGA017	SS009HA067	96-10158-17	10/08/96	10/13/96	10/16/96	All ISTD recoveries below 40%. S/N less than 10 for labeled 23478PeCDF, 123478HxCDD, 1234678HpCDF, 1234789HpCDF and OCDD. Qualify the positive congener and total homologue concentrations as estimated, "J."
DGA018	SS009HA068	96-10158-18	10/08/96	10/13/96	10/16/96	All ISTD recoveries below 40%. S/N less than 10 for 2378TCDF, 123478HxCDD, 234678HxCDF, 1234678HpCDD and OCDD. Qualify the positive congener and total homologue concentrations as estimated, "J."
DGA019	SS009HA069	96-10158-19	10/08/96	10/13/96	10/16/96	Recoveries below 40% for labeled tetra, penta and hexa standards, but S/N better than 10. Ion abundance ratios not met for 123478 and 123678HxCDF. Qualify positive congener and total homologue concentrations as estimated, "J."
DGA020	SS009HA070	96-10158-20	10/08/96	10/13/96	10/16/96	All ISTD recoveries below 40%. S/N less than 10 for labeled 1234678HpCDF and OCDD. Qualify positive congener and total homologue concentrations as estimated, "J." Ion abundance ratios not met for labeled 123478HxCDF, 1234678HpCDF and native 234678HxCDF. Qualify positive congener and total homologue concentrations as estimated, "J."

DGA021	SS009HA071	96-10158-21	10/08/96	10/13/96	10/16/96	All ISTD recoveries below 40%. S/N less than 10 for labeled 1234678HpCDF and OCDD. Qualify positive congener and total homologue concentrations as estimated, "J." Ion abundance ratios not met for labeled 123478HxCDF and 1234678HpCDF, and native 23478PeCDF, 123478HxCDF and 234678HxCDF. Qualify positive congener and total homologue concentrations as estimated, "J."
DGA058	SS009HA010	96-10227-01	10/10/96	10/13/96	10/16/96	ISTD recoveries acceptable. Ion abundance ratios not met for native 23478PeCDF, 123478HxCDF and labeled 1234678HpCDD. Qualify positive congener and total homologue concentrations as estimated, "J."

795 330

MEMORANDUM **CH2MHILL**

Kelly Air Force Base - IRP Site SS009

Level C Data validation for total and 2,3,7,8-substituted Dioxins and Furans

CANVIRO Project # 96-10158

TO: John Coffey/SAN

FROM: Kishor Gala/DEN

DATE: November 8, 1996

Overview

This data validation memorandum discusses the quality of data generated for a total of six (6) field samples collected from Kelly Air Force Base IRP Site SS009. The samples were collected on October 8, 1996. The samples included 5 field original samples (soils), and one field duplicate. In addition, extra sample volume was collected from one location for matrix spike/matrix spike duplicate analyses. This sample set is a subset of a total of 22 field samples collected from Site SS009. Table 1 presents the details of the samples included in this data evaluation memorandum.

The samples were analyzed for total and 2,3,7,8-substituted polychlorinated dibenzodioxins (PCDD) and polychlorinated dibenzofurans (PCDF) congeners using the high-resolution gas chromatography/mass spectrometric (GC/MS) method SW846/8290. Four total PCDDs and PCDFs (tetra- through hepta-chlorinated), seven 2,3,7,8-substituted PCDDs (tetra through octa) and 10 2,3,7,8-substituted PCDFs (tetra- through octa-) were reported for each sample. The samples were submitted to CANVIRO Analytical Laboratories, Ltd., of Waterloo, Ontario, Canada.

Comprehensive data packages (sample results, raw sample and calibration data raw QC data) were provided. Accordingly, comprehensive data validation was performed for the samples, including verifying at random the response factors, continuing calibration percent differences, sample calculations, etc.

Data were validated using method-specific quality control criteria, since EPA-developed data validation guidelines do not exist for the PCDD/PCDF analyses.

795 332

Overview of Analysis

A majority of the samples had significant asphaltic character. The initial sample extracts using the required 10-gram aliquot of the samples were extremely dark in color even after extract cleanup. The internal standards recoveries were significantly below the minimum advisory limit of 40 percent of the true values. After ascertaining that the required detection limits for the project (3 ng/kg or parts per trillion [ppt]) would not be compromised, the laboratory was instructed to reextract the samples using a 5-gram aliquot in a hope to obtain better recoveries for the internal standards. The quantities of the internal standards, fortified standards and the recovery standard were adjusted for the 5-gram sample aliquot. All sample data were provided using this modification of the SW846/8290 methodology.

The samples were submitted to CANVIRO for analysis; however, due to instrument problems, the laboratory was not able to perform the analyses. The sample extracts were sent to Wellington Laboratories, Guelph, Ontario, Canada.

Overview of Data Quality Evaluation

All samples were successfully analyzed. A majority of the soil samples had low level detections of total and specific detections of PCDDs/PCDFs, especially the hepta- and octa congeners. Several internal standard recoveries were below 40 percent, but in all instances, the signal to noise (S/N) ratio was deemed to be better than 10, indicating acceptable accuracy in quantification of target compounds. Matrix spike/matrix spike duplicate precision exceeded the limit of 20 relative percent difference (RPD) for 4 out of 17 2,3,7,8-substituted congeners, but this is attributed to slight differences in the composition of the sample aliquots used for MS and MSD. No contaminants were detected in the laboratory method blank. The precision between the field duplicates was excellent, indicating use of proper sampling and analytical techniques.

The data quality for this sample set was fully acceptable; therefore, no data were qualified.

Detailed Data Quality Evaluation

Holding Time. The extraction and analysis holding times were acceptable for all samples (criteria: extract within 30 days of collection and analyze within 45 days of extraction).

Mass Spectrometer Performance. The mass spectrometer resolving power was acceptable (criterion: a minimum resolution power of 10,000 at mass 304, or a mass difference of 0.0304 at 10% valley).

Gas Chromatography Column Performance. The retention time windows for the earliest and latest eluting congeners within each PCDD/PCDF homologue series was determined. Additionally, the valley separation between the 2,3,7,8-TCDD and 2,3,7,8-TCDF and closest eluting congeners was acceptable (criterion: valley height not to exceed 25% of the height of the 2,3,7,8 congeners).

Initial Calibration. A 5-point (nominal concentrations of 0.5, 2, 10, 40 and 100 ppt) initial calibration was performed on October 23, 1996, and was acceptable (criteria: RSD not exceeding 20 for native congeners and 30 for internal standards).

Continuing Calibration. A continuing calibration was run at the beginning and end of the 12-hour sequence of the sample analysis. The percent difference (%D) between the average response factors from the initial calibration and the response factors from the continuing calibration for all native congeners and standards was acceptable (criteria: %D not to exceed 20 for native congeners and 30 for standards).

Estimated Detection Limits. The project required detection limit of 3 ppt, especially in terms of 2,3,7,8-TCDD equivalents (TEQ) was amply met for all congeners and samples.

Congener Identification. Congeners were positively identified (reported as detected) using the proper criteria of ion abundance ratios and the retention windows (criteria: the ion abundance ratios specified in the method must be met for all congeners, and the congener retention time must fall within the retention window established under column performance determination).

Congener Quantification. The congener concentrations were calculated using the area and true concentrations of the internal standards, and the response factors for the native congeners. This method of quantification, automatically corrects for the recovery of the internal standards. In a few cases, the internal standard recovery fell below the limit of 40-135%. An accepted practice in lieu of poor recoveries is that the S/N ratio has to be better than 10 for good accuracy of the reported data.

The Wellington Laboratories did not include the S/N ratio information in the data package; however, a review of the chromatograms and raw data indicated that even at the lowest native standard concentration of 0.5 ppt, area counts in the range of several hundred million were obtained and the peak shapes were smooth, demonstrating ample sensitivity at 0.5 ppt level. By comparison, the internal standard is added at a concentration of 100 ppt. Assuming a recovery as low as 10%, at least 10 ppt of the standard would be recovered. This is a factor of 20 above the lowest native standard concentration. Therefore, it is inferred that the S/N would have easily exceed the minimum criterion of 10.

Method Blank. A soil blank was prepared and analyzed with the field samples. No congeners were reported for the soil blank.

Matrix Spike and Matrix Spike Duplicate Analyses. A matrix spike/matrix spike duplicate sample (DGA014) was analyzed with this sample set. The MS and MSD recoveries for this sample were acceptable, but the RPD between the MS recovery and MSD recovery did not meet the acceptance criteria for 4 out 0f 17 congeners (1,2,3,7,8,9-HxCDF [RPD = 28.1], 1,2,3,4,6,7,8-HpCDD [RPD = 35.6], OCDD [RPD = 98.9] and OCDF [RPD = 24.3]). Since the MS and MSD recoveries were acceptable, it is likely that the discrepancy in the analytical precision (RPD) arises from the differences in the native concentrations in the MS and MSD sample aliquots. No data qualification action was deemed necessary (criteria: the recoveries must be within a range of 40-135% and the RPD between MS and MSD recovery must be less than 20).

Field Duplicate Analysis. A field duplicate (DGA015FD1, a duplicate of DGA014) was analyzed in the current data set. Table 2 presents the results for the replicate samples and RPD between the replicate results. As seen from the table, the RPDs for the congeners detected in both analyses are in excellent agreement (criteria: an advisory limit of 50 RPD is used for relatively heterogeneous soil samples to encompass the sampling as well as the analytical precision errors).

Validated result sheets with appropriate data validation qualifiers and laboratory qualifiers are attached with this memorandum.

Data Usability

No data were qualified for the current data set. Therefore, all data are usable as reported by the laboratory.

Table 1 - Kelly Air Force Base Zone 4 Samples - Dioxins/Furans Data Evaluation CANVIRO # 96-10158						
Sample No.	Station ID	CANVIRO No.	Date Collected	Date Extracted	Date analyzed	Comments
DGA001	SS009HA005	96-10158-01	10/08/96	10/15/96	10/23/96	All ISTD recoveries below 40%, but S/N ratio is assumed to be better than 10. No data qualified.
DGA002	SS009HA006	96-10158-02	10/08/96	10/15/96	10/23/96	All ISTD recoveries below 40%, but S/N ratio is assumed to be better than 10. No data qualified.
DGA008	SS009HA060	96-10158-08	10/08/96	10/15/96	10/23/96	All ISTD recoveries above 40%. No data qualified.
DGA009	SS009HA061	96-10158-09	10/08/96	10/15/96	10/23/96	Tetra and penta ISTD recoveries below 40%, but S/N ratio is assumed to be better than 10. No data qualified.
DGA014	SS009HA021	96-10158-14	10/08/96	10/15/96	10/23/96	Tetra, penta and hexa ISTD recoveries below 40%, but S/N ratio is assumed to be better than 10. No data qualified.
DGA015FD1	SS009HA021	96-10158-15	10/08/96	10/15/96	10/23/96	Tetra and penta ISTD recoveries below 40%, but S/N ratio is assumed to be better than 10. No data qualified.

MEMORANDUM CH2MHILL

Kelly Air Force Base - IRP Site SS009

Level C Data validation for total and 2,3,7,8-substituted Dioxins and Furans

CANVIRO Project #s 96-10158 and 96-10227

TO: John Coffey/SAN

FROM: Kishor Gala/DEN

DATE: November 8, 1996

Overview

This data validation memorandum discusses the quality of data generated for a total of nine (9) field samples collected from Kelly Air Force Base IRP Site SS009. The samples were collected on October 8 and 10, 1996. The samples included 8 field original samples (soils). This sample set is a subset of a total of 22 field samples collected from Zone 4. No field quality control samples were included with this set of samples; however, one field duplicate (soil) and extra volume for matrix spike/matrix spike duplicate (MS/MSD) analyses have been collected. The field quality control sample results will be included in the subsequent data sets. Table 1 presents the details of the samples included in this data evaluation memorandum.

The samples were analyzed for total and 2,3,7,8-substituted polychlorinated dibenzodioxins (PCDD) and polychlorinated dibenzofurans (PCDF) congeners using the high-resolution gas chromatography/mass spectrometric (GC/MS) method SW846/8290. Four total PCDDs and PCDFs (tetra- through hepta-chlorinated), seven 2,3,7,8-substituted PCDDs (tetra through octa) and 10 2,3,7,8-substituted PCDFs (tetra- through octa-) were reported for each sample. The samples were analyzed by the CANVIRO Analytical Laboratories, Ltd., of Waterloo, Ontario, Canada.

Comprehensive data packages (sample results, raw sample and calibration data raw QC data) were provided. Accordingly, comprehensive data validation was performed for the samples, including verifying at random the response factors, continuing calibration percent differences, sample calculations, etc.

Data were validated using method-specific quality control criteria, since EPA-developed data validation guidelines do not exist for the PCDD/PCDF analyses.

Overview of Analysis

A majority of the samples had significant asphaltic character. The initial sample extracts using the required 10-gram aliquot of the samples were extremely dark in color even after extract cleanup. The internal standards recoveries were significantly below the minimum advisory limit of 40 percent of the true values. After ascertaining that the required detection limits for the project (3 ng/kg or parts per trillion [ppt]) would not be compromised, the laboratory was instructed to reextract the samples using a 5-gram aliquot in a hope to obtain better recoveries for the internal standards. The quantities of the internal standards, fortified standards and the recovery standard were adjusted for the 5-gram sample aliquot. All sample data were provided using this modification of the SW846/8290 methodology.

Overview of Data Quality Evaluation

All samples were successfully analyzed. A majority of the soil samples had low level detections of total and specific detections of PCDDs/PCDFs, especially the hepta- and octa congeners. The internal standard recoveries in most samples were below 40 percent, but in a majority of instances, the signal to noise (S/N) ratio was better than 10, indicating acceptable accuracy in quantification of target compounds. Diphenyl ether interference was evident in practically all samples. The peaks that were deemed as diphenyl ethers were not included in the total PCDD/PCDF amounts; therefore, barring other quality control problems, the total quantities are usable as reported.

Several reported values were qualified as estimated due either to the ion abundance ratios not falling within the acceptance ranges or the internal standard S/N ratios of less than 10. Overall, given the complexity of the sample matrix, the analyses were performed optimally.

Detailed Data Quality Evaluation

Holding Time. The extraction and analysis holding times were acceptable for all samples (criteria: extract within 30 days of collection and analyze within 45 days of extraction).

Mass Spectrometer Performance. The mass spectrometer resolving power was acceptable (criterion: a minimum resolution power of 10,000 at mass 304, or a mass difference of 0.0304 at 10% valley).

Gas Chromatography Column Performance. The retention time windows for the earliest and latest eluting congeners within each PCDD/PCDF homologue series was determined. Additionally, the valley separation between the 2,3,7,8-TCDD and 2,3,7,8-TCDF and closest eluting congeners was acceptable (criterion: valley height not to exceed 25% of the height of the 2,3,7,8 congeners).

Initial Calibration. A 5-point (nominal concentrations of 0.5, 2, 10, 40 and 200 ppt) initial calibration was performed on October 24, 1996. The ion abundance ratio and relative standard deviation (RSD) criteria were met for the initial calibration (criteria: RSD not exceeding 20 for native congeners and 30 for internal standards. Also the ion abundance ratios specified in the method for native congeners and labeled compounds must be met).

Continuing Calibration. A continuing calibration was run at the beginning and end of the 12-hour sequence of the sample analysis. The percent difference (%D) between the average response factors from the initial calibration and the response factors from the continuing calibration for all native congeners and standards was acceptable (criteria: %D not to exceed 20 for native congeners and 30 for standards).

Estimated Detection Limits. For most of the sample and congeners, the project required detection limit of 3 ppt was met. However, the baseline noise inherent in some samples, produced elevated detection limits for a limited number of congeners, although in all cases, the elevated detection limits were below the 3 ppt 2,3,7,8-TCDD toxicity equivalent (TEQ) concentration when multiplied by the appropriate toxicity equivalent factors (TEF). The data users are advised to keep this in mind when using the data. The elevated detection limits are as a result of the sample matrix and not due to inappropriate analysis. Attempts were made to reduce the interference by using a smaller sample aliquot (criterion: the estimated detection limit is calculated as a signal level that is 2.5 times the baseline noise level in the elution area of a congener).

Congener Identification. Congeners were positively identified (reported as detected) using the proper criteria of ion abundance ratios and the retention windows. In a few cases, the ion abundance ratios for the associated internal standard did not meet the method-specific criteria. In such events, the concentrations of the positively reported 2,3,7,8-substituted congeners and the total homologues were qualified as estimated, "J." The details of the qualification are presented in Table 1 for each sample (criteria: the ion abundance ratios specified in the method must be met for all congeners, and the congener retention time must fall within the retention window established under column performance determination).

Congener Quantification. The congener concentrations were calculated using the area and true concentrations of the internal standards, and the response factors for the native congeners. This method of quantification, automatically corrects for the recovery of the internal standards. In a few cases, the internal standard recovery fell below the limit of 40-135% and the S/N ratio was lower than 10. In these cases, the native congener and total homologue concentrations were deemed not to meet the acceptable accuracy; hence, qualified as estimated, "J." Only the positive (detected) concentrations were so qualified. The detection limits for the nondetected congeners were not qualified as estimated, since these were determined specifically using the S/N ratio as described previously.

Method Blank. A soil blank was prepared and analyzed with the field samples. No detections of the native congeners were reported for the soil blank.

Laboratory Control Spike. A controlled (clean) solid matrix sample was spiked a known concentration solution and analyzed. The recoveries of all native congeners and standards were acceptable (criteria: as an advisory, the recoveries must be within a range of 25-150%).

796 329

Matrix Spike and Matrix Spike Duplicate Analyses. A matrix spike/matrix spike duplicate sample was not included in the current sample set. However, a Kelly AFB Zone 4 soil sample (DGA014) was analyzed in another sample set. The MS and MSD recoveries for this sample were acceptable, but the RPD between the MS recovery and MSD recovery did not meet the acceptance criteria for a few congeners. Since the MS/MSD performance data are specific to a sample, the nonconformance may not be extended to other samples unless an evaluation of other performance criteria indicates a trend or potential for nonconformance in other samples. Therefore, no data in this sample set were qualified for the MS/MSD results (criteria: the recoveries must be within a range of 40-135% and the RPD between MS and MSD recovery must be less than 20).

Field Duplicate Analysis. A field duplicate was not included the current sample set. However, sample DGA015 was submitted as a field duplicate for sample DGA014 in another sample set. A few low level detections of native congeners were reported for the original sample DGA014 as well as the field duplicate DGA015FD1. The RPD between the replicate results, when the congeners were found in both samples were acceptable (criteria: an advisory limit of 50 RPD is used for relatively heterogeneous soil samples to encompass the sampling as well as the analytical precision errors).

Validated result sheets with appropriate data validation qualifiers and laboratory qualifiers are attached with this memorandum.

Data Usability

Although, some data were qualified as estimated, the types and magnitude of the most of the problems are not likely to affect the data usability significantly. In most instances, the bias in the reported data is not predictable. The bias, if any, is expected to be random. Overall, the quality of the Site SS009 sample data is equivalent to that expected for difficult matrix samples. In conclusion, the positive data are deemed usable at their reported values.

Table 1 - Kelly Air Force Base Zone 4 Samples - Dioxins/Furans Data Evaluation
CANVIRO #s 96-10158 and 96-10227

Sample No.	Station ID	CANVIRO No.	Date Collected	Date Extracted	Date analyzed	Comments
DGA003	SS009HA007	96-10158-03	10/08/96	10/17/96	10/24/96	All ISTD recoveries below 40%. S/N ratios for 2378TCDD, 12378PeCDD and OCDD less than 10. Additionally, the ion abundance ratio for 123478HxCDD not met. Qualify positive congener and total homologue values as estimated, "J."
DGA004	SS009HA063	96-10158-04	10/08/96	10/17/96	10/24/96	All ISTD, except OCDD recoveries below 40%. The S/N ratios below 10 for 2378TCDF and 123478HxCDF. Qualify the positive values for the associated congeners and total homologues as estimated, "J." Additionally, the ion abundance ratios not met for labeled 23478PeCDF, 1234678HpCDF and native 2378TCDF. Qualify the positive values for the associated congeners and total homologues as estimated, "J."
DGA007	SS009HA062	96-10158-07	10/08/96	10/17/96	10/24/96	All ISTD recoveries above 40%, except 2378TCDF at 38.8%. All S/N ratios above 10. No data qualified.
DGA010	SS009HA010	96-10158-10	10/08/96	10/17/96	10/24/96	All ISTD recoveries above 40%, except 2378TCDF at 38.4%. All S/N ratios above 10. No data qualified.
DGA011	SS009HA011	96-10158-11	10/08/96	10/17/96	10/24/96	All ISTD recoveries above 40%, except 2378TCDF (26.4%), 123678HxCDF (38%) and 123478HxCDF (39.3%), but all S/N ratios above 10. No data qualified.
DGA012	SS009HA013	96-10158-12	10/08/96	10/17/96	10/24/96	All ISTD recoveries below 40%. S/N ratio less than 10 for 1234678HpCDD. Qualify the positive values for the congener and total homologues as estimated, "J." Ion abundance ratios not met for labeled 1234678HpCDF and 123678 HxCDF. Qualify the positive values for the congeners as total homologues as estimated, "J."
DGA013	SS009HA014	96-10158-13	10/08/96	10/17/96	10/24/96	All ISTD recoveries below 40%. S/N ratios less than 10 for 234678HxCDF and 123789HxCDF. Qualify positive congener and total homologue concentrations as estimated, "J."

DGA016	SS009HA066	96-10158-16	10/08/96	10/17/96	10/24/96	All ISTD recoveries below 40%, but S/N ratios acceptable. Ion abundance ratios not met for labeled 12378PeCDD and 123478HxCDD, and native 12378PeCDF. Qualify the positive values for the congeners as total homologues as estimated, "J."
DGA059	SS009HA040	96-10227-02	10/10/96	10/17/96	10/24/96	ISTD recoveries acceptable. Ion abundance ratios not met for labeled and native 23478PeCDF and 1234678HpCDF, and native 123478HxCDF and 234678HxCDF. Qualify positive congener and total homologue concentrations as estimated, "J."

795 341

MEMORANDUM **CH2MHILL**

Kelly Air Force Base - IRP Site SS009

Level C Data validation for total and 2,3,7,8-substituted Dioxins and Furans in SPLP Leachate

CANVIRO Project # 96-10298

TO: John Coffey/SAN

FROM: Kishor Gala/DEN

DATE: November 13, 1996

Overview

This data validation memorandum discusses the quality of data generated for a total of five (5) aqueous samples. The samples consisted of Synthetic Precipitation Leaching Procedure (SPLP) extracts from four original soil samples and one equipment blank for field quality control. The soil samples were collected on October 8 and 10, 1996 from Kelly Air Force Base IRP Site SS009. Extra SPLP leachate volume was collected for matrix spike/matrix spike duplicate (MS/MSD) analyses. Table 1 presents the details of the samples included in this data evaluation memorandum.

The soil samples were subjected to the EPA's SPLP extraction (method SW846/1312) and the extracts were analyzed for total and 2,3,7,8-substituted polychlorinated dibenzodioxins (PCDD) and polychlorinated dibenzofurans (PCDF) congeners using the high-resolution gas chromatography/mass spectrometric (GC/MS) method SW846/8290. Four total PCDDs and PCDFs (tetra- through hepta-chlorinated), seven 2,3,7,8-substituted PCDDs (tetra through octa) and 10 2,3,7,8-substituted PCDFs (tetra- through octa-) were reported for each sample. The samples were extracted by CH2M HILL's Quality Analytical Laboratories, Inc., Redding, California, and the extracts were analyzed by the CANVIRO Analytical Laboratories, Ltd., of Waterloo, Ontario, Canada.

Comprehensive data packages (sample results, raw sample and calibration data raw QC data) were provided. Accordingly, comprehensive data validation was performed for the samples, including verifying at random the response factors, continuing calibration percent differences, sample calculations, etc.

Data were validated using method-specific quality control criteria, since EPA-developed data validation guidelines do not exist for the PCDD/PCDF analyses.

795 343

Overview of Analysis

The analyses of the SPLP extracted proceeded smoothly, with one exception: a syringe normally dedicated to the matrix spiking mixture was used in place of the dedicated syringe for clean solvent addition during final sample extract transfer. This syringe was inherently contaminated with residual levels of target compounds which eventually were transferred to the sample extracts in decreasing concentrations. Several samples showed congener concentrations near the reporting limits (nominal 10 picograms/Liter or 10 parts per quadrillion [ppq]). The contaminant concentrations were significantly below the reporting limits in other samples. In the sample preparation sequence, a trend in decreasing concentrations was evident in the extracts, indicating gradual cleaning of the syringe as the solvent addition process continued. An adverse impact on the data usability is not evident, given the low detection levels; however, the laboratory error must be kept in mind when using the data for critical decision-making.

Overview of Data Quality Evaluation

All SPLP extracts were successfully analyzed. Several extracts had low level detections of penta CDDs/CDFs and OCDD, but a majority of the congeners and samples were nondetects. The internal standard recoveries in all samples were acceptable (above 40 percent). The laboratory blank and the SPLP blank were clean. Matrix spike/matrix spike duplicate (MS/MSD) recoveries were acceptable. The MS/MSD precision criterion of relative percent difference (RPD) not exceeding 20 was met for all congeners, with the exception of 2,3,7,8-TCDF (RPD = 32.6). However, 2,3,7,8-TCDF was not detected in the extracts; therefore, no impact on data usability is expected. A controlled (blank) spike was analyzed with the internal standard and spike recoveries within the acceptable limits. The initial and continuing calibrations were within the acceptance ranges. The mass spectrometer and gas chromatography resolution was acceptable. No data were qualified. All data are deemed usable as reported, with consideration given to the cross-contamination problem discussed above.

Detailed Data Quality Evaluation

Holding Time. The extraction and analysis holding times were acceptable for all samples (criteria: extract within 30 days of collection and analyze within 45 days of extraction).

Mass Spectrometer Performance. The mass spectrometer resolving power was acceptable (criterion: a minimum resolution power of 10,000 at mass 304, or a mass difference of 0.0304 at 10% valley).

Gas Chromatography Column Performance. The retention time windows for the earliest and latest eluting congeners within each PCDD/PCDF homologue series was determined. Additionally, the valley separation between the 2,3,7,8-TCDD and 2,3,7,8-TCDF and closest eluting congeners was acceptable (criterion: valley height not to exceed 25% of the height of the 2,3,7,8 congeners).

Initial Calibration. A 5-point (nominal concentrations of 0.5, 2, 10, 40 and 200 ppt) initial calibration was performed on October 27, 1996. The ion abundance ratio and relative standard deviation (RSD) criteria were met for the initial calibration (criteria: RSD not exceeding 20 for native congeners and 30 for internal standards. Also the ion abundance ratios specified in the method for native congeners and labeled compounds must be met).

Continuing Calibration. A continuing calibration was run at the beginning and end of the 12-hour sequence of the sample analysis. The percent difference (%D) between the average response factors from the initial calibration and the response factors from the end-of-the-run continuing calibration marginally exceeded the percent difference criteria for three native congeners and one labeled standard. Following the corrective action specified in the method, the averages of the response factors from the mid-point initial calibration standard and the continuing calibration was used for sample calculation. This is an acceptable procedure (criteria: %D not to exceed 20 for native congeners and 30 for standards. The average response factors from the initial and continuing calibrations may be used if %D do not exceed 25 and 35, respectively).

Estimated Detection Limits. For most of the sample and congeners, the estimated detection limits (EDL) were below the method reporting limit of nominal 10 ppq, indicating ample instrument sensitivity.

Congener Identification. Congeners were positively identified (reported as detected) using the proper criteria of ion abundance ratios and the retention windows (criteria: the ion abundance ratios specified in the method must be met for all congeners, and the congener retention time must fall within the retention window established under column performance determination).

Congener Quantification. The congener concentrations were calculated using the area and true concentrations of the internal standards, and the response factors for the native congeners. This method of quantification, automatically corrects for the recovery of the internal standards (criteria: the internal standard recovery must be within 40-135% or the S/N ratio must be greater than 10 for accurate quantitation).

Method Blank. An aqueous blank was prepared and analyzed with the field samples. No detections of the native congeners were reported for the soil blank (criterion: the blank detection levels must be below the method reporting limits).

SPLP Blank. A SPLP extraction blank was analyzed with the sample extracts. No detections of the native congeners were reported for the SPLP blank (criterion: the blank detection levels must be below the method reporting limits).

Laboratory Control Spike. A controlled (clean) solid matrix sample was spiked a known concentration solution and analyzed. The recoveries of all native congeners and standards were acceptable (criteria: as an advisory, the recoveries must be within a range of 25-150%).

795 345

Matrix Spike and Matrix Spike Duplicate Analyses. The SPLP extract from sample DGA061 was used for the matrix spike/matrix spike duplicate analyses. The native congener and internal standard recoveries for MS and MSD were acceptable. Only one native congener (2,3,7,8-TCDF) exceeded the maximum RPD limit of 20. Since 2,3,7,8-TCDF was not detected in the sample or any other samples in the batch, no adverse impact on data usability is expected (criteria: the recoveries must be within a range of 40-135% and the RPD between MS and MSD recovery must be less than 20).

Field Duplicate Analysis. A field duplicate or SPLP extract duplicate was not included the current sample set.

Validated result sheets with appropriate data validation qualifiers and laboratory qualifiers are attached with this memorandum.

Data Usability

No data were qualified. The laboratory accuracy and precision criteria were met. The quality of the Kelly AFB IRP Site SS009 leachte data is acceptable and usable as reported.

Table 1 - Kelly Air Force Base Zone 4 Samples - Dioxins/Furans Data Evaluation
Synthetic Precipitation Leaching Procedure Extracts
CANVIRO # 96-10298

Sample No.	Station ID	CANVIRO No.	Date Collected	Date Extracted	Date analyzed	Comments
DGA060	SS009HA010	96-10298-01	10/10/96	10/22/96	10/26/96	12378PeCDD/PeCDF reported just above the reporting limits. Indications of other PCDDs/PCDFs in the sample, but either the ion abundance ratios do not meet the criteria or the concentrations significantly below reporting limits. The PCDD/PCDF presence is attributable to the laboratory error (see the text). No data qualified.
DGA061	SS009HA030	96-10298-02	10/10/96	10/22/96	10/26/96	Indications of PCDDs/PCDFs in the sample, but either the ion abundance ratios do not meet the criteria or the concentrations significantly below reporting limits. The PCDD/PCDF presence, if any, is attributable to the laboratory error (see the text). No data qualified.
DGA049	SS009HA063	96-10298-05	10/08/96	10/22/96	10/26/96	OCDD reported just above the reporting limit. Some indications of penta-, hexa- and hepta-CDDs/CDFs in the sample, but either the ion abundance ratios do not meet the criteria or the concentrations significantly below reporting limits. The OCDD presence is attributable to the laboratory error (see the text). No data qualified.
DGA057	SS009HA071	96-10298-06	10/08/96	10/22/96	10/26/96	Some indications of HpCDDs in the sample, but either the ion abundance ratios do not meet the criteria or the concentrations significantly below reporting limits. The PCDD/PCDF presence, if any, is attributable to the laboratory error (see the text). No data qualified
DGA022EB1	Field QC	96-10298-07	10/07/96	10/22/96	10/26/96	No reports or indications of PCDD/PCDFs.

MEMORANDUM **CH2MHILL**

Kelly Air Force Base - IRP Site SS009

Level C Data validation for 2,3,7,8-TCDD and 2,3,7,8-TCDF Confirmation Results

CANVIRO Project # 96-10158

TO: John Coffey/SAN

FROM: Kishor Gala/DEN

DATE: November 13, 1996

Overview

This data validation memorandum discusses the quality of data generated for a total of six (6) soil samples. The samples were previously analyzed for total and 2,3,7,8-substituted polychlorinated dibenzodioxins and dibenzofurans (PCDD/PCDF). In these analyses, the samples exhibited a potential presence of the 2,3,7,8-tetrachlorinated dibenzodioxin and/or dibenzofuran (2,3,7,8-TCDD/TCDF). According to the SW846/8290 method protocol, the 2,3,7,8-tetrachlorinated congener data must be confirmed on a different column that provides a better resolution of these congeners from other tetra congeners. The primary purpose for these analyses is to confirm the presence or absence of TCDD/TCDF, and not to reassess the data accuracy and precision (matrix or blank spike and duplicate analyses; these were performed with the original analyses).

The soil samples were collected on October 8, 1996 from Kelly Air Force Base IRP Site SS009. The analyses were performed by the CANVIRO Analytical Laboratories, Ltd., of Waterloo, Ontario, Canada. Table 1 presents the details of the samples included in this data evaluation memorandum.

Comprehensive data packages (sample results, raw sample and calibration data raw QC data) were provided. Accordingly, comprehensive data validation was performed for the samples, including verifying at random the response factors, continuing calibration percent differences, sample calculations, etc.

Data were validated using method-specific quality control criteria, since EPA-developed data validation guidelines do not exist for the PCDD/PCDF analyses.

Overview of Analysis

The sample extracts obtained for the previous more complete analyses were used for injecting on the confirmation column. Therefore, no sample preparation was involved with the TCDD/TCDF analyses. The analytical protocol followed the methodology outlined in the high-resolution gas chromatography/mass spectrometric (GC/MS) method SW846/8290.

Overview of Data Quality Evaluation

All sample extracts were successfully analyzed. The specific 2,3,7,8-TCDD/TCDF congeners were determined to be not present in the samples. Although the samples did exhibit presence of TCDF, the retention time matching indicated that a congener other than 2,3,7,8-TCDF was likely present. The internal standard recoveries in all samples were acceptable (above 40 percent). The laboratory blank was clean. Matrix spike/matrix spike duplicate (MS/MSD) analyses were not performed specifically for the confirmatory analyses. The initial and continuing calibrations were within the acceptance ranges. The mass spectrometer and gas chromatography resolution was acceptable. No data were qualified. All data are deemed usable as reported.

Detailed Data Quality Evaluation

Holding Time. The extraction and analysis holding times were acceptable for all samples (criteria: extract within 30 days of collection and analyze within 45 days of extraction).

Mass Spectrometer Performance. The mass spectrometer resolving power was acceptable (criterion: a minimum resolution power of 10,000 at mass 304, or a mass difference of 0.0304 at 10% valley).

Gas Chromatography Column Performance. The retention time windows for the earliest and latest eluting TCDD/TCDF congeners was determined. Additionally, the valley separation between the 2,3,7,8-TCDD and 2,3,7,8-TCDF and closest eluting congeners was acceptable (criterion: valley height not to exceed 25% of the height of the 2,3,7,8 congeners).

Initial Calibration. A 5-point (nominal concentrations of 0.5, 2, 10, 40 and 200 ppt) initial calibration was performed on October 27, 1996. The ion abundance ratio and relative standard deviation (RSD) criteria were met for the initial calibration (criteria: RSD not exceeding 20 for native congeners and 30 for internal standards. Also the ion abundance ratios specified in the method for native congeners and labeled compounds must be met).

Continuing Calibration. A continuing calibration was run at the beginning and end of the 12-hour sequence of the sample analysis. The percent difference (%D) between the average response factors from the initial calibration and the response factors from the continuing calibrations were acceptable (criteria: %D not to exceed 20 for native congeners and 30 for standards).

Estimated Detection Limits. The estimated detection limits (EDL) were below the method reporting limit of nominal 2 ppt, with the exception of samples DGA001 (2,3,7,8-TCDD EDL = 2.34 ppt) and DGA002 (2,3,7,8-TCDD EDL = 2.13 ppt). The exceedances are minor and 2,3,7,8-TCDD was not detected in these samples; therefore, no impact on data is evident.

Congener Identification. An inspection of the selected ion profiles (SIP) indicated presence of TCDF in all samples. However, a comparison with the standards indicated that while the native 2,3,7,8-TCDF congener eluted consistently 2 to 3 seconds after the elution of the labeled standard, the congener in question eluted consistently 2 to 3 seconds before the standard. A total of 38 TCDF congeners are possible with different substitution positions. The detected TCDF congener is most likely not the 2,3,7,8-TCDF congener, but some other substitution (criteria: the ion abundance ratios specified in the method must be met for all congeners, and the congener retention time must fall within the retention window established under column performance determination).

Congener Quantification. The congener concentrations were calculated using the area and true concentrations of the internal standards, and the response factors for the native congeners. This method of quantification, automatically corrects for the recovery of the internal standards (criteria: the internal standard recovery must be within 40-135% or the S/N ratio must be greater than 10 for accurate quantitation).

Method Blank. A soil blank was prepared and analyzed with the field samples. No detections of the native congeners were reported for the soil blank (criterion: the blank detection levels must be below the method reporting limits).

Laboratory Control Spike. A controlled (clean) solid matrix spiked sample was not analyzed in conjunction with the confirmatory analyses.

Matrix Spike and Matrix Spike Duplicate Analyses. The matrix spike/matrix spike duplicate analyses were not performed in conjunction with the confirmatory analyses.

Field Duplicate Analysis. A field duplicate was not included the current sample set.

Validated result sheets with appropriate data validation qualifiers and laboratory qualifiers are attached with this memorandum.

Data Usability

Presence of 2,3,7,8-TCDD/TCDF was not confirmed in the samples. No data were qualified. The previously reported 2,3,7,8-TCDD/TCDF data for these samples must be considered as nondetects and replaced with the reporting limits or EDLs, as appropriate. Note that the "total" congener data reported previously are usable, as previously qualified.

Table 1 - Kelly Air Force Base Zone 4 Samples - 2,3,7,8-TCDD/TCDF Confirmation CANVIRO # 96-10158						
Sample No.	Station ID	CANVIRO No.	Date Collected	Date Extracted	Date analyzed	Comments
DGA001	SS009HA005	96-10158-01	10/8/96	10/15/96	10/30/96	2,3,7,8-TCDD/TCDF congeners not confirmed. A different TCDF congener may be present. No data qualified.
DGA002	SS009HA006	96-10158-02	10/8/96	10/15/96	10/30/96	2,3,7,8-TCDD/TCDF congeners not confirmed. A different TCDF congener may be present. No data qualified.
DGA007	SS009HA010	96-10158-07	10/8/96	10/17/96	10/30/96	2,3,7,8-TCDD/TCDF congeners not confirmed. A different TCDF congener may be present. No data qualified.
DGA008	SS009HA060	96-10158-08	10/8/96	10/15/96	10/30/96	2,3,7,8-TCDD/TCDF congeners not confirmed. A different TCDF congener may be present. No data qualified.
DGA009	SS009HA061	96-10158-09	10/8/96	10/15/96	10/30/96	2,3,7,8-TCDD/TCDF congeners not confirmed. A different TCDF congener may be present. No data qualified.
DGA011	SS009HA011	96-10158-11	10/8/96	10/17/96	10/30/96	2,3,7,8-TCDD/TCDF congeners not confirmed. A different TCDF congener may be present. No data qualified.

795 350

MEMORANDUM CH2MHILL

Data Quality Evaluation (DQE) of Kelly AFB, Zone 4, SS009

TO: John J. Coffey/SAN

COPIES: Nelline Scheuer/WDC
Ann Castleberry/GNV

FROM: Kevin A. Sanders/GNV

DATE: November 14, 1996

The purpose of the data quality evaluation process is to assess the effect of the overall analytical process on the usability of the data. The two major categories of data evaluation are laboratory performance and matrix interferences. Evaluation of laboratory performance is a check for compliance with the method requirements; either the laboratory did, or did not, analyze the samples within the limits of the analytical method. Evaluation of matrix interferences is more subtle and involves the analysis of several areas of results including surrogate spike recoveries, matrix spike recoveries, and duplicate sample results.

Introduction

Before the analytical results were released by the laboratory, both the sample and QC data were carefully reviewed to verify sample identity, instrument calibration, detection limits, dilution factors, numerical computations, accuracy of transcriptions, and chemical interpretations. Additionally, the QC data were reduced and the resulting data were reviewed to ascertain whether they were within the laboratory-defined limits for accuracy and precision. Any non-conforming data were discussed in the data package cover letter and case narrative.

The data packages were reviewed by the project chemists using the process outlined in the Environmental Protection Agency (EPA) guidance document *National Functional Guidelines for Evaluating Inorganic Data.* The data review and validation process is independent of the laboratory's checks and focuses on the usability of the data to support the project data interpretation and decision-making processes. Common areas of review included holding time compliance, initial and continuing calibration, spiked sample results, method blank results, and duplicate sample results. A data review worksheet was completed for each data package.

Samples that were not within the acceptance limits were appended with a qualifying flag, which consists of a single or double-letter abbreviation that indicates a problem with the data. Although the qualifying flags originate during the data review and validation process, they are included in the data summary tables so that the data will not be used indiscriminately. The following flags were used in this text:

795 352

- **U** Undetected. Analyte was analyzed for but not detected above the method detection limit.

- **UJ** Detection limit estimated. Analyte was analyzed for, and qualified as not detected. The result is estimated.

- **J** Estimated. The analyte was present, but the reported value may not be accurate or precise.

- **R** Rejected. The data are unusable. (NOTE: Analyte/compound may or may not be present.)

Numerical sample results that are greater than the instrument detection limit (IDL) for inorganics but less than the contract required detection limit (CRDL) are qualified with a J for estimated as required by the EPA *National Functional Guidelines for Evaluating Inorganic Data.*

Once the data review and validation process were completed, the entire data set was reviewed for target analyte frequencies of detection, dilution factors that might affect data usability, and patterns of elemental distribution. The data set was also evaluated to identify potential data limitations, uncertainties, or both in the analytical results.

Holding Times

The holding times for each parameter were evaluated according to SW-846 requirements for aqueous samples. These aqueous holding times were also applied to the solid matrices. The holding time for metallic analytes is 180 days. All holding times were met.

Potential Field Sampling and Laboratory Contamination

A rinsate blank (as described below) was used to monitor potential contamination introduced during field sampling and sample handling activities.

- **Equipment Rinsate Blank**: A sample of the organic-free water used for the final rinse during equipment decontamination. This blank sample is collected by rinsing a piece of equipment after decontamination and is analyzed for the same analytical parameters as the corresponding samples. This blank monitors potential contamination caused by incomplete equipment decontamination. One equipment rinsate blank was analyzed for this effort.

Laboratory method blanks were also analyzed. A laboratory method blank is ASTM Type II water that is treated as a sample in that it undergoes the same analytical process as the corresponding field samples. Method blanks are used to monitor laboratory performance

and contamination introduced during the analytical procedure. One method blank was analyzed for every twenty samples, or one per analytical batch, whichever was more frequent.

According to the EPA Functional Guidelines, concentrations of contaminants detected in samples at less than 5 times the maximum concentration in the blanks can be attributed field sampling and laboratory contamination rather than environmental contamination from site activities. There were no metals detected in field or laboratory method blanks. However, calibration blanks did reflect some low level contamination and instrument noise. These values were applied on a SDG basis for this evaluation.

Sample results less than 5 times the maximum concentration found in the associated calibration blanks were attributed to low level laboratory contamination or instrument noise and are not considered to be indicative of environmental contamination. Antimony, chromium, and thallium calibration blank results were applied to 2 SDG's, while antimony, arsenic, and thallium were evaluated in the third SDG. The concentrations adjusted for the 5X rule are presented in Table 1.

Table 1 - Calibration blanks (at 5X) Applied to Field Data

Element	SDG RC244 (ug/L)	SDG RC242 (mg/kg)	SDG RC243 (mg/kg)	SDG RC264 (mg/kg)/ (ug/L)	SDG RC390 (ug/L)
Antimony	8.5	1.7	1.3	N/A	N/A
Arsenic	N/A	N/A	13.4	15.7 / 78.5	66
Cadmium	N/A	N/A	N/A	1.7 / 8.5	N/A
Chromium	11	2.2	N/A	N/A	N/A
Selenium	N/A	N/A	N/A	0.7 / 3.5	N/A
Silver	N/A	N/A	N/A	4.5 / 22.5	N/A
Thallium	4.5	0.9	0.8	N/A	N/A

Matrix Effects

Matrix Spike Recoveries

For inorganic matrix spikes, three aliquots of a single sample are analyzed; one native sample, one native duplicate, and one sample spiked with target elements. Spike recovery is used to evaluate potential matrix interferences as well as accuracy. Precision is evaluated by the comparison between the native sample and native duplicate results for each target analyte. A matrix spike and native duplicate were performed for each SDG. Arsenic was the only laboratory precision outlier at 35 %RPD. Matrix spike recoveries outside requirements are presented in Table 2. Accuracy and precision values outside criteria were appended with "J or UJ" qualifying flags. Additionally, the leachate spike results for RC264

795 354

were all outside accetance criteria at about the same level whcil may b: indicative of a spiking error. No data were rejected.

Table 2 - Matrix Spike Recoveries Outside Established Recovery Criter a

Element	SDG RC242	SDG RC244	SDG RC24:	SDG RC264
Antimony	-	-	-	44
Arsenic	-	-	-	142
Barium	-	-	-	148
Beryllium	-	-	-	137
Cadmium	-	-	-	136
Chromium	68	-	-	143
Lead	28	-	-	-
Selenium	45	65	40	-
Silver	-	-	-	137

Field Duplicate Sample Results

One duplicate field sample was collected for this site evaluatior. Both the native and duplicate samples were analyzed for the same parameters. All f eld dup licate sample measurements were within acceptable limits. (± 35% RPD)

Sample Results for Metals Near the Instrument Detection Limit (IDL)

The samples were analyzed for a project specific list of metallic analytes. Concentrations of metals near the IDL were reported for several of the target metals. The IDL is the constituent concentration that produces a signal greater than five times the signal/noise ratio of the instrument and is a statistically derived value; therefore, sample results at, or near, the IDL may be false positives caused by instrument noise or low level background shifts rather than an analyte signal. All silver and selenium results fall into this category. Approximately 26 (25 in soil) results for beryllium were reported as greater than the IDL, but less than the CRDL. A practical quantitation limit (PQL) is calculated at about 20 times the IDL and is defined as a routinely achievable detection limit with a relatively good certainty that any reported value is reliable. All of the beryllium data were equal to or less than 10 times the IDL (50% of the PQL). Eighteen of these results were less than 5 times the IDL. These limits are presented in Table 3. The majority, if not all of these results are suspect as false positives and should be treated as estimated values.

Table 3 - Detection Limit Comparisons for Beryllium (in mg/kg dry weight)

	IDL	PQL	CRDL
Beryllium	0.06	1.2	1.0

PARCCs

Precision--is defined as the agreement between duplicate results, and was estimated by comparing duplicate matrix spike recoveries and field duplicate sample results. All duplicate field sample results were within acceptable criteria indicating that the sample matrix did not interfere with sampling precision.

Accuracy--is a measure of the agreement between an experimental determination and the true value of the parameter being measured. Laboratory control samples (LCS's) consist of DI water blanks spiked with the target analytes and measures method accuracy. All LCS recoveries were within criteria. A representative field sample was spiked with known reference materials before digestion. This provides a measure of the matrix effects on the analytical accuracy. Accuracy can be estimated from the analytical data. More than 80 percent of the spike recoveries were within the method acceptance limits. Selenium, analyzed by GFAA, accounted for 60% of these outliers, common for soil matrices. Therefore, there was no evidence of matrix interferences which would affect the usability of the data.

Representativeness--this criteria is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition. Representativeness is a subjective parameter and is used to evaluate the efficacy of the sampling plan design. Representativeness was demonstrated by providing full descriptions in the project scoping documents of the sampling techniques and the rationale used for selecting sampling locations.

Completeness--is defined as the percentage of measurements that are judged to be valid compared to the to total number of measurements made. A goal of 95 percent usable data was established in the project scoping document. There were no ddata rejected during this data evaluation.

Comparability--is another qualitative measure designed to express the confidence with which one data set may be compared to another. Factors which affect comparability are: sample collection and handling techniques, sample matrix type, and analytical method. Comparability is limited by the other PARCC parameters because data sets can be compared with confidence only when precision and accuracy are known. Data from this investigation are comparable with other data collected at the site because only EPA methods were used to analyze the sample and Level 3 QC data is available to support the quality of the data.

Summary and Conclusions

Conclusions of the data quality evaluation process include:

- The laboratory analyzed the samples according to the EPA methods stated in the work plan as demonstrated by acceptable instrument calibration and blank spike recoveries

795 366

- Sample results for metals above the IDL but less than the PQL should be carefully evaluated because they may be attributed to instrument noise and not site-related activities.

- Spike recoveries and duplicate sample results indicate that the specific sample matrix did not interfere with the analytical process.

The data can be used in the project decision-making process as qualified by the data quality evaluation process.

795 357

TAB

PCDD/PCDF Laboratory Analytical Reports

795 358

KRATOS MACH3 PEAK AREA QUANTITATION:- CONCENTRATION REPORT:

Date: 18 Oct 96 Internal Standard method.
Sample: 10166_0024

Run Title: DGA005 SS009HA064 Sample Dry Weight (grams) = 3.028
Average response factor calibration method

Analytes	CAS #	pg/g	EDL	TE	RL
2,3,7,8-TCDD	1746-01-6	u	0.65		3.3
2,3,7,8-TCDF	51207-31-9	u	1.35		3.3
1,2,3,7,8-PeCDD	40321-76-4	u	1.16		3.3
1,2,3,7,8-PeCDF	57117-41-6	u	1.31		3.3
2,3,4,7,8-PeCDF	57117-31-4	u	1.26		3.3
1,2,3,4,7,8-HxCDD	39227-28-6	u	1.12		8.3
1,2,3,6,7,8-HxCDD	57653-85-7	u	0.81		8.3
1,2,3,7,8,9-HxCDD	19408-74-3	u	0.96		8.3
1,2,3,4,7,8-HxCDF	70648-26-9	u	0.91		8.3
1,2,3,6,7,8-HxCDF	57117-44-9	u	0.73		8.3
2,3,4,6,7,8-HxCDF	60851-34-5	u	0.95		8.3
1,2,3,7,8,9-HxCDF	72918-21-9	u	1.22		8.3
1,2,3,4,6,7,8-HpCDD	35822-46-9	223		2.23	8.3
1,2,3,4,6,7,8-HpCDF	67562-39-4	140		1.40	8.3
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	2.08		8.3
OCDD	3268-87-9	1419		1.42	16.7
OCDF	39001-02-0	100		0.10	16.7

Internal Standards % Recovery

13C-2,3,7,8-TCDD	76523-40-5	16.2 %
13C-2,3,7,8-TCDF	89059-46-1	12.2 %
13C-1,2,3,7,8-PeCDD	109719-79-1	11.3 %
13C-1,2,3,7,8-PeCDF	109719-77-9	10.1 %
13C-1,2,3,6,7,8-HxCDD	109719-81-5	8.1 %
13C-1,2,3,4,7,8-HxCDF	114423-98-2	10.0 %
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	17.4 %
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	7.5 %
13C-OCDD	114423-97-1	18.8 %

___ Totals entries ___

TOTAL-TCDF 55722-27-5 (MDL 1.2053)

Peaks within Isotope ratio limits: Concentration /

8 ~~25.3611~~ OUT OF RT WINDOW.

Total ~~26.3611~~ 0

TOTAL-PeCDF 30402-15-4 (MDL 1.6567)

Peaks within Isotope ratio limits: Concentration /

2 87.5780

Total 87.5780

795 350

TOTAL-HxCDF . . 55684-94-1 (MDL 8.9758)

Peaks within Isotope ratio limits: Concentration /

2 ~~123.9326~~ OUT OF RT WINDOW.

Total ~~123.9326~~ 0.

TOTAL-HpCDD 37871-00-4 (MDL 13.0167)

Peaks within Isotope ratio limits: Concentration /

1 267.6386
2 223 SA.
Total ~~267.6386~~ 49,

TOTAL-HpCDF 38998-75-3 (MDL 23.8182)

Peaks within Isotope ratio limits: Concentration /

1 140.4979 SA
2 122.1263

Total 262.6241

Validated
10/28/96 KG

KRATOS MACH3 PEAK AREA QUANTITATION:- CONCENTRATION REPORT:

Date: 18 Oct 96 Internal Standard method.
Sample: 10166_0025

795 360

Run Title: DGA006 SS009HA065
Average response factor calibration method

Sample Dry Weight (grams) = 3.146

Analytes	CAS #	pg/g	EDL	TE	RL
2,3,7,8-TCDD	1746-01-6	u	0.69		3.3
2,3,7,8-TCDF	51207-31-9	u	0.65		3.3
1,2,3,7,8-PeCDD	40321-76-4	u	0.79		3.3
1,2,3,7,8-PeCDF	57117-41-6	u	0.90		3.3
2,3,4,7,8-PeCDF	57117-31-4	u	0.87		3.3
1,2,3,4,7,8-HxCDD	39227-28-6	u	1.04		8.3
1,2,3,6,7,8-HxCDD	57653-85-7	u	0.75		8.3
1,2,3,7,8,9-HxCDD	19408-74-3	u	0.89		8.3
1,2,3,4,7,8-HxCDF	70648-26-9	21.8		2.18	8.3
1,2,3,6,7,8-HxCDF	57117-44-9	16.8		1.68	8.3
2,3,4,6,7,8-HxCDF	60851-34-5	20.2		2.02	8.3
1,2,3,7,8,9-HxCDF	72918-21-9	u	1.05		8.3
1,2,3,4,6,7,8-HpCDD	35822-46-9	146		1.46	8.3
1,2,3,4,6,7,8-HpCDF	67562-39-4	57.1		0.57	8.3
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	1.87		8.3
OCDD	3268-87-9	884 (J)		0.88	16.7
OCDF	39001-02-0	60.9 (J)		0.06	16.7

Internal Standards % Recovery

13C-2,3,7,8-TCDD	76523-40-5	22.0 %
13C-2,3,7,8-TCDF	89059-46-1	14.3 %
13C-1,2,3,7,8-PeCDD	109719-79-1	17.8 %
13C-1,2,3,7,8-PeCDF	109719-77-9	17.5 %
13C-1,2,3,6,7,8-HxCDD	109719-81-5	11.4 %
13C-1,2,3,4,7,8-HxCDF	114423-98-2	10.0 %
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	20.8 %
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	15.1 %
13C-OCDD	114423-97-1	30.7 %

___ Totals entries ___

TOTAL-TCDF 55722-27-5 (MDL 1.0229)

Peaks within Isotope ratio limits:	Concentration /
2	20.4787
Total	20.4787

TOTAL-PeCDF 30402-15-4 (MDL 1.3888)

Peaks within Isotope ratio limits:	Concentration /
6	19.0787
Total	19.0787

TOTAL-HxCDD 34465-4608 (MDL 12.0761)

Peaks within Isotope ratio limits:	Concentration /
1	41.3
2	17.1638
Total	~~17.1638~~ 58.6

795 36L

TOTAL-HxCDF 55684-94-1 (MDL 9.2794)

Peaks within Isotope ratio limits:	Concentration /
1	22.1610
2	85.4369
5	21.7816 SA
6	16.8000 SA
7	20.2000 SA
~~8~~	~~19.3315~~
Total	~~185.7110~~ 166.4

TOTAL-HpCDD 37871-00-4 (MDL 11.3337)

Peaks within Isotope ratio limits:	Concentration /
1	238.2489
2	146 SA
Total	~~238.2489~~ 384

TOTAL-HpCDF 38998-75-3 (MDL 10.2284)

Peaks within Isotope ratio limits:	Concentration /
1	57.0546 SA
2	43.6390
Total	100.6936

Validated
10/28/96 KG

795 362

KRATOS MACH3 PEAK AREA QUANTITATION:- CONCENTRATION REPORT:

Date: 18 Oct 96 Internal Standard method.
Sample: 10116_0058

Run Title: DGA017 SS009HA067 Sample Dry Weight (grams) = 4.978
Average response factor calibration method

Analytes	CAS #	pg/g	EDL	TE	RL
2,3,7,8-TCDD	1746-01-6	u	0.75		2.0
2,3,7,8-TCDF	51207-31-9	u	0.99		2.0
1,2,3,7,8-PeCDD	40321-76-4	u	5.44		2.0
1,2,3,7,8-PeCDF	57117-41-6	u	7.60		2.0
2,3,4,7,8-PeCDF	57117-31-4	u	7.34		2.0
1,2,3,4,7,8-HxCDD	39227-28-6	u	0.85		5.0
1,2,3,6,7,8-HxCDD	57653-85-7	u	0.61		5.0
1,2,3,7,8,9-HxCDD	19408-74-3	u	0.72		5.0
1,2,3,4,7,8-HxCDF	70648-26-9	u	3.85		5.0
1,2,3,6,7,8-HxCDF	57117-44-9	u	3.10		5.0
2,3,4,6,7,8-HxCDF	60851-34-5	u	4.03		5.0
1,2,3,7,8,9-HxCDF	72918-21-9	u	5.18		5.0
1,2,3,4,6,7,8-HpCDD	35822-46-9	86.7		0.87	5.0
1,2,3,4,6,7,8-HpCDF	67562-39-4	24.2 (J)		0.24	5.0
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	1.11		5.0
OCDD	3268-87-9	242 (J)		0.24	10.0
OCDF	39001-02-0	u	0.53		10.0

Internal Standards % Recovery

13C-2,3,7,8-TCDD	76523-40-5	12.8 %
13C-2,3,7,8-TCDF	89059-46-1	11.4 %
13C-1,2,3,7,8-PeCDD	109719-79-1	13.2 %
13C-1,2,3,7,8-PeCDF	109719-77-9	7.4 %
13C-1,2,3,6,7,8-HxCDD	109719-81-5	5.0 %
13C-1,2,3,4,7,8-HxCDF	114423-98-2	11.8 %
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	8.8 %
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	7.4 %
13C-OCDD	114423-97-1	18.8 %

___ Totals entries ___

TOTAL-HpCDD 37871-00-4 (MDL 26.9512)

Peaks within Isotope ratio limits: Concentration /

2 86.7374 SA

Total 86.7374

TOTAL-HpCDF 38998-75-3 (MDL 23.8248)

Peaks within Isotope ratio limits: Concentration /

1 24.1868 SA
2 33.5430

Total 57.7298

Validated
10/28/96 KG

KRATOS MACH3 PEAK AREA QUANTITATION:- CONCENTRATION REPORT: 795 363

Date: 18 Oct 96 Internal Standard method.
Sample: 10166_0026

Run Title: DGA018 SS009HA068 Sample Dry Weight (grams) = 5.003
Average response factor calibration method

Analytes	CAS #	pg/g	EDL	TE	RL
2,3,7,8-TCDD	1746-01-6	u	0.33		2.0
2,3,7,8-TCDF	51207-31-9	u	0.51		2.0
1,2,3,7,8-PeCDD	40321-76-4	u	6.72		2.0
1,2,3,7,8-PeCDF	57117-41-6	u	5.84		2.0
2,3,4,7,8-PeCDF	57117-31-4	u	5.63		2.0
1,2,3,4,7,8-HxCDD	39227-28-6	u	0.78		5.0
1,2,3,6,7,8-HxCDD	57653-85-7	u	0.56		5.0
1,2,3,7,8,9-HxCDD	19408-74-3	u	0.67		5.0
1,2,3,4,7,8-HxCDF	70648-26-9	u	2.25	-	5.0
1,2,3,6,7,8-HxCDF	57117-44-9	u	0.46		5.0
2,3,4,6,7,8-HxCDF	60851-34-5	u	2.36		5.0
1,2,3,7,8,9-HxCDF	72918-21-9	u	3.03		5.0
1,2,3,4,6,7,8-HpCDD	35822-46-9	67.9 (J)		0.679	5.0
1,2,3,4,6,7,8-HpCDF	67562-39-4	36.5		0.365	5.0
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	8.38		5.0
OCDD	3268-87-9	995 (J)		- 0.995	10.0
OCDF	39001-02-0	78.6 (J)		0.079	10.0

Internal Standards % Recovery

13C-2,3,7,8-TCDD	76523-40-5	16.4 %
13C-2,3,7,8-TCDF	89059-46-1	13.5 %
13C-1,2,3,7,8-PeCDD	109719-79-1	10.5 %
13C-1,2,3,7,8-PeCDF	109719-77-9	9.7 %
13C-1,2,3,6,7,8-HxCDD	109719-81-5	4.9 %
13C-1,2,3,4,7,8-HxCDF	114423-98-2	7.6 %
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	17.9 %
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	12.2 %
13C-OCDD	114423-97-1	26.0 %

___ Totals entries ___

TOTAL-TCDF 55722-27-5 (MDL 0.4050)

Peaks within Isotope ratio limits: Concentration /

1 22.8908

Total 22.8908 (J)

TOTAL-HxCDF 55684-94-1 (MDL 8.8739)

Peaks within Isotope ratio limits: Concentration /

3 16.7807

Total 16.7807 (J)

TOTAL-HpCDD 37871-00-4 (MDL 4.8432)

Peaks within Isotope ratio limits: Concentration /

1	90.5839	
2	67.9151	SA
Total	158.4990	(J)

TOTAL-HpCDF 38998-75-3 (MDL 3.9385)

Peaks within Isotope ratio limits: Concentration /

1	36.5293	SA
Total	36.5293	~~Total~~

Validated
10/28/96 KG

KRATOS MACH3 PEAK AREA QUANTITATION:- CONCENTRATION REPORT: 795 365

Date: 19 Oct 96 Internal Standard method.
Sample: 10166_0027

Run Title: DGA019 SS009HA069 Sample Dry Weight (grams) = 5.167
Average response factor calibration method

Analytes	CAS #	pg/g	EDL	TE	RL
2,3,7,8-TCDD	1746-01-6	u	0.61		2.0
2,3,7,8-TCDF	51207-31-9	u	0.23		2.0
1,2,3,7,8-PeCDD	40321-76-4	u	5.38		2.0
1,2,3,7,8-PeCDF	57117-41-6	u	1.85		2.0
2,3,4,7,8-PeCDF	57117-31-4	10.7		5.36	2.0
1,2,3,4,7,8-HxCDD	39227-28-6	u	8.01		5.0
1,2,3,6,7,8-HxCDD	57653-85-7	19.3		1.93	5.0
1,2,3,7,8,9-HxCDD	19408-74-3	23.4		2.34	5.0
1,2,3,4,7,8-HxCDF	70648-26-9	u	5.40		5.0
1,2,3,6,7,8-HxCDF	57117-44-9	26.9 J		2.69	5.0
2,3,4,6,7,8-HxCDF	60851-34-5	64.5		6.45	5.0
1,2,3,7,8,9-HxCDF	72918-21-9	u	2.87		5.0
1,2,3,4,6,7,8-HpCDD	35822-46-9	449		4.49	5.0
1,2,3,4,6,7,8-HpCDF	67562-39-4	197		1.97	5.0
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	4.51		5.0
OCDD	3268-87-9	2178		2.18	10.0
OCDF	39001-02-0	171		0.17	10.0

Internal Standards % Recovery

13C-2,3,7,8-TCDD	76523-40-5	31.0 %
13C-2,3,7,8-TCDF	89059-46-1	11.7 %
13C-1,2,3,7,8-PeCDD	109719-79-1	16.4 %
13C-1,2,3,7,8-PeCDF	109719-77-9	24.0 %
13C-1,2,3,6,7,8-HxCDD	109719-81-5	23.0 %
13C-1,2,3,4,7,8-HxCDF	114423-98-2	23.3 %
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	43.5 %
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	44.6 %
13C-OCDD	114423-97-1	89.6 %

___ Totals entries ___

TOTAL-TCDF 55722-27-5 (MDL 0.8772)

Peaks within Isotope ratio limits: Concentration /

2 48.2694
4 93.11
Total ~~48.2694~~ 141.38

TOTAL-PeCDF 30402-15-4 (MDL 0.8560)

Peaks within Isotope ratio limits: Concentration /

1 ~~438.6760~~ include, within window ~~OUT OF ET WINDOW~~:
2 248.6569
6 10.7000 SA

795 366

Total ~~738.6933~~ ~~33~~ ~~.17~~ .769.85

TOTAL-HxCDD 34465-4608 (MDL 3.7627)

Peaks within Isotope ratio limits: Concentration /

1	63.8321
3	19.2868 SA
4	23.4000 SA
2	74.69
Total	~~106.5189~~ 181.21

TOTAL-HxCDF 55684-94-1 (MDL 2.8916)

Peaks within Isotope ratio limits: Concentration /

2	501.1427
5	26.9000 SA
6	64.5000 SA
Total	592.5427 J

TOTAL-HpCDD 37871-00-4 (MDL 0.6396)

Peaks within Isotope ratio limits: Concentration /

1	569.4241
2	449.2304 SA
Total	1018.6544

TOTAL-HpCDF 38998-75-3 (MDL 0.5347)

Peaks within Isotope ratio limits: Concentration /

1	197.3855 SA
2	158.6840
Total	356.0695

Validated
10/28/96 KG

795 367

KRATOS MACH3 PEAK AREA QUANTITATION:- CONCENTRATION REPORT:

Date: 19 Oct 96 Internal Standard method.
Sample: 10166_0028

Run Title: DGA020 SS009?A070 Sample Dry Weight (grams) = 5.031
Average response factor calibration method

Analytes	CAS #	pg/g	EDL	TE	RL
2,3,7,8-TCDD	1746-01-6	u	~~3.23~~ 0.37		2.0
2,3,7,8-TCDF	51207-31-9	u	~~3.30~~ 0.78		2.0
1,2,3,7,8-PeCDD	40321-76-4	u	5.49		2.0
1,2,3,7,8-PeCDF	57117-41-6	u	3.40		2.0
2,3,4,7,8-PeCDF	57117-31-4	u	0.73		2.0
1,2,3,4,7,8-HxCDD	39227-28-6	u	8.72		5.0
1,2,3,6,7,8-HxCDD	57653-85-7	u	6.26		5.0
1,2,3,7,8,9-HxCDD	19408-74-3	u	7.49		5.0
1,2,3,4,7,8-HxCDF	70648-26-9	u	1.26		5.0
1,2,3,6,7,8-HxCDF	57117-44-9	u	0.00		5.0
2,3,4,6,7,8-HxCDF	60851-34-5	u	1.32		5.0
1,2,3,7,8,9-HxCDF	72918-21-9	u	5.17		5.0
1,2,3,4,6,7,8-HpCDD	35822-46-9	41.9	2.52	0.419	5.0
1,2,3,4,6,7,8-HpCDF	67562-39-4	35.0 (J)	16.2	0.350	5.0
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	15.7		5.0
OCDD	3268-87-9	421 (J)	4.26	0.421	10.0
OCDF	39001-02-0	u	16.6		10.0

Internal Standards % Recovery

13C-2,3,7,8-TCDD	76523-40-5	11.5 %
13C-2,3,7,8-TCDF	89059-46-1	9.9 %
13C-1,2,3,7,8-PeCDD	109719-79-1	12.4 %
13C-1,2,3,7,8-PeCDF	109719-77-9	10.2 %
13C-1,2,3,6,7,8-HxCDD	109719-81-5	6.9 %
13C-1,2,3,4,7,8-HxCDF	114423-98-2	7.6 %
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	10.5 %
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	7.6 %
13C-OCDD	114423-97-1	9.7 %

___ Totals entries ___

TOTAL-PeCDF 30402-15-4 (MDL 0.7516)

Peaks within Isotope ratio limits: Concentration /

1	37.01
3	33.8338
Total	~~33.8338~~ 70.84.

TOTAL-HxCDF 55684-94-1 (MDL 1.2658)

Peaks within Isotope ratio limits: Concentration /

1	37.2243
3	16.4724
Total	53.6967

795 368

Total HpCDF 1 35.0
TOTAL 35.0 (J)

Total HpCDD 1 41.9
TOTAL 41.9

Validated
KG 10/28/96

795 369

KRATOS MACH3 PEAK AREA QUANTITATION:- CONCENTRATION REPORT:

Date: 19 Oct 96 Internal Standard method.
Sample: 10166_0029

Run Title: DGA021 SS009HA071 Sample Dry Weight (grams) = 5.144
Average response factor calibration method

Analytes	CAS #	pg/g	EDL	TE	RL
2,3,7,8-TCDD	1746-01-6	u	0.35		2.0
2,3,7,8-TCDF	51207-31-9	u	0.35		2.0
1,2,3,7,8-PeCDD	40321-76-4	u	5.47		2.0
1,2,3,7,8-PeCDF	57117-41-6	u	3.34		2.0
2,3,4,7,8-PeCDF	57117-31-4	u	0.79		2.0
1,2,3,4,7,8-HxCDD	39227-28-6	u	9.65		5.0
1,2,3,6,7,8-HxCDD	57653-85-7	u	6.92		5.0
1,2,3,7,8,9-HxCDD	19408-74-3	u	8.28		5.0
1,2,3,4,7,8-HxCDF	70648-26-9	u	1.66		5.0
1,2,3,6,7,8-HxCDF	57117-44-9	u	1.34		5.0
2,3,4,6,7,8-HxCDF	60851-34-5	u	1.74		5.0
1,2,3,7,8,9-HxCDF	72918-21-9	u	4.75		5.0
1,2,3,4,6,7,8-HpCDD	35822-46-9	45.5		0.455	5.0
1,2,3,4,6,7,8-HpCDF	67562-39-4	u	6.38		5.0
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	11.0		5.0
OCDD	3268-87-9	204 J		0.204	10.0
OCDF	39001-02-0	u	8.48		10.0

Internal Standards % Recovery

13C-2,3,7,8-TCDD	76523-40-5	11.8 %
13C-2,3,7,8-TCDF	89059-46-1	10.8 %
13C-1,2,3,7,8-PeCDD	109719-79-1	9.8 %
13C-1,2,3,7,8-PeCDF	109719-77-9	10.6 %
13C-1,2,3,6,7,8-HxCDD	109719-81-5	5.5 %
13C-1,2,3,4,7,8-HxCDF	114423-98-2	5.7 %
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	7.4 %
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	8.9 %
13C-OCDD	114423-97-1	10.3 %

___ Totals entries ___

TOTAL-TCDF 55722-27-5 (MDL 0.8429)

Peaks within Isotope ratio limits: Concentration /

1 ~~25.5004~~
2 18.6765

Total ~~44.1769~~ 18.68

TOTAL-PeCDF 30402-15-4 (MDL 1.5938)

Peaks within Isotope ratio limits: Concentration /

1 ~~79.0454~~
2 40.4154

Total [illegible]

795 370

TOTAL-HxCDF 55684-94-1 (MDL 1.6266)

Peaks within Isotope ratio limits: Concentration /

3	45.7302
Total	45.7302

TOTAL-HpCDD 37871-00-4 (MDL 7.5761)

Peaks within Isotope ratio limits: Concentration /

1	63.1474
2	45.4938 SA
Total	108.6413

Validated
10/28/96 KG

795 371

KRATOS MACH3 PEAK AREA QUANTITATION:- CONCENTRATION REPORT:

Date: 19 Oct 96 Internal Standard method.
Sample: 10166_0030

Run Title: DGA058 SS009HA010 Sample Dry Weught (grams) = 3.969
Average response factor calibration method

Analytes	CAS #	pg/g	EDL	TE	RL
2,3,7,8-TCDD	1746-01-6	u	1.03		2.0.
2,3,7,8-TCDF	51207-31-9	u	0.44		2.0
1,2,3,7,8-PeCDD	40321-76-4	u	0.73		2.0
1,2,3,7,8-PeCDF	57117-41-6	u	0.41		2.0
2,3,4,7,8-PeCDF	57117-31-4	u	0.08		2.0
1,2,3,4,7,8-HxCDD	39227-28-6	u	1.59		5.0
1,2,3,6,7,8-HxCDD	57653-85-7	u	1.14		5.0
1,2,3,7,8,9-HxCDD	19408-74-3	u	1.37		5.0
1,2,3,4,7,8-HxCDF	70648-26-9	u	0.19		5.0
1,2,3,6,7,8-HxCDF	57117-44-9	u	0.00		5.0
2,3,4,6,7,8-HxCDF	60851-34-5	u	0.59		5.0
1,2,3,7,8,9-HxCDF	72918-21-9	u	0.76		5.0
1,2,3,4,6,7,8-HpCDD	35822-46-9	7.47 J		0.07	5.0
1,2,3,4,6,7,8-HpCDF	67562-39-4	u	0.93		5.0
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	1.60		5.0
OCDD	3268-87-9	74.9		0.07	10.0
OCDF	39001-02-0	11.6		0.01	10.0

Internal Standards % Recovery

13C-2,3,7,8-TCDD	76523-40-5	62.5 %
13C-2,3,7,8-TCDF	89059-46-1	65.8 %
13C-1,2,3,7,8-PeCDD	109719-79-1	86.0 %
13C-1,2,3,7,8-PeCDF	109719-77-9	84.5 %
13C-1,2,3,6,7,8-HxCDD	109719-81-5	75.4 %
13C-1,2,3,4,7,8-HxCDF	114423-98-2	80.9 %
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	65.1 %
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	76.4 %
13C-OCDD	114423-97-1	71.7 %

___ Totals entries ___

TOTAL-TCDF 55722-27-5 (MDL 0.0889)

Peaks within Isotope ratio limits: Concentration /

5 11.94
~~6 13.6153~~

Total ~~13.6153~~ 11.94

TOTAL-PeCDF 30402-15-4 (MDL 0.2159)

Peaks within Isotope ratio limits: Concentration /

1 4.2789
2 7.12

Total ~~4.2789~~ 11.39

TOTAL-HpCDD 37871-00-4 (MDL 1.8193)

Peaks within Isotope ratio limits:	Concentration /
1	11.5530
2	7.4732 SA
Total	19.0262 (J)

TOTAL-HpCDF 38998-75-3 (MDL 0.5608)

Peaks within Isotope ratio limits:	Concentration /
2	6.9955
Total	6.9955

Validated
10/28/96 KG

795 373

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-01R
Sample Id.:	DGA001 SS009HA005	File No.:	23OCT_CAN #10
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	0.3		
2,3,7,8-TCDF	51207-31-9	2.9	2		0.29	
1,2,3,7,8-PeCDD	40321-76-4	2.2	2		1.1	
1,2,3,7,8-PeCDF	57117-41-6	u	2	1.3		
2,3,4,7,8-PeCDF	57117-31-4	5.1	2		2.55	
1,2,3,4,7,8-HxCDD	39227-28-6	u	5			
1,2,3,6,7,8-HxCDD	57653-85-7	11.9	5		1.19	
1,2,3,7,8,9-HxCDD	19408-74-3	14.9	5		1.49	
1,2,3,4,7,8-HxCDF	70648-26-9	5.0	5		0.5	
1,2,3,6,7,8-HxCDF	57117-44-9	8.2	5		0.82	
2,3,4,6,7,8-HxCDF	60851-34-5	16.7	5		1.67	
1,2,3,7,8,9-HxCDF	72918-21-9	u	5			
1,2,3,4,6,7,8-HpCDD	35822-46-9	132	5		1.32	
1,2,3,4,6,7,8-HpCDF	67562-39-4	88.5	5		0.89	
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5			
OCDD	3268-87-9	722	10		0.722	
OCDF	39001-02-0	63.6	~~10~~ 10		0.06	
					TOTAL TEQ	12.60

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	26
13C-2,3,7,8-TCDF	89059-46-1	25
13C-1,2,3,7,8-PeCDD	109719-79-1	23
13C-1,2,3,7,8-PeCDF	109719-77-9	24
13C-1,2,3,6,7,8-HxCDD	109719-81-5	16
13C-1,2,3,4,7,8-HxCDF	114423-98-2	17
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	23
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	19
13C-OCDD	114423-97-1	29

795 374

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-01R
Sample Id.:	DGA001 SS009HA005	File No.:	23OCT_CAN #10
Sampling Date:	6-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	9	23.1	2
Pentachlorinated Dioxins	3	3.8	2
Pentachlorinated Furans	8	195	2
Hexachlorinated Dioxins	6	99.5	5
Hexachlorinated Furans	7	69.6	5
Heptachlorinated Dioxins	2	276	5
Heptachlorinated Furans	4	179	5
Octachlorinated Dioxins	1	722	10
Octachlorinated Furans	1	63.6	10

Validated
10/29/96 KG

795 375

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-02R
Sample Id.:	DGA002 SS009HA006	File No.:	23OCT_CAN #11
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	0.4		
2,3,7,8-TCDF	51207-31-9	4.4	2		0.44	
1,2,3,7,8-PeCDD	40321-76-4	u	2	2.5		
1,2,3,7,8-PeCDF	57117-41-6	2	2		0.1	
2,3,4,7,8-PeCDF	57117-31-4	7.7	2		3.85	
1,2,3,4,7,8-HxCDD	39227-28-6	u	5			
1,2,3,6,7,8-HxCDD	57653-85-7	13.6	5		1.36	
1,2,3,7,8,9-HxCDD	19408-74-3	13.9	5		1.39	
1,2,3,4,7,8-HxCDF	70648-26-9	8.2	5		0.82	
1,2,3,6,7,8-HxCDF	57117-44-9	11.5	5		1.15	
2,3,4,6,7,8-HxCDF	60851-34-5	28	5		2.8	
1,2,3,7,8,9-HxCDF	72918-21-9	u	5	0.4		
1,2,3,4,6,7,8-HpCDD	35822-46-9	166	5		1.66	
1,2,3,4,6,7,8-HpCDF	67562-39-4	123	5		1.23	
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5			
OCDD	3268-87-9	860	10		0.86	
OCDF	39001-02-0	84.2	10		0.08	
					TOTAL TEQ	15.74

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	27
13C-2,3,7,8-TCDF	89059-46-1	28
13C-1,2,3,7,8-PeCDD	109719-79-1	26
13C-1,2,3,7,8-PeCDF	109719-77-9	25
13C-1,2,3,6,7,8-HxCDD	109719-81-5	18
13C-1,2,3,4,7,8-HxCDF	114423-98-2	19
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	24
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	19
13C-OCDD	114423-97-1	31

795 376

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-02R
Sample Id.:	DGA002 SS009HA006	File No.:	23OCT_CAN #11
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	11	44.1	2
Pentachlorinated Dioxins	5	6.7	2
Pentachlorinated Furans	9	396	2
Hexachlorinated Dioxins	7	114	5
Hexachlorinated Furans	9	199	5
Heptachlorinated Dioxins	2	342	5
Heptachlorinated Furans	4	254	5
Octachlorinated Dioxins	1	860	10
Octachlorinated Furans	1	84.2	10

Validated
10/29/96 KG

795 377

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-08R
Sample Id.:	DGA008 SS009HA060	File No.:	23OCT_CAN #12
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2			
2,3,7,8-TCDF	51207-31-9	2.8	2		0.28	
1,2,3,7,8-PeCDD	40321-76-4	2.5	2		1.25	
1,2,3,7,8-PeCDF	57117-41-6	u	2			
2,3,4,7,8-PeCDF	57117-31-4	5.5	2		2.75	
1,2,3,4,7,8-HxCDD	39227-28-6	u	5			
1,2,3,6,7,8-HxCDD	57653-85-7	10.2	5		1.02	
1,2,3,7,8,9-HxCDD	19408-74-3	11.9	5		1.19	
1,2,3,4,7,8-HxCDF	70648-26-9	6.6	5		0.66	
1,2,3,6,7,8-HxCDF	57117-44-9	8.1	5		0.81	
2,3,4,6,7,8-HxCDF	60851-34-5	19.2	5		1.92	
1,2,3,7,8,9-HxCDF	72918-21-9	u	5			
1,2,3,4,6,7,8-HpCDD	35822-46-9	258	5		2.58	
1,2,3,4,6,7,8-HpCDF	67562-39-4	79.4	5		0.79	
1,2,3,4,7,8,9-HpCDF	55673-89-7	2.7	5		0.03	
OCDD	3268-87-9	1670	10		1.67	
OCDF	39001-02-0	71.2	10		0.07	
					TOTAL TEQ	15.02

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	45
13C-2,3,7,8-TCDF	89059-46-1	39
13C-1,2,3,7,8-PeCDD	109719-79-1	51
13C-1,2,3,7,8-PeCDF	109719-77-9	49
13C-1,2,3,6,7,8-HxCDD	109719-81-5	53
13C-1,2,3,4,7,8-HxCDF	114423-98-2	56
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	63
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	57
13C-OCDD	114423-97-1	66

795 378

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-08R
Sample Id.:	DGA008 SS009HA060	File No.:	23OCT_CAN #12
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	12	22.5	2
Pentachlorinated Dioxins	7	9.2	2
Pentachlorinated Furans	9	229	2
Hexachlorinated Dioxins	7	123	5
Hexachlorinated Furans	8	179	5
Heptachlorinated Dioxins	2	546	5
Heptachlorinated Furans	4	175	5
Octachlorinated Dioxins	1	1670	10
Octachlorinated Furans	1	71.2	10

Validated
10/29/96 KG

795 379

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-09R
Sample Id.:	DGA009 SS009HA061	File No.:	23OCT_CAN #13
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2			
2,3,7,8-TCDF	51207-31-9	2.9	2		0.29	
1,2,3,7,8-PeCDD	40321-76-4	2.6	2		1.3	
1,2,3,7,8-PeCDF	57117-41-6	u	2			
2,3,4,7,8-PeCDF	57117-31-4	5.8	2		2.9	
1,2,3,4,7,8-HxCDD	39227-28-6	4.1	5		0.41	
1,2,3,6,7,8-HxCDD	57653-85-7	7.9	5		0.79	
1,2,3,7,8,9-HxCDD	19408-74-3	11.5	5		1.15	
1,2,3,4,7,8-HxCDF	70648-26-9	6.3	5		0.63	
1,2,3,6,7,8-HxCDF	57117-44-9	8.2	5		0.82	
2,3,4,6,7,8-HxCDF	60851-34-5	18.6	5		1.86	
1,2,3,7,8,9-HxCDF	72918-21-9	u	5			
1,2,3,4,6,7,8-HpCDD	35822-46-9	180	5		1.8	
1,2,3,4,6,7,8-HpCDF	67562-39-4	64.4	5		0.64	
1,2,3,4,7,8,9-HpCDF	55673-89-7	2.5	5		0.03	
OCDD	3268-87-9	1270	10		1.27	
OCDF	39001-02-0	61.4	10		0.06	
					TOTAL TEQ	13.95

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	32
13C-2,3,7,8-TCDF	89059-46-1	30
13C-1,2,3,7,8-PeCDD	109719-79-1	35
13C-1,2,3,7,8-PeCDF	109719-77-9	34
13C-1,2,3,6,7,8-HxCDD	109719-81-5	42
13C-1,2,3,4,7,8-HxCDF	114423-98-2	42
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	59
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	53
13C-OCDD	114423-97-1	70

795 380

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-09R
Sample Id.:	DGA009 SS009HA061	File No.:	23OCT_CAN #13
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	1	0.6	2
Tetrachlorinated Furans	8	34.4	2
Pentachlorinated Dioxins	7	11.6	2
Pentachlorinated Furans	10	335	2
Hexachlorinated Dioxins	7	100	5
Hexachlorinated Furans	8	139	5
Heptachlorinated Dioxins	2	419	5
Heptachlorinated Furans	4	150	5
Octachlorinated Dioxins	1	1270	10
Octachlorinated Furans	1	61.4	10

validated
10/29/96 KG

795 381

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-14R
Sample Id.:	DGA014 SS009HA021	File No.:	23OCT_CAN #13
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	0.4		
2,3,7,8-TCDF	51207-31-9	u	2			
1,2,3,7,8-PeCDD	40321-76-4	u	2			
1,2,3,7,8-PeCDF	57117-41-6	u	2			
2,3,4,7,8-PeCDF	57117-31-4	2.6	2		1.3	
1,2,3,4,7,8-HxCDD	39227-28-6	u	5			
1,2,3,6,7,8-HxCDD	57653-85-7	u	5			
1,2,3,7,8,9-HxCDD	19408-74-3	6.8	5		0.68	
1,2,3,4,7,8-HxCDF	70648-26-9	u	5			
1,2,3,6,7,8-HxCDF	57117-44-9	u	5			
2,3,4,6,7,8-HxCDF	60851-34-5	6.8	5		0.68	
1,2,3,7,8,9-HxCDF	72918-21-9	u	5			
1,2,3,4,6,7,8-HpCDD	35822-46-9	78.9	5		0.79	
1,2,3,4,6,7,8-HpCDF	67562-39-4	26.9	6		0.27	
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5			
OCDD	3268-87-9	472	10		0.47	
OCDF	39001-02-0	28.2	10		0.03	
					TOTAL TEQ	4.22

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	33
13C-2,3,7,8-TCDF	89059-46-1	25
13C-1,2,3,7,8-PeCDD	109719-79-1	28
13C-1,2,3,7,8-PeCDF	109719-77-9	29
13C-1,2,3,6,7,8-HxCDD	109719-81-5	34
13C-1,2,3,4,7,8-HxCDF	114423-98-2	37
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	51
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	46
13C-OCDD	114423-97-1	60

795 382

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-14R
Sample Id.:	DGA014 SS009HA021	File No.:	23OCT_CAN #13
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2.0
Tetrachlorinated Furans	8	11.4	2.0
Pentachlorinated Dioxins	5	5.1	2.0
Pentachlorinated Furans	8	94.7	2.0
Hexachlorinated Dioxins	7	56.5	5
Hexachlorinated Furans	8	49.6	5
Heptachlorinated Dioxins	2	199	5
Heptachlorinated Furans	4	62.6	5
Octachlorinated Dioxins	1	472	10.0
Octachlorinated Furans	1	28.2	10.0

Validated
10/29/96 KG

795 383

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-15R
Sample Id.:	DGA015FD1 SS009HA021	File No.:	23OCT_CAN #15
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE
2,3,7,8-TCDD	1746-01-6	u	2	0.5	
2,3,7,8-TCDF	51207-31-9	u	2		
1,2,3,7,8-PeCDD	40321-76-4	u	2		
1,2,3,7,8-PeCDF	57117-41-6	u	2	0.7	
2,3,4,7,8-PeCDF	57117-31-4	2.6	2		1.3
1,2,3,4,7,8-HxCDD	39227-28-6	u	5		
1,2,3,6,7,8-HxCDD	57653-85-7	u	5		
1,2,3,7,8,9-HxCDD	19408-74-3	7.5	5		0.75
1,2,3,4,7,8-HxCDF	70648-26-9	u	5		
1,2,3,6,7,8-HxCDF	57117-44-9	u	5		
2,3,4,6,7,8-HxCDF	60851-34-5	7.6	5		0.76
1,2,3,7,8,9-HxCDF	72918-21-9	u	5		
1,2,3,4,6,7,8-HpCDD	35822-46-9	86.8	5		0.87
1,2,3,4,6,7,8-HpCDF	67562-39-4	27.9	5		0.28
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5		
OCDD	3268-87-9	528	10		0.53
OCDF	39001-02-0	28.7	10		0.03
				TOTAL TEQ	4.51

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	34
13C-2,3,7,8-TCDF	89059-46-1	23
13C-1,2,3,7,8-PeCDD	109719-79-1	33
13C-1,2,3,7,8-PeCDF	109719-77-9	33
13C-1,2,3,6,7,8-HxCDD	109719-81-5	43
13C-1,2,3,4,7,8-HxCDF	114423-98-2	46
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	59
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	51
13C-OCDD	114423-97-1	63

795 384

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-15R
Sample Id.:	DGA015FD1 SS009HA021	File No.:	23OCT_CAN #15
Sampling Date:	8-Oct-96	Extraction Date:	15-Oct-96
		Analysis Date:	23-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	7	12.3	2
Pentachlorinated Dioxins	5	4.9	2
Pentachlorinated Furans	8	97.6	2
Hexachlorinated Dioxins	7	62.9	5
Hexachlorinated Furans	7	76.3	5
Heptachlorinated Dioxins	2	235	5
Heptachlorinated Furans	4	65.3	5
Octachlorinated Dioxins	1	528	10
Octachlorinated Furans	1	28.7	10

Validated
10/29/96 KG

795 385

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10227-02
Sample Id.:	DGA059 SS009HA040	File No.:	1024960030
Sampling Date:	10-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	1.58		
2,3,7,8-TCDF	51207-31-9	u	2	1.49		
1,2,3,7,8-PeCDD	40321-76-4	u	2	1.48		
1,2,3,7,8-PeCDF	57117-41-6	u	2	0.52		
2,3,4,7,8-PeCDF	57117-31-4	u	2	0.58		
1,2,3,4,7,8-HxCDD	39227-28-6	u	5	2.92		
1,2,3,6,7,8-HxCDD	57653-85-7	u	5	2.49		
1,2,3,7,8,9-HxCDD	19408-74-3	u	5	2.87		
1,2,3,4,7,8-HxCDF	70648-26-9	u	5	0.54		
1,2,3,6,7,8-HxCDF	57117-44-9	u	5	0.47		
2,3,4,6,7,8-HxCDF	60851-34-5	u	5	0.59		
1,2,3,7,8,9-HxCDF	72918-21-9	u	5	2.42		
1,2,3,4,6,7,8-HpCDD	35822-46-9	8.78 (J)	5		0.09	
1,2,3,4,6,7,8-HpCDF	67562-39-4	u	5	0.29		
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5	2.62		
OCDD	3268-87-9	41.6	10		0.04	
OCDF	39001-02-0	u	10	4.13		
					TOTAL TEQ	0.13

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	76.3
13C-2,3,7,8-TCDF	89059-46-1	75.4
13C-1,2,3,7,8-PeCDD	109719-79-1	92.5
13C-1,2,3,7,8-PeCDF	109719-77-9	50.8
13C-1,2,3,6,7,8-HxCDD	109719-81-5	70.5
13C-1,2,3,4,7,8-HxCDF	114423-98-2	73.2
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	78.9
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	70.7
13C-OCDD	114423-97-1	102

795 386

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10227-02
Sample Id.:	DGA059 SS009HA040	File No.:	1024960030
Sampling Date:	10-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	0	u	2
Pentachlorinated Dioxins	1	11.4	2
Pentachlorinated Furans	0	u	2
Hexachlorinated Dioxins	1	13.2	5
Hexachlorinated Furans	0	u	5
Heptachlorinated Dioxins	2	18.6 (J)	5
Heptachlorinated Furans	0	u	5
Octachlorinated Dioxins	1	41.6	10
Octachlorinated Furans	0	u	10

Validated
10/30/96 KG

795 387

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-03
Sample Id.:	DGA003 SS009HA007	File No.:	1024960031
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	0.16		
2,3,7,8-TCDF	51207-31-9	u	2	0.15		
1,2,3,7,8-PeCDD	40321-76-4	u	2	1.44		
1,2,3,7,8-PeCDF	57117-41-6	u	2	0.65		
2,3,4,7,8-PeCDF	57117-31-4	u	2	0.72		
1,2,3,4,7,8-HxCDD	39227-28-6	u	5	0.25		
1,2,3,6,7,8-HxCDD	57653-85-7	u	5	0.21		
1,2,3,7,8,9-HxCDD	19408-74-3	u	5	0.25		
1,2,3,4,7,8-HxCDF	70648-26-9	u	5	0.25		
1,2,3,6,7,8-HxCDF	57117-44-9	u	5	0.21		
2,3,4,6,7,8-HxCDF	60851-34-5	u	5	0.27		
1,2,3,7,8,9-HxCDF	72918-21-9	u	5	0.32		
1,2,3,4,6,7,8-HpCDD	35822-46-9	108	5		1.08	
1,2,3,4,6,7,8-HpCDF	67562-39-4	78.0	5		0.78	
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5	0.28		
OCDD	3268-87-9	1416 (J)	10		1.42	
OCDF	39001-02-0	116 (J)	10		0.12	
					TOTAL TEQ	3.40

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	13.3
13C-2,3,7,8-TCDF	89059-46-1	13.1
13C-1,2,3,7,8-PeCDD	109719-79-1	8.6
13C-1,2,3,7,8-PeCDF	109719-77-9	3.8
13C-1,2,3,6,7,8-HxCDD	109719-81-5	7.5
13C-1,2,3,4,7,8-HxCDF	114423-98-2	7.5
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	8.1
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	6.3
13C-OCDD	114423-97-1	10.1

795 388

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-03
Sample Id.:	DGA003 SS009HA007	File No.:	1024960031
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	2	35.5	2
Pentachlorinated Dioxins	0	u	2
Pentachlorinated Furans	2	816	2
Hexachlorinated Dioxins	0	u	5
Hexachlorinated Furans	2	143	5
Heptachlorinated Dioxins	2	266	5
Heptachlorinated Furans	2	145	5
Octachlorinated Dioxins	1	1416 J	10
Octachlorinated Furans	1	116 J	10

Validated
10/30/96 KG

795 389

KRATOS MACH3 PEAK AREA QUANTITATION:- CONCENTRATION REPORT:

Date: 26 Oct 96 Internal Standard method.
Sample: 1024960032

Run Title: DGA004 SS009HA063 Sample Dry Weight (grams) = 5.425
Average response factor calibration method

Analytes	CAS #	pg/g	EDL	TE	RL	
2,3,7,8-TCDD	1746-01-6	u	0.14		2.0	
2,3,7,8-TCDF	51207-31-9	~~5.93~~ 8	0.16	~~0.59~~	2.0	~~EMP~~
1,2,3,7,8-PeCDD	40321-76-4	u	3.70		2.0	
1,2,3,7,8-PeCDF	57117-41-6	u	1.07		2.0	
2,3,4,7,8-PeCDF	57117-31-4	u	4.05		2.0	
1,2,3,4,7,8-HxCDD	39227-28-6	u	0.23		5.0	
1,2,3,6,7,8-HxCDD	57653-85-7	u	0.20		5.0	
1,2,3,7,8,9-HxCDD	19408-74-3	u	0.23		5.0	
1,2,3,4,7,8-HxCDF	70648-26-9	u	4.68		5.0	
1,2,3,6,7,8-HxCDF	57117-44-9	u	4.07		5.0	
2,3,4,6,7,8-HxCDF	60851-34-5	u	5.00		5.0	
1,2,3,7,8,9-HxCDF	72918-21-9	u	4.98		5.0	
1,2,3,4,6,7,8-HpCDD	35822-46-9	~~388~~		3.88	5.0	
1,2,3,4,6,7,8-HpCDF	67562-39-4	~~75.9~~	3.43	~~0.76~~	5.0	~~BTHE~~
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5.00		5.0	
OCDD	3268-87-9	2576		2.58	10.0	
OCDF	39001-02-0	122		0.12	10.0	

Internal Standards % Recovery TEQ = ~~7.93~~ 8 6.58

13C-2,3,7,8-TCDD	76523-40-5	8.9 %
13C-2,3,7,8-TCDF	89059-46-1	14.0 %
13C-1,2,3,7,8-PeCDD	109719-79-1	18.0 %
13C-1,2,3,7,8-PeCDF	109719-77-9	16.5 %
13C-1,2,3,6,7,8-HxCDD	109719-81-5	12.8 %
13C-1,2,3,4,7,8-HxCDF	114423-98-2	11.4 %
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	23.2 %
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	27.2 %
13C-OCDD	114423-97-1	57.8 %

___ Totals entries ___

TOTAL-TCDF 55722-27-5 (MDL 0.5948)

Peaks within Isotope ratio limits: Concentration /

2 10.0841

Total 10.0841 (J)

TOTAL-HxCDD 34465-4608 (MDL 2.9250)

Peaks within Isotope ratio limits: Concentration /

1 53.3606
2 58.7909

Total 112.1515

795.390

TOTAL-HxCDF 55684-94-1 (MDL 2.1786)

Peaks within Isotope ratio limits:	Concentration /
1	28.1656
2	113.2704
Total	141.4360 (J)

TOTAL-HpCDD 37871-00-4 (MDL 1.5633)

Peaks within Isotope ratio limits:	Concentration /
1	434.2674
2	387.6237 SA
Total	821.8911

TOTAL-HpCDF 38998-75-3 (MDL 1.5096)

Peaks within Isotope ratio limits:	Concentration /
2	83.6851
Total	83.6851

TOTAL PeCDF

Peaks within Isotope Ratio Limits:

1	71.295
Total	71.295

validated

10/30/96 KG

795-391

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-07
Sample Id.:	DGA007 SS009HA010	File No.:	1024960033
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	1.47		
2,3,7,8-TCDF	51207-31-9	3.51	2		0.35	
1,2,3,7,8-PeCDD	40321-76-4	5.62	2		2.81	
1,2,3,7,8-PeCDF	57117-41-6	u	2	0.10		
2,3,4,7,8-PeCDF	57117-31-4	5.59	2		2.79	
1,2,3,4,7,8-HxCDD	39227-28-6	6.47	5		0.65	
1,2,3,6,7,8-HxCDD	57653-85-7	10.6	5		1.06	
1,2,3,7,8,9-HxCDD	19408-74-3	9.22	5		0.92	
1,2,3,4,7,8-HxCDF	70648-26-9	7.33	5		0.73	
1,2,3,6,7,8-HxCDF	57117-44-9	8.49	5		0.85	
2,3,4,6,7,8-HxCDF	60851-34-5	u	5	0.47		
1,2,3,7,8,9-HxCDF	72918-21-9	u	5	1.70		
1,2,3,4,6,7,8-HpCDD	35822-46-9	236	5		2.36	
1,2,3,4,6,7,8-HpCDF	67562-39-4	78.4	5		0.78	
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5	0.28		
OCDD	3268-87-9	1812	10		1.81	
OCDF	39001-02-0	91.1	10		0.09	
					TOTAL TEQ	15.20

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	43.2
13C-2,3,7,8-TCDF	89059-46-1	38.8
13C-1,2,3,7,8-PeCDD	109719-79-1	68.7
13C-1,2,3,7,8-PeCDF	109719-77-9	61.4
13C-1,2,3,6,7,8-HxCDD	109719-81-5	68.4
13C-1,2,3,4,7,8-HxCDF	114423-98-2	74.9
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	78.3
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	84.0
13C-OCDD	114423-97-1	130

795 392

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-07
Sample Id.:	DGA007 SS009HA010	File No.:	1024960033
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	4	56.0	2
Pentachlorinated Dioxins	1	5.62	2
Pentachlorinated Furans	5	358	2
Hexachlorinated Dioxins	5	130	5
Hexachlorinated Furans	6	312	5
Heptachlorinated Dioxins	2	584	5
Heptachlorinated Furans	2	142	5
Octachlorinated Dioxins	1	1812	10
Octachlorinated Furans	1	91.1	10

validated
10/30/96 KG

795 393

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-10
Sample Id.:	DGA010 SS009HA062	File No.:	1024960034
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	1.61		
2,3,7,8-TCDF	51207-31-9	u	2	2.32		
1,2,3,7,8-PeCDD	40321-76-4	u	2	2.78		
1,2,3,7,8-PeCDF	57117-41-6	u	2	0.38		
2,3,4,7,8-PeCDF	57117-31-4	3.92	2		1.96	
1,2,3,4,7,8-HxCDD	39227-28-6	u	5	2.03		
1,2,3,6,7,8-HxCDD	57653-85-7	u	5	0.37		
1,2,3,7,8,9-HxCDD	19408-74-3	u	5	0.83		
1,2,3,4,7,8-HxCDF	70648-26-9	u	5	0.39		
1,2,3,6,7,8-HxCDF	57117-44-9	u	5	0.26		
2,3,4,6,7,8-HxCDF	60851-34-5	12.2	5		1.22	
1,2,3,7,8,9-HxCDF	72918-21-9	u	5	1.45		
1,2,3,4,6,7,8-HpCDD	35822-46-9	92.5	5		0.93	
1,2,3,4,6,7,8-HpCDF	67562-39-4	33.0	5		0.33	
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5	2.85		
OCDD	3268-87-9	710	10		0.71	
OCDF	39001-02-0	30.8	10		0.03	
					TOTAL TEQ	5.18

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	50.2
13C-2,3,7,8-TCDF	89059-46-1	38.4
13C-1,2,3,7,8-PeCDD	109719-79-1	64.5
13C-1,2,3,7,8-PeCDF	109719-77-9	51.8
13C-1,2,3,6,7,8-HxCDD	109719-81-5	86.7
13C-1,2,3,4,7,8-HxCDF	114423-98-2	68.5
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	77.4
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	79.4
13C-OCDD	114423-97-1	117

795 394

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-10
Sample Id.:	DGA010 SS009HA062	File No.:	1024960034
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	2	22.2	2
Pentachlorinated Dioxins	0	u	2
Pentachlorinated Furans	5	196	2
Hexachlorinated Dioxins	2	31.2	5
Hexachlorinated Furans	4	143	5
Heptachlorinated Dioxins	2	213	5
Heptachlorinated Furans	2	60.9	5
Octachlorinated Dioxins	1	710	10
Octachlorinated Furans	1	30.8	10

Validated
10/30/96 KG

795 395

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-11
Sample Id.:	DGA011 SS009HA011	File No.:	1024960035
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	0.26		
2,3,7,8-TCDF	51207-31-9	4.47	2		0.45	
1,2,3,7,8-PeCDD	40321-76-4	u	2	0.78		
1,2,3,7,8-PeCDF	57117-41-6	u	2	0.61		
2,3,4,7,8-PeCDF	57117-31-4	u	2	0.26		
1,2,3,4,7,8-HxCDD	39227-28-6	u	5	0.22		
1,2,3,6,7,8-HxCDD	57653-85-7	8.60	5		0.86	
1,2,3,7,8,9-HxCDD	19408-74-3	10.2	5		1.02	
1,2,3,4,7,8-HxCDF	70648-26-9	6.26	5		0.63	
1,2,3,6,7,8-HxCDF	57117-44-9	6.48	5		0.65	
2,3,4,6,7,8-HxCDF	60851-34-5	15.1	5		1.51	
1,2,3,7,8,9-HxCDF	72918-21-9	u	5	3.17		
1,2,3,4,6,7,8-HpCDD	35822-46-9	171	5		1.71	
1,2,3,4,6,7,8-HpCDF	67562-39-4	53.4	5		0.53	
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5	4.71		
OCDD	3268-87-9	1124	10		1.12	
OCDF	39001-02-0	66.3	10		0.07	
					TOTAL TEQ	8.55

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	47.2
13C-2,3,7,8-TCDF	89059-46-1	26.4
13C-1,2,3,7,8-PeCDD	109719-79-1	58.6
13C-1,2,3,7,8-PeCDF	109719-77-9	42.7
13C-1,2,3,6,7,8-HxCDD	109719-81-5	38.0
13C-1,2,3,4,7,8-HxCDF	114423-98-2	39.3
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	52.3
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	51.2
13C-OCDD	114423-97-1	80.5

795 396

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-11
Sample Id.:	DGA011 SS009HA011	File No.:	1024960035
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	5	94.6	2
Pentachlorinated Dioxins	0	u	2
Pentachlorinated Furans	1	171	2
Hexachlorinated Dioxins	4	60.1	5
Hexachlorinated Furans	6	213	5
Heptachlorinated Dioxins	2	364	5
Heptachlorinated Furans	2	111	5
Octachlorinated Dioxins	1	1124	10
Octachlorinated Furans	1	66.3	10

Validated
10/31/96 KG

795 397

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-12
Sample Id.:	DGA012 SS009HA013	File No.:	1024960036
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE
2,3,7,8-TCDD	1746-01-6	u	2	0.23	
2,3,7,8-TCDF	51207-31-9	u	2	2.01	
1,2,3,7,8-PeCDD	40321-76-4	u	2	0.25	
1,2,3,7,8-PeCDF	57117-41-6	u	2	0.88	
2,3,4,7,8-PeCDF	57117-31-4	u	2	0.98	
1,2,3,4,7,8-HxCDD	39227-28-6	u	5	0.34	
1,2,3,6,7,8-HxCDD	57653-85-7	u	5	0.29	
1,2,3,7,8,9-HxCDD	19408-74-3	u	5	0.34	
1,2,3,4,7,8-HxCDF	70648-26-9	u	5	1.14	
1,2,3,6,7,8-HxCDF	57117-44-9	u	5	0.97	
2,3,4,6,7,8-HxCDF	60851-34-5	6.48	5		0.65
1,2,3,7,8,9-HxCDF	72918-21-9	u	5	1.50	
1,2,3,4,6,7,8-HpCDD	35822-46-9	76.5 J	5		0.77
1,2,3,4,6,7,8-HpCDF	67562-39-4	33.1 J	5		0.33
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5	0.43	
OCDD	3268-87-9	348	10		0.35
OCDF	39001-02-0	27.3	10		0.03
				TOTAL TEQ	2.13

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	31.3
13C-2,3,7,8-TCDF	89059-46-1	23.1
13C-1,2,3,7,8-PeCDD	109719-79-1	26.9
13C-1,2,3,7,8-PeCDF	109719-77-9	27.5
13C-1,2,3,6,7,8-HxCDD	109719-81-5	21.2
13C-1,2,3,4,7,8-HxCDF	114423-98-2	28.1
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	28.6
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	30.6
13C-OCDD	114423-97-1	64.7

795 398

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-12
Sample Id.:	DGA012 SS009HA013	File No.:	1024960036
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	1	6.06	2
Pentachlorinated Dioxins	0	u	2
Pentachlorinated Furans	1	38.4	2
Hexachlorinated Dioxins	1	16.5	5
Hexachlorinated Furans	1	6.48	5
Heptachlorinated Dioxins	2	166 J	5
Heptachlorinated Furans	2	58.7 J	5
Octachlorinated Dioxins	1	348	10
Octachlorinated Furans	1	27.3	10

validated
10/31/96 KG

117

795 399

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-13
Sample Id.:	DGA013 SS009HA014	File No.:	1024960037
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	1.00		
2,3,7,8-TCDF	51207-31-9	u	2	0.59		
1,2,3,7,8-PeCDD	40321-76-4	u	2	1.04		
1,2,3,7,8-PeCDF	57117-41-6	u	2	0.20		
2,3,4,7,8-PeCDF	57117-31-4	u	2	0.83		
1,2,3,4,7,8-HxCDD	39227-28-6	u	5	1.62		
1,2,3,6,7,8-HxCDD	57653-85-7	u	5	1.38		
1,2,3,7,8,9-HxCDD	19408-74-3	u	5	1.59		
1,2,3,4,7,8-HxCDF	70648-26-9	u	5	0.99		
1,2,3,6,7,8-HxCDF	57117-44-9	u	5	0.86		
2,3,4,6,7,8-HxCDF	60851-34-5	u	5	1.07		
1,2,3,7,8,9-HxCDF	72918-21-9	u	5	1.30		
1,2,3,4,6,7,8-HpCDD	35822-46-9	112	5		1.12	
1,2,3,4,6,7,8-HpCDF	67562-39-4	144	5		1.44	
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5	3.58		
OCDD	3268-87-9	1326	10		1.33	
OCDF	39001-02-0	93.2	10		0.09	
					TOTAL TEQ	3.98

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	6.1
13C-2,3,7,8-TCDF	89059-46-1	9.3
13C-1,2,3,7,8-PeCDD	109719-79-1	13.1
13C-1,2,3,7,8-PeCDF	109719-77-9	12.3
13C-1,2,3,6,7,8-HxCDD	109719-81-5	5.0
13C-1,2,3,4,7,8-HxCDF	114423-98-2	3.1
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	9.6
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	3.7
13C-OCDD	114423-97-1	8.0

795 400

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-13
Sample Id.:	DGA013 SS009HA014	File No.:	1024960037
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	0	u	2
Pentachlorinated Dioxins	0	u	2
Pentachlorinated Furans	0	u	2
Hexachlorinated Dioxins	2	117	5
Hexachlorinated Furans	1	178 (J)	5
Heptachlorinated Dioxins	2	235	5
Heptachlorinated Furans	1	144	5
Octachlorinated Dioxins	1	1326	10
Octachlorinated Furans	1	93.2	10

validated
KG 10/30/96

795 401

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-16
Sample Id.:	DGA016 SS009HA066	File No.:	1024960038
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

Analytes	CAS #	pg/g(DWB)	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	2	0.53		
2,3,7,8-TCDF	51207-31-9	u	2	0.57		
1,2,3,7,8-PeCDD	40321-76-4	u	2	1.38		
1,2,3,7,8-PeCDF	57117-41-6	u	2	0.19		
2,3,4,7,8-PeCDF	57117-31-4	u	2	0.58		
1,2,3,4,7,8-HxCDD	39227-28-6	u	5	1.19		
1,2,3,6,7,8-HxCDD	57653-85-7	u	5	1.01		
1,2,3,7,8,9-HxCDD	19408-74-3	u	5	1.17		
1,2,3,4,7,8-HxCDF	70648-26-9	u	5	1.00		
1,2,3,6,7,8-HxCDF	57117-44-9	u	5	0.87		
2,3,4,6,7,8-HxCDF	60851-34-5	u	5	1.08		
1,2,3,7,8,9-HxCDF	72918-21-9	u	5	1.31		
1,2,3,4,6,7,8-HpCDD	35822-46-9	103	5		1.03	
1,2,3,4,6,7,8-HpCDF	67562-39-4	23.3 J	5		0.23	
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	5	1.10		
OCDD	3268-87-9	298	10		0.30	
OCDF	39001-02-0	34.1	10		0.03	
					TOTAL TEQ	1.59

Internal Standards	CAS #	% Rec.
13C-2,3,7,8-TCDD	76523-40-5	9.7
13C-2,3,7,8-TCDF	89059-46-1	10.9
13C-1,2,3,7,8-PeCDD	109719-79-1	17.5
13C-1,2,3,7,8-PeCDF	109719-77-9	10.2
13C-1,2,3,6,7,8-HxCDD	109719-81-5	6.2
13C-1,2,3,4,7,8-HxCDF	114423-98-2	7.5
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	4.5
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	6.2
13C-OCDD	114423-97-1	16.6

152

795 402

DIOXIN AND FURAN ANALYSIS

Client Name:	CH2M Hill	Lab Sample Id.:	96-10158-16
Sample Id.:	DGA016 SS009HA066	File No.:	1024960038
Sampling Date:	8-Oct-96	Extraction Date:	17-Oct-96
		Analysis Date:	24-Oct-96

TOTAL HOMOLOGUES

Congener Groups	# of peaks	pg/g(DWB)	RL
Tetrachlorinated Dioxins	0	u	2
Tetrachlorinated Furans	1	22.1	2
Pentachlorinated Dioxins	0	u	2
Pentachlorinated Furans	1	42.7	2
Hexachlorinated Dioxins	0	u	5
Hexachlorinated Furans	0	u	5
Heptachlorinated Dioxins	2	200	5
Heptachlorinated Furans	2	49.3 J	5
Octachlorinated Dioxins	1	298	10
Octachlorinated Furans	1	34.1	10

Validated
10/30/96 KG

10298-01

795 453

DGA060A

Client Name:	CH2M Hill			Lab Sample Id.:	96-10298-01	
Sample Id.:	DGA060 SS009HA010			File No.:	1026960037	
Sampling Date:	10-Oct-96			Leaching Date:	12-Oct-96	
Redding Id.:	RC264001			Extraction Date:	22-Oct-96	
				Analysis Date:	26-Oct-96	
Analytes	CAS #	pg/L	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	10	1.56		
2,3,7,8-TCDF	51207-31-9	u	10	1.14		
1,2,3,7,8-PeCDD	40321-76-4	11.4	10		5.68	
1,2,3,7,8-PeCDF	57117-41-6	11.7	10		0.68	
2,3,4,7,8-PeCDF	57117-31-4	u	10	1.61		
1,2,3,4,7,8-HxCDD	39227-28-6	u	25	0.19		
1,2,3,6,7,8-HxCDD	57653-85-7	u	25	0.20		
1,2,3,7,8,9-HxCDD	19408-74-3	u	25	0.72		
1,2,3,4,7,8-HxCDF	70648-26-9	u	25	0.32		
1,2,3,6,7,8-HxCDF	57117-44-9	u	25	0.24		
2,3,4,6,7,8-HxCDF	60851-34-5	u	25	0.34		
1,2,3,7,8,9-HxCDF	72918-21-9	u	25	0.59		
1,2,3,4,6,7,8-HpCDD	35822-46-9	u	25	0.48		
1,2,3,4,6,7,8-HpCDF	67562-39-4	u	25	0.35		
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	25	0.73		
OCDD	3268-87-9	u	50	0.37		
OCDF	39001-02-0	u	50	0.47		
					TOTAL TEQ	6.26
Internal Standards	CAS #		% Rec.			
13C-2,3,7,8-TCDD	76523-40-5		80.6			
13C-2,3,7,8-TCDF	89059-46-1		83.6			
13C-1,2,3,7,8-PeCDD	109719-79-1		103			
13C-1,2,3,7,8-PeCDF	109719-77-9		83.4			
13C-1,2,3,6,7,8-HxCDD	109719-81-5		65.4			
13C-1,2,3,4,7,8-HxCDF	114423-98-2		66.3			
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7		97.7			
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8		87.0			
13C-OCDD	114423-97-1		96.3			

00003

795 404

TOTALS 10298-01

Client Name:	CH2M Hill			Lab Sample Id.:	96-10298-01	
Sample Id.:	DGA060 SS009HA010			File No.:	1026960037	
Sampling Date:	10-Oct-96			Leaching Date:	12-Oct-96	
Redding Id.:	RC264001			Extraction Date:	22-Oct-96	
				Analysis Date:	26-Oct-96	
		TOTAL HOMOLOGUES				
Congener Groups	# of peaks	pg/L	RL			
Tetrachlorinated Dioxins	0	u	10			
Tetrachlorinated Furans	0	u	10			
Pentachlorinated Dioxins	1	11.4	10			
Pentachlorinated Furans	1	11.7	10			
Hexachlorinated Dioxins	0	u	25			
Hexachlorinated Furans	0	u	25			
Heptachlorinated Dioxins	0	u	25			
Heptachlorinated Furans	0	u	25			
Octachlorinated Dioxins	0	u	50			
Octachlorinated Furans	0	u	50			

Validated
11/5/96 KG

10298-02

Client Name:	CH2M Hill			Lab Sample Id.:	96-10298-02	
Sample Id.:	DGA061 SS009HA040			File No.:	1026960038	
Sampling Date:	10-Oct-96			Leaching Date:	12-Oct-96	
Redding Id.:	RC264002			Extraction Date:	22-Oct-96	
				Analysis Date:	26-Oct-96	
Analytes	CAS #	pg/L	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	10	0.27		
2,3,7,8-TCDF	51207-31-9	u	10	0.09		
1,2,3,7,8-PeCDD	40321-76-4	u	10	0.19		
1,2,3,7,8-PeCDF	57117-41-6	u	10	0.31		
2,3,4,7,8-PeCDF	57117-31-4	u	10	0.07		
1,2,3,4,7,8-HxCDD	39227-28-6	u	25	1.15		
1,2,3,6,7,8-HxCDD	57653-85-7	u	25	0.82		
1,2,3,7,8,9-HxCDD	19408-74-3	u	25	1.24		
1,2,3,4,7,8-HxCDF	70648-26-9	u	25	0.23		
1,2,3,6,7,8-HxCDF	57117-44-9	u	25	0.17		
2,3,4,6,7,8-HxCDF	60851-34-5	u	25	0.78		
1,2,3,7,8,9-HxCDF	72918-21-9	u	25	1.35		
1,2,3,4,6,7,8-HpCDD	35822-46-9	u	25	2.68		
1,2,3,4,6,7,8-HpCDF	67562-39-4	u	25	0.19		
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	25	1.75		
OCDD	3268-87-9	u	50	0.43		
OCDF	39001-02-0	u	50	2.21		
					TOTAL TEQ	0.00
Internal Standards	CAS #		% Rec.			
13C-2,3,7,8-TCDD	76523-40-5		64.0			
13C-2,3,7,8-TCDF	89059-46-1		63.7			
13C-1,2,3,7,8-PeCDD	109719-79-1		84.5			
13C-1,2,3,7,8-PeCDF	109719-77-9		72.8			
13C-1,2,3,6,7,8-HxCDD	109719-81-5		49.6			
13C-1,2,3,4,7,8-HxCDF	114423-98-2		64.5			
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7		70.7			
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8		66.7			
13C-OCDD	114423-97-1		105			

795 486 totals 10298-02

Client Name:	CH2M Hill			Lab Sample I.:	96-1 0298-02
Sample Id.:	DGA061 SS009HA040			File No.:	102 960038
Sampling Date:	10-Oct-96			Leaching Date:	12-Oct-96
Redding Id.:	RC264002			Extraction Date:	22-Oct-96
				Analysis Date:	28-Oct-96
		TOTAL HOMOLOGUES			
Congener Groups	# of peaks	pg/L	RL		
Tetrachlorinated Dioxins	0	u	10		
Tetrachlorinated Furans	0	u	10		
Pentachlorinated Dioxins	0	u	10		
Pentachlorinated Furans	0	u	10		
Hexachlorinated Dioxins	0	u	25		
Hexachlorinated Furans	0	u	25		
Heptachlorinated Dioxins	0	u	25		
Heptachlorinated Furans	0	u	25		
Octachlorinated Dioxins	0	u	50		
Octachlorinated Furans	0	u	50		

Validated
11/5/96 KC

96-10298-05

Client Name:	CH2M Hill			Lab Sample Id.:	96-10298-05	
Sample Id.:	DGA049 SS009HA063			File No.:	1026960041	
Sampling Date:	8-Oct-96.			Leaching Date:	12-Oct-96	
Redding Id.:	RC244002			Extraction Date:	22-Oct-96	
				Analysis Date:	26-Oct-96	
Analytes	CAS #	pg/L	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	10	2.48		
2,3,7,8-TCDF	51207-31-9	u	10	1.07		
1,2,3,7,8-PeCDD	40321-76-4	u	10	0.42		
1,2,3,7,8-PeCDF	57117-41-6	u	10	0.16		
2,3,4,7,8-PeCDF	57117-31-4	u	10	0.16		
1,2,3,4,7,8-HxCDD	39227-28-6	u	25	0.79		
1,2,3,6,7,8-HxCDD	57653-85-7	u	25	0.57		
1,2,3,7,8,9-HxCDD	19408-74-3	u	25	0.59		
1,2,3,4,7,8-HxCDF	70648-26-9	u	25	0.30		
1,2,3,6,7,8-HxCDF	57117-44-9	u	25	0.22		
2,3,4,6,7,8-HxCDF	60851-34-5	u	25	0.32		
1,2,3,7,8,9-HxCDF	72918-21-9	u	25	0.22		
1,2,3,4,6,7,8-HpCDD	35822-46-9	u	25	0.23		
1,2,3,4,6,7,8-HpCDF	67562-39-4	u	25	0.37		
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	25	3.27		
OCDD	3268-87-9	54.7	50		0.056	
OCDF	39001-02-0	u	50	0.77		
					TOTAL TEQ	0.055
Internal Standards	CAS #		% Rec.			
13C-2,3,7,8-TCDD	76523-40-5		78.9			
13C-2,3,7,8-TCDF	89059-46-1		78.2			
13C-1,2,3,7,8-PeCDD	109719-79-1		97.0			
13C-1,2,3,7,8-PeCDF	109719-77-9		84.9			
13C-1,2,3,6,7,8-HxCDD	109719-81-5		85.8			
13C-1,2,3,4,7,8-HxCDF	114423-98-2		71.7			
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7		78.1			
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8		66.3			
13C-OCDD	114423-97-1		102			

795 408

TOTALS 10298-05

Client Name:	CH2M Hill			Lab Sample Id.:	96-10298-05
Sample Id.:	DGA049 SS009HA063			File No.:	10265060041
Sampling Data:	8-Oct-96			Leaching Date:	12-Oct-96
Redding Id.:	RC244002			Extraction Date:	22-Oct-96
				Analysis Date:	26-Oct-96
		TOTAL HOMOLOGUES			
Congener Groups	# of peaks	pg/L	RL		
Tetrachlorinated Dioxins	0	u	10		
Tetrachlorinated Furans	0	u	10		
Pentachlorinated Dioxins	0	u	10		
Pentachlorinated Furans	0	u	10		
Hexachlorinated Dioxins	0	u	25		
Hexachlorinated Furans	0	u	25		
Heptachlorinated Dioxins	0	u	25		
Heptachlorinated Furans	0	u	25		
Octachlorinated Dioxins	1	54.7	50		
Octachlorinated Furans	0	u	50		

Val. dated
11/5/96 KG

96-10298-06 795 409

Client Name:	CH2M Hill			Lab Sample Id.:	96-10298-06	
Sample Id.:	DGA057 SS009HA071			File No.:	1026960042	
Sampling Date:	8-Oct-96			Leaching Date:	12-Oct-96	
Redding Id.:	RC244010			Extraction Date:	22-Oct-96	
				Analysis Date:	26-Oct-96	
Analytes	CAS #	pg/L	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	10	0.75		
2,3,7,8-TCDF	51207-31-9	u	10	1.47		
1,2,3,7,8-PeCDD	40321-76-4	u	10	2.93		
1,2,3,7,8-PeCDF	57117-41-6	u	10	0.36		
2,3,4,7,8-PeCDF	57117-31-4	u	10	1.36		
1,2,3,4,7,8-HxCDD	39227-28-6	u	25	1.67		
1,2,3,6,7,8-HxCDD	57653-85-7	u	25	1.19		
1,2,3,7,8,9-HxCDD	19408-74-3	u	25	1.8		
1,2,3,4,7,8-HxCDF	70648-26-9	u	25	0.79		
1,2,3,6,7,8-HxCDF	57117-44-9	u	25	0.58		
2,3,4,6,7,8-HxCDF	60851-34-5	u	25	0.84		
1,2,3,7,8,9-HxCDF	72918-21-9	u	25	1.45		
1,2,3,4,6,7,8-HpCDD	35822-46-9	u	25	2.61		
1,2,3,4,6,7,8-HpCDF	67562-39-4	u	25	0.77		
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	25	1.61		
OCDD	3268-87-9	u	50	0.53		
OCDF	39001-02-0	u	50	3.03		
					TOTAL TEQ	0
Internal Standards	CAS #		% Rec.			
13C-2,3,7,8-TCDD	76523-40-5		67.6			
13C-2,3,7,8-TCDF	89059-46-1		87.2			
13C-1,2,3,7,8-PeCDD	109719-79-1		102			
13C-1,2,3,7,8-PeCDF	109719-77-9		89.1			
13C-1,2,3,6,7,8-HxCDD	109719-81-5		77.2			
13C-1,2,3,4,7,8-HxCDF	114423-98-2		73.4			
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7		77.3			
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8		72.3			
13C-OCDD	114423-97-1		105			

795 4LD

TOTALS 10298-06

Client Name:	CH2M Hill			Lab Sample Id.:	96-10298-06
Sample Id.:	DGA057 SS009HA071			File No.:	10269160042
Sampling Date:	8-Oct-96			Leaching Date:	12-Oct-96
Redding Id.:	RC244010			Extraction Date:	22-Oct-96
				Analysis Date:	26-Oct-96
		TOTAL HOMOLOGUES			
Congener Groups	# of peaks	pg/L	RL		
Tetrachlorinated Dioxins	0	u	10		
Tetrachlorinated Furans	0	u	10		
Pentachlorinated Dioxins	0	u	10		
Pentachlorinated Furans	0	u	10		
Hexachlorinated Dioxins	0	u	25		
Hexachlorinated Furans	0	u	25		
Heptachlorinated Dioxins	0	u	25		
Heptachlorinated Furans	0	u	25		
Octachlorinated Dioxins	0	u	50		
Octachlorinated Furans	0	u	50		

Validated
11/5/96 KG

795 411

96-10298-07

Client Name:	CH2M Hill			Lab Sample Id.:	96-10298-07	
Sample Id.:	DGA022EB1 FIELD QC			File No.:	1026960043	
Sampling Date:	7-Oct-96			Leaching Date:	12-Oct-96	
Redding Id.:	RC242001			Extraction Date:	22-Oct-96	
				Analysis Date:	26-Oct-96	
Analytes	CAS #	pg/L	RL	EDL	TE	
2,3,7,8-TCDD	1746-01-6	u	10	0.14		
2,3,7,8-TCDF	51207-31-9	u	10	0.92		
1,2,3,7,8-PeCDD	40321-76-4	u	10	1.08		
1,2,3,7,8-PeCDF	57117-41-6	u	10	0.15		
2,3,4,7,8-PeCDF	57117-31-4	u	10	0.74		
1,2,3,4,7,8-HxCDD	39227-28-6	u	25	2.02		
1,2,3,6,7,8-HxCDD	57653-85-7	u	25	1.45		
1,2,3,7,8,9-HxCDD	19408-74-3	u	25	2.19		
1,2,3,4,7,8-HxCDF	70648-26-9	u	25	0.58		
1,2,3,6,7,8-HxCDF	57117-44-9	u	25	0.43		
2,3,4,6,7,8-HxCDF	60851-34-5	u	25	0.62		
1,2,3,7,8,9-HxCDF	72918-21-9	u	25	1.07		
1,2,3,4,6,7,8-HpCDD	35822-46-9	u	25	2.13		
1,2,3,4,6,7,8-HpCDF	67562-39-4	u	25	1.7		
1,2,3,4,7,8,9-HpCDF	55673-89-7	u	25	3.55		
OCDD	3268-87-9	u	50	3.18		
OCDF	39001-02-0	u	50	4.22		
					TOTAL TEQ	0
Internal Standards	CAS #		% Rec.			
13C-2,3,7,8-TCDD	76523-40-5		87.3			
13C-2,3,7,8-TCDF	89059-46-1		99.0			
13C-1,2,3,7,8-PeCDD	109719-79-1		107			
13C-1,2,3,7,8-PeCDF	109719-77-9		96.5			
13C-1,2,3,6,7,8-HxCDD	109719-81-5		72.6			
13C-1,2,3,4,7,8-HxCDF	114423-98-2		87.1			
13C-1,2,3,4,6,7,8-HpCDD	109719-83-7		85.9			
13C-1,2,3,4,6,7,8-HpCDF	109719-84-8		81.7			
13C-OCDD	114423-97-1		105			

00069

Sheet2 (3)

Client Name:	CH2M Hill			Lab Sample Id.:	96-10298-07
Sample Id.:	DGA022EB1 FIELD QC			File No.:	1026960043
Sampling Date:	7-Oct-96			Leaching Date:	12-Oct-96
Redding Id.:	RC242001			Extraction Date:	22-Oct-96
				Analysis Date:	26-Oct-96
		TOTAL HOMOLOGUES			
Congener Groups	# of peaks	pg/L	RL		
Tetrachlorinated Dioxins	0	u	10		
Tetrachlorinated Furans	0	u	10		
Pentachlorinated Dioxins	0	u	10		
Pentachlorinated Furans	0	u	10		
Hexachlorinated Dioxins	0	u	25		
Hexachlorinated Furans	0	u	25		
Heptachlorinated Dioxins	0	u	25		
Heptachlorinated Furans	0	u	25		
Octachlorinated Dioxins	0	u	50		
Octachlorinated Furans	0	u	50		

validated
11/5/96 KG

795 413

TAB

Metals Validation Worksheets

LEVEL C DATA REVIEW AND VALIDATION
KELLY AFB - ZONE 4 SS009

795 414

RC

CASE 244 ANALYSIS: METALS CN MATRIX EXTRACTS

REVIEWED BY K.A. SAUDERS DATE 25 OCT 96

DATE SAMPLES COLLECTED 8 OCT 96

DATA PACKAGE COMPLETE: (YES) NO complete

NUMBER of SAMPLES 4 FIELD QC SAMPLES None associated w/ this SDG.

CASE NARRARATIVE SUMMARY some QC criteria not met - see sections below

HOLDING TIMES MET: all HT criteria met

CALIBRATION: all ICV and CCV recovery requirements were met

BLANKS:

ICB/CCB see "Blanks" worksheet

PREPARATION Calculated

FB/ERB 4

SPIKES:

PREDIGESTION Se out - J/UJ

POSTDIGESTION Se @ 89%

DUPLICATES:

LAB all lab dup precision criteria were met

FIELD None associated w/ these data

LCS/CONTROL CHARTS: all LCS recovery criteria met

ICSAB: all -AS recovery requirements were met

ICP SERIAL DILUTION: all %D criteria met

GFAA QC REQUIREMENTS: POSTSPIKES

Sb out on 001 } F/D
Se out on 008 }

COMMENTS ① NOTE that the reanalytes are reported in PPM units. ② AS by ICP w/ IDL > CRDL.

INORGANIC BLANKS

795 416

SDG RC 244 VALIDATOR K.A. SANDERS

ELEMENT	ICB CCB	H2O PB	SOIL PB	ERB	FB	[illegible]	[illegible]
Aluminum							
Antimony	1.7					8.5	
Arsenic							
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium	2.2					11	
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese							
Mercury							
Nickel							
Potassium							
Selenium							
Silver							
Sodium							
Thallium	0.9					4.5	
Vanadium							
Zinc							
Cyanide							

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA048

Lab Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC244_

Matrix: SPLP EXTRACT Lab Sample ID: RC244001__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: __0.0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.0019	~~B~~	~~N~~ UJ	F_
7440-38-2	Arsenic__	0.0123	U		P_
7440-39-3	Barium___	0.309			P_
7440-41-7	Beryllium	0.00030	U		P_
7440-43-9	Cadmium__	0.0012	U		P_
7440-47-3	Chromium_	0.0033	~~B~~	U	P_
7439-92-1	Lead____	0.0033			F_
7782-49-2	Selenium_	0.00060	~~B~~	~~N~~ UJ	F_
7440-22-4	Silver___	0.0025	U		P_
7440-28-0	Thallium_	0.00060	U		F_

KB
10/25

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

ILMO2.1

U.S. EPA - CLP

795 418

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA052

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC244_

Matrix: SPLP EXTRACT Lab Sample ID: RC244005__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: __0.0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.0019	B	U	F
7440-38-2	Arsenic	0.0455	B	J	P
7440-39-3	Barium	0.432			P
7440-41-7	Beryllium	0.00051	B	J	P
7440-43-9	Cadmium	0.0012	U		P
7440-47-3	Chromium	0.0061	B	U	P
7439-92-1	Lead	0.0027	B	J	F
7782-49-2	Selenium	0.00060	U	N UJ	F
7440-22-4	Silver	0.0025	U		P
7440-28-0	Thallium	0.00060	U		F

10/25

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

ILM02.1

0607

795 419

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA054

Lab Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC244_

Matrix: SPLP EXTRACT Lab Sample ID: RC244007__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: __0.0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.0082		U	P
7440-38-2	Arsenic	0.617			P
7440-39-3	Barium	0.280			P
7440-41-7	Beryllium	0.00030	U		P
7440-43-9	Cadmium	0.0015	B	J	P
7440-47-3	Chromium	0.0049	B	U	P
7439-92-1	Lead	0.0032			P
7782-49-2	Selenium	0.00060	U	UJ	P
7440-22-4	Silver	0.0025	U		P
7440-28-0	Thallium	0.00060	B	U	P

KB 10/25

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

ILM02.1

0508

795 420

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA055

Lab Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC244_

Matrix: SPLP EXTRACT Lab Sample ID: RC244008__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: __0.0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.0010	~~B~~	U	F_
7440-38-2	Arsenic__	0.0123	U		P_
7440-39-3	Barium__	0.309			P_
7440-41-7	Beryllium	0.00030	U		P_
7440-43-9	Cadmium__	0.0012	U		P_
7440-47-3	Chromium_	0.0023	~~B~~	U	P_
7439-92-1	Lead____	0.00070	~~B~~	J	F
7782-49-2	Selenium_	0.00060	~~U~~	~~WN~~ UJ	F_
7440-22-4	Silver___	0.0025	U		P_
7440-28-0	Thallium_	0.00060	U		F_

10/25

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

ILMO2.1

795 421

LEVEL C DATA REVIEW AND VALIDATION
KELLY AFB - ZONE 4 SS009

CASE RC 242 ANALYSIS: METALS CN MATRIX SOILS

REVIEWED BY K.A. SANDERS DATE 25 OCT 96

DATE SAMPLES COLLECTED 8 OCT 96

DATA PACKAGE COMPLETE: (YES) NO complete

NUMBER of SAMPLES 13 FIELD QC SAMPLES 001 ERB ;
012 / 013 F. DUPS

CASE NARRARATIVE SUMMARY some of outside
criteria - see sections below

HOLDING TIMES MET: all HT criteria met

CALIBRATION: all ICV and CCV
recovery requirements
were met.

BLANKS:

ICB/CCB see "Blanks" worksheet

PREPARATION (Combined)
2

FB/ERB

SPIKES:

PREDIGESTION Cr, Pb, Se out (J/UJ) ("R" all
Pb U's (none))

POSTDIGESTION Cr @ 90, Pb @ 92
Se (GFAA) @ 55

DUPLICATES:

LAB all lab dup precision
requirements met.

FIELD all field dup precision
criteria were met.

KAS/METFORM.DOC

LCS/CONTROL CHARTS: all LCS recovery criteria met.

ICSAB: all -AB recovery requirements were met

ICP SERIAL DILUTION: Cd %D out - J/UJ

GFAA QC REQUIREMENTS: POST SPIKES:
Sb - all OK
Se - all out - J/UJ
Tl - all OK

COMMENTS ① As & Pb ran by ICP w/ IDL's of 12.3 & 31.2 respectively.

INORGANIC BLANKS

795 423

RC

SDG 242 VALIDATOR K. A. SAUNDERS

ELEMENT	ICB # mg/L	CCB # mg/L	ICSA # mg/L	ICSAB # mg/L	CRI # mg/L	CRA # mg/L	MDL mg/L
Aluminum							
Antimony	1.7						1.7
Arsenic							
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium	2.2						2.2
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese							
Mercury							
Nickel							
Potassium							
Selenium							
Silver							
Sodium							
Thallium	0.9		.12	.8			.9
Vanadium							
Zinc							
Cyanide							

Comments:

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA022EB1

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC242_

Matrix (soil/water): SOIL_ Lab Sample ID: RC242001__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

EB

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.70	U		F
7440-38-2	Arsenic	12.3	U		P
7440-39-3	Barium	1.7	U		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	1.2	U		P
7440-47-3	Chromium	2.0	U		P
7439-92-1	Lead	31.2	U		P
7782-49-2	Selenium	0.60	U		F
7440-22-4	Silver	2.5	U		P
7440-28-0	Thallium	0.80	B		F

RB 10/25

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

MODIFIED U.S. EPA - CLP

795 425

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA023

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC242_

Matrix (soil/water): SOIL_ Lab Sample ID: RC242002__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _99.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.5			F
7440-38-2	Arsenic	4.6			P
7440-39-3	Barium	40.9			P
7440-41-7	Beryllium	0.16			P
7440-43-9	Cadmium	14.0			P
7440-47-3	Chromium	96.4			P
7439-92-1	Lead	291			P
7782-49-2	Selenium	0.12		U	F
7440-22-4	Silver	0.50		U	P
7440-28-0	Thallium	0.26		U	F

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

MODIFIED U.S. EPA - CLP

795 426

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA024

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC242_

Matrix (soil/water): SOIL_ Lab Sample ID: RC242003__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _99.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.9	B	J	P
7440-38-2	Arsenic	10.4	B	J	P
7440-39-3	Barium	70.0			P
7440-41-7	Beryllium	0.24	B	J	P
7440-43-9	Cadmium	34.2		J	P
7440-47-3	Chromium	87.9		J	P
7439-92-1	Lead	366		J	P
7782-49-2	Selenium	0.12	U	UJ	P
7440-22-4	Silver	0.50	U		P
7440-28-0	Thallium	0.12	B	U	P

10/25

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-9a)

0008

MODIFIED U.S. EPA - CLP

795 427

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA025

Lab Name: CH2M_HILL Contract: KELLY_AFB

Lab Code: RDD Case No.: SAS No.: SDG No.: RC242

Matrix (soil/water): SOIL Lab Sample ID: RC242004

Level (low/med): LOW Date Received: 10/09/96

% Solids: 99.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	2.3	B	J	F
7440-38-2	Arsenic	5.2	B	J	P
7440-39-3	Barium	67.8			P
7440-41-7	Beryllium	0.32	B	J	P
7440-43-9	Cadmium	52.6		J	P
7440-47-3	Chromium	62.3		J	P
7439-92-1	Lead	315		J	P
7782-49-2	Selenium	0.12	U	UW J	F
7440-22-4	Silver	0.51	U		P
7440-28-0	Thallium	0.12	B	U	F

10/25

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN ILM02.1(MOD-9a)

0009

MODIFIED U.S. EPA - CLP 795428

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA026

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD Case No.: _____ SAS No.: _____ SDG No.: RC242_

Matrix (soil/water): SOIL_ Lab Sample ID: RC242005

Level (low/med): LOW Date Received: 10/09/96

% Solids: 99.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	2.0	B	J	F
7440-38-2	Arsenic	10.5	B	J	P
7440-39-3	Barium	39.2	B	J	P
7440-41-7	Beryllium	0.20	B	J	P
7440-43-9	Cadmium	12.4		J	P
7440-47-3	Chromium	46.9		J	P
7439-92-1	Lead	270		J	P
7782-49-2	Selenium	0.12	U	UW J	F
7440-22-4	Silver	1.0	B	J	P
7440-28-0	Thallium	0.12	B	U	F

10/25

Color Before: GREY Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

795 429

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA027

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC242_

Matrix (soil/water): SOIL_ Lab Sample ID: RC242006__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _99.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.5	B	U	F
7440-38-2	Arsenic	12.6	B	H	P
7440-39-3	Barium	49.5		H	P
7440-41-7	Beryllium	0.28	B	H	P
7440-43-9	Cadmium	11.0		H	P
7440-47-3	Chromium	30.1		H	P
7439-92-1	Lead	157		H	P
7782-49-2	Selenium	0.12	U	U H	F
7440-22-4	Silver	0.50	U		P
7440-28-0	Thallium	0.16	B	U	F

RDD 10/25

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MO...a

MODIFIED U.S. EPA - CLP 735 430

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA028

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC242_

Matrix (soil/water): SOIL_ Lab Sample ID: RC242007__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _97.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.6	B	U	P
7440-38-2	Arsenic	19.0			P
7440-39-3	Barium	46.9			P
7440-41-7	Beryllium	0.30	B	J	P
7440-43-9	Cadmium	7.7		J	P
7440-47-3	Chromium	35.0		N J	P
7439-92-1	Lead	187		N J	P
7782-49-2	Selenium	0.12	B	U J	P
7440-22-4	Silver	0.51	U		P
7440-28-0	Thallium	0.12	B	U	P

RD 10/25

Color Before: DK_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-9a

0012

795 431

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA029

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC242_

Matrix (soil/water): SOIL_ Lab Sample ID: RC242008__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _92.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	2.0	B	J	F
7440-38-2	Arsenic	54.0			P
7440-39-3	Barium	72.4			P
7440-41-7	Beryllium	0.23	B		P
7440-43-9	Cadmium	7.0			P
7440-47-3	Chromium	28.9			P
7439-92-1	Lead	136			P
7782-49-2	Selenium	0.13	U	UN	F
7440-22-4	Silver	0.54	U		P
7440-28-0	Thallium	0.13	U		F

10/25

Color Before: DK_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-

0013

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA030

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC242_

Matrix (soil/water): SOIL_ Lab Sample ID: RC242009__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _96.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	4.5	B	J	F
7440-38-2	Arsenic	84.5			P
7440-39-3	Barium	50.0			P
7440-41-7	Beryllium	0.28	B	J	P
7440-43-9	Cadmium	6.6		J	P
7440-47-3	Chromium	35.1		J	P
7439-92-1	Lead	168		J	P
7782-49-2	Selenium	0.14	B	UJ	F
7440-22-4	Silver	0.52	U		P
7440-28-0	Thallium	0.15	B	U	F

Color Before: DK_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

795 433

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA031

Lab Name: CH2M_HILL Contract: KELLY_AFB

Lab Code: RDD Case No.: SAS No.: SDG No.: RC242

Matrix (soil/water): SOIL Lab Sample ID: RC242010

Level (low/med): LOW Date Received: 10/09/96

% Solids: 90.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.1	B	H	F
7440-38-2	Arsenic	57.4			P
7440-39-3	Barium	52.7			P
7440-41-7	Beryllium	0.37	B	J	P
7440-43-9	Cadmium	8.2		H	P
7440-47-3	Chromium	36.9		H	P
7439-92-1	Lead	159		H	P
7782-49-2	Selenium	0.13	B	U WN	F
7440-22-4	Silver	0.55	U		P
7440-28-0	Thallium	0.15	B	U	F

CB 10/25

Color Before: DK_BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA032

Lab Name: CH2M_HILL Contract: KELLY_AFB

Lab Code: RDD Case No.: _____ SAS No.: _____ SDG No.: RC242

Matrix (soil/water): SOIL Lab Sample ID: RC242011

Level (low/med): LOW Date Received: 10/09/96

% Solids: 99.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	2.3	B	J	P
7440-38-2	Arsenic	59.3			P
7440-39-3	Barium	46.1			P
7440-41-7	Beryllium	0.32	B	J	P
7440-43-9	Cadmium	6.8		J	P
7440-47-3	Chromium	33.3		J	P
7439-92-1	Lead	172		J	P
7782-49-2	Selenium	0.12	U	UJ	P
7440-22-4	Silver	0.50	U		P
7440-28-0	Thallium	0.20	B	U	P

RDS 10/25

Color Before: GREY Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

FORM I - IN ILM02.1(MOD-9a)

0016

0018

MODIFIED U.S. EPA - CLP

795 435

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA033

ame: CH2M_HILL_____ Contract: KELLY_AFB_

Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC242_

trix (soil/water): SOIL_ Lab Sample ID: RC242012__

vel (low/med): LOW__ Date Received: 10/09/96

Solids: _99.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	5.5	~~B~~	J	F_
7440-38-2	Arsenic__	180			P_
7440-39-3	Barium___	50.0			P_
7440-41-7	Beryllium	0.22	~~B~~	J	P_
7440-43-9	Cadmium__	12.9		~~E~~ J	P_
7440-47-3	Chromium_	46.4		~~N~~ J	P_
7439-92-1	Lead____	232		~~N~~ J	P_
7782-49-2	Selenium_	0.12	~~U~~	U WN J	F_
7440-22-4	Silver___	0.50	U		P_
7440-28-0	Thallium_	0.20	~~B~~	U	F_

10/25

lor Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

lor After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

mments:

FORM I - IN ILM02.1(MOD-9

LEVEL C DATA REVIEW AND VALIDATION 795 436
KELLY AFB - ZONE 4 SS009

RC
CASE 243 ANALYSIS: METALS CN MATRIX SOILS

REVIEWED BY K.A. SAUDERS DATE 25 OCT 96

DATE SAMPLES COLLECTED 8 OCT 96

DATA PACKAGE COMPLETE: ~~YES~~ NO complete

NUMBER of SAMPLES 13 FIELD QC SAMPLES None associated w/ this SDG

CASE NARRARATIVE SUMMARY some QC criteria not met - see sections below

HOLDING TIMES MET: all HT criteria met

CALIBRATION: all ICV and CCV recovery requirements were met.

BLANKS:

ICB/CCB see "Blanks" worksheet

PREPARATION Calculated

FB/ERB Y

SPIKES:

PREDIGESTION Se @ 40% J/UJ

POSTDIGESTION Se @ 61%

DUPLICATES:

LAB As @ 35.8 RPD - J/UJ

FIELD None associated w/ this SDG.

LCS/CONTROL CHARTS: all LCS recovery criteria were met

ICSAB: all -AB recovery requirements met

ICP SERIAL DILUTION: all %D criteria met.

GFAA QC REQUIREMENTS: POST SPIKES:
Sb - all criteria met.
Se - some out "W" = J/UJ
Tl - all OK

COMMENTS ① QC was performed on a sample within this SDG - FORM 5, 6, +9 were NOT included; historical KAFB deliverable.
② As + Pb IDL's > CRDL ——

INORGANIC BLANKS

795 438

SDG RC 243 VALIDATOR K.A. SANDERS

ELEMENT	[illegible] CCB	H2O PB	SOIL PB	ERB	[illegible]	X5 ug/l	X5 mg/kg
Aluminum							
Antimony	1.3					~~6.5~~	1.3
Arsenic	13.4					~~.67~~	13.4
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium							
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese							
Mercury							
Nickel							
Potassium							
Selenium							
Silver							
Sodium							
Thallium	0.8					4	
Vanadium							
Zinc							
Cyanide							

Comments:

MODIFIED U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. 795439

1

DGA035

Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243001__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _96.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	4.9	B	J	F
7440-38-2	Arsenic	121		J	P
7440-39-3	Barium	55.1			P
7440-41-7	Beryllium	0.26	B	J	P
7440-43-9	Cadmium	9.5			P
7440-47-3	Chromium	33.6			P
7439-92-1	Lead	160			P
7782-49-2	Selenium	0.15	B	WN J	F
7440-22-4	Silver	0.52	U		P
7440-28-0	Thallium	0.19	B	U	F

10/25

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

1

INORGANIC ANALYSES DATA SHEET

795 440

EPA SAMPLE NO.

DGA036

Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243002__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _99.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	4.0	B	J	F
7440-38-2	Arsenic	104		J	P
7440-39-3	Barium	51.7			P
7440-41-7	Beryllium	0.22	B	J	P
7440-43-9	Cadmium	10.2			P
7440-47-3	Chromium	35.6			P
7439-92-1	Lead	179			P
7782-49-2	Selenium	0.12		N UJ	F
7440-22-4	Silver	0.50	U		P
7440-28-0	Thallium	0.14	B	U	F

10/25

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA037

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD Case No.: SAS No.: SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243003_

Level (low/med): LOW_ Date Received: 10/09/96

% Solids: 99.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	5.5	B	J	P
7440-38-2	Arsenic	128		J	P
7440-39-3	Barium	55.4			P
7440-41-7	Beryllium	0.22	B	J	P
7440-43-9	Cadmium	14.7			P
7440-47-3	Chromium	44.0			P
7439-92-1	Lead	242			P
7782-49-2	Selenium	0.12	B	WJ	P
7440-22-4	Silver	0.50	U		P
7440-28-0	Thallium	0.18	B	U	P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

795 442

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA038

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243004__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _99.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	2.0	B	J	P
7440-38-2	Arsenic	49.3		J	P
7440-39-3	Barium	33.8	B	J	P
7440-41-7	Beryllium	0.10	B	J	P
7440-43-9	Cadmium	4.3			P
7440-47-3	Chromium	26.0			P
7439-92-1	Lead	110			P
7782-49-2	Selenium	0.12	B	UJ	P
7440-22-4	Silver	0.50	U		P
7440-28-0	Thallium	0.16	B	U	P

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN ILM02.1(M 9a

0009

MODIFIED U.S. EPA - CLP

795 443

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA039

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243005__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _98.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.7	B	J	P
7440-38-2	Arsenic	9.9	B	J	P
7440-39-3	Barium	94.1			P
7440-41-7	Beryllium	0.28	B	J	P
7440-43-9	Cadmium	16.1			P
7440-47-3	Chromium	53.6			P
7439-92-1	Lead	263			P
7782-49-2	Selenium	0.12	U	UJ	P
7440-22-4	Silver	0.65	B	J	P
7440-28-0	Thallium	0.12	U		P

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

MODIFIED U.S. EPA - CLP

735 444

INORGANIC ANALYSES DATA SHEET

1

EPA SAMPLE NO.

DGA040

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243006__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _98.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.2			F
7440-38-2	Arsenic	9.0			P
7440-39-3	Barium	37.9			P
7440-41-7	Beryllium	0.16			P
7440-43-9	Cadmium	4.6			P
7440-47-3	Chromium	35.4			P
7439-92-1	Lead	138			P
7782-49-2	Selenium	0.12			F
7440-22-4	Silver	0.51			P
7440-28-0	Thallium	0.12			F

10/25

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

MODIFIED U.S. EPA - CLP

795 445

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA041

Lab Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243007

Level (low/med): LOW Date Received: 10/09/96

% Solids: 98.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.57	B	UJ	P
7440-38-2	Arsenic	7.3	B	UJ	P
7440-39-3	Barium	51.2			P
7440-41-7	Beryllium	0.33	B	J	P
7440-43-9	Cadmium	2.3			P
7440-47-3	Chromium	20.9			P
7439-92-1	Lead	70.8			P
7782-49-2	Selenium	0.12	B	WNUJ	P
7440-22-4	Silver	0.51	U		P
7440-28-0	Thallium	0.24	B	J	P

GB

RD 10/25

Color Before: GREY Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

MODIFIED U.S. EPA - CLP

795 446

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA042

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243008__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: 94.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.36	B	[illegible]	P
7440-38-2	Arsenic	7.6	B	[illegible]	P
7440-39-3	Barium	71.2			P
7440-41-7	Beryllium	0.63	B	J	P
7440-43-9	Cadmium	1.1			P
7440-47-3	Chromium	22.4			P
7439-92-1	Lead	37.8			P
7782-49-2	Selenium	0.13	U	[illegible]	P
7440-22-4	Silver	0.53	U		P
7440-28-0	Thallium	0.21	B	U	P

10/25

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

MODIFIED U.S. EPA - CLP

795 447

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA043

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243009__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _94.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.3	B	U	F
7440-38-2	Arsenic	12.2	B	UJ	P
7440-39-3	Barium	49.4			P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	5.0			P
7440-47-3	Chromium	27.9			P
7439-92-1	Lead	106			P
7782-49-2	Selenium	0.13	U	UJ	F
7440-22-4	Silver	0.53	U		P
7440-28-0	Thallium	0.19	B	U	F

10/25

Color Before: DK_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

MODIFIED U.S. EPA - CLP

1.

795 449 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA044

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243010__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _93.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.77	P	B	F
7440-38-2	Arsenic	11.1	P	N	P
7440-39-3	Barium	61.3			P
7440-41-7	Beryllium	0.29	P	J	P
7440-43-9	Cadmium	3.7			P
7440-47-3	Chromium	42.1			P
7439-92-1	Lead	166			P
7782-49-2	Selenium	0.13	P	W	F
7440-22-4	Silver	0.86	P	J	P
7440-28-0	Thallium	0.19	P	U	F

10/25

Color Before: DK_BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

MODIFIED U.S. EPA - CLP 705 449

1 EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA045

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243011__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _99.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.1	B	J	P
7440-38-2	Arsenic	30.3		J	P
7440-39-3	Barium	67.3			P
7440-41-7	Beryllium	0.40	B	J	P
7440-43-9	Cadmium	3.9			P
7440-47-3	Chromium	48.8			P
7439-92-1	Lead	158			P
7782-49-2	Selenium	0.12	U	UWJ	F
7440-22-4	Silver	0.59	B	J	P
7440-28-0	Thallium	0.14	B	U	F

10/25

Color Before: GREY_____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

795 450

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA046

Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243012__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _91.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	2.1	B	K J	F
7440-38-2	Arsenic	22.2		J	P
7440-39-3	Barium	75.9			P
7440-41-7	Beryllium	0.59	B	J	P
7440-43-9	Cadmium	4.9			P
7440-47-3	Chromium	141			P
7439-92-1	Lead	401			P
7782-49-2	Selenium	0.13	W	W UJ	F
7440-22-4	Silver	0.54	U		P
7440-28-0	Thallium	0.26	B	U	F

10/25

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

MODIFIED U.S. EPA - CLP

795 451

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA047

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC243_

Matrix (soil/water): SOIL_ Lab Sample ID: RC243013__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: _99.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	53.0	B	J	F
7440-38-2	Arsenic	8.0	B	J	P
7440-39-3	Barium	97.7			P
7440-41-7	Beryllium	0.26	B	J	P
7440-43-9	Cadmium	13.7			P
7440-47-3	Chromium	74.1			P
7439-92-1	Lead	366			P
7782-49-2	Selenium	0.12	U	UN J	F
7440-22-4	Silver	1.6	B	J	P
7440-28-0	Thallium	0.18	B	U	F

10/25

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

LEVEL C DATA REVIEW AND VALIDATION
KELLY AFB - ZONE 4 SS009

795 452

CASE RC 264 ANALYSIS: METALS [redacted] MATRIX SOILS

REVIEWED BY K.A. SANDERS DATE ~~10 OCT~~ 96 (11 NOV)

DATE SAMPLES COLLECTED 10 OCT 96

DATA PACKAGE COMPLETE: (YES) NO compl

NUMBER of SAMPLES 2 FIELD QC SAMPLES none associated w/ this SDG.

CASE NARRARATIVE SUMMARY some QC criteria NOT met - see sections below

HOLDING TIMES MET: all HT criteria met

CALIBRATION: all ICV and CCV recovery requirements were met

BLANKS:

ICB/CCB see "BLANKS" worksheet

PREPARATION (attached)

FB/ERB 2

SPIKES:

PREDIGESTION Sb @ 44 (SOIL); As, Ba, Be, Cd, Cr + Ag out for LEACHATE - J/UJ

POSTDIGESTION Sb @ 99; all leachate %REC criteria met.

DUPLICATES:

LAB all lab dup precision criteria were met

FIELD none associated w/ this SDG.

KAS/METFORM.DOC

LCS/CONTROL CHARTS: all LCS recovery criteria were met.

ICSAB: all -AB recovery requirements were met

ICP SERIAL DILUTION: all serial dilution criteria met.

GFAA QC REQUIREMENTS: GFAA post spike out for Se on soil - J/UJ

COMMENTS ① As + Pb ran by ICPES; IDL > CRDL —

795 454

INORGANIC BLANKS

SDG RC 264 VALIDATOR K.A. SANDERS

ELEMENT	ICB CCB	H2O PB	SOIL PB	ERB	HB	XS ug/L	XS ug/kg
Aluminum							
Antimony							
Arsenic	15.7					78.5	15.7
Barium							
Beryllium							
Cadmium	1.7					8.5	1.7
Calcium							
Chromium							
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese							
Mercury							
Nickel							
Potassium							
Selenium	0.7					3.5	0.7
Silver	4.5					22.5	4.5
Sodium							
Thallium							
Vanadium							
Zinc							
Cyanide							

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA060

ab Name: CH2M_HILL Contract: KELLY_AFB_

ab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC264_

atrix (soil/water): SOIL_ Lab Sample ID: RC264003__

evel (low/med): LOW__ Date Received: 10/11/96

Solids: _79.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.43	B	N J	F
7440-38-2	Arsenic	8.3	B	U	P
7440-39-3	Barium	113			P
7440-41-7	Beryllium	1.0	B	J	P
7440-43-9	Cadmium	0.74	B	U	P
7440-47-3	Chromium	18.3			P
7439-92-1	Lead	21.2			P
7782-49-2	Selenium	0.15	B	W U J	F
7440-22-4	Silver	0.63	U		P
7440-28-0	Thallium	0.28	B	J	F

11/11

Color Before: BLACK Clarity Before: _____ Texture: COARSE

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_SAMPLE

FORM I - IN

ILMO2.1

0606

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

795 456

DGA060A

Lab Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD Case No.: _____ SAS No.: _____ SDG No.: RC264_

Matrix: SPLP EXTRACTION Lab Sample ID: RC264004

Level (low/med): LOW Date Received: 10/11/96

% Solids: 0.0

Concentration: MG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.00070	U		F
7440-38-2	Arsenic	0.0123	B	J UJ	P
7440-39-3	Barium	0.490		J	P
7440-41-7	Beryllium	0.00070	B	J UJ	P
7440-43-9	Cadmium	0.0012	B	J UJ	P
7440-47-3	Chromium	0.0130		J	P
7439-92-1	Lead	0.0039	B	J	F
7782-49-2	Selenium	0.00095	B	J	F
7440-22-4	Silver	0.0025	U	J UJ	P
7440-28-0	Thallium	0.00060	U		F

11/11

Color Before: BROWN Clarity Before: CLEAR Texture: _____

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

SPLP_EXTRACT

FORM I - IN

ILMO2.1

0007

LEVEL C DATA REVIEW AND VALIDATION
KELLY AFB - ZONE 4 SS009

795 457

RC
CASE 390 ANALYSIS: METALS CN MATRIX LEACHATE

REVIEWED BY K.A. SAUDERS DATE 11 NOV 96

DATE SAMPLES COLLECTED 8 OCT 96

DATA PACKAGE COMPLETE: (YES) NO complete

NUMBER of SAMPLES 19 FIELD QC SAMPLES None associated w/ this SDG.

CASE NARRARATIVE SUMMARY No exceptions were documented

HOLDING TIMES MET: all HT criteria met

CALIBRATION: all ICV and CCV recovery requirements were met

BLANKS:

ICB/CCB see "BLANKS" worksheet

PREPARATION (attached)

FB/ERB 4

SPIKES:

PREDIGESTION all recovery criteria were met

POSTDIGESTION N/A for this SDG.

DUPLICATES:

LAB all lab dup precision requirements were met

FIELD None associated w/ this SDG.

LCS/CONTROL CHARTS: all LCS recovery criteria were met

ICSAB: N/A for As —

ICP SERIAL DILUTION: all serial dil %D criteria met.

GFAA QC REQUIREMENTS: N/A — all ICP

COMMENTS (1) As by ICPES — IDL > CRDL —

795 459

INORGANIC BLANKS

SDG RC 390 VALIDATOR K.A. SAUDERS

ELEMENT	WATER ICB / CCB ug/L	WATER PB ug/L	SOIL ICB / CCB mg/kg	SOIL PB mg/kg	WATER CRDL ug/L	SOIL CRDL mg/kg	WATER IDL ug/L	SOIL IDL mg/kg
Aluminum								
Antimony								
Arsenic	13.2						66	
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								
Cyanide								

Comments: _____

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA023A

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390001__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0123	U		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA0244

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390002__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0123	U		P

11/11

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

795 462

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA025A

Lab Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390003__

Level (low/med): LOW Date Received: 10/09/96

% Solids: 0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0123	U		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

SPLP_EXTRACT

FORM I - IN

ILMO

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA026A

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390004__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0287	B	U	P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

FORM I - IN

ILMO2.1

795 464

1

EPA SAMPLE NO.

DGA028A

INORGANIC ANALYSES DATA SHEET

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390005__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0123	U		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA030K

Lab Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390006__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0548	B	U	P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

795 466

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA031A

a. Name: CH2M_HILL_____ Contract: KELLY_AFB_

ab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

atrix: SPLP EXTRACT Lab Sample ID: RC390007__

evel (low/med): LOW__ Date Received: 10/09/96

Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0314		U	P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA032A

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390008__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	0.0644	B	U	P_

4/11

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

FORM I - IN

ILM02.1

795 468

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

DGA035A

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390009__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.144			P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

FORM I - IN

ILMO2.1

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA036A

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390010_

Level (low/med): LOW Date Received: 10/09/96

% Solids: 0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.151			P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

795 470

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA037A

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390011__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.254			P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

795 471

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA038A

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390012__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.166			P

11/11

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

SPLP_EXTRACT

795 472

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA039A

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390013__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0123	U		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA040 K

Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390014__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0123	U		P

11/11

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

795 474

1

EPA SAMPLE NO.

DGA042 A

INORGANIC ANALYSES DATA SHEET

Lab Name: CH2M_HILL_____ Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No. _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390015__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0164	B		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT_____

FORM I - IN

ILMO

795 475

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA043A

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390016__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0123	U		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

795 476

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA044 A

Lab Name: CH2M_HILL Contract: KELLY_AF3

Lab Code: RDD Case No.: SAS No.: SDG No.: RC390

Matrix: SPLP EXTRACT Lab Sample ID: RC390017

Level (low/med): LOW Date Received: 10/09/96

% Solids: 0

Concentration Units: MG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0123	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
SPLP_EXTRACT

FORM I - IN

ILMO2.

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA045A

Name: CH2M_HILL Contract: KELLY_AFB

Lab Code: RDD Case No.: SAS No.: SDG No.: RC390

Matrix: SPLP EXTRACT Lab Sample ID: RC390018

Level (low/med): LOW Date Received: 10/09/96

% Solids: 0

Concentration Units: MG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.0386	B	U	P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
SPLP_EXTRACT

795 478

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DGA046A

Name: CH2M_HILL Contract: KELLY_AFB_

Lab Code: RDD___ Case No.: _____ SAS No.: _____ SDG No.: RC390_

Matrix: SPLP EXTRACT Lab Sample ID: RC390019__

Level (low/med): LOW__ Date Received: 10/09/96

% Solids: ____0

Concentration Units: MG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	0.021	B		P_

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SPLP_EXTRACT

FORM I - IN

ILM

795 479

TAB

Chain of Custody Forms

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA **Report Print Date** 10/8/96 16:31 **Lab SDG Number:** RC242

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments
DGA022EB1		FIELDQC	0	0	10/7/96 17:30	WQ	3	DIFR EQMET *	010B	☐	1	Equipment Blank TAKEN FROM SS SPOONS
DGA023		SS009HA005	0	0	10/8/96 12:05	SO	1	METS 7	010B	☐	2	
DGA024		SS009HA006	0	0	10/8/96 12:09	SO	1	METS 7	010B	☐	3	
DGA025		SS009HA007	0	0	10/8/96 12:14	SO	1	METS 7	010B	☐	4	
DGA026		SS009HA008	0	0	10/8/96 13:45	SO	1	METS 7	010B	☐	5	
DGA027		SS009HA009	0	0	10/8/96 13:48	SO	1	METS 5	010B	☐	6	
~~DGA028~~		~~SS009HA010~~	~~0~~	~~0~~	~~10/8/96 12:30~~	~~SO~~	~~1~~	~~METS 7~~	010B	☐	7	
DGA029		SS009HA011	0	0	10/8/96 12:40	SO	1	METS 10	010B	☐	8	
DGA030		SS009HA057	0	0	10/8/96 13:55	SO	1	METS 3	010B	☐	9	
DGA031		SS009HA058	0	0	10/8/96 13:57	SO	1	METS 3	010B	☐	10	
DGA032		SS009HA059	0	0	10/8/96 13:59	SO	1	METS 3	010B	☐	11	
DGA033		SS009HA012	0	0	10/8/96 14:05	SO	3	METS 10	010B	☒	12	Extra Samples for Lab QC MS/MSD
DGA034FD1		SS009HA012	0	0	10/8/96 14:05	SO	1	METS 10	010B	☐	13	Field Duplicate DUP
DGA035		SS009HA054	0	0	10/8/96 14:10	SO	1	METS 2	010B	☐	14	
DGA036		SS009HA055	0	0	10/8/96 14:13	SO	1	METS 2	010B	☐	15	
DGA037		SS009HA056	0	0	10/8/96 14:15	SO	1	METS 2	010B	☐	16	
DGA038		SS009HA013	0	0	10/8/96 12:50	SO	1	METS 4	010B	☐	17	
DGA039		SS009HA014	0	0	10/8/96 12:53	SO	1	METS 7	010B	☐	18	
DGA040		SS009HA020	0	0	10/8/96 14:47	SO	1	METS 7	010B	☐	19	
DGA041		SS009HA021	0	0	10/8/96 13:03	SO	1	METS 7A	010B	☐	20	
DGA042		SS009HA051	0	0	10/8/96 14:50	SO	1	METS 3	010B	☐	21	
DGA043		SS009HA052	0	0	10/8/96 14:52	SO	1	METS 3	010B	☐	22	
DGA044		SS009HA053	0	0	10/8/96 14:54	SO	1	METS 3	010B	☐	23	
DGA045		SS009HA022	0	0	10/8/96 14:56	SO	1	METS 7	010B	☐	24	
DGA046		SS009HA026	0	0	10/8/96 15:04	SO	1	METS 4	010B	☐	25	
DGA047		SS004SB017	0	0	10/8/96 14:58	SO	1	METS 1	010B	☐	26	

ok to analyze 10/14 ✓ 10/9/96 BA

5 this are for (medium) 10/9/96

QAL / REDDING RECEIPT	
QC LEVEL 2H	ICE Y
COC Y	TEMP 2°/3°C
CUST SEAL Y	PH SE N/A *
BUS UPS (FED-EX)	OTHER____

pH = 2 of HNO3 pres EQBLK

795 480

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA

Report Print Date: 10/8/96 16 31

Lab SDG Number: _____

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments

Sampled by: Lyndon D. Smoot Date and Time: 10-8-96 1635 Relinquished by: Lyndon D. Smoot Date and Time: 10-8-96 1745

Received by: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Received by LAB: Christine E Sutton Date and Time: 10/9/96 0945 Relinquished by: _____ Date and Time: _____

Received by LAB: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Shipped by: UPS BUS FED-EX HAND Othe _____ Shipping No: 033 2064456 033 2064 375

Remarks: Lab Do not use field QC samples (TB, EB, AB, FD) for Lab MS/MSD/DUP

795 481

Chain of Cust dy Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA

Report Print Date: 10/8/96 16:32

Lab SDG Number: RC2438 RC244

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments
DGA048		SS009HA009	0	0	10/8/96 13:48	SO	1	METS5 SPLP	000C	☐	1	
DGA049		SS009HA063	0	0	10/8/96 12:18	SO	1	DIFRS SPLP	000C	☐	2	
~~DGA050~~		~~SS009HA010~~	~~0~~	~~0~~	~~10/8/96 12:30~~	~~SO~~	~~3~~	~~DIFRS SPLP~~	000C	☒	3	Extra Samples for Lab QC. MS/MSD
~~DGA051FD1~~		~~SS009HA010~~	~~0~~	~~0~~	~~10/8/96 12:30~~	~~SO~~	~~1~~	~~DIFRS SPLP~~	000C	☐	4	Field Duplicate. DUP.
DGA052		SS009HA011	0	0	10/8/96 12:40	SO	3	METS10SPLP	000C	☒	5	Extra Samples for Lab QC.
~~DGA053FD1~~		~~SS009HA011~~	~~0~~	~~0~~	~~10/8/96 12:40~~	SO	1	METS10SPLP	000C	☐	6	Field Duplicate.
DGA054		SS009HA012	0	0	10/8/96 14:05	SO	1	METS10SPLP	000C	☐	7	
DGA055		SS009HA021	0	0	10/8/96 13:03	SO	1	METS7ASPLP	000C	☐	8	
~~DGA056~~		~~SS009HA007~~	~~0~~	~~0~~	~~10/8/96 13:17~~	~~SO~~	~~1~~	~~DIFRS SPLP~~	000C	☐	9	
DGA057		SS009HA071	0	0	10/8/96 13:40	SO	1	DIFRS SPLP	000C	☐	10	

Sampled by: Lynda D. Smoot Date and Time: 10-8-96 1635 Relinquished by: Lynda D. Smoot Date and Time: 10-8-96 1745

Received by: Date and Time: Relinquished by: Date and Time:

Received by LAB: Christine Elliott Date and Time: 10/9/96 0945 Relinquished by: Date and Time:

Received by LAB: Date and Time: Relinquished by: Date and Time:

Shipped by: UPS BUS (FED-EX) HAND Othe Shipping No: 0332064456

Remarks: Lab: Do not use field QC samples (TB, EB, AB, FD) for Lab MS/MSD/DUP. 0332064375

Cancel per Bob Goodson 10/9/96 BM

QAL / REDDING RECEIPT	
QC LEVEL 2H	ICE Y
COC Y	TEMP 2°/3°C
CUST SEAL Y	PH N/A
BUS UPS (FED-EX) OTHER	

0557

795 482

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

RC243

Sampling Group. DGA

Report Print Date 10/8/96 16:31

Lab SDG Number: RC2429

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments
DGA022EB1		FIELDQC	0	0	10/7/96 17:30	WQ	3	DIFR, EQMET	010B	☐	1	Equipment Blank TAKEN FROM SS SPOONS.
DGA023		SS009HA005	0	0	10/8/96 12:05	SO	1	METS 7	010B	☐	2	
DGA024		SS009HA006	0	0	10/8/96 12.09	SO	1	METS 7	010B	☐	3	
DGA025		SS009HA007	0	0	10/8/96 12.14	SO	1	METS 7	010B	☐	4	
DGA026		SS009HA008	0	0	10/8/96 13.45	SO	1	METS 7	010B	☐	5	
DGA027		SS009HA009	0	0	10/8/96 13:48	SO	1	METS 5	010B	☐	6	
DGA028		SS009HA010	0	0	10/8/96 12 30	SO	1	METS 7	010B	☐	7	
DGA029		SS009HA011	0	0	10/8/96 12:40	SO	1	METS 10	010B	☐	8	
DGA030		SS009HA057	0	0	10/8/96 13:55	SO	1	METS 3	010B	☐	9	
DGA031		SS009HA058	0	0	10/8/96 13 57	SO	1	METS 3	010B	☐	10	
DGA032		SS009HA059	0	0	10/8/96 13:59	SO	1	METS 3	010B	☐	11	
DGA033		SS009HA012	0	0	10/8/96 14 05	SO	3	METS 10	010B	☒	12	Extra Samples for Lab QC MS/MSD
DGA034FD1		SS009HA012	0	0	10/8/96 14 05	SO	1	METS 10	010B	☐	13	Field Duplicate DUP
DGA035		SS009HA054	0	0	10/8/96 14 10	SO	1	METS 2	010B	☐	14	1
DGA036		SS009HA055	0	0	10/8/96 14:13	SO	1	METS 2	010B	☐	15	2
DGA037		SS009HA056	0	0	10/8/96 14.15	SO	1	METS 2	010B	☐	16	3
DGA038		SS009HA013	0	0	10/8/96 12:50	SO	1	METS 4	010B	☐	17	4
DGA039		SS009HA014	0	0	10/8/96 12:53	SO	1	METS 7	010B	☐	18	5
DGA040		SS009HA020	0	0	10/8/96 14.47	SO	1	METS 7	010B	☐	19	6
DGA041		SS009HA021	0	0	10/8/96 13:03	SO	1	METS 7A	010B	☐	20	7
DGA042		SS009HA051	0	0	10/8/96 14:50	SO	1	METS 3	010B	☐	21	8
DGA043		SS009HA052	0	0	10/8/96 14:52	SO	1	METS 3	010B	☐	22	9
DGA044		SS009HA053	0	0	10/8/96 14 54	SO	1	METS 3	010B	☐	23	10
DGA045		SS009HA022	0	0	10/8/96 14:56	SO	1	METS 7	010B	☐	24	11
DGA046		SS009HA026	0	0	10/8/96 15.04	SO	1	METS 4	010B	☐	25	12
DGA047		SS004SB017	0	0	10/8/96 14:58	SO	1	METS 1	010B	☐	26	13

QAL / REDDING RECEIPT	
QC LEVEL 2H	ICE Y
COC Y	TEMP 2°/3°C
CUST SEAL Y	PH SE N/A
DHS UPS (FED-EX)	OTHER

795 483

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA

Report Print Date 10/8/96 16 31

Lab SDG Number: RC243

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments

Sampled by: Lynda D. Smoot Date and Time: 10.8.96 1635 Relinquished by: Lynda D. Smoot Date and Time: 10 8.96 1745

Received by: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Received by LAB: Christine Edwards Date and Time: 10/9/96 0945 Relinquished by: _____ Date and Time: _____

Received by LAB: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Shipped by: UPS BUS (FED-EX) HAND Othe _____ Shipping No: 033 2064 456

Remarks: Lab: Do not use field QC samples (TB, EB, AB, FD) for Lab MS/MSD/DUP 033 2064 375

795 484

19.00

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA Report Print Date 10/10/96 14:21 Lab SDG Number: RC264

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments
DGA060		SS009HA010	0.3	1	10/10/96 13:45	SO	1	DIFRS SPLP	000E	☐	1	
DGA061		SS009HA040	0.8	1	10/10/96 14:05	SO	1	DIFRS SPLP	000E	☐	2	MS/MSD ALSO FROM THIS SAMPLE

Sampled by: Glynda D. Smoot Date and Time: 10/10/96 1425 Relinquished by: Glynda D. Smoot Date and Time: 10/10/96 1700

Received by: Date and Time: Relinquished by: Date and Time:

Received by LAB: Christie Shelton Date and Time: 10/11/96 0930 Relinquished by: Date and Time:

Received by LAB: Date and Time: Relinquished by: Date and Time:

Shipped by: UPS BUS (FED-EX) HAND Othe Shipping No: 012 7411 443

Remarks: Lab Do not use field QC samples (TB, EB, AB, FD) for Lab MS/MSD/DUP.

QAL / REDDING RECEIPT	
QC LEVEL 2H	ICE Y
COC Y	TEMP 2°C
CUST SEAL Y	PH N/A
BUS UPS (FED-EX)	OTHER

C059

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

New # → RC390

Sampling Group: DGA

Report Print Date: 10/8/96 16:31

Lab SDG Number: RC242

OK to Analyze 10/10/96

→ Hold per Rob Creecy 10/9/96 - SR

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments
~~DGA022EB1~~		~~FIELDQC~~	~~0~~	~~0~~	~~10/7/96 17:30~~	~~WQ~~	~~3~~	~~DIFR EQMET~~ *	~~010B~~	☐	1	Equipment Blank TAKEN FROM SS SPOONS
DGA023		SS009HA005	0	0	10/8/96 12:05	SO	1	METS 7	010B	☐	2 RC390	RC390 -1
DGA024		SS009HA006	0	0	10/8/96 12:09	SO	1	METS 7	010B	☐	3	-2
DGA025		SS009HA007	0	0	10/8/96 12:14	SO	1	METS 7	010B	☐	4	-3
DGA026		SS009HA008	0	0	10/8/96 13:45	SO	1	METS 7	010B	☐	5	-4
~~DGA027~~		~~SS009HA009~~	~~0~~	~~0~~	~~10/8/96 13:48~~	~~SO~~	~~1~~	~~METS 5~~	~~010B~~	☐	~~6~~	~~—~~
~~DGA028~~		~~SS009HA010~~	~~0~~	~~0~~	~~10/8/96 13:30~~	~~SO~~	~~1~~	~~METS 7~~	~~010B~~	☐	~~7~~	-5
~~DGA029~~		~~SS009HA011~~	~~0~~	~~0~~	~~10/8/96 12:40~~	~~SO~~	~~1~~	~~METS 10~~	~~010B~~	☐	~~8~~	~~—~~
DGA030		SS009HA057	0	0	10/8/96 13:55	SO	1	METS 3	010B	☐	9	-6
DGA031		SS009HA058	0	0	10/8/96 13:57	SO	1	METS 3	010B	☐	10	-7
DGA032		SS009HA059	0	0	10/8/96 13:59	SO	1	METS 3	010B	☐	11	-8
~~DGA033~~		~~SS009HA012~~	~~0~~	~~0~~	~~10/8/96 14:05~~	~~SO~~	~~3~~	~~METS 10~~	~~010B~~	☒	~~12~~	~~Extra Samples for Lab QC MS/MSD~~
~~DGA034FB1~~		~~SS009HA013~~	~~0~~	~~0~~	~~10/8/96 14:05~~	~~SO~~	~~1~~	~~METS 10~~	~~010B~~	☐	~~13~~	~~Field Duplicate DUP~~
DGA035		SS009HA054	0	0	10/8/96 14:10	SO	1	METS 2	010B	☐	14	RC243-1 -9
DGA036		SS009HA055	0	0	10/8/96 14:13	SO	1	METS 2	010B	☐	15	2 -10
DGA037		SS009HA056	0	0	10/8/96 14:15	SO	1	METS 2	010B	☐	16	3 -11
DGA038		SS009HA013	0	0	10/8/96 12:50	SO	1	METS 4	010B	☐	17	4 -12
DGA039		SS009HA014	0	0	10/8/96 12:53	SO	1	METS 7	010B	☐	18	5 -13
DGA040		SS009HA020	0	0	10/8/96 14:47	SO	1	METS 7	010B	☐	19	6 -14
~~DGA041~~		~~SS009HA021~~	~~0~~	~~0~~	~~10/8/96 13:03~~	~~SO~~	~~1~~	~~METS 7A~~	~~010B~~	☐	~~20~~	~~—~~
DGA042		SS009HA051	0	0	10/8/96 14:50	SO	1	METS 3	010B	☐	21	8 -15
DGA043		SS009HA052	0	0	10/8/96 14:52	SO	1	METS 3	010B	☐	22	9 -16
DGA044		SS009HA053	0	0	10/8/96 14:54	SO	1	METS 3	010B	☐	23	10 -17
DGA045		SS009HA022	0	0	10/8/96 14:56	SO	1	METS 7	010B	☐	24	11 -18
DGA046		SS009HA026	0	0	10/8/96 15:04	SO	1	METS 4	010B	☐	25	12 -19
~~DGA047~~		~~SS004SB017~~	~~0~~	~~0~~	~~10/8/96 14:58~~	~~SO~~	~~1~~	~~METS 1~~	~~010B~~	☐	~~26~~	~~13~~ ——

SPLP - As

SPLP - As

SPLP - As

SPLP As

SPLP - As

Request for additional analysis -
SPLP Arsenic only - received 10/21/96

QAL / REDDING RECEIPT	
QC LEVEL 2H	ICE Y
COC Y	TEMP 2°/3°C
CUST SEAL Y	PH ~~SE~~ N/A *
BUS UPS (FED-EX)	OTHER

* PH = 2 of HNO3 prior EQBLK

2500

795 486

795 487

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA

Report Print Date: 10/8/96 16 31

Lab SDG Number: _____

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments

Sampled by: Lyndon D. Smoot Date and Time: 10-8-96 1635 Relinquished by: Lyndon D. Smoot Date and Time: 10-8-96 1745

Received by: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Received by LAB: Christine E Sutton Date and Time: 10/9/96 0946 Relinquished by: _____ Date and Time: _____

Received by LAB: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Shipped by: UPS BUS FED-EX HAND Othe _____ Shipping No: 033 2064456

Remarks: Lab Do not use field QC samples (TB, EB, AB, FD) for Lab MS/MSD/DUP. 033 2064 375

0053

Analysis

6/6/96

Analysis:	Description:	Preservation Code:	Bottle Count:	Lab ID:
ACTS	Alka,TDS,Chloride,Sulfate	CHIL	1	CHMR
AS	Arsenic	HNO3	1	CHMR
ASS	Arsenic in soil	CHL4	1	CHMR
CECP	Cat Exc Cap/Part Size	CHLB	1	CHMR
CN	Cyanide	NAOH	1	CHMR
CNS	Cyanide in soil	CHL4	1	CHMR
COD/AMMON	COD AND AMMONIA	H2SO	1	CHMR
DIFR	Dioxin/Furans	CHLL	2	CHMR
DIFRS	Dioxin/Furans in soil (8290)	CHLB	1	CHMR
DIFRS SPLP	DIDXIN,FURAN IN SOIL (SPLP)	CHL4	1	CHMR
EQMET	Sb,As,Ba,Be,Cd,Cr,Pb,Se,Ag,Tl.	HNO3	1	CHMR
FEC COLIF	FECAL COLIFORM	CHIL	1	CHMR
MET	Metals - total (unfilter)	HNO3	1	CHMR
METF	Metals-Filtered	HNO3	1	CHMR
METS	Metals - total in soil	CHL4	1	CHMR
METS 1	Lead	CHLB	1	CHMR
METS 10	Sb,As,Ba,Be,Cd,Cr,Pb,Se,Ag,Tl.	CHL8	1	CHMR
METS 2	Arsenic,Cadmium	CHL8	1	CHMR
METS 3	Arsenic,Cadmium,Lead	CHLB	1	CHMR
METS 4	Be,Se,Ag,Tl.	CHLB	1	CHMR
METS 5	Ba,Be,Se,Ag,Tl	CHL8	1	CHMR
METS 6	As,Be,Cd,Se,Ag,Tl.	CHLB	1	CHMR
METS 7	As,Ba,Cd,Cr,Pb,Se,Ag.	CHLB	1	CHMR
METS 7A	As,Be,Cd,Pb,Se,Ag,Tl.	CHL8	1	CHMR
METS10SPLP	Sb,As,Ba,Be,Cd,Cr,Pb,Se,Ag,Tl.	CHL8	1	CHMR
METS5 SPLP	Ba,Be,Se,Ag,Tl.	CHLB	1	CHMR
METS6 SPLP	As,Be,Cd,Se,Ag,Tl.	CHL8	1	CHMR
METS7ASPLP	As,Be,Cd,Pb,Se,Ag,Tl.	CHL8	1	CHMR
O AND G	OIL AND GREASE	H2SO	1	CHMR
PAH	Polynuclear Aromatic Hydrocarbons	C2.5	1	CHMR
PCB	PCB	C2.5	1	CHMR
PCBS	PCB in soil	CHL8	1	CHMR
PES	Pesticides in soil	CHL8	1	CHMR
PEST/PCB	Pesticides/PCB	C2.5	1	CHMR
RESID CL	RESIDUAL CHLORINE	CHIL	1	CHMR
SVCS	Semi vols. in soil	CHLB	1	CHMR
SVOC	Semivolatiles	C2.5	1	CHMR
SVOPNPS	Semivolatiles,Polynuclear Aromatics,Pest/PCB soil	CHIL	1	CHMR
TDP	TOTAL DISS PHOS	H2SO	1	CHMR
TOC	Total Organic Carbon	H2SO	1	CHMR
TOCS	Total Org Carb in soil	CHL2	1	CHMR
TPH	Total Petro Hydrocarb	H2SO	1	CHMR
TPHS	Total Petro HC's in soil	CHL4	1	CHMR

795 488

6559

Group Name:	Description:
CHEM	VOC, SVOC, MET, PEST, PCB, CN
CHEMBLK	VOC,SVOC,MET,TPH,PEST,PCB,CN
CHEMS	VOCS,SVCS,METS,TPHS,PES,PCBS,CNS
HA 1	METS 1
HA 10	METS 10
HA 10 SPLP	METS 10
HA 2	METS 2
HA 3	METS 3
HA 4	METS 4
HA 5	METS 5
HA 5 SPLP	METS 5
HA 6	METS 6
HA 6 SPLP	METS 6
HA 7	METS 7
HA 7A	METS 7A
HA 7A SPLP	METS 7A
HA DF SPLP	DIFRS-SPLP
HA DFS	DIFRS
HA EQBLNK	EQMET,DIFR

795 489

0660

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA Report Print Date: 10/8/96 16:26 Lab SDG Number: _____

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments
DGA001		SS009HA005	0	0	10/8/96 12:05	SO	1	DIFRS	000A	☐		
DGA002		SS009HA006	0	0	10/8/96 12:09	SO	1	DIFRS	000A	☐		
DGA003		SS009HA007	0	0	10/8/96 12:14	SO	1	DIFRS	000A	☐		
DGA004		SS009HA063	0	0	10/8/96 12:18	SO	1	DIFRS	000A	☐		
DGA005		SS009HA064	0	0	10/8/96 12:21	SO	1	DIFRS	000A	☐		
DGA006		SS009HA065	0	0	10/8/96 12:23	SO	1	DIFRS	000A	☐		
DGA007		SS009HA010	0	0	10/8/96 12:30	SO	1	DIFRS	000A	☐		
DGA008		SS009HA060	0	0	10/8/96 12:34	SO	1	DIFRS	000A	☐		
DGA009		SS009HA061	0	0	10/8/96 12:36	SO	1	DIFRS	000A	☐		
DGA010		SS009HA062	0	0	10/8/96 12:37	SO	1	DIFRS	000A	☐		
DGA011		SS009HA011	0	0	10/8/96 12:40	SO	1	DIFRS	000A	☐		
DGA012		SS009HA013	0	0	10/8/96 12:50	SO	1	DIFRS	000A	☐		
DGA013		SS009HA014	0	0	10/8/96 12:53	SO	1	DIFRS	000A	☐		
DGA014		SS009HA021	0	0	10/8/96 13:03	SO	3	DIFRS	000A	☒		Extra Samples for Lab QC. MS/MSD
DGA015FD1		SS009HA021	0	0	10/8/96 13:03	SO	1	DIFRS	000A	☐		Field Duplicate. DUP.
DGA016		SS009HA066	0	0	10/8/96 13:15	SO	1	DIFRS	000A	☐		
DGA017		SS009HA067	0	0	10/8/96 13:17	SO	1	DIFRS	000A	☐		
DGA018		SS009HA068	0	0	10/8/96 13:20	SO	1	DIFRS	000A	☐		
DGA019		SS009HA069	0	0	10/8/96 13:33	SO	1	DIFRS	000A	☐		
DGA020		SS009HA070	0	0	10/8/96 13:36	SO	1	DIFRS	000A	☐		
DGA021		SS009HA071	0	0	10/8/96 13:40	SO	1	DIFRS	000A	☐		

Sampled by: Glynda D. Smoot Date and Time: 10-8-96 1635 Relinquished by: Glynda D. Smoot Date and Time: 10-8-96 1745

Received by: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Received by LAB: Pike Date and Time: 10/9/96 12:00 Relinquished by: _____ Date and Time: _____

Received by LAB: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Shipped by: UPS BUS FED-EX HAND Othe _____ Shipping No: 400-5713-0382

Remarks: Lab: Do not use field QC samples (TB, EB, AB, FD) for Lab MS/MSD/DUP.

795 496

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA

Report Print Date: 10/8/96 16:26

Lab SDG Number: 795 491

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments
GA001		SS009HA005	0	0	10/8/96 12:05	SO	1	DIFRS	000A	☐		
GA002		SS009HA006	0	0	10/8/96 12:09	SO	1	DIFRS	000A	☐		
GA003		SS009HA007	0	0	10/8/96 12:14	SO	1	DIFRS	000A	☐		
GA004		SS009HA063	0	0	10/8/96 12:18	SO	1	DIFRS	000A	☐		
GA005		SS009HA064	0	0	10/8/96 12:21	SO	1	DIFRS	000A	☐		
GA006		SS009HA065	0	0	10/8/96 12:23	SO	1	DIFRS	000A	☐		
GA007		SS009HA010	0	0	10/8/96 12:30	SO	1	DIFRS	000A	☐		
GA008		SS009HA060	0	0	10/8/96 12:34	SO	1	DIFRS	000A	☐		
GA009		SS009HA061	0	0	10/8/96 12:36	SO	1	DIFRS	000A	☐		
GA010		SS009HA062	0	0	10/8/96 12:37	SO	1	DIFRS	000A	☐		
GA011		SS009HA011	0	0	10/8/96 12:40	SO	1	DIFRS	000A	☐		
GA012		SS009HA013	0	0	10/8/96 12:50	SO	1	DIFRS	000A	☐		
GA013		SS009HA014	0	0	10/8/96 12:53	SO	1	DIFRS	000A	☐		
GA014		SS009HA021	0	0	10/8/96 13:03	SO	3	DIFRS	000A	☒		Extra Samples for Lab QC. MS/MSD
GA015FD1		SS009HA021	0	0	10/8/96 13:03	SO	1	DIFRS	000A	☐		Field Duplicate. DUP.
GA016		SS009HA066	0	0	10/8/96 13:15	SO	1	DIFRS	000A	☐		
GA017		SS009HA067	0	0	10/8/96 13:17	SO	1	DIFRS	000A	☐		
GA018		SS009HA068	0	0	10/8/96 13:20	SO	1	DIFRS	000A	☐		
GA019		SS009HA069	0	0	10/8/96 13:33	SO	1	DIFRS	000A	☐		
GA020		SS009HA070	0	0	10/8/96 13:38	SO	1	DIFRS	000A	☐		
GA021		SS009HA071	0	0	10/8/96 13:40	SO	1	DIFRS	000A	☐		

Sampled by: Rhonda D. Stewart Date and Time: 10-8-96 1635 Relinquished by: Rhonda D. Stewart Date and Time: 10-8-96 1745

Received by: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Received by LAB: Pike Date and Time: 10/9/96 12:00 Relinquished by: _____ Date and Time: _____

Received by LAB: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Shipped by: UPS BUS FED-EX HAND Othe _____ Shipping No: 400-5713-0382

Remarks: Lab: Do not use field QC samples (TB, EB, AB, FD) for Lab MS/MSD/DUP.

001020

frmAnaly

10/6

Analysis:	Description:	Preservation Code:	Bottle Count:	Lab ID:
ACTS	Alka,TOS,Chloride,Sulfate	CHIL	1	CHMR
AS	Arsenic	HNO3	1	CHMR
ASS	Arsenic in soil	CHL4	1	CHMR
CECP	Cat Exc Cap/Part Size	CHL8	1	CHMR
CN	Cyanide	NAOH	1	CHMR
CNS	Cyanide in soil	CHL4	1	CHMR
COD/AMMON	COD AND AMMONIA	H2SO	1	CHMR
DIFR	Dioxin/Furans	CHLL	2	CHMR
DIFRS	Dioxin/Furans in soil (8290)	CHL8	1	CHMR
DIFRS SPLP	DIOXIN,FURAN IN SOIL (SPLP)	CHL4	1	CHMR
EQMET	Sb,As,Ba,Be,Cd,Cr,Pb,Se,Ag,Tl.	HNO3	1	CHMR
FEC COLIF	FECAL COLIFORM	CHIL	1	CHMR
MET	Metals - total (unfilter)	HNO3	1	CHMR
METF	Metals-Filtered	HNO3	1	CHMR
METS	Metals - total in soil	CHL4	1	CHMR
METS 1	Lead	CHL8	1	CHMR
METS 10	Sb,As,Ba,Be,Cd,Cr,Pb,Se,Ag,Tl.	CHL8	1	CHMR
METS 2	Arsenic,Cadmium	CHL8	1	CHMR
METS 3	Arsenic,Cadmium,Lead	CHL8	1	CHMR
METS 4	Ba,Se,Ag,Tl.	CHL8	1	CHMR
METS 5	Ba,Be,Se,Ag,Tl	CHL8	1	CHMR
METS 6	As,Be,Cd,Se,Ag,Tl.	CHL8	1	CHMR
METS 7	As,Ba,Cd,Cr,Pb,Se,Ag.	CHL8	1	CHMR
METS 7A	As,Ba,Cd,Pb,Se,Ag,Tl.	CHL8	1	CHMR
METS10SPLP	Sb,As,Ba,Be,Cd,Cr,Pb,Se,Ag,Tl.	CHL8	1	CHMR
METS5 SPLP	Ba,Be,Se,Ag,Tl.	CHL8	1	CHMR
METS6 SPLP	As,Be,Cd,Se,Ag,Tl.	CHL8	1	CHMR
METS7ASPLP	As,Ba,Cd,Pb,Se,Ag,Tl.	CHL8	1	CHMR
O AND G	OIL AND GREASE	H2SO	1	CHMR
PAH	Polynuclear Aromatic Hydrocarbons	C2.5	1	CHMR
PCB	PCB	C2.5	1	CHMR
PCBS	PCB in soil	CHL8	1	CHMR
PES	Pesticides in soil	CHL8	1	CHMR
PEST/PCB	Pesticides/PCB	C2.5	1	CHMR
RESID CL	RESIDUAL CHLORINE	CHIL	1	CHMR
SVCS	Semi vols. in soil	CHL8	1	CHMR
SVOC	Semivolatiles	C2.5	1	CHMR
SVOPNPS	Semivolatiles,Polynuclear Aromatics,Pest/PCB soil	CHIL	1	CHMR
TDP	TOTAL DISS PHOS	H2SO	1	CHMR
TOC	Total Organic Carbon	H2SO	1	CHMR
TOCS	Total Org Carb in soil	CHL2	1	CHMR
TPH	Total Petro Hydrocarb	H2SO	1	CHMR
TPHS	Total Petro HC's in soil	CHL4	1	CHMR

00103

795 492

795 493

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA Report Print Date: 10/10/96 14:21 Lab SDG Number: _____

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments
DGA058		SS009HA010	0.8	1	10/10/96 13:45	SO	1	DIFRS	000D	☐		
DGA059		SS009HA040	0.8	1	10/10/96 14:05	SO	1	DIFRS	000D	☐		

Sampled by: Hyder D. Smart Date and Time: 10/10/96 1425 Relinquished by: Hyder D. Smart Date and Time: 10.10.96 1700

Received by: [illegible] Date and Time: 10/11/96 (1250) Relinquished by: _____ Date and Time: _____

Received by LAB: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Received by LAB: _____ Date and Time: _____ Relinquished by: _____ Date and Time: _____

Shipped by: UPS BUS (FED-EX) HAND Othe _____ Shipping No: _____

Remarks: Lab: Do not use field QC samples (TB, EB, AB, FD) for Lab MS/MSD/DUP.

00355

Chain of Custody Form

Kelly Zone 4- SS009 - 111487.A0.CS

Sampling Group: DGA **Report Print Date:** 10/10/96 14:21 **Lab SDG Number:** _____

Sample ID	Site	Station ID	Begin Depth	End Depth	Date & Time Collected	Matrix	No of Bottles	Analysis Requested	Field Lot #	Lab QC	Lab Samp	Comments
DGA058		SS009HA010	0.8	1	10/10/96 13:45	SO	1	DIFRS	000D	☐		
DGA059		SS009HA040	0.8	1	10/10/96 14:05	SO	1	DIFRS	000D	☐		

Sampled by: Lyndon D. Smart **Date and Time:** 10/10/96 1425 **Relinquished by:** Lyndon D. Smart **Date and Time:** 10.10.96 1700

Received by: [signature] **Date and Time:** 10/11/96 (1250) **Relinquished by:** _____ **Date and Time:** _____

Received by LAB: _____ **Date and Time:** _____ **Relinquished by:** _____ **Date and Time:** _____

Received by LAB: _____ **Date and Time:** _____ **Relinquished by:** _____ **Date and Time:** _____

Shipped by: UPS BUS (FED-EX) HAND Othe _____ **Shipping No:** _____

Remarks: Lab: Do not use field QC samples (TB, EB, AB, FD) for Lab MS/MSD/DUP.

795 494

Subcontract D Il Report

Date: 11-OCT-96
Time: 04:25 pm

To: LKW
Date Due: 22-OCT-96 (Tuesday)

Batch: RC242
QA Level: 2
Batch Comments: None

Test Description	Reporting List ID	Method	Quick Turn Around Req Days	Date
Sample: RC242001 EB Matrix: Water	Sample Comments: None			
Collected: 07-OCT-96 05:30 pm	Client Sample ID: DGA022EB1	Client Sample Description: FIELD QC		
8290-GC/MS Dioxins/Furans	8290-LRD-KELLY	SW-846 8290	N	

795 495

09714600

Key: EB = Equipment Blank

Relinquished by (Date/Time): Christine E Sutton 10/15/96 1600

Received by (Date/Time): [illegible] 10/17/96 (800)

Airbill Number: 400-7043-8031

Send Report to: Quality Analytical Laboratories, 5090 Caterpillar Road, Redding, CA 96003. We can be reached at (916) 244-5227 or fax (916) 244-4109

Subcontract [illegible]l Report

[illegible]ate: 11-OCT-96
[illegible]ime: 05:25 pm

To: LKW
Date Due: 22-OCT-96 (Tuesday)

Batch: RC244
QA Level: 2
Batch Comments: None

Test Description	Reporting List ID	Method	Quick Turn Around Req Days Date
Sample: RC244002 FS Matrix: Soil Collected: 08-OCT-96 12:18 pm	Sample Comments: None Client Sample ID: DGA049	Client Sample Description: SS009HA063	
8290-GC/MS Dioxins/Furans	8290-LRD-KELLY	SW-846 8290	N
Sample: RC244010 FS Matrix: Soil Collected: 08-OCT-96 01:40 pm	Sample Comments: None Client Sample ID: DGA057	Client Sample Description: SS009HA071	
8290-GC/MS Dioxins/Furans	8290-LRD-KELLY	SW-846 8290	N

00315

795 496

Key: FS = Field Sample

Relinquished by (Date/Time): Christine E Sutton 10/15/96 1600 Received by (Date/Time): [illegible] 10/17/96 (1200) Airbill Number: 400-7043-8034.

Send Report to: Quality Analytical Laboratories, 5090 Caterpillar Road, Redding, CA 96003. We can be reached at (916) 244-5227 or fax (916) 244-4109

Subcontract Report

Date: 12-OCT-96
Time: 11:20 am

To: LKW
Date Due: 23-OCT-96 (Wednesday)

Batch: RC264
QA Level: 2
Batch Comments: None

Test Description	Reporting List ID	Method	Quick Turn Around Req Days Date
Sample: RC264001 FS Matrix: Soil Collected: 10-OCT-96 01:45 pm	Sample Comments: None Client Sample ID: DGA060	Client Sample Description: SS009HA010	
8290-GC/MS Dioxins/Furans	8290-LRD-KELLY	SW-846 8290	N
Sample: RC264002 FS Matrix: Soil Collected: 10-OCT-96 02:05 pm	Sample Comments: None Client Sample ID: DGA061	Client Sample Description: SS009HA040	
8290-GC/MS Dioxins/Furans	8290-LRD-KELLY	SW-846 8290	N
Sample: RC264002MS MSD Matrix: Soil Collected: 10-OCT-96 02:05 pm	Sample Comments: None Client Sample ID: DGA061MS	Client Sample Description: SS009HA040	
8290-GC/MS Dioxins/Furans	8290-LRD-KELLY	SW-846 8290	N
Sample: RC264002MSD MSD Matrix: Soil Collected: 10-OCT-96 02:05 pm	Sample Comments: None Client Sample ID: DGA061MSD	Client Sample Description: SS009HA040	
8290-GC/MS Dioxins/Furans	8290-LRD-KELLY	SW-846 8290	N

1951 497

00316

Key: FS = Field Sample; MSD = Matrix Spike Duplicate; MSO = Matrix Spike, Organic

Relinquished by (Date/Time): Christine Eludon 10/15/96 1600 Received by (Date/Time): 10/17/96 (1200) Airbill Number: 400-703-8084

Send Report to: Quality Analytical Laboratories, 5090 Caterpillar Road, Redding, CA 96003. We can be reached at (916) 244-5227 or fax (916) 244-4109

795 498

TAB

Appendix 1

795 499

APPENDIX I

Calculation of Reasonable Maximum Exposure Concentrations

APPENDIX I

Calculation of Representative Concentrations

The reasonable maximum exposure (RME) will be referred to in this appendix as the representative concentration (RC). The RC is the concentration considered representative of the contamination found at a site. The RC is used to evaluate compliance with the Risk Reduction Standards (RRSs) and to calculate the potential risk posed by a site. The RC is calculated in accordance with 30 TAC 335.553 (d) using EPA guidance for statistical analysis of groundwater monitoring data (EPA, 1989 and EPA, 1992a) where appropriate.

The specific statistical methodology used to evaluate the RC is described below. Section I.1 describes the methodology for small data sets (data sets with less than 10 analytical results). Section I.2 describes the basic tests and equations used to select the statistical protocol. Section I.3 describes the specific statistical tests used to evaluate the normality of the data set, thereby selecting the appropriate equations for calculating the RC. Section I.4 summarizes the Cohen's Method for adjusting the sample mean and sample standard deviation values in data sets with 15 to 50 percent nondetects. Section I.5 presents the references that serve as the basis of the statistical protocol.

I.1 The RC for Data Sets with Less than 10 Analytical Results

For data sets consisting of 9 or less analytical results the maximum detected concentration is used as the RC.

I.2 The RC for Data Sets with 10 or More Analytical Results

For data sets with 10 or more analytical results the methodology used for calculating the RC is described below. The methodology is presented graphically in Figure I-1.

I.2.1 Data Sets with less than 15 Percent Nondetects

For data sets containing less than 15 percent nondetects, statistical tests were conducted to evaluate the normality of sample sets because the parametric evaluation of the 95 percent UCL assumes the underlying data set is normally distributed. The untransformed and/or log transformed data were tested for fit to a normal or lognormal distribution. The 95 percent UCL values were calculated for untransformed or log transformed data sets. The RC was calculated as the 95 percent UCL value for the untransformed or log transformed data set, depending on the fit of the data to a normal or lognormal distribution, or the maximum detected value, whichever was smaller. For data sets with less than 15 percent nondetects, a proxy value of one-half the detection limit was substituted for nondetects. The Shapiro-Wilk ("W-test") was then used for data sets with 10 to 50 samples to determine if the data was normally or lognormally distributed (EPA, 1992a and Gilbert, 1987). For data sets with more than 50 samples, the D'Agostino test was used for determining the type of distribution (Gilbert, 1987).

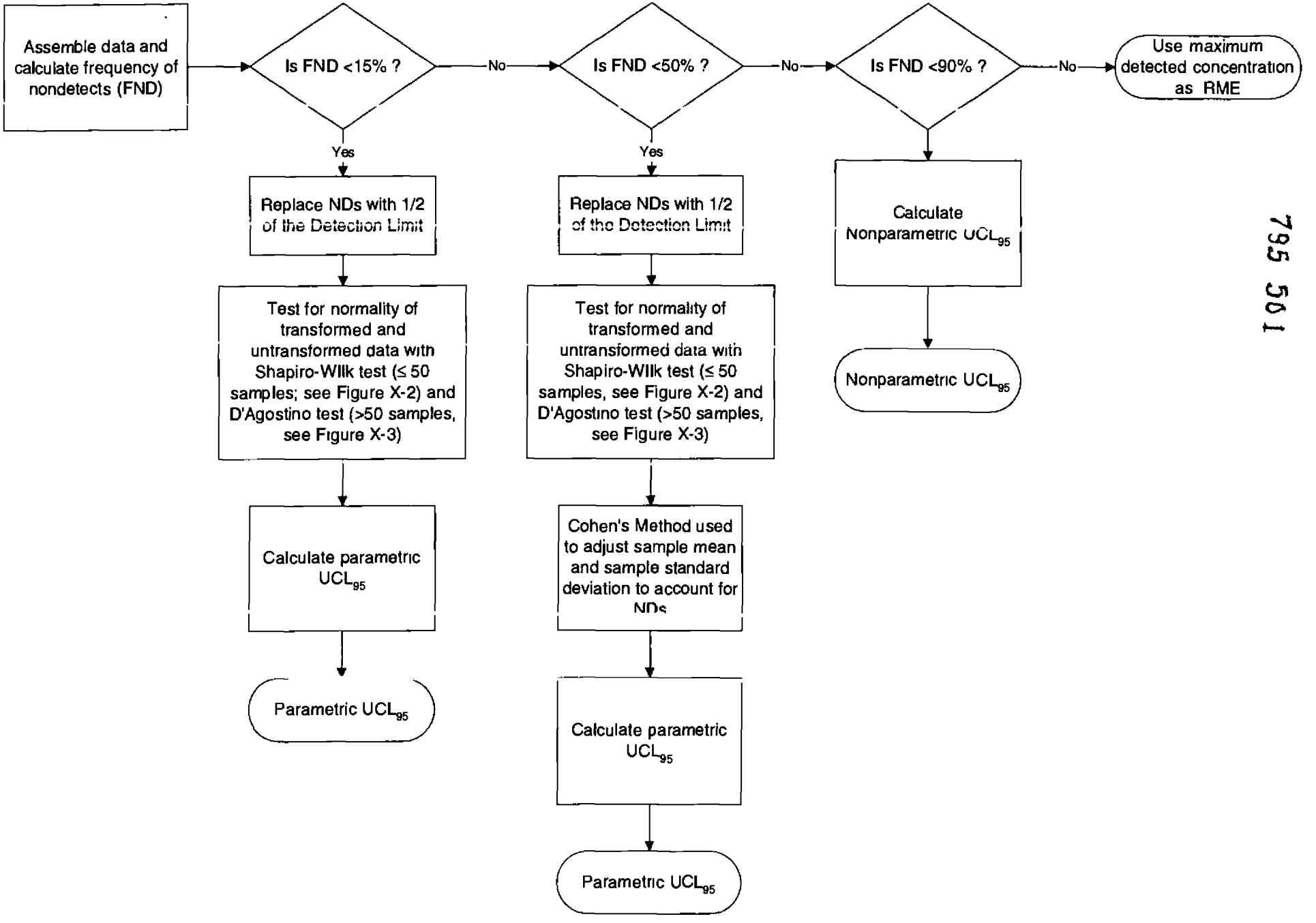


FIGURE I-1
Overview of Statistical Protocol

795 501

WDC972060003.VSD

If the data set was distributed normally, the 95 percent UCL was calculated using the following formula (EPA, 1992a):

$$UCL = \bar{x} + t\left(\frac{s}{\sqrt{n}}\right) \quad (1)$$

Where:

UCL = Upper confidence limit

$\bar{x}$ = mean of the untransformed data

t = Student-t statistic (e.g., from Table A2 published in Gilbert, 1987)

s = standard deviation of the untransformed data

n = number of samples

If the data set was distributed lognormally, the 95 percent UCL was calculated using the following formula (EPA, 1992a):

$$UCL = e^{\left(\bar{x}+0.5s^2+sH/\sqrt{n-1}\right)} \quad (2)$$

Where:

UCL = Upper confidence limit

e = constant (base of the natural log, equal to 2.718)

$\bar{x}$ = mean of the transformed data

s = standard deviation of the transformed data

H = H-statistic (Table A12 in Gilbert, 1987)

n = number of samples

If the W-test indicated that the data for data sets between 10 and 50 samples follow both normal and lognormal distributions, the distribution with the largest W-test statistic was selected, and the 95 percent UCL was calculated using either Equation 1 or Equation 2, as appropriate.

If the D'Agostino test indicated that the data of sets with more than 50 samples fit both normal and lognormal distributions, the assumption was that the data was distributed lognormally and the 95 percent UCL was calculated using log-transformed data and Equation 2. This assumption was based on Gilbert's *Statistical Methods for Environmental Pollution Monitoring* (1987) and the Resource Conservation and Recovery Act (RCRA) guidance for statistical analysis of data (EPA, 1989). These references state that, in general, environmental data must closely follow a lognormal distribution. The RCRA guidance explains that pollutant sources are randomly and repeatedly diluted by mixing in the environmental media, which leads mathematically to a lognormal distribution of concentrations. Therefore, the lognormal distribution is generally more appropriate as a default statistical model than the normal distribution.

If either test (W-test or D'Agostino) indicated that the data set deviated from both the normal and lognormal distributions, a nonparametric confidence interval was calculated according the methodology in the RCRA guidance (EPA, 1989) described in Section I.3.3 below.

All calculated 95 percent UCLs were compared to the maximum detected concentration, and if the 95 percent UCL exceeded the maximum detected concentration, then the maximum detected concentration was used as the RC.

I.2.2 Data Sets with between 15 and 50 Percent Nondetects

For data sets containing between 15 and 50 percent nondetects, the sample mean and sample standard deviation for the log transformed data were estimated using the Cohen's Method (EPA, 1989). Cohen's Method adjusts the sample mean and sample standard deviation to account for data below the detection limit. The Cohen's Method requires that the data are normally distributed (log transformed) and that the nondetect values are "censored" at the detection limit.

In order to perform the Cohen's Method on data sets in which the detection limit was not constant, the maximum detection limit (DL) for the nondetected results was used as the DL value in the calculations. The adjusted sample mean and adjusted sample standard deviation were calculated as described in Section I.4. The 95 percent UCL was calculated using either Equation 1 or Equation 2 above, as appropriate Using the adjusted mean and standard deviations, the RC was calculated as the lesser of the 95 percent UCL value or the maximum detected value.

I.2.3 Data Sets with more than 50 Percent Nondetects

If the data sets contained more than 50 percent nondetects and less than 90 percent nondetects, a nonparametric upper confidence interval (nonparametric UCI) was calculated (EPA, 1989). The nonparametric UCI is used for the median concentration (which equals the mean if the distribution is symmetric). If the data point selected as the UCI by the nonparametric method was a nondetect, the maximum detected value was used as the RC.

For data sets containing more than 90 percent nondetects, the maximum detected values for each analyte were used as the RC.

I.3 Statistical Tests for Calculating Sample Set Normality

The statistical tests used to evaluate the normality of the sample set are described below. The normality of the sample set was used for selecting the most representative equation for calculating the RC.

I.3.1 Shapiro-Wilk Test (10 to 50 Analytical Results)

The Shapiro-Wilk test (W-test) was used for data sets with 10 to 50 analytical results. The W-test is based on the assumption that if a set of data (or the natural log values of a data set) is normally distributed, the ordered values should be highly correlated with corresponding quantiles taken from a normal distribution. The W- test gives substantial

weight to evidence of non-normality in the tails of the distribution, where the robustness of statistical tests based on the normality assumption is most severely affected (EPA, 1992b).

The methodology used to calculate the RC based on the W-test is presented graphically in Figure I-2. The following steps were followed to calculate the W-test statistic:

1. Begin with the log transformed data set and order the data from smallest to largest concentration $\left(x_{(i)}\right)$ and from largest to the smallest concentration $\left(x_{(n-i+1)}\right)$; where n is the number of observations.
2. Compute the differences $x_{(n-i+1)} - x_{(i)}$.
3. Compute k as the greatest integer less than or equal to $n/2$, where n is the number of samples and k is used to identify the coefficients for the W-test.
4. Look up the coefficient a_{n-i+1} from Table A-1 in the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Addendum to Interim Final Guidance* (EPA, 1992b).
5. Compute the mean ($\bar{x}$) and standard deviation (SD) of the log transformed data set using the following formulas:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i \tag{3}$$

Where:

n = total number of observations
x_i = ith observation
$\bar{x}$ = mean of the log transformed data

and

$$SD = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}} \tag{4}$$

Where:

SD = standard deviation of the log transformed data.
x_i = ith observation.
$\bar{x}$ = mean of the log transformed data (from Equation 3).
n = total number of observations.

795 505

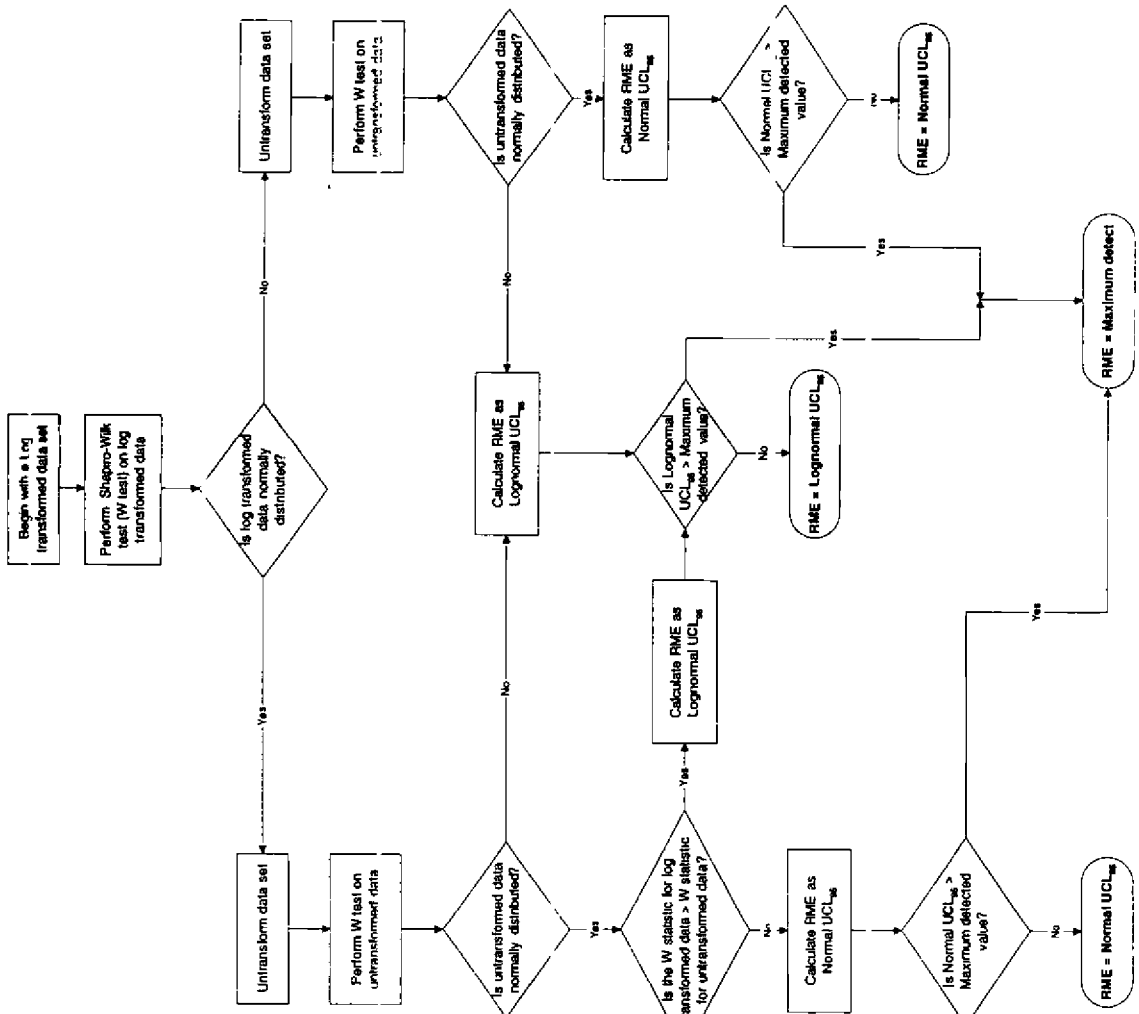


FIGURE I-2
Shapiro-Wilk test (W test) Protocol

6. Calculate the W-test statistic using the following equation:

$$W = \left[\frac{b}{SD\sqrt{n-1}}\right]^2 \quad (5)$$

and

$$b = \sum_{i=1}^{k} a_{n-i+1}\left(x_{(n-i+1)} - x_{(i)}\right) \quad (6)$$

Where:

SD = standard deviation of the log transformed data.
n = total number of observations.
a_{n-i+1} = coefficient for the W-test.

7. Compare the W-test statistic to the 5 percent critical value for sample size n in Table A-2 of *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Addendum to Interim Final Guidance* (EPA, 1992b). If the W-statistic was greater than the critical value, the data set was considered normally distributed.

8. Untransform the data values to check if the data is distributed normally. The same tests for normality were conducted on the untransformed data using the methods described above. If both the untransformed data set and log-transformed data set had W-statistics greater than the critical value, the distribution with the greater test statistic was selected for calculating the 95 percent UCL.

9. Calculate a nonparametric UCI according to methodology described in Section I.3.3. If the W-test indicated that the data set deviated from both the normal and lognormal distributions.

I.3.2 D'Agostino's Test (more than 50 Analytical Results)

The D'Agostino test was used to evaluate the normality of the data sets with more than 50 samples. The methodology used to calculate the RC based on the D'Agostino test is presented graphically in Figure I-3. The test uses the following steps (Gilbert, 1987):

1. Order the data from smallest to largest.

2. Compute statistic D from the following equation:

$$D = \frac{\sum_{i=1}^{n}\left[i - \frac{1}{2}(n+1)\right]x_{[i]}}{n^2 s} \quad (7)$$

where

$$s = \left[\frac{1}{n}\sum_{i=1}^{n}\left(x_i - \bar{x}\right)^2\right]^{\frac{1}{2}} \quad (8)$$

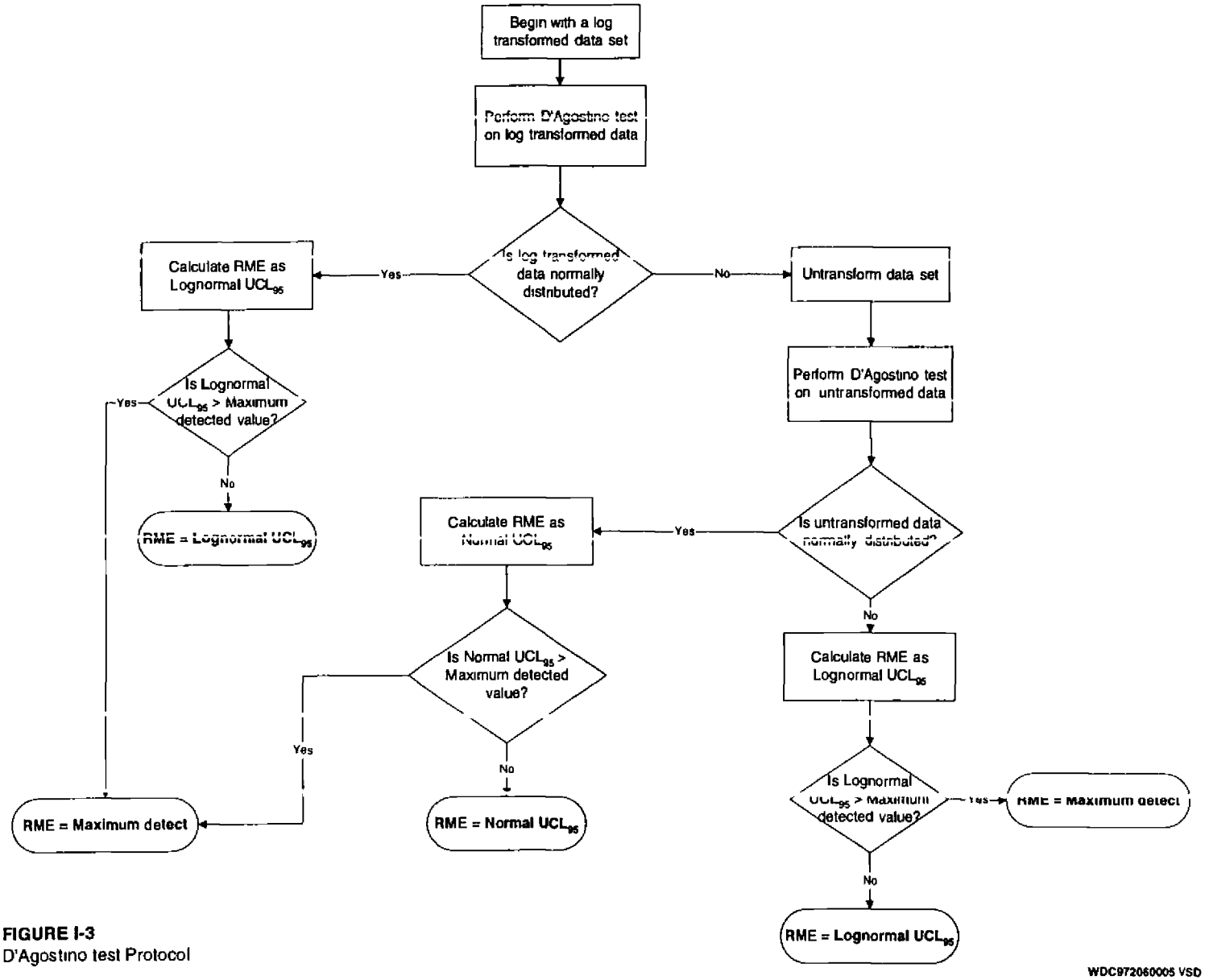


FIGURE I-3
D'Agostino test Protocol

and

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i \qquad (9)$$

3. Transform the statistic D to the statistic Y by computing:

$$Y = \frac{D - 0.28209479}{0.02998598 / \sqrt{n}} \qquad (10)$$

If n is large and the data are drawn from a normal distribution, then the expected value of Y is zero. For nonnormal distributions, Y will tend to be either less than or greater than zero, depending on the particular distribution. This fact necessitates a two-tailed test.

If Y is less than the $\alpha/2$ (i.e., 0.025) quantile or greater than the 1-$\alpha/2$ (i.e., 0.975) quantile of the distribution of Y (Table A8 in Gilbert, 1987), the untransformed data do not fit a normal distribution at the 95% significance level (or α = 0.05)

If the data did not follow a normal distribution, then they are transformed by taking the natural logarithm of each concentration value to check if the data were distributed lognormally. The same tests for distribution fit were conducted on the log-transformed data using the methods described above. If the test indicated the untransformed data set and log transformed data set did not follow a normal distribution, a nonparametric upper confidence interval was found (Section I.3.3).

I.3.3 Nonparametric Upper Confidence Interval (50 to 90 Percent Nondetects)

A nonparametric UCI was calculated for data sets containing between 50 and 90 percent nondetects. The steps described below were followed for determining the nonparametric UCI:

1. Order the n data from by value from least to greatest denoting the data by $x_1 \leq x_2 \leq x_3 \leq \ldots \leq x_n$ where n is the total number of observations.

2. Calculate M from the following equation:

$$M = n/2 + 1 + Z_{0.99}\sqrt{(n/4)} \qquad (11)$$

Where:

n = number of observations
$Z_{0.99}$ = 99th percentile from the normal distribution (Table 4, Appendix B in EPA, 1989)

3. Take values of the Mth data point $\left[X_{(M)}\right]$ as the upper confidence interval.

4. Use the maximum detected value in the UCI if M was a nondetect.

I.4 Cohen's Method (15 to 50 Percent Nondetects)

Cohen's Method was used to adjust the sample mean and standard deviation to account for data below the detection limit in sample sets with between 15 and 50 percent nondetects. The method is a reliable statistical test in instances where less than 50 percent of the data are below the detection limit, where the data are not overly skewed, and where the data are first log-transformed (because the procedure is based on the assumption that the underlying data are distributed normally).

The adjusted sample mean and standard deviation were calculated by using the following steps:

1. The sample variance (S_d^2) of the detected concentrations was calculated using the following equation:

$$S_d^2 = \frac{\sum_{i=1}^{m}(x_i - \bar{x}_d)^2}{m-1} \qquad (12)$$

Where:

S_d^2 = sample variance
m = number of data points above the detection limit
x_i = i[th] constituent value above the detection limit
$\bar{x}_d$ = mean of the detected concentrations

2. Subsequently, two parameters, h and γ, were calculated as follows:

$$h = \frac{(n-m)}{n} \qquad (13)$$

and

$$\gamma = \frac{S_d^2}{(\bar{x}_d - DL)^2} \qquad (14)$$

Where:

n = total number of observations (above and below the detection limit)
m = number of data points above the detection limit (DL)

Note: If the DL value was not the same for all nondetects in the data set, the maximum detection limit among the nondetects was used as the DL value.

3. The values then were used for determining the value of the parameter λ, obtained from Table A-5 in the EPA guidance document, (EPA, 1992b).

4. The corrected sample mean, which accounts for the data below the detection limit, then was estimated as follows:

$$\overline{X} = \overline{x}_d - \lambda\ (\overline{x}_d - DL) \tag{15}$$

5. The corrected sample standard deviation, which accounts for the data below the detection limit, also was estimated:

$$S = (S_d^2 + \lambda(\overline{x}_d - DL)^2)^{1/2} \tag{16}$$

The adjusted values of $\overline{X}$ and S were used in the procedure for calculating the 95 percent UCL (Section I.2.1).

I.5 References

EPA, 1989. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Interim Final Guidance.* Office of Solid Waste Management Division. PB89-151047. April.

EPA, 1992a. *Supplemental Guidance to RAGS: Calculating the Concentration Term.* Office of Solid Waste and Emergency Response. Publication 9285.7-081. May.

EPA, 1992b. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Addendum to Interim Final Guidance.* Office of Solid Waste, Permits and State Programs Division. June.

Gilbert, 1987. R.O. Gilbert. *Statistical Methods for Environmental Pollution Monitoring.* Van Nostrand Reinhold. New York.

795 511

TAB

Appendix J

APPENDIX J

Development of Risk Reduction Standard No. 2 Soil/Air Inhalation and Ingestion Standard—Industrial

795 513

APPENDIX J

Development of Risk Reduction Standard No. 2 Soil/Air Inhalation and Ingestion Standard—Industrial (SAI-Ind)

In developing the Risk Reduction Standard No. 2 Soil MSC (Soil/Air Inhalation and Ingestion Standard—Industrial, SAI-Ind) criteria, potential exposure pathways other than direct soil ingestion and inhalation of volatiles and particulates were evaluated as indicated in 30 TAC335.556(b). For Site SS009, the chemical nature of several of the COPCs, specifically arsenic and the PCDDs/PCDFs, indicated that potential exposure to the identified industrial worker population via the dermal absorption route could be of significance. Therefore, the SAI-Ind criteria were developed using the methodology described in 30 TAC 335.559(g) with the addition of a dermal absorption term. The following equations were used to calculate the SAI-Ind values. Parameters definitions are provided in Table J-1. Toxicity criteria used in the equations are provided in Table J-2.

The soil MSC (SAI-Ind) for Worker Ingestion, Dermal Contact, and Inhalation of volatiles and particulate; Carcinogenic Effects, in units of milligram per kilogram (mg/kg):

$$MSC = \frac{TR \times 286.6}{\left[\left(\left(5\times10^{-5}\right)\times SF_o\right)+\left(\left(4.32\times10^{-4}\right)\times SF_o\times ABS\right)+\left(SF_i\times\left({}^{20}/_{VF}\right)+\left(4.3\times10^{-9}\right)\right)\right]}$$

is derived from the following expression:

$$MSC = \frac{TR \times BW \times AT_c \times 365\,{}^{days}/_{yr}}{\left[EF\times ED\times\left(SF_o\times10^{-6}\,{}^{kg}/_{mg}\times IR_{soil}\right)+\left(SF_o\times10^{-6}\,{}^{kg}/_{mg}\times SA\times ABS\times AF\right)+\left(SF_i\times IR_{air}\times\left({}^{1}/_{VF}+{}^{1}/_{PEF}\right)\right)\right]}$$

The soil MSC (SAI-Ind) for Worker Ingestion, Dermal Contact, and Inhalation of volatile and particulates; Systemic Effects, in units of milligram per kilogram (mg/kg):

$$MSC = \frac{102.2}{\left[\left({}^{5\times10^{-5}}/_{RfD_o}\right)+\left(\left({}^{4.32\times10^{-4}}/_{RfD_o}\right)\times ABS\right)+\left(\left({}^{1}/_{RfD_i}\right)\times\left({}^{20}/_{VF}\right)+\left(4.3\times10^{-9}\right)\right)\right]}$$

is derived from the following expression:

$$MSC = \frac{THI \times BW \times AT_{nc} \times 365\,{}^{days}/_{yr}}{\left[EF\times ED\times\left(\left({}^{1}/_{RfD_o}\right)\times10^{-6}\,{}^{kg}/_{mg}\times IR_{soil}\right)+\left(\left({}^{1}/_{RfD_o}\right)\times10^{-6}\,{}^{kg}/_{mg}\times SA\times ABS\times AF\right)+\left(\left({}^{1}/_{RfD_i}\right)\times IR_{air}\times\left({}^{1}/_{VF}+{}^{1}/_{PEF}\right)\right)\right]}$$

795 514

Table J-1
Parameters Used in the Calculation of the SAI-Ind

Parameters	Definitions (Units)	Values (a)
MSC	Medium Specific Concentration (mg/kg)	chemical-specific
TR	Target excess individual lifetime cancer risk (unitless)	10^{-6} for Class A and B carcinogens; 10^{-5} for Class C carcinogens
THI	Target hazard index (unitless)	1.0
SF_o	Oral cancer slope factor ((mg/kg-day)$^{-1}$)	chemical-specific, See Table J-2
SF_i	Inhalation cancer slope factor ((mg/kg-day)$^{-1}$)	chemical-specific, See Table J-2
RfD_o	Oral chronic reference dose ((mg/ kg-day)$^{-1}$)	chemical-specific , See Table J-2
RfD_i	Inhalation chronic reference dose ((mg/kg-day)$^{-1}$)	chemical-specific, See Table J-2
BW	Adult body weight (kg)	70 kg
AT_c	Averaging time for carcinogens (yr)	70 yr
AT_{nc}	Averaging time for systemic toxicants (yr)	25 yr
EF	Exposure frequency (days/yr)	250 days/yr
ED	Exposure duration (yr)	25 yr
IR_{soil}	Workday soil ingestion rate (mg/day)	50 mg/day
IR_{air}	Daily indoor inhalation rate (m^3/day)	20 m^3/day
ABS	Dermal relative absorption fraction (unitless)	chemical-specific (c)
AF	Adherence factor (soil-to-skin) (mg/cm^2-event)	0.12
PEF	Particulate emission factor (m^3/kg)	4.63×10^9 m^3/kg
SA	Skin Surface Area	3600 cm^2 (b)
VF	Soil to air volatilization factor (m^3/kg)	chemical-specific

(a) Values from 30 TAC 335.553

(b) SA includes skin surface area of forearms, head and hands (50th percentile for each body part, adult males) from Exposure Factors Handbook, U.S. EPA. Office of Research and Development, Washington DC, EPA/600/P-95/002A. June 1995. Review Draft.

(c) ABS values from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Table II-3, pg 245 [arsenic = 0.05, mercury = 0.10, other metals = 0.01, PCDDs/PCDFs = 0.03].

795 515

TABLE J-2

Toxicity Values for Chemicals of Potential Concern

Parameter	WOE	Slope Factor Oral	Source	Slope Factor Inhalation	Source	Reference Dose Oral	Source	Reference Dose Inhalation	Source
ALUMINUM		NA	NA	NA	NA	1 00E+00	E	NA	NA
ANTIMONY	D	NA	NA	NA	NA	4 00E-04	I	NA	NA
ARSENIC	A	1 50E+00	I	1 51E+01	I	3 00E-04	I	NA	NA
BARIUM	D	NA	NA	NA	NA	7.00E-02	I	1 43E-04	HA
BERYLLIUM	B2	4 30E+00	I	8 40E+00	I	5 00E-03	I	NA	NA
CADMIUM	B1	NA	NA	6 30E+00	I	5 00E-04	I	5 71E-05	W
CHROMIUM, TOTAL	A	NA	NA	4 20E+01	IC	5 00E-03	IC	5 71E-07	WC
COBALT		NA	NA	6.00E-02	E	NA	NA	NA	NA
COPPER	D	NA	NA	NA	NA	4 00E-02	E	NA	NA
LEAD	B2	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE		NA	NA	NA	NA	4 20E-01	IM	1 43E-05	I
NICKEL	D	NA	NA	NA	NA	2 00E-02	I	NA	NA
SELENIUM	D	NA	NA	NA	NA	5 00E-03	I	NA	NA
SILVER	D	NA	NA	NA	NA	5 00E-03	I	NA	NA
THALLIUM	D	NA	NA	NA	NA	8 00E-05	I	NA	NA
VANADIUM	NA	NA	NA	NA	NA	7 00E-03	H	NA	NA
ZINC	D	NA	NA	NA	NA	3 00E-01	I	NA	NA
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	B2	1.56E+05	H	1 16E+05	H	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	B2	7 80E+04	TEF	5 80E+04	TEF	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	B2	7 80E+03	TEF	5 80E+03	TEF	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	B2	7 80E+04	TEF	5 80E+04	TEF	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-p-DIOXIN	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-p-DIOXIN	B2	1 56E+04	TEF	1.16E+04	TEF	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA

795 516

TABLE J-2

Toxicity Values for Chemicals of Potential Concern

Parameter	WOE	Slope Factor Oral	Source	Slope Factor Inhalation	Source	Reference Dose Oral	Source	Reference Dose Inhalation	Source
2,3,4.6,7,8-HEXACHLORODIBENZOFURAN	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3.7,8,9-HEXACHLORODIBENZOFURAN	B2	1.56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3 4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	B2	1 56E+03	TEF	1.16E+03	TEF	NA	NA	NA	NA
1,2,3 4,6,7,8-HEPTACHLORODIBENZOFURAN	B2	1 56E+03	TEF	1 16E+03	TEF	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	B2	1.56E+03	TEF	1 16E+03	TEF	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	B2	1 56E+02	TEF	1 16E+02	TEF	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	B2	1 56E+02	TEF	1 16E+02	TEF	NA	NA	NA	NA

Notes:

E EPA-NCEA Regional Support provisional value (from EPA Region III Risk Based Concentration Table)
I Integrated Risk Information System (IRIS, 1996).
IC IRIS value for Chromium VI used
IM IRIS value for Manganese based on modifying factor of 3 for nondietary exposures
H Health Effects Assessment Tables Alternate (HEAST, 1995).
NA Not Available
TEF Slope factor adjusted using the toxicity equivalent factors for TCDD.
W Withdrawn from IRIS Value listed in HEAST is used
WC Value for Chromium III was withdrawn from IRIS The Chromium III value listed in HEAST is used
WOE Weight of evidence

795 517

TAB

Appendix K

795 518

APPENDIX K

TNRCC and EPA Correspondence

795 519

To: Program Areas which Utilize the Risk Reduction Rules and Site Specific Risk Analysis

Date: May 19, 1995

From: Dan Pearson
Executive Director

Subject: Arsenic Soil Cleanup Standards

As a result of the TNRCC's experience at the Hi-Yield Superfund Site, it has become apparent there is considerable controversy regarding cleanup standards for arsenic. The TNRCC has Risk Reduction Rules which set a goal for risk due to residual contamination after cleanup ($1x10^{-6}$). When this goal is translated into a cleanup level for arsenic in soil, the result is .3 to .4 parts per million (ppm). This level of arsenic is below common background levels of arsenic in soil.

In such cases, the Risk Reduction Rules allow an alternate cleanup level of the background concentration. These background levels can be quite low (~2.6 ppm) when compared to cleanup levels utilized by other agencies such as EPA and other state environmental agencies.

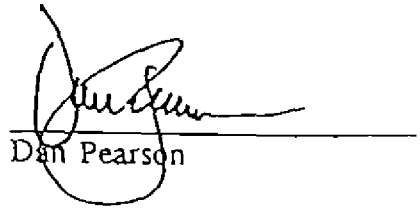
I have asked the Risk Reduction Implementation Committee to examine this issue and report back to me with a recommendation for an appropriate cleanup level for arsenic after careful examination of the relevant science and literature. I expect that this will take some time.

RECEIVED
MAY 23 1995
INDUSTRIAL & HAZARDOUS WASTE

In the meanwhile, the TNRCC must move forward and address sites contaminated with arsenic.

Therefore, in the interim, I am directing the various program areas that must make decisions in regard to arsenic contamination, to utilize a remediation cleanup level of 20 ppm for arsenic in soils in residential areas, based on soil exposure only. If other considerations, such as potential groundwater contamination, indicate that a lower level may be appropriate, those analyses should be followed rather than this directive. The EPA has used 20 ppm as a removal action level.

Until the Risk Reduction Implementation Committee presents its recommendations this value will serve as an adequately protective concentration in the meantime.



Dan Pearson

Barry R. McBee, *Chairman*
R. B "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Dan Pearson, *Executive Director*

795 520

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

September 13, 1996

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Edward Roberson
Environmental Engineer
SA-ALC/EMRO
305 Tinker Drive
Building 305, Suite 2
Kelly AFB, Texas 78241-5915

Re: Kelly Air Force Base (Kelly AFB), San Antonio, Texas
Solid Waste Registration No. 31750; EPA ID No. TX2571724333
Review of Investigation Documentation for Installation Restoration Program (IRP) Site S-7

Dear Mr. Roberson:

The Texas Natural Resource Conservation Commission (TNRCC) Federal Facilities Team staff has completed a review of Kelly AFB's submittal entitled Information for IRP Site S-7, dated September 9, 1996, and other documents relating to the above-referenced site. It is our understanding that Kelly AFB wishes to close IRP Site S-7 in order to lease portions of the site, as per United States Air Force requirements.

As stated in available documents, an estimated maximum of 5,000 55-gallon drums containing Herbicide Blue and Agent Orange (herbicides 2,4-D and 2,4,5-T) were stored over an area of approximately 0.5 acres for at least four (4) years during the early 1970's. Interviews with Kelly AFB personnel indicate some product released from the drums due to temperature-driven expansion and contraction. To date, several shallow soil samples have been collected from an area of approximately 28 acres, including the storage area, and analyzed for dioxins, a class of chemicals known to be present in herbicides 2,4-D and 2,4,5-T. The analyses indicate a maximum concentration of dioxin in soil of 117 parts per trillion (ppt) (reported as toxicity equivalences (TEQ) relative to 2,3,7,8-tetrachlorodibenzo-para-dioxin).

The conclusions offered in Kelly AFB's September 9, 1996 submittal suggest that the dioxin contamination at IRP Site S-7 may result from the application of herbicide to the surface of the site to control unwanted plant growth. Documentation or references to known past practices to support such a conclusion, however, are not provided. A United States Environmental Protection Agency

795 521

Re: Kelly Air Force Base (Kelly AFB), San Antonio, Texas
Solid Waste Registration No. 31750; EPA ID No. TX2571724333
Review of Investigation Documentation for Installation Restoration Program Site S-7

draft guidance document that evaluates several soil sampling studies of world-wide background dioxin concentrations indicates there is an average background dioxin concentration in soil in the United States of 8 ppt TEQ. Kelly AFB may use this value as a background concentration for dioxin TEQ at IRP Site S-7, or conduct a background study to derive a different background value.

Once a background dioxin concentration in soil has been established, Kelly AFB should evaluate the need for additional investigation at IRP Site S-7 to determine the extent of detected dioxin and/or other contamination exceeding action levels. Please note that the method detection limits used in the analyses to date should especially be taken into consideration in evaluating the need for further investigation. Also, samples for dioxin analysis should be collected from the upper 3 to 4 inches of the soil column to reduce dilution of the sample.

Kelly AFB shall submit to the TNRCC Federal Facilities Team within 10 days of receipt of this letter notification that Kelly AFB will either use the above-mentioned background value for dioxin or establish a facility-specific background value. If the literature value for background is selected, the notification must be accompanied by a brief workplan for TNRCC approval detailing the scope of an investigation designed to determine the extent of detected dioxin (and possibly other) contamination that exceeds action levels. If Kelly AFB elects to conduct a facility-specific background investigation, the notification must be accompanied by a workplan for TNRCC approval to perform such an investigation

Should you have any questions regarding this matter please contact Gordon Banner of the Federal Facilities Team at 512/239-5914, Mail Code MC-127.

Sincerely,

Paul S. Lewis

Paul S. Lewis
Manager, Corrective Action Section
Industrial and Hazardous Waste (I&HW) Division

PSL:gb

cc: Craig Meppen, TNRCC Region 13 Office, San Antonio
Richard Ehrhart, EPA Region VI
Tennie Larson, TNRCC I&HW Division, Corrective Action Section

Barry R. McBee, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Dan Pearson, *Executive Director*

795 522

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

February 27, 1997

Mr. Edward Roberson
Environmental Engineer
SA-ALC/EMRO
305 Tinker Drive
Building 305, Suite 2
Kelly AFB, Texas 78241-5915

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Re: Kelly Air Force Base (Kelly AFB), San Antonio, Texas
Solid Waste Registration No. 31750; EPA ID No. TX2571724333
Response to Kelly AFB's Concerns on Review of IRP Site SS009 [S-7] Closure Report, dated November 1996, and Meetings of December 13, 1996 and January 30, 1997

Dear Mr. Roberson:

The Texas Natural Resource Conservation Commission Federal Facilities Team staff (TNRCC) has conducted a partial review of the above-referenced document (Closure Report), received from Kelly AFB on November 26, 1996. The Closure Report was reviewed during meetings between Kelly AFB personnel and the TNRCC on the above-referenced dates. As a result of these discussions, Kelly AFB has requested clarification from the TNRCC regarding the issues of arsenic response concentrations and the herbicide release area at Installation Restoration Project Site SS009 (also known as IRP Site S-7; hereafter referred to as SS009). Following are Kelly AFB's concerns, as understood by the TNRCC, and the TNRCC's responses.

1) Does the TNRCC Executive Director's May 19, 1995 Interoffice Memorandum entitled Arsenic Soil Cleanup Standards (IOM) apply to closure standards at SS009?

The IOM states that 20 parts per million (ppm) is to be used as a "remediation cleanup level" for arsenic for "soil exposure only" in residential areas. In light of the issues raised in the IOM, the Industrial and Hazardous Waste Division, Corrective Action Section has allowed the use of 20 ppm as a replacement for the Soil/Air and Ingestion Standard (provided in 30 Texas Administrative Code § 335.568) for arsenic for industrial property. Site closure at levels higher than 20 ppm for surface exposure would require a Risk Reduction Standard (RRS) No.3 approach. The RRS No.1 goal for arsenic in soil is the background level established for Kelly AFB (8.5 ppm). Areas with concentrations between 8.5 and 20 ppm would require closure under RRS No.2

Re: Response to Kelly AFB's Concerns on Review of IRP Site SS009 [S-7] Closure Report, dated November 1996, and Meetings of December 13, 1996 and January 30, 1997

unless remediated to the RRS No.1 goal.

2) Is the former SS009 an acceptable herbicide release area with respect to the calculation of contaminant levels using the Upper Confidence Limit on the Mean (UCL)?

Kelly AFB has proposed using the formerly designated location of SS009 as the herbicide release area. Moreover, Kelly AFB has proposed that a single UCL be calculated for the entire SS009 area (producing a UCL of approximately 18 ppm, according to Kelly AFB), which would allow for closure of the entire area of the former SS009 under RRS No.2.

It should be noted, first, that former SS009 is a 6 to 7 acre rectangular parcel situated within the larger area that has been investigated in association with the herbicide storage. In response to recently acquired information, however, Kelly AFB revised the SS009 boundary to more accurately coincide with the extent of the area where the drums of herbicides were known to have been stored and to have leaked. The current SS009 area is a half-acre parcel located within the former SS009. Below are points which strongly indicate use of a single UCL for the entire former SS009 to be inappropriate.

- It is now known that the former SS009 was not the herbicide storage area, but rather an estimated storage area that would now serve as a somewhat arbitrary release area.

- Figures 4.4 and 4.6 in the Closure Report (Arsenic Concentrations and Contours in Surface Soil) appear to confirm that the extent of the arsenic (herbicide) release very closely approximates the area of the current SS009 (ie., the known herbicide storage area). Data from inside the half-acre storage area range between 20 and 226 ppm and produce clearly concentric concentration contours around two centers or "hot spots." Data from outside the storage area range between 2.6 and 22.2 ppm and produce no discernable pattern, with high and low concentrations scattered throughout the investigation area.

- While it is possible that the arsenic detected at concentrations above background (>8.5 ppm) outside the storage area may have migrated from the "hot spots" via wind or storm runoff, it should also be noted that it is suspected by Kelly AFB that herbicides were applied to control plant growth across the former SS009 area. Since these applied herbicides may have contained arsenic it cannot be readily concluded that arsenic found outside the storage area in excess of background came from the arsenic released from the herbicide drums.

795 524

Re: Response to Kelly AFB's Concerns on Review of IRP Site SS009 [S-7] Closure Report, dated November 1996, and Meetings of December 13, 1996 and January 30, 1997

- Use of a single UCL for the entire former SS009 would allow for closure of the entire former SS009 under RRS No.2, effectively ignoring the significantly large area (approximately 0.6 acres) that exceeds the RRS No.2 goal and that, when considered separately, apparently requires some remediation to attain closure even under RRS No.3.

Given the above points, the TNRCC does not concur with Kelly AFB's proposal to calculate contaminant UCLs for the entire former SS009. The TNRCC recommends that if contaminant UCLs are used they should be calculated only for the obviously discernable release area, which, in this case, appears to approximately coincide with both the known storage/release area (current SS009) and the area containing arsenic concentrations in excess of the RRS No.2 goal.

Should you have any questions regarding this matter please contact Mr. Gordon Banner of the Federal Facilities Team at 512/239-5914, Mail Code MC-127.

Sincerely,

Paul S. Lewis

Paul S. Lewis
Manager, Corrective Action Section
Industrial and Hazardous Waste (I&HW) Division

PSL:gb

cc: Ms. Camille Hueni, EPA Region VI, Dallas
Mr. Thomas Edwards, Texas Attorney General's Office, Austin
Mr. Craig Meppen, TNRCC Region 13 Office, San Antonio
Mr. Parker Wilson, TNRCC Legal Division, Hazardous Waste/Superfund Section
Ms. Tennie Larson, TNRCC I&HW Division, Corrective Action Section

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

795 525

AUG 25 1997

Mr. Ed Roberson
SA-ALC/EMRO
305 Tinker Drive, Building 305, Suite 2
Kelly AFB, TX 78241-5915

RE: Review of Draft Final IRP Site SS009 (Revised) Closure Report, Zone 2, Kelly Air Force Base (AFB), EPA I.D. No. TX 2571724333, dated July 1997.

Dear Mr. Roberson:

We have completed our review of the Draft Final Site SS009 Closure Report and agree with the Texas Natural Resources Conservation Commission (TNRCC) recommendation to approve the document with modification, as was discussed in the on-board review at TNRCC offices on August 19,1997. The following points were discussed through the review, via conference call, with recommendations that clarifications be provided in the final document:

Page 3-4 (third paragraph): "Kelly AFB is using the national average of 8 ppt for 2,3,7,8-TCDD TEQ as the background level for Site SS009 rather than determining a site-specific background level. Because the background level is greater than the GWP-Ind [Soil-Ground Water Cross-Media Protection Concentration], the background level is used as the MSC [Media-Specific Concentration] instead of the calculated GWP-Ind value." **Comment:** The TNRCC is allowing a national average of 8 ppt for dioxin to be applied to the SS009 site as a background concentration. Please include a copy of the TNRCC letter in the appendices which establishes this concentration as the background standard.

Page 4-1 (eighth paragraph): Provide clarification that SPLP analyses used surface samples (0-2') only. Subsurface samples were not represented.

Section 5.2.2.2 (*Comparison to RRS No. 2 Criteria*), Section 5.4 (*Conclusion of RRS Evaluation*), and Section 7.0 (*Conclusions and Recommendations*): Modify these sections to reflect that soil was excavated to remove a "hot spot" of arsenic concentrations which exceeded the Risk Reduction Standard (RRS) No. 2 SAI-Ind [Soil Media-Specific Concentration] (20 ppm) *and* GWP-Ind (8.5 ppm) concentration for the area of designated release. Pre-excavation calculated exposure point concentrations (Reasonable Maximum Exposure Concentrations, or RMEs) were not included for the

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 100% Recycled Paper (40% Postconsumer)

arsenic "hot spot." Include those RME concentrations if available. Clarify in the text that soil was excavated within the "hot spot" to meet RRS No. 2 standards, which includes the SAI-Ind and GWP-Ind MSC for the arsenic release area.

Table 5.3 (Page 5-8): Clarify, as a footnote or addition to corresponding text, that maximum surface soil concentrations were compared to "black clay" background concentrations, and that maximum subsurface concentrations were compared to "brown clay" background concentrations.

Section 5.3.1 (*Surface Soil Contamination*), Section 5.3.1.2 (*Dioxins/Furans*), Section 5.3.2 (*Subsurface Soil Contamination*): RRS No. 2 requires that both the SAI and GWP MSC's be met to achieve that standard. These sections should clarify if the RME meets both standards, or if the optional Synthetic Precipitation Leaching Procedure (SPLP) analyses for metals and 17 dioxin congeners was used to meet RRS No. 2, confirming that ground water will not be impacted by concentrations within the SS009 Site.

Table 5.8: Please clarify if the Reasonable Maximum Exposure RME) for arsenic represents a pre- or post-excavation scenario, and if the RME was calculated for the entire SS009 Site or just the arsenic-contaminated "foot print." Provide clarification in the text, and as a footnote to the table, if possible.

Section 6.3 (*Evaluation of Post-Excavation Conditions*): Again, RRS No. 2 requires that both the SAI and GWP MSCs be met. Please add language to the text to clarify that confirmatory sampling for the release area indicates that both the RRS No. 2 SAI-Ind and GWP-Ind standards have been met for the release area.

Tanks at HA023 Location: Two fuel tanks were unearthed in recent excavations at location HA023, north of Site SS009; sample analyses from this storage area are also included in this report. Air Force has sampled contents of each tank and underlying soils. Please provide visual site inspection information, tank details, and sample analyticals to confirm that there have been no releases of hazardous constituents from those tanks to surrounding media at that location.

Page J-2, Table J-1: For reference, future risk assessments should not reference TNRCC's Draft Version for Comment of the Texas Risk Reduction Program since the information contained in that document is subject to change and the guidance document specifically notes that it is not applicable to sites currently undergoing the correction action process.

795 527
3

Appendix N (*Risk Assessment*): Please add language to the text to clarify that the risk assessment presented is for a post-excavation scenario. See previous comments.

Thank you again for addressing our questions during the on-board review of this document. If you have any questions concerning the above comments, please do not hesitate to call me at (214) 665-2231.

Sincerely,

Camille D. Hueni
Sr. Project Manager
NM\Federal Facilities Section

cc: Mr. Gordon Banner
Texas Natural Resources Conservation Commission
Mr. Gary Beyer
Texas Natural Resource Conservation Commission
Mr. Larry Bailey
SA-ALC\EM

795 528

FAX TRANSMITTAL

TNRCC

Protecting Texas by Reducing and Preventing Pollution

DATE: Sept 10, 1997 NUMBER OF PAGES *(including this cover sheet)*: 5

TO:

Name	Ed Roberson / William Ryan
Organization	SA-ALC/EMRO at Kelly AFB
FAX Number	210-925-1814

FROM: TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Name	Gordon Banner
Division/Region	Industrial & Hazardous Waste
Telephone Number	(512) 239-5914
FAX Number	(512) 239-2346

NOTES:

Ed / William:

Following is the final letter entitled

Review of IRP Site SS009 Closure Report, Draft Final (Revised), dated July 1997
Closure Approved with Modifications

The letter is signed but will not be dated and mailed until next week due to administrative backlog.
Let me know if this is a *major* inconvenience and I'll do the mailout myself.

Gordon.

795 529

Barry R. McBee, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Dan Pearson, *Executive Director*

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

Mr. William Ryan
Chief, Restoration Operations Branch
SA-ALC/EMRO
305 Tinker Drive
Building 305, Suite 2
Kelly AFB, Texas 78241-5915

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Re: Kelly Air Force Base (Kelly AFB), San Antonio, Texas
Solid Waste Registration No. 31750; EPA ID No. TX2571724333
Review of IRP Site SS009 Closure Report, Draft Final (Revised), dated July 1997
Closure Approved with Modifications

Dear Mr. Ryan:

The Texas Natural Resource Conservation Commission Federal Facilities Team staff (TNRCC) has completed review of the above-referenced document (Report), received from Kelly AFB on July 29, 1997. The Report was submitted to meet the requirements of TNRCC Risk Reduction Standard (RRS) No. 2, as promulgated in Title 30 of Texas Administrative Code (30 TAC) Sections 335.551-569, for closure of Installation Restoration Program (IRP) Site SS009 and surrounding property affected by operations at the IRP site. Kelly AFB has defined IRP Site SS009 (hereafter referred to as "Site SS009") as an approximately 1.2 acre rectangular tract measuring approximately 200 by 250 feet. The area affected by operations at Site SS009 has been surveyed for county deed recordation purposes (Report Appendix O) as a 33.01 acre tract surrounding Site SS009. This larger tract coincides with the areas occupied by storage yard No. 68 and the "Dock Staging Area," and is referred to in Report Figure 1.1 as "Southwest Corner of East Kelly." This 33.01 acre tract is hereafter referred to as "the Site."

The TNRCC herein approves closure of the Site under RRS No. 2 with modifications to the Report as detailed below. Please be advised that should additional information and/or interpretation of existing data become available which indicates the Site is not suitable for closure, the TNRCC will require Kelly AFB to conduct further investigation and/or remediation of the contamination.

The following modifications to the Report resulted from the TNRCC's review of the Report and other applicable documents, and its meeting on August 19, 1997 with personnel from Kelly AFB,

CH2M Hill, and the US EPA Region VI Office.

1) The Executive Summary and other applicable sections should be amended to state that, in accordance with 30 TAC §335.560(b), Kelly AFB shall submit to the TNRCC proof of deed recordation within 90 days of the date of this letter.

2) In the legend in Figure 1.2, page 1-6, the dashed line should be identified as "Southwest Corner of East Kelly," rather than as "SS009." Also, storage yards No. 68 and the "Dock Staging Area" should be identified on the figure and discussed in Section 1.4.1. The Dock Staging Area is defined by Kelly personnel as the area north of storage yard 68 and south of Lawrence Street.

3) Section 1.4 should clearly state the size of Site SS009 and what the site boundary represents (ie., extent of storage, extent of release, etc.); also, evidence for the extent should be cited (ie., aerial photos, site photos, interviews with base personnel). The boundary of Site SS009 should be added to Figures 3.1, 4.1 and 6.1, and modified, if needed, on Figures 1.2 and 2.2.

4) The term "the site" should be defined early in the Report and used in a manner consistent with the definition. The TNRCC suggests using the definition given in the first paragraph of this letter.

5) On page 1-14, Table 1.1, Category 20 should be revised to state that the Findings of Suitability to Lease or Transfer the Site must include restrictions in accordance with a non-residential land use.

6) On page 1-15, Table 1.1, Category 22 indicates that the surface drains located at the Site were not considered with respect to impacts to surface water. This exposure pathway needs to be evaluated and the Report amended accordingly.

7) The second bullet on page 3-6 should clarify that the objective here applies only to determining if contaminants are present in the soil samples from monitoring well MW 134. The two paragraphs after the bullets should be changed to clearly link results with samples of groundwater, soil from the well boring, or soil from the hand augered borings. Also, the text should clearly state results for all the parameters tested.

8) On page 4-1, a fourth bullet should be added to specify that the SPLP samples were collected from surface soil only.

9) Table 5.1 should state the dates the samples were collected (month/year) and the categories of locations from which they were collected (ie., hand augered borings, well boring, etc.). Also, results for lead are missing from the second half of the table.

795 531

10) The shaded header for Table 5.2 should specify the SPLP results are for surface soil samples.

11) The series of maps beginning with Figure 5.2 (which show concentrations in soil for various contaminants) should include a map for the lead distribution in surface and subsurface soil.

12) In Section 5.2.1.1, page 5-7, the second paragraph should reference the TNRCC's September 13, 1996 letter; a copy of the letter should be included in Appendix K.

13) In Table 5.4, the depths from which the samples were collected should be indicated for all locations, not just for HA06 and MW134.

14) In Table 5.8, the SAI-Ind for lead should be given as 1.00E+03, rather than "not calculated".

15) In Table 5.8, the RME (Reasonable Maximum Exposure Concentration) for arsenic should be based only on samples collected from the obvious release area, as per the TNRCC's February 27, 1997 letter, a final copy of which should be included in Appendix K. The "RME Exceeds SAI-Ind" column for arsenic should read "yes." Also, the first paragraph of Section 5.2.2.2, Section 5.4, the Executive Summary, and any other applicable areas of the Report should be changed to reflect the fact that the arsenic RME for the obvious release area exceeded both the RRS No.2 GWP-Ind and SAI-Ind values, resulting in the need for corrective action to attain closure under RRS No.2. Finally, Figure 5.20 or 6.1 should be modified to show the area within which soil arsenic results were used to calculate the RME (ie., the area designated as the obvious release area); the arsenic results also should be shown on the figure.

16) Sections 5.3.1 and 5.3.2 should include summaries of the SPLP results for each contaminant.

17) Section 6.3 states that post-excavation arsenic concentrations in the release area meet a RRS No.2 value of 20 ppm (the SAI-Ind), but fails to mention whether RRS No.2 is met with respect to the GWP-Ind value of 8.5 ppm. Both the SAI-Ind and GWP-Ind must be considered since both criteria were exceeded by the pre-excavation concentrations.

18) Page 7-1, second paragraph, states that "Although only a 1.2-acre area required remediation to meet the RRS No.2 criterion of 20 mg/kg arsenic, Kelly AFB is voluntarily deed-recording a 33-acre parcel which includes Site SS009 and the remediation area." This sentence is confusing because it seems to imply that, in general, deed recordation is performed only for remediated areas. Please note that deed recordation is required for areas exhibiting contaminant concentrations exceeding RRS No.1. The sentence should be changed to indicate that: 1) the area exceeding RRS No.1 for the contaminants associated with Site SS009 was defined by the investigations and covers an area of approximately 20 (?) acres, and 2) however, a larger tract coinciding with the area covered by

795 532

storage yard No. 68 and the Dock Staging Area (and shown in Report Figures 1.1 and 1.2 as "Southwest Corner of East Kelly") was deed recorded for convenience and to provide an additional level of protection to human health and the environment.

19) In Appendix O (Deed Recordation), Section 1 of the Industrial Solid Waste Certification of Remediation, and Table 1 (showing maximum contaminant concentrations remaining at the Site) should be changed to indicate that: 1) the dioxins/furans and arsenic are the only contaminants listed in the table which are demonstrably associated with the herbicide storage that occurred at Site SS009, 2) therefore, although the non-associated contaminants are listed in Table 1, they are not included under the closure of Site SS009, 3) these non-associated contaminants are listed in Table 1 only as public notification of their presence, and 4) the investigations conducted at Site SS009 demonstrate that these non-associated contaminants are present at concentrations meeting RRS No.2. Similar statements should be included in the body of the Report wherever applicable, particularly in the Executive Summary. In addition, the body of the Report should clarify that the source(s) and extent of the non-associated contaminants have not been determined, and that Kelly AFB will conduct further investigation of these contaminants under the ongoing Zone 4 Remedial Investigation.

Pursuant to Item 19 above, Kelly AFB shall submit within 90 days of receipt of this letter a work plan to investigate the contaminants identified--but not fully delineated--by the Site SS009 investigations. Kelly AFB is encouraged to work closely with the TNRCC and EPA in preparation of the required plan.

Should you have any questions regarding this matter please contact Mr. Gordon Banner of the Federal Facilities Team at 512/239-5914, Mail Code MC-127.

Sincerely,

Paul S. Lewis

Paul S. Lewis
Manager, Corrective Action Section
Industrial and Hazardous Waste (I&HW) Division

PSL:gb

cc: Ms. Camille Hueni, EPA Region VI, Dallas
Mr. Thomas Edwards, Texas Attorney General's Office, Austin
Mr. Arun Bokkasada, TNRCC Region 13 Office, San Antonio
Mr. Parker Wilson, TNRCC Legal Division, Hazardous Waste/Superfund Section
Ms. Tennie Larson, TNRCC I&HW Division, Corrective Action Section (ICL380)

795 533

TAB

Appendix L

795 534

APPENDIX L

Manifests for Disposal of Excavated Soil

F41650-95-D-2008
Delivery Order 5002
Call Order 97-7

795 535

Manifest Number	Tonage	Manifest Number	Tonage	Manifest Number	Tonage
468052	27.31	513980	27 04	468021	26.44
468031	24.56	513960	25 09	532106	32 39
468035	26.64	468037	27.19	468002	26.57
468042	26.78	468047	21.11	532113	22.82
468045	23 90	468040	27 80	514000	26.20
467128	20 30	468034	27.99	513997	26 07
468032	28.59	468057	25.73	513941	26 82
468036	30.44	468029	25.64	513929	27.23
468038	30 79	468018	25 50	513982	30.84
468043	31 16	468004	26.81	513949	24.23
468048	20.47	467131	26 99	513932	27.49
468051	31 65	532104	27.29	513986	26 85
468049	20 83	468017	25.20	513961	28 87
468044	24 36	468024	26 76	513946	27 21
468041	24 84	468005	27.52	513998	29 02
468033	24.41	468003	25 60	532108	29 57
468030	25.86	468019	25.55	532107	27.22
468050	25 52	468022	23.75	532111	27.20
467129	19.07	468026	24.97	532116	25.01
468046	23.00	513985	26.01	513943	26.31
468039	23.80	513926	27 57	513937	27.59
468056	25.86	513945	26.08	468001	25 83
468055	25.66	513935	29 49	467133	25 00
468053	25.63	513933	25.02	513903	30.07
513959	16.55	513940	28 92	513994	27.97
532117	15.56	513939	28.79	513988	27 81
468009	17.62	513995	29.99	513989	27.00
532118	16 46	532101	26.79	513925	26.62
468016	16 02	532110	27.11	513948	25 97
532112	16.74	532115	25 46	513934	23.85
532103	17 28	468006	25.25	513931	27 25
513999	17 02	467132	27.65	513936	28.94
513996	19 28	468023	27.33	513928	22.80
513938	18.80	468012	27.09	513947	26.15
513983	15.37	468028	28.20	513944	25.13
513984	15.81	468025	28.01	513987	24.68
513927	15.55	468020	25 47	513993	26.23
519930	17.39	4568054	26.92	532102	30.52
513978	7.01	467120	25.98	532114	27.66
513979	18.27	467121	27.07	532105	29.51
513981	16.04	468027	26.82	532109	30.06
Subtotal of Tonage	**888.20**		**1090.55**		**1111.00**
Total of Tonage					**3089.75**

795 536

Engineers, Geologists, Hygienists and Environmental Sci

Raba-Kist
Consul

12021 W. Golden
P.O. Box 690287, San Antonio, TX 78269
(210) 699-9090 FAX (210) 699

FACSIMILE TRANSMISSION COVER PAGE

DATE: ~~7/29~~ 7/30 NUMBER OF PAGE(S): 2.
(including this Cover)

TO: DALE DALLIS FAX NO.: ( ) 680-4292

COMPANY: OLMOS ENVIR.

FROM: JOHN MURCHISON

SUBJECT: _____

( ) The original of this transmittal will be sent by:
( ) U.S. Mail ( ) Messenger ( ) Overnight Mail

( ) This will be the only form of delivery of this transmittal.

IF YOU DO NOT RECEIVE ALL PAGES, PLEASE CALL (210)699-9090

Fax Transmitted by: _____

COMMENTS:

CONFIDENTIALITY NOTICE: The document(s) accompanying this facsimile transmission contain legally privileged and/or confidential and proprietary information of Raba-Kistner Consultants, Inc. The information is intended only for the use of the recipient named herein. If you have received this facsimile in error, please immediately notify us by telephone and arrange for return of the original document(s) to us at the above address. You are hereby notified that any disclosure, copying, distribution or the taking of any action in reliance on the contents of this facsimile information is strictly prohibited.

Engineers, Geologists, Hygienists and Environmental Scientists

Raba Kistner

Raba-Kistner Consultants, I
12821 W Golden L
P.O Box 690287, San Antonio, TX 78269 0
(210) 699 0090 • FAX (210) 699 6

795 537

NUCLEAR MOISTURE-DENSITY REPORT

CLIENT: Olmos Environmental Services
Attn: Mr. David Hillman

PROJECT NAME: East KAFB - Storage Area

CONTRACTOR: Olmos Construction

REFERENCE: Storage Area

PROJECT NO.: ASD97-222-00

TECHNICIAN: JWB

DATE: 7-9-97

TROXLER NO.: 11

TEST NO.	TEST LOCATION	SOIL TYPE	LIFT NO.	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCE OF PROCT
1	N0'E, 30'N of SW Corner	1	Final	5.0	128.8	89.1
2	45'E, 170'N of SW Corner	1	Final	5.1	129.5	90.0
3	140'E, 165'N of SW Corner	1	Final	4.4	140.0	97.0
4	170'E, 55'N of SW Corner	1	Final	5.6	129.6	90.0
5	50'E, 185'N of SW Corner (Retest of Test No. 2)	1	Final	4.6	140.6	98.0
6	105'E, 60'N of SW Corner (Retest of Test No. 4)	1	Final	7.1	127.0	88.0

REMARKS: Conforming Test Nos.: 3 and 5

Non-Conforming Test Nos.: 1, 2, 4 and 6

PERSON NOTIFIED: Mr. Dale Davis with Olmos Construction

Notice: Raba-Kistner Consultants, Inc. considers the data and information in this report to be proprietary. This information is intended only for the use of the recipient(s) named herein. Test results presented herein relate only to those items tested. This document and any information contained herein shall not be disclosed and shall not be duplicated or used in whole or in part for any purpose other than to evaluate test results without written approval from Raba-Kistner Consultants, Inc.

SOIL TYPE	OPTIMUM MOISTURE (%)	DRY DENSITY (pcf)	REQUIRED MOISTURE (%)	REQUIR DENSIT (% Proct
1) Crushed Limestone Flexible Base (Vulcan No. 2)	5.0	144.0	NP	95.0

TEST METHOD: Laboratory Test Procedure: ASTM D1557
Field Test Procedure: ASTM D2922 & D3017

COPIES TO: Above (2)

RABA-KISTNER CONSULTANTS, INC.

by Dennis C. Charkow

Dennis C. Charkow

ASSIGNMENT NO.: 5-206949
BY 7/18/1997

A027877

BROWNING-FERRIS INDUSTRIES

795 538

TESSMAN LANDFILL

Date : 07-24-97 Time In: 08:26:52 Time Out: 08:44:59
Ticket # : A58048 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000145 Trailer #: 000022 Lic Plate:
Manifest # : 467129 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 34.32 Tare Wt: 15.25 Net Wt: 19.07 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day''

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

TES

Kelly soil
call order
97-7

795 539

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 467129

97-7 weight IN BC

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925-3100

STATE GENERATOR ID NUMBER 3171

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02113012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0723

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 1485

PHONE NO. 673-2940

TRANSPORTER NAME Hall Trucking

DRIVER NAME (PRINT) Frank Lima

ADDRESS X-Hall Trucking

VEHICLE LICENSE NO/STATE X 2A0-357

X San Ant TX 78237

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Frank Lima — 072497 — X Frank Lima — 0724

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WA... WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-6614

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACC...

Mike Cantu — Mike Cantu — 07

NAME OF AUTHORIZED AGENT — SIGNATURE

PREPRINTED ONLY THROUGH BFI / UARCO CONTRACT

A027902

BROWNING-FERRIS INDUSTRIES

795 540

TESSMAN LANDFILL

Date : 07-24-97 Time In: 09:49:40 Time Out: 09:59:49
Ticket # : A58075 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000145 Trailer #: 000022 Lic Plate:
Manifest # : 468046 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANIJ
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 38.15 Tare Wt: 15.15 Net Wt: 23.00 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TES-LF1

795 541 NON-HAZARDOUS SPECIAL WASTE MANIFEST Kelly AR # 3923 Page 544 of 880 97-7 IN & OUT

GENERATOR

GENERATOR NAME SA-ALC/EMC GENERATING LOCATION SAFB - East Kelly Storage - IRP Sites 5-7

ADDRESS 307 Tinker Drive (Building 306) ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917 San Antonio, TX

PHONE NO. 210 925 3100 STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130112	Soil with petroleum hydrocarbons	82	Y

BFI WASTE CODE TX 755 980118 230413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRL C-CAR B-BAC T-TRL P-POI Y-YAR O-OTI

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson Spencer Albertson 07

GENERATOR AUTHORIZED AGENT NAME SIGNATURE SHIPMENT DATE

TRANSPORTER

TRUCK NO. 145 PHONE NO. 673-2740

TRANSPORTER NAME Halls Trucking DRIVER NAME (PRINT) Frank Vivar

ADDRESS 6428 MARCUM VEHICLE LICENSE NO/STATE [illegible]

S.A., TX. 78277 STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Frank Vivar 072497

DRIVER SIGNATURE SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Frank Vivar 07249

DRIVER SIGNATURE DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu Mike Cantu 07249

NAME OF AUTHORIZED AGENT SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT 109-720

TRANSPORTER RETAIN

BFI BROWNING-FERRIS INDUSTRIES

No. A027967

795 542

TESSMAN LANDFILL

Date : 07-24-97 Time In: 12:35:36 Time Out: 12:48:50
Ticket # : 059140 CMS # : 1218154 LMS #: 1218194
Customer : OLMOS ENV/KAFB
Vehicle # : 000145 Trailer #: 000022 Lic Plate:
Manifest # : 468039 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 39.52 Tare Wt: 15.72 Net Wt: 23.80 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Frank Vinson

TES-LI

795 543

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 468039

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION ~~KAPB - East Kelly Storage - IRP Sites S-~~

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 31775

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 080118 230413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DP C-CA B-BA T-TR P-PC Y YA O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable stat[illegible] been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatm[illegible] of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordanc[illegible] requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 09

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 145 PHONE NO. 623-2940

TRANSPORTER NAME Hills Trucking DRIVER NAME (PRINT) X Frank Limon

ADDRESS 6423 Mapleton S.A. Tx VEHICLE LICENSE NO/STATE 2AC357

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Frank Limon — 07 24 97

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI[illegible] WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — 07 24 97

DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACC[illegible]

Mike Carter — Mike Carter — 07 24 97

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

BROWNING-FERRIS INDUSTRIES

795 544

TESSMAN LANDFILL

Date : 07-24-97 Time In: 14:16:11 Time Out: 14:32:19
Ticket # : A58181 CMS # : 1210194 LMS #: 1210194
Customer : CLMOS ENV/KAFB
Vehicle # : 000145 Trailer #: 000022 Lic Plate:
Manifest # : 460856 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.56 Tare Wt: 15.70 Net Wt: 25.86 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Frank Simon

TES

795 545 Kelly AR # 3923 Page 548 of 880 No. A029042

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 15:48:44 Time Out: 16:00:03
Ticket #: 058214 CMS #: 1218194 LMS #: 1218104
Customer : OLMOS ENV/KAFB
Vehicle # : 000145 Trailer #: 000622 Lic Plate:
Manifest # : 468035 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE_CANTU
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 41.24 Tare Wt: 15.58 Net Wt: 25.66 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413UF	SOIL	22.00	22.00 YD	8.18000	179.20
	Sub Total..... $				179.20
	Total..... $				179.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Frank Limon

BFI TEXAS 795 546 NO 400033

NON-HAZARDOUS SPECIAL WASTE MANIFEST 97-7

weigh in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T N R.C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T N R.C C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T N.R C C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DF C-CA B-BA T TR P-PC Y-YA O-OT

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, I been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resic of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 4 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X145

PHONE NO. 673-2940

TRANSPORTER NAME Hall Trucking

DRIVER NAME (PRINT) X Frank Lemon

ADDRESS San Antonio TX S.A., TX. 78227

VEHICLE LICENSE NO./STATE ZAG 347

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Frank Lemon — 0 7 2 4 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Frank Lemon — 0 7 2 4 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 0 1 4 1

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantor — Mike Cantor — 0 7 2 4 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

BROWN NG-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-24-97 Time In: 17:12:47 Time Out: 17:28:27
Ticket # : A56226 CMS # : 1210194 LMS #: 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000145 Trailer #: 000022 Lic Plate:
Manifest # : 468053 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: C. GARCIA
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.23 Tare Wt: 15.60 Net Wt: 25.63 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Frank Limon

795 549

TEXAS

Kelly AR # 3923 Page 552 of 880

NO. 468053

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7 with IND

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, I been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, If the waste is a treatment resic of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson Spencer Albertson 07249

GENERATOR/AUTHORIZED AGENT NAME SIGNATURE SHIPMENT DATE

TRANSPORTER

TRUCK NO. 1945 PHONE NO. 623-2940

TRANSPORTER NAME Hall's Trucking DRIVER NAME (PRINT) X Frank Limon

ADDRESS 6923 Mimosa VEHICLE LICENSE NO./STATE LAG 347

San Antonio, TX 78227 STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR'S SITE LISTED ABOVE.

X Frank Limon 07249

DRIVER SIGNATURE SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Frank Limon 07249

DRIVER SIGNATURE DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Garcia C Garcia 07249

NAME OF AUTHORIZED AGENT SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7201

TRANSPORTER RETAIN

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 04:02:00 Time Out: 09:12:23
Ticket # : 058058 CMS # : 1216194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 468049 PO #: 3 Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt: 36.40 Tare Wt: 15.57 Net Wt: 20.83 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] #153

795 551

BFI

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 468049

97-7

weigh in & out

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRI
C-CA
B-BA
T TRU
P-PO
Y-YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. #153

PHONE NO. X 6732940

TRANSPORTER NAME Hills Trucking

DRIVER NAME (PRINT) Albert Treviño

ADDRESS X 6428 Marcum

SA TX 78227

VEHICLE LICENSE NO./STATE X 2AG377

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Albert Treviño 153 — 0 7 2 4 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Treviño — 0 7 2 4 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

EREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu — Mike Cantu — 0 7 2 4 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7201

795 552

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-24-97 Time In: 10:19:41 Time Out: 10:2[illegible]:29
Ticket # : A58085 LMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000322 Lic Plate:
Manifest # : 468044 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 39.76 Tare Wt: 15.40 Net Wt: 24.36 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE ATREVIWO #153

TEXAS

Kelly AR # 3923 Page 556 of 488

NO 488044

795 553

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

D-DRU
C-CAR
B-BAG
T-TRU
P-POU
Y-YAR
O-OTH

BFI WASTE CODE TX 755 980118 239413

T.N R.C C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R C.C.	DESCRIPTION OF WASTE		
			15

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — SHIPMENT DATE 07 09

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE

TRANSPORTER

TRUCK NO. 153

PHONE NO 623-2940

TRANSPORTER NAME HALL Trucking

DRIVER NAME (PRINT) ALBERT T. TREVINO

ADDRESS 6428 MAKIN

VEHICLE LICENSE NO./STATE 2AG-377

S.A., TX 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Albert Trevino #153 — SHIPMENT DATE 07 24 97

DRIVER SIGNATURE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Albert Trevino — DELIVERY DATE 07 24 9

DRIVER SIGNATURE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu — Mike Cantu — 07 24 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7207

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 11:40:45 Time Out: 12:00:20
Ticket # : A58120 CMS # : 1210194 CMS #: 12101-4
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 468041 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 40.37 Tare Wt: 15.53 Net Wt: 24.84 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: ATREVIÑO 153

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 556 400041

97-7

GENERATOR

RATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210-9253100

STATE GENERATOR ID NUMBER 31754

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM
C-CART
B-BAG
T-TRUCK
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 — 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 153 — PHONE NO. 673-2940

TRANSPORTER NAME HALL TRUCKING — DRIVER NAME (PRINT) ALBERT TREVINO

ADDRESS 6128 MARCUM — VEHICLE LICENSE NO./STATE 2AG-977 TX

S.A., TX 78227 — STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Albert Trevino 153 — 07 24 97

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Albert Trevino — 07 24 97

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill — PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Curtis — Mike Curtis — 07 24 97 — 153

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

795 556

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 13:33:51 Time Out: 13:51:24
Ticket # : A581177 OMS # : 1210194 LMS #: 1210134
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000082 Lic Plate:
Manifest # : 468033 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 39.64 Tare Wt: - 15.23 Net Wt: 24.41 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day'!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: ARZENIO 153

BFI

TEXAS

Kelly AR # 3923 Page 560 of 880

NO. 468033

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 557 97-7

GENERATOR

GENERATOR NAME SA ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	02	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		
		153	

BFI WASTE CODE

D-DRUM
C-CARTO
B-BAG
T-TRUCK
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

07249 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 153

PHONE NO 673-2940

TRANSPORTER NAME Hills Trucking

DRIVER NAME (PRINT) X Albert Trevino

ADDRESS 6423 Marcum

SA, TX 78227

VEHICLE LICENSE NO./STATE 206-377 TX

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Albert Trevino #153 — DRIVER SIGNATURE

072497 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Albert Trevino — DRIVER SIGNATURE

07249 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu — NAME OF AUTHORIZED AGENT

Mike Cantu — SIGNATURE

07249

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

795 558

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 15:07:49 Time Out: 15:20:41
Ticket # : 858198 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 880153 Trailer #: 000022 Lic Plate:
Manifest # : 468030 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.11 Tare Wt: 15.25 Net Wt: 25.86 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Arevino 153

Kelly AR # 3923 Page 562 of 890

795 559

BFI

TEXAS

NO. 468030

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weight in & out

GENERATOR

GENERATOR NAME ~~SA-ALC / EMC~~

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

D-DRUM
C-CARTO
B-BAG
T-TRUCK
P POUN
Y YARD
O-OTHE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

0 7 2 4 9 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO. 673-2940

TRANSPORTER NAME HALLS TRUCKING

DRIVER NAME (PRINT) X ALBERT TREVIÑO

ADDRESS 6425 MARCUM

SA TX 78227

VEHICLE LICENSE NO./STATE 2AG-377 TX

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Albert Treviño 153 — DRIVER SIGNATURE

0 7 2 4 9 7 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Albert Treviño — DRIVER SIGNATURE

0 7 2 4 9 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — NAME OF AUTHORIZED AGENT

[signature] — SIGNATURE

0 7 2 4 9

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

795 560

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 16:25:02 Time Out: 16:44:16
Ticket # : 958225 CMS # : 1218194 LMS #: 1218194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 468050 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt: 40.74 Tare Wt: 15.22 Net Wt: 25.52 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
235413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: ATREVINO 153

TE

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 3923 Page 564 of 488050

795 561

97-7

WEIGH IN + OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130112	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM
C-CAR
B-BAG
T-TRUCK
P-POUND
Y-YARD
O-OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson Spencer Albertson 07 24 97

GENERATOR AUTHORIZED AGENT NAME SIGNATURE SHIPMENT DATE

TRANSPORTER

TRUCK NO. 153 PHONE NO. 673-2940

TRANSPORTER NAME HALL TRUCKING DRIVER NAME (PRINT) ALBERT TREVINO

ADDRESS 6403 MARKUM VEHICLE LICENSE NO./STATE 2AG-377

SAN TX 78227 STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Albert Trevino 153 07 24 97

DRIVER SIGNATURE SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Albert Trevino 07 24 97

DRIVER SIGNATURE DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Canton Mike Canton 07 24 97

NAME OF AUTHORIZED AGENT SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

BRO NING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 15:35:07 Time Out: 15:55:04
Ticket # : A58205 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000022 Lic Plate:
Manifest # : 468032 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 44.88 Tare Wt: 16.29 Net Wt: 28.59 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

TESSMAN LANDFILL

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TEXAS

Kelly AR # 3923.795563 Page 6 of 886

NO 468032

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME: SA-ALC / EMC

GENERATING LOCATION: KAFB - East Kelly Storage - IRP Sites S-

ADDRESS: 307 Tinker Drive (Building 306)

ADDRESS: 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE: TX 755 980118 239413

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE:

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE:

D-DR
C-CA
B-BA
T-TR
P-PO
Y-YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — SHIPMENT DATE 07249

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE

TRANSPORTER

TRUCK NO. 150

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Roy Peña

ADDRESS 6423 Marcum

VEHICLE LICENSE NO./STATE 2KC 3H9

S.A., TX 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Roy Peña — 072497

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Roy Peña — 07249

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME: BFI Landfill

PHONE NO. 210-661-4111

ADDRESS: 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Canto — Mike Canto — 07249

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-24-97 Time In: 13:54:13 Time Out: 14:19:49
Ticket # : A58172 CMS # : 1210194 LMS #: 1210194
Customer : CLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000022 Lic Plate:
Manifest # : 468036 PO #: Transporter: OUT
Generator : KAB - KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 47.14 Tare Wt: 16.70 Net Wt: 30.44 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

BFI

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 468036

795 565

97-7

WEIGH IN + OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTO
B-BAG
T-TRUCK
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07249

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 750

PHONE NO 673-2940

TRANSPORTER NAME Hills Trucking

DRIVER NAME (PRINT) X Roy Pe...

ADDRESS 6423 Marcum

VEHICLE LICENSE NO./STATE 2PC 376

S.A. TX 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Roy Pe... — 072497

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Roy Pe... — 07249

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu — M Cantu — 07249

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

735 566

No AU27965

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-24-97 Time In: 12:21:28 Time Out: 12:44:08
Ticket # : 458135 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000022 Lic Plate:
Manifest # : 468038 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: MIKE CONTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 47.06 Tare Wt: 16.27 Net Wt: 30.79 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
2394131F	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Roy

TES

BFI

TEXAS

Kelly AR # 795567 3923 Page 570 of 880

NO 488030

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7 INFI IN 4 C

GENERATOR

NERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 3 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	2 2	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 3

T.N R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRI
C-CAI
B-BAC
T-TRI
P-PO
Y-YAI
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, I been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer A. Albertson — Spencer Albertson — 07 - 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 750 — PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking — DRIVER NAME (PRINT) X Roy Penn

ADDRESS 6423 MORUM — VEHICLE LICENSE NO./STATE 2FC 329

S.A., TX.

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Roy Penn — 0 7 2 4 9 7 — Roy Penn — 0 7 2 4 9

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill — PHONE NO. 2 1 0 - 6 6 4

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu — Mike Cantu — 0 7 2 4 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

795 568 Kelly AR # 3923 Page 571 No. A027326

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 10:37:35 Time Out: 10:56:51
Ticket # : 858093 EMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000022 Lic Plate:
Manifest # : 468043 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 47.59 Tare Wt: 16.43 Net Wt: 31.16 tn

TES:MAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ray Pena

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 3923 Page 972 of 880 97-7

95 569

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

DRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DR C-CA B-BA T-TR P-PO Y-YA O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, I been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment resic of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 150

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Roy Peña

ADDRESS 6428 Maxum

VEHICLE LICENSE NO./STATE 2AG - 376

S.A., TX

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Roy Peña — 0 7 2 4 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Roy Peña — 0 7 2 4 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Cantin — Mike Cantin — 0 7 2 4 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

TRANSPORTER RETAIN

No. A027890

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 09:11:11 Time Out: 09:25.84
Ticket # : 668062 DKS #: 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 800156 Trailer #: 800922 Lic Plate:
Manifest # : A68048 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 36.88 Tare Wt: 16.41 Net Wt: 20.47 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4184
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ray

NO 400040

NON-HAZARDOUS SPECIAL WASTE MANIFEST 95 571

97-7

weigh in & out

GENERATOR

GENERATOR NAME ~~USA ALC / EMC~~

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 025310 00

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0-4130 12	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 080118 230413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM C-CART B-BAG T TRUCK P-POUN Y YARD O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07-97

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 150

PHONE NO 623-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Ray Rena

ADDRESS 642 S Main

VEHICLE LICENSE NO./STATE 2RC 326

San Ant. TX 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ray Rena — 07-14-97 — DRIVER SIGNATURE — SHIPMENT DATE

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Conte — Mike Conte — 07-16-97

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

No. AU28069

795 572

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 17:03:02 Time Out: 17:07:17
Ticket # : 858232 CMS # : 1218194 CMS #: 1218194
Customer : OLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000022 Lic Plate:
Manifest # : 468051 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: C. GARCIA
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 47.82 Tare Wt: 16.17 Net Wt: 31.65 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

BFI

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 468051

97-7

WEIGH IN CO OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment res of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07249

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X-130

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Roy Pena

ADDRESS 6423 Marcum

SA TX 78227

VEHICLE LICENSE NO./STATE NRC 370

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Roy Pena — 072497

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Roy Pena — 0724

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-66141

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURAT

C Garcia — C Garcia — 07249

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-24-97 Time In: 17:09:04 Time Out: 17:24:57
Ticket # : A58234 CMS # : 1210194 LMS #: 1210194
Customer : OLMUS ENV/KAFB
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 468052 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: C. GARCIA
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.62 Tare Wt: 14.31 Net Wt: 27.31 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerra

BFI

TEXAS

Kelly AR # 795 575 Page 578 of 480

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weigh in + out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CAR
B-BAG
T-TRU
P-POU
Y-YAR
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 4 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 148

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Ronald Guerra

ADDRESS 6423 Madam

SA, TX 78227

VEHICLE LICENSE NO./STATE 2AG-379

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 0 7 2 4 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 0 7 2 4 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

C. Garcia — C. Garcia — 0 7 2 4 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TD

TRANSPORTER RETAIN

Kelly AR # 795 576

BFI 923 Page 579 of 880

A028041

BROWN NG-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 15:47:29 Time Out: 15:57:04
Ticket # : 058213 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 468031 PO #: - Transporter: OUT-
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 39.01 Tare Wt: 14.45 Net Wt: 24.56 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Ducklo

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795577 97-7

weight in + out

GENERATOR

ERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUI
C-CAR
B-BAG
T-TRUC
P-POU
Y-YARI
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07249

GENERATOR AUTHORIZED AGENT NAME / SIGNATURE / SHIPMENT DATE

TRANSPORTER

TRUCK NO. X-148 PHONE NO. 673-2940

TRANSPORTER NAME Halls Truck Ing DRIVER NAME (PRINT) X Ronald Guerra

ADDRESS 6423 Harcum VEHICLE LICENSE NO./STATE 2AG-379

SA, TX 78227 STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Ronald Guerra — 072497

DRIVER SIGNATURE / SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 072497

DRIVER SIGNATURE / DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill PHONE NO. 210-333-

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu — Mike Cantu — 07247

NAME OF AUTHORIZED AGENT / SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7207

TRANSPORTER RETAIN

No A023006

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 13:55:32 Time Out: 14:17:57
Ticket # : RS8171 CNS # : 1210194 LNS #: 1210154
Customer : OLMIG ENV/KAFB
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 468035 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.40 Tare Wt: 14.76 Net Wt: 26.64 tn

TIESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerra

BFI

TEXAS

Kelly AR # 3923 Page 582 of 480

795 570 NO 468035

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weigh in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CART
B-BAG
T-TRUC
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson / Spencer Albertson 07249

GENERATOR AUTHORIZED AGENT NAME SIGNATURE SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 148

PHONE NO. 673-2940

TRANSPORTER NAME Hall's Trucking

DRIVER NAME (PRINT) X Ronald Guerri

ADDRESS 1423 Marcum

VEHICLE LICENSE NO./STATE ZAG-379

S.A. TX 78207

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra 07249

DRIVER SIGNATURE SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra 07249

DRIVER SIGNATURE DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 1

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu Mike Cantu 07249

NAME OF AUTHORIZED AGENT SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7201

No: A027959

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 11:51:04 Time Out: 12:17:40
Ticket # : 059124 CMS # : 1218194 LMS #: 1218194
Customer : OLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 468042 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.37 Tare Wt: 14.59 Net Wt: 26.78 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerra

BFI

TEXAS

Kelly AR # 3929 Page 584 of 880 795 581 NO. 468042

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

overall [illegible]

GENERATOR

GENERATOR NAME ~~SA-ALC / EMC~~

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	4

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 4 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CAF
B-BAC
T-TRU
P-POL
Y-YAF
O-OTI

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 148

PHONE NO. 673-2940

TRANSPORTER NAME Falls Trucking

DRIVER NAME (PRINT) Ronald Guerra

ADDRESS 6428 Marcum

S.A. TX

VEHICLE LICENSE NO./STATE 2AG-379

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 07 24 97

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 07 24 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 6 1 4 1

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Conte — Mike Conte — 07 24

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72

TRANSPORTER RETAIN

795 582 Kelly AR # 3923 Page 585 of 880 A027913

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-24-97 Time In: 10:02:20 Time Out: 10:25:28
Ticket # : 858079 CMS # : 1218194 LMS #: 1218194
Customer : OLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: 000822 Lic Plate:
Manifest # : 468045 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 38.93 Tare Wt: 15.03 Net Wt: 23.90 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ponciano Guerra

Kelly AR # 3922 Page 586 of 880

BFI

TEXAS

795 583

NO. 468045

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

w/ 97-7 IRP out

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION ~~KAFB East Kelly Storage - IRP Sites S-7~~

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917.

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 925 3110

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 230413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CAR
B-BAG
T-TRU
P-POU
Y YAR
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 148

PHONE NO. 673-2740

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Ronald Guerra

ADDRESS 6428 Marcum

S.A. TX 78277

VEHICLE LICENSE NO./STATE 2AG-379

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 072497

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 07249

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Conti — Mike Conti — 07249

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

795 584

No: A027876

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 08:25:10 Time Out: 08:41:41
Ticket # : A58047 CMS # : 1210194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 467128 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 35.95 Tare Wt: 15.65 Net Wt: 20.30 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

ESSMAN LANDFILL

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerra

BFI

TEXAS

Kelly AR # 3923 795 585 Page 588 of 480 NO 467128

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

WEIGH IN + OUT

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CAR
B-BAG
T-TRU
P-POL
Y-YAR
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 3 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 148

PHONE NO. 210) 673-2940

TRANSPORTER NAME RONALD GUERRA

DRIVER NAME (PRINT) X RONALD GUERRA

ADDRESS Halls Trucking

X SAN ANTONIO TX 78237

VEHICLE LICENSE NO./STATE 12 AG 279

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 0 7 2 4 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Ronald Guerra — 0 7 2 4 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu — Mike Cantu — 0 7 2 4 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

795 586

No. A028300

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-25-97 Time In: 14:50:07 Time Out: 14:50:19
Ticket # : A50458 CMS # : 1210194 LMS #: 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 27.39 Tare Wt: 10.93 Net Wt: 16.46 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

BFI

TEXAS

Kelly AR # 39235 Page 590 of 580

795 587 532118

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	12	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DR C-CA B-BA T-TR P-PO Y-YA O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT-NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. XDT102

PHONE NO. 680-8300

TRANSPORTER NAME OMOS ENVIRON. SERVS. INC.

DRIVER NAME (PRINT) Russel Carter

ADDRESS 7054 Snowflake

SA, TX 78238

VEHICLE LICENSE NO./STATE X 333 T-U

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X [signature] — 07257

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X [signature] — 07259

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07759

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

No: A028204

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-25-97 Time In: 11:34:52 Time Out: 11:42:14
Ticket # : A58364 CMS #: 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : 468016 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 26.98 Tare Wt: 10.96 Net Wt: 16.02 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

Kelly AR #795 589 23 Page 592 of 480

BFI

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

Weigh in + Weigh ou

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	12	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DR
C-CA
B-BA
T-TR
P-PO
Y-YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h bean properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X-102

PHONE NO. 680-8300

TRANSPORTER NAME Olmos Environmental Servs.

DRIVER NAME (PRINT) X Russell Carter

ADDRESS 7054 Snowflake
S.A., TX. 78250

VEHICLE LICENSE NO./STATE 533*9VU

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Russell Carter — 072597

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Russell Carter — 07259

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07259

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

795 590

A028895

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 16:10:14 Time Out: 16:21:16
Ticket # : 859830 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : 513983 _ PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: CHRIS MCCUNE
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 25.96 Tare Wt: 10.59 Net Wt: 15.37 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

: (210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TEXAS

Kelly AR # 3923 Page 594 of 850 795 591 513983

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	12	Y

D-DRUM C-CART B-BAG T-TRUCK P-POUN Y-YARD O-OTHE

BFI WASTE CODE TX 755 980118 239413

BFI WASTE CODE

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT 102

PHONE NO. 680-8300

TRANSPORTER NAME ECMOS ENVIRON.

DRIVER NAME (PRINT) Russell Carter

ADDRESS 7254 Snowflake SA, Tx. 78238

VEHICLE LICENSE NO./STATE 537 YVU

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Russell Carter — 07289

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Russell Carter — 07289

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661-4110

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — DATE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

795 592

No: A028368

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-29-97 Time In: 15:01:22 Time Out: 15:12:12
Ticket # : A58959 CMS # : 1210194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : 513984 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 26.36 Tare Wt: 10.55 Net Wt: 15.81 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

BFI

TEXAS

Kelly AR # 3923 795 593 Page 606 of 880

NO. 513984

97-7

weight in & out

NON-HAZARDOUS SPECIAL WASTE MANIFEST

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	1 2	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CART
B-BAG
T-TRUC
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 8 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT-102

PHONE NO. 680-8300

TRANSPORTER NAME XUMOS ENVIRON.

DRIVER NAME (PRINT) RUSSELL CARTER

ADDRESS 7054 Snowflake
SA, TX. 78238

VEHICLE LICENSE NO./STATE 533 9YU

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

[signature] — 0 7 2 8 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

[signature] — 0 7 2 8 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 4 4

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 0 7 2 8 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 10:27:36 Time Out: 10:37:47
Ticket # : 056879 CNS # : 1210194 LNS #: 1210194
Customer : OLMOS ENVIRNMEN
Vehicle # : 000102 Trailer #: 000312 Lic Plate:
Manifest # : 513927 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 26.23 Tare Wt: 10.68 Net Wt: 15.55 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
2394131F	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4184
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TES-

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 595 NO 513921

97-7 weight IN & out

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130112	Soil with petroleum hydrocarbons	12	Y

BFI WASTE CODE TX 755 980118 230413

BFI WASTE CODE

BFI WASTE CODE

D-DRU
C-CAF
B-BAC
T-TRU
P-POL
Y YAF
O-OTI

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

07289 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT 102

PHONE NO. 680-8300

TRANSPORTER NAME ANES ENVIRONMENTAL

DRIVER NAME (PRINT) Russell Carter

ADDRESS 7054 Snowflake

VEHICLE LICENSE NO./STATE 533 9VU

SA, TX 78238

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

x Russell Carter — DRIVER SIGNATURE

07289 — SHIPMENT DATE

x Russell Carter — DRIVER SIGNATURE

07289 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[illegible] — NAME OF AUTHORIZED AGENT

[illegible] — SIGNATURE

[illegible]

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7201

TRANSPORTER RETAIN

No: A028691

BROWN NG-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 08:36:41 Time Out: 08:51:58
Ticket # : 058829 CMS #: 1210194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000182 Trailer #: 000012 Lic Plate:
Manifest # : 513938 PO #: Transporter: OUT
Generator : KAB : KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 28.13 Tare Wt: 10.74 Net Wt: 17.39 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	$7.20
	Sub Total..... $				$7.20
	Total..... $				$7.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

BFI

TEXAS

Kelly AR # 3923 Page 600 of 880

795 597 NO. 513930

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	12	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CAF
B-BAG
T TRU
P-POL
Y-YAF
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

07289 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT102

PHONE NO. 680-8300

TRANSPORTER NAME Olmos Environmental

DRIVER NAME (PRINT) Russell Carter

ADDRESS 7054 Snowflake

SA, TX 78227

VEHICLE LICENSE NO./STATE 533 9VU

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

x Russell Carter — DRIVER SIGNATURE

07289 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

x Russell Carter — DRIVER SIGNATURE

07289 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

David Barrera — NAME OF AUTHORIZED AGENT

David Barrera — SIGNATURE

07289

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

795 598 Kelly AR # 3923 Page 601 of 880 No. A028248

BROWNING-FERRIS INDUSTRIES

Date : 07-25-97 Time In: 13:05:38 Time Out: 13:14:56
Ticket # : 458469 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : 468899 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 28.55 Tare Wt: 10.93 Net Wt: 17.62 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	T/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.100000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

BFI

TEXAS

Kelly AR # 3923 Page 602 of 680

NO 468009

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 599 97-7

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Stonage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	12	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM
C-CART(
B-BAG
T-TRUCI
P-POUN
Y YARD'
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X-102

PHONE NO. 680-8300

TRANSPORTER NAME Ames Environmental Svcs

DRIVER NAME (PRINT) Russell Cantu

ADDRESS 7054 Southgate

VEHICLE LICENSE NO./STATE 533 9VU

S.A. TX. 78238

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Russell Cantu — 07259 — Russell Cantu — 07259

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Cantu — Mike Cantu — 07259

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

795 600

No A028331

BROWN NG-FEFRIS INDUSTRIES

15409

TESSMAN LANDFILL

Date : 07-25-97 Time In: 16:03:24 Time Out: 16:09:15
Ticket # : A[illegible]7 CMS # : 1210194 CMS #: 1210194
Customer : ALMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : 532117 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 26.46 Tare Wt: 10.90 Net Wt: 15.56 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TEXAS

Kelly AR # 3923 Page 604 NO. 532117

NON-HAZARDOUS SPECIAL WASTE MANIFEST 795 601

97-J

GENERATOR

GENERATOR NAME SA ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	1 9	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resi of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 102

PHONE NO. 680-8300

TRANSPORTER NAME OLMOS ENVIRON. SERVS. INC

DRIVER NAME (PRINT) RUSSELL CARTER

ADDRESS 7054 SNOWFLAKE

VEHICLE LICENSE NO./STATE 533 9VU

SA, TX 78238

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — 07 25 97 SHIPMENT DATE — DRIVER SIGNATURE — 07 25 9 DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07 25 97

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7201

795 602 Kelly AR # BFI 923 Page 605 of 8 No. A023356

BROWNING-FERRIS INDUSTRIES

95409

Date : 07-25-97 Time In: 17:11:25 Time Out: 17:21:12
Ticket # : A58505 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000162 Trailer #: 000012 Lic Plate:
Manifest # : 513959 PO #: Transporter: OUT
Generator : KAB- KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 27.63 Tare Wt: 11.08 Net Wt: 16.55 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TEXAS

Kelly AR # 3925 795 603 Page 606 of 850 513959

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	12	Y

BFI WASTE CODE TX 755 U801 18 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRU
C-CAF
B-BAC
T-TRU
P-POL
Y YAF
O-OTI

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT102

PHONE NO. 680-8300

TRANSPORTER NAME Chios Environ Servs, Inc

DRIVER NAME (PRINT) Russell Carter

ADDRESS 2054 Southf/AK

VEHICLE LICENSE NO./STATE 533 YU

SA, TX. 78238

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — 07 25 97 SHIPMENT DATE

DRIVER SIGNATURE — 07259 DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

BROWN NG-FEFRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-26-97 Time In: 07:42:05 Time Out: 07:47:25
Ticket # : 058542 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : 532112 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 27.50 Tare Wt: 10.76 Net Wt: 16.74 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TEXAS

Kelly AR # 795 605 3923 Page 608 of 880

NO 532112

NON-HAZARDOUS SPECIAL WASTE MANIFEST

weight 97-7 in & out

GENERATOR

ENERATOR NAME SA-ALC/EMC

GENERATING LOCATION ~~KAFB-East Kelly Storage-IRP Sites &~~

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024-130-12	Soil with petroleum hydrocarbons	12	Y

BFI WASTE CODE TX 755 080118 230413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, I been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resic of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT 102

PHONE NO. 680-8300

TRANSPORTER NAME OES

DRIVER NAME (PRINT) Russell Carter

ADDRESS 7054 SNOWFLAKE

VEHICLE LICENSE NO./STATE 537 9VU

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Russell Carter — 07269 — DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Russell Carter — 07269 — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

No: A028446

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 08:51:01 Time Out: 09:08:15
Ticket # : A58594 CMS # : 1210194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : 532183 PO #: Transporter: OUT
Generator : KAB - KELLY AIR FORCE BASE
Comment : Operator: CHRIS MOORE
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 28.02 Tare Wt: 10.74 Net Wt: 17.28 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 532103

97-7

weigh in + out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	12	Y

BFI WASTE CODE TX 755 080118 234133

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DR
C-CA
B-BA
T-TR
P-PO
Y-YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT102

PHONE NO. 680-8300

TRANSPORTER NAME OMNI ENVIRON. SERVICE INC

DRIVER NAME (PRINT) Russell Gilstrap

ADDRESS 7054 Snowflake

San Antonio TX 78238

VEHICLE LICENSE NO./STATE 553 9VU

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Russell Gilstrap — 072697

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Russell Gilstrap — 072697

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Tony Cisneros — [signature] — 072697

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

TRANSPORTER RETAIN

109-720T

No: A028481

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 10:34:26 Time Out: 10:48:29
Ticket # : A59630 CNS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle #: 000102 Trailer #: 000812 Lic Plate:
Manifest # : 512999 PO #: Transporter: OUT
Generator : KAB - KELLY AIR FORCE BASE
Consent : Operator: CHRIS MCCUNE
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 27.72 Tare Wt: 10.70 Net Wt: 17.02 tn

"ESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

BFI

TEXAS

Kelly AR # 3923 Page 612 of 880

513999

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

795 609

WORTH. IN 8 OT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306) Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	1 2	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU C-CAF B-BAC T-TRU P-POU Y YAF O-OTI

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

07269 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT102

PHONE NO 680-8300

TRANSPORTER NAME Curtis Environ. Servs Inc

DRIVER NAME (PRINT) Russel Carter

ADDRESS 7054 Snowflake SA., TX 78227

VEHICLE LICENSE NO./STATE 533 9YU

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

DRIVER SIGNATURE — SHIPMENT DATE 072697

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — DELIVERY DATE 07269

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07269

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

795 610 Kelly AR # 923 Page 613 of 880

No. AU2552

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-06-97 Time In: 12:52:49 Time Out: 13:13:42
Ticket # : 053622 CMS #: 1210194 LMS #: 1210194
Customer : DEMOS ENV/FAEB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : 513996 PO #: Transporter: DJT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: CHRIS MCCUNE
Capacity : 12.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 29.96 Tare Wt: 10.68 Net Wt: 19.28 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TEXAS

Kelly AR #- 3923 795 611 Page 614 of 880 NO 513996

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7 WEIGH IN

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241 3-012	Soil with petroleum hydrocarbons	12	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DR
C-CA
B-BA
T-TR
P-PO
Y YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT102 PHONE NO 680-8300

TRANSPORTER NAME OLMOS ENVIRON. SERVS. INC. DRIVER NAME (PRINT) RUSSEL CARTER

ADDRESS 7054 SNOWFLAKE VEHICLE LICENSE NO./STATE 533 9YU

SA, TX. 78238 STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

DRIVER SIGNATURE — 07269 7 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — 09269 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 09269

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

735 612 Kelly AR # 3923 Page 615 of 880 A028557

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 12:11:49 Time Out: 13:03:18
Ticket # : 058703 CMS #: 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000012 Lic Plate:
Manifest # : 513938 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 29.54 Tare Wt: 10.74 Net Wt: 18.80 tn

TEISSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

Job#
95409

SIGNATURE:

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 3923 795 613 Page 616 of 880 NO. 513938

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	12	Y

D-DRUM C-CART B-BAG T-TRUC P-POUN Y-YARD O-OTHE

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 072609

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. XDT102 — PHONE NO. 680-8300

TRANSPORTER NAME Olmos Environ. Servs. Inc — DRIVER NAME (PRINT) Russell Carter

ADDRESS 2054 Snowflake — VEHICLE LICENSE NO./STATE 533 9VU

SA, TX 78238 — STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Russell Carter — 072617 — DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Russell Carter — 072609 — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill — PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 7/7/7

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

No AU23062

BROWNING-FERRIS INDUSTRIES

Date : 07-29-97 Time In: 10:36:31 Time Out: 10:54:33
Ticket # : 054164 CMS # : 1210194 LMS #: 1210194
Customer : CEMOS ENV/KAFB
Vehicle # : 000102 Trailer #: 000010 Lic Plate:
Manifest # : 513978 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : 1 Operator: DAVID BARRERA
Capacity : 10.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 17.67 Tare Wt: 10.66 Net Wt: 7.01 tn

Item	Descr	Actual	Bill Qty	U/Unit	Extended
239413LF	SOIL	10.00	10.00 YD	8.10000	$1.00
	Sub Total..... $				$1.00
	Total..... $				$1.00

(210) 661-4104
Thanks & Have A Great Day!!

TESSMAN LANDFILL

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

954094

SIGNATURE: _____

TES

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 3923 795 615 Page 618 of 880 NO 513978

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 300)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petrolcum hydrocarbons	1K	Y

BFI WASTE CODE TX 755 .980118 239413

T N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, I been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment resic of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07299

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT 102

PHONE NO. 680-8300

TRANSPORTER NAME OLMOS ENVIRON. SERVS.

DRIVER NAME (PRINT) Russell CARTER

ADDRESS 7054 SNOWFLAKE

VEHICLE LICENSE NO./STATE 533 9VV, TX

S.A., TX 78238

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — 07 29 97 SHIPMENT DATE

DRIVER SIGNATURE — 07 29 9 DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-6[illegible]

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[illegible] — NAME OF AUTHORIZED AGENT

SIGNATURE — 07 29 9[illegible]

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

No A029045

BROWNING-FERRIS INDUSTRIES

105

95417-5

Date : 07-29-97 Time In: 09:57:14 Time Out: 10:11:31
Ticket # : 059171 CMS #: 1210194 LMS #: 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000100 Trailer #: 000012 Lic Plate:
Manifest # : 513979 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: DAVID BARRERA
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt: 35.06 Tare Wt: 16.79 Net Wt: 18.27 tn

TISSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
2394136F	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

95409

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE -
DRIVER SIGN TICKET

SIGNATURE: Thomas

9.25, start

TEXAS

Kelly AR # 3923 Page 620 of 880

NO. 513979

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weigh in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	1 2	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CART
B-BAG
T-TRUC
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 9 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. RO100

PHONE NO. 680-8300

TRANSPORTER NAME OLMOS ENVIRON. SERVS.

DRIVER NAME (PRINT) x Damasio Estrada

ADDRESS 7054 Snowflake
S.A. TX. 78238

VEHICLE LICENSE NO./STATE EL9-326 TX.

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

x Damasio Estrada — 0 7 2 9 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

x Damasio Estrada — 0 7 2 9 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

David Barrera — David Barrera — 0 7 2 9 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

795 C18 Kelly AR # 923 Page 621 of 880 No: A029010

BROWNING-FERRIS INDUSTRIES

Date : 07-24-97 Time In: 08:34:23 Time Out: 08:49:17
Ticket # : A59140 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000182 Trailer #: 000012 Lic Plate:
Manifest # : 513981 -- PO #: Transporter: GUT -- --
Generator : KAB KELLY AIR FORCE BASE
Comment : 1 Operator: DAVID BARRERA
Capacity : 12.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 26.92 Tare Wt: 10.88 Net Wt: 16.04 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
23-413LF	SOIL	12.00	12.00 YD	8.10000	97.20
	Sub Total..... $				97.20
	Total..... $				97.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

95409

SIGNATURE: [signature]

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 513981

795 619 97-7

weigh in at

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	12	Y

D-DRUM, C-CARTO, B-BAG, T TRUCK, P-POUND, Y-YARDS, O-OTHER

BFI WASTE CODE TX 755 980118 230413

T.N.R C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N R C C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07299

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. DT102

PHONE NO. 680-8300

TRANSPORTER NAME Olmos Environ. Servs.

DRIVER NAME (PRINT) x Russell Carter

ADDRESS 7054 Sinclair Ave

SA, TX. 78228

VEHICLE LICENSE NO./STATE 533 9VU

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

x [signature] — 07297 — DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

x [signature] — 07299 — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07299

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

BROWNING-FERRIS INDUSTRIES

Date : 07-25-97 Time In: 06:32:37 Time Out: 06:43:48
Ticket # : A54534 LMS # : 1210194 LMS #: 1210194
Customer : U.S.DOS ENV/RAFB
Vehicle # : 000145 Trailer #: 000022 Lic Plate:
Manifest # : 532116 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : 1 Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 40.70 Tare Wt: 15.69 Net Wt: 25.01 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Frank Limon

TEXAS

Kelly AR # 3923 Page 624 of 580

795 621

NO 532116

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weigh in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CART
B-BAG
T-TRUC
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 145

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Frank Limar

ADDRESS 6423 Marcum

SA TX 78227

VEHICLE LICENSE NO./STATE [illegible]

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Frank Limar — 072697

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Frank Limar — 07269

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Tony [illegible] — [signature] — 07282

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

TRANSPORTER RETAIN

795 622 Kelly AR # 3923 Page 625 of 880 No A022578

BROWNING-FERRIS INDUSTRIES

151

TESSMAN LANDFILL

Date : 07-25-97 Time In: 13:43:42 Time Out: 14:00:31
Ticket-# : A58719 CMS # : 1210194 LMS #: 1210194
Customer : CH MTG ENV/KAFB
Vehicle # : 000151 Trailer #: 000822 Lic Plate:
Manifest # : 513943 PO #: Transporter: CUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.22 Tare Wt: 14.91 Net Wt: 26.31 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413&F	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

BFI

TEXAS

Kelly AR #. 3923 795 623 626 of 880 NO 513943

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment res of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

07269 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 151

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Peter & Gilbert

ADDRESS 6423 Marcum
SA, TX 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X [signature] — DRIVER SIGNATURE

07269 7 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

[signature] — DRIVER SIGNATURE

07269 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — NAME OF AUTHORIZED AGENT

[signature] — SIGNATURE

07269

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72

TRANSPORTER RETAIN

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-26-97 Time In: 14:07:23 Time Out: 14:16:55
Ticket # : 056729 CMS # : 1-10194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000149 Trailer #: 000622 Lic Plate:
Manifest # : 513937 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 42.54 Tare Wt: 14.95 Net Wt: 27.59 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(216) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Leonard T Setter

TES

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 3923 795625 Page 028 of 88 513937

97-7 HIGH IN & OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment resi of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. Leonard Sitton 149 — PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking — DRIVER NAME (PRINT) Leonard Sitton

ADDRESS 6423 Macon — VEHICLE LICENSE NO./STATE 2ED 961

SA TX. 78227 — STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Leonard Sitton — 07 26 97

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Leonard Sitton — 07 26 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill — PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7207

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-25-97 Time In: 16:55:32 Time Out: 17:05:02
Ticket # : A58505 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000152 Trailer #: 000022 Lic Plate:
Manifest # : 468001 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 42.05 Tare Wt: 16.22 Net Wt: 25.83 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4184
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TES-

795 627

Kelly AR # 3923 Page 630 of 880

BFI

TEXAS

NO. 468001

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

Weight in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTO
B BAG
T-TRUCK
P-POUND
Y YARDS
O-OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 5 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 150

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X James L. Ziperian

ADDRESS 6423 Marcum
SA, TX 78227

VEHICLE LICENSE NO./STATE 2AG378

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — SHIPMENT DATE 0 7 2 5 9 — DRIVER SIGNATURE — DELIVERY DATE 0 7 2 5 9

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 0 7 2 5 9

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (

BROWNING-FERRIS INDUSTRIES

Date : 07-25-97 Time In: 15:0[illegible] Time Out: 15:5[illegible]
Ticket # : A58963 CMS # : 1210194 LMS #: 1210[illegible]
Customer : OLMOS ENV/KAFB
Vehicle # : 000152 Trailer #: 000000 Lic Plate:
Manifest # : 467137 PO #: Transporter: OST
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.38 Tare Wt: 16.38 Net Wt: 25.00 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED /
HAZARDOUS WASTE

DRIVER SIGN TICKET

SIGNATURE:

TES

BFI

TEXAS

795 629

NO 467133

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 317

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resi of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

07259 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 152

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X JAMES L. ZAPRIAN

ADDRESS 6423 MARCUM
SA, TX. 78227

VEHICLE LICENSE NO./STATE 2AG 318

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — SHIPMENT DATE 07259

DRIVER SIGNATURE — DELIVERY DATE 07259

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07259

REORDER ONLY THROUGH BFI / UARCO CONTRACT

No. AU_8233

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-25-97 Time In: 12:38:00 Time Out: 12:38:00
Ticket # : A58396 CMS # : 1210194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000145 Trailer #: 000022 Lic Plate:
Manifest # : 513903 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 90700 Scale Out #: 30,560
Gross Wt : 45.35 Tare Wt: 15.78 Net Wt: 30.67 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 631 NO 513903

97-7

Within 4 working days

GENERATOR

GENERATOR NAME SA-ALC/EMC

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

PHONE NO. 210 9253100

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive,

San Antonio, TX

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

D-DRU
C-CAR
B-BAG
T TRU
P-POL
Y-YAR
O-OTH

BFI WASTE CODE TX 755 9801 18 239413

BFI WASTE CODE

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h
been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu
of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t
requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — SHIPMENT DATE 072599

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE

TRANSPORTER

TRUCK NO X-150

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X James L. Zipprian

ADDRESS 6423 Marcum

San Antonio, TX 78227

VEHICLE LICENSE NO./STATE JAG-357 Texas

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X — DRIVER SIGNATURE — SHIPMENT DATE 072599

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI
WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — DELIVERY DATE 072799

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 072599

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

795 632 Kelly AR # 923 Page 635 of 880 No. A028392

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 16:02:55 Time Out: 16:12:58
Ticket # : A59026 CMS # : 1210194 CMS #: 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 513988 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 42.94 Tare Wt: 15.13 Net Wt: 27.81 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: ATREVIÑO 153

BFI

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 633 Kelly AR # 3923 Page 636 of 880 No 513988

97-7

WPPH IN & OL

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - Last Kelly Storage - IRP Sites

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment res of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 8 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. L 153

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X ALBERT TREVIÑO

ADDRESS 6423 Marcum

SA., TX 78227

VEHICLE LICENSE NO./STATE 2AG-377

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Albert Treviño — 0 7 2 8 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Treviño — 0 7 2 8

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 4

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — [signature] — 0 7 7 8 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

BROWNING-FERRIS INDUSTRIES

Date : 07-25-97 Time In: 14:40:51 Time Out: 1 :52:24
Ticket # : 055809 CMS # : 1218194 LMS #: 1218194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 42.15 Tare Wt: 15.15 Net Wt: 27.00 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4134
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] 153

BFI

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 635

NO 513989

97-7

WEGH IN 4 o

GENERATOR

GENERATOR NAME SA ALC / EMC

GENERATING LOCATION KAFB - East Storage Sites S

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resi of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X ALBERT TREVIÑO

ADDRESS 6423 MARCUM

SA, TX, 78227

VEHICLE LICENSE NO./STATE 2AG-377

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Albert Treviño — 072897

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Treviño — 07289

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07287

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

795 636 Kelly AR # 3923 Page 639 of 800 A028757

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 11:42:44 Time Out: 11:57:55
Ticket # : 058699 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 513925 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCLANE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.83 Tare Wt: 15.21 Net Wt: 26.62 tn

TESSMAN LANDFILL

Itm#	Descr	Actual	Bill Qty	U/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] FT 153

Kelly AR # 3923 795 637 Page 340 of 885

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

No 513925

97-7

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T N R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N R.C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment resi of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 28 97

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X ALBERT TREVINO

ADDRESS 6423 Moreum

VEHICLE LICENSE NO./STATE 2MG-377 TX

SA, TX. 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Trevino — 07 28 97

DRIVER SIGNATURE — SHIPMENT DATE

X Albert Trevino — 07 28 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — DATE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

A029824

795 638

BROWNING-FERRIS INDUSTRIES

Date : 07-02-97 Time In: 12:59:02 Time Out: 13:31:00
Ticket # : A59949 CMS #: 12:0194 LMS #: 12:0194
Customer : CLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 513548 PO #: Transporter: CUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 41.15 Tare Wt: 15.18 Net Wt: 25.97 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
2394136F	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4101
Thanks & Have A Great Day!!

TIESSMAN LANDFILL

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Irving FF 153

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 6394 NO. 513948

Kelly AR # 3923 Page 512 of 880

97-7

WEIGH IN OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Stowage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

UNITS: D-DRUM, C-CARTO, B-BAG, T TRUCK, P-POUNC, Y YARDS, O-OTHEF

BFI WASTE CODE: T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

BFI WASTE CODE:

BFI WASTE CODE:

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X-153

PHONE NO. 673-2940

TRANSPORTER NAME Hall Trucking

DRIVER NAME (PRINT) X ALBERT TREVIÑO

ADDRESS 6212-3 MARCUM

SA, TX 78227

VEHICLE LICENSE NO./STATE 2AG-377

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

X Albert Trevino — 07289 — DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

X Albert Trevino — 07289 — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07289

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

795 639B

Kelly AR 3923 Page 640 of 320

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-20-97 Time In: 10:22:58 Time Out: 10:36:28
Ticket # : A58876 CMS # : 1210194 LMS #: 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 513934 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 33.14 Tare Wt: 15.29 Net Wt: 23.85 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] #153

TE

BFI

TEXAS

Kelly AR # 3923 795 Page 644 of 880 NO 513934

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7 weigh in 80

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 0 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CAR
B BAG
T-TRU
P-POU
Y YAR
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

0 7 2 8 9 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 153

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Albert Treviño

ADDRESS 6423 Marcum

SA, TX. 78227

VEHICLE LICENSE NO./STATE 2AG-377

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Albert Treviño — DRIVER SIGNATURE

0 7 2 8 9 7 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Treviño — DRIVER SIGNATURE

0 7 2 8 9 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — NAME OF AUTHORIZED AGENT

[signature] — SIGNATURE

0 7 2 8 9

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

795 641 Kelly AR # 923 Page 645 of 880 No A028692

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-28-97 Time In: 08:37:46 Time Out: 08:53:20
Ticket # : A56930 CMS # : 12-0154 LMS #: 1210-94
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 513931 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 42.53 Tare Wt: 15.28 Net Wt: 27.25 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
235413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Atravino FT. 153

TEXAS

795 642 No 513931

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

WEIGHT IN TO

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 230413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRI
C-CAF
B-BAC
T-TRL
P-POL
Y-YAF
O-OTI

GENERATOR'S CERTIFICATION. I hereby certify that the above-named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

07 09 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO. 673-2440

TRANSPORTER NAME Hills Trucking

DRIVER NAME (PRINT) X ALBERT TREVINO

ADDRESS 6423 MARCUM

SA, TX. 78227

VEHICLE LICENSE NO./STATE 2AG-377 TX.

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Albert Trevino — DRIVER SIGNATURE

07 09 97 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Trevino — DRIVER SIGNATURE

07 09 97 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

David Barrera — NAME OF AUTHORIZED AGENT

David Barrera — SIGNATURE

07 09 97

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

No A028685

795 643

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-20-97 Time In: 03:13:37 Time Out: 02:34:14
Ticket # : A58931 CMS # : 1210194 LMS #: 1210194
Customer : CLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 513936 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.18 Tare Wt: 14.24 Net Wt: 28.94 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE Ronald Guerra

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 3923 795 644 Page 648 of 580 NO 513936

97-7

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 31750

T.N R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
04130112	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

D-DRUM C-CARTON B BAG T TRUCK P-POUND Y YARDS O-OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 148

PHONE NO. 210) 673-2940

TRANSPORTER NAME Hall's Trucking

DRIVER NAME (PRINT) Ronald Guerra

ADDRESS 6423 Marcum

San Antonio, Tx

VEHICLE LICENSE NO./STATE 2AG 379

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 07285

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 07289

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

795 645

A020138

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-28-97 Time In: 10:24:02 Time Out: 10:39:23
Ticket # : 056677 CMS # : 1210194 CMS #: 1210194
Customer : GLMOS ENV/NRCR
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 513928 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 37.01 Tare Wt: 14.21 Net Wt: 22.80 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extend-d
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerra

TES-

11

TEXAS

Kelly AR # 3923 795 646 Page 650 of 880 NO 513928

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7 weight in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	20	Y

BFI WASTE CODE TX 755 080118 239413

BFI WASTE CODE

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residual of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X148

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Ronald Guerra

ADDRESS 6423 Marcum

VEHICLE LICENSE NO./STATE

SA, TX 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Konald Guerra — 07289 — Ronald Guerra — 07289

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661411

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 0279

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72(

TRANSPORTER RETAIN

795 647

No A023786

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-28-97 Time In: 12:20:22 Time Out: 12:34:18
Ticket # : A58919 CMS # : 1210194 CMS #: 1210194
Customer : DLNOS ENV/KAFB
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 513947 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 40.79 Tare Wt: 14.64 Net Wt: 26.15 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerrt

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 795 648 Page 652 of 880 NO. 513941

97-7 WEIGH IN & OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

D DRUM, C-CART, B BAG, T-TRUC, P-POUN, Y-YARD, O-OTHE

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — SHIPMENT DATE 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE

TRANSPORTER

TRUCK NO. X-148

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Ronald Guerra

ADDRESS 6423 Harum

VEHICLE LICENSE NO./STATE 2AG. 379

SA, TX. 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Ronald Guerra — SHIPMENT DATE 07289

DRIVER SIGNATURE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Ronald Guerra — DELIVERY DATE 07289

DRIVER SIGNATURE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[illegible] — [illegible] — 07289

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TD

TRANSPORTER RETAIN

795 649

No A028340

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 13:42:08 Time Out: 14:06:32
Ticket # : 058971 CMS # : 1:10194 CMS #: 1210194
Customer : DEMOS ENV/KAFB
Vehicle # : 030145 Trailer #: 000022 Lic Plate:
Manifest # : 513944 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 39.79 Tare Wt: 14.66 Net Wt: 25.13 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerra

TES

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 795 650 3923 Page 654 of 880 NO 513944

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D DR
C-CA
B-BA
T-TR
P-PC
Y YA
O-OT

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer A Albertson — Spencer Albertson — 0 7 2 8 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 148

PHONE NO. 673-2940

TRANSPORTER NAME Hollis Trucking

DRIVER NAME (PRINT) Ronald Guerra

ADDRESS 6423 MARCUM

San. TX. 78227

VEHICLE LICENSE NO./STATE 2AG. 329

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 0 7 2 8 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 0 7 2 8

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 0 7 2 8

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7

No. A023378

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-28-97 Time In: 15:17:15 Time Out: 15:37:01
Ticket # : 65-[illegible] CKS # : 1210194 INS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000146 Trailer #: 000022 Lic Plate:
Manifest # : 513987 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 39.35 Tare Wt: 14.67 Net Wt: 24.68 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guefft

TEXAS

Kelly AR # 795 652 3923 Page 656 of 851 513987

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7 weigh in 0a

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T N R C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 234133

T N R C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N R C C	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM
C-CART
B-BAG
T-TRUC
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 28 99

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 148

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) ZAG. 375

ADDRESS 6423 Marcum

SA, TX 78227

VEHICLE LICENSE NO./STATE ZAG. 375

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 07 28 99 AP

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 07 29 99

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Marcus Ramos — Marcus Ramos — 7 28 99

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

NO AU[illegible]

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-20-97 Time In: [illegible] Time Out: [illegible]
Ticket # : 059042 CMS # : [illegible] LMS #: [illegible]
Customer : [illegible]
Vehicle # : 000148 Trailer #: 000072 Lic Plate:
Manifest # : 513993 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 40.23 Tare Wt: 14.00 Net Wt: 26.23 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerrero

TES-

Kelly AR # 3923 Page 658 of 800

BFI

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 513993

795 654 weight in + out 91-7

GENERATOR

GENERATOR NAME: SA-ALC/EMC

GENERATING LOCATION: KAFB - East Kelly Storage - IRP Sites S-

ADDRESS: 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS: 307 Tinker Drive
San Antonio, TX

PHONE NO.: 210 9253100

STATE GENERATOR ID NUMBER: 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE: TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE:

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE:

D-DRUM
C-CARTO
B-BAG
T-TRUCK
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 148

PHONE NO. 673-2940

TRANSPORTER NAME: Halls Trucking

DRIVER NAME (PRINT) X Ronald Guerra

ADDRESS: 6423 Marcum
SA, TX 78227

VEHICLE LICENSE NO./STATE: 2AG: 329

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 07289

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 07289

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME: BFI Landfill

PHONE NO. 210-661410

ADDRESS: 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07289

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

Kelly AR 3923 Page 659 of 880

795 655 No. A026481

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-26-97 Time In: 10:35:44 Time Out: 10:51:42
Ticket # : A56629 CMS # : 1210194 LMS #: 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000022 Lic Plate:
Manifest # : 532102 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 46.79 Tare Wt: 16.26 Net Wt: 30.52 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day''

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: _____

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

No 532102

97-7

WORK IN OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241-3012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N R.C C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resi of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer Albertson — Spencer Albertson — SHIPMENT DATE 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE

TRANSPORTER

TRUCK NO. X 150

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Roy Penn

ADDRESS 6423 MARAM

SA, TX. 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

V — DRIVER SIGNATURE — SHIPMENT DATE 072697

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

V — DRIVER SIGNATURE — DELIVERY DATE 07269

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661411

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 07261

No: A029403

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-06-17 Time In: 07:15:17 Time Out: 07:31:40
Ticket # : 055548 EMS # : 1218154 EMS #: 1218154
Customer : OLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000822 Lic Plate:
Manifest # : 532114 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS NOONE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.82 Tare Wt: 16.16 Net Wt: 27.66 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
2394LSLF	SOIL	22.00	22.00 YD	8.100000	178.20
	Sub Total.....				178.20
	Total.....				178.20

(210) 661-4764
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

BFI

TEXAS

Kelly AR # 3923 795 658 Page 662 NO 582114

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM
C-CART
B BAG
T TRUC
P-POUN
Y YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 150

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Roy Pena

ADDRESS 6423 MARCUM
SA, TX 78220

VEHICLE LICENSE NO./STATE [illegible]

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Roy Pena — 072697

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Roy Pena — 07249

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[illegible] — [illegible] — 07567

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

No. A028579

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 13:52:02 Time Out: 14:04 07
Ticket # : 906726 CMS # : 1210194 CMS #: 1210194
Customer : OLMOS LNV/KOFB
Vehicle # : 000150 Trailer #: 000022 Lic Plate:
Manifest # : 536105 PO #: Transporter: OUT
Generator : KAR KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 45.64 Tare Wt: 16.13 Net Wt: 29.51 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: _____

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 532105

97-7 weight in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N R.C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

D-DRUM C-CARTO B-BAG T TRUCK P-POUND Y YARDS O-OTHER

BFI WASTE CODE TX 755 980118 239413

BFI WASTE CODE

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — SHIPMENT DATE 072699

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE

TRANSPORTER

TRUCK NO. X 150

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Ray Penn

ADDRESS 6423 Marcum

SA, TX 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ray Penn — 072697

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X — 072699

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 7-26-99

REORDER ONLY THROUGH BFI / UARCO CONTRACT

795 661

No: A029448

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 09:11:43 Time Out: 09:11:59
Ticket # : A58595 CNG #: 1210194 LNG #: 1210194
Customer : OLMOS ENV/MAFB
Vehicle # : 600150 Trailer #: 000022 Lic Plate:
Manifest # : 532104 PO #: Transporter: OUT
Generator : KAB: KELLY AIR FORCE BASE
Convent : Operator: CHRIS MCDUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 46.25 Tare Wt: 16.19 Net Wt: 30.06 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	U/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	9.10000	170.20
	Sub Total..... $				170.20
	Total..... $				170.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: _____

BFI

TEXAS

795 662 NO 332100

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weigh in & out

GENERATOR

RATOR NAME SA-ALC / FMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

D DRUM
C-CARTO
B BAG
T-TRUCK
P-POUND
Y-YARDS
O-OTHER

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 150

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X [illegible]

ADDRESS 6423 Marcum
SA, TX 78227

VEHICLE LICENSE NO./STATE [illegible]

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X [signature] — 072697 — [signature] — 07269

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07269

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

795 663

No A02853

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-26-97 Time In: 12:17:18 Time Out: 12:37:45
Ticket # : 858478 CMS # : 1210194 CMS #: 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 532106 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 48.67 Tare Wt: 16.28 Net Wt: 32.39 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
209413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

BFI

TEXAS

Kelly AR # 795 664 Page 668 of 880 NO 532106

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weight in + out

GENERATOR

GENERATOR NAME: SA-ALC / EMC

GENERATING LOCATION: KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS: 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS: 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE: T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N R C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N R C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTO
B BAG
T-TRUCK
P-POUND
Y-YARDS
O-OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 150

PHONE NO 673-2940

TRANSPORTER NAME: Halls Trucking

DRIVER NAME (PRINT) ✓ Roy Penn

ADDRESS: 6423 Marcum
SA, TX 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Roy Penn — 072697 — ✓ Roy Penn — 07269

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME: BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS: 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07261

NAME OF AUTHORIZED AGENT — SIGNATURE

SECURED ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

BROWNING-FERRIS INDUSTRIES

Date : 07-[illegible]-92 Time In: [illegible] Time Out: [illegible]
Ticket # : A58523 CMS #: 1210194 LNS #: 1210194
Customer : OLMOS ENVIRONMENTAL
Vehicle # : 000140 Trailer #: 000022 Lic Plate:
Manifest # : 460822 PO #: Transporter: BFI
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 41.63 Tare Wt: 15.06 Net Wt: 26.57 tn

795 665

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
2394131LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4184
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerra

TES

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 3923 735 666 Page 670 of 880 No. 468002

97-7

GENERATOR

GENERATOR NAME: SA-ALC / EMC

GENERATING LOCATION: KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS: 307 Tinker Drive (Building 306)

ADDRESS: 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO.: 210 9253100

STATE GENERATOR ID NUMBER: 31754

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	V

D-DRUM, C-CARTON, B-BAG, T-TRUCK, P-POUND, Y-YARDS, O-OTHER

BFI WASTE CODE: TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE:

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE:

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — SHIPMENT DATE: 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE

TRANSPORTER

TRUCK NO.: X 148

PHONE NO.: 673-2940

TRANSPORTER NAME: Halls Trucking

DRIVER NAME (PRINT): X Ronald Guerra

ADDRESS: 6423 Macwm

SA, TX 78227

VEHICLE LICENSE NO./STATE: 2AG 329

STATE TRANSPORTER ID NO.:

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — SHIPMENT DATE: 07259 — DRIVER SIGNATURE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — DELIVERY DATE: 07259 — DRIVER SIGNATURE

DESTINATION

SITE NAME: BFI Landfill

PHONE NO.: 210-000-1410

ADDRESS: 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07/26/97

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

795 667

A022414

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 07:35:17 Time Out: 07:54:51
Ticket # : 648556 CMS # : 1210194 LMS #: 1210194
Customer : CLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: BM0022 Lic Plate:
Manifest # : 532113 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent # : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 37.73 Tare Wt: 14.91 Net Wt: 22.82 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
235413LF	SOIL	22.00	22.00 YD	8.100000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE Ronald Guerra

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 532113

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T N R C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 080118 239413

T N.R C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T N R C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM
C-CARTO
B-BAG
T-TRUCK
P-POUNC
Y-YARDS
O-OTHEF

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 148 — PHONE NO (623) -2940

TRANSPORTER NAME Halls Trucking — DRIVER NAME (PRINT) X RONALD GUERRA

ADDRESS 6423 MARKUM — VEHICLE LICENSE NO./STATE

SA, TX. 78227 — STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Ronald Guerra — 07269 — DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Ronald Guerra — 07269 — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill — PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

EBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — [illegible]

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

No A028469

795 669

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 09:19:24 Time Out: 10:11:37
Ticket # : A0A683 CMS #: 1210144 LMS #: 1210134
Customer : OLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: 002822 Lic Plate:
Manifest # : 514838 PO #: Transporter: OUT
Generator : KAB - KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt: 40.52 Tare Wt: 14.32 Net Wt: 26.20 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day'!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE Ronald Greene

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 670 NO 514000

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 080118 23041 3

T.N.R C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM
C-CARTO
B BAG
T-TRUCK
P-POUN
Y YARDS
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 748

PHONE NO. 673-7940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Ramon Garcia

ADDRESS 6423 Mapcum

VEHICLE LICENSE NO./STATE

SA TX 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — 072697 SHIPMENT DATE — DRIVER SIGNATURE — 07269 DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07269

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

No: AU25528

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-26-97 Time In: 12:01:53 Time Out: 12:14:57
Ticket # : 859671 CNS # : 1210194 CNS #: 1210194
Customer : OLMOS ENV/RAFB
Vehicle # : 000148 Trailer #: 000322 Lic Plate:
Manifest # : 513997 PO #: 1 Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 40.40 Tare Wt: 14.33 Net Wt: 26.07 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ismael Guerra

TES-L

BFI

TEXAS

Kelly AR # 3923 795 672 Page 6 of 8 513997

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weight in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

D-DRUM C-CART B-BAG T-TRUC P-POUN Y-YARD O-OTH

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X-148

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Ronald Guerra

ADDRESS 6423 Marcum
SA, TX 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 072699

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

Ronald Guerra — 07269

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07269

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

795 073

No A02S576

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

e : 07-26-91 Time In: 13:41:25 Time Out: 12:54:57
cket # : 058718 CMS # : 1210194 LMS #: 1210194
stomer : DLMOS ENV/KAFB
hicle # : 000148 Trailer #: 000022 Lic Plate:
nifest # : 513941 PO #: Transporter: OUT
nerator : KAB KELLY AIR FORCE BASE
ssent... : Operator: CHRIS MCCUNE
pacity : 22.00 yd Scale In # : 1 Scale Out #: 1
oss Wt : 41.27 Tare Wt: 14.45 Net Wt: 26.82 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
39413	LF SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guella

BFI

TEXAS

795674 NO 513941

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

WASH IN + OU

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DR
C-CA
B-BA
T TR
P-PO
Y YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, I been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 148

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Ronald Guerra

ADDRESS 6423 Marcum

SA., TX 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 072697

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 07269

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — [signature] — 07269

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

No: A028831

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 13:33:36 Time Out: 13:48:45
Ticket # : 053966 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 513929 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.38 Tare Wt: 16.15 Net Wt: 27.23 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

795 676

Kelly AR # 3923 Page 680 of 880

TEXAS

NO 513929

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

WEIGH IN & OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTO
B-BAG
T-TRUCK
P-POUND
Y-YARDS
O-OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 001

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) x Clayton Hall

ADDRESS 6423 Marcum

SA, TX 78222

VEHICLE LICENSE NO./STATE 2EC 040

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

[signature] — 07289

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

x [signature] — 07289

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature]

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

795 677

No A028928

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 17:30:42 Time Out: 17:47:42
Ticket # : A59061 CMS # : 1218194 LMS #: 1218194
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000622 Lic Plate:
Manifest # : 513982 PO #: Transporter: OUT
Generator : KAB - KELLY AIR FORCE BASE
Consent : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 47.10 Tare Wt: 16.26 Net Wt: 30.84 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: _____

BFI

TEXAS

Kelly AR # 3923 795 678 Page 382 of 850 513982

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

WEIGH IN & C

GENERATOR

GENERATOR NAME SA-ALC / FMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CART
B-BAG
T-TRUC
P-POU
Y-YARD
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR/AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 001

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Clayton Hatley

ADDRESS 6423 Marcum St, TX 78227

VEHICLE LICENSE NO./STATE 2EC 040

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X [signature] — 072897

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X [signature] — 07289

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-6[illegible]

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas, 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07289

NAME OF AUTHORIZED AGENT — SIGNATURE

ORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

795 679

A023740

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 10:21:55 Time Out: 10:43:47
Ticket # : A58475 CMS # : 1214094 LMS #: 1218191
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000422 Lic Plate:
Manifest # : 513949 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: CHRIS MCGUIRE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 40.48 Tare Wt: 16.25 Net Wt: 24.23 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE

BFI

TEXAS

Kelly AR # 3923 795 680 Page 684 of 880

NO 513949

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

WEIGH IN & OUT

GENERATOR

GENERATOR NAME SA ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5 0

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	82	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTO
B-BAG
T-TRUCK
P-POUND
Y-YARDS
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 2 001

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Clayton Hall

ADDRESS 6423 Marcum

SA TX 78227

VEHICLE LICENSE NO./STATE 2EC010

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

[signature] — 072897

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

[signature] — 07289

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07289

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TD

No: A028700

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-28-97 Time In: 08:55:48 Time Out: 09:09:12
Ticket # : A58836 CMS # : 1210194 LMS #: 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 513932 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment: Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 44.00 Tare Wt: 16.51 Net Wt: 27.49 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE

Kelly AR # 3923 795 682 Page 686 of 880

BFI

TEXAS

NO 513932

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

WASH IN + OT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CAR
B BAC
T-TRU
P-POU
Y YAR
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 001

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Clayton Hall

ADDRESS 6423 Marcum
SA, TX 78227

VEHICLE LICENSE NO./STATE 2EC 040

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

[signature] — 072897 — [signature] — 07289

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07289

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7207

795 683

No: A023869

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 14:58:07 Time Out: 15:13:38
Ticket #: 459097 CMS #: 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle #: 000001 Trailer #: 000022 Lic Plate:
Manifest #: 513966 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent #: Operator: CHRIS MCCUNE
Capacity #: 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt: 43.18 Tare Wt: 16.33 Net Wt: 26.85 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
2394131F	SOIL	22.00	22.00 YD	8.100000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: _____

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 513986

684

97-7

WEIGHT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130112	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRU
C-CAR
B-BAG
T-TRU
P-POU
Y YAR
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 072889

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 100

PHONE NO 673-2440

TRANSPORTER NAME Hall trucking

DRIVER NAME (PRINT) CLAYTON HALL

ADDRESS 6423 Marcum

SA, TX 78227

VEHICLE LICENSE NO./STATE 2FP640

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — 072897 SHIPMENT DATE

DRIVER SIGNATURE — 072897 DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661-4140

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07

REORDER ONLY THROUGH BFI / UARCO CONTRACT

795 685

BROWNING-FERRIS INDUSTRIES

Date : 07-06-97 Time In: 09:57:55 Time Out: 09:13:07
Ticket # : 458548 CMS # : 1210194 LMS # 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 536108 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 45.62 Tare Wt: 16.05 Net Wt: 29.57 tn

Item	Descr	Actual	Bill Qty	Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

TESSMAN LANDFILL

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TES

TEXAS

Kelly AR # 3923 796 686 Page 686 of 880

NO. 532108

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

MUCH IN & OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

D-DRUM, C-CARTO, B-BAG, T TRUCK, P-POUND, Y-YARDS, O-OTHER

BFI WASTE CODE: TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 26 97

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 8001

PHONE NO 673-2940

TRANSPORTER NAME Hall's TRUCKING

DRIVER NAME (PRINT) [illegible] Hall

ADDRESS 1623 MARCUM

VEHICLE LICENSE NO./STATE [illegible]

SA, TX 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

[signature] — 07 26 97 — SHIPMENT DATE

DRIVER SIGNATURE

[signature] — 07 26 97 — DELIVERY DATE

DRIVER SIGNATURE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — [illegible]

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (5

795 687

No A022486

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-26-97 Time In: 10:25:01 Time Out: 10:50:09
Ticket # : A56623 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 532107 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.42 Tare Wt: 16.20 Net Wt: 27.22 ln

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TES

TEXAS

795 688 NO 532107

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N R C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 23941 3

BFI WASTE CODE

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment residual of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer Albertson Spencer Albertson 07269

GENERATOR AUTHORIZED AGENT NAME SIGNATURE SHIPMENT DATE

TRANSPORTER

TRUCK NO. X101

PHONE NO 673-2940

TRANSPORTER NAME Hals Trucking

DRIVER NAME (PRINT) X Clayton Holt

ADDRESS 6423 Marcum

VEHICLE LICENSE NO/STATE 2EC 040

San Antonio TX 78217

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

X [signature] 07269 DRIVER SIGNATURE SHIPMENT DATE

X [signature] 07269 DRIVER SIGNATURE DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210 661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] [signature] 07

NAME OF AUTHORIZED AGENT SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

795 689 **TEXAS** Kelly AR # 3923 Page 693 of 850 513994

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	82	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE

BFI WASTE CODE

D-DR
C-CA
B-BA
T TR
P-PO
Y YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, I been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment resic of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordanc requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 28 89

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X ALBERT TREVINO

ADDRESS 6423 MARCIA

VEHICLE LICENSE NO./STATE 2AG-377 TX

SA. TX. 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Albert Trevino — 07 28 89

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Trevino — 07 28 89

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661-1

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — DATE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

795 698

No. A02892

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-28-97 Time In: 17:25:07 Time Out: 17:43:21
Ticket # : 059057 CMS # : 1210194 CMS #: 1210194
Customer : DLMOS ENV/KAB
Vehicle # : 000153 Trailer #: 000002 Lic Plate:
Manifest # : 512994 PO #: Transporter: SUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.08 Tare Wt: 15.14 Net Wt: 27.94 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Arevino 15

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 513940

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Stamper - IRP S[illegible]

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y
BFI WASTE CODE	TX 755 980118 23413		
T.N.R.C.C.	DESCRIPTION OF WASTE		
BFI WASTE CODE			
T.N.R.C.C.	DESCRIPTION OF WASTE		
BFI WASTE CODE			

D-DF C-CA B-BA T-TR P-PC Y YA O-O

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 072699

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 661

PHONE NO. 673-2940

TRANSPORTER NAME HALL TRUCKING

DRIVER NAME (PRINT) CLAYTON HALL

ADDRESS 6423 MARBLE

VEHICLE LICENSE NO./STATE 2EC040

St. Tx. 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — 072697 SHIPMENT DATE — DRIVER SIGNATURE — 0726 DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 07-1

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

BROWNING-FERRIS INDUSTRIES

795 692

TESSMAN LANDFILL

Date : 07-26-97 Time In: 13:1[illegible] Time Out: 13:[illegible]
Ticket # : [illegible] CMS # : [illegible] LMS #: 1210194
Customer : OLMUS [illegible]
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 513940 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 45.08 Tare Wt: 16.16 Net Wt: 28.92 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	6.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

795 693

No. AU 3321

BROWNING-FERRIS INDUSTRIES

Date : 07-25-97 Time In: 15:12:16 Time Out: 15:49:20
Ticket # : A58467 CMS #: 121019 LMS #: 121034
Customer : OLM35 ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 467128 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 41.18 Tare Wt: 15.20 Net Wt: 25.98 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4184
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE. ATREVINO 153

795 694

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 467120

97-7

WEIGHT IN & OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

D DRUM
C-CARTON
B-BAG
T TRUCK
P-POUND
Y YARDS
O-OTHER

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer Albertson — Spencer Albertson — SHIPMENT DATE 072599

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE

TRANSPORTER

TRUCK NO. X 153

PHONE NO. 673-2940

TRANSPORTER NAME HALLS TRUCKING

DRIVER NAME (PRINT) X ALBERT TREVINO

ADDRESS 6423 MARCUM

S.A., TX. 78227

VEHICLE LICENSE NO./STATE 2AG-377

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

X Albert Trevino — 072599 — Albert Trevino

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O Box 201690, 78220) San Antonio, Texas 78109

REBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 072599

BROWNING-FERRIS INDUSTRIES

Date : 07-29-97 Time In: 17:06:31 Time Out: 17:19:43
Ticket # : 059507 CNS #: 1210194 LMS #: 1210194
Customer : DLMDS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 467121 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 42.18 Tare Wt: 15.11 Net Wt: 27.07 tn

TES-SMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] 153

TES-L

BFI

TEXAS

795 696 NO 467121

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

WEIGH IN & OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5 0

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTON
B BAG
T-TRUCK
P-POUNDS
Y YARDS
O-OTHER

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

0 7 2 5 9 7 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO 673-5940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Albert Trevino

ADDRESS 6423 Marcum
SA. TX 78227

VEHICLE LICENSE NO./STATE 2AG377

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

Albert Trevino — DRIVER SIGNATURE

0 7 2 5 9 7 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVER WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Albert Trevino — DRIVER SIGNATURE

DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT

SIGNATURE

0 7 2 5 9 7

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (5

795 697

No. A028409

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 07:[illegible]:04 Time Out: [illegible]
Ticket # : A58560 CMS # : 1210[illegible] LMS #: 1210[illegible]
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 532111 PO #: Transporter: OUI
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.88 Tare Wt: 16.68 Net Wt: 27.20 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4194
Thanks & Have A Great Day!!

TESSMAN LANDFILL

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TESSMAN

BFI

TEXAS

795 698

NO 532111

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weight in ta

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T N R C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

D DR
C-CA
B-BA
T-TR
P-PO
Y-YA
O-OT

T N R C C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N R.C C	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously-restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 6 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 001

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Clayton Hall

ADDRESS 6423 Marcum
SA, TX, 78238

VEHICLE LICENSE NO./STATE 2 FC 040

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — SHIPMENT DATE 0 7 2 6 9 7

DRIVER SIGNATURE — DELIVERY DATE 0 7 2 6 9

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 0 7 2 6 9

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

795 699

No A02826

BROWNING-FERRIS INDUSTRIES

Date : 07-25-97 Time In: 13:47:19 Time Out: 13:57:19
Ticket # : 058427 CMS # : 1210194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000062 Lic Plate:
Manifest # : 456B054 -- PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID HARPERA
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 42.12 Tare Wt: 15.20 Net Wt: 26.92 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10450	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4101
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] 153

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 468054

97-7

weight in & out

GENERATOR

GENERATOR NAME SA-ALC/EMC

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

PHONE NO. 210 925 3100

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites

ADDRESS 307 Tinker Drive

San Antonio, TX

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130112	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

BFI WASTE CODE

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been propedy described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment res of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 072497

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO. 673-2940

TRANSPORTER NAME HAYS TRUCKING

DRIVER NAME (PRINT) X ALBERT TREVIÑO

ADDRESS 623 MAPLEWOOD

VEHICLE LICENSE NO./STATE 276-377

SA TX. 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X Albert Trevino Sr. — 072597

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Albert Trevino — 07259?

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661411

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[illegible] — [illegible] — OK KS

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72

BROWNING-FERR S INDUSTRIES

Date : 07-25-97 Time In: 15:21:24 Time Out: 15:21:24
Ticket # : 858470 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 00014A Trailer #: 000422 Lic State:
Manifest # : 468605 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In # : Scale Out #:
Gross Wt : 85100 Tare Wt: 30060 Net Wt: 27.52 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: David Guerra

TES-1

795 702

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 468005

97-7

WRIGHT IN 4 OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 - 925-3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 98014 - 8 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

UNITS: D-DRUM, C-CART, B-BAG, T-TRUC, P POUN, Y YARD, O-OTHE

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 148

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) RONALD GUERRA

ADDRESS 6423 MARCUM

SA., TX 78227

VEHICLE LICENSE NO./STATE 2AG. 379

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 072578

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 072579

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210 - 661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 072579

PROPER ONLY THROUGH BFI HAZCO CONTRACT

100 720T

795 703

No. A028268

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-25-97 Time In: 13:44:58 Time Out: 13:59:33
Ticket # : 058425 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 468003 PO #: Transporter: GUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 40.55 Tare Wt: 14.95 Net Wt: 25.60 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

BFI

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 704 NO 468003

97-7

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTO
B-BAG
T TRUCK
P-POUN
Y YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 148

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Ronald Guerra

ADDRESS 6423 Marcum

SA, TX 78227

VEHICLE LICENSE NO./STATE 2AG 379

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Guerra — 072597

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Guerra — 07259

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07259

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

795 705

BFI

No: A029526

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

ate : 07-26-97 Time In: 11:59:59 Time Out: 12:11:59
icket # : 058670 CMS # : 1210194 LMC #: 1210194
ustomer : OLMOS ENV/KAFB
ehicle # : 000001 Trailer #: 000022 Lic Plate:
anifest # : 513998 PO #: Transporter: OUT
erator : KAB KELLY AIR FORCE BASE
omment : Operator: CHRIS MCCUNE
apacity : 22.00 yd Scale In # : 1 Scale Out #: 1
oss Wt : 45.17 Tare Wt: 16.15 Net Wt: 29.02 tn

em	Descr	Actual	Bill Qty	$/Unit	Extended
5413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE.

TES-LF116-SW

BFI

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 315550

97-7

795.706 weigh in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5 0

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTON
B-BAG
T TRUCK
P-POUNDS
Y YARDS
O-OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 6 9 7

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 001

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Clayton Hall

ADDRESS 6423 Marcum

SA TX 78227

VEHICLE LICENSE NO./STATE 2EC 040

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

X [signature] — 0 7 2 6 9 7 — X [signature] — 0 7 2 6 9 7

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0 4

ADDRESS 7790 Tessman Road (P.O Box 201690. 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — [signature] — 0 7 2 6 9 7

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (5/90)

TRANSPORTER RETAIN

No. A023177

795 707

BROWNING-FERRIS INDUSTRIES

Date : 07-25-97 Time In: 10:23:23 Time Out: 10:23:03
Ticket # : 056349 CMS # : 1210194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 002148 Trailer #: 000022 Lic Plate:
Manifest # : 468022 PO #: Transporter: BFI
Generator : KAE KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 77046 Scale Out #: 29546
Gross Wt : 38.52 Tare Wt: 14.77 Net Wt: 23.75 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended $
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4134
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ronald Guerra

TEXAS

795 708 NO 468022

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weigh in + weigh out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N R.C C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRL C-CAR B-BAG T-TRU P-POL Y YAF O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with r requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson Spencer Albertson 07259

GENERATOR AUTHORIZED AGENT NAME SIGNATURE SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 148

PHONE NO. 673-2940

TRANSPORTER NAME HALS Trucking

DRIVER NAME (PRINT) x Ronald Guerra

ADDRESS 6423 MARCum

VEHICLE LICENSE NO./STATE 2AG 375

S.A., TX. 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

x Ronald Guerra 07257 Ronald Guerra 07257

DRIVER SIGNATURE SHIPMENT DATE DRIVER SIGNATURE DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661-4141

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Carter Mike Carter 07257

NAME OF AUTHORIZED AGENT SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72(

795 709 Kelly AR # 923 Page 713 of 880 No A023977

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-29-97 Time In: 15:15:59 Time Out: 15:35:19
Ticket # : A59028 CMS # : 1210194 IMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000227 Lic Plate:
Manifest # : 513985 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 42.04 Tare Wt: 16.03 Net Wt: 26.01 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: _____

795 710 NO 513985

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DR C-CA B BA T-TR P-PO Y-YA O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resic of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. V-150

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Roy Pena

ADDRESS 6423 Marcum

SA, TX, 78227

VEHICLE LICENSE NO./STATE [illegible]

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Roy Pena — 072897 — X Roy Pena — 07289

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

EREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[illegible] — [illegible] — 7 2 8 9

NAME OF AUTHORIZED AGENT — SIGNATURE

795 711

No. A023830

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 12:09:11 Time Out: 13:[illegible]
Ticket # : 658965 CMS #: 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000022 Lic Plate:
Manifest # : 513926 PO #: Transporter: OJT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 44.30 Tare Wt: 16.73 Net Wt: 27.57 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.18000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4184
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Ru

TEXAS

795 712 NO 513926

NON-HAZARDOUS SPECIAL WASTE MANIFEST

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 317

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law and has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 150

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X P.O. Box

ADDRESS 6423 Harcum

VEHICLE LICENSE NO./STATE

SA, TX. 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — 07289 7 — SHIPMENT DATE

DRIVER SIGNATURE — 07289 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07

REORDER ONLY THROUGH BFI / HARCO CONTRACT

Kelly AR # 795 713

A028775

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 11:59:58 Time Out: 12:15:46
Ticket # : 659-89 CNS #: 1210794 LNS #: 1218194
Customer : U.S.G ENV/KAFB
Vehicle # : 000150 Trailer #: 000062 Lic Plate:
Manifest # : 513945 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 42.67 Tare Wt: 16.59 Net Wt: 26.08 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
2394131F	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 513945

97-7

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site S-

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 080118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRI
C-CAI
B BAC
T TRU
P-PO
Y-YA
O-OTI

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 150

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Roy Perez

ADDRESS 6423 MARCIM

SA, TX. 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

DRIVER SIGNATURE — SHIPMENT DATE 07 25 97

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

DRIVER SIGNATURE — DELIVERY DATE 07 28 97

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07 28 97

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

795 715

No A028880

BROWNING-FERRIS INDUSTRIES

Date : 07-26-97 Time In: 03:06:47 Time Out: 08:25:25
Ticket # : A58816 CMS # : 1210194 CMS #: 1c10194
Customer : OLMOS ENV/KAFB
Vehicle # : 020150 Trailer #: 0000022 Lic Plate:
Manifest # : 513935 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 46.07 Tare Wt: 16.58 Net Wt: 29.49 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE

TES-LF1

BFI

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 716

NO 513935

97-7

weigh in + out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5 0

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

D-DRUM
C-CARTON
B-BAG
T-TRUCK
P POUNDS
Y YARDS
O-OTHER

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

0 7 2 8 9 7 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 150

PHONE NO 673-2940

TRANSPORTER NAME Halls. Trucking

DRIVER NAME (PRINT) X Roy Peña

ADDRESS 6423 Marcum

SA, TX. 78227

VEHICLE LICENSE NO./STATE 2AG 379

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

Roy Peña — DRIVER SIGNATURE

0 7 2 8 9 7 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

Roy Peña — DRIVER SIGNATURE

0 7 2 8 9 7 — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT

SIGNATURE

0 7 2 8 9 7

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

795 717

No A028739

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-28-97 Time In: 10:20:56 Time Out: 10:41:41
Ticket # : A59374 CMS # : 1210194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000150 Trailer #: 000022 Lic Plate:
Manifest # : 513333 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCONE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.62 Tare Wt: 16.60 Net Wt: 25.02 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: _____

BFI

TEXAS

795 718 NO 513933

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

(Next in Text)

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site 5

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRU
C-CAP
B-BAC
T-TRU
P-PO
Y-YAP
O-OT

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations. AND, If the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 150

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Ron Pine

ADDRESS 6423 Marcum

SA, TX 78227

VEHICLE LICENSE NO./STATE [illegible]

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

[signature] — 072892 — X [signature] — 07289

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — [signature] — 0772

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72

TRANSPORTER RETAIN

BROWNING-FERRIS INDUSTRIES

151

TESSMAN LANDFILL

Date : 07-23-97 Time In: 17:47:13 Time Out: 17:54:32
Ticket # : 65-0 7 CMS # : 1.1019- LMS #: 1210[illegible]
Customer : ULMOS ENV.[illegible]
Vehicle # : 000151 Trailer #: 000022 Lic Plate:
Manifest # : 513980 PO #: Transporter: OUT
Generator : KAR KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.89 Tare Wt: 14.85 Net Wt: 27.04 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4164
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

BFI

TEXAS

795 720 513980

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CAR
B-BAD
T TRU
P-PO
Y YAR
O-OTH

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with th requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — GENERATOR AUTHORIZED AGENT NAME

Spencer Albertson — SIGNATURE

07289 — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X151

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Peter J Gilbert

ADDRESS 6423 Marcum

SA, TX. 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — SHIPMENT DATE 072897

DRIVER SIGNATURE — DELIVERY DATE 07289

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

NAME OF AUTHORIZED AGENT — SIGNATURE — 07289

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

795 721

BROWNING-FERRIS INDUSTRIES

Date : 07-29-97 Time In: 16:15:50 Time Out: 16:[illegible]
Ticket # : [illegible] CMS # : 1210194 LMS #: 1210194
Customer : GLMOS ENV/KAFB
Vehicle # : 000151 Trailer #: 000022 Lic Plate:
Manifest # : 513968 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 39.77 Tare Wt: 14.68 Net Wt: 25.09 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TEXAS

Kelly AR # : 395 722 Page 726 of 880

NO 513960

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7 WEHH, INC

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Stormer - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	2 2	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DF C-CA B-BA T TR P PC Y YA O-O

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resi of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 28 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X151

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Peter J Gilbert

ADDRESS 6423 Marcum

SA, TX. 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X — 07 28 97

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X — 07 28

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 7

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72

795 723

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-24-97 Time In: 12:03:12 Time Out: 12:14:52
Ticket # : A58129 CMS # : 1210194 LMS #: 1210194
Customer : DLMOS ENV/FAFA
Vehicle # : 000001 Trailer #: 000822 Lic Plate:
Manifest # : 468037 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.10 Tare Wt: 15.91 Net Wt: 27.19 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] #66

TE

BFI

No: A028153

BROWNING-FERRIS INDUSTRIES

Date : 07-25-97 Time In: 08:53:44 Time Out: 09:07:26
Ticket # : 059313 CMS T : 1c10194 LMS #: 1c10194
Customer : OLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: 00002c Lic Plate:
Manifest # : 468026 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt: 39.68 Tare Wt: 14.71 Net Wt: 24.97 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4194
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: _____

TES-LF116

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 468026

97-7

weigh in + weigh out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 31750

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130-12	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

UNITS: D-DRUM, C-CARTON, B-BAG, T-TRUCK, P-POUND, Y-YARDS, O-OTHER

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO X

PHONE NO (673) 2940

TRANSPORTER NAME HALLS Trucking #148

DRIVER NAME (PRINT) X RONALD GUERRA

ADDRESS 6423 Marcum

VEHICLE LICENSE NO./STATE 2AG 379

S.A., TX. 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

X Ronald Guerra — 072597

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

Ronald Guerra — 072597

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Curtis — Mike Curtis — 07257

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 726 NO 513961

97-7 weight in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 31750

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	03	Y

BFI WASTE CODE TX 75598011823941 3

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM
C-CARTON
B-BAG
T-TRUCK
P-POUNDS
Y-YARDS
O-OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations. AND, If the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer A Albertson — Spencer Albertson — 072897

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 401 — PHONE NO 673-2940

TRANSPORTER NAME Hall's Trucking — DRIVER NAME (PRINT) Melvin Hall

ADDRESS 6423 Marcum — VEHICLE LICENSE NO./STATE 2FA 040

SA., TX. 78227 — STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

DRIVER SIGNATURE — SHIPMENT DATE 072897

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

DRIVER SIGNATURE — DELIVERY DATE 072897

DESTINATION

SITE NAME BFI Landfill — PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 7/29/97

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (5/

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-28-97 Time In: [illegible] Time Out: 16:[illegible]:19
Ticket # : A[illegible]9835 LMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 513961 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 44.99 Tare Wt: 16.12 Net Wt: 28.87 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

A027396

BROWNING-FERRIS INDUSTRIES

795 728

Date : 07-24-97 Time In: 09:30:05 Time Out: 09:37:56
Ticket # : A58066 CMS # : 1210194 LMS #: 1210194
Customer : DEMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 468047 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 37.14 Tare Wt: 16.03 Net Wt: 21.11 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE [signature] #1001

TES LF1

BFI 795 729

TEXAS
NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 468041

weigh 97-7 IN + out

GENERATOR

GENERATOR NAME SA-ALC / ENC

GENERATING LOCATION LAFB - East Kelly Storage - IRP Site #7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5 0

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	2 2	Y

D-DRUM C-CARTO B-BAG T TRUCK P-POUNC Y-YARDS O-OTHEF

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

BFI WASTE CODE

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously-restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 — —

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 001

PHONE NO. 673-2940

TRANSPORTER NAME Hills Trucking

DRIVER NAME (PRINT) Clayton Hall

ADDRESS 6428 Maxcum

VEHICLE LICENSE NO/STATE 2EC 640

S.A., TX. 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

DRIVER SIGNATURE — 0 7 2 4 9 7 SHIPMENT DATE

DRIVER SIGNATURE — 0 7 2 4 9 7 DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Cantu — Mike Cantu — 0 7 2 4 9 7

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

TRANSPORTER RETAIN

109-720TX

No. A027096

BROWNING-FERRIS INDUSTRIES

795 730

TESSMAN LANDFILL

Date : 07-24-97 Time In: 13:39:36 Time Out: 13:56:58
Ticket # : 958160 CMS # : 1210194 LMS #: 1210194
Customer : DEMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 468034 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 44.06 Tare Wt: 16.07 Net Wt: 27.99 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TES-L

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 468034

97-7
weight in ⊕ out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CART
B-BAG
T TRUC
P-POUN
Y-YARD
O-OTHE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07249

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. Y-001

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Clayton Hall

ADDRESS 6423 Marcum
S.A., TX. 78227

VEHICLE LICENSE NO./STATE 2EC 640

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X [signature] — 072497

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

[signature] — 07249

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220), San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 072[illegible]

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

BROWNING-FERRIS INDUSTRIES

795 732

TESSMAN LANDFILL

Date : 07-24-97 Time In: 16:04:09 Time Out: 16:15:44
Ticket # : A54216 CMS # : 1210194 LMS #: 1210194
Customer : DLMTS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 468029 PO #: Transporter: GUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.51 Tare Wt: 15.67 Net Wt: 25.64 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] #001

TES-LI

BFI

TEXAS

795 733

NO 468029

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weight in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

D-DRUM C-CART B-BAG T-TRUC P POUN Y YARD O-OTHE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state [illegible] been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment [illegible] of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 24 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 001

PHONE NO. 623-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X 2EC 040 Clayton

ADDRESS 6423 Marcum
SA TX 78227

VEHICLE LICENSE NO./STATE ?

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

[signature] — 072497

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

[signature] — 07 24 9

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCU[illegible]

Mike Cauto — Mike Cauto — 07 24 9

NAME OF AUTHORIZED AGENT — SIGNATURE

BROWNING-FERRIS INDUSTRIES

795 734

TESSMAN LANDFILL

Date : 07-25-97 Time In: 0[illegible]:28 Time Out: 0[illegible]:30:31
[illegible]et # : A56309 CMS # : 1210194 LMS #: 1210194
[illegible]oser : OLMOS ENV/[illegible]
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 468027 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 42.10 Tare Wt: 15.28 Net Wt: 2[illegible].82 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: A TREVIÑO #153

TES-LF1

BFI 795 735 TEXAS NO 468021

Kelly AR # 3923 Page 739 of 880

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 0253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130112	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 080118 23413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07159

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO X-153

PHONE NO. 673 2940

TRANSPORTER NAME HAILS TRUCKING

DRIVER NAME (PRINT) X ALBERT TREVINO

ADDRESS 6423 MARCUM

VEHICLE LICENSE NO/STATE 2AG-377

S.A. TX 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Trevino — 07259 — Albert Trevino — 07259

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Curtis — Mike Curtis — 072

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720T

TRANSPORTER RETAIN

No AU2[illegible]58

BROWNING-FERRIS INDUSTRIES

795 736

TESSMAN LANDFILL

Date : 07-24-97 Time In: 12:03.12 Time Out: 12:14:52
Ticket # : A58129 CMS # : 1218194 LMS #: 1218194
Customer : KELLY AFB/KAFB
Vehicle # : 000001 Trailer #: [illegible] Lic Plate:
Manifest # : 468037 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : -- Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.10 Tare Wt: 15.91 Net Wt: 27.19 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE.

TES LF

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

Kelly AR # 3923 Page 741 of 468037

795 737

97-7

GENERATOR

GENERATOR NAME SA ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site 7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130112	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 2304 3

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRU
C-CAR
B-BAG
T-TRU
P-POU
Y YAR
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, If the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance t requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 001 PHONE NO. 573-2940

TRANSPORTER NAME Hall Trucking DRIVER NAME (PRINT) Clayton Hall

ADDRESS 5213 Marcom VEHICLE LICENSE NO./STATE 2EC040

San Antonio TX 78227 STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

DRIVER SIGNATURE — SHIPMENT DATE 07 12 97

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

DRIVER SIGNATURE — DELIVERY DATE 07 12 97

DESTINATION

SITE NAME BFI Landfill PHONE NO. 210-661411

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Curtis — Mike Curtis — 07 12 97

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-721

No. AU2C1C1

BROWNING-FERRIS INDUSTRIES

795 738

TESSMAN LANDFILL

Date : 07-25-97 Time In: 09:39:40 Time Out: 09:51:56
Ticket # : 859326 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/SVFB
Vehicle # : 000153 Trailer #: 000322 Lic Plate:
Manifest # : 460024 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 42.15 Tare Wt: 15.39 Net Wt: 26.76 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.140000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-9104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] 153

Kelly AR # 3923 Page 743 of 846

795 739

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

468024

97-7

WEIGH IN & WEIGH OUT

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment res of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accorda requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO. 673-2940

TRANSPORTER NAME HALLS TRUCKING

DRIVER NAME (PRINT) ALBERT JEWINS

ADDRESS 6423 MARCUM

VEHICLE LICENSE NO./STATE 206-377

S.A. TX 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Jewins — 072597 — Albert Jewins — 0725

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661411

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURAT

Mike Coulter — Mike Coulter — 07

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7

No A028776

BROWNING-FERRIS INDUSTRIES

Date : 07-28-97 Time In: 12:01:00 Time Out: 12:17:06
cket # : 858910 CMS # : 1210194 LNE #: 1210154
stomer : OLMOS ENV/KAFB
Vehicle # : 0400001 Trailer #: 400022 Lic Plate:
Manifest # : 513946 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.56 Tare Wt: 16.35 Net Wt: 27.21 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TES-LF1

795 741

TEXAS

NO 513946

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME: SA ALC / EMC

GENERATING LOCATION: KAFB - East Kelly Storage - IRP Sites S

ADDRESS: 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS: 307 Tinker Drive
San Antonio, TX

PHONE NO: 210 9253100

STATE GENERATOR ID NUMBER: 31750

T N R C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE: TX 755 980118 239413

D-DRUM
C-CARTON
B-BAG
T TRUCK
P-POUNDS
Y-YARDS
O-OTHER

T N R C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE:

T N R C C	DESCRIPTION OF WASTE		

BFI WASTE CODE:

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment re[illegible] of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance w[illegible] requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer Albertson — Spencer Albertson — 072897

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO: X 001

PHONE NO: 673-2940

TRANSPORTER NAME: Halls Trucking

DRIVER NAME (PRINT): [illegible] Hall

ADDRESS: 6423 Marcum
SA, TX. 78227

VEHICLE LICENSE NO./STATE: 2FC-040

STATE TRANSPORTER ID NO:

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

[signature] — 072897

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVER[illegible] WITHOUT INCIDEN[illegible] TO THE DESTINATION LISTED BELOW

[signature] — 072891

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME: BFI Landfill

PHONE NO: 210-661410

ADDRESS: 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — [signature] — 072[illegible]

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

No: A028225

BROWNING-FERRIS INDUSTRIES

Date : 07-25-97 Time In: 12:07:05 Time Out: 12:16:36
Ticket # : 456588 EMS # : 1210194 LMS #: 1210194
Customer : DLMOS ENV/KAFB
Vehicle # : 000148 Trailer #: 000022 Lic Plate:
Manifest # : 468019 PO #: Transporter: OUT
Generator : KAB, KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt: 40.52 Tare Wt: 14.97 Net Wt: 25.55 tn

795 742

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Francis Garcia

TES

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

~~715~~ 743

NO 468019

97-7

Weigh in + weigh out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treated waste of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X-148

PHONE NO 673-2940

TRANSPORTER NAME HALLS Trucking

DRIVER NAME (PRINT) RONALD QUERK

ADDRESS 6123 MARCUM

S.A., TX 78227

VEHICLE LICENSE NO./STATE 2AG 375

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Ronald Querk — 07259

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Ronald Querk — 07259

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661411

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Caut — Mike Caut — 07259

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7

No A020470

BROWNING-FERRIS INDUSTRIES

795 744

TESSMAN LANDFILL

Date : 07-26-97 Time In: 09:43:39 Time Out: 10:14:52
Ticket # : A58609 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/LAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 532101 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 42.03 Tare Wt: 15.24 Net Wt: 26.79 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day''

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: ATREVINO 153

TES-

795 745

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 532101

97-7 weight in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

D-DRUM, C-CART, B-BAG, T-TRUCK, P-POUN, Y-YARD, O-OTHE

BFI WASTE CODE: TX 755 080118 239413

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE:

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE:

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X ALBERT TREVINO

ADDRESS 6423 Marcum

VEHICLE LICENSE NO/STATE 2AG-377 TX

SA, TX 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

X Albert Trevino — 072697

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

X Albert Trevino — 072697

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661-4110

ADDRESS 7790 Tessman Road (P O Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 072697

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

BROWNING-FERRIS INDUSTRIES

795 746

Date : 07-26-97 Time In: 09:05:20 Time Out: 09:28:01
Ticket # : 409571 CNS #: 1210194 LMS #: 1210194
Customer : OLMOS ENV/KOSP
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 532110 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCURNE
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 42.38 Tare Wt: 15.27 Net Wt: 27.11 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
229413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] 153

TES-L

795 747

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 532110

97-7

WEIGH IN

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinke Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-D C-C B B T TI P-P Y Y O-C

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO. 673-2940

TRANSPORTER NAME AALLS TRUCKING

DRIVER NAME (PRINT) ALBERT TREVIÑO

ADDRESS 6423 MARCUM

SA, TX 78227

VEHICLE LICENSE NO./STATE 2PG-377 TX

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Albert Treviño — 072697 — Albert Treviño — 07269

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661411

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Tony Vargas — NAME OF AUTHORIZED AGENT — SIGNATURE — 07

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72

No. A028391

BROWNING-FERRIS INDUSTRIES

795 748

TESSMAN LANDFILL

Date : 07-26-97 Time In: 0[illegible]:40:18 Time Out: 0[illegible]:[illegible]:33
Ticket # : 058542 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 532115 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 40.80 Tare Wt: 15.34 Net Wt: 25.46 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4184
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE. [signature] #153

TES-LF11

TEXAS

795 749 NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 532115

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	

BFI WASTE CODE TX 755 980118 23043

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D DRU
C-CAF
B-BAG
T TRU
P POL
Y-YAF
O-OTH

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable sta[illegible] been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatme[illegible] of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with t[illegible] requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer Albertson — Spencer Albertson — 07 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Albert Treviño

ADDRESS 6423 Marcum
SA. TX. 78227

VEHICLE LICENSE NO./STATE 2A6-377

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI[illegible] WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

Albert Treviño — 072697 — Albert Treviño — 07269

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661410

ADDRESS 7790 Tesseman Road (P.O Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACC[illegible]

[illegible] — [illegible] — 07261

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

No. A023256

BROWNING-FERRIS INDUSTRIES

795 750

TESSMAN LANDFILL

Date : 07-25-97 Time In: 12:43:50 Time Out: 13:55:30
Ticket # : A50424 CMS #: 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 468828 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 44.30 Tare Wt: 16.10 Net Wt: 28.20 tn

Item	Descr	Actual	Bill Qty.	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4184
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TES-

BFI 795 751

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 468028

97-7

WEIGH IN & OUT

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites 3

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DF
C-CA
B-BA
T-TR
P-PC
Y-YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state [illegible] has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment [illegible] of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Albertson — 07249

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 601

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Claude Hall

ADDRESS 6423 Pharcum

San Antonio, TX 78227

VEHICLE LICENSE NO./STATE 2FC 010

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

DRIVER SIGNATURE — 07 25 97 SHIPMENT DATE — DRIVER SIGNATURE — 7 25 97 DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

David Brewer — David Brewer — 07 25 97

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI/UARCO CONTRACT

109-720

No A028195

BROWNING-FERRIS INDUSTRIES

795 752

TESSMAN LANDFILL

Date : 07-25-97 Time In: 11:15:46 Time Out: 11:15:46
Ticket # : A53359 CMS # : 1210194 LMS #: 1210194
[redacted]oner : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 468020 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 83120 Scale Out #: 32180
Gross Wt : 41.56 Tare Wt: 16.09 Net Wt: 25.47 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE

TES-LF116

BFI

TEXAS

795 753

NON-HAZARDOUS SPECIAL WASTE MANIFEST

No 468020

97-7

Weigh in + weigh out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

D-DRUM
C-CART
B-BAG
T-TRUC
P-POUN
Y-YARD
O-OTHE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, ha been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residu of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 001

PHONE NO 673-2940

TRANSPORTER NAME Hall's Trucking

DRIVER NAME (PRINT) X Clayton Hall

ADDRESS 6423 MARCUM
S.A., TX. 78227

VEHICLE LICENSE NO./STATE 2EC040

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIV WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

X [signature] — 072597 — [signature] — 072[illegible]

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Carter — Mike Carter — 072[illegible]

NAME OF AUTHORIZED AGENT — SIGNATURE

RECORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7201

 A028231

BROWNING-FERRIS INDUSTRIES

795 754

TESSMAN LANDFILL

Date : 07-25-97 Time In: 12:22:20 Time Out: 12:32:02
Ticket # : 058390 CMS #: 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 468017 PO #: Transporter: GUT
Generator : KAR KELLY AIR FORCE BASE
Consent : Operator: MIKE CASTRO
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 40.39 Tare Wt: 15.19 Net Wt: 25.20 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: ARVIND 153

TES

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO. 468017

795 755

97-7 weighin & weigh out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 31750

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
241301 2	Soil with petroleum hydrocarbons	22	Y

FI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

FI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

FI WASTE CODE

UNITS: D-DRUM, C-CARTON, B-BAG, T-TRUCK, P-POUNDS, Y-YARDS, O-OTHER

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 072597

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO X 153

PHONE NO 673-2940

TRANSPORTER NAME Hall's Trucking

DRIVER NAME (PRINT) ALBERT TREVINO

ADDRESS 6623 Macon

VEHICLE LICENSE NO./STATE 6AG-377

SA, TX 78227

STATE TRANSPORTER ID NO

HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Albert Trevino — 072597

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

Albert Trevino — 072597

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410 4

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

Mike Canto — Mike Canto — 072597

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (5/90)

BROWNING-FERRIS INDUSTRIES

795 756

TESSMAN LANDFILL

Date : 07-25-97 Time In: 13:46:26 Time Out: 14:01:27
Ticket # : 856426 CMS # : 1210194 CMS #: 1210194
[illegible]er : CLMOS ENV/KAFB
Vehicle # : 000152 Trailer #: 000022 Lic Plate:
Manifest # : 468004 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 42.99 Tare Wt: 16.18 Net Wt: 26.81 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4164
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TES-LF1

BFI 795 757 **TEXAS** NO. 468004

NON-HAZARDOUS SPECIAL WASTE MANIFEST 97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 31750

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 901188 239413

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

D-DRUM
C-CARTO
B-BAG
T-TRUCK
P-POUNC
Y-YARDS
O-OTHEF

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations. AND, If the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — SHIPMENT DATE 07 25 97

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE

TRANSPORTER

TRUCK NO X 152

PHONE NO 673 2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Frank Hall

ADDRESS 6423 Marburn

VEHICLE LICENSE NO./STATE X AAL 374

SA. TX. 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

DRIVER SIGNATURE — SHIPMENT DATE 07 25 97

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

DRIVER SIGNATURE — DELIVERY DATE 07 25 97

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210 661 4110

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 07 25 97

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (E

No. A029484

BROWNING-FERRIS INDUSTRIES

795 758

TESSMAN LANDFILL

Date : 07-26-97 Time In: 09:18:52 Time Out: 10:47:15
Ticket # : A55574 CMS # : 1210194 LMS #: 1210194
Customer : DLNOS ENV/KAFB
Vehicle # : 000145 Trailer #: 000022 Lic Plate:
Manifest # : 532104 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : 1 Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 37.99 Tare Wt: 10.70 Net Wt: 27.29 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TES-L

BFI

TEXAS

Kelly AR # 3923 Page 763 of 830

NO 532104

795 759

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weight in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRU
C-CAR
B BAG
T-TRU
P POC
Y-YAR
O-OT

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment resid of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordan requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 6 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. x 145

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) x Frank Limon

ADDRESS 6423 Marcum
SA, TX 78227

VEHICLE LICENSE NO./STATE 2AG - 378

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

x Frank Limon — 0 7 2 6 9 7 — x — 0 7 2 6 9

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 0 7 2 6 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

No. A023193

BROWNING-FERRIS INDUSTRIES

795 760

TESSMAN LANDFILL

Date : 07-25-97 Time In: 11:09:00 Time Out: 11:09:16
Ticket # : 058353 CMS # : 1210154 LMS #: 1210154
Customer : D_MOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000202 Lic Plate:
Manifest # : 468021 PO #: Transporter: OUT
Generator : KAFB KELLY AIR FORCE BASE
Comment : Operator: MIKE CHAVEZ
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.76 Tare Wt: 15.32 Net Wt: 26.44 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: ATREVINO #153

TES-L

795 761

TEXAS

NON-HAZARDOUS SPECIAL WASTE MANIFEST

No 468021

97-7

Work in Lieu of Work

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130112	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 080118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D C B T P Y C

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state la been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, If the waste is a treatment re of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance w as requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 25

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153

PHONE NO. 673-2940

TRANSPORTER NAME Hall Trucking

DRIVER NAME (PRINT X ALBERT TREVINO

ADDRESS 6423 Marcum

VEHICLE LICENSE NO./STATE 2AG-377

SA, TX 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Albert Trevino — 672557

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

Albert Trevino — 0725

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661411

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCUR

Mike Curtis — Mike Curtis — 07

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

10

BFI

No. A028302

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

[redacted] : 07-25-07 Time In: 14:49:34 Time Out: 15:03:00
t # : 258457 CMS # : 1218194 LMS #: 1218194
Customer : OLMOS ENV/KGFB
Vehicle # : 000145 Trailer #: 000022 Lic Plate:
Manifest # :467131 PO #: Transporter: OJT
Generator : KAB KELLY AIR FORCE BASE
Cogent : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 42.38 Tare Wt: 15.39 Net Wt: 26.99 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4109
Thanks & Have A Great Day'!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

#145

SIGNATURE: [signature]

TES-LF11

795 763

TEXAS

NO 467131

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

unsigh in & out

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites S-7

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5 0

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	T

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

UNITS: D-DRUM, C-CARTON, B-BAG, T TRUCK, P-POUND, Y YARDS, O-OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 195

PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Frank Hall

ADDRESS 6423 Marcum

SA, TX. 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

X [signature] — 07-25-97

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

[signature] — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P O Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — [signature] — 07-25-97

NAME OF AUTHORIZED AGENT — SIGNATURE

109 720TX

A027925

BROWNING-FERRIS INDUSTRIES

795 764

TESSMAN LANDFILL

Date : 07-24-97 Time In: [illegible] Time Out: [illegible]
Ticket # : 059655 CYS # : [illegible] LMS #: [illegible]
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000002 Lic Plate:
Manifest # : 468040 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.61 Tare Wt: 16.81 Net Wt: 27.80 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] #601

TES-

TEXAS NON-HAZARDOUS SPECIAL WASTE MANIFEST

795 765

NO. 468040

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP S[illegible]

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925-3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413-012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 230413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residual of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07 [illegible] 9

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X-[illegible]

PHONE NO. 673-2940

TRANSPORTER NAME Hall's Trucking

DRIVER NAME (PRINT) Clayton Hall

ADDRESS 6423 Marem

VEHICLE LICENSE NO./STATE 2EC 040

S.A., TX. 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL[illegible] WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X [signature] — 07 24 [illegible]1

DRIVER SIGNATURE — SHIPMENT DATE

[signature] — 07 24 [illegible]1

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Canta — Mike Canta — 07 2[illegible]

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-72[illegible]

TRANSPORTER RETAIN

No. A028152

BROWNING-FERRIS INDUSTRIES

795 766

TESSMAN LANDFILL

Date : 07-25-97 Time In: 08:55:17 Time Out: 09:05:30
Ticket # : 858314 CMS #: 1210154 LMS #: 1210154
Hauler : OLMOS ENVIRON
Vehicle # : 000001 Trailer #: 000002 Lic Plate:
Manifest # : 458625 PO #: Transporter: CUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt : 44.06 Tare Wt: 16.05 Net Wt: 28.01 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE

TES-LF1

TEXAS

Kelly AR # 3923 Page 771 of 788

No 468025

795 767 NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

Mech in + weigh out

GENERATOR

GENERATOR NAME SA-ALC/EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 31754

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

D-DRUM
C-CARTO
B BAG
T-TRUCK
P POUN
Y YARDS
O-OTHE

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations. AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 051

PHONE NO 673-2940

TRANSPORTER NAME HALLS TRUCKING

DRIVER NAME (PRINT) X Clayton Hall

ADDRESS 6423 Marcum

VEHICLE LICENSE NO/STATE 2EC 040

S.A., TX 78227

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X — 07259 — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

DRIVER SIGNATURE — DRIVER SIGNATURE — 5 7 2 [illegible] — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

Mike Canter — Mike Canter — 07259

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

A029232

BROWNING-FERRIS INDUSTRIES

795 768

Date : 07-25-97 Time In: 12:25:13 Time Out: 12:35:21
Ticket # : 058393 CNS #: 1213154 LMS #: 1210194
Customer : OLMOS ENVIRON
Vehicle # : 000061 Trailer #: 000022 Lic Plate:
Manifest # : 468012 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In #: 1 Scale Out #: 1
Gross Wt: : 43.17 Tare Wt: 16.08 Net Wt: 27.09 tn

TESSMAN LANDFILL

Item	Descr	Actual	Bill Qty	$/Unit	Extended
235413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] 4601

TES-

BFI

TEXAS

NO. 468012

795 769

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

Weigh in & out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP S

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DR
C-CA
B-BA
T-TR
P-PO
Y-YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, h been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07259

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X001

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X Clayton Hall

ADDRESS 6423 Marcum

SA TX 78227

VEHICLE LICENSE NO./STATE 2EC040

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELI WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

X [signature] — 072597 — [signature] — 07259

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[signature] — [signature] — 07259

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-7207

BROWNING-FERRIS INDUSTRIES

795 770

TESSMAN LANDFILL

Date : 07-25-97 Time In: 10:0[illegible] Time Out: 10:17:11
Ticket # : 058334 CMS # : 1210194 [illegible] #: 1210194
[illegible]tomer : D.MOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 468023 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.38 Tare Wt: 16.05 Net Wt: 27.33 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TES LF1

TEXAS

Kelly AR # 3923 Page 775 of 880

No 468023

795 771 NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

Weigh in & Weigh out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)
Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive
San Antonio TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 31750

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

D-DRUM
C-CARTON
B-BAG
T-TRUCK
P-POUNDS
Y YARDS
O-OTHER

T N R C C	DESCRIPTION OF WASTE		

BFI WASTE CODE

T N R C C	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer Albertson — Spencer Albertson — 072597

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 001

PHONE NO 673-2940

TRANSPORTER NAME HALLS TRUCKING

DRIVER NAME (PRINT) X Clayton Hall

ADDRESS 6423 MARCUM
S.A. TX. 78227

VEHICLE LICENSE NO./STATE 2EC 010

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X [signature] — 072597 — [signature] — 072597

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — [signature] — 072597

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (E

TRANSPORTER RETAIN

BFI

No A029226

BROWNING-FERRIS INDUSTRIES

795 772

TESSMAN LANDFILL

Date : 07-25-97 Time In: 12:10:23 Time Out: 12:20:16
Ticket # : A58393 CMS # : 1210.94 LMS #: 1210154
Customer : OLMOS CHV/KAFB
Vehicle # : 000152 Trailer #: 000022 Lic Plate:
Manifest # : 468018 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CANTU
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.85 Tare Wt: 16.35 Net Wt: 25.50 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature]

TES-LF116-SW

BFI

TEXAS

NO 468018

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

Weigh in + weigh out

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio TX

PHONE NO. 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5 0

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTON
B-BAG
T-TRUCK
P-POUNDS
Y-YARDS
O-OTHER

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment r[illegible] of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance w[illegible] requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 0 7 2 5 9 7

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 152

PHONE NO 673-2940

TRANSPORTER NAME HALLS TRUCKING

DRIVER NAME (PRINT) X Frank Hanson

ADDRESS 61123 MARCUM

S.A. TX. 78227

VEHICLE LICENSE NO./STATE

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

X [signature] — 0 7 2 5 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE[illegible] WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

[signature] — 0 7 2 5 9 7

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 6 1 4 1 0

ADDRESS 7790 Tessman Road (P.O Box 201690, 78220) San Antonio, Texas 7810[illegible]

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURA[illegible]

[signature] — [signature] — 0 7 2 5 9

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (S

No A028308

BROWNING-FERRIS INDUSTRIES

795 774

TESSMAN LANDFILL

Date : 07-25-97 Time In: 15:09:48 Time Out: 15:19:13
[redacted] # : A08461 CMS # : 1210194 LMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer #: 000022 Lic Plate:
Manifest # : 467132 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Consent : Operator: DAVID FARRERA
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.71 Tare Wt: 16.06 Net Wt: 27.65 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE

TES-LF116

TEXAS

795 775

NO. 467132

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME: SA-ALC / EMC

GENERATING LOCATION: KAFB - East Kelly Storage - IRP Sites S

ADDRESS: 307 Tinker Drive (Building 306)

ADDRESS: 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO.: 210 9253100

STATE GENERATOR ID NUMBER: 3175

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
024130112	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE: TX 755 980118 239413

D-DR
C-CA
B-BA
T-TR
P-PO
Y-YA
O-OT

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable sta[illegible] been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatme[illegible]id of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer — [signature] — 072599

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 001

PHONE NO 673-2940

TRANSPORTER NAME HALLS TRUCKING

DRIVER NAME (PRINT) X CLAYTON HALL

ADDRESS 6423 MARCUM

VEHICLE LICENSE NO./STATE 2EC 040

SA., TX. 78227

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL[illegible] WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X [signature] — 072597 — [signature] — 072[illegible]

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME: BFI Landfill

PHONE NO: 210-661410

ADDRESS: 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACC[illegible]

[signature] — [signature] —

NAME OF AUTHORIZED AGENT — SIGNATURE

No A028520

BROWNING-FERRIS INDUSTRIES

795 776

TESSMAN LANDFILL

Date : 07-26-97 Time In: 11:32:31 Time Out: 12:00:04
Ticket # : A58658 CMS # : 1210194 CMS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 513995 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 45.17 Tare Wt: 15.18 Net Wt: 29.99 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE. [signature] #153

TES-LF11

795 777 **TEXAS** Kelly AR # 3923 Page 78 No of 80 513995

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

weigh in & out

GENERATOR

GENERATOR NAME USAALC/LMC

GENERATING LOCATION LAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

D-DRUM C-CARTON B-BAG T TRUCK P-POUND Y YARDS O-OTHER

BFI WASTE CODE TX 755 08011 8 239413

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations. AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07269

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO X 153

PHONE NO. 613-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) X ALBERT TREVINO

ADDRESS 6123 MARCIM

SA, TX. 78227

VEHICLE LICENSE NO./STATE 2AG-377 TX

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

Albert Trevino — 072697 — DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

Albert Trevino — 07269 — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661-1110

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

TRANSPORTER RETAIN

A0C3337

BROWNING-FERRIS INDUSTRIES

795 778

TESSMAN LANDFILL

Date : 07-25-97 Time In: 16:16:38 Time Out: 16:38:39
Ticket # : 858493 CMS # : 1210194 LMS #: 121014
Customer : OLMOS ENV/KAFB
Vehicle # : 000001 Trailer t: 000022 Lic Plate:
Manifest # : 468006 PO #: Transporter: OUT
Generater : KAB KELLY AIR FORCE BASE
Comment : Operator: DAVID BARRERA
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 41.12 Tare Wt: 15.87 Net Wt: 25.25 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: _____

TES-LF11c

795 779 **TEXAS** Kelly AR # 3923 Page 783 of 880 NO 468006

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)

ADDRESS 307 Tinker Drive

Kelly AFB, Texas 78241-5917

San Antonio, TX

PHONE NO. 210 925 3100

STATE GENERATOR ID NUMBER 3175

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
0241301 2	Soil with petroleum hydrocarbons	22	Y

D-DRUM, C-CARTON, B-BAG, T-TRUCK, P-POUNDS, Y-YARDS, O-OTHER

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been property described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

GENERATOR AUTHORIZED AGENT NAME Spencer Albertson SIGNATURE Spencer Albertson SHIPMENT DATE 072599

TRANSPORTER

TRUCK NO 601 PHONE NO 673-2940

TRANSPORTER NAME Halls Trucking DRIVER NAME (PRINT) Clayton Hall

ADDRESS 6423 Marcum VEHICLE LICENSE NO./STATE 2EC 410

San Antonio, TX. 78221 STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

DRIVER SIGNATURE SHIPMENT DATE 7-25-99

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

DRIVER SIGNATURE DELIVERY DATE 7-25-99

DESTINATION

SITE NAME BFI Landfill PHONE NO. 210-661410

ADDRESS 7790 Tessman Road (P.O Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT SIGNATURE 7-25-99

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

No A023566

BROWNING-FERRIS INDUSTRIES

795 780

TESSMAN LANDFILL

Date : 07-26-97 Time In: 13:14:51 Time Out: 13:36:41
Market # : A58705 CNS # : 1210194 LNS #: 1210194
Customer : OLMOS ENV/KAFB
Vehicle # : 000153 Trailer #: 000022 Lic Plate:
Manifest # : 513939 PO #: Transporter: OUT
Generator : KAB - KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.96 Tare Wt: 15.17 Net Wt: 28.79 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: [signature] FF 153

TES-LF1

BFI

TEXAS

795 781 NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 513939

97-7

WEATH IN @ 001

GENERATOR

GENERATOR NAME SA-ALC / EMC

GENERATING LOCATION KAFB - East Kelly Storage - IRP Site

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO 2 1 0 9 2 5 3 1 0 0

STATE GENERATOR ID NUMBER 3 1 7 5 0

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
0 2 4 1 3 0 1 2	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE T X 7 5 5 9 8 0 1 1 8 2 3 9 4 1 3

D-DRUM
C-CARTON
B-BAG
T TRUCK
P POUNDS
Y-YARDS
O-OTHER

T N R C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

T N R C C	DESCRIPTION OF WASTE		

BFI WASTE CODE

GENERATOR'S CERTIFICATION. I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261

Spencer Albertson — Spencer Albertson — 0 7 2 6 9 7

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO DT 153

PHONE NO 680-8300

TRANSPORTER NAME OMOS ENVIRON SERVS, INC

DRIVER NAME (PRINT) Albert Trevino

ADDRESS 7054 Snowflake

S.A., TX. 78238

VEHICLE LICENSE NO./STATE 2AG-377 TX

STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Albert Trevino — 0 7 2 6 9 7

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVERED WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

Albert Trevino — 0 7 2 6 9 7

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 2 1 0 - 6 6 1 4 1 0 -

ADDRESS 7790 Tessman Road (P.O Box 201690, 78220) San Antonio, Texas 78100

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

NAME OF AUTHORIZED AGENT — SIGNATURE — 0 7 2 6

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX (5

TRANSPORTER RETAIN

No A023022

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-24-97 Time In: 14:57:04 Time Out: 14:57:34
Ticket # : R58195 OMS # : 1210194 LMS #: 1210194
Hauler : OLMOS ENV/KAFB
Vehicle # : 000081 Trailer #: 000022 Lic Plate:
Manifest # : 468057 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: MIKE CONTU
Capacity : 22.00 yd Scale In # : 31,720 Scale Out #:
Gross Wt : 83180 Tare Wt: 15.84 Net Wt: 25.73 tn
(41.59)

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE:

TES-LF116

BFI 795 783 **TEXAS** NON-HAZARDOUS SPECIAL WASTE MANIFEST

NO 468057

97-7

GENERATOR

GENERATOR NAME ~~SA ALC/EMC~~

GENERATING LOCATION KAFB - East Kelly Storage - IRP Sites

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241 5917

ADDRESS 307 Tinker Drive

San Antonio, TX

PHONE NO. 210 9253100

STATE GENERATOR ID NUMBER 3175.0

T.N.R.C.C	DESCRIPTION OF WASTE	QUANTITY	UNITS
07413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 980118 239413

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

T.N.R.C.C	DESCRIPTION OF WASTE		

BFI WASTE CODE

D-DRUM
C-CARTON
B-BAG
T TRUCK
P-POUNDS
Y YARDS
O-OTHER

GENERATOR'S CERTIFICATION I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations, AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07249

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. 001

PHONE NO. 673-2940

TRANSPORTER NAME Halls Trucking

DRIVER NAME (PRINT) Clayton Hill

ADDRESS 6423 Marcum

SA TX 78227

VEHICLE LICENSE NO./STATE 2EC 040

STATE TRANSPORTER ID NO.

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DELIVE WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW

[signature] — 072497 — [signature] — 072497

DRIVER SIGNATURE — SHIPMENT DATE — DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill

PHONE NO 210-661410

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE

[signature] — [signature] — 07249

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720TX

795 784

No A028927

BROWNING-FERRIS INDUSTRIES

TESSMAN LANDFILL

Date : 07-28-97 Time In: 17:25:07 Time Out: 17:43:21
Ticket # : 059057 CMS # : 1210194 CMS #: 1210194
Customer : OLMTS ENV/KAB
Vehicle # : 000153 Trailer #: 000002 Lic Plate:
Manifest # : 513894 PO #: Transporter: OUT
Generator : KAB KELLY AIR FORCE BASE
Comment : Operator: CHRIS MCCUNE
Capacity : 22.00 yd Scale In # : 1 Scale Out #: 1
Gross Wt : 43.08 Tare Wt: 15.14 Net Wt: 27.94 tn

Item	Descr	Actual	Bill Qty	$/Unit	Extended
239413LF	SOIL	22.00	22.00 YD	8.10000	178.20
	Sub Total..... $				178.20
	Total..... $				178.20

(210) 661-4104
Thanks & Have A Great Day!!

I CERTIFY
THIS LOAD CONTAINS NO
UNAUTHORIZED
HAZARDOUS WASTE
DRIVER SIGN TICKET

SIGNATURE: Arevino #153

TES

BFI 795 785 **TEXAS** Kelly AR # 3923 Page 789 of 830 NO. 513994

NON-HAZARDOUS SPECIAL WASTE MANIFEST

97-7

WEIGHT IN LBS

GENERATOR

GENERATOR NAME SA-ALC/EMC

ADDRESS 307 Tinker Drive (Building 306)

Kelly AFB, Texas 78241-5917

PHONE NO. 210 9253100

GENERATING LOCATION KAFB - East Kelly Storage - [illegible]

ADDRESS 307 Tinker Drive

San Antonio, TX

STATE GENERATOR ID NUMBER 3171

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS
02413012	Soil with petroleum hydrocarbons	22	Y

BFI WASTE CODE TX 755 98011823941 3

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

T.N.R.C.C.	DESCRIPTION OF WASTE	QUANTITY	UNITS

BFI WASTE CODE

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residual of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Spencer Albertson — Spencer Albertson — 07289

GENERATOR AUTHORIZED AGENT NAME — SIGNATURE — SHIPMENT DATE

TRANSPORTER

TRUCK NO. X 153 PHONE NO. 623-2940

TRANSPORTER NAME Halls Trucking DRIVER NAME PRINT) ALBERT TREVINO

ADDRESS 6423 Marcum VEHICLE LICENSE NO/STATE 2AG-377 TX

SA. TX. 78227 STATE TRANSPORTER ID NO

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS PICKED UP AT THE GENERATOR SITE LISTED ABOVE.

Albert Trevino — 072897

DRIVER SIGNATURE — SHIPMENT DATE

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL WAS DEL[illegible] WITHOUT INCIDENT TO THE DESTINATION LISTED BELOW.

X Albert Trevino — 07289

DRIVER SIGNATURE — DELIVERY DATE

DESTINATION

SITE NAME BFI Landfill PHONE NO. 210-6[illegible]

ADDRESS 7790 Tessman Road (P.O. Box 201690, 78220) San Antonio, Texas 78109

I HEREBY CERTIFY THAT THE ABOVE NAMED MATERIAL HAS BEEN ACCEPTED AND TO THE BEST OF MY KNOWLEDGE THE FOREGOING IS TRUE AND ACCURATE.

[illegible] — [illegible] — [illegible]

NAME OF AUTHORIZED AGENT — SIGNATURE

REORDER ONLY THROUGH BFI / UARCO CONTRACT

109-720

TRANSPORTER DETAIL

795 786

TAB

Appendix M

APPENDIX M

Chain-of-Custody Forms and Analytical Data for Confirmatory Sampling

14619

CHAIN-OF-CUSTODY RECORD

DIRECTORATE OF ENVIRONMENTAL MANAGEMENT
KELLY AIR FORCE BASE
SAN ANTONIO, TEXAS

(If no box checked use routine)
☐ Routine
☐ Urgent
☒ EMERGENCY

FUND DO# ACRN
BRAC ☒ [illegible] 10.40C2 X37 47E6 000 6420000 BJ25
304300

ORIGINAL

Chain of Custody Number K97081	Kelly AFB Project Manager (Print) ED ROBERSON	Field Team Leader (Print) CHARLIE MATTHEWS	Laboratory Anacon Inc.
Contractor EMRO	Project Name S-7	Sampler's Name (Print) CHARLIE MATTHEWS	Laboratory Contract Number F41650-95-D-2002
IRPIMS ☒ Yes ☐ No	Kelly AFB Site Number SS009	Sampler's Signature Charlie Matthews	ANALYSES REQUESTED

	Sample Number LNNNNNNNLL	Station Number LLNNN	Sample Type See VVL	Sample Matrix See VVL	Sample Method LL	Begin Depth NN.N	End Depth NN.N	Date dd mmm yy NN LLL NN	Time 24 HR NNNN	Field Lot Number NNNL	Number of Contain. N	7060
01	K9708101	Equip. Bl.	EB	WQ	G	0.00	0.00	3 Jun 97	0800	040A	1	X
02	K9708102	01	N1	SO	G	0.1	0.2	3 Jun 97	0935	040A	1	X
03	K9708103	02	N1	SO	G	0.1	0.2	3 Jun 97	0945	040A	1	X
04	K9708104	03	N1	SO	G	0.1	0.2	3 Jun 97	0959	040A	1	X
05	K9708105	04	N1	SO	G	0.1	0.2	3 Jun 97	1007	040A	1	X
06	K9708106	05	N1	SO	G	0.1	0.2	3 Jun 97	1018	040A	1	X
07	K9708107	10	N1	SO	G	0.1	0.2	3 Jun 97	1318	040A	1	X
08	K9708108	06	N1	SO	G	0.1	0.2	3 Jun 97	1326	040A	1	X
09	K9708109	09	N1	SO	G	0.1	0.2	3 Jun 97	1331	040A	1	X
10	K9708110	08	N1	SO	G	0.1	0.2	3 Jun 97	1340	040A	1	X
11	K9708111	07	N1	SO	G	0.1	0.2	3 Jun 97	1348	040A	1	X

Relinquished By (Signature)	Date/Time	Received By (Signature)	Date/Time
Charlie Matthews	1525 3 JUNE 97	Lorraine R Helm	1050 *6-5-97
Relinquished By (Signature)	Date/Time	Received By (Signature)	Date/Time
Relinquished By (Signature)	Date/Time	Received By (Signature)	Date/Time

PROTOCOL (circle one)
HAZWRAP EPA OTHER
QC LEVEL (circle one)
1 2 3 4 5

FOR LABORATORY USE ONLY
CONDITIONS OF SAMPLES UPON RECEIPT

CHAIN OF CUSTODY	Y N	ICE	✓
REQUEST FOR ANAL	Y N	TEMP	16°C
CUSTODY SEAL	Y N	pH	✓

Sample Shipped Via (circle one):
UPS FED-EX AIRBORNE BUS
HAND OTHER

Waybill Number:
2037345155

SAMPLE CONDITION
GOOD

REMARKS
*Airborne error delayed receipt of samples

795 788

ANACON, INC.
730 FM 1959
HOUSTON TX 77034

795 789

ANALYTICAL AND CONSULTING LABORATORIES
PHONE (713) 522-7000 • FAX (713) 481-0039

FAX TRANSMITTAL COVER SHEET

DATE: 6/6/97 TIME: _____

TO: 310-925-1814

ATTENTION: John Glass

FROM: John Infante

NUMBER OF PAGES INCLUDING COVER SHEET: 13

FAX CONFIDENTIALITY NOTICE:

This message is intended only for the use of the individual or entity to which it is address and may contain information that is privileged, confidential, and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, or the employee or agent responsible for delivering this message to the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this message in error, please notify sender immediately by telephone and return the original message to us at the following address via postal service.

MESSAGE:

Method blank, LCS, MS/MSD, + CCV's were all within recovery limits, therefore the results are valid. However, the analyst ran a dilution test and ICP spectral scan to check for interference and there was matrix interference present. Therefore, Ted flagged the results with the "M" qualifier.

THANK YOU

VOICE: (281) 922-7000
FAX: (281) 481-0089
(281) 922-9158

ANACON, INC.
730 FM 1959
HOUSTON, TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE: (281) 922-7000 • FAX (281) 481-0089

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-01	Field Sample Number	K9708101
Site Number	SS009	Station Number	Equip. Bl.
Sample Log Date	3-Jun-97	Sample Log Time	0800
Sample Matrix	WQ	Sample Type	EB
Begin Depth	0.00	End Depth	0.00
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	X
Extraction Date	5-Jun-97	Extraction Time	1200
Analysis Date	6-Jun-97	Analysis Time	0955

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, ug/l	EPA Data Qualifiers
Arsenic	7440-38-2	2.00	< 2.00	U

Analyzed by XS

Laboratory Manager John Ynfante

This report shall not be reproduced, except in full, without the written approval of this laboratory.
Reported results represent only the sample tested

ANACON, INC.
730 FM 1959
HOUSTON, TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE (281) 922-7000 • FAX (281) 481-0089

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-02	Field Sample Number	C9708102
Site Number	SS009	Station Number	01
Sample Log Date	3-Jun-97	Sample Log Time	0935
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	120
Analysis Date	6-Jun-97	Analysis Time	0830

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	0.88	M

Analyzed by XS

Laboratory Manager John Ynfante

This report shall not be reproduced, except in full, without the written approval of this laboratory.
Reported results represent only the sample tested.

619-03as.xls 795 792

ANACON, INC.
730 FM 1959
HOUSTON, TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE (281) 922-7000 • FAX (281) 481-0069

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-03	Field Sample Number	C9708103
Site Number	SS009	Station Number	02
Sample Log Date	3-Jun-97	Sample Log Time	0945
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	1200
Analysis Date	6-Jun-97	Analysis Time	0850

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	1.35	M

Analyzed by XS

Laboratory Manager John Ynfante

This report shall not be reproduced, except in full, without the written approval of this laboratory.
Reported results represent only the sample tested.

ANACON, INC.
730 FM 1959
HOUSTON, TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE (281) 922 7000 • FAX (281) 481 0069

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-04	Field Sample Number	C9708104
Site Number	SS009	Station Number	03
Sample Log Date	3-Jun-97	Sample Log Time	0959
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	120
Analysis Date	6-Jun-97	Analysis Time	0855

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	2.68	M

Analyzed by XS

Laboratory Manager John Yofante

This report shall not be reproduced, except in full, without the written approval of this laboratory.
Reported results represent only the sample tested.

ANACON, INC.
730 FM 1959
HOUSTON, TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE (281) 922-7000 • FAX (281) 481-0089

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-05	Field Sample Number	C9708105
Site Number	SS009	Station Number	04
Sample Log Date	3-Jun-97	Sample Log Time	1007
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	1200
Analysis Date	6-Jun-97	Analysis Time	0900

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	0.89	M

Analyzed by XS

Laboratory Manager John Yotanis

This report shall not be reproduced, except in full, without the written approval of this laboratory.
Reported results represent only the sample tested

ANACON, INC.
730 FM 1959
HOUSTON, TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE (281) 922-7000 • FAX (281) 48 -0089

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-06	Field Sample Number	C9708106
Site Number	SS009	Station Number	05
Sample Log Date	3-Jun-97	Sample Log Time	1018
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	12
Analysis Date	6-Jun-97	Analysis Time	0905

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	1.58	M

Analyzed by XS

Laboratory Manager John Infante

This report shall not be reproduced, except in full, without the written approval of the laboratory.
Reported results represent only the sample tested

619-07as.xls

795 796

ANACON, INC.
730 FM 1959
HOUSTON, TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE (281) 922-7000 • FAX (281) 461-0089

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-07	Field Sample Number	C9708107
Site Number	SS009	Station Number	10
Sample Log Date	3-Jun-97	Sample Log Time	1318
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	1200
Analysis Date	6-Jun-97	Analysis Time	0910

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	0.83	M

Analyzed by XS

Laboratory Manager _____
John Infante

This report shall not be reproduced, except in full, without the written approval of this laboratory.
Reported results represent only the sample tested.

ANACON, INC.
735 FM 1959
HOUSTON, TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE (281) 922 7000 • FAX (281) 481-3089

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report: 6-Jun-97

Lab Sample Number	14619-08	Field Sample Number	C9708108
Site Number	SS009	Station Number	06
Sample Log Date	3-Jun-97	Sample Log Time	1326
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	1200
Analysis Date	6-Jun-97	Analysis Time	0925

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	1.80	M

Analyzed by XS

Laboratory Manager John Infante

This report shall not be reproduced, except in full, without the written approval of this laboratory.
Reported results represent only the sample tested.

795 798

ANACON, INC.
730 FM 1959
HOUSTON, TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE (281) 922-7000 • FAX (281) 481-0089

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-09	Field Sample Number	C9708109
Site Number	SS009	Station Number	09
Sample Log Date	3-Jun-97	Sample Log Time	1331
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	1200
Analysis Date	6-Jun-97	Analysis Time	0930

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	0.67	M

Analyzed by XS

Laboratory Manager John Ynfante

This report shall not be reproduced, except in full, without the written approval of this laboratory.
✓ Reported results represent only the sample tested

619-10as.xls

ANACON, INC.
730 FM 1959
HOUSTON TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE: (281) 922-7000 • FAX (281) 481 0089

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-10	Field Sample Number	C9708110
Site Number	SS009	Station Number	08
Sample Log Date	3-Jun-97	Sample Log Time	1340
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	1200
Analysis Date	6-Jun-97	Analysis Time	0935

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	1.80	M

Analyzed by XS

Laboratory Manager John Infante

This report shall not be reproduced, except in full, without the written approval of this laboratory.
Reported results represent only the sample tested

ANACON, INC.
730 FM 1959
HOUSTON TX 77034
ANALYTICAL AND CONSULTING LABORATORIES
PHONE (281) 922-7000 • FAX (281) 481-0289

Directorate Of Environmental Management
305 Tinker Drive, Suite 2, Building 305
Kelly AFB, TX 78241-5515

Phone (210) 925-1815 Fax (210) 925-1814

SAMPLE INFORMATION

Date of Report 6-Jun-97

Lab Sample Number	14619-11	Field Sample Number	C9708111
Site Number	SS009	Station Number	07
Sample Log Date	3-Jun-97	Sample Log Time	1348
Sample Matrix	SO	Sample Type	N1
Begin Depth	0.1	End Depth	0.2
Field Lot Control Number	040A	Lab QC Lot Number	14619-QC

SAMPLE PREPARATION

Analytical Method	SW7060	Extraction Method	SW3020
PVC Code	PR	Basis	W
Extraction Date	5-Jun-97	Extraction Time	1200
Analysis Date	6-Jun-97	Analysis Time	0940

ANALYTICAL RESULTS

Analyte	CAS #	Detection Limit	Parameter Value Qualifier and Value, mg/kg	EPA Data Qualifiers
Arsenic	7440-38-2	0.025	3.06	M

Analyzed by XS

Laboratory Manager John Ynfante

This report shall not be reproduced, except in full, without the written approval of this laboratory.
Reported results represent only the sample tested.

795 801

TAB

Appendix N

795 802

APPENDIX N

Baseline Risk Assessment

Contents

Section **Page**

1.0 Risk Assessment Objectives **1-1**

2.0 Data Evaluation and Selection of Contaminants of Potential Concern **2-1**

2.1 Contaminants of Potential Concern **2-1**
2.1.1 Results of Background Comparison 2-1
2.1.2 Methodology for Calculating 95 Upper Confidence Limits 2-4

3.0 Exposure Assessment **3-1**

3.1 Exposure Pathways **3-1**
3.1.1 Sources, Contaminant Release Mechanisms, and Environmental Transport Media 3-1
3.1.2 Land Use 3-3
3.1.3 Receptors and Exposure Routes 3-3
3.2 Quantification of Exposure **3-6**
3 2.1 Estimation of Chemical Intake 3-6
3.2.2 Reasonable Maximum Exposure Concentrations 3-9

4.0 Toxicity Assessment **4-1**

4.1 Issues Related to Lead **4-1**
4.2 Issues Related to Arsenic **4-1**
4.3 Issues Related to PEDDs and PCDFs **4-4**

5.0 Health Risk Characterization **5-1**

5.1 Cancer Risk Estimation Methods **5-1**
5.2 Noncancer Risk Estimation Methods **5-2**
5.3 Short-Term Construction (Excavation) Worker Risks **5-2**
5.4 Short-Term Construction (Track Installation) Worker Risks **5-2**
5.5 Long-Term Railcar Worker Risks **5-2**
5.6 Soil-To-Groundwater Cross-Media Effects **5-3**

6.0 Uncertainty Analysis **6-1**

7.0 Conclusions **7-1**

7.1 Cumulative Risks **7-1**
7.2 Conclusions **7-1**

8.0 References **8-1**

Attachments

1 Risk Calculations
2 Background Risk Comparison
3 Background Risk Calculations

795 804

Contents (Continued)

Figure **Page**

3-1 Conceptual Site Model 3-2
3-2 Future Site Layout 3-4
3-3 Planned Site Layout 3-5
3-4 Location of Proposed Structures Relative to Sample Locations 3-12

Table **Page**

2-1 Summary of Chemicals of Potential Concern (COPCs) in Surface Soil 2-2

3-1 Exposure Parameters--Future Scenarios 3-7
3-2 Exposure Point Concentrations for Chemicals of Potential Concern 3-10
3-3 RME Concentrations for Chemicals of Potential Concern (COPCs) 3-13

4-1 Toxicity Values for Chemicals of Potential Concern 4-2
4-2 Toxicity Equivalent Factors for Dioxin COPCs 4-3

5-1 Total Risk and Hazard Indices for Site SS009 5-1

6-1 Uncertainties Associated with Human Health Risk Estimations 6-2

795 805

List of Acronyms and Abbreviations

ABS	absorption factor
AF	adherence factor
AFB	Air Force Base
AT	averaging time
BAF	bioavailability factors
BRA	baseline risk assessment
BW	body weight
C	concentration in soil
CF	conversion factor
COPC	contaminants of potential concern
DL	detection limit
ED	exposure duration
EF	exposure frequency
EPA	United States Environmental Protection Agency
FS	feasibility study
g/mol	grams per mole
HEAST	Health Effects Assessment Summary Tables
HI	Hazard Index
HQ	Hazard Quotient
IR	intake rate for air
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
mg/kg	milligrams per kilogram
MSC	medium-specific concentration
MS/MSD	matrix spike/matrix spike duplicates
PCDD	polychlorinated dibenzo-p-dioxin
PCDF	polychlorinated dibenzo-p-furan
PEF	particulate emission factor
QA/QC	quality assurance and quality control

RCRA	Resource Conservation and Recovery Act
Rfc	reference concentration
RfD	reference dose
RI	Remedial Investigation
RME	reasonable maximum exposure
RRS	Risk Reduction Standard
SA	skin surface area
SAI-Ind	Texas Risk Reduction Rules Media Specific Concentration (MSC) for Worker Ingestion of Soils and Inhalation of Volatiles and Particulates
SI	site inspection
SPLP	Synthetic Precipitation Leaching Procedure
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TAC	Texas Administrative Code
TCDD	tetracholordibenzo-p-dioxin
TEF	Toxicity Equivalency Factor
TNRCC	Texas Natural Resources Conservation Commission
UCL	upper confidence limit
VOC	volatile organic compound
WOE	weight of evidence

SECTION 1.0

795 807

Risk Assessment Objectives

This Baseline Risk Assessment (BRA) for Site SS009, Kelly Air Force Base (AFB), was prepared as an adjunct to the Closure Investigation report (CH2M Hill, 1997). Although the BRA was not required to satisfy site closure under Risk Reduction Standard No. 2 (RRS No. 2), it was performed to evaluate the potential for site-related contaminants to affect human health under current and future conditions. This risk assessment was prepared according to guidance in the Texas Natural Resources Conservation Commission (TNRCC) RRSs regulations and current U.S. Environmental Protection Agency (EPA) guidance for assessing human health risks associated with exposure to environmental contamination (EPA, 1989b).

Site SS009 was used from the 1940s to the 1970s as a nonhazardous materials storage facility. In the 1970s, part of the site was used to store herbicides in 55-gallon drums. Historical information for the site indicates that some of the drums leaked and consequently, herbicide-related constituents were released to the surrounding soil. Historical data indicate that herbicides have not been detected in soil samples at the site. However, polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDDs/PCDFs) and metals above background levels have been measured in soil samples. Therefore, the focus of this risk assessment was to evaluate risks associated with exposure to soil containing metals and PCDDs/PCDFs through direct contact (incidental ingestion, inhalation, and dermal contact). Direct exposure to groundwater was not evaluated quantitatively in this risk assessment since this medium will be addressed in the Kelly AFB Installation Restoration Program (IRP) Zone 4 Remedial Investigation (RI) report. However, the potential for soil-to-groundwater cross-media effects was evaluated using Synthetic Precipitation Leaching Procedure (SPLP) soil data.

Cumulative risks from all contaminants of potential concern (COPCs) were calculated for workers exposed to soils at Site SS009 through incidental ingestion, inhalation, and dermal contact. In addition, site data were compared to Media Cleanup Levels to assess the potential for contaminated soil to affect groundwater. These Media Cleanup Levels were calculated according to the methodology in 30 Texas Administrative Code (TAC) 335.559(g).

The remainder of this BRA is organized into the following sections:

- Section 2.0: Data Evaluation and Selection of Contaminants of Potential Concern
- Section 3.0: Exposure Assessment
- Section 4.0: Toxicity Assessment
- Section 5.0: Health Risk Characterization
- Section 6.0: Uncertainty Analysis
- Section 7.0: Conclusions
- Section 8.0: References

795 808

SECTION 2.0

Data Evaluation and Selection of Contaminants of Potential Concern

The data set evaluated as part of the BRA was described in detail in the 1996 Kelly AFB IRP Site SS009 closure report presented earlier. These data represent both historical site data, new data collected as part of the 1996 site investigation effort, and conformatory data collected in 1997 following a soil removal action .

- Supplementary Sampling at Site S-7 (CH2M Hill, 1994), Appendix A
- Summary of Halliburton NUS Metals & PCDD/PCDF Data (1992)—Appendix C
- Summary of October 1996 Sampling Results—Appendix E
- Summary of Post-Removal Sampling Results—Table 6-1

The data set evaluated in section 2.0 is representative of post-removal soil conditions at Site SS009.

2.1 Contaminants of Potential Concern

Chemicals that potentially could contribute to risks at the site based on detection frequency and concentrations are referred to as contaminants of potential concern (COPCs). The COPCs were selected for the risk assessment by comparing the maximum detected concentration for all chemicals detected in surface and subsurface soil to background levels based on historical (1996) and post-remediation (1997) data. Chemicals with maximum concentrations that exceeded the background levels were retained as COPCs, and risks associated with exposure to these chemicals were evaluated quantitatively in the risk assessment.

Background values for metals in surface soil and subsurface soil have been established for Kelly AFB (Halliburton NUS, 1994). These background values were used to select COPCs for metals. Congener-specific background values are not available for PCDDs and PCDFs Therefore, all PCDDs and PCDFs detected in the soil samples at Site SS009 were retained as COPCs.

2.1.1 Results of Background Comparison

The maximum detected concentrations for metals in soil samples collected from surface soil (i.e., 0- to 2- foot depth range) and subsurface soil (i.e., greater than 2 feet below ground surface) at SS009 were compared to the Kelly AFB background values (Table 2-1). In the surface soil, the following metals have maximum concentrations that exceed background values and were selected as COPCs: antimony, arsenic, barium, beryllium, cadmium, chromium, lead, manganese, silver, and vanadium. In the subsurface soil, the following metals have 95 UCLs that exceed background concentrations and were selected as COPCs: barium, beryllium, cadmium, cobalt, copper, lead, and thallium.

TABLE 2-1
Summary of Chemicals of Potential Concern (COPCs) in Surface Soil
IRP Site SS009 Closure Report

Parameter	Units	Number Analyzed	Detects	MinDet	MeanDet	MaxDet	Background Concentration	Max Exceeds Background
Surface Soils (0-2 ft)								
ANTIMONY	mg/kg	30	19	0 3	5.77	53	0 98	Yes
ARSENIC	mg/kg	48	41	2.6	34 71	226	8.50	Yes
BARIUM	mg/kg	35	35	33 8	77 91	230	210	Yes
BERYLLIUM	mg/kg	35	35	0.1	1 88	12	2	Yes
CADMIUM	mg/kg	32	27	1	10.13	52.6	0 43	Yes
CHROMIUM, TOTAL	mg/kg	35	35	17.6	39.98	141	43 6	Yes
COBALT	mg/kg	11	10	6 2	7 68	10.4	10.8	No
COPPER	mg/kg	11	11	7 7	10 85	15	18	No
LEAD	mg/kg	24	24	37.8	202	401	23 6	Yes
MANGANESE	mg/kg	11	11	105	375	824	593	Yes
NICKEL	mg/kg	11	10	12	16 54	22 6	26.8	No
SELENIUM	mg/kg	30	2	0 14	0.15	0.15	0 24	No
SILVER	mg/kg	35	5	0.59	0 94	1.6	0 25	Yes
THALLIUM	mg/kg	35	4	0.22	0 24	0 28	0.61	No
VANADIUM	mg/kg	11	11	18.4	35 72	65 5	64.8	Yes
ZINC	mg/kg	11	11	38.7	60 11	84 2	89 4	No

TABLE 2-1
Summary of Chemicals of Potential Concern (COPCs) in Surface Soil
IRP Site SS009 Closure Report

Parameter	Units	Number Analyzed	Detects	MinDet	MeanDet	MaxDet	Background Concentration	Max Exceeds Background
Subsurface Soils (2-17 ft)								
ARSENIC	mg/kg	9	8	2 9	4 44	6.3	9 9	No
BARIUM	mg/kg	6	6	51.8	84 62	139	112 00	Yes
BERYLLIUM	mg/kg	9	9	0 54	0.83	1.2	1 10	Yes
CADMIUM	mg/kg	9	3	0 31	0 43	0 57	0.49	Yes
CHROMIUM, TOTAL	mg/kg	9	9	9 3	15.82	22.6	33 20	No
COBALT	mg/kg	6	4	5.2	6.53	8.7	8 40	Yes
COPPER	mg/kg	9	9	6	9 59	11.6	11.30	Yes
LEAD	mg/kg	9	9	6.4	11 4	20 8	14 80	Yes
MANGANESE	mg/kg	6	6	147	248 67	411	987.00	No
NICKEL	mg/kg	9	9	7	9.84	14.4	17 10	No
THALLIUM	mg/kg	9	4	0 16	0 21	0.25	0 24	Yes
VANADIUM	mg/kg	6	6	17 9	28 67	35 5	56 10	No
ZINC	mg/kg	9	9	19 3	30.53	40 3	61 60	No

795 810

795 811

2.1.2 Methodology for Calculating 95 Upper Confidence Limits

The methodology for calculating the 95 Upper Confidence Limits (UCLs) depends on the number of positive detections and distribution of the data set. The data for each detected analyte were group into one the following categories:

- Data sets with less than 15 percent nondetects
- Data sets with between 15 and 50 percent nondetects
- Data sets with greater than 50 percent nondetects
- Data sets with greater than 90 percent nondetects

The statistical protocol described in Appendix I was used to determine the distributions of the data sets and to calculate the 95 UCLs for the COPCs. This protocol is consistent with current Texas and EPA guidance (30 TAC 335.553 [d] and EPA 1989a).

SECTION 3.0

Exposure Assessment

An exposure assessment is an evaluation of the magnitude, frequency, duration, and route of exposure for receptors. The first step of the exposure assessment is to identify appropriate exposure pathways for the site conditions using information about contaminant sources, migration processes, and land use in the vicinity of the site. Then the magnitude of exposure is calculated using site-specific concentration data for environmental media that receptors may contact and other parameters such as frequency and duration of exposure.

3.1 Exposure Pathways

A complete exposure pathway has five elements:

- Chemical source (e.g., herbicide containers)
- Mechanism for chemical release (e.g., spills or leaks from herbicide containers)
- Environmental transport medium (e.g., soil)
- Exposure point (e.g., storage yard)
- Feasible route of exposure (e.g., inhalation of suspended particulates)

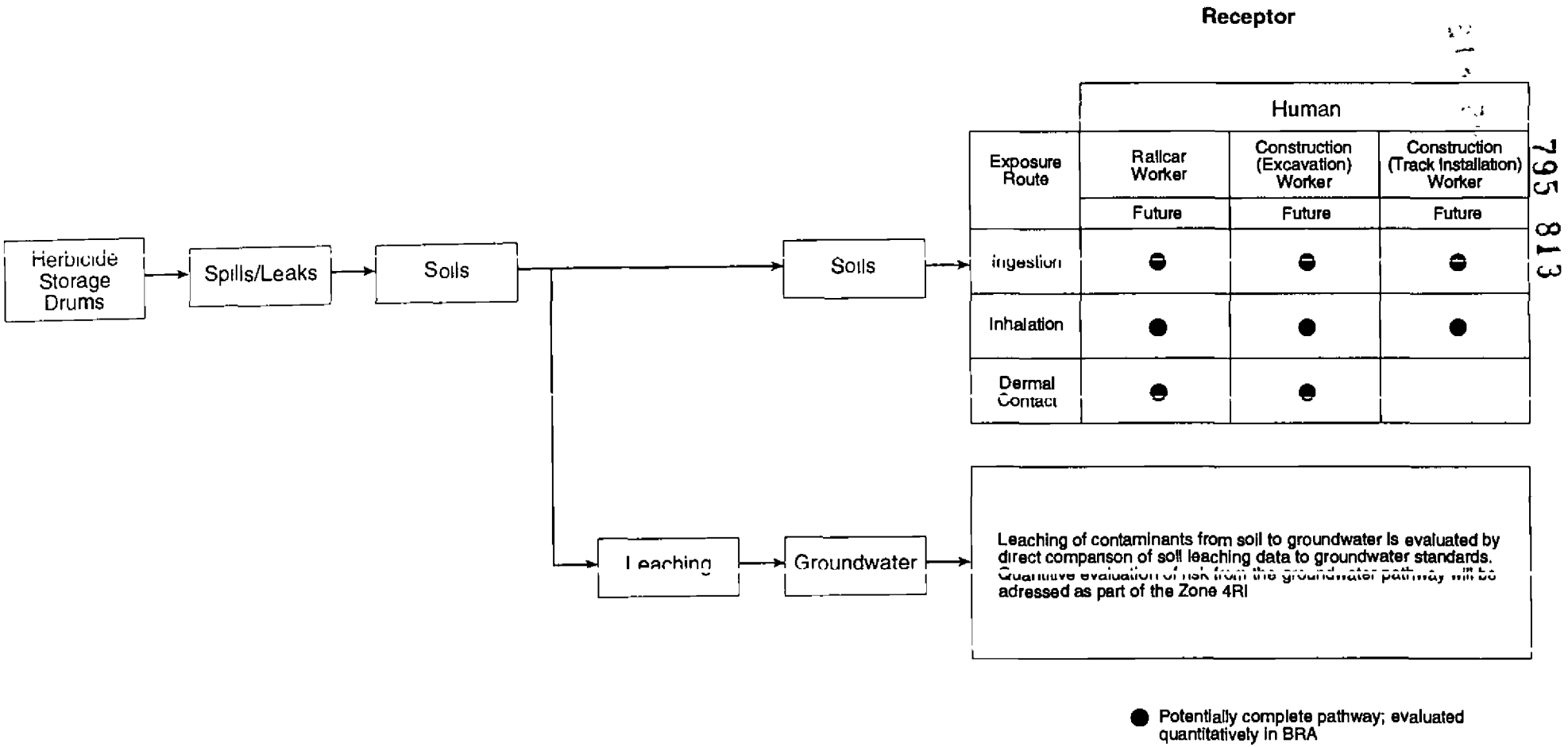
Exposure may occur when chemicals migrate from their source or when a receptor directly contacts source materials containing COPCs. An exposure pathway is complete only when all five elements of the exposure pathway are present.

Figure 3-1 is a site conceptual model that identifies the potential exposure pathways for current and future receptors at Site SS009. This site conceptual model depicts how contaminants may have been released from their primary source and transported to an exposure medium of importance to receptors. In addition, Figure 3-1 illustrates how contaminated media may interact with each other, potentially resulting in cross-media contamination. The various elements of the site conceptual model are described in more detail below.

3.1.1 Sources, Contaminant Release Mechanisms, and Environmental Transport Media

Site SS009 was used from the 1940s to the 1970s mainly as a non-hazardous materials storage facility. Heavy equipment, airplane and engine parts, and war surplus equipment were stored at the site at various times. During the early 1970s, part of the site was used for storing herbicides in 55-gallon drums. Although SS009 also contains the recreational area Reinmaker Park, the BRA is focused on the area sampled in and around the former herbicide storage area (the majority of the site).

According to the Site Investigation (SI) Report (Halliburton NUS, 1992), the herbicide storage drums were stored on wooden pallets and the drums leaked due to expansion and contraction caused by ambient temperature changes. The contaminated soil in the area of the drums may then have acted as a secondary source of contamination to other



7955 813

Figure 3.1.
Conceptual Site Model Site SS009
Kelly AFB 1997

environmental media through mechanisms such as re-suspension of particulates or leaching of contaminants through subsurface soil to groundwater.

3.1.2 Land Use

The main part of Site SS009 is currently used by the Kelly AFB Motor Vehicles group for storing vehicles and equipment. The area around the loading platforms is used by Kelly AFB Civil Engineering for storing heavy equipment and by Environmental Management/ Compliance. Figure 3.2 shows the current layout of Site SS009.

Kelly AFB plans to turn over this property to the Greater Kelly Development Corporation for leasing to a railcar company, Rail Car America. Some short-term construction projects will take place at the site by Rail Car America such as upgrading the railroad track and constructing two repair buildings, a transfer table, and additional storage track (Charles Franklin, Rail Car America, memorandum to Jesse Lopez, GKDC, August 26, 1996). The area then will be used for rehabilitating railcars. The parcel will remain an industrial area after the property is transferred from the Air Force. Figure 3-3 shows the proposed future layout for the site, as described by Rail Car America.

3.1.3 Receptors and Exposure Routes

3.1.3.1 Human Receptors

At the present time, only maintenance activities are occurring at the site, which involve limited, infrequent exposure of receptors to environmental media. Future exposure scenarios involving construction workers and daily workers at the railcar facility will result in higher exposure and consequently higher risks as compared to the scenario involving the current worker. Therefore, only the future scenarios are evaluated quantitatively as the "worst-case" scenarios.

Shallow groundwater in the vicinity is not being used as a drinking water source, and this condition is expected to continue in the future. In addition, issues related to groundwater contamination in this vicinity are being addressed under Kelly AFB IRP Zone 4 RI/feasibility study (FS). Therefore, exposure to groundwater is not included as a current or future pathway in this risk assessment; risk evaluations are limited to future exposure to soil at Site SS009. However, in the Risk Characterization section of the risk assessment (Section 5 0), SPLP soil data are compared to RRS No. 2 water medium-specific concentrations (MSCs) to evaluate the potential for soil COPCs to affect groundwater.

Because Site SS009 will remain an industrial area in the future, the following receptors and exposure routes were selected for evaluation in the BRA:

- Exposure of short-term construction (excavation) workers through incidental ingestion of soil, inhalation of particulates, and dermal contact with soil. It was assumed for the risk assessment that short-term construction workers could be exposed to surface soil and subsurface soil that may be brought to the surface during construction activities. Future activities planned for the site include construction of repair buildings; holes for the foundation of one of these buildings are estimated to be approximately 6 to 10 feet deep. (Charles Franklin, Rail Car America, memorandum to Jesse Lopez, GKDC, August 26, 1996).

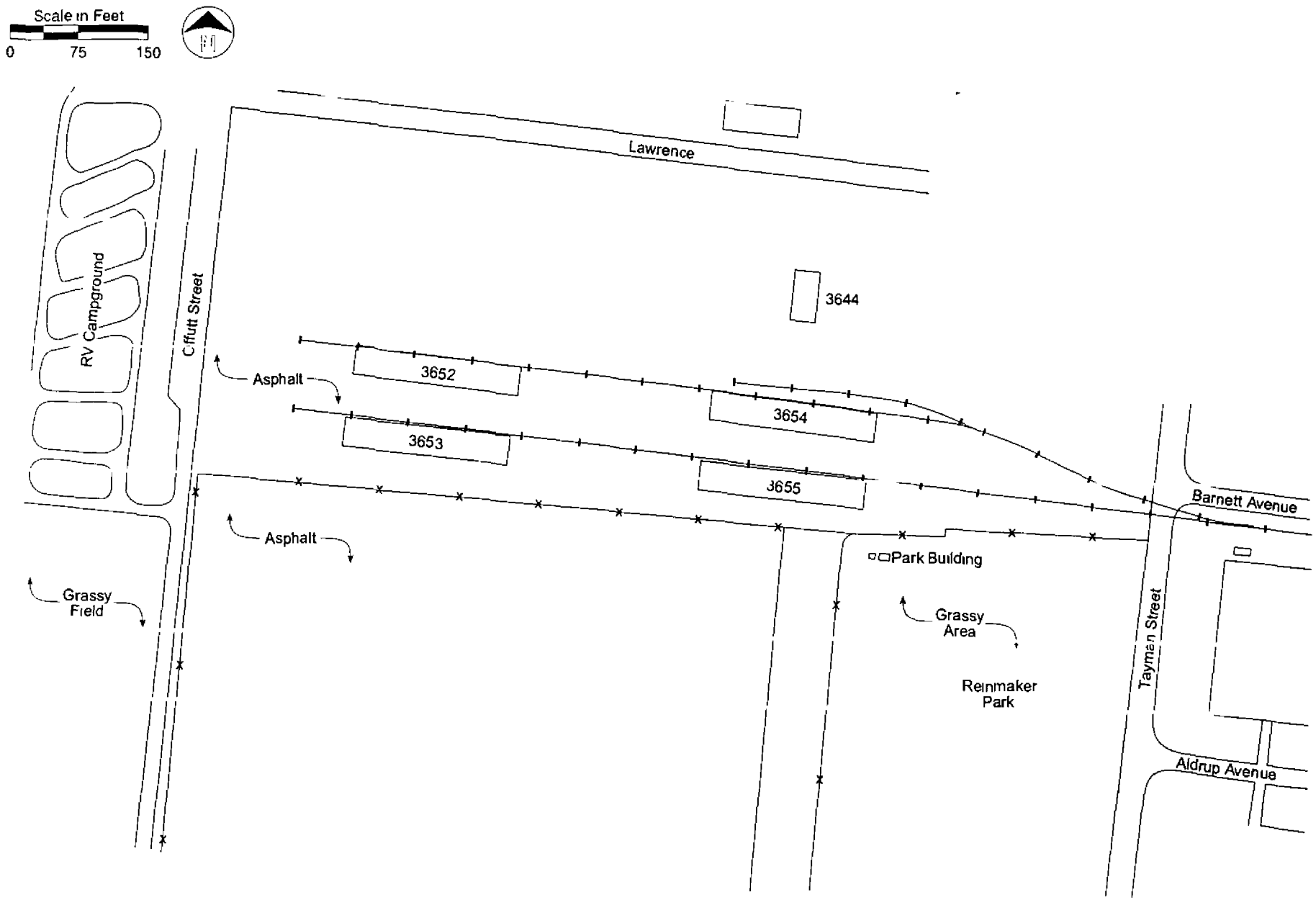
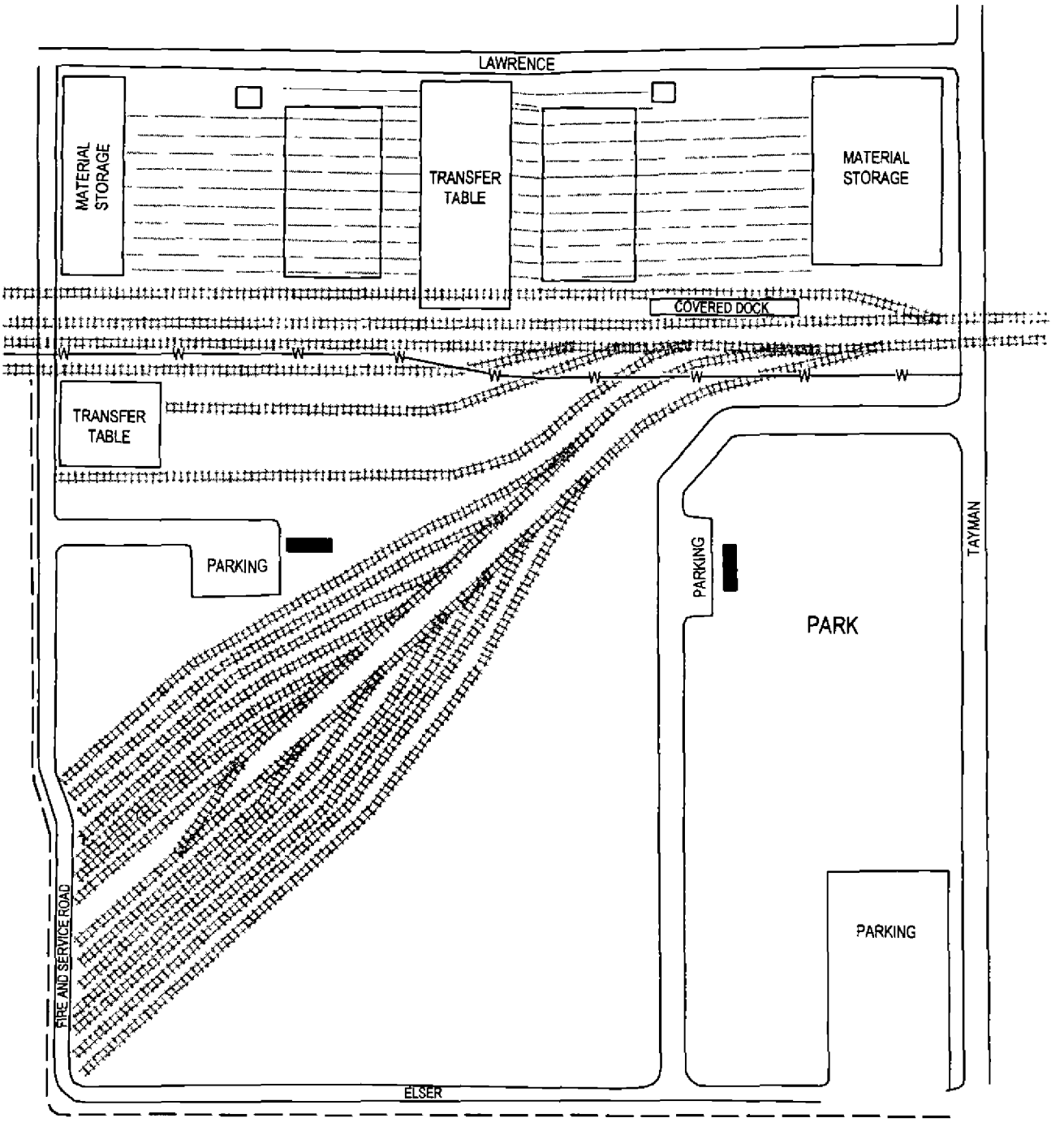


FIGURE 3.2
Current Land Use (as of November 1996)

795 815



LEGEND

- Fenceline
- Proposed R R lines
- Waterlines —W—
- Structures

NOTE Adapted from Rail Car America Proposed Shop Layout SK-012596

N

0 20 40
SCALE IN FEET

SAN ANTONIO AIR LOGISTICS CENTER
PARTNERS WITH THE ENVIRONMENT
ENVIRONMENTAL MANAGEMENT

FIGURE 3-3
Planned Site Layout
IRP Site SS009 Baseline Risk Assessment

- Exposure of short-term construction (track installation) workers through incidental ingestion of soil, inhalation of particulates, and dermal contact with soil. It was assumed for the risk assessment that short-term construction workers could be exposed to surface soil and subsurface soil that may be brought to the surface during construction activities. Future activities planned for the site include upgrading the railroad track, which is estimated to be approximately 2 feet deep.

- Exposure of future railcar workers through incidental ingestion of soil, inhalation of particulates, and dermal contact with the soil. It was assumed for the risk assessment that the future railcar workers only will be exposed to surface soil because their normal activities do not include excavation that would expose them to subsurface materials. Actual worker contact with surface soils will be limited by the nature of the work activities on the site. Railcar workers will be primarily involved in metal fabrication and welding activities that will be carried out inside railcars or inside future onsite structures. For this scenario, it was assumed that workers would spend approximately 50 percent of their time outside where they could be exposed to surface soils.

3.1.3.2 Ecological Receptors

The ecological habitat in Site SS009 is extremely modified and limited due to the weathered asphalt that covers the majority of the site. However, opportunistic plants and grasses are growing in some areas of the site. Site SS009 is bounded by roads and fences that limit the movement and habitat of wildlife species. In addition, no aquatic habitat has been documented on SS009. Future use of the site will not provide additional habitat and is likely to discourage the presence of ecological receptors. Potential exposure of ecological receptors to site-related contaminants is, therefore, not addressed in this BRA.

3.2 Quantification of Exposure

Exposure to receptors is calculated by combining estimates of chemical intake by various exposure routes (i.e., ingestion, inhalation, or dermal contact) with exposure point concentrations for the COPCs. EPA guidance states that exposure parameters should be combined to produce an overall estimate of the reasonable maximum exposure (RME) for receptors (EPA, 1989b).

3.2.1 Estimation of Chemical Intake

Chemical intakes were calculated for exposure to soil through incidental ingestion, inhalation of particulates, and dermal contact. The exposure parameters used for the three future worker scenarios are summarized in Table 3-1. The formulas used to calculate the intakes are provided below.

Values of exposure for receptors at SS009 were estimated using EPA guidance and best professional judgment. A brief discussion of the standard parameters for each receptor is given below.

The short-term construction (excavation) scenario assumes an estimated exposure duration and frequency for a 2-month construction project. This value results in a total exposure of 8 weeks (40 working days, 0.167 of a year) and is a conservative estimate for risk

Table 3-1
Exposure Factors

Parameter	Short-term Construction (Excavation) Worker	Short-term Construction(Track Installation) Worker	Long-term Railcar Worker
Body weight	70 kg	70 kg	70 kg
Averaging time - carcinogens	25,550 days (70 years)	25,550 days (70 years)	25,550 days (70 years)
Averaging time - noncarcinogens	60.8 days(0 167 years x 365 days/year)	182.5 days (0.5 years x 365 days/year)	9,125 days (25 years)
Exposure frequency	320 hours	1040 hours	125 days/year
Exposure duration(a)	0 167 year	0 5 year	25 years
Ingestion rate - soil	480 mg/day	100 mg/day	50 mg/day
Inhalation rate	2.5m3/hour	2.5 m3/hr	20 m3/day
Skin surface area	3,600 cm2	3,600 cm2	2,400 cm2
Absorption factor (b)	0.01 - Metals (default)	0.01 - Metals (default)	0 01 - Metals (default)
	0.05 - Arsenic	0 05 - Arsenic	0 05 - Arsenic
	0 03 - Dioxins	0.03 - Dioxins	0 03 - Dioxins
Adherence factor (b)	0.12 mg/cm2	0.12 mg/cm2	0.12 mg/cm2
Particulate emission factor (b)	N/A	N/A	4.63 x 109 mg3/kg
Particulate Concenetration (c)	0.7 mg/m3	0 7 mg/m3	N/A
Bioavailability factor (b)	0.78 - Arsenic	0.78 - Arsenic	0.78 - Arsenic

(a) Excavation = 8hrs/day*5days/wk*8weeks/yr; Track Installation= 8hrs/day*5days/wk*25weeks/yr
(b) Texas Natural Resource Conservation Commission, Texas Risk Reduction Program, Draft Version for Comment, December, 1996
(c) See Attachment 1- Particulate Concentration Calculations

793 818

calculation. Using best professional judgment, the estimated exposure duration and frequency for the short-term construction (track installation) scenario was based on the laying of track for a 6 month installation period. This value results in a total exposure of 26 weeks (120 working days, 0.5 of a year). The activities of the long-term railcar worker is assumed to have a more limited exposure than the EPA default industrial worker. The railcar worker activities include metal fabrication and welding and require more personal protective equipment. These workers are assumed to have more limited exposure to soil on the site. Therefore, an estimated exposure duration of 25 years with an exposure frequency of 125 days per year was selected.

3.2.1.1 Intake from Ingestion Pathway

$$\text{Intake} = \frac{C \times IR \times EF \times ED \times CF}{BW \times AT}$$

Where:

C	=	Concentration in soil (mg/kg)
IR	=	Intake rate for soil (mg/day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
CF	=	Conversion factor (10^{-6} kg/mg)
BW	=	Body weight
AT	=	Averaging time (ED x 365 days/year for noncarcinogenic COPCs; 70 x 365 days/year for carcinogenic COPCs)

3.2.1.2 Intake for Inhalation Pathway

$$\text{Intake} = \frac{C \times (1/PEF) \times IR \times EF \times ED}{BW \times AT}$$

Where:

C	=	Concentration in soil (mg/kg)
PEF	=	Particulate emission factor (m^3/kg)
IR	=	Intake rate for air (m^3/day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
BW	=	Body weight
AT	=	Averaging time (ED x 365 days/year for noncarcinogenic COPCs; 70 x 365 days/year for carcinogenic COPCs)

A soil-to-air volatilization factor was not included in the intake formula for the inhalation pathway because the COPCs for Site SS009 (i.e., metals and PCDDs/PCDFs) are not considered volatile. Volatile chemicals typically are defined as those chemicals having a Henry's Law constant greater than 10^{-5} (atm-m^3/mol) and a molecular weight less than 200 grams per mole (g/mol) (EPA, 1996a). The dioxins and furans all have molecular weights greater than 200 g/mol. Henry's Law constants for metals are assumed to be zero, except for mercury (EPA, 1994). Mercury is not a COPC for Site SS009.

3.2.1.3 Intake from Dermal Contact Pathway

$$\text{Intake} = \frac{C \times ABS \times SA \times AF \times EF \times ED \times CF}{BW \times AT}$$

Where:

C	=	Concentration in soil (mg/kg)
ABS	=	Absorption factor (unitless)
SA	=	Skin surface area (cm2)
AF	=	Adherence factor (mg/cm2/day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
CF	=	Conversion factor (10-6 kg/mg)
BW	=	Body weight
AT	=	Averaging time (ED x 365 days/year for noncarcinogenic COPCs; 70 x 365 days/year for carcinogenic COPCs)

The skin surface area used for the short-term construction scenarios (both the excavation and track installation) was 3600 cm^2, which includes the head, hands, and forearms. The skin surface area for the long-term railcar worker was 2400 cm^2, which includes the hands and forearms. The lower skin surface area for the long-term railcar worker is based on the use of additional personal protective equipment by this worker. The surface areas were calculated from Table 6.2 of the *Exposure Factors Handbook* (EPA, 1996) for an average of the 50th percentile of each body part for adult males.

3.2.2 Reasonable Maximum Exposure Concentrations

The 95 UCL or maximum detected concentration (whichever value was lower) was used for the RME concentration for each COPC. The methodology that was described previously in subsection 2.1.1 was used to determine the distributions of the data sets and to calculate the 95 UCLs for the COPCs. In calculating RMEs for each of the identified exposure scenarios (short-term excavation worker, short-term track-installation worker and long-term railcar worker), consideration was given as to which areas of the site would receive the highest use or the most impact (i.e. disturbance of soils) under each scenario. RMEs were calculated by grouping data from sampling locations associated with each scenario. For the long term railcar worker scenario, RMEs were calculated using all of the surface soil (0-2 feet) chemical data. For the short-term track-installation scenario RME calculations, only surface soil chemical data from samples located beneath, or immediate adjacent to, the railroad track footprint were included. For the short-term building excavation scenario RMEs, only soil data beneath or adjacent to the future locations of buildings and transfer tables were included. The exposure point concentrations for all exposure scenarios are summarized in Table 3-2. Figure 3-4 shows soil sampling locations in reference to the future locations of site buildings, transfer tables and railroad tracks. Table 3-2 provides a list of samples used to calculate RMEs for each scenario. The exposure point concentrations for all exposure scenarios are summarized in Table 3-3.

Table 3-2
Sample Results Used in the Calculation of RME Concentrations

Scenario	Location	SampleID	Data Set	Scenario	Location	SampleID	Data Set
Excavation	HA20	KS7HA20U0102	HNUS	***Railcar Worker Cont'd***	HA08C	DGA037	CH2MHill96
	HA12	KS7HA12U0001	HNUS		09	C9708109	KellyAFB97*
	HA23	KS7HA23U0102	HNUS		07	C9708111	KellyAFB97*
	HA22	KS7HA22U0001	HNUS		HA06A	DGA008	CH2MHill96
	HA22	DGA046	CH2MHill96		03	C9708104	KellyAFB97*
	HA19	KS7HA19U0001	HNUS		04	C9708105	KellyAFB97*
Railcar Worker	HA09	DGA012	CH2MHill96		05	C9708106	KellyAFB97*
	HA06C	DGA010	CH2MHill96		10	C9708107	KellyAFB97*
	HA06	DGA007	CH2MHill96		06	C9708108	KellyAFB97*
	HA02	DGA002	CH2MHill96		HA045A	DGA019	CH2MHill96
	HA01	DGA001	CH2MHill96		HA06B	DGA009	CH2MHill96
	S7B05	KS7SB05U0001	HNUS		02	C9708103	KellyAFB97*
	HA10	DGA013	CH2MHill96		HA08B	DGA036	CH2MHill96
	S7B01	KS7SB01U0001	HNUS		HA040C	DGA018	CH2MHill96
	HA040B	DGA017	CH2MHill96		HA045B	DGA020	CH2MHill96
	S7B08	KS7SB08U0001	HNUS		HA045C	DGA021	CH2MHill96
	S7B07	KS7SB07U0001	HNUS		HA01	DGA023	CH2MHill96
	S7B06	KS7SB06U0001	HNUS		HA03	DGA025	CH2MHill96
	S7B04	KS7SB04U0001	HNUS		HA04	DGA026	CH2MHill96
	HA050	C9401516	CH2MHill94		HA06	DGA028	CH2MHill96
	S7B02	KS7SB02U0001	HNUS		HA07	DGA029	CH2MHill96
	HA17	DGA041	CH2MHill96		HA07A	DGA030	CH2MHill96
	HA05B	DGA005	CH2MHill96		HA08	DGA033	CH2MHill96
	HA040	DGA061	CH2MHill96		HA08A	DGA035	CH2MHill96
	HA06	DGA060	CH2MHill96		HA07	DGA011	CH2MHill96
	HA040	DGA059	CH2MHill96	***Track Installation***	HA07B	DGA031	CH2MHill96
	S7B01	DGA047	CH2MHill96		HA045A	DGA019	CH2MHill96
	HA17	DGA014	CH2MHill96		HA07	DGA029	CH2MHill96
	HA017A	DGA042	CH2MHill96		HA07	DGA052	CH2MHill96
	HA049	C9401515	CH2MHill94		HA045C	DGA021	CH2MHill96
	HA10	DGA039	CH2MHill96		HA045B	DGA020	CH2MHill96
	HA07C	DGA032	CH2MHill96		HA040C	DGA018	CH2MHill96
	HA07B	DGA031	CH2MHill96		HA040B	DGA017	CH2MHill96
	HA05	DGA027	CH2MHill96		HA040A	DGA016	CH2MHill96
	HA02	DGA024	CH2MHill96		HA05C	DGA006	CH2MHill96
	HA046	C9401512	CH2MHill94		HA05B	DGA005	CH2MHill96
	HA040A	DGA016	CH2MHill96		HA07C	DGA032	CH2MHill96
	HA017B	DGA043	CH2MHill96		HA05A	DGA004	CH2MHill96
	HA09	KS7HA09U0102	HNUS		HA07	DGA011	CH2MHill96
	HA048	C9401514	CH2MHill94		HA050	C9401516	CH2MHill94
	HA15	KS7HA15U0001	HNUS		S7B01	KS7SB01U0001	HNUS
	HA14	KS7HA14U0001	HNUS		S7B01	DGA047	CH2MHill96
	HA13	KS7HA13U0102	HNUS		10	C9708107	KellyAFB97*
Railcar Worker	HA12	KS7HA12U0001	HNUS	***Track Installation***	08	C9708110	KellyAFB97*
	HA17	KS7HA17U0001	HNUS		06	C9708108	KellyAFB97*

Table 3-2
Sample Results Used in the Calculation of RME Concentrations

Scenario	Location	SampleID	Data Set	Scenario	Location	SampleID	Data Set
	HA10	KS7HA10U0001	HNUS		05	C9708106	KellyAFB97*
	HA18	KS7HA18U0001	HNUS		04	C9708105	KellyAFB97*
	HA08	KS7HA08U0001	HNUS		03	C9708104	KellyAFB97*
	HA07	KS7HA07U0001	HNUS		02	C9708103	KellyAFB97*
	HA06	KS7HA06U0001	HNUS		HA07A	DGA030	CH2MHill96
	HA05	KS7HA05U0001	HNUS		S7B02	KS7SB02U0001	HNUS
	HA04	KS7HA04U0001	HNUS		HA17	DGA014	CH2MHill96
	HA03	KS7HA03U0001	HNUS		01	C9708102	KellyAFB97*
	HA02	KS7HA02U0001	HNUS		HA17	KS7HA17U0001	HNUS
	HA01	KS7HA01U0102	HNUS		HA04	KS7HA04U0001	HNUS
	HA11	KS7HA11U0001	HNUS		HA04	DGA026	CH2MHill96
	HA039	C9401505	CH2MHill94		HA05	KS7HA05U0001	HNUS
	HA047	C9401513	CH2MHill94		HA05	DGA027	CH2MHill96
	HA06	DGA058	CH2MHill96		HA08	KS7HA08U0001	HNUS
	HA045	C9401511	CH2MHill94		HA08	DGA033	CH2MHill96
	HA044	C9401510	CH2MHill94		HA13	KS7HA13U0102	HNUS
	HA043	C9401509	CH2MHill94		HA14	KS7HA14U0001	HNUS
	HA042	C9401508	CH2MHill94		HA15	KS7HA15U0001	HNUS
	HA16	KS7HA16U0001	HNUS		HA16	KS7HA16U0001	HNUS
	HA040	C9401506	CH2MHill94		HA18	DGA045	CH2MHill96
	HA05C	DGA006	CH2MHill96		HA17	DGA041	CH2MHill96
	HA038	C9401504	CH2MHill94		HA08C	DGA037	CH2MHill96
	HA25	KS7HA25U0001	HNUS		HA18	KS7HA18U0001	HNUS
	HA24	KS7HA24U0001	HNUS		HA039	C9401505	CH2MHill94
	HA23	KS7HA23U0102	HNUS		HA040	DGA059	CH2MHill96
	HA22	KS7HA22U0001	HNUS		HA040	C9401506	CH2MHill94
	HA21	KS7HA21U0102	HNUS		HA041	C9401507	CH2MHill94
	HA20	KS7HA20U0102	HNUS		HA044	C9401510	CH2MHill94
	HA19	KS7HA19U0001	HNUS		HA045	C9401511	CH2MHill94
	HA041	C9401507	CH2MHill94		HA046	C9401512	CH2MHill94
	01	C9708102	KellyAFB97*		HA017A	DGA042	CH2MHill96
	HA09	DGA038	CH2MHill96		HA017B	DGA043	CH2MHill96
	HA16	DGA040	CH2MHill96		HA017C	DGA044	CH2MHill96
	HA017C	DGA044	CH2MHill96		HA08A	DGA035	CH2MHill96
	HA18	DGA045	CH2MHill96		HA08B	DGA036	CH2MHill96
					HA16	DGA040	CH2MHill96

Notes Kelly97. Arsenic Only

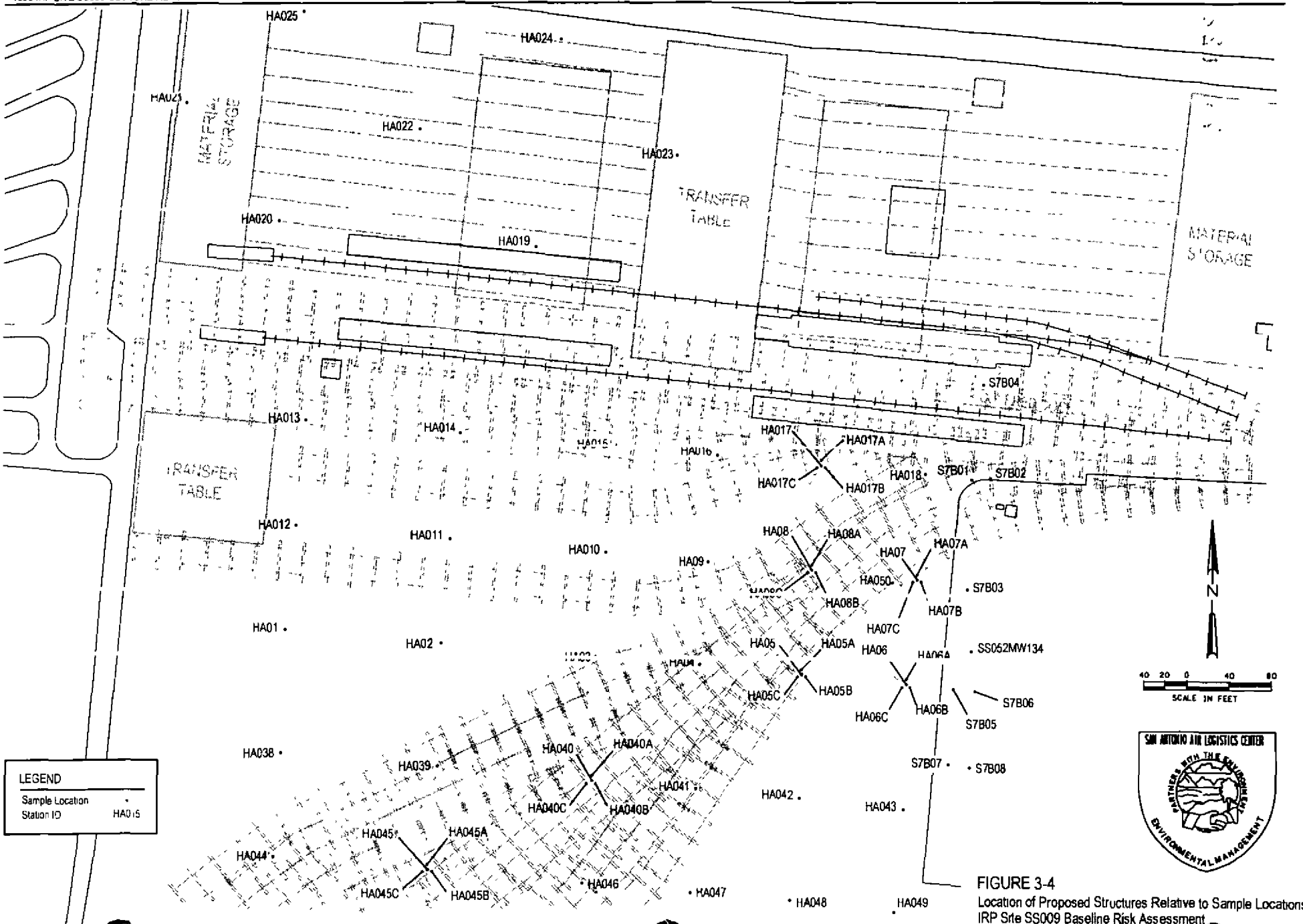


FIGURE 3-4
Location of Proposed Structures Relative to Sample Locations
IRP Site SS009 Baseline Risk Assessment

TABLE 3-3
RME Concentrations for Chemicals of Potential Concern (COPCs)
Kelly AFB Site SS009 BRA Report

Parameter	Units	Frequency of Non-Detects	Mean Concentration	Maximum Detected Concentration	RME	RME Basis
Short Term Construction (Excavation) Scenario						
ALUMINUM	mg/kg		2 92E+04	2 92E+04	2.92E+04	MAXDET
ANTIMONY	mg/kg	50%-90%	2.10E+00	2.10E+00	2.10E+00	MAXDET
ARSENIC	mg/kg		1.36E+01	2.22E+01	2 22E+01	MAXDET
BARIUM	mg/kg		7.98E+01	8.37E+01	8.37E+01	MAXDET
BERYLLIUM	mg/kg		4 95E+00	9.30E+00	9.30E+00	MAXDET
CADMIUM	mg/kg		4.90E+00	4 90E+00	4.90E+00	MAXDET
CHROMIUM, TOTAL	mg/kg		8.28E+01	1 41E+02	1 41E+02	MAXDET
LEAD	mg/kg		2.09E+02	4.01E+02	4 01E+02	MAXDET
MANGANESE	mg/kg		3.23E+02	3.23E+02	3 23E+02	MAXDET
VANADIUM	mg/kg		2 70E+01	2.70E+01	2.70E+01	MAXDET
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	50%-90%	1.00E-05	1.00E-05	1.00E-05	MAXDET
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	50%-90%	2.00E-06	2.00E-06	2.00E-06	MAXDET
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	mg/kg	50%-90%	2 50E-06	3.00E-06	3 00E-06	MAXDET
2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	50%-90%	1 00E-06	1.00E-06	1 00E-06	MAXDET
Short Term Construction (Track Installation) Scenario						
ALUMINUM	mg/kg		2.33E+04	3.27E+04	3.27E+04	MAXDET
ANTIMONY	mg/kg	15%-50	7 52E+00	5 30E+01	1.32E+01	Adjusted LOGNORM
ARSENIC	mg/kg	<15%	5.35E+00	1 63E+01	7 15E+00	LOGNORM
BARIUM	mg/kg		7 54E+01	2.30E+02	7 24E+01	NONPARAMETRIC
BERYLLIUM	mg/kg		1 54E+00	1.20E+01	4.04E-01	NONPARAMETRIC
CADMIUM	mg/kg	<15%	7.21E+00	1.47E+01	8 33E+00	NORM
CHROMIUM, TOTAL	mg/kg		3 48E+01	7.41E+01	3 94E+01	NONPARAMETRIC
LEAD	mg/kg		1 39E+02	3.66E+02	1 72E+02	NORM
MANGANESE	mg/kg		3 75E+02	8.24E+02	8 24E+02	MAXDET
SILVER	mg/kg	50%-90%	1.01E+00	1.60E+00	1.60E+00	MAXDET
VANADIUM	mg/kg		3.75E+01	6.55E+01	6.55E+01	MAXDET

TABLE 3-3
RME Concentrations for Chemicals of Potential Concern (COPCs)
Kelly AFB Site SS009 BRA Report

Parameter	Units	Frequency of Non-Detects	Mean Concentration	Maximum Detected Concentration	RME	RME Basis
Short Term Construction (Track Installation) Scenario (Continued)						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	mg/kg	15%-50	1.08E-04	4 49E-04	3 14E-04	ADJLOGNORM (Cohen's Method)
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	15%-50	4.43E-05	1.97E-04	9 29E-05	ADJLOGNORM (Cohen's Method)
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	>90%	1 00E-05	1 00E-05	1.00E-05	MAXDET
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	50%-90%	1 23E-05	2.18E-05	2 18E-05	MAXDET
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	50%-90%	1.28E-05	2 00E-05	2 00E-05	MAXDET
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	50%-90%	1.22E-05	2 69E-05	2 69E-05	MAXDET
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	50%-90%	1.26E-05	2 34E-05	2 34E-05	MAXDET
1 2 3 7 8 9-HEXACHLORODIBENZOFURAN	mg/kg	>90%	1 00E-05	1.00E-05	1.00E-05	MAXDET
1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg	50%-90%	1 76E-04	4.10E-04	4 10E-04	MAXDET
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	50%-90%	1.60E-05	6 45E-05	1.35E-06	NONPARAMETRIC
2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg	>90%	6 65E-06	1.07E-05	1.07E-05	MAXDET
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	mg/kg	>90%	4 00E-06	4 00E-06	4.00E-06	MAXDET
2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	50%-90%	4.00E-06	8.00E-06	8 00E-06	MAXDET
OCTACHLORODIBENZO-p-DIOXIN	mg/kg	15%-50	4.77E-04	2 58E-03	2 58E-03	MAXDET
OCTACHLORODIBENZOFURAN	mg/kg	15%-50	5 56E-05	1 71E-04	1 71E-04	MAXDET
Long-term Railcar America Worker Scenario						
ALUMINUM	mg/kg		2 58E+04	3 46E+04	3 27E+04	NONPARAMETRIC
ANTIMONY	mg/kg	15% 50%	5 50E+00	5.30E+01	5 30E+01	MAXDET
ARSENIC	mg/kg	<15%	6 31E+00	2 22E+01	7.59E+00	LOGNORM
BARIUM	mg/kg		7.93E+01	2 30E+02	9 14E+01	LOGNORM
BERYLLIUM	mg/kg		1.86E+00	1.20E+01	6.30E-01	NONPARA
CADMIUM	mg/kg	15%-50%	1 01E+01	5.26E+01	1.79E+01	ADJLOGNORM (Cohen's Method)
CHROMIUM, TOTAL	mg/kg		3 95E+01	1.41E+02	3.69E+01	NONPARAMETRIC
LEAD	mg/kg		1 42E+02	4.01E+02	1.72E+02	NONPARAMETRIC
MANGANESE	mg/kg		3 75E+02	8 24E+02	5 53E+02	LOGNORM
SILVER	mg/kg	50%-90%	9 40E-01	1 60E+00	1 60E+00	MAXDET
VANADIUM	mg/kg		3.57E+01	6.55E+01	4 40E+01	LOGNORM

795 825

TABLE 3-3
RME Concentrations for Chemicals of Potential Concern (COPCs)
Kelly AFB Site SS009 BRA Report

Parameter	Units	Frequency of Non-Detects	Mean Concentration	Maximum Detected Concentration	RME	RME Basis
Long-term Railcar America Worker Scenario (Continued)						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	mg/kg	15%-50%	1.67E-04	3 10E-03	2 82E-04	ADJLOGNORM (Cohen's Method)
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	50%-90%	6.93E-05	5.70E-04	1.67E-05	NONPARAMETRIC
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	>90%	9 55E-06	2.30E-05	2 30E-05	MAXDET
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	mg/kg	>90%	1 35E-05	3 00E-05	3.00E-05	MAXDET
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	50%-90%	1.38E-05	7 00E-05	7 00E-05	MAXDET
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	50%-90%	1.46E-05	5.00E-05	5.00E-05	MAXDET
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	50%-90%	1.07E-05	2.69E-05	2 69E-05	MAXDET
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	50%-90%	1 92E-05	8 00E-05	8.00E-05	MAXDET
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg	>90%	1.00E-05	1.00E-05	1 00E-05	MAXDET
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	mg/kg	>90%	7 78E-06	2.60E-05	2 60E-05	MAXDET
1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg	50%-90%	1.04E-04	4 10E-04	4 10E-04	MAXDET
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	50%-90%	1.59E-05	6.45E-05	6 45E-05	MAXDET
2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg	50%-90%	7 21E-06	1.80E-05	1 80E-05	MAXDET
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	MG/KG	>90%	3.40E-06	6 00E-06	6.00E-06	MAXDET
2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	>90%	4.00E-06	1 00E-05	1.00E-05	MAXDET
OCTACHLORODIBENZO-p-DIOXIN	mg/kg	15%-50%	1 08E-03	2 37E-02	2.37E-02	MAXDET
OCTACHLORODIBENZOFURAN	mg/kg	50%-90%	5.13E-05	1.71E-04	2 36E-05	NONPARAMETRIC

Notes
FOND—Frequency of Non-Detects
RME—Reasonable Maximum Exposure
Concentration
Cohen's Method—Cohen's method is used to adjust the sample mean and sample standard deviation

SECTION 4.0

795 827

Toxicity Assessment

The toxicity assessment consists of two components:

- Hazard identification: the process of determining what adverse human health effects, if any, could result from exposure to a particular COPC.
- Dose-response evaluation: a quantitative examination of the relationship between the level of exposure and the incidence of adverse health effects in an exposed population.

Health effects are divided into two categories: cancer and noncancer effects. This division is based on the different mechanisms of action associated with each category. Chemicals with cancer effects also may have noncancer effects.

Table 4-1 summarizes the toxicity information for the COPCs, including reference doses for chemicals with noncancer effects, critical effects associated with noncancer COPCs, slope factors for carcinogenic COPCs, and the weight-of evidence (WOE) carcinogen classification for all COPCs. The information presented in Table 4-1 was obtained from EPA's Integrated Risk Information System (IRIS) (EPA, 1996b) and Health Effects Assessment Summary Tables (HEAST) (EPA, 1995).

As shown in Table 4-1, the COPCs for IRP Site SS009 include metals and dioxins. Toxicity values are available for all COPCs except lead. Special issues related to the evaluation of exposure to lead, arsenic, and dioxins are discussed below.

4.1 Issues Related to Lead

Toxicity values are not available for lead; therefore, exposure to lead is evaluated by using models that estimate blood-lead levels associated with intake from various environmental sources, including air, water, soil, and dust. Risks associated with exposure to lead in soils were evaluated by comparing representative site concentrations to the RRS 2 soil/air inhalation and ingestion standard for industrial use (SAI-Ind) value. The RRS2 value for lead for an industrial setting (i.e., SAI-Ind) is 1,000 milligrams per kilogram (mg/kg). This criterion is based on values calculated using EPA's Lead Uptake/Biokinetic Model, Version 0.4.

4.2 Issues Related to Arsenic

The oral toxicity values for arsenic in IRIS were derived from a Taiwanese epidemiological study of arsenic in drinking water. Because the relative bioavailabilities of chemicals may differ in soil and water, a bioavailability factor may be used in calculating intake or acceptable risk-based concentrations (e.g., MSCs) for soil. Consistent with the approach taken by TNRCC, 1996, a bioavailability factor of 0.78 (78 percent) and an oral cancer slope factor of 1.5 (mg/kg-day) for arsenic was used to calculate risk. This alternative cancer slope factor is

TABLE 4-1
Toxicity Values for Chemicals of Potential Concern
Kelly AFB Site SS009 BRA Report

Paramaeter	WOE	Slope Factor (mg/kg-d)$^{-1}$ Oral	Source	Slope Factor (mg/kg-d)$^{-1}$ Inhalation	Source	Reference Dose (mg/kg-d) Oral	Source	Reference Dose (mg/kg-d) Inhalation	Source
ALUMINUM		NA	NA	NA	NA	1 00E+00	E	NA	NA
ANTIMONY	D	NA	NA	NA	NA	4 00E-04	I	NA	NA
ARSENIC	A	1 50E+00	I	1 51E+01	I	3.00E-04	I	NA	NA
BARIUM	D	NA	NA	NA	NA	7.00E-02	I	1 43E-04	HA
BERYLLIUM	B2	4 30E+00	I	8.40E+00	I	5 00E-03	I	NA	NA
CADMIUM	B1	NA	NA	6.30E+00	I	5.00E-04	I	NA	
CHROMIUM, TOTAL	A	NA	NA	4.20E+01	IC	5 00E-03	IC	5.71E-07	WC
LEAD	B2	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE		NA	NA	NA	NA	5 00E-2	IM	1.43E-05	I
SILVER	D	NA	NA	NA	NA	5.00E-03	I	NA	NA
VANADIUM	NA	NA	NA	NA	NA	7.00E-03	H	NA	NA
2 3 7 8-TETRACHLORODIBENZO-p-DIOXIN	B2	1.56E+05	H	1.16E+05	H	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	B2	1 56E+04	TEF	1.16E+04	TEF	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	B2	7.80E+04	TEF	5 80E+04	TEF	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	B2	7 80E+03	TEF	5 80E+03	TEF	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	B2	7 80E+04	TEF	5.80E+04	TEF	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	B2	1 56E+04	TEF	1.16E+04	TEF	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	B2	1.56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	B2	1.56E+04	TEF	1.16E+04	TEF	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	B2	1 56E+04	TEF	1.16E+04	TEF	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	B2	1 56E+04	TEF	1.16E+04	TEF	NA	NA	NA	NA

TABLE 4-1
Toxicity Values for Chemicals of Potential Concern
Kelly AFB Site SS009 BRA Report

Paramaeter	WOE	Slope Factor (mg/kg-d)$^{-1}$ Oral	Source	Slope Factor (mg/kg-d)$^{-1}$ Inhalation	Source	Reference Dose (mg/kg-d) Oral	Source	Reference Dose (mg/kg-d) Inhalation	Source
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	B2	1.56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	B2	1 56E+04	TEF	1 16E+04	TEF	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	B2	1.56E+03	TEF	1 16E+03	TEF	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	B2	1 56E+03	TEF	1.16E+03	TEF	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	B2	1.56E+03	TEF	1 16E+03	TEF	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	B2	1.56E+02	TEF	1 16E+02	TEF	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	B2	1 56E+02	TEF	1 16E+02	TEF	NA	NA	NA	NA

Notes
E—EPA-NCEA Regional Support provisional value (from EPA Region III Risk-Based Concentration Table).
I—Integrated Risk Information System (IRIS, 1996)
IC—IRIS value for Chromium VI used.
IM—IRIS value for Manganese based on modifying factor of 3 for nondietary exposures.
HA—Health Effects Assessment Tables Alternate (HEAST, 1995).
NA—Not Available
TEF—Slope factor adjusted using the toxicity equivalent factors for TCDD
W—Withdrawn from IRIS Value listed in HEAST is used.
WC—Value for Chromium III was withdrawn from IRIS. The Chromium III value listed in HEAST is used
WOE—Weight of evidence

795 829

consistent with the default values recommended by EPA Region X and Region VIII and was developed to account for the uncertainty and underestimation in the water intake assumptions of the current slope factor that is available in IRIS.

4.3 Issues Related to PCDDs and PCDFs

Polychlorinated dibenzodioxins and PCDFs are chemically classified as halogenated aromatic hydrocarbons. The chlorinated dibenzodioxins and dibenzofurans are tricyclic aromatic compounds with similar physical, chemical, and structural properties. The most widely studied of these compounds is 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). Consequently, this compound represents the reference chemical for this class of compounds.

The EPA defines dioxin-like compounds to include the subset of this class of compounds which are generally agreed to produce dioxin-like toxicity. These compounds are assigned individual Toxicity Equivalency Factor (TEF) values as defined by international convention (EPA, 1989c) in proportion to their toxicity relative to 2,3,7,8-TCDD. All PCDDs/PCDFs with chlorine atoms substituted in the 2,3,7 and 8 positions are assigned TEF values. Generally accepted TEFs for the COPCs are shown in Table 4-2 (EPA, 1986c). The toxicity factors for PCDDs/PCDFs represented in Table 4-1 are based on the cancer slope factor for 2,3,7,8-TCDD and the TEFs for individual compounds.

TABLE 4-2
Toxicity Equivalent Factors for Dioxin COPCs
Kelly AFB Site SS009 BRA Report, 1996

Parameter	Toxicity Equivalent Factor
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1
2,3,7,8-Tetrachlorodibenzofuran	0.1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.5
1,2,3,7,8-Pentachlorodibenzofuran	0.05
2,3,4,7,8-Pentachlorodibenzofuran	0.5
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.1
1,2,3,4,7,8-Hexachlorodibenzofuran	0.1
1,2,3,6,7,8-Hexachlorodibenzofuran	0.1
2,3,4,6,7,8-Hexachlorodibenzofuran	0.1
1,2,3,7,8,9-Hexachlorodibenzofuran	0.1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.01
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01
Octachlorodibenzo-p-dioxin	0.001
Octachlorodibenzofuran	0.001

SECTION 5.0

Health Risk Characterization

Cancer and noncancer risks were calculated for future short-term construction workers (for both excavation and track installation scenarios) and long-term railcar workers. Risks were not calculated for current workers because these receptors are involved in infrequent maintenance activities that would result in lower exposure and risks than the future workers. Therefore, only the future scenarios were evaluated quantitatively as the "worst-case" scenarios. Table 5-1 summarizes the cancer and noncancer risks for the three future worker scenarios. Risk calculation spreadsheets are provided in Attachment 2. Cancer and noncancer risks were also calculated for established Kelly soil background concentrations of metals. These calculations are presented in Attachment 2.

TABLE 5-1
Total Risk and Hazard Indices for Site SS009
Kelly AFB Site SS009 BRA Report, 1997

	Lifetime Excess Cancer Risks				Hazard Indices			
Exposure Receptors	Ingestion	Dermal Contact	Inhalation	Totals	Ingestion	Dermal Contact	Inhalation	Totals
Soil								
Short-term Construction (Excavation) Worker	1E-7	1E-9	3E-7	5E-7	0.1	0 0015	0.51	0 62
Short-term Construction (Track Installation) Worker	6E-8	9E-9	9E-7	1E-6	0 060	.0041	4 0	4 1
Long-term Railcar America worker	2E-6	5E-7	1E-8	3E-6	0 058	0 0042	0.0008	0 061

5.1 Cancer Risk Estimation Methods

Excess lifetime cancer risks were calculated for each carcinogenic COPC for each exposure route using the following formula:

Risk = Intake x Slope factor

Because multiple COPCs were selected for the site, risks for all carcinogenic COPCs were combined for each exposure route. Risks from the three exposure routes (incidental ingestion, inhalation, and dermal contact) were combined to give the overall excess lifetime cancer risk for each scenario.

5.2 Noncancer Risk Estimation Methods

Noncancer risks were estimated by comparing the intake for each noncarcinogenic COPC for each exposure route to its reference dose (RfD). The ratio of the intake to the RfD is described as the Hazard Quotient (HQ). The HQs for all COPCs that have noncarcinogenic effects were combined to estimate the Hazard Index (HI) for each exposure route. The HIs for the three exposure routes were combined to give an overall HI for each scenario.

5.3 Short-Term Construction (Excavation) Worker Risks

The short-term construction (excavation) worker scenario was evaluated by estimating the cancer and noncancer risks associated with exposure to surface and subsurface soil (assuming subsurface soil is brought to the surface during construction activities) through incidental ingestion, inhalation of airborne particulates, and dermal contact.

Cancer risks for the excavation worker from each of the three exposure routes and the total risk from all routes combined are well below the acceptable cumulative cancer risk of 1×10^{-4} specified in the RRSs (30 TAC 335.563[b]) (see Table 5-1).

The HIs for the construction worker from the three exposure routes and the total HI for all exposure routes are well below the threshold value of 1.0 (Table 5-1) for noncarcinogenic effects.

5.4 Short-Term Construction (Track Installation) Worker Risks

The short-term construction (track-installation) worker scenario was evaluated by estimating the cancer and noncancer risks associated with exposure to surface soil and through incidental ingestion, inhalation of particulates, and dermal contact.

Cancer risks for the track-installation worker from each of the three exposure routes and the total risk from all routes combined are well below the acceptable cumulative cancer risk of 1×10^{-4} specified in the RRSs (30 TAC 335.563[b]) (see Table 5-1).

The total HIs for the excavation worker for all three routes of exposure was 4.1 (see Table 5.1). Exposure to manganese through inhalation of particulates contributed greater than 99 percent of the total HI for this scenario. The RME concentration for manganese was the maximum detected concentration of 824 mg/kg. This concentration is in the range of the Kelly AFB background concentrations of 523 and 987 mg/kg, for the black clay and the brown clay, respectively. (Halliburton NUS, 1994).

5.5 Long-Term Railcar Worker Risks

The long-term railcar worker scenario was evaluated by estimating the cancer and noncancer risks associated with exposure to surface soil through incidental ingestion, inhalation of re-suspended particulates, and dermal contact. For this scenario, it was assumed that workers would spend approximately 50 percent of their time outside where they could be exposed to COPCs in soil. It also was assumed that these workers only would

be exposed to surface soil (0- to 2- foot depth range) because their normal activities are not expected to include excavation involving subsurface materials.

Cancer risks for the long-term railcar worker from each of the three exposure routes and the total risk from all routes combined are well below the acceptable cumulative cancer risk of 1×10^{-4} (Table 5-1). The ingestion route had risks within the acceptable risk range of 1×10^{-4} to 1×10^{-6} with an excess lifetime cancer risk of (2×10^{-6}). The greatest contributors to the risk for this scenario are arsenic, beryllium, 1,2,3,7,8,9-hexachlorodibenzo-p-dioxin, 1,2,3,7,8-pentachlorodibenzofuran, and octachlorodibenzo-p-dioxin congeners by the ingestion route, all of which had individual excess lifetime cancer risks below the of 1×10^{-4} to 1×10^{-6} risk range.

The HIs for the railcar worker from the three exposure routes and the total HI for all exposure routes are well below the threshold value of 1.0 (Table 5-1) for noncarcinogenic effects.

5.6 Soil-to-Groundwater Cross-Media Effects

Soil-to-groundwater cross-media effects were evaluated by comparing leachate concentrations of SPLP samples to RRS No. 2 GW-MSC in Section 5 of the Closure Investigation report. Representative SPLP concentrations did not exceed GW-RRS No. 2-MSCs and site-related contaminants in soil are not expected to negatively affect groundwater. This conclusion is supported by the fact that PCDDs/PCDFs and metals have not been reported at concentrations of concern in groundwater samples taken from an onsite downgradient well (SS052MW134). Potential health risks from detected chemicals in groundwater will be addressed in the Kelly AFB IRP Zone 4 RI/FS report.

SECTION 6.0

Uncertainty Analysis

Uncertainty associated with the results of this BRA is a function of both the "state-of-the-practice" of risk assessment in general, and the uncertainty specific to the SS009 site. This risk assessment is subject to uncertainty from a variety of sources including:

- Sampling, analysis, and data evaluation
- Fate and transport estimation
- Exposure estimation
- Toxicological data

General and site-specific uncertainties, as well as the potential effects on risk assessment results, are summarized in Table 6-1. Specific uncertainties related to the noncancer risk driver manganese are discussed below.

Of the exposure scenarios and potential human receptors evaluated in the Risk Characterization section of this report, only manganese was identified as a potential risk driver for short-term construction worker involved in track installation activities. In evaluating the significance of the calculated HIs (primarily for the inhalation route of exposure), several potential sources of uncertainty must be considered:

- Relative risk contributions from background metals concentrations at Site SS009
- Uncertainties in the inhalation reference concentration (RfC) for manganese
- Size of the data set used to calculate the RME concentration

The established Kelly AFB background concentrations for manganese in soils (523 mg/kg and 987 mg/kg, for the black clay and the brown clay, respectively [Halliburton NUS, 1994]) are in the range of the identified RME for manganese for this exposure scenario. Risk from exposure to background soils are very similar to risk from exposure to Site SS009 soils (at the RME concentration). Background soil risks are presented in Attachment 3.

The inhalation RFC in IRIS is based on a lowest observed adverse effects level for occupational exposure to manganese dioxide dust. Although the principle and supporting studies were conducted in human populations, an uncertainty factor of 1,000 is used in developing the RfC. This modifying factor may be overly conservative.

Another source of uncertainty in the risk calculation is the small size of the available data set from which the manganese RME was derived. Sample concentrations below the proposed track footprint ranged from 105 mg/kg to 824 mg/kg with and average of 375. Use of the maximum detected concentration as the RME in this case likely overestimates the true exposure-point concentration.

TABLE 6-1
Uncertainties Associated With Human Health Risk Estimations
Kelly AFB Site SS009 BRA Report, 1996

Uncertainty Factor	Effects of Uncertainty	Comment
I. Uncertainty in Environmental Sampling and Analysis		
Estimates of chemical concentrations	May underestimate or overestimate risk	Sampling errors, sample representativeness, heterogeneity of the sample matrix, and variability in chemical analyses will affect chemical concentrations. Reporting limits for some analytes were higher for historical data due to different methods of analysis.
II. Uncertainty in Fate and Transport		
Source concentrations assumed constant over time	May underestimate or overestimate risk	Did not account for environmental fate, transport, or transfer which may alter contaminant concentrations
III. Exposure Assessment		
Exposure assumptions	May underestimate or overestimate risk	Assumptions regarding media intake, population characteristics, and exposure patterns may not characterize exposures.
Use of applied dose to estimate risks.	May overestimate or underestimate risks	Assumes that the absorption of the chemical is the same as it was in the study that derived the toxicity value. Assumes that absorption is equivalent across species (animal to humans). Absorption may vary with age and species.
Population characteristics	May overestimate or underestimate risks	Assumes weight, lifespan, ingestion rate, etc., are potentially representative for a potentially exposed population
Intake	May underestimate risks	Assumes all intake of COPCs is from the exposure medium being evaluated (no relative source contribution)
Bioavailability factors (BAFs)	May overestimate risks	BAF only available for arsenic, risks from ingestion for other COPCs may be overestimated since 100 percent bioavailability is assumed

795 836

TABLE 6-1
Uncertainties Associated With Human Health Risk Estimations
Kelly AFB Site SS009 BRA Report, 1996

Uncertainty Factor	Effects of Uncertainty	Comment
III. Exposure Assessment (Continued)		
Exposure point concentrations	May overestimate risks	In some cases, maximum concentrations of COPCs measured at the site were used, may not represent actual exposure over the entire site. Use of historical data to estimate exposure point concentration may not be representative of current site conditions The particulate concentration model may be conservative, resulting in overestimation of the chemical intake via inhalation
IV. Toxicity Assessment		
Slope factor	May overestimate risks	Slope factors are upper 95th percent confidence limits derived from a linearized model Considered unlikely to underestimate risk
Toxicity values derived from animal studies	May overestimate or underestimate risks	Extrapolation from animal to humans may induce error because of differences in pharmacokinetics, target organs, and population variability
Toxicity values derived primarily from high doses; most exposures are at low doses	May overestimate or underestimate risks	Assumes linear at low doses. Tends to have conservative exposure assumptions
Dermal toxicity values	May overestimate or underestimate risks	No dermal toxicity values available, route-to-route extrapolation from oral values is uncertain
Toxicity values	May overestimate or underestimate risks	Not all values represent the same degree of certainty All are subject to change as new evidence becomes available.
Toxicity values derived from homogeneous animal populations	May overestimate or underestimate risks	Human populations may have a wide range of sensitivities to a chemical
V. Risk Estimation		
Estimation of risks across exposure routes	May overestimate or underestimate risks	Some exposure routes have greater uncertainty associated with their risk estimates than others
Cumulative risk estimates	May overestimate or underestimate risks	Assumes additivity of risks from multiple chemicals, may have synergistic or antagonistic effects

795 837

TABLE 6-1
Uncertainties Associated With Human Health Risk Estimations
Kelly AFB Site SS009 BRA Report, 1996

Uncertainty Factor	Effects of Uncertainty	Comment
V. Risk Estimation (Continued)		
Background Risks (metals)	May overestimate risk	Metallic COPCs were selected by comparing maximum detected concentration in soils to Kelly AFB background values which are UTL95. RMEs may be below actual background concentrations.
Cancer risk estimates—no threshold assumed	May overestimate risks	Possibility that some thresholds do exist
Cancer risk estimate—low dose linearity	May overestimate risks	Response at low doses is not known

SECTION 7.0

Conclusions

795 838

7.1 Cumulative Risks

Cancer risks for the short-term construction (excavation) worker, short-term construction (track-installation) worker, and long-term railcar worker from each of the three exposure routes and the total risk from all routes combined are below the acceptable cumulative cancer risk of 1×10^{-4} specified in the RRSs (30 TAC 335.563[b]). Cancer risks for the long-term railcar worker from the ingestion route had risks within the acceptable risk range of 1×10^{-4} to 1×10^{-6} with an excess lifetime cancer risk of (2×10^{-6}). The greatest contributors to the risk for this scenario are arsenic, beryllium, 1,2,3,7,8,9-hexachlorodibenzo-p-dioxin, 1,2,3,7,8-pentachlorodibenzofuran, and octachlorodibenzo-p-dioxin congeners by the ingestion route, all of which had individual excess lifetime cancer risks below the of 1×10^{-4} to 1×10^{-6} risk range.

The HIs for the short-term construction (track installation) worker and long-term railcar worker from the three exposure routes and the total HI for all exposure routes are well below the threshold value of 1.0 as specified in the RRSs (30 TAC 335.563[c]) for noncarcinogenic effects. The HIs for the short-term construction (track-installation) worker was above the 1.0 threshold value at 4.1. Manganese exposure via the inhalation route contributed greater than 99 percent of the risk. Because the soil RME concentration was in the range of site background, exposure to manganese at this level is expected to result in noncancer risks similar to exposure to manganese at background levels.

7.2 Conclusions

The risk assessment evaluated potential risks to human health and the environment from exposure to site-related contaminants in soils. For the identified future long-term railcar workers scenario, Site SS009 is not expected to pose a threat to human health because cumulative risks were well within risk levels identified in the RRSs For the short-term worker scenarios evaluated, cumulative risks for the construction (excavation) worker were within acceptable levels for all routes of exposures. Cumulative noncancer risk for the future construction (track-installation) worker scenario, as indicted by a HI of 4.1 , was above the level of concern value of 1.0. Although this risk may be associated with near-background levels of manganese in soils, consideration should be given to the minimization of worker exposure to soils during track-installation activities. Cancer risks were within acceptable levels for this scenario. In addition, soil COPCs are not expected to negatively impact groundwater because SPLP data evaluated in Section 5 of the Closure report meet RRS No 2. criteria for soil to groundwater cross-media effects.

SECTION 8.0

References

795 839

Charles Franklin, Rail Car America, Memorandum to Jesse Lopez, GKDC. August 26, 1996.

EPA. Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities. Interim Final Guidance. Office of Solid Waste Management Division. April 1989a.

EPA. Risk Assessment Guidance for Superfund, Volume 1. Human Health Evaluation Manual, Part A. EPA/540/1-89/002. December 1989b.

EPA. Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-dioxins and -Dibenzofurans (CDDs and CDFs) and 1989 Update. EPA/625/3-89/016. March, 1989c.

EPA. Supplemental Guidance to RAGS: Calculating the Concentration Term. Publication 9285.7-081. May 1992a.

EPA. Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities. Addendum to Interim Final Guidance. Office of Solid Waste Management Division. April 1992b.

EPA. Soil Screening Guidance. EPA/540/R-94/101. December 1994.

EPA. Health Effects Assessment Summary Tables. OERR 9200.6-303. 1995.

EPA. Region 9 Preliminary Remediation Goals (PRGs) August 1996a.

EPA. Integrated Risk Information System. Chemical Files. U.S. EPA Information System Database. Office of Research and Development. Cincinnati, Ohio. 1996b.

Gilbert R O. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold. New York, NY. 1987.

Halliburton NUS. Final Background Levels of Inorganics in Soils at Kelly Air Force Base. United States Air Force IRP Kelly Air Force Base, San Antonio, Texas. March 1994.

Halliburton NUS Final Draft, Site Investigation Report, East Kelly, Site S-7. U.S. Air Force Installation Restoration Program. June 1992.

Texas Natural Resources Conservation Commission (TNRCC). Texas Risk Reduction Program Concept Document 2; Volumes 1, 2, and 3. Texas Natural Resource Conservation Commission. December 16, 1996.

795 840

Attachment 1

Particulate Matter Emission Estimates for Kelly Site SS009

MEMORANDUM CH2MHILL

Particulate Matter Emission Estimates for Kelly SS009 Site

TO: John Coffey/SAN

COPIES: Keith Long/PDX

FROM: Robert Koster/PDX

DATE: July 24, 1997

We have estimated emissions of particulate matter for the closure construction activities on the SSOO9 site, roughly a 1.3 acre area which will have several buildings and several rail spurs constructed on it. Information provided included a site plan that indicated buildings and rail spurs would be constructed on about 2/3 of the surface of the acreage.

An emission factor for `heavy construction' activities from EPA's AP-42 compilation of air pollutant emission factors (EPA AP-42, 4th Edition, page 13.2.3-1) was determined to best represent the surface flux of particulate matter during uncontrolled construction activities for this site. This factor, 1.2 pounds total suspended particulate matter (TSP)/acre-month, was converted to g/m^2-s (0.000174 g/m^2-s) using site-specific operating schedule information.

The particulate matter emission flux described above was then incorporated into a box model recommended by EPA (U.S. Environmental Protection Agency, 1991, Risk Assessment Guidance for Superfund: Vol. 1, Human Health Evaluation Manual (Part B, Development of Risk Based Preliminary Remediation Goals), EPA 540/R-92/003, December 1991) with site specific areas to be disturbed by construction, and site-specific average wind speed. The box model relies on the assumption that the concentration of a contaminant in air above an area source (in the 'box' volume) is proportional to the emission rate and the wind speed across the source area.

Concentrations in air from emissions from an area source (such as surface flux emissions) are expected to be highest at the source and decrease with increasing distance from the source. EPA has recommended the use of a "box" model for calculating concentrations in air over an area source (EPA 1986, 1991b). In the "box" model, the concentration in air within a defined box is proportional to the emission rate and the wind speed across the source area.

Surface area was calculated using an estimate of the total site area shown to have site improvements in the proposed site plan. The following shows the equation used to calculate the "box" model concentrations.

$$C_a = \frac{Q \; x \; A \; x \; 1{,}000 \; mg/g}{L \; x \; V \; x \; H}$$

The parameters for this equation are presented in Table 1.

795 842

Table 1 Parameters for Estimating TSP Concentrations in Air			
Parameter	Description	Units	Value
Ca	Concentration in air	(mg/m^3)	Box Model Result
Q	Surface emissions flux	(g/m^2-s)	0.000174 g/m^2-s
A	Surface area of the source area	(m^2)	3567
H	Box height	m	1 5
V	Average windspeed in the box	(m/s)	3.05
L	Width of source area perpendicular to wind direction	m	73.15

The resulting concentration, using the box model with the data in Table 1, is 1.85 mg/m^3. This concentration, representing an on-site breathing zone (1.5 meter box height) concentration, is based on a total suspended particulate emission factor. To convert the concentration to respirable particulate matter (particles with aerodynamic diameters of 10 microns or less, PM_{10}), a percentage of the TSP made up of PM_{10} was located for coal mining overburden removal (75 %) in AP-42, page 11.9-4. The respirable particulate concentration for construction activities at site SS009 is conservatively estimated at .39 mg PM_{10}/m3. Typical dust control activities during construction (ie. spraying of water on disturbed soil areas) would result in a reduction of the expected particulate concentration by approximately 50% to a value of 0.7 mg PM_{10}/m^3.

795 843

Attachment 2

Risk Calculations

Soil - Long-term Rail Car Worker Scenario
Kelly AFB Site SS009 BRA Report, 1997

Ingestion:

$$CDI = \frac{Cs * IR * FI * EF * ED * CF}{BW * AT}$$

		Carcinogenic	Noncarcinogenic
Cs =	Concentration in soil (mg/kg)	RME	RME
IR =	Ingestion Rate (mg/day)	50 a	50 a
FI =	Fraction Ingested (unitless)	100%	100%
EF =	Exposure Frequency (day/year)	125 b	125 b
ED =	Exposure Duration (year)	25 a	25 a
CF =	Conversion Factor (kg/mg)	1 00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	9125

Dermal:

$$CDI = \frac{Cs * SA * AF * ABS * EF * ED * CF}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
SA =	Surface Area (cm^2)	2400 c	2400 c
AF =	Soil-Skin Adherence Factor (mg/cm^2)	0 12 d	0 12 d
ABS =	Absorption Factor (unitless)	(Chemical Specific) e	(Chemical Specific) e
EF =	Exposure Frequency (day/year)	125 a	125 a
ED =	Exposure Duration (year)	25 a	25 a
CF =	Conversion Factor (kg/mg)	1.00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	9125

Inhalation:

$$CDI = \frac{Cs * (1/PEF) * IR * EF * ED}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
PEF =	Particulate Emission Factor (m^3/kg)	4 63E+09 f	4 63E+09 f
IR =	Inhalation Rate (m^3/day)	20 a	20 a
EF =	Exposure Frequency (day/year)	125 b	125 b
ED =	Exposure Duration (year)	25 a	25 a
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	9125

References:

a = U S. EPA, Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors" OSWER Directive 9285 6-03, March 25, 1991

b = the default inductnal exposure frequency of 250 days/yr was modified by 50% to account for limited contact with soils (125 working days per year).

c=includes skin surface area of hands and forearms (50th percentile, males) from Exposure Factors Handbook, U S EPA Office of Research and Development, Washington DC, EPA/600/P-95/002A. June 1995. Review Draft

d = Dermal Soil-to-Skin Adherence Factor (AF) value used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Appendix II, Section II.2.3 3 Commercial/Industrial (Construction Worker), (page269).

e = Dermal Absorption Fraction (ABS) values used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Table II-3 (page 245)

f = Particulate emission factor for all receptors obtained from Title 31 of the Texas Administrative Code (31 TAC) Subchapter S (Risk Reduction Standards), §335.567 Appendix I (Derivation of Reduced Equations for Calculation of Medium Specific Concentrations of Risk Reduction Standard Number 2, February 11, 1994 (The Bureau of National Affairs, Inc , Washington, D C)

Soil - Long-term Rail Car Worker Carcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	SFo	SFI	RME	ABS	CDI	ELCR	CDI	ELCR	CDI	ELCR
MG/KG	ALUMINUM				3 27E+04		2 86E-03				2 47E-07	
MG/KG	ANTIMONY	D			5 30E+01	0 01	4 63E-06		2 67E-07		4 00E-10	
MG/KG	ARSENIC	A	1 50E+00	1 51E+01	7 59E+00	0 05	5 17E-07	7 76E-07	1 49E-07	2 23E-07	4 47E-11	6 75E-10
MG/KG	BARIUM	D			9 14E+01	0 01	7 98E-06		4 60E-07		6 90E-10	
MG/KG	BERYLLIUM	B2	4 30E+00	8 40E+00	6 30E-01	0 01	5 50E-08	2 37E-07	3 17E-09	1 36E-08	4 76E-12	3 99E-11
MG/KG	CADMIUM	B1		6 30E+00	1 79E+01	0 01	1 57E-06		9 02E-08		1 35E-10	8 52E-10
MG/KG	CHROMIUM, TOTAL	D		4 20E+01	3 69E+01	0 01	3 22E-06		1 86E-07		2 79E-10	1 17E-08
MG/KG	LEAD	B2			1 72E+02	0 01	1 50E-05		8 66E-07		1 30E-09	
MG/KG	MANGANESE	D			5 53E+02	0 01	4 83E-05		2 78E-06		4 17E-09	
MG/KG	SELENIUM	D			1 50E-01	0 01	1 31E-08		7 55E-10		1 13E-12	
MG/KG	SILVER	D			1 60E+00	0 01	1 40E-07		8 05E-09		1 21E-11	
MG/KG	VANADIUM	NA			4 40E+01	0 03	3 84E-06		6 64E-07		3 32E-10	
MG/KG	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	B2	1 50E+03	1 16E+03	2 82E-04	0 03	2 47E-11	3 70E-08	4 26E-12	6 39E-09	2 13E-15	2 46E-12
MG/KG	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	B2	1 50E+03	1 16E+03	1 67E-05	0 03	1 46E-12	2 19E-09	2 52E-13	3 78E-10	1 26E-16	1 46E-13
MG/KG	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	B2	1 50E+03	1 16E+03	2 30E-05	0 03	2 01E-12	3 01E-09	3 47E-13	5 21E-10	1 74E-16	2 01E-13
MG/KG	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	B2	1 50E+04	1 16E+04	3 00E-05	0 03	2 62E-12	3 93E-08	4 53E-13	6 79E-09	2 26E-16	2 62E-12
MG/KG	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	7 00E-05	0 03	6 12E-12	9 17E-08	1 06E-12	1 59E-08	5 28E-16	6 10E-12
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	B2	1 50E+04	1 16E+04	5 00E-05	0 03	4 37E-12	6 55E-08	7 55E-13	1 13E-08	3 77E-16	4 36E-12
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	2 69E-05	0 03	2 35E-12	3 53E-08	4 06E-13	6 09E-09	2 03E-16	2 35E-12
MG/KG	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	B2	1 50E+04	1 16E+04	8 00E-05	0 03	6 99E-12	1 05E-07	1 21E-12	1 81E-08	6 04E-16	6 97E-12
MG/KG	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	1 00E-05	0 03	6 81E-13	1 02E-08	1 18E-13	1 77E-09	5 89E-17	6 80E-13
MG/KG	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	B2	7 50E+04	5 78E+04	2 60E-05	0 03	2 27E-12	1 70E-07	3 93E-13	2 94E-08	1 96E-16	1 13E-11
MG/KG	1,2,3,7,8-PENTACHLORODIBENZOFURAN	B2	7 50E+03	5 78E+03	4 10E-04	0 03	3 58E-11	2 69E-07	6 19E-12	4 64E-08	3 09E-15	1 79E-11
MG/KG	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	6 45E-05	0 03	5 63E-12	8 45E-08	9 74E-13	1 46E-08	4 87E-16	5 62E-12
MG/KG	2,3,4,7,8-PENTACHLORODIBENZOFURAN	B2	7 50E+04	5 78E+04	1 80E-05	0 03	1 57E-12	1 18E-07	2 72E-13	2 04E-08	1 36E-16	7 85E-12
MG/KG	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	B3	1 50E+05	1 16E+05	6 00E-06	0 03	5 24E-13	7 86E-08	9 06E-14	1 36E-08	4 53E-17	5 23E-12
MG/KG	2,3,7,8-TETRACHLORODIBENZOFURAN	B4	1 50E+04	1 16E+04	1 00E-05	0 03	8 74E-13	1 31E-08	1 51E-13	2 26E-09	7 55E-17	8 72E-13
MG/KG	OCTACHLORODIBENZO-p-DIOXIN	B5	1 50E+02	1 16E+02	2 37E-02	0 03	2 07E-09	3 11E-07	3 58E-10	5 37E-08	1 79E-13	2 07E-11
MG/KG	OCTACHLORODIBENZOFURAN	B6	1 50E+02	1 16E+02	2 36E-05	0 03	2 06E-12	3 09E-10	3 56E-13	5 34E-11	1 78E-16	2 06E-14
	Total Risk							2 45E-06		4 86E-07		1 34E-08

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration, ELCR = Excess Lifetime Cancer Exposure

Soil - Long-term Rail Car Worker NonCarcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	RfDo	RfDi	RME	ABS	CDI	HQ	CDI	HQ	CDI	HQ
MG/KG	ALUMINUM		1 00E+00		3 27E+04		8 00E-03	8 00E-03			6 91E-07	
MG/KG	ANTIMONY	D	4 00E-04		5 30E+01	0 01	1 30E-05	3 24E-02	7 47E-07	1 87E-03	1 12E-09	
MG/KG	ARSENIC	A	3 00E-04		7 59E+00	0 05	1 45E-06	4 83E-03	4 17E-07	1 39E-03	1 25E-10	
MG/KG	BARIUM	D	7 00E-02	1 43E-04	9 14E+01	0 01	2 24E-05	3 19E-04	1 29E-06	1 84E-05	1 93E-09	1 35E-05
MG/KG	BERYLLIUM	B2	5 00E-03		6 30E-01	0 01	1 54E-07	3 08E-05	8 88E-09	1 78E-06	1 33E-11	
MG/KG	CADMIUM	B1	1 00E-03	5 70E-05	1 79E+01	0 01	4 38E-06	4 38E-03	2 52E-07	2 52E-04	3 79E-10	6 64E-06
MG/KG	CHROMIUM, TOTAL	D	5 00E-03		3 69E+01	0 01	9 03E-06	1 81E-03	5 20E-07	1 04E-04	7 80E-10	
MG/KG	LEAD	B2			1 72E+02	0 01	4 21E-05		2 42E-06		3 63E-09	
MG/KG	MANGANESE	D	5 00E-02	1 43E-05	5 53E+02	0 01	1 35E-04	2 71E-03	7 79E-06	1 56E-04	1 17E-08	8 18E-04
MG/KG	SELENIUM	D	5 00E-03		1 50E-01	0 01	3 67E-08	7 34E-06	2 11E-09	4 23E-07	3 17E-12	
MG/KG	SILVER	D	5 00E-03		1 60E+00	0 01	3 91E-07	7 83E-05	2 25E-08	4 51E-06	3 38E-11	
MG/KG	VANADIUM	NA	7 00E-03		4 40E+01	0 03	1 08E-05	1 54E-03	1 86E-06	2 66E-04	9 30E-10	
MG/KG	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	B2			2 82E-04	0 03	6 90E-11		1 19E-11		5 96E-15	
MG/KG	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	B2			1 67E-05	0 03	4 09E-12		7 06E-13		3 53E-16	
MG/KG	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	B2			2 30E-05	0 03	5 63E-12		9 72E-13		4 86E-16	
MG/KG	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	B2			3 00E-05	0 03	7 34E-12		1 27E-12		6 34E-16	
MG/KG	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	B2			7 00E-05	0 03	1 71E-11		2 96E-12		1 48E-15	
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	B2			5 00E-05	0 03	1 22E-11		2 11E-12		1 06E-15	
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	B2			2 69E-05	0 03	6 58E-12		1 14E-12		5 68E-16	
MG/KG	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	B2			8 00E-05	0 03	1 96E-11		3 38E-12		1 69E-15	
MG/KG	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	B2			1 00E-05	0 03	2 45E-12		4 23E-13		2 11E-16	
MG/KG	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	B2			2 60E-05	0 03	6 36E-12		1 10E-12		5 49E-16	
MG/KG	1,2,3,7,8-PENTACHLORODIBENZOFURAN	B2			4 10E-04	0 03	1 00E-10		1 73E-11		8 66E-15	
MG/KG	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	B2			6 45E-05	0 03	1 58E-11		2 73E-12		1 36E-15	
MG/KG	2,3,4,7,8-PENTACHLORODIBENZOFURAN	B2			1 80E-05	0 03	4 40E-12		7 61E-13		3 80E-16	
MG/KG	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	B3			6 00E-06	0 03	1 47E-12		2 54E-13		1 27E-16	
MG/KG	2,3,7,8-TETRACHLORODIBENZOFURAN	B4			1 00E-05	0 03	2 45E-12		4 23E-13		2 11E-16	
MG/KG	OCTACHLORODIBENZO-p-DIOXIN	B5			2 37E-02	0 03	5 80E-09		1 00E-09		5 01E-13	
MG/KG	OCTACHLORODIBENZOFURAN	B6			2 36E-05	0 03	5 77E-12		9 98E-13		4 99E-16	
	Hazard Index							0 056		0 004		0 0008

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration, HQ = Hazard Quotient, HI = Hazard Index

Soil - Short-term Construction (Track Installation) Worker Scenario
Kelly AFB Site SS009 BRA Report, 1997

Ingestion:

$$CDI = \frac{Cs * IR * FI * EF * ED * CF}{BW * AT}$$

		Carcinogenic	Noncarcinogenic
Cs =	Concentration in soil (mg/kg)	RME	RME
IR =	Ingestion Rate (mg/day)	100 a	100 a
FI =	Fraction Ingested (unitless)	100%	100%
EF =	Exposure Frequency (day/year)	120 b	120 b
ED =	Exposure Duration (year)	0 5 b	0.5 b
CF =	Conversion Factor (kg/mg)	1.00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	182.5

Dermal:

$$CDI = \frac{Cs * SA * AF * ABS * EF * ED * CF}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
SA =	Surface Area (cm)	3600 c	3600 c
AF =	Soil-Skin Adherence Factor (mg/cm^2)	0 12 d	0 12 d
ABS =	Absorption Factor (unitless)	(Chemical Specific) e	(Chemical Specific) e
EF =	Exposure Frequency (day/year)	120 b	120 b
ED =	Exposure Duration (year)	0 5 b	0 5 b
CF =	Conversion Factor (kg/mg)	1.00E-06	1.00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	182.5

Inhalation:

$$CDI = \frac{Cs * (PCa*CF) * IR * EF * ED}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
CF=	Converstion factor (1x10-6)		
IR =	Inhalation Rate (m3/day)	20 a	20 a
EF =	Exposure Frequency (day/year)	1040 b	1040 b
ED =	Exposure Duration (year)	0 5 b	0 5 b
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	182 5
PCa=	Particulate Concentration in Air (mg/m3)	0 7 f	0 7 f

References:

a = U S EPA, Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors" OSWER Directive 9285.6-03, March 25, 1991

b = the average duration of this construction project is approximately 26 weeks (60 working days, 0 5 years [1040 hours]).

c=includes skin surface area of forearms (50th percentile, males) from Exposure Factors Handbook, U.S. EPA. Office of Research and Development, Washington DC, EPA/600/P-95/002A June 1995. Review Draft.

d = Dermal Soil-to-Skin Adherence Factor (AF) value used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Appendix II, Section II.2.3 3 Commercial/Industrial (Construction Worker), (page269)

e = Dermal Absorption Fraction (ABS) values used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14 1996, Table II-3 (page 245).

f = Particulate concentration calculated using site-specific parameters, see Attachment 1

Soil - Short-term Construction (Track Installation) Worker Carcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	SFo	SFi	RME	ABS	CDI	ELCR	CDI	ELCR	CDI	ELCR
MG/KG	ALUMINUM				3 27E+04	0 01	1 10E-04		4 74E-06		1 60E-05	
MG/KG	ANTIMONY	D			1 32E+01	0 01	4 41E-08		1.91E-09		6 44E-09	
MG/KG	ARSENIC	A	1 50E+00	1 51E+01	7 15E+00	0 05	1 87E-08	2 81E-08	4 04E-09	6.06E-09	3 50E-09	5 28E-08
MG/KG	BARIUM	D			7 24E+01	0 01	2 43E-07		1 05E-08		3 54E-08	
MG/KG	BERYLLIUM	B2	4 30E+00	8 40E+00	4 04E-01	0 01	1 35E-09	5 82E-09	5 85E-11	2 51E-10	1.97E-10	1.66E-09
MG/KG	CADMIUM	B1		6 30E+00	8 33E+00	0 01	2 79E-08		1 21E-09		4 07E-09	2 57E-08
MG/KG	CHROMIUM, TOTAL	D		4 20E+01	3 94E+01	0 01	1 32E-07		5 71E-09		1 93E-08	8 09E-07
MG/KG	LEAD	B2			1 72E+02	0 01	5 79E-07		2 50E-08		8 44E-08	
MG/KG	MANGANESE	D			8 24E+02	0 01	2 76E-06		1 19E-07		4 03E-07	
MG/KG	SILVER	D			1 60E+00	0 01	5 37E-09		2 32E-10		7 83E-10	
MG/KG	VANADIUM	NA			6 55E+01	0 01	2 20E-07		9 49E-09		3 20E-08	
MG/KG	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	B2	1 50E+03	1.16E+03	3 14E-04	0 03	1 05E-12	1 58E-09	1 36E-13	2 05E-10	1 54E-13	1 77E-10
MG/KG	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	B2	1 50E+03	1 16E+03	9 29E-05	0 03	3.12E-13	4 67E-10	4 04E-14	6.06E-11	4 54E-14	5 25E-11
MG/KG	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	B2	1.50E+03	1 16E+03	1.00E-05	0 03	3 35E-14	5 03E-11	4 35E-15	6 52E-12	4 89E-15	5 65E-12
MG/KG	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	2 18E-05	0 03	7.31E-14	1 10E-09	9 48E-15	1 42E-10	1 06E-14	1 23E-10
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	B2	1 50E+04	1 16E+04	2 00E-05	0 03	6 71E-14	1 01E-09	8 70E-15	1.30E-10	9.78E-15	1 13E-10
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	2 69E-05	0 03	9.02E-14	1 35E-09	1 17E-14	1 75E-10	1 32E-14	1 52E-10
MG/KG	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	B2	1 50E+04	1.16E+04	2 34E-05	0 03	7 85E-14	1 18E-09	1 02E-14	1 53E-10	1.14E-14	1 32E-10
MG/KG	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	1 00E-05	0 03	2 62E-14	3 93E-10	3.39E-15	5 09E-11	4 89E-15	5 65E-11
MG/KG	1,2,3,7,8-PENTACHLORODIBENZOFURAN	B2	7.50E+03	5.78E+03	4.10E-04	0 03	1 38E-12	1 03E-08	1 78E-13	1.34E-09	2.01E-13	1 16E-09
MG/KG	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	B2	1 50E+04	1.16E+04	1 35E-06	0 03	4 53E-15	6 79E-11	5 87E-16	8 80E-12	6 60E-16	7 63E-12
MG/KG	2,3,4,7,8-PENTACHLORODIBENZOFURAN	B2	7 50E+04	5 78E+04	1 07E-05	0 03	3 59E-14	2 69E-09	4 65E-15	3 49E-10	5 23E-15	3 02E-10
MG/KG	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	B2	1 50E+05	1.16E+05	4 00E-06	0 03	1 34E-14	2 01E-09	1 74E-15	2 61E-10	1 96E-15	2 26E-10
MG/KG	2,3,7,8-TETRACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	8 00E-06	0 03	2 68E-14	4 03E-10	3 48E-15	5.22E-11	3 91E-15	4 52E-11
MG/KG	OCTACHLORODIBENZO-p-DIOXIN	B2	1 50E+02	1 16E+02	2.58E-03	0 03	8 64E-12	1 30E-09	1 12E-12	1.68E-10	1 26E-12	1 46E-10
MG/KG	OCTACHLORODIBENZOFURAN	B2	1 50E+02	1 16E+02	1 71E-04	0 03	5 74E-13	8 60E-11	7 43E-14	1.12E-11	8 37E-14	9 66E-12
	Total Risk							5 79E-08		9.42E-09		8 92E-07

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration; ELCR = Excess Lifetime Cancer Exposure

795 848

Soil - Short-term Construction (Track Installation) Worker NonCarcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	RfDo	RfDi	RME	ABS	CDI	HQ	CDI	HQ	CDI	HQ
MG/KG	ALUMINUM		1 00E+00		3 27E+04	0 01	1 54E-02	1 54E-02	6 63E-04	6 63E-04	4 45E-03	
MG/KG	ANTIMONY	D	4 00E-04		1 32E+01	0 01	6 18E-06	1 54E-02	2 67E-07	6 67E-04	1 79E-06	
MG/KG	ARSENIC	A	3 00E-04		7 15E+00	0 05	2 62E-06	8 73E-03	5 66E-07	1 89E-03	9 72E-07	
MG/KG	BARIUM	D	7 00E-02	1 43E-04	7 24E+01	0 01	3 40E-05	4 86E-04	1 47E-06	2.10E-05	9 85E-06	6 89E-02
MG/KG	BERYLLIUM	B2	5 00E-03		4 04E-01	0 01	1 90E-07	3 79E-05	8 19E-09	1 64E-06	5 49E-08	
MG/KG	CADMIUM	B1	1 00E-03	5 70E-05	8 33E+00	0 01	3 91E-06	3 91E-03	1 69E-07	1 69E-04	1 13E-06	1 99E-02
MG/KG	CHROMIUM, TOTAL	D	3 00E-03		3 04E+01	0 01	1 43E-05	4 76E-03	7 00E-07	2 33E-04	5 36E-06	
MG/KG	LEAD	B2			1 72E+02	0 01	8 10E-05		3 50E-06		2 35E-05	
MG/KG	MANGANESE	D	5 00E-02	1 43E-05	8 24E+02	0 01	3 87E-04	7 74E-03	1 67E-05	3 34E-04	1 12E-04	7 84E+00
MG/KG	SILVER	D	5 00E-03		1 60E+00	0 01	7 51E-07	1 50E-04	3 25E-08	6 49E-06	2 18E-07	
MG/KG	VANADIUM	NA	7 00E-03		6 55E+01	0 01	3 08E-05	4 39E-03	1 33E-06	1 90E-04	8 91E-06	
MG/KG	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	B2			3 14E-04	0 03	1 47E-10		1 91E-11		4 27E-11	
MG/KG	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	B2			9 29E-05	0 03	4 36E-11		5 65E-12		1 26E-11	
MG/KG	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	B2			1 00E-05	0 03	4 70E-12		6 09E-13		1 36E-12	
MG/KG	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	B2			2 18E-05	0 03	1 02E-11		1 33E-12		2 96E-12	
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	B2			2 00E-05	0 03	9 39E-12		1 22E-12		2 72E-12	
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	B2			2 69E-05	0 03	1 26E-11		1 64E-12		3 66E-12	
MG/KG	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	B2			2 34E-05	0 03	1 10E-11		1 42E-12		3 18E-12	
MG/KG	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	B2			1 00E-05	0 03	3 66E-12		4 75E-13		1 36E-12	
MG/KG	1,2,3,7,8-PENTACHLORODIBENZOFURAN	B2			4 10E-04	0 03	1 93E-10		2 50E-11		5 58E-11	
MG/KG	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	B2			1 35E-06	0 03	6 34E-13		8 22E-14		1 84E-13	
MG/KG	2,3,4,7,8-PENTACHLORODIBENZOFURAN	B2			1 07E-05	0 03	5 03E-12		6 51E-13		1 46E-12	
MG/KG	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	B2			4 00E-06	0 03	1 88E-12		2 43E-13		5 44E-13	
MG/KG	2,3,7,8-TETRACHLORODIBENZOFURAN	B2			8 00E-06	0 03	3 76E-12		4 87E-13		1 09E-12	
MG/KG	OCTACHLORODIBENZO-p-DIOXIN	B2			2 58E-03	0 03	1 21E-09		1 57E-10		3 50E-10	
MG/KG	OCTACHLORODIBENZOFURAN	B2			1 71E-04	0 03	8 03E-11		1 04E-11		2 33E-11	
	Hazard Index							0 0600		0 0041		7 934

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration, HQ = Hazard Quotient, HI = Hazard Index

795 849

Soil - Short-term Construction (Excavation) Worker Scenario
Kelly AFB Site SS009 BRA Report, 1997

Ingestion:

$$CDI = \frac{Cs * IR * FI * EF * ED * CF}{BW * AT}$$

		Carcinogenic	Noncarcinogenic
Cs =	Concentration in soil (mg/kg)	RME	RME
IR =	Ingestion Rate (mg/day)	480 a	480 a
FI =	Fraction Ingested (unitless)	100%	100%
EF =	Exposure Frequency (day/year)	40 b	40 b
ED =	Exposure Duration (year)	0 167 b	0 167 b
CF =	Conversion Factor (kg/mg)	1.00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	60 8

Dermal:

$$CDI = \frac{Cs * SA * AF * ABS * EF * ED * CF}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
SA =	Surface Area (cm^2)	3600 c	3600 c
AF =	Soil-Skin Adherence Factor (mg/cm^2)	0 12 d	0 12 d
ABS =	Absorption Factor (unitless)	(Chemical Specific) e	(Chemical Specific) e
EF =	Exposure Frequency (day/year)	40 b	40 b
ED =	Exposure Duration (year)	0 167 b	0 167 b
CF =	Conversion Factor (kg/mg)	1 00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	60 8

Inhalation:

$$CDI = \frac{Cs * (PCa * CF) * IR * EF * ED}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
CF=	Conversion factor (1x 10-6)		
IR =	Inhalation Rate (m3/day)	20 a	20 a
EF =	Exposure Frequency (hours/year)	320 b	320 b
ED =	Exposure Duration (year)	0 167 b	0 167 b
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	60 8
PCa=	Particulate Concentration in Air (mg/m3)	0 7 f	0 7 f

References:

a = U S EPA, Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors" OSWER Directive 9285.6-03, March 25, 1991.

b = the average duration of this construction project is approximately 8 weeks (40 working days, 0 167 years)

c=includes skin surface area of forearms, head and hands (50th percentile for each body part, adult males) from Exposure Factors Handbook, U S. EPA, Office of Research and Development, Washington DC, EPA/600/P-95/002A June 1995. Review Draft.

d = Dermal Soil-to-Skin Adherence Factor (AF) value used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Appendix II, Section II.2.3 3 Commercial/Industrial (Construction Worker), (page269)

e = Dermal Absorption Fraction (ABS) values used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Table II-3 (page 245)

f = Particulate concentration calcualted using site-specific parameters, see Attachment 1

Soil - Short-term Construction (Excavation) Worker Carcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	SFo	SFi	RME	ABS	CDI	ELCR	CDI	ELCR	CDI	ELCR
MG/KG	ALUMINUM				2 92E+04		5 22E-05				1 53E-06	
MG/KG	ANTIMONY	D			2 10E+00	0 01	3 76E-09		3 38E-11		1 10E-10	
MG/KG	ARSENIC	A	1 50E+00	1 51E+01	2 22E+01	0 01	3 10E-08	4 65E-08	2.79E-10	4 18E-10	1.16E-09	1.75E-08
MG/KG	BARIUM	D			8 37E+01	0 01	1.50E-07		1 35E-09		4.38E-09	
MG/KG	BERYLLIUM	B2	4 30E+00	8.40E+00	9 30E+00	0 01	1.66E-08	7.16E-08	1 50E-10	6 44E-10	4.86E-10	4 08E-09
MG/KG	CADMIUM	B1		6 30E+00	4 90E+00	0 01	8 77E-09		7 89E-11		2.56E-10	1 61E-09
MG/KG	CHROMIUM, TOTAL	D		4 20E+01	1 41E+02	0 05	2 52E-07		1 14E-08		7.37E-09	3 10E-07
MG/KG	LEAD	B2			4 01E+02	0 01	7.17E-07		6.46E-09		2 10E-08	
MG/KG	MANGANESE	D			3.23E+02	0 01	4.51E-07		4.06E-09		1.69E-08	
MG/KG	VANADIUM	NA			2 70E+01	0 01	4 83E-08		4 35E-10		1.41E-09	
MG/KG	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	B2	1.50E+04	1 16E+04	1 00E-05	0.03	1 79E-14	2 68E-10	4 83E-16	7 25E-12	5.23E-16	6.04E-12
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	2 00E-06	0 03	3 58E-15	5.37E-11	9 66E-17	1.45E-12	1.05E-16	1.21E-12
MG/KG	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	B2	1 50E+05	1 16E+05	3 00E-06	0 03	5 37E-15	8 05E-10	1 45E-16	2 17E-11	1.57E-16	1 81E-11
MG/KG	2,3,7,8-TETRACHLORODIBENZOFURAN	B2	1 50E+04	1 16E+04	1 00E-06	0 03	1 79E-15	2 68E-11	4 83E-17	7 25E-13	5.23E-17	6 04E-13
	Total Risk							1.19E-07		1.09E-09		3 33E-07

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration, ELCR = Excess Lifetime Cancer Exposure

Soil - Short-term Construction (Excavation) Worker NonCarcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	RfDo	RfDi	RME	ABS	CDI	HQ	CDI	HQ	CDI	HQ
MG/KG	ALUMINUM		1 00E+00		2 92E+04		2 19E-02	2 19E-02			6 40E-05	
MG/KG	ANTIMONY	D	4.00E-04		2.10E+00	0 01	1 58E-06	3 95E-03	1 42E-08	3 55E-05	4.60E-08	
MG/KG	ARSENIC	A	3 00E-04		2 22E+01	0 01	1 30E-05	4 34E-02	1 17E-07	3 90E-04	4 87E-07	
MG/KG	BARIUM	D	7 00E-02	1 43E-04	8 37E+01	0 01	6 29E-05	8 99E-04	5.66E-07	8 09E-06	1 83E-06	1.28E-02
MG/KG	BERYLLIUM	B2	5 00E-03		9.30E+00	0 01	6 99E-06	1 40E-03	6 29E-08	1 26E-05	2 04E-07	
MG/KG	CADMIUM	B1	1 00E-03	5 70E-05	4 90E+00	0 01	3 68E-06	3 68E-03	3 31E-08	3 31E-05	1.07E-07	1 88E-03
MG/KG	CHROMIUM, TOTAL	D	5 00E-03		1.41E+02	0 05	1.06E-04	2 12E-02	4 77E-06	9 54E-04	3.09E-06	
MG/KG	LEAD	B2			4 01E+02	0 01	3 01E-04		2 71E-06		8 79E-06	
MG/KG	MANGANESE	D	5 00E-02	1 43E-05	3 23E+02	0 01	1 89E-04	3 79E-03	1 70E-06	3 41E-05	7 08E-06	4 96E-01
MG/KG	VANADIUM	NA	7 00E-03		2 70E+01	0 01	2 03E-05	2 90E-03	1 83E-07	2.61E-05	5 92E-07	
MG/KG	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	B2			1 00E-05	0 03	7 51E-12		2 03E-13		2 19E-13	
MG/KG	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	B2			2 00E-06	0 03	1 50E-12		4 06E-14		4.38E-14	
MG/KG	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	B2			3 00E-06	0 03	2 25E-12		6 09E-14		6 58E-14	
MG/KG	2,3,7,8-TETRACHLORODIBENZOFURAN	B2			1 00E-06	0 03	7 51E-13		2 03E-14		2.19E-14	
	Hazard Index							0 103		0 001		0 510

Notes: WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration, HQ = Hazard Quotient, HI = Hazard Index

795 853

Attachment 3

Backround Risk Calculations

795 854

795 855

ATTACHMENT 3

BACKGROUND SOIL RISK AT KELLY AFB SITE SS009

Introduction

In response to a request by U.S. EPA Region VI, background risk has been calculated for Site SS009. The intent of the background risk calculation is to identify the contribution of risk to human health from exposure to the identified background levels of metals.

The data used in this background risk assessment are the background metals concentrations established for Kelly AFB. The metals background values are 95percent upper tolerance limits [UTLs] (Halliburton NUS, 1994). In the population of background samples, 95 percent of the background concentrations are expected to fall below the UTL-95 value. Conversely, only 5 percent of the background concentrations are expected to be greater than the UTL95. For the BRA, the RMEs concentrations are often UCL95 values. These UCL95s are upper confidence limits on the mean value (the upper bound value of the mean). In normally or lognormally distributed data, the UTL95 will be significantly larger that the UCL95. For normally or lognormally distributed background populations, risk estimates using UTL95s as exposure point concentrations will be higher that risks estimated using UCL95s from the same population.

The background risk calculations were performed using the methodology presented in the BRA.

COPC Selection and Exposure Point Concentrations

In developing the Site SS009 BRA, metallic COPCs were selected by comparison of maximum detected concentrations in soils to established background values for Kelly AFB (Halliburton NUS, 1994). These comparisons were performed in Section 2.1.2 of the BRA.

For surface soil, the following metals had maximum concentrations that exceeded background values and were selected as COPCs: antimony, arsenic, barium, beryllium, cadmium, chromium, lead, manganese, silver, and vanadium. In the subsurface soil, the following metals had 95 UCLs that exceed background concentrations and were selected as COPCs: barium, beryllium, cadmium, cobalt, copper, lead, and thallium.

In order to calculate risk from background, the Kelly AFB background metal concentrations were used as exposure point concentrations for only those analytes selected as COPCs in the BRA. Table 1 presents a summary of the exposure point concentrations.

Table 1
Background Exposure Point Concentrations for Metals in Soils

Metal	Units	Background Concentration *
ANTIMONY	MG/KG	0.98

795 856

ARSENIC	MG/KG	8.5
BARIUM	MG/KG	210
BERYLLIUM	MG/KG	2
CADMIUM	MG/KG	0.43
CHROMIUM, TOTAL	MG/KG	43 6
COPPER	MG/KG	11 3
LEAD	MG/KG	23.6
MANGANESE	MG/KG	593
SILVER	MG/KG	0.25
THALLIUM	MG/KG	0.24
VANADIUM	MG/KG	64 8

Notes Metal concentrations in the Black Clay (Halliburton NUS, 1994).

Exposure Scenarios and Toxicity Factors

The exposure scenarios for the background risk calculations were those identified in Section 3.1 of the BRA and were the following:

- Long-Term Railcar Worker
- Short-term Construction (Excavation) Worker
- Short-term Construction (Track Installation) Worker

Toxicity data used in these risk calculations were presented in Section 4 of the BRA.

Background Risk Estimates

Table 2 provides a summary of the cumulative risks from exposure to the UTL95 background levels of metals in soils. Risk estimates by parameter, scenario and exposure route are presented in Attachment 3.

Table 2
Background Risk for Metals
IRP Site SS009 Closure Report

Exposure Receptors	Lifetime Excess Cancer Risks				Hazard Indices			
	Ingestion	Dermal Contact	Inhalation	Totals	Ingestion	Dermal Contact	Inhalation	Totals
Background Soil								
Short-term Construction (Excavation) Worker	8E-09	1E-09	3E-07	3E-07	0 055	0.003	0 942	1 00
Short-term Construction (Track Installation) Worker	7E-08	1E-08	1E-06	1E-06	0.165	0 00941	2 94	3 11
Long-term Railcar Worker	2E-06	4E-07	1E-08	2E-06	0 0832	0 0064	0 0025	0 0921

795 857

795 858

Soil Background - Long-term Rail Car Worker Scenario
Kelly AFB Site SS009 BRA Report, 1997

Ingestion:

$$CDI = \frac{Cs * IR * FI * EF * ED * CF}{BW * AT}$$

		Carcinogenic	Noncarcinogenic
Cs =	Concentration in soil (mg/kg)	RME	RME
IR =	Ingestion Rate (mg/day)	50 a	50 a
FI =	Fraction Ingested (unitless)	100%	100%
EF =	Exposure Frequency (day/year)	125 b	125 b
ED =	Exposure Duration (year)	25 a	25 a
CF =	Conversion Factor (kg/mg)	1 00E-06	1.00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	9125

Dermal:

$$CDI = \frac{Cs * SA * AF * ABS * EF * ED * CF}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
SA =	Surface Area (cm^2)	2400 c	2400 c
AF =	Soil-Skin Adherence Factor (mg/cm^2)	0 12	0 12
ABS =	Absorption Factor (unitless)	(Chemical Specific) d	(Chemical Specific) d
EF =	Exposure Frequency (day/year)	125 a	125 a
ED =	Exposure Duration (year)	25 a	25 a
CF =	Conversion Factor (kg/mg)	1 00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	9125

Inhalation:

$$CDI = \frac{Cs * (1/PEF) * IR * EF * ED}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
PEF =	Particulate Emission Factor (m^3/kg)	4.63E+09 e	4 63E+09 e
IR =	Inhalation Rate (m^3/day)	20 a	20 a
EF =	Exposure Frequency (day/year)	125 b	125 b
ED =	Exposure Duration (year)	25 a	25 a
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	9125

References:

a = U S. EPA, Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposur, (20m3/day)/8 hours Factors" OSWER Directive 9285 6-03, March 25, 1991.

b = the default inductnal exposure frequency of 250 days/yr was modified by 50% to account for limited contact with soils (125 working days per year).

c=includes skin surface area of hands and forearms (50th percentile, males) from Exposure Factors Handbook, U.S EPA Office of Research and Development, Washington DC, EPA/600/P-95/002A June 1995. Review Draft.

d = Dermal Soil-to-Skin Adherence Factor (AF) value used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Appendix II, Section II 2 3 3 Commercial/Industnal (Construction Worker), (page269).

e = Dermal Absorption Fraction (ABS) values used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Table II-3 (page 245)

f = Particulate emission factor for all receptors obtained from Title 31 of the Texas Administrative Code (31 TAC) Subchapter S (Risk Reduction Standards), §335 567 Appendix I (Denvation of Reduced Equations for Calculation of Medium Specific Concentrations of Risk Reduction Standard Number 2, February 11, 1994 (The Bureau of National Affairs, Inc , Washington, D C)

Soil Background - Long-term Rail Car Worker Carcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	SFo	SFi	RME	ABS	CDI	ELCR	CDI	ELCR	CDI	ELCR
MG/KG	ANTIMONY	D			9 80E-01	0 01	8 56E-08		4 93E-09		7 40E-12	
MG/KG	ARSENIC	A	1 50E+00	1 51E+01	8 50E+00	0 05	7 43E-07	1 11E-06	2 14E-07	3 21E-07	6 42E-11	9 69E-10
MG/KG	BARIUM	D			2 10E+02	0 01	1 43E-05		8 24E-07		1 24E-09	
MG/KG	BERYLLIUM	B2	4 30E+00	8 40E+00	2 00E+00	0 01	1 75E-07	7 51E-07	1 01E-08	4 33E-08	1 51E-11	1 27E-10
MG/KG	CADMIUM	B1		6 30E+00	4 30E-01	0 01	3 76E-08		2 16E-09		3 25E-12	2 04E-11
MG/KG	CHROMIUM, TOTAL	D		4 20E+01	4 36E+01	0 01	3 81E-06		2 19E-07		3 29E-10	1 38E-08
MG/KG	COPPER				1 13E+01	0 01	9 87E-07		5 69E-08		8 53E-11	
MG/KG	LEAD				2 36E+01	0 01	2 06E-06		1 19E-07		1 78E-10	
MG/KG	MANGANESE	D			5 93E+02	0 01	5 18E-05		2 98E-06		4 48E-09	
MG/KG	SILVER	D			2 50E-01	0 01	2 18E-08		1 26E-09		1 89E-12	
MG/KG	THALLIUM	NA			2 40E-01	0 01	2 10E-08		1 21E-09		1 81E-12	
MG/KG	VANADIUM	NA			6 48E+01	0 01	5 66E-06		3 26E-07		4 89E-10	
	Total Risk							1 87E-06		3 64E-07		1 49E-08

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration, ELCR = Excess Lifetime Cancer Exposure

795 859

Soil Background - Long-term Rail Car Worker NonCarcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	**Chemical**	**WOE**	**RfDo**	**RfDI**	**RME**	**ABS**	**CDI**	**HQ**	**CDI**	**HQ**	**CDI**	**HQ**
MG/KG	ANTIMONY	D	4.00E-04		9 80E-01	0.01	2 40E-07	5 99E-04	1 38E-08	3 45E-05	2 07E-11	
MG/KG	ARSENIC	A	3 00E-04		8 50E+00	0 05	2 08E-06	6 93E-03	5 99E-07	2 00E-03	1 80E-10	
MG/KG	BARIUM	D	7.00E-02	1.43E-04	2 10E+02	0 01	4 01E-05	5 72E-04	2 31E-06	3 30E-05	3 46E-09	2 42E-05
MG/KG	BERYLLIUM	B2	5 00E-03		2 00E+00	0 01	4 89E-07	9 78E-05	2 82E-08	5 64E-06	4 23E-11	
MG/KG	CADMIUM	B1	1 00E-03	5 71E-05	4 30E-01	0 01	1 05E-07	1 05E-04	6 06E-09	6 06E-06	9 09E-12	1 59E-07
MG/KG	CHROMIUM, TOTAL	D	1 00E+00	5 71E-07	4 36E+01	0 01	1 07E-05	1 07E-05	6 14E-07	6 14E-07	9 21E-10	1 61E-03
MG/KG	COPPER		4 00E-02		1 13E+01	0 01	2 76E-06	6 91E-05	1 59E-07	3 98E-06	2 39E-10	
MG/KG	LEAD		8.00E-05		2 36E+01	0 01	5 77E-06	7 22E-02	3 33E-07	4 16E-03	4 99E-10	
MG/KG	MANGANESE	D	4 20E-01	1 43E-05	5 93E+02	0 01	1 45E-04	3 45E-04	8 36E-06	1 99E-05	1 25E-08	8 77E-04
MG/KG	SILVER	D	5.00E-03		2 50E-01	0 01	6 12E-08	1 22E-05	3 52E-09	7 05E-07	5 28E-12	
MG/KG	THALLIUM	NA	7.00E-03		2 40E-01	0 01	5 87E-08	8.39E-06	3 38E-09	4 83E-07	5 07E-12	
MG/KG	VANADIUM	NA	7 00E-03		6 48E+01	0 01	1 59E-05	2 26E-03	9 13E-07	1 30E-04	1 37E-09	
	Hazard Index							0 083		0.006		0.003

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration, HQ = Hazard Quotient, HI = Hazard Index

795 860

795 861

Background Soil • Short-term Construction (Excavation) Worker Scenario
Kelly AFB Site SS009 BRA Report, 1997

Ingestion:

$$CDI = \frac{Cs * IR * FI * EF * ED * CF}{BW * AT}$$

		Carcinogenic	Noncarcinogenic
Cs =	Concentration in soil (mg/kg)	RME	RME
IR =	Ingestion Rate (mg/day)	100 a	100 a
FI =	Fraction Ingested (unitless)	100%	100%
EF =	Exposure Frequency (day/year)	40 b	40 b
ED =	Exposure Duration (year)	0 2 b	0 2 b
CF =	Conversion Factor (kg/mg)	1 00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	60 8

Dermal:

$$CDI = \frac{Cs * SA * AF * ABS * EF * ED * CF}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
SA =	Surface Area (cm^2)	3600 c	3600 c
AF =	Soil-Skin Adherence Factor (mg/cm^2)	0 12 d	0.12 d
ABS =	Absorption Factor (unitless)	(Chemical Specific) e	(Chemical Specific) e
EF =	Exposure Frequency (day/year)	40 b	40 b
ED =	Exposure Duration (year)	0 2 b	0 2 b
CF =	Conversion Factor (kg/mg)	1 00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	60 8

Inhalation:

$$CDI = \frac{Cs * (PCa*CF) * IR * EF * ED}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
CF=	Conversion Factor (1x10-6)		
IR =	Inhalation Rate (m^3/hr)	2 5 a	2 5 a
EF =	Exposure Frequency (hours/year)	320 b	320 b
ED =	Exposure Duration (year)	0 167 b	0 167 b
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	182 5
PCa=	Particulate Concentration in Air (mg/m^3)	0 7 f	0 7 f

References:

a = U.S EPA, Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors" OSWER Directive 9285 6-03, March 25, 1991

b = the average duration of this construction project is approximately 8 weeks (60 working days, 0 5 years)

c=includes skin surface area of forearms (50th percentile, males) from Exposure Factors Handbook, U S. EPA, Office of Research and Development, Washington DC, EPA/600/P-95/002A June 1995. Review Draft

d = Dermal Soil-to-Skin Adherence Factor (AF) value used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Appendix II, Section II.2 3 3 Commercial/Industrial (Construction Worker), (page269)

e = Dermal Absorption Fraction (ABS) values used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Table II-3 (page 245).

f = Particulate concentration was calculated using site-specific parameters, see Attachment 1

Background Soil - Short-term Construction (Track Installation) Worker Carcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	SFo	SFi	RME	ABS	CDI	ELCR	CDI	ELCR	CDI	ELCR
MG/KG	ANTIMONY	D			9 80E-01	0 01	3 65E-10		1 58E-11		1 53E-10	
MG/KG	ARSENIC	A	1 50E+00	1.51E+01	8 50E+00	0 05	3 17E-09	4 75E-09	6 84E-10	1 03E-09	1.33E-09	2 01E-08
MG/KG	BARIUM	D			2 10E+02	0 01	6 11E-08		2 64E-09		3 29E-08	
MG/KG	BERYLLIUM	B2	4 30E+00	8 40E+00	2 00E+00	0 01	7 46E-10	3 21E-09	3 22E-11	1 38E-10	3 13E-10	2 63E-09
MG/KG	CADMIUM	B1		6 30E+00	4 30E-01	0 01	1 60E-10		6 92E-12		6 73E-11	4 24E-10
MG/KG	CHROMIUM, TOTAL	D		4 20E+01	4 36E+01	0 01	1 63E-08		7 02E-10		6 83E-09	2 87E-07
MG/KG	COPPER				1 13E+01	0 01	4 21E-09		1 82E-10		1.77E-09	
MG/KG	LEAD				2 36E+01	0 01	8 80E-09		3 80E-10		3.69E-09	
MG/KG	MANGANESE	D			5 93E+02	0 01	2 21E-07		9 55E-09		9 28E-08	
MG/KG	SILVER	D			2 50E-01	0 01	9 32E-11		4 03E-12		3.91E-11	
MG/KG	THALLIUM	NA			2.40E-01	0 01	8 95E-11		3 86E-12		3 76E-11	
MG/KG	VANADIUM	NA			6 48E+01	0 01	2 42E-08		1 04E-09		1 01E-08	
	Total Risk							7 96E-09		1 17E-09		3.10E-07

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake; RME = Reasonable Maximum Exposure Concentration, ELCR = Excess Lifetime Cancer Exposure

Background Soil - Short-term Construction (Track Installation) Worker NonCarcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	RfDo	RfDi	RME	ABS	CDI	HQ	CDI	HQ	CDI	HQ
MG/KG	ANTIMONY	D	4 00E-04		9 80E-01	0 01	1 53E-07	3 84E-04	6 63E-09	1 66E-05	2 15E-08	
MG/KG	ARSENIC	A	3 00E-04		8 50E+00	0 05	1 33E-06	4 44E-03	2 87E-07	9 58E-04	1 86E-07	
MG/KG	BARIUM	D	7 00E-02	1 43E-04	2 10E+02	0 01	2 56E-05	3 66E-04	1 11E-06	1 58E-05	4 60E-06	3 22E-02
MG/KG	BERYLLIUM	B2	5 00E-03		2 00E+00	0 01	3 13E-07	6 26E-05	1 35E-08	2 71E-06	4 38E-08	
MG/KG	CADMIUM	B1	1 00E-03	5 71E-05	4 30E-01	0 01	6 73E-08	6 73E-05	2 91E-09	2 91E-06	9 42E-09	1 65E-04
MG/KG	CHROMIUM, TOTAL	D	1 00E+00		4 36E+01	0 01	6 83E-06	6 83E-06	2 95E-07	2 95E-07	9 56E-07	
MG/KG	COPPER		4 00E-02		1 13E+01	0 01	1 77E-06	4 42E-05	7 64E-08	1 91E-06	2 48E-07	
MG/KG	LEAD		8 00E-05		2 36E+01	0 01	3 69E-06	4 62E-02	1 60E-07	2 00E-03	5 17E-07	
MG/KG	MANGANESE	D	5 00E-02	1 43E-05	5 93E+02	0 01	9 28E-05	1 86E-03	4 01E-06	8 02E-05	1 30E-05	9 10E-01
MG/KG	SILVER	D	5 00E-03		2 50E-01	0 01	3 91E-08	7 83E-06	1 69E-09	3 38E-07	5 48E-09	
MG/KG	THALLIUM	NA	7 00E-03		2 40E-01	0 01	3 76E-08	5 37E-06	1 62E-09	2 32E-07	5 26E-09	
MG/KG	VANADIUM	NA	7 00E-03		6 48E+01	0 01	1 01E-05	1 45E-03	4 38E-07	6 26E-05	1 42E-06	
	Hazard Index							0 055		0 003		0 942

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration, HQ = Hazard Quotient, HI = Hazard Index

795 864

Background Soil - Short-term Construction (Track Installation) Worker Scenario
Kelly AFB Site SS009 BRA Report, 1997

Ingestion:

$$CDI = \frac{Cs * IR * FI * EF * ED * CF}{BW * AT}$$

		Carcinogenic	Noncarcinogenic
Cs =	Concentration in soil (mg/kg)	RME	RME
IR =	Ingestion Rate (mg/day)	100 a	100 a
FI =	Fraction Ingested (unitless)	100%	100%
EF =	Exposure Frequency (day/year)	120 b	120 b
ED =	Exposure Duration (year)	0 5 a	0 5 a
CF =	Conversion Factor (kg/mg)	1 00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	182 5

Dermal:

$$CDI = \frac{Cs * SA * AF * ABS * EF * ED * CF}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
SA =	Surface Area (cm^2)	3600 c	3600 c
AF =	Soil-Skin Adherence Factor (mg/cm^2)	0 12 d	0 12 d
ABS =	Absorption Factor (unitless)	(Chemical Specific) e	(Chemical Specific) e
EF =	Exposure Frequency (day/year)	120 b	120 b
ED =	Exposure Duration (year)	0 5 b	0 5 b
CF =	Conversion Factor (kg/mg)	1 00E-06	1 00E-06
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	182 5

Inhalation:

$$CDI = \frac{Cs * (PCa*CF) * IR * EF * ED}{BW * AT}$$

Cs =	Concentration in soil (mg/kg)	RME	RME
CF=	Converstion Factor (1x10-6)		
IR =	Inhalation Rate (m3/hr)	2 5 a	2 5 a
EF =	Exposure Frequency (hours/year)	1040 b	1040 b
ED =	Exposure Duration (year)	0 5 b	0 5 b
BW =	Body Weight (kg)	70 a	70 a
AT =	Averaging Time (days)	25550	182 5
PCa=	Particulate Concentration in Air (mg/m3)	0 7 f	0 7 f

References:

a = U S EPA, Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors" OSWER Directive 9285 6-03, March 25, 1991.

b = the average duration of this construction project is approximately 25 weeks (60 working days, 0 5 years [1040 hours]).

c=includes skin surface area of forearms (50th percentile, males) from Exposure Factors Handbook, U.S. EPA Office of Research and Development, Washington DC, EPA/600/P-95/002A June 1995 Review Draft.

d = Dermal Soil-to-Skin Adherence Factor (AF) value used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Appendix II, Section II.2 3 3 Commercial/Industrial (Construction Worker), (page269).

e = Dermal Absorption Fraction (ABS) values used from Texas Natural Resource Conservation Commission (TNRCC) Texas Risk Reduction Program, Draft Version for Comment, May 14, 1996, Table II-3 (page 245).

f= Particulate concentration calculated using site-specific parameters, see Attachment 1

Soil - Short-term Construction (Track Installation) Worker Carcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	SFo	SFI	RME	ABS	CDI	ELCR	CDI	ELCR	CDI	ELCR
MG/KG	ANTIMONY	D			9 80E-01	0 01	3 29E-09		1.42E-10		4 79E-10	
MG/KG	ARSENIC	A	1 50E+00	1.51E+01	8 50E+00	0 05	2 85E-08	4 28E-08	6 16E-09	9 24E-09	4 16E-09	6 28E-08
MG/KG	BARIUM	D			2 10E+02	0.01	5 50E-07		2.37E-08		1.03E-07	
MG/KG	BERYLLIUM	B2	4.30E+00	8.40E+00	2 00E+00	0 01	6 71E-09	2 89E-08	2 90E-10	1 25E-09	9 78E-10	8.22E-09
MG/KG	CADMIUM	B1		6.30E+00	4.30E-01	0 01	1 44E-09		6 23E-11		2 10E-10	1.33E-09
MG/KG	CHROMIUM, TOTAL	D		4 20E+01	4 36E+01	0 01	1 46E-07		6 32E-09		2 13E-08	8 96E-07
MG/KG	COPPER				1.13E+01	0 01	3 79E-08		1 64E-09		5 53E-09	
MG/KG	LEAD				2 36E+01	0 01	7 92E-08		3 42E-09		1 15E-08	
MG/KG	MANGANESE	D			5 93E+02	0 01	1 99E-06		8.59E-08		2 90E-07	
MG/KG	SILVER	D			2 50E-01	0 01	8 39E-10		3 62E-11		1.22E-10	
MG/KG	THALLIUM	NA			2 40E-01	0 01	8 05E-10		3 48E-11		1 17E-10	
MG/KG	VANADIUM	NA			6.48E+01	0 01	2 17E-07		9.39E-09		3.17E-08	
	Total Risk							7 16E-06		1 05E-06		9 66E-07

Notes WOE = Weight of Evidence, CDI = Chronic Daily Intake, RME = Reasonable Maximum Exposure Concentration, ELCR = Excess Lifetime Cancer Exposure

TRK_BK 8 45 AM

Soil - Short-term Construction (Track Installation) Worker NonCarcinogenic Scenario

Kelly AFB Site SS009 BRA Report, 1997

							Ingestion		Dermal		Inhalation	
Units	Chemical	WOE	RfDo	RfDi	RME	ABS	CDI	HQ	CDI	HQ	CDI	HQ
MG/KG	ANTIMONY	D	4 00E-04		9 80E-01	0 01	4 60E-07	1 15E-03	1 99E-08	4 97E-05	6 71E-08	
MG/KG	ARSENIC	A	3 00E-04		8 50E+00	0 05	3 99E-06	1 33E-02	8 62E-07	2 87E-03	5 82E-07	
MG/KG	BARIUM	D	7 00E-02	1 43E-04	2 10E+02	0 01	7 69E-05	1 10E-03	3 32E-06	4 75E-05	1 44E-05	1 01E-01
MG/KG	BERYLLIUM	B2	5 00E-03		2 00E+00	0 01	9 39E-07	1 88E-04	4 06E-08	8 12E-06	1 37E-07	
MG/KG	CADMIUM	B1	1 00E-03	5 71E-05	4 30E-01	0 01	2 02E-07	2 02E-04	8 72E-09	8 72E-06	2 95E-08	5 16E-04
MG/KG	CHROMIUM, TOTAL	D	1 00E+00		4 36E+01	0 01	2 05E-05	2 05E-05	8 85E-07	8 85E-07	2 99E-06	
MG/KG	COPPER		4.00E-02		1 13E+01	0 01	5 31E-06	1 33E-04	2 29E-07	5 73E-06	7 74E-07	
MG/KG	LEAD		8 00E-05		2 36E+01	0 01	1 11E-05	1 39E-01	4 79E-07	5 99E-03	1 62E-06	
MG/KG	MANGANESE	D	5 00E-02	1 43E-05	5 93E+02	0 01	2 79E-04	5 57E-03	1 20E-05	2 41E-04	4 06E-05	2 84E+00
MG/KG	SILVER	D	5 00E-03		2 50E-01	0 01	1 17E-07	2 35E-05	5 07E-09	1 01E-06	1 71E-08	
MG/KG	THALLIUM	NA	7.00E-03		2 40E-01	0 01	1 13E-07	1 61E-05	4 87E-09	6 96E-07	1 64E-08	
MG/KG	VANADIUM	NA	7.00E-03		6 48E+01	0 01	3 04E-05	4 35E-03	1 31E-06	1 88E-04	4 44E-06	
	Hazard Index							1 65E-01		9 41E-03		2 94E+00

Notes WOE = Weight of Evidence; CDI = Chronic Daily Intake; RME = Reasonable Maximum Exposure Concentration, HQ = Hazard Quotient, HI = Hazard Index

TAB

Appendix D

APPENDIX O

Deed Recordation

State of Texas
Bexar County

795 869

INDUSTRIAL SOLID WASTE
CERTIFICATION OF REMEDIATION

97- 0170580

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas natural Resource Conservation Commission pertaining to Industrial Solid Waste Management, this document is hereby filed in the Deed Records of Bexar County, Texas in compliance with the recordation requirements of said rules:

I

Kelly Air Force Base has performed a remediation of the land described herein. A description of the facility, is attached hereto as Exhibit A and is made part of this filing. A list of the known waste constituents, including known concentrations, which have been left in place is attached hereto as Table 1 and is made a part of this filing. Herbicide storage activities were identified as the onsite source of contamination. Only the arsenic, dioxin, and furan constituents are demonstrably associated with the herbicide storage activities. Other compounds are included to provide notification of their presence. The contamination remaining at the site meets Texas National Resource Conservation Commission Risk Reduction Standard No. 2. Further information concerning this matter may be found by an examination of company records, which are available for inspection upon request at the central office of the Texas Natural Resource Conservation Commission in Austin, Texas.

The Texas Natural Resource Conservation Commission derives its authority to review the remediation of this tract of land from the Texas Solid Waste Disposal Act §361.002, Texas Health and Safety Code, Chapter 361, which enables the Texas Natural Resource Conservation Commission to promulgate closure and remediation standards to safeguard the health, welfare, and physical property of the people of the State and to protect the environment by controlling the management of solid waste. In addition, pursuant to the Texas Waste Code, §5.012 and §5.013, Texas Water Code, Annotated, Chapter 5, the Texas Natural Resource Conservation Commission is given primary responsibility for implementing the laws of the State of Texas relating to water and shall adopt any rules necessary to carry out its powers and duties under the Texas Water Code. In accordance with this authority, the Texas Natural Resource Conservation Commission requires certain persons to provide certification and/or recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This deed certification is not a representation or warranty by the Texas Natural Resource Conservation Commission of the suitability of this land for any purpose, nor does it constitute any guarantee by the Texas Natural Resource Conservation Commission that the remediation standards specified in this certification have been met by Kelly Air Force Base.

II

BEING a 33.01-acre tract, more or less, lying in Lots 11 and 12, Range 1, District 6, City Tract Map of 1852, City of San Antonio, Bexar County, Texas, same being a portion of Artesian Gardens Subdivision as described in volume 105, page 269 and a portion of South San Antonio Subdivision, Seventh Filing, as described in volume 642, page 31 of the Plat Records of Bexar County, Texas, and lying within the limits of East Kelly Air Force Base and being also described by a drawing (96142-H1.DWG, dated November 25, 1996) attached as Exhibit B to and made part hereof and more particularly described as follows:

Book Volm Page
D 07277 0179

State of Texas
Bexar County

795 870

BEGINNING at a 1/2" iron rod set at the southwest corner of the herein described 33.01-acre tract, from which the southwest corner of East Kelly Air Force Base, same point also being the southwest corner of Lot 15, Block 5 of the aforementioned Artesian Gardens Subdivision bears S06°00'38"W a distance of 349.98 feet to the south line of East Kelly Air Force Base and the north line of Fay Avenue and along the north line of Fay Avenue N83°59'22"W a distance of 250.78 feet to a 5/8" iron rod found;

THENCE along the west line of the herein described 33.01-acre tract, N06°49'39"E a distance of 317.24 feet to a fence corner, N06°39'07"W a distance of 102.12 feet to a fence corner and N05°59'02"E a distance 850.02 feet to a 1/2" iron rod set at the northwest corner of the herein described 33.01-acre tract;

THENCE along the north line of the herein described 33.01-acre tract, S84°02'16'E a distance of 1136.18 feet to a 1/2" iron rod set, at the point of curvature of a curve to the right having a central angle of 90°17'13", a radius of 16.00 feet and a chord which bears S38°53'40"E a distance of 22.69 feet;

THENCE along said curve to the right an arc length of 25.22 feet to a 1/2" iron rod set in an east line of the herein described 33.01-acre tract;

THENCE along the east line of the herein described 33.01-acre tract, S06°14'57"W a distance of 712.32 feet to a 1/2" iron rod set, N85°11'30"W a distance of 18 09 feet to a fence corner and S06°21'46"W a distance of 537.12 feet to a 1/2" iron rod set at the south east corner of the herein described 33.01-acre tract;

THENCE along the south line of the herein described 33.01-acre tract, N84°05'26"W a distance of 1109.59 feet to the PLACE OF BEGINNING containing 33.01 acres of land.

The bearing basis for this survey is Grid North, Texas State Plane Coordinate System, South Central Zone, NAD 1927.

Contaminants deposited hereon have been remediated to meet non-residential soil criteria (i.e., industrial/commercial soil criteria), in accordance with a plan designed to meet the Texas Natural Resource Conservation Commission's requirements in 30 Texas Administrative Code, §335.555, which mandates that the remedy be designed to eliminate substantial present and future risk such that no post-closure care or engineering or institutional control measures are required to protect human health and the environment. Future land use is considered suitable for non-residential (i.e., industrial/commercial) purposes in accordance with risk reduction standards applicable at the time of this filing. Future land use is intended to be non-residential.

III

The owner of the site is the United States and its address is SA-ALC, Building 3794, Kelly Air Force Base, Texas 78241, where more specific information may be obtained from the Director of Environmental Management, the authorized representative of the principal executive officer of the site, the base commander.

Book Volm Page
D 07277 01980

795 871

State of Texas
Bexar County

EXECUTED this the 24th day of November, 1997.

Kelly Air Force Base
United States Air Force

Lawrence O. Bailey Jr.

LAWRENCE O. BAILEY, JR.
Director, Environmental Management

STATE OF TEXAS
BEXAR COUNTY

BEFORE ME, on this the 24th day of November, 1997, personally appeared Lawrence O Bailey, Jr, of Kelly Air Force Base and the United States Air Force, known to me to be the person and agent of said organization whose name is subscribed to the foregoing instrument, and he acknowledged to be that he executed the same for the purpose and in the capacity therein expressed.

GIVE UNDER MY HAND AND SEAL OF OFFICE, this the 24 day of November, 1997.

Notary Public in and for
the State of Texas
County of Bexar

Mary Helen Vasquez

My Commission Expires

13 March 2001.

CH2M Hill
613 NW Loop 410 #840
San Antonio TX 78216
Mary L. Quintero

Book Vol/m Page
D 07277 01981

Table 1
RISK REDUCTION STANDARD NO. 2 REMEDIATION
DEED RECORDATION CERTIFICATION
SITE SS009, KELLY AIR FORCE BASE

Compounds Remaining In Soil at Concentrations Above Background	Maximum Total Concentration	Maximum SPLP Concentration	
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	3100 PG/G	25 U	PG/L
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	570 PG/G	25 U	PG/L
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	23 PG/G	25 U	PG/L
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	30 PG/G	25 U	PG/L
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70 PG/G	25 U	PG/L
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	50 PG/G	25 U	PG/L
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	26.9 PG/G	25 U	PG/L
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	80 PG/G	25 U	PG/L
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	10 PG/G	25 U	PG/L
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	26 PG/G	11.4	PG/L
1,2,3,7,8-PENTACHLORODIBENZOFURAN	410 PG/G	11.7	PG/L
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	64.5 PG/G	25 U	PG/L
2,3,4,7,8-PENTACHLORODIBENZOFURAN	18 PG/G	10 U	PG/L
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	6 PG/G	10 U	PG/L
2,3,7,8-TETRACHLORODIBENZOFURAN	10 PG/G	10 U	PG/L
OCTACHLORODIBENZO-p-DIOXIN	23700 PG/G	54 7	PG/L
OCTACHLORODIBENZOFURAN	171 PG/G	50 U	PG/L
ANTIMONY	53 MG/KG	0.0082 U	MG/L
ARSENIC	22.2 MG/KG	0 617	MG/L
BARIUM	371 MG/KG	0 432	MG/L
BERYLLIUM	12 MG/KG	0.0003 U	MG/L
CADMIUM	52.6 MG/KG	0 0012	MG/L
CHROMIUM	141 MG/KG	0.013 J	MG/L
COBALT	10.4 MG/KG	NA	
COPPER	15 MG/KG	NA	
LEAD	401 MG/KG	0.0033 =	MG/L
MANGANESE	824 MG/KG	NA	
SILVER	1.6 MG/KG	0.0025 UJ	MG/L
THALLIUM	0.28 MG/KG	0 0006 U	MG/L
VANADIUM	65.5 MG/KG	NA	

Notes:

Dioxins/furans and arsenic are the only contaminants demonstrably associated with the herbicide storage activities at Site SS009

Other contaminants are included for notification purposes only.

SPLP: Synthetic Precipitation Leaching Procedure (SW846 Method 1312)
MG/KG: Milligram/kilogram
MG/L: Milligram/liter
PG/G: Picogram/gram
PG/L: Picogram/liter
U. Not detected
J Estimated Value
NA: Not Analyzed

Book D Volm 07277 Page 01982

CDS
CIVIL DESIGN SERVICES, INC.

795 873

33.01 ACRE TRACT
EAST KELLY AIR FORCE BASE
SAN ANTONIO, TEXAS

EXHIBIT "A"

BEING 33.01 acres of land lying in Lots 11 and 12, Range 1, District 6, City Tract Map of 1852, City of San Antonio, Bexar County, Texas, same being a portion of Artesian Gardens Subdivision as describe in volume 105, page 269 and a portion of South San Antonio Subdivision, Seventh Filing, as describe in volume 642, page 31 of the Plat Records of Bexar County, Texas and lying within the limits of East Kelly Air Force Base and being also described by a drawing (96142-H1.DWG, dated November 25, 1996) attached to and made part hereof and more particularly described as follows:

BEGINNING at a 1/2" iron rod set at the southwest corner of the herein described 33.01 acre tract, from which the southwest corner of East Kelly Air Force Base, same point also being the southwest corner of Lot 15, Block 5 of the aforementioned Artesian Gardens Subdivision bears S06°00'38"W a distance of 349.98 feet to the south line of East Kelly Air Force Base and the north line of Fay Avenue and along the north line of Fay Avenue N83°59'22"W a distance of 250.78 feet to a 5/8" iron rod found;

THENCE along the west line of the herein described 33.01 acre tract, N06°49'39"E a distance of 317.24 feet to a fence corner, N06°39'07"W a distance of 102.12 feet to a fence corner and N05°59'02"E a distance 850.02 feet to a 1/2" iron rod set at the northwest corner of the herein described 33.01 acre tract;

THENCE along the north line of the herein described 33.01 acre tract, S84°02'16"E a distance of 1136.18 feet to a 1/2" iron rod set at the point of curvature of a curve to the right having a central angle of 90°17'13", a radius of 16.00 feet and a chord which bears S38°53'40"E a distance of 22.69 feet;

Book Volm Page
D 07277 01983

924.fnd
November 25, 1996

CONSULTING ENGINEERS • LAND SURVEYORS
575 SPENCER LANE SAN ANTONIO TEXAS 78201 • (210) 736-3188 • FAX (210) 736-3198

795 874

33.01 ACRE TRACT
EAST KELLY AIR FORCE BASE
SAN ANTONIO, TEXAS

THENCE along said curve to the right an arc length of 25.22 feet to a 1/2" iron rod set in an east line of the herein described 33.01 acre tract;

THENCE along the east line of the herein described 33.01 acre tract, S06°14'57"W a distance of 712.32 feet to a 1/2" iron rod set, N85°11'30"W a distance of 18.09 feet to a fence corner and S06°21'46"W a distance of 537.12 feet to a 1/2" iron rod set at the south east corner of the herein described 33.01 acre tract;

THENCE along the south line of the herein described 33.01 acre tract, N84°05'26"W a distance of 1109.59 feet to the **PLACE OF BEGINNING** containing 33.01 acres of land.

The bearing basis for this survey is Grid North, Texas State Plane Coordinate System, South Central Zone, NAD 1927.

THE STATE OF TEXAS X
X KNOWN TO ALL MEN BY THESE PRESENTS:
COUNTY OF BEXAR X

I, Billy H. Ethridge, Jr., a Registered Professional Land Surveyor, do hereby certify that the above field notes were prepared using information obtained by an on the ground survey made under my direction and supervision in November, 1996.

Date 25th day of NOVEMBER, 1996, A.D.

STATE OF TEXAS REGISTERED BILLY H. ETHRIDGE 4302 PROFESSIONAL LAND SURVEYOR

Billy H. Ethridge, Jr.
Registered Professional Land Surveyor
No. 4302 - State of Texas

924.fnd
November 25, 1996

Book D Volm 07277 Page 01984

795 875

EXHIBIT "B"

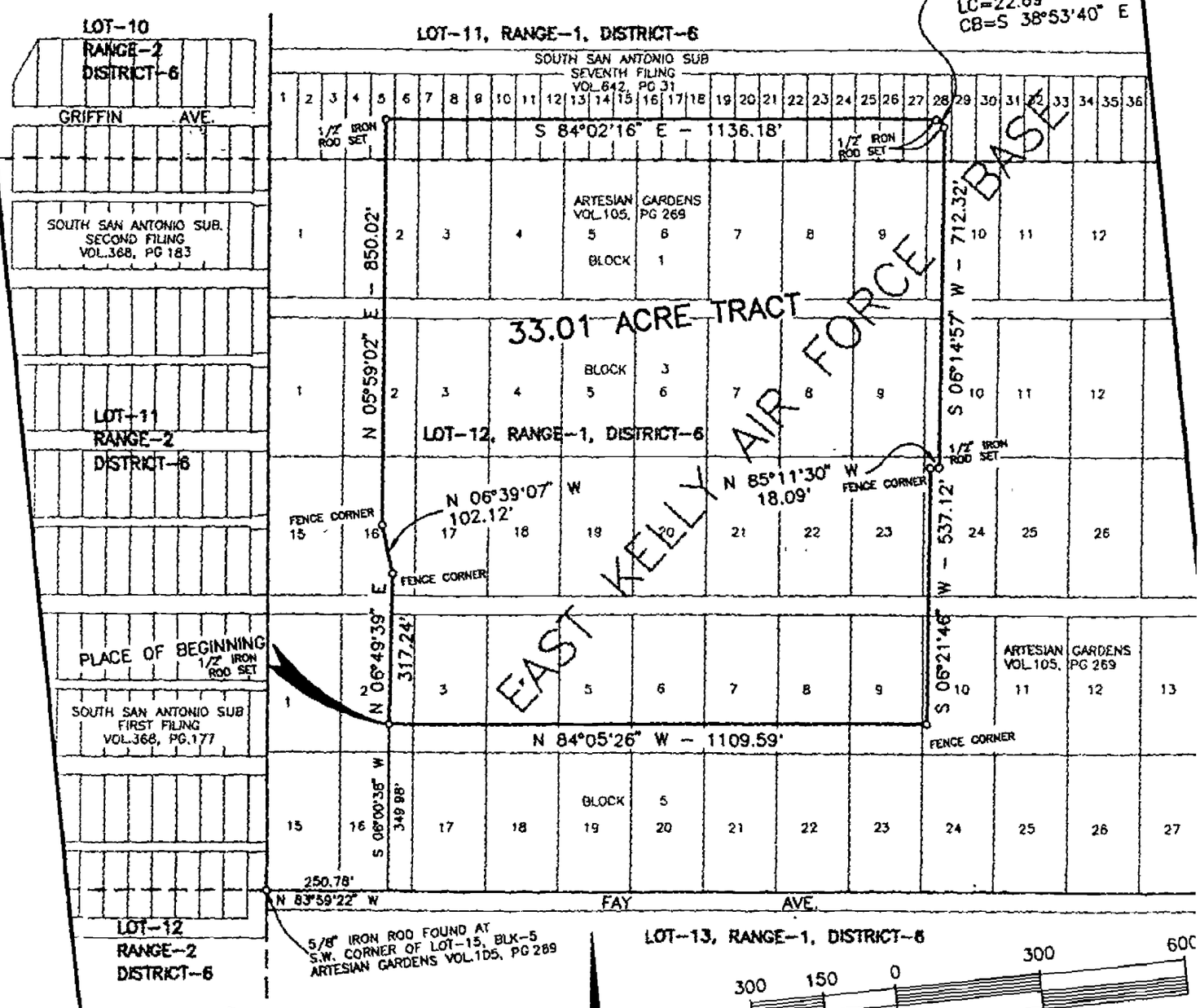
LEGAL DESC. NO. 924
CDS JOB NO. 96142.H1
CDS PLAT NO. 96142-H1.DWG

BEARING BASIS: GRID NORTH, TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD 1927

NOVEMBER 25, 1996

33.01 ACRE TRACT
EAST KELLY AIR FORCE BASE
PORTIONS OF
LOTS 11 & 12
RANGE 1 - DISTRICT 6
CITY TRACT MAP OF 1852
CITY OF SAN ANTOINO, BEXAR COUNTY, TEXAS

Book D Volm 07277 Page 01985



STATE OF TEXAS
REGISTERED
BILL M. ETHRIDGE, JR.
4302
PROFESSIONAL LAND SURVEYOR

NOVEMBER 26, 1996

CDS
CIVIL • DESIGN • SERVICE
CONSULTING ENGINEERS • LAND SURVEY
575 SPENCER LANE • SAN ANTONIO, TEXAS 78201 • 210-736-

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE