DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

1999 RECEIVED

19 MAY 1999

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT (NMED)
Attn: Mr. Cornelius Amindyas
Hazardous & Radioactive Materials Bureau
P.O. Box 26110
Santa Fe NM 87502

FROM: 49 CES/CC
550 Tabosa Avenue
Holloman AFB NM 88330-8458

SUBJECT: Submittal of the Revised Closure Report for the 300-Pound Open Burn Treatment Unit (OBU)

1. We are submitting the revised final closure report for the 300-pound OBU (Atch 1) for your review. This report replaces the report submitted on 16 April 99. The revised report incorporates a section discussing a risk-based closure approach (Section 1.6). In addition, closure sample results are posted in Appendix J for clarification. Note that Appendix I, submitted with the original report on 16 April, still applies to the revised report. Therefore, please retain your copy of Appendix I received with the original report.

2. In accordance with the 300-Pound OBU Closure Plan, the certification of closure includes the signature of a New Mexico professional registered engineer and Holloman AFB representative (page i).

3. Finally, Atch 2 includes photographs of the 300-Pound OBU area. During a 4 May inspection by NMED staff, a scrap metal pile was identified at the site and the inspectors requested we remove the pile. The photographs show this area. Air Force personnel sifted through the pile to ensure the material was not hazardous waste. Any suspicious material was containerized and delivered to the Defense Reutilization and Marketing Organization (DRMO) as hazardous waste. All remaining scrap metal was recycled at DRMO.

4. If you have any questions or require additional information, please contact Jose Gallegos at (505) 475-5395.

Howard E. Moffitt
HOWARD E. MOFFITT
Deputy Base Civil Engineer

Attachments:
Final Closure Report for the 300-Pound Open Burn Treatment Unit (dated May 1999)
Photographs (3 total) of 300-Pound OBU

Received

FINAL CLOSURE REPORT
FOR THE
300-POUND OPEN BURN TREATMENT UNIT

Prepared for:
49 CES/CEVR
Holloman Air Force Base, NM
and
HQ ACC/CEVC
Langley Air Force Base, VA

Prepared by:
Foster Wheeler Environmental Corporation
143 Union Boulevard, Suite 1010
Lakewood, Colorado 80228-1824

Under Contract No. DACW45-94D-0003

Delivery Order 11, Work Authorization Directive 03

U.S. Army Corps of Engineers
Omaha District
Omaha, Nebraska

May 1999

CERTIFICATION AND MANAGEMENT APPROVAL

The following certification by a Professional Engineer and approval from management conforms to the requirements of Title 40 Code of Federal Regulations CFR Part 122.

Professional Engineer Certification

This Closure Report was prepared by or under the direct supervision of the undersigned, a registered Professional Engineer in the State of New Mexico with experience in unexploded ordnance/Open Burn Unit closure. The report contains information generated by the undersigned as well as information from other sources that the undersigned believes to be true and accurate.

DEREK W. JOHNSON NEW MEXICO 13069 REGISTERED PROFESSIONAL ENGINEER

5-6-99

Derek W. Johnson, P.E. Date

License Number: New Mexico P.E. No. 13069

Management Approval Statement

This Closure Report, which contains information regarding risk-based closure of the 300-Pound Open Burn Treatment Unit, is fully supported by the Holloman Air Force Command.

Howard E. Moffitt 11 May 99

Howard Moffitt Date
Civ 49 CES/CD
Holloman Air Force Base

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LIST OF ACRONYMS

AFB	Air Force Base
BDU	bomb dummy unit
CFR	Code of Federal Regulations
C-O-C	chain-of-custody
CQC	construction quality control
cy	cubic yards
DNAPL	dense nonaqueous phase liquid
DQCR	Data Quality Control Report
DQO	data quality objective
EOD	explosive ordnance disposal
EPA	United States Environmental Protection Agency
°F	degrees Fahrenheit
FCR	field change request
ft	foot/feet
FSP	Field Sampling Plan
Foster Wheeler	Foster Wheeler Environmental Corporation
LCS	laboratory control sample
LNAPL	light nonaqueous phase liquid
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mm	millimeter
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
OBA	Open Burn Area
OBU	Open Burn Treatment Unit
OEW	ordnance explosive waste
OSHA	Occupational Safety and Health Administration
PID	photoionization detector
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference

LIST OF ACRONYMS (Concluded)

SDG	sample delivery group
SHSO	Site Health and Safety Officer
SOP	Standard Operating Procedure
SSHP	Site Safety and Health Plan
SUXOSUP	Senior UXO Supervisor
SVOC	semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
TDS	total dissolved solids
TDU	thermal decontamination unit
TPH	total petroleum hydrocarbon
TRPH	total recoverable petroleum hydrocarbon
TSDF	Treatment, Storage and Disposal Facility
USACE	United States Army Corps of Engineers
UTL	upper tolerance limit
UXO	unexploded ordnance
VOC	volatile organic compound

1.0 INTRODUCTION

This Closure Report documents the completion of the construction activities at the former 300-Pound Open Burn Treatment Unit (OBU), located at Holloman Air Force Base (AFB), New Mexico. Closure project activities included mobilization, unexploded ordnance (UXO) and ordnance explosive waste (OEW) surface investigations, UXO avoidance and anomaly identification, construction activities, and demobilization. Foster Wheeler Environmental Corporation (Foster Wheeler) conducted the field activities for the United States Army Corps of Engineers (USACE), Omaha District under the Total Environmental Restoration Contract No. DACW45-94D-0003, Delivery Order 11, Work Authorization Directive 03.

The Final Construction Work Plan (Work Plan) for the 300-Pound OBU closure was prepared in August 1997 prior to commencement of the construction activities (Foster Wheeler, 1997). The state-approved Work Plan satisfied all requirements stipulated by the Contract, Holloman AFB, and USACE. Construction activities involved in the closure of the site were based on the state-approved 300-Pound OBU Closure Plan (NMED, 1997), developed in accordance with Resource Conservation and Recovery Act (RCRA) Subtitle C and the New Mexico Waste Management Regulations (20 New Mexico Administrative Code [NMAC] 4.1). The construction activities at the site began in January 1998 and were completed in October 1998.

This Closure Report presents a brief site background; the project objectives; a summary of the on-site activities, technical approach, and scope of fieldwork (including sampling and analysis); the data quality control summary report; and construction documentation. Appendix A contains the as-constructed plan survey. Field change requests (FCRs) are found in Appendix B, and manufacturer's certificates are contained in Appendix C. Appendix D presents the completion inspection report. The material delivery ticket summaries are contained in Appendix E; site inspection quality control (QC) reports are found in Appendix F. Upper tolerance limits (UTLs) for metals are contained in Appendix G. Appendix H includes the analytical detections for each trench, and Appendix I presents the complete analytical data for the sampling events. The analytical results for the in-place closure samples for each trench are presented in Appendix J. Appendix K contains laboratory results for the decontamination water, and Appendix L includes the trench excavation and materials summary.

1.1 BACKGROUND

The 300-Pound OBU consisted of the Open Burn Area (OBA) and Trench Number 4 (Trench 4) and contained a cleared, circular area with a diameter of approximately 800 feet (ft) (11.5 acres). There were three trenches (Trenches 1, 2, and 3) in the OBA and one trench (Trench 4) outside and to the east of this circular area. The cleared, circular area was encompassed by an earthen berm, and the entire 300-Pound OBU, including Trench 4, was surrounded by a barbed-wire fence. Figures 1-1 and 1-2 present the vicinity map and locations of the four trenches.

Shortly before preparation of the Work Plan, an independent, two-phased geophysical investigation and a visual investigation were conducted at the site. An electromagnetic (EM-31) survey was performed to identify the areal extent of the trenches and to determine whether additional trenches existed at the 300-Pound OBU. This investigation was followed by a more detailed EM-61 survey to better define the backfilled trench locations. The geophysical survey results confirmed that there were only four trenches at the site (NMED, 1997).

Each of the three trenches within the circular OBA was approximately 20 ft long, 10 to 12 ft deep, and 6 ft wide. Based on visual observations, Foster Wheeler estimated that Trench 4 was approximately 60 ft long, 12 ft deep, and 6 ft wide. The 300-Pound OBU was active from the 1950s until 1994. Previous records indicated that these trenches were used to thermally treat waste pyrotechnics, propellants, and ordnance. During open burning activities, a typical treatment event included thermal treatment conducted in layers. Each treatment event involved a 12-inch layer of wood (dunnage), the layer of waste ordnance, and another 12-inch layer of dunnage atop the waste layer. The dunnage was soaked with approximately 100 gallons of diesel fuel and then ignited. The treatment of waste ordnance continued in this manner until the trench had a headspace of 4 ft. Then the remaining volume of the trench was backfilled with soil to the existing grade. The total number of burn events conducted at the site is unknown.

Runon and runoff at the site were controlled by both perimeter berms along the outside of the cleared area and small diversion trenches surrounding the treatment trenches. Since the site is located in a semiarid region, only small amounts of precipitation occur. As a result, the current runon/runoff controls at the site are sufficient to prevent surface water runon and runoff

Figure 1-1 Site Map

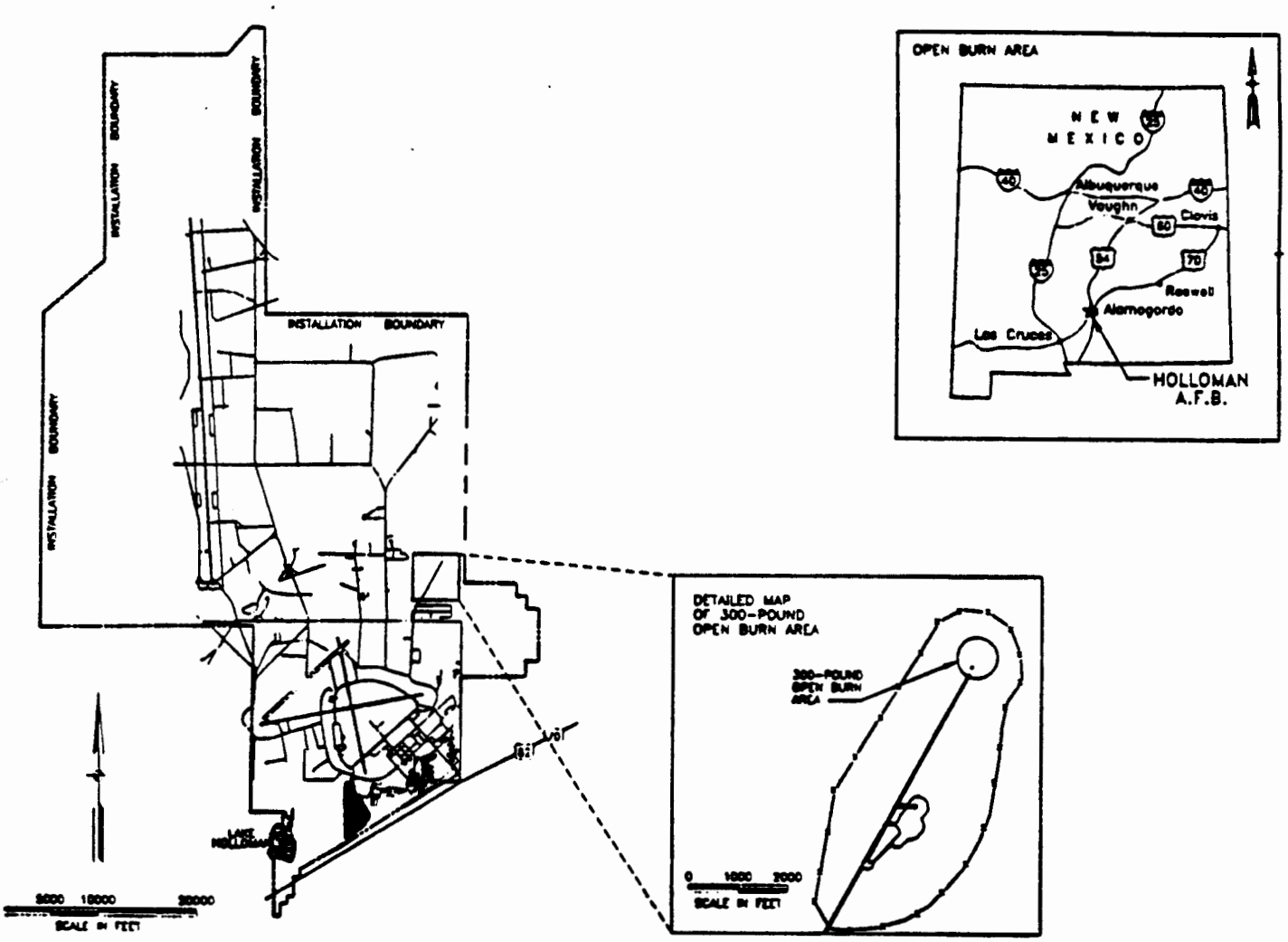
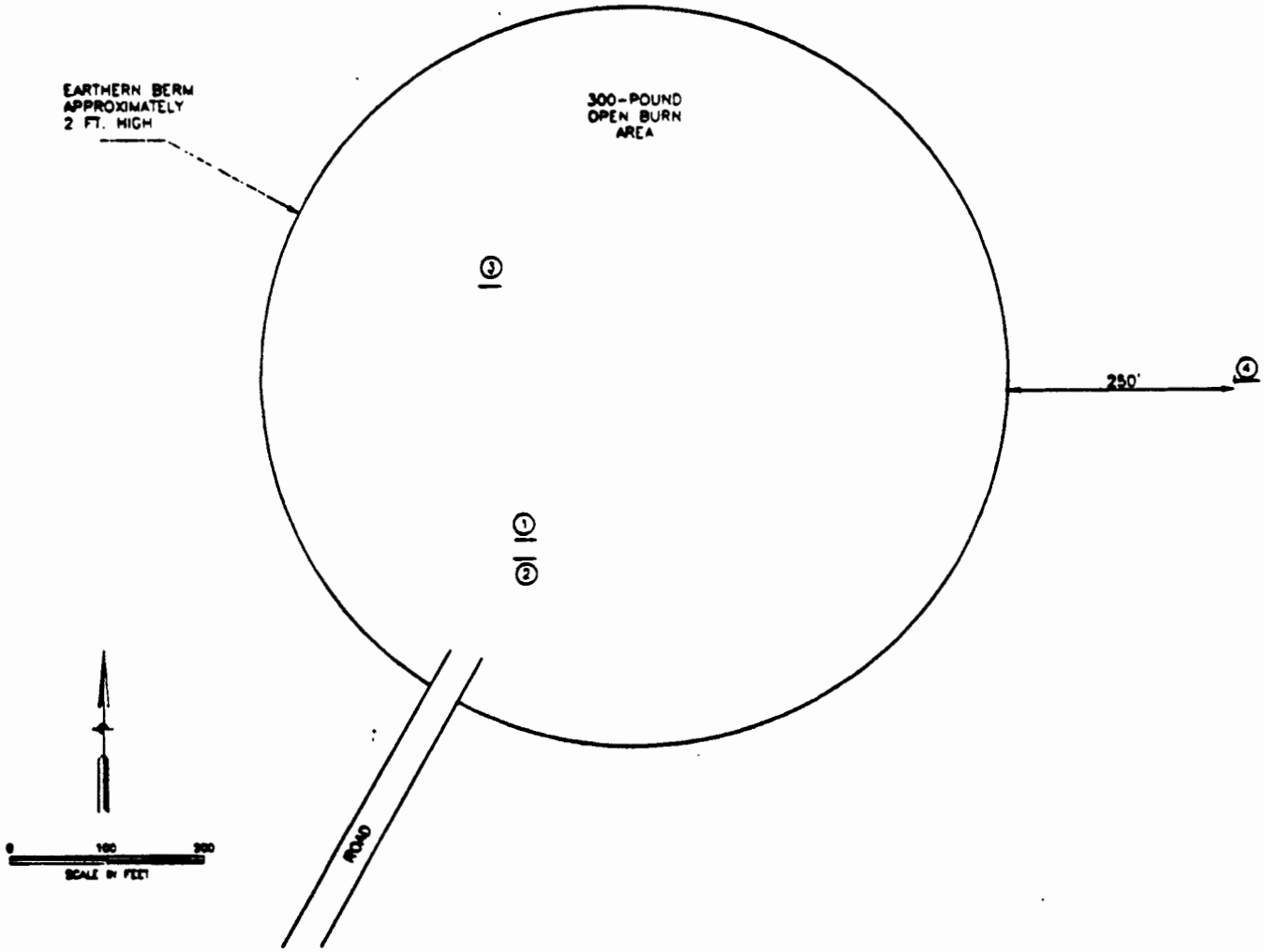


Figure 1-2 Trench Locations



following closure of the trenches. Therefore, no soil erosion reports were prepared during this project.

No contamination of the groundwater is believed to have occurred as a result of 300-Pound OBU operations. Analytical results from in-place soil samples collected at depths above the groundwater table indicated that no constituents were present at concentrations posing a threat to human health or the environment. There is also low potential for migration of contaminants to the groundwater at the site based on the following factors (NMED, 1997):

- Wastes were stored in original casings or containers that are designed for long-term stabilization, ensuring no releases occurred prior to treatment.
- No free-liquid wastes were treated at the site.
- The treatment process generally resulted in complete destruction of the waste.
- The metal debris remaining after thermal treatment was typically present in elemental states or as oxides that are either insoluble or of limited solubility in water.
- The low precipitation rates for the entire Holloman AFB area, coupled with the high evapotranspiration rates, minimized the driving force for contaminant migration and resulted in low potential for contaminants to leach into the groundwater.

In addition, shallow groundwater in the Tularosa Basin and beneath Holloman AFB is naturally high in salinity and considered nonpotable. Investigations of the groundwater indicate that in almost all locations sampled, the total dissolved solids (TDS) content exceeds 10,000 mg/kg, and therefore, the groundwater does not require protection by the New Mexico Water Quality Commission Regulations (NMED, 1997). The shallow groundwater does not discharge into a surface water body of better quality and the Tularosa Basin does not discharge or connect to any adjacent aquifers. There are no surface water bodies in the area of the site, and the remote location results in no receptors for the groundwater.

The New Mexico Environment Department (NMED) and United States Environmental Protection Agency (EPA) do not require treatment of groundwater unless light nonaqueous phase liquids (LNAPLs) or dense nonaqueous phase liquids (DNAPLS) are present. Because the 300-Pound OBU site is expected to have TDS levels exceeding 10,000 mg/kg and no LNAPLs or

DNAPLs are present, further investigation or monitoring of the groundwater beneath the site is not required (NMED, 1997).

1.2 PROJECT OBJECTIVES

The objectives for the 300-Pound OBU Closure Project were to:

- Remove all hazardous waste residuals or constituents posing a threat to human health and the environment from the four treatment trenches
- Minimize the migration of any hazardous waste, hazardous constituents, leachate, contaminated runoff, or decomposition products
- Initially remove the soil from both the floor and the sidewalls of the respective trenches to a depth of 1 ft below excavated grade and subsequently remove soil to a depth of 5 ft as required by confirmation sampling results
- Prove that all of the residual waste had been effectively remediated through verification soil sampling and analysis
- Declare a clean closure of the 300-Pound OBU site if clean closure objectives were achieved
- Implement a risk-based closure of the site if analytical results indicated clean closure criteria were not accomplished.

1.3 TECHNICAL APPROACH

This section summarizes the technical approach used during construction activities. The detailed Scope of Work, including the phases of fieldwork, sampling, and analyses activities, is discussed in Section 2 of this report. The following is a summary of the field tasks:

- Mobilization (temporary facilities, staging and storage areas, site preparation)
- UXO surface investigation
- UXO avoidance/anomaly identification
- Construction activities (sampling and analysis, trench excavation, material screening and segregation, construction of the thermal decontamination unit (TDU), additional thermal treatment of UXO material, radiation surveys, disposition of waste materials, backfill, decontamination, engineering oversight, QC, and health and safety)
- Demobilization

1.4 ON-SITE ACTIVITIES

The on-site activities performed during the closure construction at the 300-Pound OBU include the following:

- Mobilization
- UXO surface investigation
- UXO avoidance/anomaly identification
- Trench excavation
- Screen plant operation
- Segregation of material
- Waste handling and disposal
- Construction of thermal decontamination unit
- Sampling and analysis
- Site restoration (backfill)
- Decontamination
- Demobilization
- Field engineering and QC activities
- Health and safety

1.5 CLOSURE STRATEGY

As detailed in the state-approved 300-Pound OBU Closure Plan (NMED, 1997), the site was to achieve clean closure by removing all residuals or hazardous constituents from the four trenches, excavating the soils from both the floor and sidewalls of the trenches, and characterizing all waste materials generated during closure activities for appropriate waste management and disposal. When analytical results determined constituent concentrations did exceed the established clean closure criteria, a risk-based approach to closure was implemented. The following sections discuss implementation of the project data quality objectives (DQOs) as the clean closure criteria and introduces the risk-based closure approach.

1.5.1 Clean Closure Criteria

To verify closure, DQOs for the site were implemented as the clean closure criteria. The DQOs for the 300-Pound OBU included the UTLs developed from metals analysis of background soil samples collected at Holloman AFB (Appendix G) and the Base remediation (cleanup) goals of 1,000 milligrams per kilogram (mg/kg) for total recoverable petroleum hydrocarbons (TRPH) and 25 mg/kg for benzene. Any other volatile organic compound (VOC) or semivolatile organic compound (SVOC) detection exceeding the method reporting limit (presented in Appendix E of the Work Plan [Foster Wheeler, 1997]) for that analyte was also considered as exceeding background levels.

Implementation of the DQOs ensured the clean closure criteria were met for the removal of TRPH and benzene during trench excavation. When soil samples failed to meet the closure criteria for TRPH, additional excavation of the soil and verification/confirmation sampling was conducted. This process continued until the data from the soil sample results indicated that there were no detections above the Holloman AFB cleanup goals for TRPH and benzene. The project DQOs were then implemented to evaluate the in-place soil analytical results to determine which metals, VOC, and SVOC analytes met the clean closure criteria. Finally, application of the DQOs for the 300-Pound OBU was used to determine the proper disposal options for cover soil, trench contents, additional trench floor and sidewall soil resulting from excavation, debris, and decontamination water generated during remedial activities. All soil sampling and analytical data for the project are provided in Appendices H and I; the analytical results for the in-place closure samples are summarized in Appendix J. Appendix K includes the analytical data for the decontamination water, and Appendix L presents the trench excavation and materials summary.

1.5.2 Risk-Based Closure

Analysis of the in-place soil confirmation samples collected at Trenches 1 and 4 indicated that although the clean closure criteria were achieved for TRPH and benzene, objectives were not met for several metals, one VOC, and five SVOCs at the 300-Pound OBU. Therefore, in accordance with Section 3 of the state-approved 300-Pound OBU Closure Plan (NMED, 1997) and Work Plan (Foster Wheeler, 1997), the site was evaluated through a risk-based approach to demonstrate that any hazardous constituents remaining after the excavation and removal of soil and treatment residuals were below levels that would pose an unacceptable risk to human health

and the environment. The risk-based approach for closing the 300-Pound OBU is described in the following section.

1.6 RISK-BASED APPROACH FOR CLOSURE OF THE 300-POUND OPEN BURN UNIT

Analytical results for Trenches 1 and 4 were compared to Holloman AFB background UTLs for metals (Appendix G), Base cleanup goals for TRPH and benzene (Section 1.5), and human health risk-based screening levels (RBSLs) and ecological screening values (ESVs) for other organics detections (and metals when required) to demonstrate that closure criteria were met. These comparisons were conducted as a step-wise evaluation, and subsequent steps were used only if the analyte comparison resulted in an exceedance in the previous screening step. The first step in the metals evaluation compared the maximum concentration of each detected metal in each trench to the background UTL values. If the metal exceeded the UTL, then the maximum concentration was compared to RBSLs for human health and ESVs for ecological receptors. More realistic metals exposure point concentrations (EPCs) were used in the event that a human health or ecological screening value was exceeded for a specific analyte. Based on EPA guidance (1992b), the 95 percent Upper Confidence Limit (UCL) on the mean was used as the EPC because it represents an upper bound estimate of the average concentration across the site. All organics detections were similarly compared to RBSLs for the human health assessment and ESVs for the ecological assessment. Only the most recent round of sampling data was used in the assessment because these analytical results reflect site soils still in place. The Trench 1 data were collected April 29, 1998; Trench 4 data were collected March 9 and 10, 1998. As discussed in Section 4.4 of the state-approved Closure Plan (NMED, 1997) and the Work Plan (Foster Wheeler, 1997), analytical results for Trench 1 were considered to represent site conditions within the OBA; therefore, in-place soil samples collected at Trenches 2 and 3 were analyzed only for TPH. Since Trench 4 was located outside the perimeter of the OBA, the in-place soil samples for this trench were analyzed for the same parameters as Trench 1. Sections 3, 4, 5, and 6 contain more detailed discussion of the closure for Trenches 1, 2, 3, and 4.

1.6.1 Risk-Based Screening Levels

Metals exceeding the UTLs and all VOC and SVOC detections were compared to RBSLs in the human health risk-based screening step. The RBSLs developed for this comparison were based

on the EPA Region 6 medium-specific screening levels (EPA, 1999) for industrial land use. The EPA Region 6 soil concentrations correspond to target risk levels of 1×10^{-6} (one in one million) for cancer risk and a noncancer hazard index of 1.0; therefore, soil concentrations that are below the RBSL levels will have risk levels that are less than these target risk levels. The RBSLs based on noncancer risk were divided by 10 to account for the potential additive risk from exposure to multiple noncarcinogenic chemicals. The RBSLs were calculated assuming exposure to soil through ingestion, dermal absorption, and inhalation. Further action is not required to meet goals for human health protection for analytes with maximum concentrations below the RBSLs.

1.6.2 Ecological Screening Levels

Metals exceeding the UTLs and all VOC and SVOC detections were compared to ESVs in the ecological risk-based screening step. For potential terrestrial ecological receptors, screening values were not available from EPA or the state of New Mexico; therefore, several other references were used. ESVs were based on screening values derived for the Savannah River Site by Friday (1998) and by the Oak Ridge National Laboratory (Efroymson et al., 1997a, b, c). Screening values were developed for a variety of receptors; the lowest value appropriate for this site was selected as the ESV. In most cases, the ESVs reported by Friday were the same or lower than the values reported in the three reports by Efroymson et al. The value for lead was based on Efroymson et al. (1997a) because it was lower than the value reported by Friday. In addition, the lowest ESVs for chromium based on earthworms (0.4 mg/kg) and plants (1.0 mg/kg) in Efroymson et al. (1997b) are considered unrealistic since they are well below the background UTLs. Therefore, the lowest wildlife value in Efroymson et al. (1997a), 16.1 mg/kg for the woodcock, was used as the ESV. Likewise, the lowest ESV for mercury (0.00051 mg/kg), based on the woodcock (Efroymson et al., 1997a), is considered unrealistic because it is well below commonly available background values (0.065 mg/kg for western United States soils as reported by Shacklette and Boerngen [1984]). Therefore the next highest ESV of 0.1 mg/kg (based on earthworms in Efroymson et al. [1997c]) was used. This value is below all of the other wildlife values reported by Efroymson et al. (1997a). It should be noted that exceedance of an ESV does not automatically indicate that there is risk to an ecological receptor. In these cases, the risk characterization needs to consider other important factors, such as habitat quality, and the likelihood that a receptor will use the site and the size of the site relative to the home range of

the receptor. In addition, the goal of ecological risk is protection of populations, and a small exceedance of an ESV over a very limited area is not expected to adversely affect a population.

1.7 POST-CLOSURE CARE

The in-place confirmation sampling results indicated that no concentrations exceeding the risk-based closure criteria for soil were present following completion of the construction activities. The site is remote and access will be limited. In addition, the Base Comprehensive Plan designates this area as "Open Space," and it will not be used for any activity. Groundwater monitoring at the site is not required due to the low potential for migration of hazardous waste or hazardous constituents from the 300-Pound OBU into the surrounding media, as discussed in Section 7 of the state-approved Closure Plan (NMED, 1997). Therefore, as stated in Section 5 of the Closure Plan (NMED, 1997), post-closure monitoring or care is not required at the site.

2.0 SCOPE OF WORK

2.1 MOBILIZATION

Mobilization consisted of site preparation, including identification of trench locations, the placement of temporary facilities and utilities, and designation of staging and storage areas.

2.1.1 Temporary Facilities and Utilities

Temporary facilities were provided in accordance with Section 01500 of the Technical Specifications, Temporary Facilities and Utilities. Once the closure activities were completed, these temporary facilities were removed to the satisfaction of Holloman AFB personnel.

2.1.2 Staging and Storage Areas

Both the staging and storage of waste were conducted within the 300-Pound OBU work zone in areas that did not interfere with the ongoing trench operations at the site. These areas were used to store rolloffs, stockpile material, store equipment and supplies, maintain operations, and conduct general construction administration.

2.1.3 Miscellaneous Site Preparation

Work zones for the project were established for both the construction and health and safety personnel in accordance with the Site Safety and Health Plan (SSHP), Section 6 of the Work Plan (Foster Wheeler, 1997). Three-ft-high wooden stakes were used to identify the outer perimeters of each trench, and yellow caution tape was fastened to the stakes as a warning barrier for personnel.

2.2 UXO SURFACE INVESTIGATION

A circle with an approximate radius of 50 ft from the center of each trench was marked with pin flags and visually inspected for the presence of explosive items that may have been thrown from the pit during burning operations. The UXO team used two Schonstedt Mode GA-72CV Magnetic Locators to define the boundaries of Trenches 3 and 4 prior to moving equipment and personnel into this work area. In addition, the UXO team used the Magnetic Locator to identify any subsurface anomalies or hazards within the site prior to work crews and equipment entering any work zones.

2.3 UXO AVOIDANCE/ANOMALY IDENTIFICATION

When explosive munitions, explosive wastes, suspect materials, or other conditions indicating a potential health hazard were found, work efforts were temporarily stopped pending evaluation by the UXO personnel, Construction Quality Control (CQC) Systems/Site Health and Safety Officer (SHSO), and Site Superintendent. Operations continued only when it was determined safe to proceed.

Any items or materials that were considered to be explosive hazards were immediately reported to the Holloman AFB Explosive Ordnance Disposal (EOD) personnel. Items that were considered explosive in classification, but that did not present a real hazard to field personnel (i.e., primers, small arms cartridges, etc.) that the Senior UXO Supervisor (SUXOSUP) considered safe to move, were removed to an on-site storage area. These items were temporarily stored in a United States Department of Transportation-approved 55-gallon drum until removed and treated by the Holloman AFB EOD personnel.

When an explosive item was considered unsafe to move, operations were immediately stopped and all personnel moved to the support area located outside the exclusion zone and upwind of the excavation operations. The item was left in place and the Holloman AFB EOD team was immediately notified. Work efforts in that trench did not resume until the Holloman AFB EOD personnel had removed the hazard for subsequent disposal. A determination (based upon the explosive hazard involved) was made between the SUXOSUP and USACE representatives as to whether work would be permitted to continue in adjoining trenches before the existing hazard had been removed.

2.4 TRENCH EXCAVATION

The excavation activities were accomplished using a 1-624 John Deere Loader, 1-310 John Deere Backhoe, and 1-690 ELC John Deere Excavator with thumb attachment to a bucket. This equipment was used to remove the trench contents and transfer the material to a loader for subsequent transport to the Reed Screening Plant. The excavated material was deposited into the front-end loader and placed in the screening device for segregation of metal and soil/ash residue. Qualified equipment operators and two UXO personnel performed the trenching operations in

accordance with Occupational Safety and Health Administration (OSHA) Title 29 of the Code of Federal Regulations (CFR) 1926, Subpart P (Safety Regulations for Construction—Excavations).

One UXO Specialist was present at the site to observe the backhoe operations and direct the equipment operator, as necessary. When the bucket was filled, the backhoe operator deposited the debris into the front-end loader bucket for transport to the screening device. A second UXO Specialist observed the transfer of material from the backhoe bucket into the bucket of the front-end loader. The UXO Specialist performed a primary screening of the material as it was deposited in the front-end loader bucket for large UXO debris, which would be detrimental to the operation of the grizzly screen. All large materials were removed, handled, and disposed of in accordance with the procedures described in Section 2.7. The remaining excavated materials were sent to the grizzly screen at the screen plant.

Initially, trenches were excavated 1 ft beyond the limits of the trench bottom and sidewalls. If sidewall and bottom soil confirmation sample results indicated detections above the Holloman AFB cleanup goal for TRPH, the trench excavation was expanded approximately 5 ft and additional samples were taken. This process continued at each trench until sample analyses indicated contamination below the cleanup goal for TRPH as described in Section 1.5. The final excavated area for Trench 1 was 50 ft by 80 ft by 21 ft deep and for Trench 2 was 50 ft by 90 ft by 38 ft deep. Trench 3 was 70 ft by 107 ft by 24 ft deep, and Trench 4 was 15 ft by 107 ft by 6 ft deep. Section 2.9 details the sampling and analysis procedures for the project.

2.5 SCREENING PLANT OPERATION

An on-site screening plant was used to separate the excavated debris by size. The screening plant was a self-contained unit that included the following components:

- A grizzly with bars spaced at 3 inches mounted onto a hopper
- A variable speed feeder belt. The speed of the feeder belt determined how much material could be processed in any given time. The rate of material flow through the screen was adjusted on site, allowing as much material to pass through as possible while still achieving maximum efficiency (separation) of the screen process.
- A conveyor belt to transfer the material from the feeder to the screen deck

- A vibratory screen deck with 1-inch openings used to separate the material greater than 1 inch in diameter

The screening plant was staged in an area within the exclusion zone that did not interfere with backhoe operations and that was accessible for receiving the excavated material from the front-end loader. A rolloff was placed under the screening device to recover and contain the soil and ash residue shaken free from the metallic objects. In addition, the rolloffs were also positioned to receive/retain the segregated metal debris.

The screening procedure was performed as follows:

1. A front-end loader transported material from the backhoe and dumped the material onto the grizzly. The grizzly rejected most of the material with dimensions greater than 3 inches. One UXO Specialist observed the transfer of material and inspected the debris contents remaining on the grizzly for potential explosive hazards. The UXO/OEW/metallic debris was then removed and temporarily placed in 55-gallon drums that were subsequently transferred into rolloffs for future treatment and disposal.
2. The remaining soil/ash residue material (passing the grizzly) was dropped into the hopper and onto the variable speed feeder.
3. From the feeder, the material was dropped onto the conveyor for transport to the screen.
4. When the material reached the top of the conveyor belt, it was dumped onto a wire-mesh vibrating screen deck that allowed material with a diameter less than 1 inch to pass through and accumulate directly beneath the screen in the rolloff.
5. A UXO Specialist was positioned at the screen to remove UXO/OEW/metallic items from the conveyor belt before they reached the screen and to temporarily place the items in 55-gallon drums and subsequently into rolloffs for future disposal. During the project operations, UXO personnel determined all UXO/OEW/metallic items to be suspect/unsafe for immediate disposal. As a result, all materials were treated and disposed of as detailed in Sections 2.7 and 2.8.

When processing of the trench contents was completed, the screening device was then repositioned to a new trench location within the respective exclusion area.

2.6 SEGREGATION OF MATERIALS

Each trench had four types of excavated trench materials after the separation process: (1) cover soil, (2) trench ash and soil contents, (3) trench metallic debris (UXO/OEW), and (4) additional trench sidewall and bottom excavated soils. Each type of material was screened and appropriately segregated. The clean cover soil, contaminated soil, and additional trench

excavated soils were placed in stockpiles in a 40-mil high density polyethylene-lined, bermed containment area that met the NMED stockpiling requirements. Railroad ties were set on the perimeter of the bermed stockpile area. The stockpiles were then covered with an additional plastic cover to the outside of the railroad ties and then anchored with another set of railroad ties. The soil ash and UXO/OEW/metallic debris was placed into rolloffs and 55-gallon drums, respectively.

The stockpiled soil materials were sampled, and any over-excavated soil that was determined to be clean by the sampling results was redeposited as backfill in the trenches. All other materials generated during the project were handled and properly disposed of as discussed in Section 2.7.

2.7 WASTE HANDLING AND DISPOSAL

All soil ash that was excavated from the four trenches was immediately placed into rolloff containers, transported, and disposed of at the Rhino Construction landfill facility in Texas. All UXO/OEW/metallic debris was contained in both 55-gallon drums and rolloff containers. The SUXOSUP determined all UXO/OEW/metallic debris to be suspect/unsafe for immediate disposal; therefore, all debris was treated in the on-site TDU (Section 2.8) once the unit was operational. Only the bomb dummy units (BDUs) used for training operations and 20-millimeter (mm) munitions casings were stored in 55-gallon drums and taken to the 20,000-Pound Open Detonation Unit or used for training at ranges (Red Rio/Oscura).

Pending treatment, the UXO/OEW/metallic debris was stored on site in proper containers. The 90-day accumulation of material deemed to require further treatment in the TDU began on January 15, 1998. The TDU became operational in June 1998 and the accumulated material was then treated in batches. NMED granted Holloman AFB three 30-day extensions for the on-site storage of the material. By the end of the third extension on July 14, 1998, all accumulated material had been treated and disposed of.

All thermally treated material was certified inert by the Holloman AFB EOD and stored in locked rolloffs. The Environmental Flight Compliance Element (CEVC) arranged for proper disposal of the thermally treated UXO/OEW/metallic debris at an EPA-registered treatment, storage, and disposal facility (TSDF). After the completion of trench excavation, a total of forty-two 55-gallon drums and five 12-cubic-yard (cy) rolloff containers were used. Rhino

Construction properly transported and disposed of approximately 1,110 tons of contaminated material; Laidlaw Environmental Services transported and disposed of 1 ton of lead-contaminated material.

Approximately 85 gallons of decontamination water were generated by the project activities. The water was deemed nonhazardous through comparison of the analytical sampling results (Section 2.9.4) to the RCRA regulatory levels for disposal characterization. Therefore, the decontamination water was released onto the site. The decontamination pad materials were disposed of at the Holloman AFB Recycling Facility following the nonhazardous characterization of the decontamination water.

2.8 THERMAL DECONTAMINATION UNIT

Holloman AFB EOD personnel determined that the segregated UXO/OEW/metallic debris was unsafe for immediate disposal. Therefore, to properly treat and destroy the waste materials, Foster Wheeler built a TDU on site. Upon completion of the TDU, ownership of thermal treatment operations was transferred to Holloman AFB. The Holloman AFB personnel assumed responsibility for thermally treating the UXO materials that were determined to be unsafe, and the thermally treated waste was properly disposed of at an EPA-registered TSDF. The TDU was constructed and operated in accordance with 20 NMAC 2.60, which stipulates regulations regarding open burning of materials in the State of New Mexico.

The TDU consists of a combustion enclosure, propane combustion system, propane storage tank, instrumentation, and a monitoring system. The separated UXO/OEW/metallic materials were heated for approximately 1 hour at 600 degrees Fahrenheit (°F) to vaporize and/or break down residual contamination on the metal and soils. The TDU operated effectively throughout the duration of the project and did not experience significant mechanical problems or downtime. Holloman AFB EOD personnel performed all routine maintenance required for the TDU. Once the UXO/OEW/metallic materials were treated, CEVC arranged for proper disposal at an EPA-registered TSDF. The construction and operation of the TDU is detailed in the Thermal Decontamination Unit—300-Pound Burn Site report (Foster Wheeler, 1998).

To prevent any unintended future operation of the TDU, Foster Wheeler will decommission the unit through purging of the gas feed lines and disabling of the operations control panel. A document verifying this deactivation will be issued.

2.9 SAMPLING AND ANALYSIS

The sampling and analysis activities conducted for the closure of the 300-Pound OBU were performed in accordance with the Field Sampling Plan (FSP), which was detailed in Section 7 of the Work Plan (Foster Wheeler, 1997). The FSP outlines the constituent sampling and analytical procedures and methodologies used in support of closure for the 300-Pound OBU. This FSP was used in tandem with the Quality Assurance Project Plan (QAPP) (Section 8 of the Work Plan) to provide specific rationales, protocols, and methodologies to be followed for field sampling or data collection activities during the project.

The sample matrices generated during the closure activities consisted of cover and backfill material, contaminated stockpiled soil, soil ash, decontamination water, and soil samples collected from each trench bottom and four sidewalls during the trench excavation. Each waste stream matrix was sampled and analyzed in accordance with the FSP; QAPP; Standard Operating Procedures (SOPs) G1 through G6 as specified in the Work Plan (Foster Wheeler, 1997); the latest revision of EPA SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA, 1986); EPA Methods for Chemical Analysis of Waters and Wastes (EPA, 1979), and EPA Standard Methods for the Examination of Water and Wastewater, Eighteenth Edition (EPA, 1992a).

As described in Section 4.4 of the 300-Pound OBU Closure Plan (NMED, 1997), the same type of waste ordnance was treated in each of the four trenches; therefore, the approach used for characterizing the hazardous constituents for the site (i.e., all four trenches) was to first evaluate the analytical results from the Trench 1 subunit investigation. The soils and materials from Trench 1 were analyzed for the entire analyte list provided in the Closure Plan, including VOCs, SVOCs, explosives, total petroleum hydrocarbons (TPH), and metals. The in-place soil samples collected from Trenches 2 and 3 were analyzed for TPH only. This sampling approach was justified because Trenches 2 and 3 were located in close proximity to Trench 1 within the OBA, and the analytical results reported for Trench 1 would be representative of the constituents

present in Trenches 2 and 3. Benzene concentrations for all samples collected at Trench 1 were at nondetect levels, and based on these results, the in-place soil confirmation samples were not analyzed for benzene at Trenches 2 and 3. Because Trench 4 was located outside of the OBA, it was decided that the entire analyte list from Trench 1 would be used to evaluate samples collected from Trench 4.

The analytical detections for each individual trench are presented in Appendix H, and the complete analytical data for all samples are presented in Appendix I.

2.9.1 Site Closure Samples

The site closure samples for the project were collected from the four trenches as described in the previous section. The in-place soil samples were collected from four lateral sidewall locations and from the bottom of each trench excavation (Figure 2-1). Field screening of the soil was conducted using a photoionization detector (PID) in accordance with SOP G5 of the Work Plan (Foster Wheeler, 1997). In-place soil samples were collected using a backhoe bucket and stainless steel tools in accordance with SOP G4 of the Work Plan. All samples were transported to Laucks Testing Laboratories in Seattle, Washington, for analysis under strict chain-of-custody (C-O-C) procedures and in accordance with the QAPP.

As described in the previous section, the in-place soil samples at Trenches 1 and 4 were analyzed for VOCs, SVOCs, explosives, TPH, and metals; in-place samples from Trenches 2 and 3 were analyzed for TPH only. All laboratory analyses were performed in accordance with EPA and Standard Methods as identified in Section 8.0 of this report. The analytical results for the in-place site closure samples are presented in Appendix J.

2.9.2 Soil Ash Samples

The soil ash sampling was performed in accordance with the SOP G6 as specified in the Work Plan. Field screening of the soil was conducted using a PID in accordance with SOP G5 of the Work Plan (Foster Wheeler, 1997). All samples were transported to Laucks Testing Laboratories in Seattle, Washington, for analysis under strict C-O-C procedures and in accordance with the QAPP.

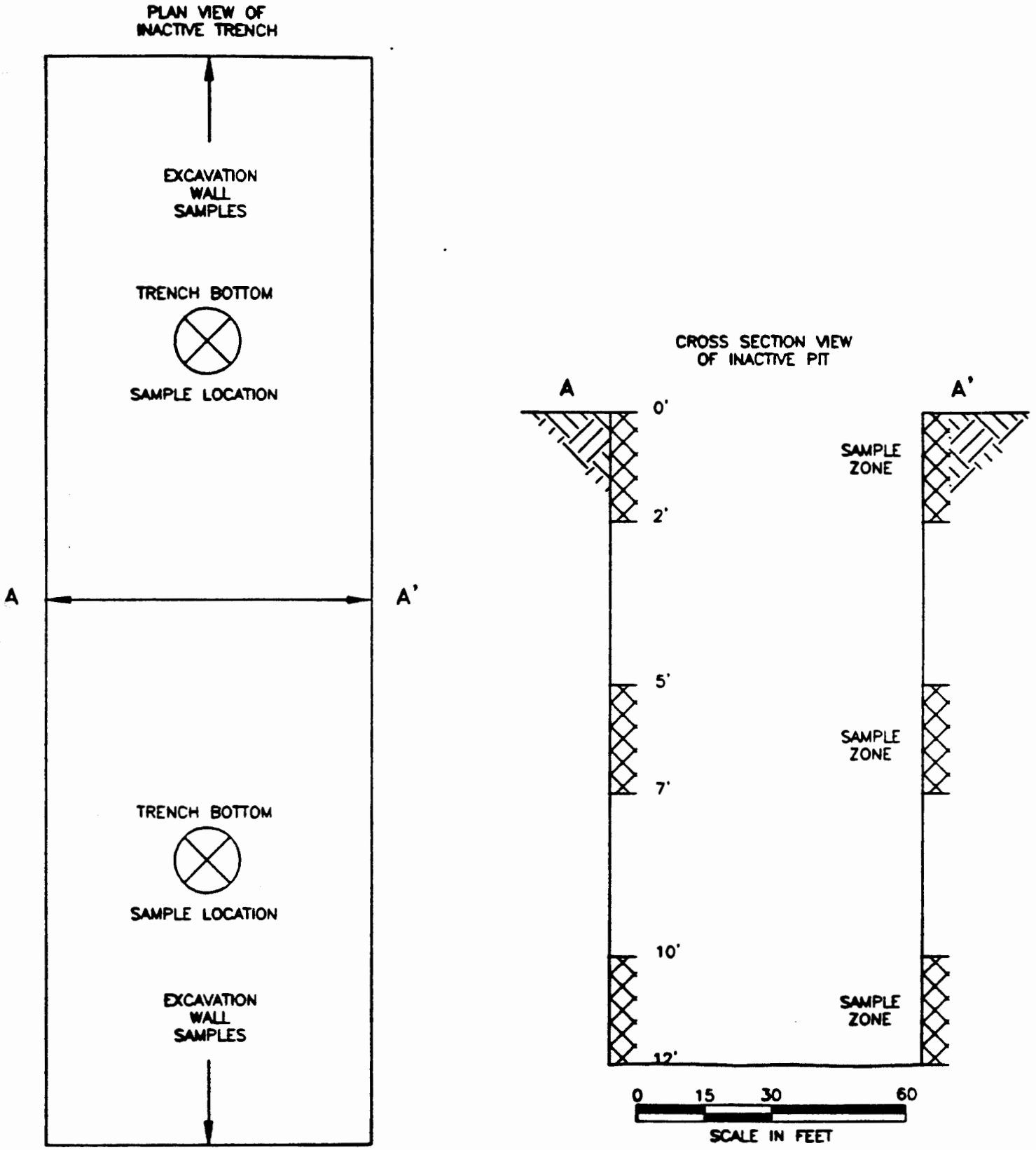


Figure 2-1. Trench Sampling Locations

The soil ash samples were analyzed for TRPH; Toxicity Characteristic Leaching Procedure (TCLP) metals, VOCs, and SVOCs; corrosivity; reactivity; and ignitability. All laboratory analyses were performed in accordance with EPA and Standard Methods as identified in Section 8.0 of this report. The analytical detections for the soil ash samples are presented in Appendix H.

2.9.3 Soil Stockpile Samples

As trench soils/materials were excavated, the materials were segregated into clean and contaminated stockpiles (as discussed in Section 2.6) based on odor, PID readings, visual, and other field screening determinations field personnel made as discussed in the FSP. Stockpile soil samples were collected for each trench, except for Trench 4 (Section 6.2.2), in accordance with SOP G4 of the Work Plan. The stockpile samples were analyzed for TRPH; TCLP metals, VOCs, and SVOCs; corrosivity; reactivity; and ignitability.

All samples were transported to Laucks Testing Laboratories in Seattle, Washington, for analysis under strict C-O-C procedures and in accordance with both EPA methods as specified in Section 8 of the Work Plan and the QAPP.

2.9.4 Waste Disposal Samples

One composite waste disposal sample was collected from the two 55-gallon drums of decontamination water for waste characterization and disposal purposes. The samples were analyzed for the contaminants listed in Table 2-1. The water sample was transported to Laucks Testing Laboratories in Seattle, Washington, for analysis under strict C-O-C procedures and in accordance with both EPA methods as specified in Table 2-1 and the QAPP. The sample was collected, labeled, preserved, and stored in accordance with the FSP, SOPs (G5 and G6) of the Work Plan, and appropriate requirements as specified in EPA Method SW-846. The analytical sample results indicated that the water was nonhazardous; therefore, the water was disposed of as specified in Section 2.7. The analytical results for the composite sample are shown in Appendix K.

Table 2-1
Analytical Methods for Waste Disposal Sample—Decontamination Water

Parameter	EPA Testing Method
Volatile Organics (VOCs)	8260A
Semivolatile Organics (SVOCs)	8270B
Explosives	8330
Metals	6010A, 7470, & 7000
Reactive Cyanide	Chapter 7.3, SW-846
Reactive Sulfide	Chapter 7.3, SW-846
Ignitability	1020

Notes:

SVOC semivolatile organic compound
VOC volatile organic compound

2.9.5 Quality Assurance/Quality Control Samples

There were four quality assurance (QA) soil samples that were collected, analyzed, and used to evaluate the precision of the sampling and analysis conducted for the site. Three of the samples were taken from Trench 1 (OBU01S14, OBU01S12, and OBU01S23); the fourth sample was taken from Trench 4 (OBU04S07).

Additional information regarding the QA samples is detailed in Section 8 of this report. All samples were transported to the USACE Chemical Quality Assurance Branch Laboratory of the Waterways Experiment Station for independent analysis under strict C-O-C procedures and in accordance with the QAPP.

The QA replicate soil samples were analyzed for VOCs, SVOCs, explosives, TPH, and metals in accordance with the EPA methods as specified in Section 8 and the QAPP.

2.10 SITE RESTORATION (BACKFILL)

As the confirmation soil sampling and excavation activities for each trench were completed, each trench area was restored to the preconstruction conditions by backfilling each trench with uncontaminated soil and imported base course material as described below. The materials used for backfill of the trenches were excavated material, which was determined through sampling and analysis to be nonhazardous, and base course material (approximately 1,580 tons), which

was imported from off-site sources (Appendix E contains the material tickets summary). Thorough compaction of the backfill was performed with the backhoe bucket; however, there were no specific compaction criteria for the closure project. The backfill materials were brought above grade and sloped away from the trench center; the remainder of the area was returned to its original condition. There was no vegetation of the closed 300-Pound OBU during site restoration, because vegetation of the site was not required by the state-approved Closure Plan (NMED, 1997).

2.11 DECONTAMINATION

All equipment used during the removal of the treatment residuals and soil was decontaminated using a high-pressure steam cleaner. Decontamination took place on a lined pad, and the water from the process was placed in two 55-gallon drums. Approximately 85 gallons of decontamination water were generated as a result of closure activities. A composite sample from the two drums was analyzed in accordance with Section 2.9.4 to determine if the water was hazardous. The water was deemed nonhazardous through comparison of the analytical results to the RCRA regulatory levels for disposal characterization. The decontamination water and other pad materials were disposed of as described in Section 2.7.

2.12 DEMOBILIZATION

Demobilization activities for the closure activities included the following:

- Equipment decontamination
- Site cleanup
- Disposal
- Inventory of investigation derived wastes
- Personnel and equipment demobilization; organization of field records
- Notification to USACE on the site's status
- Final restoration of the project site to its preconstruction condition
- Completion of the Certification of Completion

2.13 FIELD ENGINEERING AND QUALITY CONTROL

Field engineering and QC included the engineering and QC inspections of the construction and the site. Field engineering for the project was performed under the direction of the Construction Site Manager.

FCRs and nonconformance notices were documented when discrepancies concerning constructed elements and associated drawings and specifications occurred. Daily quality control reports (DQCRs) were maintained and submitted to USACE throughout the duration of the project, and therefore, these documents have not been included in this closure report. Exact locations of the trenches were identified and surveyed after completion of the project. This information has been incorporated into the as-constructed plan survey in Appendix A.

The CQC Systems Manager/SHSO performed QC inspections in accordance with the Work Plan (Section 9 of the CQC Plan [Foster Wheeler, 1997]). The CQC Systems Manager/SHSO documented the daily construction activities on the DQCR, which is included in the CQC Plan. The CQC Systems Manager/SHSO issued and maintained FCRs and nonconformance reports, also included within the CQC Plan.

2.14 HEALTH AND SAFETY

Health and safety activities were conducted in accordance with the Basewide Health and Safety Plan (Foster Wheeler, 1995); Foster Wheeler Corporate Health and Safety Program; USACE Safety and Health Requirements Manual (EM 385-1-1); the SSHP, Section 6 of the Work Plan (Foster Wheeler, 1997); and the addendum to the Health and Safety Plan, attached to the DQCR dated February 12, 1998. All employees were responsible for complying with these documents. The Construction Site Manager and the CQC Systems Manager/SHSO were responsible for the proper implementation of these programs and procedures.

3.0 TRENCH 1—CLOSURE ACTIVITIES

Trench 1 was located near the entrance road in the southeast portion of the circular OBA. Closure activities conducted for Trench 1 included removal of all hazardous residuals or constituents, preventing contaminant migration, and sampling and analysis as detailed in Section 2.9. Approximately 50 cy from the 20-ft-by-6-ft-by-11-ft-deep trench were anticipated to be removed during the construction activities as shown in the as-constructed plan survey in Appendix A.

Trench 1 was one of the most recently active trenches prior to closure of the site. Ordnance items destroyed in Trench 1 included: (1) small arms ammunition; (2) cartridge actuated devices from aircraft systems; (3) practice bombs; (4) 20-mm ammunition; (5) 2.75, Hones John, Nike, Zap, Pupfish, and Sergeant rocket motors and components; (6) ignitors; (7) detonators; (8) smoke/illumination signals; (9) propellant; (10) shape charges; (11) dynamite; (12) impulse devices; (13) flares; (14) thermal batteries; (15) gas generators; (16) initiators; (17) detonating cord; and (18) various other explosive/pyrotechnic devices. Trench 1 was not backfilled prior to closure construction and was temporarily covered by sheets of steel plates to prevent wind disturbance or potential infiltration from precipitation.

3.1 FIELD ACTIVITIES

The field procedures specified in Section 2 were used to remove the hazardous residuals and constituents associated with Trench 1. All excavated material was screened, stockpiled, sampled, and properly disposed of. Waste handling and disposal of all materials generated as a result of closure activities at Trench 1 are detailed in Section 3.4. Once confirmation soil sample results demonstrated that the sidewall and bottom samples of the trench had no TRPH detections above the Holloman AFB cleanup goal of 1,000 mg/kg (Section 1.5), excavation ceased and the trench was properly backfilled (Section 2.10). The final estimated volume of material excavated from Trench 1 for the closure activities was approximately 700 cy (650 cy of additional excavation was required).

3.2 SAMPLING AND ANALYSIS

Representative site closure samples were collected from the trench sidewalls, trench bottom, and soil ash material. Samples were also taken from the excavated soil stockpiles (excluding soil ash) at the site. Waste disposal sampling for the project involved the composite sampling of the decontamination water resulting from the project activities (approximately 85 gallons). All samples were collected using the methodology specified in Section 2; laboratory analytical results are provided in Appendices H, I, J, and K.

3.2.1 Site Closure Samples

Fifty-six soil samples were collected in association with Trench 1 and analyzed for VOCs, SVOCs, explosives, TPH, and metals in accordance with the FSP (Foster Wheeler, 1997). Trench excavation and sidewall/bottom sampling were performed in accordance with Sections 1.5, 1.6, 2.4, and 2.9. Due to the presence of contaminant detections above the Holloman AFB cleanup goal for TRPH of 1,000 mg/kg, two additional rounds of sampling (40 additional samples) were required at Trench 1. This additional sampling resulted in approximately 650 cy of additional excavation, which is 325 cy per additional sampling round, or approximately 16 cy for each additional soil sample. A summary of the in-place closure sample analytical results is provided in Appendix J.

3.2.1.1 *Human Health Risk-Based Results*

Table 3-1 presents the comparison of the maximum detected metals concentrations from the Trench 1 in-place soil confirmation samples collected on April 29, 1998, to the Holloman AFB background UTLs. The maximum concentrations of barium, beryllium, chromium, copper, and nickel exceeded the background UTLs. Therefore, these analytes were carried forward in the risk-based assessment. A UTL value was not available for mercury , and therefore, it was also carried into the risk-based assessment. The maximum concentrations of arsenic, lead, and strontium were below the UTL values and further evaluation was not necessary.

None of the maximum concentrations of metals or organic compounds exceeded the human health RBSLs (see Table 3-2). Therefore, further action is not required to meet goals for human health protection.

Table 3-1
Comparison of Maximum Detected Concentrations of Metals to Background UTLs at Trench 1

Analyte	UTL Concentration (mg/kg)	Maximum Concentration (mg/kg)	Maximum Exceeds UTL?
Arsenic	6.8833	2.8	No
Barium	84.3632	84.4	Yes
Beryllium	0.4000	0.55	Yes
Chromium	6.6049	24.4	Yes
Copper	4.8438	10.2	Yes
Lead	8	5.9	No
Mercury	NA	0.15	—
Nickel	5.6125	8.3	Yes
Strontium	3077.1267	2400	No

Notes:

NA Not available
UTL Upper Tolerance Limit

Table 3-2
Comparison of Maximum Detected Analyte Concentrations to RBSLs at Trench 1

Analyte	RBSL (a) (mg/kg)	Maximum Concentration (mg/kg)	Maximum Exceeds RBSL?
Barium	10,000 N	84.4	No
Beryllium	2,200	0.55	No
Chromium (b)	64	24.4	No
Copper	7,000 N	10.2	No
Mercury (c)	11 N	0.15	No
Nickel	3,700 N	8.3	No
Bis(2-ethylhexyl)phthalate	210	1.00	No
Di-n-octylphthalate	2,100 N	0.081	No

Notes:

(a) RBSLs are based on EPA Region 6 Medium-Specific Screening Levels for Human Health (EPA, 1999) for the Industrial Land Use Scenario

(b) RBSL based on Chromium VI because it is the lowest value reported for chromium compounds

(c) RBSL based on methyl mercury because it is the lowest value reported for mercury compounds

N RBSL based on noncarcinogenic effects; the value is the RBSL divided by 10 to account for additive risk from potential exposure to multiple noncarcinogenic chemicals

RBSL Risk-Based Screening Level

mg/kg milligrams per kilogram

3.2.1.2 *Ecological Risk-Based Results*

Table 3-3 presents the comparison of the maximum concentrations of metals exceeding UTLs and organics detected at Trench 1 to the ESVs. Detections of two phthalates reported at Trench 1 were all below the associated ESVs. The maximum concentrations of chromium and mercury exceeded the ESVs. Using the maximum concentration as the EPC provides a very conservative risk estimate because it assumes that the potential receptor is exposed to that concentration 100 percent of the time. As mentioned previously, the 95 percent UCL concentration represents a more realistic representation of the EPC, and therefore, the 95 percent UCL concentrations of chromium and mercury were compared to the ESVs. The mercury 95 percent UCL was less than the ESV, whereas the chromium 95 percent UCL slightly exceeded the ESV. However, chromium is not expected to result in risks to potential ecological receptors for the following reasons:

1) The ESV for chromium is unrealistically conservative because it is based on a bird ingesting earthworms as 100 percent of its diet. Earthworms are not expected to occur at the site or are encountered only infrequently. In addition, the area of soils affected is small and a bird's home range is expected to be significantly larger; therefore, the bird would potentially consume only a fraction of its diet from the site area. Because of the small site size and fairly typical habitat quality, only some individuals of a given species are likely to use the site and thus the general population would not be impacted.
2) Chromium in Trench 1 (maximum concentration of 24.4 mg/kg) is within the range of chromium background values reported for New Mexico and the western United States, and by EPA Region 6. Chromium values from 59 samples taken throughout New Mexico range from 5 to 500 mg/kg and have a mean value of 56 mg/kg (mode and median values both equal 50 mg/kg) (Boerngen and Shacklette, 1981). The mean chromium concentration for the western United States is also 56 mg/kg (Shacklette and Boerngen, 1984). In addition, the regional background value reported by EPA Region 6 is 38 mg/kg (EPA, 1999).

Therefore, based on the ecological risk-based screening, no risk is expected to result to ecological receptors at Trench 1, and no further action is required to protect the environment.

Table 3-3
Comparison of Maximum Detected Analyte Concentrations to ESVs at Trench 1

Analyte	ESV (mg/kg)(a)	Maximum Concentration (mg/kg)	Maximum Exceeds ESV?	95% UCL Exceeds ESV?	
Barium	165	84.4	No	—	—
Beryllium	1.1	0.55	No	—	—
Chromium	16.1 (d)	24.4	Yes	19.9 (f)	Yes *
Copper	40	10.2	No	—	—
Mercury (g)	0.1	0.15	Yes	0.0434 (f)	No
Nickel	30	8.3	No	—	—
Bis(2-ethylhexyl)phthalate	100 (b)	1.00	No	—	—
Di-n-octylphthalate	100 (b)	0.081	No	—	—

Notes:

(a) Values are from Friday (1998) unless cited otherwise

(b) ESV not available; value used is for diethylphthalate which is the lowest phthalate value reported in Friday (1998) or Efroymson et al. (1997a)

(c) Efroymson et al. (1997a)

(d) Value is lowest wildlife value in Efroymson et al. (1997a)

(e) 95% UCL calculated assuming a normal distribution (based on EPA, 1992b).

(f) 95% UCL calculated assuming a normal distribution (based on EPA, 1992b).

(g) ESV based on inorganic mercury because it is the lowest realistic value reported for mercury compounds, see text for discussion.

* See text for discussion

-- UCL not calculated because maximum concentration is less than ESV or NA

ESV Ecological Screening Value

mg/kg milligrams per kilogram

NA not applicable

UCL 95% upper confidence limit on the arithmetic mean (based on EPA, 1992b)

3.2.2 Soil Ash Sample

One soil ash sample was analyzed for TRPH; TCLP metals, VOCs, and SVOCs; corrosivity; reactivity; and ignitability. Table 3-4 presents the summary of analytical results for soil ash. The concentration of TRPH detected (49,000 mg/kg) was above the established Base cleanup goal of 1,000 mg/kg. All analytical detections for Trench 1 are presented in Appendix H, and the complete analytical results for the Trench 1 sampling events are presented in Appendix I.

3.2.3 Soil Stockpile Samples

Two stockpile samples were collected during the excavation activities at Trench 1. Stockpile samples were analyzed for TRPH; TCLP metals, VOCs, and SVOCs; corrosivity; reactivity; and ignitability. One sample (OBU01SP03) had a TRPH detection (10,000 mg/kg) that was above the Base cleanup goal (Table 3-5). All analytical detections for Trench 1 are presented in Appendix H, and the complete analytical results for the detections for Trench 1 sampling events are presented in Appendix I.

3.2.4 Waste Disposal Samples

Decontamination water from the activities at Trench 1 was placed in a 55-gallon drum for characterization and disposal. One composite sample representing the decontamination water from construction activities at all four trenches (Section 2.9.4) was analyzed for VOCs, SVOCs, explosives, metals, reactive cyanide, reactive sulfide, and ignitability. The analytical results were compared to RCRA regulatory levels for disposal characterization, and the decontamination water was determined to be nonhazardous. Analytical results for the decontamination water composite sample are presented in Appendix K.

3.3 SITE RESTORATION

The surface dimensions of the excavated area of Trench 1 were 50 ft by 80 ft, with a maximum depth of 21 ft. The final excavated volume measured approximately 700 cy. The open trench was completely backfilled with excavated clean soil (determined through sampling and analysis), and imported base course as specified in Section 2.10. Once the trench was backfilled, the soil was compacted as specified in Section 2.10. A copy of the completion inspection report is included in Appendix D; the trench excavation and materials summary is included in Appendix L.

Table 3-4
Summary of Soil Ash Samples
Analytical Results at Trench 1

Sample ID: **Sample Date:**		**OBU01SA01** **1/20/98**	
Parameter	**Method[1]**	**Results**	**Action Level**
TRPH	9071/418.1	**49,000 mg/kg**	1,000 mg/kg
TCLP VOCs	1311/8260A	No Detections	200-200,000 µg/L
TCLP SVOCs	1311/8270B	No Detections	130-400,000 µg/L
TCLP Arsenic	1311/6010A	< 25 µg/L	5,000 µg/L
TCLP Barium	1311/6010A	136 µg/L	100,000 µg/L
TCLP Cadmium	1311/6010A	163 µg/L	1,000 µg/L
TCLP Chromium	1311/6010A	96.1 µg/L	5,000 µg/L
TCLP Lead	1311/6010A	55.9 µg/L	5,000 µg/L
TCLP Mercury	1311/7470	< 0.2 µg/L	200 µg/L
TCLP Selenium	1311/6010A	155 µg/L	1,000 µg/L
TCLP Silver	1311/6010A	< 3.7 µg/L	5,000 µg/L
Reactive Cyanide	9010	< 250 mg/kg	250 mg/kg
Reactive Sulfide	9030	< 500 mg/kg	500 mg/kg
Ignitability	1020	> 230 °F	140 °F
Corrosivity	9040	7.1	≤ 2 or ≥ 12.5

Notes:

[1]Method EPA SW-846 Test Methods for Evaluating Solid Waste, Third Edition, 1986
Bolded text indicates a detection above the action level.

°F	degrees Fahrenheit
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
SVOC	semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
TRPH	total recoverable petroleum hydrocarbons
VOC	volatile organic compound

Table 3-5
Summary of Soil Stockpile Samples
Analytical Results at Trench 1

Sample ID:		**OBU01SP03**	**OBU01SP04OC**	
Sample Date:		**1/20/98**	**5/7/98**	
Parameter	**Method[1]**	**Results**	**Results**	**Action Level**
TRPH	9071/418.1	**10,000 mg/kg**	800 mg/kg	1,000 mg/kg
TCLP VOCs	1311/8260A	No Detections	No Detections	200-200,000 µg/L
TCLP SVOCs	1311/8270B	No Detections	No Detections	130-400,000 µg/L
TCLP Arsenic	1311/6010A	< 25 µg/L	< 12 µg/L	5,000 µg/L
TCLP Barium	1311/6010A	98.8 µg/L	272 µg/L	100,000 µg/L
TCLP Cadmium	1311/6010A	4.5 µg/L	4.1 µg/L	1,000 µg/L
TCLP Chromium	1311/6010A	82.8 µg/L	179 µg/L	5,000 µg/L
TCLP Lead	1311/6010A	< 19 µg/L	< 10 µg/L	5,000 µg/L
TCLP Mercury	1311/7470	< 0.2 µg/L	< 1 µg/L	200 µg/L
TCLP Selenium	1311/6010A	152 µg/L	85.7 µg/L	1,000 µg/L
TCLP Silver	1311/6010A	< 3.7 µg/L	< 1.5 µg/L	5,000 µg/L
Reactive Cyanide	9010	< 250 mg/kg	< 250 mg/kg	250 mg/kg
Reactive Sulfide	9030	< 500 mg/kg	< 500 mg/kg	500 mg/kg
Ignitability	1020	> 230 °F	> 230 °F	140 °F
Corrosivity	9040	7.4	7.7	≤ 2 or ≥ 12.5

Notes:

[1]Method EPA SW-846 Test Methods for Evaluating Solid Waste, Third Edition, 1986
Bolded text indicates a detection above the action level.
°F degrees Fahrenheit
µg/L micrograms per liter
mg/kg milligrams per kilogram
SVOC semivolatile organic compound
TCLP Toxicity Characteristic Leaching Procedure
TRPH total recoverable petroleum hydrocarbons
VOC volatile organic compound

3.4 WASTE HANDLING AND DISPOSAL

The contaminated soil ash and stockpiled soil was placed in containers and removed by Rhino Construction for final disposal at their landfill facility in Texas. The separated metallic debris and UXO/OEW was treated and disposed of in accordance with Sections 2.7 and 2.8. CEVC arranged for proper disposal of the material at an EPA-registered TSDF. Decontamination water generated throughout the project (85 gallons) was stored in 55-gallon drums and was determined to be nonhazardous through sampling and analysis. The decontamination water was disposed of on site (Section 2.7).

3.5 CONCLUSIONS AND RECOMMENDATIONS

All soil ash, metallic debris, and UXO/OEW were effectively removed from Trench 1. The clean closure project objectives for TRPH and benzene were also achieved through the complete removal of contaminated soil with concentrations exceeding the established Holloman AFB cleanup goals for these constituents. A risk-based closure was achieved for metals, VOCs, and SVOCs as described in Section 3.2.1. Closure was achieved through the performance of proper backfilling techniques, collection of 40 additional soil samples, excavation of an additional 655 cy, and the thermal treatment/disposal of suspect/unsafe UXO materials from the trench. As a result, there are no post-closure care monitoring requirements for Trench 1, because (1) clean closure criteria for TRPH and benzene were achieved and (2) no hazardous waste constituents remain that are above the risk-based closure criteria for metals, other VOCs, or SVOCs. The need for further site maintenance is therefore minimized.

4.0 TRENCH 2—CLOSURE ACTIVITIES

Trench 2 was located approximately 20 ft south of Trench 1 within the circular OBA. Closure activities for Trench 2 included removing all hazardous residuals or constituents, preventing contaminant migration, and sampling and analysis as detailed in Section 2.9. It was anticipated that approximately 50 cy from the 20-ft-by-6-ft-by-11-ft deep trench would be removed during the construction activities as shown on the as-constructed plan survey in Appendix A.

Trench 2 was also one of the most recently active trenches at the site prior to closure activities. The ordnance items destroyed in Trench 2 were the same as those that were destroyed in Trench 1. Trench 2 was not backfilled prior to closure construction and was temporarily covered by sheets of steel plate to prevent wind disturbance or potential infiltration from precipitation.

4.1 FIELD ACTIVITIES

The field procedures specified in Section 2 were used to remove the hazardous residuals and constituents associated with Trench 2. All excavated material was screened, stockpiled, sampled, and properly disposed of. Waste handling and disposal of all materials generated as a result of closure activities at Trench 2 are detailed in Section 4.4. Once confirmation soil sample results demonstrated that the sidewall and bottom samples of the trench had no TRPH detections above the Holloman AFB cleanup goal of 1,000 mg/kg (Section 1.5), excavation ceased and the trench was properly backfilled (Section 2.10). The final estimated volume of material excavated from Trench 2 for the closure activities was approximately 1,220 cy (1,170 cy of additional excavation was required).

4.2 SAMPLING AND ANALYSIS

Representative site closure samples were collected from the trench sidewalls, trench bottom, and soil ash material. Samples were taken from the excavated soil stockpiles (excluding soil ash) at the site. Waste disposal sampling for the project involved the composite sampling of the decontamination water resulting from the project activities (approximately 85 gallons). All samples were collected using the methodology specified in Section 2.9; laboratory analytical results are provided in Appendices H, I, J, and K. Tables 4-1 and 4-2 summarize the analytical results for soil ash and stockpile sampling events, respectively.

Table 4-1
Summary of Soil Ash Samples
Analytical Results at Trenches 2 and 3

Sample ID: **Sample Date:**		**OBU0203SA01** **2/19/98**	
Parameter	**Method[1]**	**Results**	**Action Level**
TRPH	9071/418.1	**19,000 mg/kg**	1,000 mg/kg
TCLP VOCs	1311/8260A	No Detections	200-200,000 µg/L
TCLP SVOCs	1311/8270B	No Detections	130-400,000 µg/L
TCLP Arsenic	1311/6010A	29.5 µg/L	5,000 µg/L
TCLP Barium	1311/6010A	160 µg/L	100,000 µg/L
TCLP Cadmium	1311/6010A	67.1 µg/L	1,000 µg/L
TCLP Chromium	1311/6010A	96.3 µg/L	5,000 µg/L
TCLP Lead	1311/6010A	<19 µg/L	5,000 µg/L
TCLP Mercury	1311/7470	< 1 µg/L	200 µg/L
TCLP Selenium	1311/6010A	84.7 µg/L	1,000 µg/L
TCLP Silver	1311/6010A	< 3.7 µg/L	5,000 µg/L
Reactive Cyanide	9010	< 250 mg/kg	250 mg/kg
Reactive Sulfide	9030	< 500 mg/kg	500 mg/kg
Ignitability	1020	> 230 °F	140 °F
Corrosivity	9040	7.1	≤ 2 or ≥ 12.5

Notes:

[1]Method EPA SW-846 Test Methods for Evaluating Solid Waste, Third Edition, 1986
Bolded text indicates a detection above the action level.

°F	Degrees Fahrenheit
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
TCLP	Toxicity Characteristic Leaching Procedure
TRPH	total recoverable petroleum hydrocarbons
SVOC	semivolatile organic compound
VOC	volatile organic compound

Table 4-2
Summary of Soil Stockpile Samples
Analytical Results at Trench 2

Sample ID: **Sample Date:**		**OBU02SP** **2/19/98**	**OBU02SP02OC** **5/7/98**	
Parameter	**Method[1]**	**Results**	**Results**	**Action Level**
TRPH	9071/418.1	**2,500 mg/kg**	710 mg/kg	1,000 mg/kg
TCLP VOCs	1311/8260A	No Detections	No Detections	200-200,000 µg/L
TCLP SVOCs	1311/8270B	No Detections	No Detections	130-400,000 µg/L
TCLP Arsenic	1311/6010A	< 25 µg/L	< 12 µg/L	5,000 µg/L
TCLP Barium	1311/6010A	165 µg/L	135 µg/L	100,000 µg/L
TCLP Cadmium	1311/6010A	< 1.9 µg/L	82 µg/L	1,000 µg/L
TCLP Chromium	1311/6010A	91.5 µg/L	93 µg/L	5,000 µg/L
TCLP Lead	1311/6010A	35.6 µg/L	< 10 µg/L	5,000 µg/L
TCLP Mercury	1311/7470	< 1 µg/L	< 1 µg/L	200 µg/L
TCLP Selenium	1311/6010A	150 µg/L	70.6 µg/L	1,000 µg/L
TCLP Silver	1311/6010A	< 3.7 µg/L	< 1.5 µg/L	5,000 µg/L
Reactive Cyanide	9010	< 250 mg/kg	< 250 mg/kg	250 mg/kg
Reactive Sulfide	9030	< 500 mg/kg	< 500 mg/kg	500 mg/kg
Ignitability	1020	> 230 °F	> 230 °F	140 °F
Corrosivity	9040	7.4	7.7	≤ 2 or ≥ 12.5

Notes:

[1]Method EPA SW-846 Test Methods for Evaluating Solid Waste, Third Edition, 1986
Bolded text indicates a detection above the action level.

°F degrees Fahrenheit
µg/L micrograms per liter
mg/kg milligrams per kilogram
SVOC semivolatile organic compound
TCLP Toxicity Characteristic Leaching Procedure
TRPH total recoverable petroleum hydrocarbons
VOC volatile organic compound

4.2.1 Site Closure Samples

Thirty-six soil samples were collected during the excavation activities at Trench 2 and analyzed for TPH in accordance with the Work Plan (Foster Wheeler, 1997). Trench excavation and sidewall/bottom sampling were performed in accordance with Sections 1.5, 1.6, 2.4, and 2.9. Due to TRPH detections above the Holloman AFB cleanup goal of 1,000 mg/kg, one additional round of sampling (20 additional samples) was required for the determination of closure at Trench 2. This additional sampling resulted in approximately 1,170 cy of additional excavation, which equates to approximately 58.5 cy per each additional soil sample. Appendix J contains the analytical results for the in-place site closure samples collected at Trench 2. Evaluation of closure criteria at Trench 2 for benzene, metals, and organics was performed in accordance with the closure assessment at Trench 1, as described in Sections 2.9 and 3.2.1.

4.2.2 Soil Ash Sample

The soil ash sample associated with Trench 2 was one composite sample of soil ash from both Trench 2 and Trench 3. The composite sample was analyzed for TRPH; TCLP metals, VOCs and SVOCs; corrosivity; reactivity; and ignitability. The summary of analytical results for soil ash is presented in Table 4-1. The concentration of TRPH in sample OBU0203SA01(19,000 mg/kg) was detected above the Base cleanup goal of 1,000 mg/kg for the site. All analytical detections for Trench 2 are presented in Appendix H, and the complete analytical results for the Trench 2 sampling events are presented in Appendix I

4.2.3 Soil Stockpile Samples

Two stockpile samples were collected during the excavation activities at Trench 2 and analyzed for TRPH; TCLP metals, VOCs, and SVOCs; corrosivity; reactivity; and ignitability. One sample (OBU02SP) had a TRPH detection (2,500 mg/kg) that was above the Base cleanup goal (shown in Table 4-2). All analytical detections for Trench 2 are presented in Appendix H, and the complete analytical results for the Trench 2 sampling events are presented in Appendix I.

4.2.4 Waste Disposal Samples

Decontamination water from the activities at Trench 2 was placed in a 55-gallon drum for characterization and disposal. One composite sample representing the decontamination water from construction activities at all four trenches (Section 2.9.4) was analyzed for VOCs, SVOCs,

explosives, metals, reactive cyanide, reactive sulfide, and ignitability. The analytical results were compared to RCRA regulatory levels for disposal characterization, and the decontamination water was determined to be nonhazardous. Analytical results for the decontamination water composite sample are presented in Appendix K.

4.3 SITE RESTORATION

The surface dimensions of Trench 2 were 80 ft by 91 ft, with a maximum depth of 38 ft. The areal extent of the bottom of the excavated area measured 10 ft by 20 ft, and the final excavated volume of Trench 2 was approximately 1,220 cy. The open trench was completely backfilled with excavated clean soil (determined through sampling and analysis) and imported base course as specified in Section 2.10. Once the trench was backfilled, the soil was compacted as specified in Section 2.10. A copy of the completion inspection report is included in Appendix D, and the trench excavation and materials summary is included in Appendix L.

4.4 WASTE HANDLING AND DISPOSAL

The contaminated soil ash and stockpiled soil was placed in containers and removed by Rhino Construction for final disposal in their landfill facility in Texas. The separated metallic debris and UXO/OEW was treated and disposed of in accordance with Sections 2.7 and 2.8. CEVA arranged for proper disposal of the material at an EPA-registered TSDF. Decontamination water generated throughout the project (85 gallons) was stored in 55-gallon drums and determined to be nonhazardous through analytical sampling. The decontamination water was disposed of on site (Section 2.7).

4.5 CONCLUSIONS AND RECOMMENDATIONS

All soil ash, metallic debris, and UXO/OEW was effectively removed from Trench 2. The clean closure project objectives for TRPH and benzene were also achieved through the complete removal of contaminated soil with concentrations exceeding the established Holloman AFB cleanup goals for these constituents. A risk-based closure was achieved for metals, VOCs, and SVOCs as described in Section 4.2.1. Closure was achieved through the performance of proper backfilling techniques; collection of 20 additional soil samples; excavation of an additional 1,220 cy; and the thermal treatment/disposal of suspect/unsafe UXO materials from the trench. As a result, there are no post-closure care monitoring requirements for Trench 2, because (1) clean

closure criteria for TRPH and benzene were achieved and (2) no hazardous waste constituents remain that are above the risk-based closure criteria for metals, other VOCs, and SVOCs. The need for further site maintenance is therefore minimized.

5.0 TRENCH 3—CLOSURE ACTIVITIES

Trench 3 was located approximately 265 ft to the north of Trench 1 within the cleared, circular OBA. Closure activities for Trench 3 included removing all hazardous residuals or constituents, preventing contaminant migration, and sampling and analysis as detailed in Section 2.9. Trench 3 had been completely backfilled prior to closure construction and, therefore, the exact location of Trench 3 was determined during the field closure activities. For the closure activities, it was assumed that Trench 3 contained the same thermally treated materials as found in Trenches 1 and 2. Approximately 50 cy (20 ft by 6 ft by 11 ft deep) of material was anticipated to be removed from Trench 3 during the construction activities, as shown on the as-constructed plan survey in Appendix A.

5.1 FIELD ACTIVITIES

The field procedures specified in Section 2 were used to remove the hazardous residuals and constituents associated with Trench 3. All excavated material was screened, stockpiled, sampled, and properly disposed of. Waste handling and disposal of all materials generated as a result of closure activities at Trench 3 are detailed in Section 5.4. Once confirmation soil sample results demonstrated that the sidewall and bottom samples of the trench had no TRPH detections above the Holloman AFB cleanup goal of 1,000 mg/kg (Section 1.5), excavation ceased and the trench was properly backfilled (Section 2.10). The final estimated volume of material excavated from Trench 3 for the closure activities was approximately 1,205 cy (1,155 cy of additional excavation was required).

5.2 SAMPLING AND ANALYSIS

Representative site closure samples were collected from the trench sidewalls, trench bottom, and soil ash material. Soil samples were taken from the excavated soil stockpiles (excluding soil ash) at the site. Waste disposal sampling for the project involved the composite sampling of the decontamination water resulting from the project activities (approximately 85 gallons). All samples were collected using the methodology specified in Section 2.9; laboratory analytical results are provided in Appendices H, I, J, and K. Tables 4-1 and 5-1 summarize the analytical results for soil ash (composite sample for Trenches 2 and 3) and soil stockpile sampling events respectively.

Table 5-1
Summary of Soil Stockpile Samples
Analytical Results at Trench 3

Sample ID: **Sample Date:**		**OBU03SP01** **2/19/98**	**OBU03SP02** **2/19/98**	**OBU03SP03** **2/19/98**	
Parameter	**Method[1]**	**Results**	**Results**	**Results**	**Action Level**
TRPH	9071/418.1	**2,000 mg/kg**	**1,700 mg/kg**	**2,700 mg/kg**	1,000 mg/kg
TCLP VOCs	1311/8260A	No Detections	No Detections	No Detections	200-200,000 µg/L
TCLP SVOCs	1311/8270B	No Detections	No Detections	No Detections	130-400,000 µg/L
TCLP Arsenic	1311/6010A	< 25 µg/L	< 25 µg/L	< 25 µg/L	5,000 µg/L
TCLP Barium	1311/6010A	131 µg/L	108 µg/L	130 µg/L	100,000 µg/L
TCLP Cadmium	1311/6010A	< 1.9 µg/L	8.7 µg/L	7.1 µg/L	1,000 µg/L
TCLP Chromium	1311/6010A	90.6 µg/L	93.2 µg/L	93.3 µg/L	5,000 µg/L
TCLP Lead	1311/6010A	< 19 µg/L	55 µg/L	< 19 µg/L	5,000 µg/L
TCLP Mercury	1311/7470	< 1 µg/L	< 1 µg/L	< 1 µg/L	200 µg/L
TCLP Selenium	1311/6010A	104 µg/L	74 µg/L	116 µg/L	1,000 µg/L
TCLP Silver	1311/6010A	< 3.7 µg/L	< 3.7 µg/L	< 3.7 µg/L	5,000 µg/L
Reactive Cyanide	9010	< 250 mg/kg	< 250 mg/kg	< 250 mg/kg	250 mg/kg
Reactive Sulfide	9030	< 500 mg/kg	< 500 mg/kg	< 500 mg/kg	500 mg/kg
Ignitability	1020	> 230 °F	> 230 °F	> 230 °F	140 °F
Corrosivity	9040	7.4	7.4	7.1	≤ 2 or ≥ 12.5

Notes:

[1]Method EPA SW-846 Test Methods for Evaluating Solid Waste, Third Edition, 1986
Bolded text indicates a detection above the action level.

°F degrees Fahrenheit
µg/L micrograms per liter
mg/kg milligrams per kilogram
SVOC semivolatile organic compound
TCLP Toxicity Characteristic Leaching Procedure
TRPH total recoverable petroleum hydrocarbons
VOC volatile organic compound

5.2.1 Site Closure Samples

Thirty-six soil samples and one composite soil ash sample were collected during the excavation activities at Trench 3 and analyzed for TPH in accordance with the Work Plan (Foster Wheeler, 1997). Trench excavation and sidewall/bottom sampling was performed in accordance with Sections 1.5, 1.6, 2.4, and 2.9. As a result of TRPH detections above the Holloman AFB cleanup goal of 1,000 mg/kg, one additional round of sampling (20 additional samples) was required for the determination of closure at Trench 3. This additional sampling resulted in approximately 1,155 cy of additional excavation, which equated to approximately 58 cy per each additional soil sample. Appendix J contains the analytical results for the in-place site closure samples collected at Trench 3. Evaluation of closure criteria at Trench 3 was performed for benzene, TRPH, metals and organics in accordance with the closure assessment at Trench 1, as described in Sections 2.9 and 3.2.1.

5.2.2 Soil Ash Sample

The soil ash sample associated with Trench 3 was one composite sample of soil ash from both Trenches 2 and 3. The composite sample was analyzed for TRPH; TCLP metals, VOCs, and SVOCs; corrosivity; reactivity; and ignitability. The summary of analytical results for soil ash is presented in Table 4-1. Only the concentration of TRPH in sample OBU0203SA01 (19,000 mg/kg) was above the Base cleanup goal for the site. All analytical detections for Trench 3 are presented in Appendix H, and the complete analytical results for the Trench 3 sampling events are presented in Appendix I.

5.2.3 Soil Stockpile Samples

Three stockpile samples were collected during the excavation activities at Trench 3 and analyzed for TRPH; TCLP metals, VOCs, and SVOCs; corrosivity; reactivity; and ignitability. TRPH was detected in all three samples (2,000 mg/kg; 1,700 mg/kg; and 2,700 mg/kg) above the Base cleanup goals (Table 5-1). All analytical detections for Trench 3 are presented in Appendix H, and the complete analytical results for the Trench 3 sampling events are presented in Appendix I.

5.2.4 Waste Disposal Samples

Decontamination water from the activities at Trench 3 was placed in a 55-gallon drum for characterization and disposal. One composite sample representing the decontamination water

from construction activities at all four trenches (Section 2.9.4) was analyzed for VOCs, SVOCs, explosives, metals, reactive cyanide, reactive sulfide, and ignitability. The analytical results were compared to RCRA regulatory levels for disposal characterization, and the decontamination water was determined to be nonhazardous. Analytical results for the decontamination water composite sample are presented in Appendix K.

5.3 SITE RESTORATION

The surface dimensions of Trench 3 were 70 ft by 107 ft, with a maximum depth of 24 ft. The areal extent of the bottom of the excavated area measured 30 ft by 45 ft, and the final excavated volume of Trench 3 was approximately 1,205 cy. The open trench was completely backfilled with excavated clean soil (determined through sampling and analysis) and imported base course as specified in Section 2.10. Once the trench was backfilled, the soil was compacted as specified in Section 2.10. A copy of the completion inspection report is included in Appendix D; the trench excavation and materials summary is included in Appendix L.

5.4 WASTE HANDLING AND DISPOSAL

The contaminated soil ash and stockpiled soil was placed in containers and removed by Rhino Construction for final disposal in their landfill facility in Texas. The separated metallic debris and UXO/OEW was treated and disposed of in accordance with Sections 2.7 and 2.8. CEVC arranged for proper disposal of the material at an EPA-registered TSDF. Decontamination water generated throughout the project (85 gallons) was stored in 55-gallon drums and determined to be nonhazardous through analytical sampling. The decontamination water was disposed of on site (Section 2.7).

5.5 CONCLUSIONS AND RECOMMENDATIONS

All soil ash, metallic debris, and UXO/OEW was effectively removed from Trench 3. The clean closure project objectives for TRPH and benzene were also achieved through the complete removal of contaminated soil with concentrations exceeding the established Holloman AFB cleanup goals for these constituents. A risk-based closure was achieved for metals, VOCs, and SVOCs as described in Section 5.2.1. Closure was achieved through the performance of proper backfilling techniques, collection of 20 additional soil samples; excavation of an additional 1,210 cy; and the thermal treatment/disposal of suspect/unsafe UXO materials from the trench.

As a result, there are no post-closure care monitoring requirements for Trench 3, because (1) clean closure criteria were achieved for TRPH and benzene and (2) no hazardous waste constituents remain that are above the risk-based closure criteria for metals, other VOCs, and SVOCs. The need for further site maintenance is therefore minimized.

6.0 TRENCH 4—CLOSURE ACTIVITIES

Trench 4 is located approximately 300 ft east of the cleared, circular OBA. Closure activities for Trench 4 included removal of all hazardous residuals or constituents, preventing contaminant migration, and sampling and analysis as detailed in Section 2.9. Prior to construction, there was no record of disposed materials or trench contents for Trench 4. From the variety of debris that was visible in the open portions of Trench 4, it was assumed that the trench was used for general disposal in addition to disposal of UXO/OEW materials. The anticipated volume of material to be removed from the 60-ft-by-6-ft-by-12-ft-deep trench during the construction activities was approximately 160 cy as shown on the as-constructed plan survey in Appendix A.

6.1 FIELD ACTIVITIES

The field procedures specified in Section 2 were used to remove the hazardous residuals and constituents associated with Trench 4. All excavated material was screened, stockpiled, sampled, and properly disposed of. Waste handling and disposal of all materials generated as a result of closure activities at Trench 4 are detailed in Section 6.4. Once confirmation soil sample results demonstrated that the sidewall and bottom samples of the trench had no TRPH detections above the established Base clean up goal of 1,000 mg/kg (Section 1.5), excavation ceased and the trench was properly backfilled (Section 2.10). The final estimated volume of material excavated from Trench 4 for the closure activities was approximately 355 cy (195 cy of additional excavation was required).

On February 6, 1998, the operations at the site were shut down and all personnel evacuated from the area after UXO screening personnel found a "radiation tag" in the excavated material from Trench 4. A radiological investigation was performed, and no radioactive materials were identified in the area. In addition, an addendum to the existing SSHP (in Section 6 of the Work Plan ([Foster Wheeler, 1997]), which addressed the radiological issues at the site, was prepared and submitted on February 12, 1998 (addendum was an attachment to the DQCR dated February 12, 1998). All field personnel received radiation safety training, and an FCR for the out-of-scope work (addendum to SSHP and radiation safety training) was prepared, submitted, and approved on February 12, 1998 (see Appendix B). Normal operations at the site resumed, with the additional procedure of performing hourly radiation surveys of the excavated material,

equipment, and personnel each working day. The radiation surveys found no radioactive material at the site during the remainder of the remedial activities.

Additionally, approximately 2,000 pounds (four 55-gallon drums) of lead-contaminated soil was located at Trench 4 during soil ash sampling. Laidlaw Environmental Services properly disposed of the material in strict accordance with the Work Plan (Foster Wheeler, 1997). No additional lead-contaminated soil was found during the remainder of the excavation and closure activities.

6.2 SAMPLING AND ANALYSIS

Representative site closure samples were collected from the trench sidewalls, trench bottom, and soil ash material. Soil samples were taken from the excavated soil stockpiles (excluding soil ash) at the site. Waste disposal sampling for the project involved the composite sampling of the decontamination water resulting from the project activities (approximately 85 gallons). All samples were collected using the methodology specified in Section 2.9; laboratory analytical results are provided in Appendices H, I, J, and K.

6.2.1 Site Closure Samples

Twenty-two in-place soil samples were collected during the excavation activities at Trench 4 and analyzed for VOCs, SVOCs, explosives, TRPH, and metals in accordance with the FSP (Foster Wheeler, 1997). Trench excavation and sidewall/bottom sampling was performed in accordance with Sections 1.5, 1.6, 2.4, and 2.9. Since there were no contaminant detections above the established Base cleanup goals for TRPH, no additional sampling at Trench 4 was required. A summary of the in-place closure sample analytical results is provided in Appendix J.

6.2.1.1 *Human Health Risk-Based Results*

Table 6-1 presents the comparison of the maximum detected metals concentrations from the in-place soil confirmation samples collected on March 9 and 10, 1998, to the Holloman AFB background UTLs. The maximum concentrations of barium, beryllium, cadmium, chromium, copper, lead, nickel, and silver exceed the background UTLs. Therefore, these analytes were carried forward in the risk-based assessment. A UTL value is not available for mercury, and therefore, it was also carried into the risk-based assessment. Arsenic and strontium were less than the UTLs and further evaluation was not necessary.

Table 6-1
Comparison of Maximum Detected Concentrations of Metals to Background UTLs at Trench 4

Analyte	UTL Concentration (mg/kg)	Maximum Concentration (mg/kg)	Maximum Exceeds UTL?
Arsenic	6.8833	3.2	No
Barium	84.3632	340	Yes
Beryllium	0.4000	0.48	Yes
Cadmium	1.0359	5.9	Yes
Chromium	6.6049	25	Yes
Copper	4.8438	59.4	Yes
Lead	8	17.2	Yes
Mercury	NA	0.09	—
Nickel	5.6125	9.2	Yes
Silver	0.7342	26.5	Yes
Strontium	3077.1267	840	No

Notes:

mg/kg milligrams per kilogram
NA Not available
UTL Upper Tolerance Limit

None of the maximum concentrations of metals or organic compounds exceeded the human health RBSLs (see Table 6-2). Therefore, further action is not required to meet goals for human health protection.

6.2.1.2 *Ecological Risk-Based Results*

Table 6-3 presents the comparison of the maximum concentrations of metals exceeding UTLs and organics detected at Trench 4 to the ESVs. Detections of three phthalates reported at Trench 4 were all below their associated ESVs. ESVs were not available for 2,4-dinitrotoluene, and N-nitrosodiphenylamine; therefore, comparisons could not be made. However, these compounds are not expected to pose risk to ecological receptors because the maximum concentrations are well below the human health RBSLs and the chemicals were detected infrequently. N-nitrosodiphenylamine and 2,4-dinitrotoluene were detected in only 2 of 22 samples.

The maximum concentrations of barium, cadmium, chromium, copper, and silver exceeded the ESV values. The 95 percent UCL concentrations for these analytes were further compared to the ESVs and only chromium exceeded the ESV, by a very slight margin. As discussed above for Trench 1, chromium is not expected to result in adverse risks to ecological receptors because the ESV is based on very conservative assumptions and because chromium is within the background concentrations reported for New Mexico and the western United States and by EPA Region 6 (see Trench 1 discussion). Therefore, based on the ecological risk-based screening, no risk is expected to result to ecological receptors at Trench 4, and no further action is required to protect the environment.

6.2.2 Soil Ash Samples

The five soil ash samples taken from Trench 4 were analyzed for TRPH; TCLP metals, VOCs, and SVOCs; corrosivity; reactivity; and ignitability. The summary of analytical results for soil ash is presented in Table 6-4. Only sample OBU04SA01 had a detection of TCLP lead (10,400 micrograms per liter [µg/L]) above the established action levels of 5,000 µg/L for the site. All analytical detections for Trench 4 are presented in Appendix H, and the complete analytical results for the Trench 4 sampling events are presented in Appendix I.

Table 6-2
Comparison of Maximum Detected Analyte Concentrations to RBSLs at Trench 4

Analyte	RBSL (a) (mg/kg)	Maximum Concentration (mg/kg)	Maximum Exceeds RBSL?
Barium	10,000 N	340	No
Beryllium	2,200	0.48	No
Cadmium	93 N	5.9	No
Chromium (b)	64	25	No
Copper	7,000 N	59.4	No
Lead	200 N	17.2	No
Mercury (c)	11 N	0.09	No
Nickel	3,700 N	9.2	No
Silver	940 N	26.5	No
Bis(2-ethyhexyl)phthalate	210	2.8	No
Diethylphthalate	10,000 N	0.54	No
Di-n-butylphthalate	10,000 N	2.1	No
2,4-Dinitrotoluene	210 N	1.1	No
Methylene chloride	20	0.55	No
N-nitrosodiphenylamine	610	0.57	No

Notes:

(a) RBSLs are based on EPA Region 6 Medium-Specific Screening Levels for Human Health (EPA, 1999) for the Industrial Land Use Scenario

(b) RBSL based on Chromium VI because it is the lowest value reported for chromium compounds

(c) RBSL based on methyl mercury because it is the lowest value reported for mercury compounds

N RBSL based on noncarcinogenic effects; the value is the RBSL divided by 10 to account for additive risk from potential exposure to multiple noncarcinogenic chemicals

RBSL Risk-Based Screening Level

mg/kg milligrams per kilogram

Table 6-3
Comparison of Maximum Detected Analyte Concentrations to ESVs at Trench 4

Analyte	ESV (mg/kg)(a)	Maximum Concentration (mg/kg)	Maximum Exceeds ESV?	95% UCL Exceeds ESV?	
Barium	165	340	Yes	111 (f)	No
Beryllium	1.1	0.48	No	—	—
Cadmium	1.6	5.9	Yes	1.11 (e)	No
Chromium	16.1 (d)	25	Yes	16.4 (f)	Yes *
Copper	40	59.4	Yes	17.8 (e)	No
Lead	40.5 (c)	17.2	No	—	—
Mercury (g)	0.1	0.09	No	—	—
Nickel	30	9.2	No	—	—
Silver	2.0	26.5	Yes	1.38 (e)	No
Bis(2-ethyhexyl)phthalate	100 (b)	2.8	No	—	—
Diethylphthalate	100		No	—	—
Di-n-butylphthalate	200	0.54	No	—	—
2,4-Dinitrotoluene	NA	2.1	NA	—	—
Methylene chloride	2.0	1.1	No	—	—
N-nitrosodiphenylamine	NA	0.57	NA	—	—

Notes:

(a) Values are from Friday (1998) unless cited otherwise

(b) ESV not available; value used is for diethylphthalate which is the lowest phthalate value reported in Friday (1998) or Efroymson et al. (1997a)

(c) Efroymson et al. (1997a)

(d) Value is lowest wildlife value in Efroymson et al. (1997a)

(e) 95% UCL calculated assuming a normal distribution (based on EPA, 1992b).

(f) 95% UCL calculated assuming a normal distribution (based on EPA, 1992b).

(g) ESV based on inorganic mercury because it is the lowest realistic value reported for mercury compounds; see text for discussion.

* See text for discussion

-- UCL not calculated because maximum concentration is less than ESV or NA

ESV Ecological Screening Value

mg/kg milligrams per kilogram

NA not applicable

UCL 95% upper confidence limit on the arithmetic mean (based on EPA, 1992b)

Table 6-4
Summary of Soil Ash Samples
Analytical Results at Trench 4

Sample ID:		**OBU04SA 01**	**OBU04SA 02**	**OBU04SA 03**	**OBU04S A03A**	**OBU04S A03B**	
Sample Date:		**3/10/98**	**3/10/98**	**3/10/98**	**4/17/98**	**4/16/98**	
Parameter	**Method[1]**	**Results**	**Results**	**Results**	**Results**	**Results**	**Action Level**
TRPH	9071/418.1	<20 mg/kg	<20 mg/kg	<20 mg/kg	NA	NA	1,000 mg/kg
TCLP VOCs	1311/8260A	No Detections	No Detections	No Detections	No Detections	No Detections	200-200,000 µg/L
TCLP SVOCs	1311/8270B	No Detections	No Detections	No Detections	No Detections	No Detections	130-400,000 µg/L
TCLP Arsenic	1311/6010A	< 25 µg/L	< 130 µg/L	< 130 µg/L	< 23 µg/L	< 23 µg/L	5,000 µg/L
TCLP Barium	1311/6010A	261 µg/L	160 µg/L	294 µg/L	185 µg/L	190 µg/L	100,000 µg/L
TCLP Cadmium	1311/6010A	321 µg/L	60 µg/L	74.5 µg/L	6.4 µg/L	5.9 µg/L	1,000 µg/L
TCLP Chromium	1311/6010A	170 µg/L	118 µg/L	134 µg/L	94.4 µg/L	95.7 µg/L	5,000 µg/L
TCLP Lead	1311/6010A	**10,400 µg/L**	159 µg/L	1,820 µg/L	<20 µg/L	< 20 µg/L	5,000 µg/L
TCLP Mercury	1311/7470	< 1 µg/L	< 1 µg/L	< 1 µg/L	< 1 µg/L	< 1 µg/L	200 µg/L
TCLP Selenium	1311/6010A	33 µg/L	222 µg/L	196 µg/L	31.2 µg/L	< 30 µg/L	1,000 µg/L
TCLP Silver	1311/6010A	< 3.7 µg/L	< 19 µg/L	< 19 µg/L	< 3 µg/L	< 3 µg/L	5,000 µg/L
Reactive Cyanide	9010	< 250 mg/kg	< 250 mg/kg	< 250 mg/kg	NA	NA	250 mg/kg
Reactive Sulfide	9030	< 500 mg/kg	< 500 mg/kg	< 500 mg/kg	NA	NA	500 mg/kg
Ignitability	1020	> 230 °F	> 230 °F	> 230 °F	NA	NA	140 °F
Corrosivity	9040	7.2	7.3	7.4	NA	NA	≤ 2 or ≥ 12.5

Notes:
[1]Method EPA SW-846 Test Methods for Evaluating Solid Waste, Third Edition, 1986
Bolded text indicates a detection above the action level.

°F degrees Fahrenheit
µg/L micrograms per liter
mg/kg milligrams per kilogram
NA not analyzed
SVOC semivolatile organic compound
TCLP Toxicity Characteristic Leaching Procedure
TRPH total recoverable petroleum hydrocarbons
VOC volatile organic compound

6.2.3 Soil Stockpile Samples

During the construction activities, it was discovered that Trench 4 contained only soil ash, metallic debris, and UXO/OEW materials. Since there was no significant amount of soil material removed for stockpiling during the excavation activities, no stockpile samples were obtained.

6.2.4 Waste Disposal Samples

Decontamination water from the activities at Trench 4 was placed in a 55-gallon drum for characterization and disposal. One composite sample representing the decontamination water from construction activities at all four trenches (Section 2.9.4) was analyzed for VOCs, SVOCs, explosives, metals, reactive cyanide, reactive sulfide, and ignitability. The analytical results were compared to RCRA regulatory levels for disposal characterization, and the decontamination water was determined to be nonhazardous. Analytical results for the decontamination water composite sample are presented in Appendix J.

6.3 SITE RESTORATION

The final excavated volume of Trench 4 was approximately 355 cy (14.5 ft by 107 ft by 6 ft deep). The open trench was completely backfilled with excavated clean soil (determined through sampling and analysis) and imported base course as specified in Section 2.10. Once the trench was backfilled, the soil was compacted as specified in Section 2.10. A copy of the completion inspection report is included in Appendix D; the trench excavation and materials summary is included in Appendix L.

6.4 WASTE HANDLING AND DISPOSAL

The contaminated soil ash and stockpiled soil was placed in containers and removed by Rhino Construction for final disposal in their landfill facility in Texas. The separated metallic debris and UXO/OEW was treated and disposed of in accordance with Sections 2.7 and 2.8. CEVC arranged for proper disposal of the material at an EPA-registered TSDF. Decontamination water generated throughout the project (85 gallons) was stored in 55-gallon drums and determined to be nonhazardous through analytical sampling. The decontamination water was disposed of on site (Section 2.7). Laidlaw Environmental Services properly disposed of the additional lead-

contaminated material (approximately 2,000 pounds) in strict accordance with the Work Plan (Foster Wheeler, 1997).

6.5 CONCLUSIONS AND RECOMMENDATIONS

All soil ash, metallic debris, and UXO/OEW was effectively removed from Trench 4. The clean closure project objectives for TRPH and benzene were also achieved through the complete removal of contaminated soil exceeding the established Holloman AFB cleanup goals for these constituents. A risk-based closure was achieved for metals, VOCs, SVOCs, as described in Section 6.2.1. Closure was achieved through the performance of radiation training and hourly radiation surveys, accurate delineation/disposal of lead-contaminated soils, proper backfilling techniques, excavation of an additional 185 cy, and the thermal treatment/disposal of suspect/unsafe UXO materials from the trench. As a result, there are no post-closure care monitoring requirements for Trench 4, because (1) clean closure criteria for TRPH and benzene were achieved and (2) no hazardous waste constituents remain that are above the risk-based criteria for metals, VOCs, or SVOCs. The need for further site maintenance is therefore minimized.

7.6 SITE INSPECTION QUALITY CONTROL REPORTS

The initial inspection report (completed February 2, 1998) and inspection checklist (completed January 12, 1998) are provided in Appendix F. The erosion and sediment control inspection checklists for the project were not required, because it was agreed, prior to construction activities, that the existing berm around the site was sufficient for erosion and sediment control for the project.

8.0 DATA QUALITY CONTROL REPORT

The analytical program in support of risk-based closure of the 300-Pound OBU consisted of chemical testing performed by Laucks Testing Laboratories, Seattle, Washington. Analytical methods for chemical analysis were taken from the latest revision of EPA Test Methods for Evaluating Solid Waste, SW-846 Third Edition (EPA, 1986); EPA Methods for Chemical Analysis of Water and Wastes (EPA, 1979); and EPA Standard Methods for the Examination of Water and Wastewater, Eighteenth Edition (EPA, 1992a). The specific analytical methods used for this program are as follows:

- VOCs—SW8260A
- SVOCs—SW8270B
- Explosives—SW8330
- TPH—SW8015 modified
- TRPH—SW9071/418.1
- Inductively Coupled Plasma Metals—SW6010A
- Graphite Furnace Atomic Absorption Metals—SW7060, SW7421, SW7740, SW7041
- Mercury—SW7470/7471
- Strontium—SM 3500
- TCLP—SW1311
- Reactivity—SW-846 Chapter 7.3
- Ignitability—SW1020
- Corrosivity—EPA 150.1

8.1 DATA VALIDATION

The data validation procedure used for the 300-Pound OBU analytical data was performed in accordance with the EPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review (EPA 1994a, 1994b). One hundred percent of the analytical data were reviewed for the following criteria:

- Completeness of data deliverables
- Extraction and analysis holding times
- Calibration verification
- Blanks
- System monitoring compounds (surrogate recoveries)
- Matrix spike/matrix spike duplicate recovery
- Laboratory control sample recovery
- Overall data assessment

8.2 DATA PRESENTATION AND EVALUATION

The types of laboratory QC samples associated with the 300-Pound OBU data included method blanks, laboratory control samples, and matrix spike/spike duplicate samples. These QC samples are used to measure the analytical precision and accuracy; the method blank is used to assess laboratory contamination. The results of the laboratory QC sample data are summarized below.

8.2.1 Laboratory Method Blank Samples

Laboratory method blank samples were analyzed with each batch of field samples for every analytical method, with the exception of ignitability. Method blank detections were evaluated as part of the validation process. No detections were reported in the method blank samples, with the exception of VOCs, SVOCs, and metals.

Methylene chloride was detected in the method blank sample for sample delivery group (SDG) 9801508 at concentrations of 390 and 270 micrograms per kilogram (µg/kg). The methylene chloride detections in the field samples associated with these method blanks were B-qualified, signifying blank contamination.

Barium was detected in the TCLP extraction blank samples for SDG 9804579 at 414 µg/L, SDG 9805243 at 192 µg/L, and for SDG 9803371 at concentrations of 148 and 256 µg/L. As a result, the barium detections in the associated field samples were B-qualified.

Selenium was detected in the TCLP extraction blank sample for SDG 9808234 at a concentration of 31.8 µg/L. Therefore, the selenium detections in the associated field samples were B-qualified.

Bis(2-ethylhexyl)phthalate was detected in the method blank sample for SDG 9804815 at a concentration of 58 µg/kg. The bis(2-ethylhexyl)phthalate detections in the associated field samples were B-qualified.

8.2.2 Laboratory Control Samples

Laboratory control samples (LCS) were analyzed with each batch of field samples for every analytical method. LCS spike recoveries reported at concentrations above or below the method-specific control limits required examination of those analytes in the associated field samples. LCS recoveries for all parameters were within the method-specific control limits, with the exception of antimony.

One LCS recovery for antimony in SDG 9801508 was above the method control criteria at 135 percent. Therefore, the antimony detections in the associated field samples were J-qualified, signifying an estimated value.

8.2.3 Matrix Spike/Matrix Spike Duplicate Samples

Laboratory matrix spike matrix spike duplicate (MS/MSD) samples were analyzed at a frequency of 10 percent for each analytical method. MS/MSD sample recoveries were evaluated in conjunction with the LCS sample recoveries to assess the quality of the analytical data based on the potential interference from sample matrix. MS/MSD samples were not analyzed for ignitability, corrosivity, or reactivity. MS/MSD recoveries for all parameters were within the method-specific control limits, with the exception of metals and TRPH.

8.2.3.1 *Total Recoverable Petroleum Hydrocarbons*

The TRPH MS/MSD recoveries in SDG 9802495 were above the method control limits at 158 percent and 180 percent. Therefore, the TRPH detections in the associated field samples were J-qualified.

8.2.3.2 *Mercury*

The mercury MS recoveries in SDGs 9801508 and 9804815 were above the method control criteria at 136 percent and 127 percent respectively. Therefore, the mercury detections in the associated field samples were J-qualified.

The TCLP mercury MS recoveries in SDG 9803371 were below the method control criteria at 15.5 percent and 15.7 percent, indicating potential matrix interference. Therefore, the TCLP mercury detects were J-qualified, and nondetects were UJ-qualified, signifying an estimated nondetect value.

8.2.3.3 *Metals*

The lead MS recoveries in SDGs 9801508, 9803371, 9804579, 9804814, 9804815, 9808376, and 9803367 were below the method control limit at 28 percent, 71 percent, 66 percent, 30 percent, 15 percent, 47 percent, and 46 percent, respectively, indicating potential matrix interference. In accordance with the method requirements, the analyses were run using the matrix spike addition technique. Lead detections were J-qualified, and nondetects were UJ-qualified.

The TCLP lead MS recoveries in SDG 9805243 were below the method control limit at 67 percent and 38 percent, indicating potential matrix interference. Therefore, the lead detections were J-qualified, and nondetects were UJ-qualified.

The selenium MS recoveries in SDGs 9801508, 9803371, 9804814, 9804815, 9808376, and 9803367 were below the method control limit at 0 percent, indicating matrix interference. In accordance with the method requirements, the analyses were run using the matrix spike addition technique. Selenium detections were J-qualified, and nondetects have been UJ-qualified.

The relative percent difference (RPD) for the TCLP selenium MS recovery in SDG 9808234 was above the method control limit at 61 percent. Therefore, the TCLP selenium detections have been J-qualified, and nondetects were UJ-qualified.

The antimony MS recoveries in SDGs 9803371, 9804814, 9804815, and 9803367 were below the method control limit at 40 percent, 29 percent, 38 percent, and 46 percent, respectively, indicating potential matrix interference. Therefore, the antimony detections were J-qualified, and nondetects were UJ-qualified.

The TCLP silver matrix spike recoveries in SDGs 9803371, 9804579, and 9805243 were below the method control limit at 64 percent and 58 percent, 66 percent and 73 percent, and 60 percent, respectively. Therefore, the silver detections were J-qualified, and nondetects were UJ-qualified.

The TCLP barium matrix spike recoveries in SDGs 9804579 at 38 percent and 9805243 at 45 and 17 percent were below the method control limit. Therefore, the barium detections were J-qualified, and nondetects were UJ-qualified.

8.3 FIELD SAMPLE DUPLICATE COMPARISON

Three split field samples, two at Trench 1 and one at Trench 4, were submitted to the laboratory as blind duplicate samples and analyzed for VOCs, SVOCs, explosives, TRPH, and metals. RPD calculations were performed to measure the precision of duplicate analytical results. The RPD values for all detected parameters were within the 50 percent acceptance criteria for field precision, with the exceptions of di-n-butyl phthalate and bis(2-ethylhexyl)phthalate. Di-n-butyl phthalate was reported in the Trench 1 and Trench 4 samples and not in the duplicate; bis(2-ethylhexyl)phthalate was reported in the second field sample from Trench 1 but not in the duplicate sample. Phthalates were identified as a laboratory contaminant resulting from the data validation process, and data were qualified accordingly.

8.4 DATA USABILITY

Review of the QC data associated with the field sample data indicates project measurement data are reliable and fulfill project DQOs. Precision and accuracy data point to minimal limitations within the analytical data. Based on the data validation procedure, 236 data results were J-or UJ-qualified (estimated data) but are, however, still usable to support clean closure. Thirty data results have been B- and BJ-qualified (method blank contaminated data); these data do not meet the project DQOs and, therefore, are not considered usable data. A data completeness objective of greater than 99 percent was achieved in support of clean closure for the 300-Pound OBU.

9.0 REFERENCES

Environmental Protection Agency (EPA)

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APPENDIX A
As-Constructed Survey Drawing

TO VIEW THE MAP AND/OR MAPS WITH THIS DOCUMENT, PLEASE CALL THE HAZARDOUS WASTE BUREAU AT 505-476-6000 TO MAKE AN APPOINTMENT

APPENDIX B
Field Change Requests

FIGURE 9-4

FOSTER WHEELER ENVIRONMENTAL CORPORATION
ENGINEERING PROCEDURES
DEVELOPING AND ISSUING ENGINEERING DOCUMENTS

FIELD CHANGE REQUEST

Project	Proj. No.	Field Change No.
300-Pound Open Burn Treatment Unit	DACW45-94-D-0003 D.O. 11	1

TO _____ DEPT _____ LOCATION _____ DATE 1-14-98

RE: ? Drawing No. N/A Title N/A
? Spec No. N/A Title N/A
? Other work plan Sec 4.2.5.2. paragraph 5.

1. Description (Items involved, submit sketch if applicable)
Paragraph # 5 A UXO specialist will remove all non-explosive metallic items from the conveyor prior to reaching the screen.

2. Reasons for Change (If from disposition of nonconformance report, list report number) _____
The UXO specialist should remove all suspect explosive metallic material

3. Recommended Disposition (✓) Minor Change ? Major Change

Paragraph should be changed to A UXO specialist will be positioned at the screen to remove suspect explosive metallic material from the conveyor before it reaches the screen & place them in rolloffs for future disposal.

4. Resident Engineer (Signature)	Date	Project Supt. Concurrence (Signature)	Date
[signature]	1/16/98	[signature]	1/15/98

5. Disposition
? NOT APPROVED (Give Reason)

? CONSIDERED MINOR CHANGE - Approved per Recommended Disposition-Design documents will not be normally revised; field to maintain as-built records

? CONSIDERED MAJOR CHANGE - Action will be taken as prescribed on DCN -

Lead Discipline Engineer or Designee (Signature)	Date	Project Engineer or Designee	Date

Project Engineer signs and returns to LDE for transmittal to Resident Engineer with copies to:

Project Manager _____
Project Supt. _____
Project Files _____

Others as Required _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION
ENGINEERING PROCEDURES
DEVELOPING AND ISSUING ENGINEERING DOCUMENTS

FIELD CHANGE REQUEST

Project	Proj. No.	Field Change No.
300 lb. OPEN BURN	5155 0011 0003 110300	02

TO WARREN NEFF DEPT _____ LOCATION HOLLOMAN DATE 3/31/98

RE: Drawing No. _____ Title _____
Spec No. _____ Title _____
Other WASTE ACCUMULATION START DATES

1. Description (items involved, submit sketch if applicable)
Per Holloman AFB, NMED has indicated that waste accumulation start times for EOD related wastes will not begin until the completion of earth work at the 300 lb. project site.

2. Reasons for Change (If from disposition of nonconformance report, list report number) _____
Direction from Holloman AFB

3. Recommended Disposition (Minor Change) Major Change

4. Project Engineer (Signature) FWENC Date 3/31/98 Project Supt. Concurrence (Signature) Date

5. Disposition
NOT APPROVED (Give Reason)

CONSIDERED MINOR CHANGE - Approved per Recommended Disposition-Design documents will not be normally revised; field to maintain as-built records

CONSIDERED MAJOR CHANGE - Action will be taken as prescribed on DCN - COC 3/31/98

Lead Discipline Engineer or Designee (Signature)	Date	~~Project Engineer or Designee USACE~~ Program Manager, Holloman AFB	Date
			3/31/98

Project Engineer signs and returns to LDE for transmittal to Project Engineer with copies to:

Others as Required _____

Project Files _____

FIGURE 9-4

FOSTER WHEELER ENVIRONMENTAL CORPORATION
ENGINEERING PROCEDURES
DEVELOPING AND ISSUING ENGINEERING DOCUMENTS

FIELD CHANGE REQUEST

Project	Proj. No.	Field Change No.
300 Pound OPEN BURN	5155 0011 0001 H010	003

TO _____ DEPT _____ LOCATION _____ DATE _____

RE: ? Drawing No. _____ Title _____
? Spec No. _____ Title _____
? Other _____

1. Description (Items involved, submit sketch if applicable)

ADDENDUM TO HEALTH & SAFETY PLAN ATTACHED

2. Reasons for Change (If from disposition of nonconformance report, list report number) _____

Found (Potential) RADIO ACTIVE ID TAG from EQUIPMENT.

3. Recommended Disposition ? Minor Change ? Major Change

Modify & Improve HASP (See Addendum)

4. Resident Engineer (Signature)	Date	Project Supt. Concurrence (Signature) HSO	Date
	2/12/98		2-12-98

Project Health & Safety Manager
DATE 2/12/98

5. Disposition
? NOT APPROVED (Give Reason)

? CONSIDERED MINOR CHANGE - Approved per Recommended Disposition-Design documents will not be normally revised; field to maintain as-built records

? CONSIDERED MAJOR CHANGE - Action will be taken as prescribed on DCN -

Lead Discipline Engineer or Designee (Signature)	Date	Project Engineer or Designee	Date

Project Engineer signs and returns to LDE for transmittal to Resident Engineer with copies to:

Project Manager _____
Project Supt. _____
Project Files _____

PHSM 2/12/98

Others as Required _____
USACE PROJ ENGR
AFB COE 2/12/98

FOSTER WHEELER ENVIRONMENTAL CORPORATION
ENGINEERING PROCEDURES
DEVELOPING AND ISSUING ENGINEERING DOCUMENTS

FIELD CHANGE REQUEST

Project: 300 Lb. OPEN BURN | Proj. No. SISS 00110003 H0300 | Field Change No.

TO George Fish DEPT _____ LOCATION Holbrook DATE 5/8/98

RE: Drawing No. _____ Title _____
Spec No. _____ Title _____
Other Thermal Decontamination System

1. Description (Items involved, submit sketch if applicable)
The system will be welded together rather than bolting it together.

2. Reasons for Change (If from disposition of nonconformance report, list report number) _____
Reduce cost and accelerate assembly.

3. Recommended Disposition (Minor Change) Major Change

4. Project Engineer (Signature) FWENC | Date 5/8/98 | Project Supt. Concurrence (Signature) | Date

5. Disposition
NOT APPROVED (Give Reason)

CONSIDERED MINOR CHANGE - Approved per Recommended Disposition-Design documents will not be normally revised; field to maintain as-built records

CONSIDERED MAJOR CHANGE - Action will be taken as prescribed on DCN -

Lead Discipline Engineer or Designee (Signature) | Date | Project Engineer or Designee USACE | Date 6/23/98

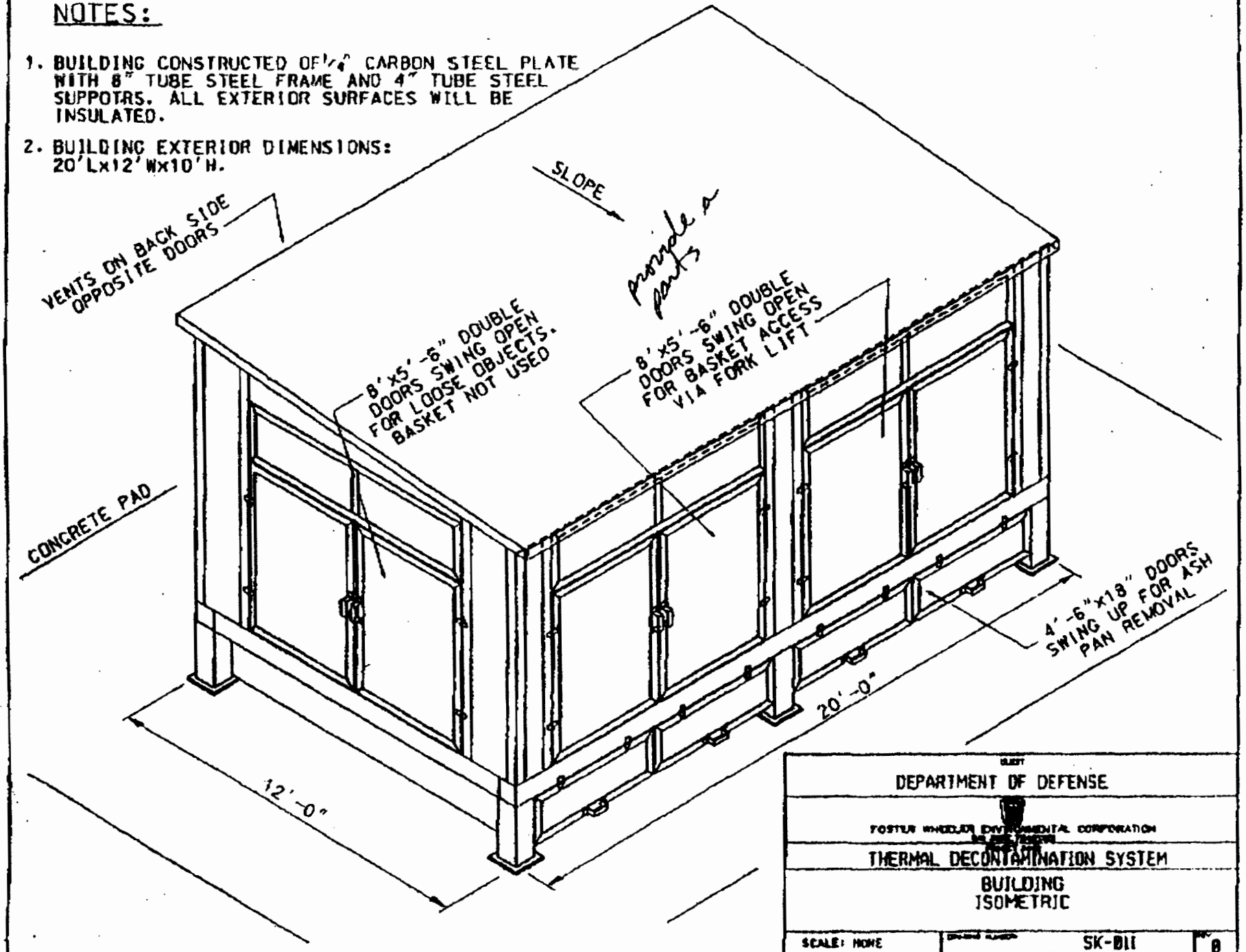
Project Engineer signs and returns to LDE for transmittal to Project Engineer with copies to:

Others as Required _____

Project Files _____

NOTES:

1. BUILDING CONSTRUCTED OF 1/4" CARBON STEEL PLATE WITH 8" TUBE STEEL FRAME AND 4" TUBE STEEL SUPPOTRS. ALL EXTERIOR SURFACES WILL BE INSULATED.
2. BUILDING EXTERIOR DIMENSIONS: 20'Lx12'Wx10'H.



CLIENT	DEPARTMENT OF DEFENSE
	FOSTER WHEELER ENVIRONMENTAL CORPORATION
	THERMAL DECONTAMINATION SYSTEM
	BUILDING ISOMETRIC
SCALE: NONE	DRAWING NUMBER SK-011 REV 0

APPENDIX C
Manufacturer's Certificates

North American Mfg. Co.
4455 East 71st Street
Cleveland, Ohio 44105

Bill of Material
FOSTER WHEELER ENVIRONMENTAL CORP.

Date Printed: Wed May 20 14:56:53 1998

Order: gl7740 Item: 0530 Drawing: 23-7771 Revision: 0

Item	Qty.	Stock Number	Description	
Assy		23-7771-1	**Electrical Control Cabinet Assembly**	
1	9	R350-1125	Panduit 1" Wire Duct Cover C1LG6	Totaling 16'-9"
2	9	R350-1124	Panduit 1"x3" Wire Duct G1X3LG6	Totaling 16'-9"
3	2	EDT-1492-DR6	Allen Bradley High Rise Mounting Rail 1492-DR6	Totaling 3'-5"
4	3	EDT-1492-DR1	DIN Mounting Rail 1492-DR1	Totaling 4'-8"
5	1	EHE-4533	45 x 33 Sub-Panel SCE-48P36	
6	1	EHE-4837.3812/D	48 x 37 x 12 Nema 4 & 12 Enviroline Disc. Enclosure SCE-48XEL3712LP	
7	1	EWX-800H-HR2D1	Allen Bradley 2 Pos. Selector Sw. w/ N.O. Contact 800H-HR2D1	
8	1	R190-9890	Allen Bradley 3 Pole Contactor 100-A09ND3	
9	1	R190-9892	Allen Bradley 3 Pole Contactor 100-A18ND3	
10	1	R820-7382	Allen Bradley Adjustable Overload Relay 193-BSB80	
11	1	R820-7384	Allen Bradley Adjustable Overload Relay 193-BSC15	
[illegible]	1	EWX-800H-PRB16A	Allen Bradley Amber PBLight w/ N.O. & N.C. Contact 800H-PRB16A	
[illegible]	1	EWX-800H-PR16A	Allen Bradley Amber Pilot Light 800H-PR16A	
14	1	EWX-800H-PRB16B	Allen Bradley Blue PBLight w/ N.O. & N.C. Contact 800H-PRB16B	
15	19	EDT-1492-CAM1LB	Allen Bradley Blue Terminal Block 1492-CAM1LB	
16	1	R830-7865	Allen Bradley Connecting Rod #1494V-RA2	
17	3	EWH-800T-XD2	Allen Bradley Contact 1 N.C. 800T-XD2	
18	1	R830-7871	Allen Bradley Disconnect Handle #1494V-W1	
19	4	EDT-1492-EA35	Allen Bradley End Anchor 1492-EA35	
20	2	EWX-800H-PRB16G	Allen Bradley Green PBLight w/ N.O. & N.C. Contact 800H-PRB16G	
21	3	EWX-800H-PR16G	Allen Bradley Green Pilot Light 800H-PR16G	
22	1	EWX-800H-FRXT6D4	Allen Bradley Push-Pull Operator w/ N.C. Contact 800H-FRXT6D4	
23	2	EWX-800H-PRB16R	Allen Bradley Red PBLight w/ N.O. & N.C. Contact 800H-PRB16R	
24	2	EWX-800H-BR6D2	Allen Bradley Red Pushbutton With N.C. Contact 800H-BR6D2	
25	1	EWH-800T-N310	Allen Bradley Shroud For Master Stop Unit 800T-N310	
[illegible]	4	EDT-1492-NM16	Allen Bradley White End Barrier 1492-NM16	
[illegible]	1	EWX-800H-PR16W	Allen Bradley White Pilot Light 800H-PR16W	

FINAL Release on May 20, 1998

Order: gl7740 Item: 0530 Drawing: 23-7771 Revision: 0

	Qty.	Stock Number	Description
28	78	EDT-1492-CAM1L	Allen Bradley White Terminal Block 1492-CAM1L
29	5	EWX-800T-XD1	Allen-Bradley Contact 1 N.O. 800T-XD1
30	4	23-7161-1	ATC Timer Assembly 405A100FKK
31	9	EHG-JTN60030	Bussman 1 Pole 30A/600V DIN Rail Fuse Holder JTN60030
32	4	EHF-10-600	Bussman 10 Amp 600V Type J Fuse LPJ-10SP
33	3	EHF-20-600	Bussman 20 Amp 600V Type J Fuse LPJ-20SP
34	2	EHF-3-600	Bussman 3 Amp 600V Type J Fuse LPJ-3SP
35	2	R680-3501	Bussman DIN Rail Adapter DRA1
36	1	R315-2057	Federal Alarm Horn Gasket Kit 3435666A
37	1	R315-2045	Federal Signal Alarm Horn 350-120-30
38	1	U11921-1	FEDERAL SIGNAL BEACON LIGHT FB2PST-120R
39	1	U11921-2	FEDERAL SIGNAL BEACON LIGHT FB2PST-120G
40	1	R890-7661	G.E. 750VA Transformer 9T58B51G8
41	1	R130-5372	Honeywell Burner Control RM7890B1014
42	1	R130-5382	Honeywell Flame Amplifier R7849A1023
43	1	R130-5392-10	Honeywell Keyboard Display Extension Cable 221818C
44	1	R130-5384	Honeywell Keyboard Display Module (Door Mounted) S7800A1001
45	1	R860-5380	Honeywell NEMA 4 Cover Assembly For S7800 Keyboard 204718A
46	1	R130-5369	Honeywell Wiring Base Q7800A1005
47	7	R680-1309	Idec 11 Pin Relay Socket SR3B-05
48	4	R680-1311	Idec 8 Pin Octal Timer Socket SR2P-06
49	6	R350-1222	Idec Snap On Spacer SA-406
50	1	EHX-D167-6	Ilsco Neutral Bar D167-6
51	1	16-2924-1	Nameplate 3/4" x 2" BLANK
52	5	16-2924-2	Nameplate Blank Retangular 1-1/4" X 3"
53	14	24-1259-1	Nameplate For Lights; Pushbuttons; And Selector Switches BLANK
54	1	24-0942-4	North American 3.5" x 14.5" Identification Nameplate GRF284
[illegible]	8	R700-2179	Potter Brumfield Relay 3PDT 120VAC KUP14A35

North American Mfg. Co.
4455 East 71st Street
Cleveland, Ohio 44105

Bill of Material

FOSTER WHEELER ENVIRONMENTAL CORP.

Date Printed: Wed May 20 14:56:53 1998

Order: gl7740 Item: 0530 Drawing: 23-7771 Revision: 0

Item	Qty.	Stock Number	Description
56	1	U11847	Tegam 14 x 18 Window AW1418
57	1	R840-8101	UNDERWRITERS 3 Pole Distribution Block 16021-3
58	1	R860-5263	Yokogawa Digital Indicating Controller MODEL UT350L-00
59	2	R860-1040	Yokogawa Digital Indicating Controller UT550-00
60	1	U11848	Yokogawa Pen Recorder 436006

FINAL Release on May 20, 1998

APPENDIX D
Completion Inspection Reports

FOSTER WHEELER ENVIRONMENTAL
300-POUND BURN PROJECT
TERC Contract No. DACW45-94-D0003
HOLLOMAN AFB, NEW MEXICO

COMPLETION INSPECTION

PERSONNEL PRESENT:

NAME	REPRESENTING	TITLE	DATE
James Morning	FWENC	Site Mgr	3/2/99
George Fish	US ACE	Engineer	3/2/99

SPECIFICATIONS:
Final Survey Plat, Site Demobilization.
9.4.4

INSPECTION ITEMS:
NO items were noted that were unacceptable

OBSERVATIONS/DISCREPANCIES:
NONE, Site Restored to Pre Construction Status

COMPLETENESS/QUALITY OF WORK:
Work was completed in a professional manner

COMMENTS:
NO Problems Noted

3-2-99
DATE

QUALITY CONTROL MANAGER

APPENDIX E
Material Delivery Ticket Summaries

300-Pound OBU

Tally of Connie H. Danley, Construction Co. Imported Soil Hauling Weight Tickets

[illegible]	[illegible]	[illegible]	Net Weight [illegible]	[illegible]	[illegible]	[illegible]	Daily [illegible] Number of [illegible]
1/6/98	D70	222159	25,000	12.500	12.500	12.500	1
1/6/98	D75	222160	25,000	12.500	25.000	12.500	1
1/6/98	D95	222161	25,400	12.700	37.700	12.700	1
1/6/98	D101	222162	40,200	20.100	57.800	20.100	1
1/6/98	D15	222163	43,000	21.500	79.300	21.500	1
					TOTAL	**79.300**	**1**

300-Pound OBU
Tally of Connie H. Danley, Construction Co. Imported Soil Hauling Weight Tickets

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3/11/98	D101	223381	48,200	24.100	24.100		
3/11/98	D101	223389	44,100	22.050	46.150		
3/11/98	D101	223398	50,800	25.400	71.550		
3/11/98	D101	223407	49,200	24.600	96.150		
3/11/98	D101	223415	51,500	25.750	121.900	121.900	5
3/11/98	D95	223382	25,400	12.700	134.600		
3/11/98	D95	223390	24,100	12.050	146.650		
3/11/98	D95	223399	26,800	13.400	160.050		
3/11/98	D95	223408	27,400	13.700	173.750		
3/11/98	D95	223416	24,800	12.400	186.150	64.250	5
3/11/98	D73	223383	27,100	13.550	199.700		
3/11/98	D73	223391	25,800	12.900	212.600		
3/11/98	D73	223400	25,400	12.700	225.300		
3/11/98	D73	223409	26,100	13.050	238.350		
3/11/98	D73	223417	27,000	13.500	251.850	65.700	5
3/11/98	D70	223384	27,000	13.500	265.350		
3/11/98	D70	223396	29,100	14.550	279.900		
3/11/98	D70	223406	27,300	13.650	293.550		
3/11/98	D70	223414	28,000	14.000	307.550	55.700	4
3/11/98	D75	223385	26,500	13.250	320.800		
3/11/98	D75	223395	28,300	14.150	334.950		
3/11/98	D75	223405	27,300	13.650	348.600		
3/11/98	D75	223413	26,200	13.100	361.700	54.150	4
3/11/98	H7	223386	51,900	25.950	387.650		
3/11/98	H7	223392	44,000	22.000	409.650		
3/11/98	H7	223402	44,800	22.400	432.050		
3/11/98	H7	223410	44,500	22.250	431.900		
3/11/98	H7	223418	44,200	22.100	454.000	114.700	5
3/11/98	D15	223387	49,500	24.750	478.750		
3/11/98	D15	223393	48,700	24.350	503.100		
3/11/98	D15	223403	49,500	24.750	527.850		
3/11/98	D15	223411	51,400	25.700	553.550		
3/11/98	D15	223419	53,300	26.650	580.200	126.200	5
3/11/98	D45	223388	44,900	22.450	602.650		
3/11/98	D45	223394	46,700	23.350	626.000		
3/11/98	D45	223404	45,900	22.950	648.950		
3/11/98	D45	223412	46,500	23.250	672.200	92.000	4
					TOTAL	**694.600**	**37**

300-Pound OBU

Tally of Connie H. Danley, Construction Co. Imported Soil Hauling Weight Tickets

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Daily [illegible] Number of [illegible] Trips
6/15/98	D70	225871	29,300	14.650	14.650		
6/15/98	D70	225890	28,200	14.100	28.750		
6/15/98	D70	225902	26,700	13.350	42.100		
6/15/98	D70	225920	28,700	14.350	56.450		
6/15/98	D70	225935	27,900	13.950	70.400	70.400	5
6/15/98	D75	225879	27,200	13.600	84.000		
6/15/98	D75	225889	26,700	13.350	97.350		
6/15/98	D75	225919	33,700	16.850	114.200		
6/15/98	D75	225932	28,900	14.450	128.650		
6/15/98	D75	225946	26,200	13.100	141.750	71.350	5
6/15/98	D95	225841	27,800	13.900	155.650		
6/15/98	D95	225861	28,300	14.150	169.800		
6/15/98	D95	225877	26,500	13.250	183.050		
6/15/98	D95	225903	26,900	13.450	196.500	54.750	4
					TOTAL	**196.500**	**14**

300-Pound OBU

Tally of Connie H. Danley, Construction Co. Imported Soil Hauling Weight Ticket

Ticket Date	Truck #	Ticket #	Net Weight	Short Tons	Net Total	Daily Total	Daily Individual Number of Truck Trips
6/16/98	D70	225979	25,800	12.900	12.900		
6/16/98	D70	225998	25,700	12.850	25.750		
6/16/98	D70	226022	26,200	13.100	38.850		
6/16/98	D70	226037	28,700	14.350	53.200		
6/16/98	D70	226054	27,500	13.750	66.950		
6/16/98	D70	226067	26,100	13.050	80.000		
6/16/98	D70	226086	28,400	14.200	94.200	94.200	7
6/16/98	D75	225987	25,400	12.700	106.900		
6/16/98	D75	226006	30,700	15.350	122.250		
6/16/98	D75	226020	30,300	15.150	137.400		
6/16/98	D75	226036	33,000	16.500	153.900		
6/16/98	D75	226051	29,300	14.650	168.550		
6/16/98	D75	226063	35,000	17.500	186.050		
6/16/98	D75	226082	27,500	13.750	199.800		
6/16/98	D75	226097	33,900	16.950	216.750	122.550	8
6/16/98	D95	226015	25,400	12.700	229.450		
6/16/98	D95	226031	25,400	12.700	242.150		
6/16/98	D95	226049	29,300	14.650	256.800		
6/16/98	D95	226062	27,600	13.800	270.600		
6/16/98	D95	226084	29,400	14.700	285.300	68.550	5
					TOTAL	**285.300**	**20**

300-Pound OBU
Tally of Mesa Verde Imported Soil Hauling Weight Tickets

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6/16/98	HT18	025310	45,300	22.650	22.650	22.650	1
6/16/98	HT20	025313	72,440	36.220	58.870	36.220	1
6/16/98	HT21	025301	49,680	24.840	83.710		
6/16/98	HT21	025303	43,220	21.610	105.320		
6/16/98	HT21	025312	42,660	21.330	126.650	67.780	3
6/16/98	HT22	025309	64,320	32.160	158.810	32.160	1
6/16/98	HT23	025330	69,140	34.570	193.380	34.570	1
6/16/98	HT25	025308	65,200	32.600	225.980	32.600	1
6/16/98	HT26	025302	49,640	24.820	250.800		
6/16/98	HT26	025304	41,280	20.640	271.440		
6/16/98	HT26	025305	50,800	25.400	296.840		
6/16/98	HT26	025329	49,520	24.760	321.600	95.620	4

TOTAL 321.600 12

300-Pound OBU
Tally of Rhino Construction Exported Material Hauling Weight Tickets

Date	Truck	Ticket	Gross	Tare	Net	Total	Daily	Cumulative
2/18/98	101	014273	67,780	35,500	17.750	17.750		
2/18/98	101	014277	66,660	34,380	17.190	34.940	34.940	2
						TOTAL	**34.940**	**2**
2/19/98	45	014283	68,430	33,340	16.670	16.670	16.670	1
2/19/98	101	014286	69,650	37,370	18.685	35.355		
2/19/98	101	014287	71,860	39,580	19.790	55.145	38.475	2
						TOTAL	**55.145**	**3**
2/20/98	45	014295	66,980	31,890	15.945	15.945	15.945	1
2/20/98	101	014291	67,520	35,240	17.620	33.565	17.620	1
						TOTAL	**33.565**	**2**
3/5/98	45	014334	70,100	35,010	17.505	17.505		
3/5/98	45	014342	61,800	26,710	13.355	30.860		
3/5/98	45	014356	71,770	36,680	18.340	49.200	49.200	3
3/5/98	101	014333	75,400	43,120	21.560	70.760		
3/5/98	101	014340	66,100	33,820	16.910	87.670		
3/5/98	101	014352	74,050	41,770	20.885	108.555	59.355	3
						TOTAL	**108.555**	**6**
3/6/98	45	014332	73,270	38,180	19.090	19.090		
3/6/98	45	014359	75,920	40,830	20.415	39.505		
3/6/98	45	014369	72,880	37,790	18.895	58.400	58.400	3
3/6/98	101	014331	77,240	44,960	22.480	80.880		
3/6/98	101	014355	74,550	42,270	21.135	102.015		
3/6/98	101	014357	74,400	42,120	21.060	123.075		
3/6/98	101	014594	75,800	43,520	21.760	144.835	86.435	4
						TOTAL	**144.835**	**7**
3/9/98	45	014370	76,060	40,970	20.485	20.485		
3/9/98	45	014375	73,650	38,560	19.280	39.765		
3/9/98	45	014379	74,450	39,360	19.680	59.445	59.445	3
3/9/98	101	014343	76,490	44,210	22.105	81.550		
3/9/98	101	014374	75,940	43,660	21.830	103.380		
3/9/98	101	014378	77,450	45,170	22.585	125.965	66.520	3
						TOTAL	**125.965**	**6**
3/10/98	45	014387	69,430	34,340	17.170	17.170	17.170	1
3/10/98	101	014382	75,290	43,010	21.505	38.675		
3/10/98	101	014386	68,740	36,460	18.230	56.905	39.735	2
						TOTAL	**56.905**	**3**

300-Pound OBU
Tally of Rhino Construction Exported Material Hauling Weight Tickets

Date	Truck ID	Ticket #	Gross Total	Tare Total	Net Tons	Net Tons	Total Tons	Daily Individual Number of Truck Loads
4/28/98	45	014579	70,820	35,730	17.865	17.865		
4/28/98	45	014586	73,270	38,180	19.090	36.955		
4/28/98	45	014590	72,090	37,000	18.500	55.455		
4/28/98	45	014595	73,160	38,070	19.035	74.490	74.490	4
4/28/98	101	014580	68,400	36,120	18.060	92.550		
4/28/98	101	014585	72,050	39,770	19.885	112.435		
4/28/98	101	014589	72,520	40,240	20.120	132.555	58.065	3
						TOTAL	**132.555**	**7**
4/29/98	45	014593	72,780	37,690	18.845	18.845	18.845	1
4/29/98	101	014592	71,830	39,550	19.775	38.620	19.775	1
						TOTAL	**38.620**	**2**
4/30/98	45	014598	72,290	37,200	18.600	18.600		
4/30/98	45	014603	76,370	41,280	20.640	39.240	39.240	2
4/30/98	101	014597	76,040	43,760	21.880	61.120		
4/30/98	101	014602	76,470	44,190	22.095	83.215	43.975	2
						TOTAL	**83.215**	**4**
5/1/98	45	014610	74,860	39,770	19.885	19.885	19.885	1
5/1/98	101	014609	74,870	42,590	21.295	41.180	21.295	1
						TOTAL	**41.180**	**2**
5/4/98	45	014619	73,090	38,000	19.000	19.000		
5/4/98	45	014624	74,910	39,820	19.910	38.910	38.910	2
5/4/98	101	014618	76,620	44,340	22.170	61.080		
5/4/98	101	014623	72,500	40,220	20.110	81.190	42.280	2
						TOTAL	**81.190**	**4**
5/10/98	45	014383	75,380	40,290	20.145	20.145	20.145	1
						TOTAL	**20.145**	**1**
9/22/98	101	015253	77,960	45,680	22.840	22.840		
9/22/98	101	015254	79,970	47,690	23.845	46.685	46.685	2
						TOTAL	**46.685**	**2**
9/23/98	101	015257	76,140	43,860	21.930	21.930		
9/23/98	101	015264	74,790	42,510	21.255	43.185	43.185	2
						TOTAL	**43.185**	**2**
9/24/98	101	015265	75,790	43,510	21.755	21.755		
9/24/98	101	015268	76,000	43,720	21.860	43.615		
9/24/98	101	015272	73,890	41,610	20.805	64.420	64.420	3
						TOTAL	**64.420**	**3**
						TOTAL	**1,111.105**	**56**

APPENDIX F
Site Inspection Quality Control Reports

FOSTER WHEELER ENVIRONMENTAL
300 OPEN BURN TREATMENT UNIT
CONTRACT NO: DACW-45-94-D-0003

INITIAL INSPECTION

ATTENDEES:

NAME	TITLE	COMPANY
Richard Petty	QCSM	FWENC
JAMES MORNING	Site Supt	FWENC
GEORGE FISH	PROJ ENGR	COE

1. **Is work performed in accordance with specifications and methods discussed in preparatory inspection meeting?**
   yes. Half Trench 1 completed & sampled, Trench complete awaiting sampling, Trench 3 excavation in progress

2. **Regulatory compliance, are drums, roll offs, and storage areas properly labeled and inspected weekly**
   yes see attached copies

3. **Is work being performed in safe manner? (Note discrepancies/suggestions)**
   yes

4. **Contract variance if any, (include all FCR # to date).** FCR-1 & FCR 2

5. **Comments:** N/A

QCSM Richard Petty

2-2-98
Date

300lb open Burn Treatment Unit closure

FIGURE 6-1

INSPECTION CHECKLIST

Page 1 of 2

ITEM: Preoperatory Inspection				DATE: 1-12-98
Contract Specifications: D				
MATERIAL / Equipment	QTY	CONDITION	TESTING	COMMENTS
55 gallon Barrels	30	New	N/A	N/A
40 ml HDPE	1 roll	New	N/A	N/A
Cross ties	20	good	N/A	N/A
6 ml Poly	2 rolls	New	N/A	N/A
J.D. Backhoe 310	1	good	N/A	N/A
J.D Trackhoe 690	1	good	N/A	N/A
3,700 gal Water Truck	1	good	N/A	N/A
Rock Screening Plant	1	good	N/A	N/A
J.D Loader, 624C	1	good	N/A	N/A

STORAGE CONDITIONS:

All materials stored above ground surface & covered when needed.

SUBMITTALS:

All submittals have been submitted & accepted

FIGURE 6-1 (Continued)
INSPECTION CHECKLIST
Page 2 of 2

MATERIAL/EQUIPMENT CERTIFICATIONS: N/A

PREPARATORY SITE CONDITIONS: Area ~~[illegible]~~ RP has been cleared by UXO team. All UXO on surface was removed & the Trail have been located & defined

CONTRACT VARIANCE: N/A

COMMENTS: N/A

ATTENDEES:
See Attached Signature Sheet

QC REPRESENTATIVE DATE
1-12-98

QCSM DATE

300 OB

FIGURE 3-1 INSPECTION CHECKLIST

FINAL

ITEM: SURVEY - LOCATION MAP				DATE: 1-20-99
Contract Specifications:				
MATERIAL	QTY	CONDITION	TESTING	COMMENTS
NA				

STORAGE CONDITIONS:

NA
Site Cleared of FWENC Property
OVEN IS Disconnected

SUBMITTALS:

SW Engineering Doing Location MAP

FIGURE 3-1 INSPECTION CHECKLIST

MATERIAL/EQUIPMENT CERTIFICATIONS:

NA

PREPARATORY SITE CONDITIONS:

SITE Graded to DRAIN

CONTRACT VARIANCE:

NA

COMMENTS:

STAKE OUT LOCATIONS of T-1,2,3,4
Surveyors Locating Excavation Limits
tied to OVEN Location
(thermo Unit)
Site is Demobilized

ATTENDEES:

SW Engineering Crew

James Molnar 1-20-99

QC REPRESENTATIVE DATE

QCSM DATE

APPENDIX G
Upper Tolerance Limits for Metals at Holloman Air Force Base

Upper Tolerance Limits (UTLs) for Background Soils at Holloman AFB

Aluminum	SW6010	8764.4972
Antimony	SW6010	7.2844
Antimony	SW7041	0.2533
Arsenic	SW6010	6.8833
Barium	SW6010	84.3632
Beryllium	SW6010	0.4000
Boron	SW6010	15.0118
Cadmium	SW6010	1.0359
Calcium	SW6010	250000.0000
Chromium	SW6010	6.6049
Cobalt	SW6010	2.4852
Copper	SW6010	4.8438
Iron	SW6010	6361.6513
Lead	SW6010	8[a]
Lithium	SW6010	17.7993
Magnesium	SW6010	14656.2132
Maganese	SW6010	164.9104
Mercury	SW7471	NS[b]
Molybdenum	SW6010	5.4258
Nickel	SW6010	5.6125
Potassium	SW6010	2501.3873
Selenium	SW6010	10.531
Silicon	SW6010	483.9082
Silver	SW6010	0.7342
Sodium	SW6010	5000.0000
Strontium	SW6010	3077.1267
Thallium	SW6010	11.3153
Thallium	SW7841	0.4977
Tin	SW6010	3.1743
Titanium	SW6010	197.4081
Uranium	SW6010	12.4107
Vanadium	SW6010	15.4597
Zinc	SW6010	20.2464

APPENDIX H
Analytical Results Detections for Soil, Stockpile, and Soil Ash Samples

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S01	1/20/98	A303A	STRONTIUM	950	MG/KG	
		M8015D	PHC AS DIESEL FUEL	9200	MG/KG	
		SW6010	BARIUM	27.4	MG/KG	
			CHROMIUM, TOTAL	14.9	MG/KG	
			COPPER	2.7	MG/KG	
			NICKEL	2.3	MG/KG	
		SW7060	ARSENIC	1.3	MG/KG	
		SW7421	LEAD	0.99	MG/KG	J
		SW8260	ACETONE	1800	UG/KG	
			METHYLENE CHLORIDE	980	UG/KG	B
		SW8270	2-METHYLNAPHTHALENE	4500	UG/KG	
			ACENAPHTHENE	1500	UG/KG	
			BIS(2-ETHYLHEXYL) PHTHALATE	3800	UG/KG	
			DI-N-BUTYL PHTHALATE	620	UG/KG	
			DIBENZOFURAN	1300	UG/KG	
			FLUORENE	3200	UG/KG	
			PHENANTHRENE	3900	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	8400	MG/KG	
	4/29/98	A303A	STRONTIUM	1600	MG/KG	
		SW6010	BARIUM	52.4	MG/KG	
			CHROMIUM, TOTAL	18.2	MG/KG	
			COPPER	4.9	MG/KG	
			NICKEL	5.6	MG/KG	
		SW7060	ARSENIC	1.6	MG/KG	
		SW7421	LEAD	3.5	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	540	UG/KG	
OBU01S02	1/20/98	A303A	STRONTIUM	870	MG/KG	
		M8015D	PHC AS DIESEL FUEL	5000	MG/KG	
		SW6010	BARIUM	19.3	MG/KG	
			CHROMIUM, TOTAL	15.8	MG/KG	
			COPPER	3.6	MG/KG	
		SW7060	ARSENIC	0.52	MG/KG	
		SW7471	MERCURY	0.07	MG/KG	J
		SW8260	METHYLENE CHLORIDE	900	UG/KG	B

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S02	1/20/98	SW8270	2-METHYLNAPHTHALENE	910	UG/KG	
			ACENAPHTHENE	1400	UG/KG	
			BIS(2-ETHYLHEXYL) PHTHALATE	2200	UG/KG	
			DIBENZOFURAN	520	UG/KG	
			FLUORENE	2100	UG/KG	
			PHENANTHRENE	2500	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	8000	MG/KG	
	4/29/98	A303A	STRONTIUM	1900	MG/KG	
		SW6010	BARIUM	63.5	MG/KG	
			CHROMIUM, TOTAL	19.3	MG/KG	
			COPPER	5.8	MG/KG	
			NICKEL	6.1	MG/KG	
		SW7060	ARSENIC	1.5	MG/KG	
		SW7421	LEAD	2.9	MG/KG	J
OBU01S03	1/20/98	A303A	STRONTIUM	870	MG/KG	
		M8015D	PHC AS DIESEL FUEL	6200	MG/KG	
		SW6010	BARIUM	16.3	MG/KG	
			CHROMIUM, TOTAL	15.7	MG/KG	
		SW8260	METHYLENE CHLORIDE	850	UG/KG	B
		SW8270	2-METHYLNAPHTHALENE	1900	UG/KG	
			ACENAPHTHENE	1600	UG/KG	
			DIBENZOFURAN	1500	UG/KG	
			FLUORENE	3400	UG/KG	
			PHENANTHRENE	4000	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	4600	MG/KG	
	4/29/98	A303A	STRONTIUM	1400	MG/KG	
		SW6010	BARIUM	84.4	MG/KG	
			BERYLLIUM	0.53	MG/KG	
			CHROMIUM, TOTAL	19.7	MG/KG	
			COPPER	9.6	MG/KG	
			NICKEL	8.3	MG/KG	
		SW7060	ARSENIC	2.2	MG/KG	
		SW7421	LEAD	5.4	MG/KG	J
		SW7471	MERCURY	0.05	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S03	4/29/98	SW8270	DI-N-OCTYLPHTHALATE	81	UG/KG	
OBU01S04	1/20/98	A303A	STRONTIUM	890	MG/KG	
		M8015D	PHC AS DIESEL FUEL	2100	MG/KG	
		SW6010	BARIUM	17	MG/KG	
			CHROMIUM, TOTAL	15.5	MG/KG	
		SW7471	MERCURY	0.05	MG/KG	J
		SW8260	METHYLENE CHLORIDE	370	UG/KG	B
		SW8270	2-METHYLNAPHTHALENE	2900	UG/KG	
			ACENAPHTHENE	180	UG/KG	
			BIS(2-ETHYLHEXYL) PHTHALATE	64	UG/KG	
			DIBENZOFURAN	820	UG/KG	
			FLUORENE	590	UG/KG	
			NAPHTHALENE	180	UG/KG	
			PHENANTHRENE	990	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	5100	MG/KG	
	4/29/98	A303A	STRONTIUM	2300	MG/KG	
		SW6010	BARIUM	48.9	MG/KG	
			CHROMIUM, TOTAL	19.6	MG/KG	
			COPPER	4.4	MG/KG	
			NICKEL	4.2	MG/KG	
		SW7060	ARSENIC	1.2	MG/KG	
		SW7421	LEAD	2.1	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	1000	UG/KG	
OBU01S05	1/21/98	A303A	STRONTIUM	270	MG/KG	
		SW6010	BARIUM	132	MG/KG	
			CHROMIUM, TOTAL	13.7	MG/KG	
			COPPER	6.5	MG/KG	
			NICKEL	6.7	MG/KG	
		SW7060	ARSENIC	3.1	MG/KG	
		SW7421	LEAD	2.5	MG/KG	J
		SW7471	MERCURY	0.05	MG/KG	J
		SW8260	METHYLENE CHLORIDE	360	UG/KG	B
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	62	UG/KG	
			DI-N-BUTYL PHTHALATE	250	UG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S05	3/19/98	M8015D	PHC AS DIESEL FUEL	190	MG/KG	
	4/29/98	A303A	STRONTIUM	1500	MG/KG	
		SW6010	BARIUM	42.8	MG/KG	
			CHROMIUM, TOTAL	14.8	MG/KG	
			COPPER	3.8	MG/KG	
			NICKEL	4	MG/KG	
		SW7060	ARSENIC	1.1	MG/KG	
		SW7421	LEAD	2.6	MG/KG	J
		SW7471	MERCURY	0.15	MG/KG	
		SW8270	DIETHYL PHTHALATE	140	UG/KG	
OBU01S06	1/21/98	A303A	STRONTIUM	1600	MG/KG	
		M8015D	PHC AS DIESEL FUEL	88	MG/KG	
		SW6010	BARIUM	42.6	MG/KG	
			CHROMIUM, TOTAL	18.6	MG/KG	
			COPPER	1.3	MG/KG	
		SW7060	ARSENIC	0.88	MG/KG	
		SW7471	MERCURY	0.05	MG/KG	J
		SW8260	METHYLENE CHLORIDE	400	UG/KG	B
		SW8270	PHENANTHRENE	84	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	4100	MG/KG	
	4/29/98	A303A	STRONTIUM	2100	MG/KG	
		SW6010	BARIUM	78.6	MG/KG	
			CHROMIUM, TOTAL	24.4	MG/KG	
			COPPER	7.5	MG/KG	
			NICKEL	8.3	MG/KG	
		SW7060	ARSENIC	2	MG/KG	
		SW7421	LEAD	5.9	MG/KG	J
		SW8270	DIETHYL PHTHALATE	190	UG/KG	
OBU01S07	1/20/98	A303A	STRONTIUM	1200	MG/KG	
		M8015D	PHC AS DIESEL FUEL	8600	MG/KG	
		SW6010	BARIUM	21.5	MG/KG	
			CHROMIUM, TOTAL	18.4	MG/KG	
			COPPER	1.1	MG/KG	
		SW7060	ARSENIC	0.75	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S07	1/20/98	SW8260	ACETONE	2800	UG/KG	
			METHYLENE CHLORIDE	1200	UG/KG	B
		SW8270	2-METHYLNAPHTHALENE	15000	UG/KG	
			ACENAPHTHENE	1300	UG/KG	
			DI-N-BUTYL PHTHALATE	1300	UG/KG	
			DIBENZOFURAN	2400	UG/KG	
			FLUORENE	3900	UG/KG	
			NAPHTHALENE	1200	UG/KG	
			PHENANTHRENE	5000	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	130	MG/KG	
	4/29/98	A303A	STRONTIUM	1800	MG/KG	
		SW6010	BARIUM	60.4	MG/KG	
			CHROMIUM, TOTAL	18.4	MG/KG	
			COPPER	5.2	MG/KG	
			NICKEL	5.6	MG/KG	
		SW7060	ARSENIC	1.3	MG/KG	
		SW7421	LEAD	2.3	MG/KG	J
OBU01S08	1/20/98	A303A	STRONTIUM	1700	MG/KG	
		M8015D	PHC AS DIESEL FUEL	130	MG/KG	
		SW6010	BARIUM	83.6	MG/KG	
			CHROMIUM, TOTAL	15.1	MG/KG	
			COPPER	4.4	MG/KG	
			NICKEL	4.2	MG/KG	
		SW7060	ARSENIC	1.5	MG/KG	
		SW7421	LEAD	0.75	MG/KG	J
		SW8260	METHYLENE CHLORIDE	380	UG/KG	B
		SW8270	2-METHYLNAPHTHALENE	55	UG/KG	
			BIS(2-ETHYLHEXYL) PHTHALATE	140	UG/KG	
			FLUORENE	66	UG/KG	
			PHENANTHRENE	100	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	46	MG/KG	
	4/29/98	A303A	STRONTIUM	1600	MG/KG	
		SW6010	BARIUM	57.9	MG/KG	
			CHROMIUM, TOTAL	18.6	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S08	4/29/98	SW6010	COPPER	5.1	MG/KG	
			NICKEL	5.1	MG/KG	
		SW7060	ARSENIC	1.5	MG/KG	
		SW7421	LEAD	4	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	110	UG/KG	
OBU01S09	1/20/98	A303A	STRONTIUM	1200	MG/KG	
		SW6010	CHROMIUM, TOTAL	8.9	MG/KG	
		SW8260	METHYLENE CHLORIDE	420	UG/KG	B
	3/19/98	M8015D	PHC AS DIESEL FUEL	200	MG/KG	
	4/29/98	A303A	STRONTIUM	2100	MG/KG	
		SW6010	BARIUM	43.7	MG/KG	
			CHROMIUM, TOTAL	18.9	MG/KG	
			COPPER	3.9	MG/KG	
			NICKEL	3.7	MG/KG	
		SW7060	ARSENIC	1.2	MG/KG	
		SW7421	LEAD	2.4	MG/KG	J
OBU01S10	1/20/98	A303A	STRONTIUM	870	MG/KG	
		SW6010	BARIUM	18.8	MG/KG	
			CHROMIUM, TOTAL	16.1	MG/KG	
		SW7060	ARSENIC	1.2	MG/KG	
		SW7471	MERCURY	0.05	MG/KG	J
		SW8260	METHYLENE CHLORIDE	400	UG/KG	B
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	75	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	56	MG/KG	
	4/29/98	A303A	STRONTIUM	1800	MG/KG	
		SW6010	BARIUM	54.7	MG/KG	
			CHROMIUM, TOTAL	18.8	MG/KG	
			COPPER	4.4	MG/KG	
			NICKEL	5	MG/KG	
		SW7060	ARSENIC	1.2	MG/KG	
		SW7421	LEAD	2.7	MG/KG	J
OBU01S11	1/21/98	A303A	STRONTIUM	840	MG/KG	
		M8015D	PHC AS DIESEL FUEL	160	MG/KG	
		SW6010	BARIUM	85.1	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S11	1/21/98	SW6010	CHROMIUM, TOTAL	14.8	MG/KG	
			COPPER	8.8	MG/KG	
			NICKEL	6.6	MG/KG	
		SW7041	ANTIMONY	1.7	MG/KG	J
		SW7060	ARSENIC	2.1	MG/KG	
		SW7421	LEAD	8.8	MG/KG	J
		SW8260	METHYLENE CHLORIDE	480	UG/KG	B
		SW8270	2-METHYLNAPHTHALENE	140	UG/KG	
			DI-N-BUTYL PHTHALATE	1200	UG/KG	
			DIBENZOFURAN	41	UG/KG	
			FLUORENE	59	UG/KG	
			PHENANTHRENE	95	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	890	MG/KG	
	4/29/98	A303A	STRONTIUM	1700	MG/KG	
		SW6010	BARIUM	63.8	MG/KG	
			CHROMIUM, TOTAL	21.1	MG/KG	
			COPPER	5.3	MG/KG	
			NICKEL	5.8	MG/KG	
		SW7060	ARSENIC	1.6	MG/KG	
		SW7421	LEAD	4.1	MG/KG	J
		SW7471	MERCURY	0.05	MG/KG	
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	53	UG/KG	
			DIETHYL PHTHALATE	980	UG/KG	
OBU01S12	1/21/98	A303A	STRONTIUM	510	MG/KG	
		M8015D	PHC AS DIESEL FUEL	450	MG/KG	
		SW6010	BARIUM	103	MG/KG	
			CHROMIUM, TOTAL	14.2	MG/KG	
			COPPER	12	MG/KG	
			NICKEL	7.4	MG/KG	
		SW7060	ARSENIC	2.2	MG/KG	
		SW7421	LEAD	7.3	MG/KG	J
		SW8270	2-METHYLNAPHTHALENE	47	UG/KG	
			BIS(2-ETHYLHEXYL) PHTHALATE	89	UG/KG	
			DI-N-BUTYL PHTHALATE	1100	UG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S12	1/21/98	SW8270	PHENANTHRENE	160	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	220	MG/KG	
	4/29/98	A303A	STRONTIUM	1700	MG/KG	
		SW6010	BARIUM	53.7	MG/KG	
			CHROMIUM, TOTAL	18.8	MG/KG	
			COPPER	5.2	MG/KG	
			NICKEL	5.2	MG/KG	
		SW7060	ARSENIC	1.4	MG/KG	
		SW7421	LEAD	2.8	MG/KG	J
OBU01S13	1/21/98	A303A	STRONTIUM	2100	MG/KG	
		M8015D	PHC AS DIESEL FUEL	15000	MG/KG	
		SW6010	BARIUM	14.5	MG/KG	
			CHROMIUM, TOTAL	18.4	MG/KG	
		SW7060	ARSENIC	0.62	MG/KG	
		SW8270	2-METHYLNAPHTHALENE	20000	UG/KG	
			ANTHRACENE	680	UG/KG	
			DI-N-BUTYL PHTHALATE	620	UG/KG	
			DIBENZOFURAN	3600	UG/KG	
			FLUORENE	4500	UG/KG	
			NAPHTHALENE	2500	UG/KG	
			PHENANTHRENE	7300	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	370	MG/KG	
	4/29/98	A303A	STRONTIUM	1500	MG/KG	
		SW6010	BARIUM	81.2	MG/KG	
			BERYLLIUM	0.51	MG/KG	
			CHROMIUM, TOTAL	19.6	MG/KG	
			COPPER	7.6	MG/KG	
			NICKEL	7.6	MG/KG	
		SW7060	ARSENIC	1.7	MG/KG	
		SW7421	LEAD	4.6	MG/KG	J
OBU01S14	1/21/98	A303A	STRONTIUM	1300	MG/KG	
		M8015D	PHC AS DIESEL FUEL	2900	MG/KG	
		SW6010	BARIUM	88.8	MG/KG	
			CHROMIUM, TOTAL	13.3	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S14	1/21/98	SW6010	COPPER	7.4	MG/KG	
			NICKEL	7.5	MG/KG	
		SW7060	ARSENIC	2.2	MG/KG	
		SW7421	LEAD	2.4	MG/KG	J
		SW7471	MERCURY	0.05	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	250	UG/KG	
		SW8330	3-NITROTOLUENE	8.8	MG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	85	MG/KG	
	4/29/98	A303A	STRONTIUM	1600	MG/KG	
		SW6010	BARIUM	66.6	MG/KG	
			BERYLLIUM	0.46	MG/KG	
			CHROMIUM, TOTAL	20.4	MG/KG	
			COPPER	6.4	MG/KG	
			NICKEL	6.6	MG/KG	
		SW7060	ARSENIC	1.6	MG/KG	
		SW7421	LEAD	4.5	MG/KG	J
OBU01S15	1/21/98	A303A	STRONTIUM	1100	MG/KG	
		M8015D	PHC AS DIESEL FUEL	510	MG/KG	
		SW6010	BARIUM	255	MG/KG	
			CHROMIUM, TOTAL	16.2	MG/KG	
			COPPER	5.6	MG/KG	
			NICKEL	6.1	MG/KG	
		SW7060	ARSENIC	2.1	MG/KG	
		SW7421	LEAD	2	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	92	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	77	MG/KG	
	4/29/98	A303A	STRONTIUM	1400	MG/KG	
		SW6010	BARIUM	80.4	MG/KG	
			BERYLLIUM	0.55	MG/KG	
			CHROMIUM, TOTAL	20.8	MG/KG	
			COPPER	10.2	MG/KG	
			NICKEL	8	MG/KG	
		SW7060	ARSENIC	1.8	MG/KG	
		SW7421	LEAD	5.7	MG/KG	J

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S15	4/29/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	200	UG/KG	
OBU01S16	1/21/98	A303A	STRONTIUM	1200	MG/KG	
		M8015D	PHC AS DIESEL FUEL	750	MG/KG	
		SW6010	BARIUM	44.1	MG/KG	
			CHROMIUM, TOTAL	18.5	MG/KG	
			COPPER	2.9	MG/KG	
			NICKEL	3.3	MG/KG	
		SW7060	ARSENIC	1	MG/KG	
		SW7421	LEAD	0.87	MG/KG	J
		SW7471	MERCURY	0.06	MG/KG	J
		SW8270	2-METHYLNAPHTHALENE	230	UG/KG	
			ACENAPHTHENE	44	UG/KG	
			DIBENZOFURAN	110	UG/KG	
			FLUORENE	140	UG/KG	
			PHENANTHRENE	200	UG/KG	
	3/19/98	M8015D	PHC AS DIESEL FUEL	63	MG/KG	
	4/29/98	A303A	STRONTIUM	2400	MG/KG	
		SW6010	BARIUM	65	MG/KG	
			CHROMIUM, TOTAL	23.6	MG/KG	
			COPPER	5.8	MG/KG	
			NICKEL	6.4	MG/KG	
		SW7060	ARSENIC	1.8	MG/KG	
		SW7421	LEAD	4.1	MG/KG	J
		SW8270	DIETHYL PHTHALATE	81	UG/KG	
OBU01S17		A303A	STRONTIUM	1700	MG/KG	
		SW6010	BARIUM	57.5	MG/KG	
			CHROMIUM, TOTAL	20.4	MG/KG	
			COPPER	5.1	MG/KG	
			NICKEL	5.5	MG/KG	
		SW7060	ARSENIC	1.4	MG/KG	
		SW7421	LEAD	4.1	MG/KG	J
		SW7471	MERCURY	0.06	MG/KG	
OBU01S18		A303A	STRONTIUM	1600	MG/KG	
		SW6010	BARIUM	58.3	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S18	4/29/98	SW6010	CHROMIUM, TOTAL	19.7	MG/KG	
			COPPER	4.9	MG/KG	
			NICKEL	5.4	MG/KG	
		SW7060	ARSENIC	1.5	MG/KG	
		SW7421	LEAD	3.6	MG/KG	J
		SW7471	MERCURY	0.06	MG/KG	
OBU01S19		A303A	STRONTIUM	1300	MG/KG	
		SW6010	BARIUM	66.6	MG/KG	
			CHROMIUM, TOTAL	19.8	MG/KG	
			COPPER	7.1	MG/KG	
			NICKEL	7.2	MG/KG	
		SW7060	ARSENIC	1.6	MG/KG	
		SW7421	LEAD	4	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	66	UG/KG	
OBU01S20		A303A	STRONTIUM	2200	MG/KG	
		SW6010	BARIUM	45.5	MG/KG	
			CHROMIUM, TOTAL	16.9	MG/KG	
			COPPER	3.7	MG/KG	
			NICKEL	4.3	MG/KG	
		SW7060	ARSENIC	1.6	MG/KG	
		SW7421	LEAD	2.9	MG/KG	J
OBU01S21		A303A	STRONTIUM	1900	MG/KG	
		SW6010	BARIUM	70.7	MG/KG	
			CHROMIUM, TOTAL	17.4	MG/KG	
			COPPER	6	MG/KG	
			NICKEL	6.7	MG/KG	
		SW7060	ARSENIC	2.8	MG/KG	
		SW7421	LEAD	5.6	MG/KG	J
OBU01S22		A303A	STRONTIUM	2000	MG/KG	
		SW6010	BARIUM	62.5	MG/KG	
			CHROMIUM, TOTAL	17.5	MG/KG	
			COPPER	5.8	MG/KG	
			NICKEL	6.4	MG/KG	
		SW7060	ARSENIC	2.4	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01S22	4/29/98	SW7421	LEAD	3.6	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	350	UG/KG	B
OBU01S23		A303A	STRONTIUM	1600	MG/KG	
		SW6010	BARIUM	46.7	MG/KG	
			CHROMIUM, TOTAL	15	MG/KG	
			COPPER	3.7	MG/KG	
			NICKEL	4.6	MG/KG	
		SW7060	ARSENIC	1.4	MG/KG	
		SW7421	LEAD	3.1	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	180	UG/KG	B
OBU01S24		A303A	STRONTIUM	1700	MG/KG	
		SW6010	BARIUM	54.3	MG/KG	
			CHROMIUM, TOTAL	16.1	MG/KG	
			COPPER	4.6	MG/KG	
			NICKEL	5.3	MG/KG	
		SW7060	ARSENIC	1.3	MG/KG	
		SW7421	LEAD	3.5	MG/KG	J
OBU01SA01	1/20/98	E418.1	PETROLEUM HYDROCARBONS	49000	MG/KG	
		SW1020	IGNITABILITY	230	DEG F	
		SW6010	BARIUM	136	UG/L	
			CADMIUM	163	UG/L	
			CHROMIUM, TOTAL	96.1	UG/L	
			LEAD	55.9	UG/L	
			SELENIUM	155	UG/L	
		SW9040	PH	7.1	PH UNITS	
OBU01SP03		E418.1	PETROLEUM HYDROCARBONS	10000	MG/KG	
		SW1020	IGNITABILITY	230	DEG F	
		SW6010	BARIUM	98.8	UG/L	
			CADMIUM	4.5	UG/L	
			CHROMIUM, TOTAL	82.8	UG/L	
			SELENIUM	152	UG/L	
		SW9040	PH	7.4	PH UNITS	
OBU01SP04OC	5/7/98	E418.1	PETROLEUM HYDROCARBONS	800	MG/KG	
		SW1020	IGNITABILITY	230	DEG F	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 1

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU01SP04OC	5/7/98	SW6010	BARIUM	272	UG/L	BJ
			CADMIUM	4.1	UG/L	
			CHROMIUM, TOTAL	179	UG/L	
			SELENIUM	85.7	UG/L	
		SW9040	PH	7.7	PH UNITS	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 2

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU0203SA01	2/19/98	E418.1	PETROLEUM HYDROCARBONS	19000	MG/KG	J
		SW1020	IGNITABILITY	230	DEG F	
		SW6010	ARSENIC	29.5	UG/L	
			BARIUM	160	UG/L	
			CADMIUM	67.1	UG/L	
			CHROMIUM, TOTAL	96.3	UG/L	
			SELENIUM	84.7	UG/L	
		SW9040	PH	7.1	PH UNITS	
OBU02S01	3/19/98	M8015D	PHC AS DIESEL FUEL	3600	MG/KG	
OBU02S02			PHC AS DIESEL FUEL	3100	MG/KG	
OBU02S03			PHC AS DIESEL FUEL	2900	MG/KG	
OBU02S04			PHC AS DIESEL FUEL	2600	MG/KG	
OBU02S05			PHC AS DIESEL FUEL	120	MG/KG	
OBU02S09			PHC AS DIESEL FUEL	46	MG/KG	
OBU02S10			PHC AS DIESEL FUEL	74	MG/KG	
	9/11/98		PHC AS DIESEL FUEL	60	MG/KG	
OBU02S13			PHC AS DIESEL FUEL	790	MG/KG	
OBU02S14	3/19/98		PHC AS DIESEL FUEL	73	MG/KG	
OBU02S15			PHC AS DIESEL FUEL	64	MG/KG	
OBU02S16			PHC AS DIESEL FUEL	70	MG/KG	
OBU02SP	2/19/98	E418.1	PETROLEUM HYDROCARBONS	2500	MG/KG	J
		SW1020	IGNITABILITY	230	DEG F	
		SW6010	BARIUM	165	UG/L	
			CHROMIUM, TOTAL	91.5	UG/L	
			LEAD	35.6	UG/L	
			SELENIUM	150	UG/L	
		SW9040	PH	7.4	PH UNITS	
OBU02SP02OC	5/7/98	E418.1	PETROLEUM HYDROCARBONS	710	MG/KG	
		SW1020	IGNITABILITY	230	DEG F	
		SW6010	BARIUM	135	UG/L	BJ
			CADMIUM	82	UG/L	
			CHROMIUM, TOTAL	93	UG/L	
			SELENIUM	70.6	UG/L	
		SW9040	PH	7.7	PH UNITS	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 3

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU03S01	3/19/98	M8015D	PHC AS DIESEL FUEL	380	MG/KG	
OBU03S02			PHC AS DIESEL FUEL	45	MG/KG	
OBU03S03			PHC AS DIESEL FUEL	380	MG/KG	
OBU03S04			PHC AS DIESEL FUEL	450	MG/KG	
OBU03S05	9/11/98		PHC AS DIESEL FUEL	210	MG/KG	
OBU03S06	3/19/98		PHC AS DIESEL FUEL	310	MG/KG	
	9/11/98		PHC AS DIESEL FUEL	73	MG/KG	
OBU03S07	3/19/98		PHC AS DIESEL FUEL	71	MG/KG	
	9/11/98		PHC AS DIESEL FUEL	40	MG/KG	
OBU03S08	3/19/98		PHC AS DIESEL FUEL	2100	MG/KG	
	9/11/98		PHC AS DIESEL FUEL	33	MG/KG	
OBU03S14	3/19/98		PHC AS DIESEL FUEL	410	MG/KG	
			PHC AS KEROSENE	370	MG/KG	
OBU03S15			PHC AS DIESEL FUEL	770	MG/KG	
			PHC AS KEROSENE	610	MG/KG	
OBU03S16			PHC AS DIESEL FUEL	1000	MG/KG	
			PHC AS KEROSENE	840	MG/KG	
OBU03SP01	2/19/98	E418.1	PETROLEUM HYDROCARBONS	2000	MG/KG	J
		SW1020	IGNITABILITY	230	DEG F	
		SW6010	BARIUM	131	UG/L	
			CHROMIUM, TOTAL	90.6	UG/L	
			SELENIUM	104	UG/L	
		SW9040	PH	7.4	PH UNITS	
OBU03SP02		E418.1	PETROLEUM HYDROCARBONS	1700	MG/KG	J
		SW1020	IGNITABILITY	230	DEG F	
		SW6010	ARSENIC	27.7	UG/L	
			BARIUM	108	UG/L	
			CADMIUM	8.7	UG/L	
			CHROMIUM, TOTAL	93.2	UG/L	
			LEAD	55	UG/L	
			SELENIUM	74	UG/L	
		SW9040	PH	7.4	PH UNITS	
OBU03SP03		E418.1	PETROLEUM HYDROCARBONS	2700	MG/KG	J
		SW1020	IGNITABILITY	230	DEG F	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 3

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU03SP03	2/19/98	SW6010	BARIUM	130	UG/L	
			CADMIUM	7.1	UG/L	
			CHROMIUM, TOTAL	93.3	UG/L	
			SELENIUM	116	UG/L	
		SW9040	PH	7.1	PH UNITS	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 4

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU04S01	3/9/98	A303A	STRONTIUM	430	MG/KG	
		SW6010	BARIUM	45.7	MG/KG	
			CHROMIUM, TOTAL	13.9	MG/KG	
			COPPER	13.5	MG/KG	J
			NICKEL	3.4	MG/KG	
		SW7060	ARSENIC	0.88	MG/KG	
		SW7421	LEAD	6.1	MG/KG	J
		SW8270	2,4-DINITROTOLUENE	1100	UG/KG	
			BIS(2-ETHYLHEXYL) PHTHALATE	100	UG/KG	
			DI-N-BUTYL PHTHALATE	280	UG/KG	
			N-NITROSODIPHENYLAMINE	99	UG/KG	
OBU04S02		A303A	STRONTIUM	710	MG/KG	
		SW6010	BARIUM	37.2	MG/KG	
			CHROMIUM, TOTAL	16.9	MG/KG	
			COPPER	3	MG/KG	J
			NICKEL	2.9	MG/KG	
		SW7060	ARSENIC	0.83	MG/KG	
		SW7421	LEAD	2	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	55	UG/KG	
OBU04S03		A303A	STRONTIUM	540	MG/KG	
		SW6010	BARIUM	39.5	MG/KG	
			CHROMIUM, TOTAL	16.3	MG/KG	
			COPPER	41.5	MG/KG	J
			NICKEL	3	MG/KG	
		SW7060	ARSENIC	0.76	MG/KG	
		SW7421	LEAD	4	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	43	UG/KG	
OBU04S04		A303A	STRONTIUM	710	MG/KG	
		SW6010	BARIUM	38.7	MG/KG	
			CHROMIUM, TOTAL	18.7	MG/KG	
			COPPER	5.2	MG/KG	J
			NICKEL	2.6	MG/KG	
		SW7060	ARSENIC	0.55	MG/KG	
		SW7421	LEAD	1.7	MG/KG	J

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 4

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU04S04	3/9/98	SW8260	METHYLENE CHLORIDE	360	UG/KG	
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	2800	UG/KG	
OBU04S05		A303A	STRONTIUM	840	MG/KG	
		SW6010	BARIUM	30	MG/KG	
			CHROMIUM, TOTAL	17.7	MG/KG	
			COPPER	2.8	MG/KG	J
			NICKEL	2.3	MG/KG	
		SW7060	ARSENIC	3.2	MG/KG	
		SW7421	LEAD	0.8	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	67	UG/KG	
OBU04S06		A303A	STRONTIUM	500	MG/KG	
		SW6010	BARIUM	41	MG/KG	
			CHROMIUM, TOTAL	18.2	MG/KG	
			COPPER	3.5	MG/KG	J
			NICKEL	4.2	MG/KG	
		SW7060	ARSENIC	0.69	MG/KG	
		SW7421	LEAD	1.2	MG/KG	J
		SW8260	METHYLENE CHLORIDE	430	UG/KG	
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	110	UG/KG	
OBU04S07		A303A	STRONTIUM	130	MG/KG	
		SW6010	BARIUM	61.6	MG/KG	
			CHROMIUM, TOTAL	6.4	MG/KG	
			COPPER	7.8	MG/KG	J
			NICKEL	4.4	MG/KG	
		SW7060	ARSENIC	1.1	MG/KG	
		SW7421	LEAD	9.8	MG/KG	J
		SW8260	METHYLENE CHLORIDE	420	UG/KG	
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	56	UG/KG	
OBU04S08		A303A	STRONTIUM	390	MG/KG	
		SW6010	BARIUM	71.7	MG/KG	
			CADMIUM	1.1	MG/KG	
			CHROMIUM, TOTAL	13.6	MG/KG	
			COPPER	10.2	MG/KG	J
			NICKEL	4.7	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 4

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU04S08	3/9/98	SW7060	ARSENIC	1.3	MG/KG	
		SW7421	LEAD	7.1	MG/KG	J
		SW8260	METHYLENE CHLORIDE	550	UG/KG	
OBU04S09		A303A	STRONTIUM	340	MG/KG	
		SW6010	BARIUM	89.3	MG/KG	
			CHROMIUM, TOTAL	13.9	MG/KG	
			COPPER	9.9	MG/KG	J
			NICKEL	6.9	MG/KG	
		SW7060	ARSENIC	2.3	MG/KG	
		SW7421	LEAD	5	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	50	UG/KG	
			DIETHYL PHTHALATE	77	UG/KG	
OBU04S10		A303A	STRONTIUM	360	MG/KG	
		SW6010	BARIUM	112	MG/KG	
			CHROMIUM, TOTAL	12.9	MG/KG	
			COPPER	6	MG/KG	J
			NICKEL	5.6	MG/KG	
		SW7060	ARSENIC	2.1	MG/KG	
		SW7421	LEAD	3.6	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	52	UG/KG	
			DIETHYL PHTHALATE	540	UG/KG	
OBU04S11	3/10/98	A303A	STRONTIUM	830	MG/KG	
		SW6010	BARIUM	209	MG/KG	
			CHROMIUM, TOTAL	15.6	MG/KG	
			COPPER	5	MG/KG	J
			NICKEL	4.5	MG/KG	
		SW7060	ARSENIC	2.3	MG/KG	
		SW7421	LEAD	1.9	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	44	UG/KG	
			DI-N-BUTYL PHTHALATE	53	UG/KG	
OBU04S12		A303A	STRONTIUM	370	MG/KG	
		SW6010	BARIUM	50.8	MG/KG	
			CHROMIUM, TOTAL	14.8	MG/KG	
			COPPER	3.5	MG/KG	J

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 4

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU04S12	3/10/98	SW6010	NICKEL	3.2	MG/KG	
		SW7060	ARSENIC	1.4	MG/KG	
		SW7421	LEAD	1.8	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	130	UG/KG	
OBU04S13		A303A	STRONTIUM	310	MG/KG	
		SW6010	BARIUM	340	MG/KG	
			CHROMIUM, TOTAL	18.5	MG/KG	
			COPPER	5.8	MG/KG	J
			NICKEL	5.6	MG/KG	
		SW7060	ARSENIC	2.8	MG/KG	
		SW7421	LEAD	1.6	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	64	UG/KG	
OBU04S14		A303A	STRONTIUM	380	MG/KG	
		SW6010	BARIUM	136	MG/KG	
			CADMIUM	1.5	MG/KG	
			CHROMIUM, TOTAL	15.6	MG/KG	
			COPPER	11.8	MG/KG	J
			NICKEL	4.7	MG/KG	
		SW7060	ARSENIC	2	MG/KG	
		SW7421	LEAD	4.6	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	39	UG/KG	
			DI-N-BUTYL PHTHALATE	2100	UG/KG	
OBU04S15		A303A	STRONTIUM	320	MG/KG	
		SW6010	BARIUM	92.7	MG/KG	
			CADMIUM	5.9	MG/KG	
			CHROMIUM, TOTAL	13.6	MG/KG	
			COPPER	59.4	MG/KG	J
			NICKEL	9.2	MG/KG	
		SW7060	ARSENIC	1.9	MG/KG	
		SW7421	LEAD	17.2	MG/KG	J
		SW7471	MERCURY	0.06	MG/KG	
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	79	UG/KG	
OBU04S16		A303A	STRONTIUM	370	MG/KG	
		SW6010	BARIUM	45.8	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 4

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU04S16	3/10/98	SW6010	CHROMIUM, TOTAL	14.6	MG/KG	
			COPPER	14.6	MG/KG	J
			NICKEL	3.7	MG/KG	
		SW7060	ARSENIC	1.2	MG/KG	
		SW7421	LEAD	2.9	MG/KG	J
		SW7471	MERCURY	0.06	MG/KG	
OBU04S17		A303A	STRONTIUM	570	MG/KG	
		SW6010	BARIUM	92.7	MG/KG	
			CHROMIUM, TOTAL	15.8	MG/KG	
			COPPER	8.6	MG/KG	J
			NICKEL	4.7	MG/KG	
		SW7060	ARSENIC	1.9	MG/KG	
		SW7421	LEAD	2.6	MG/KG	J
OBU04S18		A303A	STRONTIUM	570	MG/KG	
		SW6010	BARIUM	43.5	MG/KG	
			CHROMIUM, TOTAL	14.2	MG/KG	
			COPPER	9.6	MG/KG	J
			NICKEL	3.3	MG/KG	
		SW7060	ARSENIC	2.2	MG/KG	
		SW7421	LEAD	3.5	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	46	UG/KG	
OBU04S19		A303A	STRONTIUM	170	MG/KG	
		SW6010	BARIUM	97.7	MG/KG	
			BERYLLIUM	0.48	MG/KG	
			CADMIUM	2.2	MG/KG	
			CHROMIUM, TOTAL	10.9	MG/KG	
			COPPER	9.2	MG/KG	J
			NICKEL	9.1	MG/KG	
		SW7060	ARSENIC	2	MG/KG	
		SW7421	LEAD	4.7	MG/KG	J
		SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	41	UG/KG	
OBU04S20		A303A	STRONTIUM	300	MG/KG	
		SW6010	BARIUM	67.5	MG/KG	
			BERYLLIUM	0.29	MG/KG	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 4

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU04S20	3/10/98	SW6010	CHROMIUM, TOTAL	25	MG/KG	
			COPPER	14	MG/KG	
			NICKEL	5.5	MG/KG	
		SW7060	ARSENIC	1.4	MG/KG	
		SW7421	LEAD	5.1	MG/KG	J
		SW7471	MERCURY	0.09	MG/KG	
		SW8270	DIETHYL PHTHALATE	500	UG/KG	
OBU04S21		A303A	STRONTIUM	310	MG/KG	
		SW6010	BARIUM	58.2	MG/KG	
			BERYLLIUM	0.26	MG/KG	
			CHROMIUM, TOTAL	10.8	MG/KG	
			COPPER	8.7	MG/KG	
			NICKEL	3.9	MG/KG	
		SW7060	ARSENIC	1.4	MG/KG	
		SW7421	LEAD	13.2	MG/KG	J
		SW8270	2,4-DINITROTOLUENE	740	UG/KG	
			N-NITROSODIPHENYLAMINE	570	UG/KG	
OBU04S22		A303A	STRONTIUM	290	MG/KG	
		SW6010	BARIUM	72.9	MG/KG	
			BERYLLIUM	0.3	MG/KG	
			CHROMIUM, TOTAL	12.9	MG/KG	
			COPPER	21.3	MG/KG	
			NICKEL	4.5	MG/KG	
			SILVER	26.5	MG/KG	
		SW7060	ARSENIC	1.3	MG/KG	
		SW7421	LEAD	15.4	MG/KG	J
		SW8270	DI-N-BUTYL PHTHALATE	120	UG/KG	
OBU04SA01		SW1020	IGNITABILITY	230	DEG F	
		SW6010	BARIUM	261	UG/L	B
			CADMIUM	321	UG/L	
			CHROMIUM, TOTAL	170	UG/L	
			LEAD	10400	UG/L	
		SW9040	PH	7.2	PH UNITS	
OBU04SA02		SW1020	IGNITABILITY	230	DEG F	

Holloman Air Force Base
300 Pound Open Burn
Analytical Results - Trench 4

Location	Sample Date	Method	Parameter	Value	Units	EPA Qualifier
OBU04SA02	3/10/98	SW6010	BARIUM	160	UG/L	B
			CADMIUM	60	UG/L	
			CHROMIUM, TOTAL	118	UG/L	
			LEAD	159	UG/L	
			SELENIUM	222	UG/L	
		SW9040	PH	7.3	PH UNITS	
OBU04SA03		SW1020	IGNITABILITY	230	DEG F	
		SW6010	BARIUM	294	UG/L	B
			CADMIUM	74.5	UG/L	
			CHROMIUM, TOTAL	134	UG/L	
			LEAD	1820	UG/L	
			SELENIUM	196	UG/L	
		SW9040	PH	7.4	PH UNITS	
OBU04SA03A	4/17/98	SW6010	BARIUM	185	UG/L	BJ
			CADMIUM	6.4	UG/L	
			CHROMIUM, TOTAL	94.4	UG/L	
			SELENIUM	31.2	UG/L	
OBU04SA03B	4/16/98		BARIUM	190	UG/L	BJ
			CADMIUM	5.9	UG/L	
			CHROMIUM, TOTAL	95.7	UG/L	

APPENDIX I
Complete Analytical Results for Soil, Stockpile, and Soil Ash Samples

This data is available upon request.

APPENDIX J
Closure Samples—Trenches 1, 2, 3, and 4

Hollman Air Force Base
Trench 1
Closure Samples

Location	Sample Date	Method	Parameter	flag	Value	Units
OBU01S01						
	4/29/98	A303A	STRONTIUM	=	1600	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	52.4	MG/KG
	4/29/98	SW6010	CHROMIUM	=	18.2	MG/KG
	4/29/98	SW6010	COPPER	=	4.9	MG/KG
	4/29/98	SW6010	NICKEL	=	5.6	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.6	MG/KG
	4/29/98	SW7421	LEAD	=	3.5	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.34	MG/KG
	4/29/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	540	UG/KG
OBU01S02						
	4/29/98	A303A	STRONTIUM	=	1900	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	63.5	MG/KG
	4/29/98	SW6010	CHROMIUM	=	19.3	MG/KG
	4/29/98	SW6010	COPPER	=	5.8	MG/KG
	4/29/98	SW6010	NICKEL	=	6.1	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	4/29/98	SW7060	ARSENIC	=	1.5	MG/KG
	4/29/98	SW7421	LEAD	=	2.9	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.34	MG/KG
OBU01S03						
	4/29/98	A303A	STRONTIUM	=	1400	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	84.4	MG/KG
	4/29/98	SW6010	BERYLLIUM	=	0.53	MG/KG
	4/29/98	SW6010	CHROMIUM	=	19.7	MG/KG
	4/29/98	SW6010	COPPER	=	9.6	MG/KG
	4/29/98	SW6010	NICKEL	=	8.3	MG/KG
	4/29/98	SW7060	ARSENIC	=	2.2	MG/KG
	4/29/98	SW7421	LEAD	=	5.4	MG/KG
	4/29/98	SW7471	MERCURY	=	0.05	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.35	MG/KG
	4/29/98	SW8270	DI-N-OCTYLPHTHALATE	=	81	UG/KG
OBU01S04						
	4/29/98	A303A	STRONTIUM	=	2300	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	30	MG/KG
	4/29/98	SW6010	BARIUM	=	48.9	MG/KG
	4/29/98	SW6010	CHROMIUM	=	19.6	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	4/29/98	SW6010	COPPER	=	4.4	MG/KG
	4/29/98	SW6010	NICKEL	=	4.2	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.2	MG/KG
	4/29/98	SW7421	LEAD	=	2.1	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.36	MG/KG
	4/29/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	1000	UG/KG
OBU01S05						
	4/29/98	A303A	STRONTIUM	=	1500	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	30	MG/KG
	4/29/98	SW6010	BARIUM	=	42.8	MG/KG
	4/29/98	SW6010	CHROMIUM	=	14.8	MG/KG
	4/29/98	SW6010	COPPER	=	3.8	MG/KG
	4/29/98	SW6010	NICKEL	=	4	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.1	MG/KG
	4/29/98	SW7421	LEAD	=	2.6	MG/KG
	4/29/98	SW7471	MERCURY	=	0.15	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.36	MG/KG
	4/29/98	SW8270	DIETHYL PHTHALATE	=	140	UG/KG
OBU01S06						
	4/29/98	A303A	STRONTIUM	=	2100	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	36	MG/KG

EPA SAL = 1.5

= 1 mg/kg.

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	4/29/98	SW6010	BARIUM	=	78.6	MG/KG
	4/29/98	SW6010	CHROMIUM	=	24.4	MG/KG
	4/29/98	SW6010	COPPER	=	7.5	MG/KG
	4/29/98	SW6010	NICKEL	=	8.3	MG/KG
	4/29/98	SW7060	ARSENIC	=	2	MG/KG
	4/29/98	SW7421	LEAD	=	5.9	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.44	MG/KG
	4/29/98	SW8270	DIETHYL PHTHALATE	=	190	UG/KG
OBU01S07						
	4/29/98	A303A	STRONTIUM	=	1800	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	30	MG/KG
	4/29/98	SW6010	BARIUM	=	60.4	MG/KG
	4/29/98	SW6010	CHROMIUM	=	18.4	MG/KG
	4/29/98	SW6010	COPPER	=	5.2	MG/KG
	4/29/98	SW6010	NICKEL	=	5.6	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.3	MG/KG
	4/29/98	SW7421	LEAD	=	2.3	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.36	MG/KG
OBU01S08						
	4/29/98	A303A	STRONTIUM	=	1600	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	30	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	4/29/98	SW6010	BARIUM	=	57.9	MG/KG
	4/29/98	SW6010	CHROMIUM	=	18.6	MG/KG
	4/29/98	SW6010	COPPER	=	5.1	MG/KG
	4/29/98	SW6010	NICKEL	=	5.1	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.5	MG/KG
	4/29/98	SW7421	LEAD	=	4	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.36	MG/KG
	4/29/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	110	UG/KG
OBU01S09						
	4/29/98	A303A	STRONTIUM	=	2100	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	30	MG/KG
	4/29/98	SW6010	BARIUM	=	43.7	MG/KG
	4/29/98	SW6010	CHROMIUM	=	18.9	MG/KG
	4/29/98	SW6010	COPPER	=	3.9	MG/KG
	4/29/98	SW6010	NICKEL	=	3.7	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.2	MG/KG
	4/29/98	SW7421	LEAD	=	2.4	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.36	MG/KG
OBU01S10						
	4/29/98	A303A	STRONTIUM	=	1800	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	30	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	4/29/98	SW6010	BARIUM	=	54.7	MG/KG
	4/29/98	SW6010	CHROMIUM	=	18.8	MG/KG
	4/29/98	SW6010	COPPER	=	4.4	MG/KG
	4/29/98	SW6010	NICKEL	=	5	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.2	MG/KG
	4/29/98	SW7421	LEAD	=	2.7	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.36	MG/KG
OBU01S11						
	4/29/98	A303A	STRONTIUM	=	1700	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	36	MG/KG
	4/29/98	SW6010	BARIUM	=	63.8	MG/KG
	4/29/98	SW6010	CHROMIUM	=	21.1	MG/KG
	4/29/98	SW6010	COPPER	=	5.3	MG/KG
	4/29/98	SW6010	NICKEL	=	5.8	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.6	MG/KG
	4/29/98	SW7421	LEAD	=	4.1	MG/KG
	4/29/98	SW7471	MERCURY	=	0.05	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.43	MG/KG
	4/29/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	53	UG/KG
	4/29/98	SW8270	DIETHYL PHTHALATE	=	980	UG/KG
OBU01S12						

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	4/29/98	A303A	STRONTIUM	=	1700	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	53.7	MG/KG
	4/29/98	SW6010	CHROMIUM	=	18.8	MG/KG
	4/29/98	SW6010	COPPER	=	5.2	MG/KG
	4/29/98	SW6010	NICKEL	=	5.2	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.4	MG/KG
	4/29/98	SW7421	LEAD	=	2.8	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.35	MG/KG
OBU01S13						
	4/29/98	A303A	STRONTIUM	=	1500	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	81.2	MG/KG
	4/29/98	SW6010	BERYLLIUM	=	0.51	MG/KG
	4/29/98	SW6010	CHROMIUM	=	19.6	MG/KG
	4/29/98	SW6010	COPPER	=	7.6	MG/KG
	4/29/98	SW6010	NICKEL	=	7.6	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.7	MG/KG
	4/29/98	SW7421	LEAD	=	4.6	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.34	MG/KG
OBU01S14						

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	4/29/98	A303A	STRONTIUM	=	1600	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	66.6	MG/KG
	4/29/98	SW6010	BERYLLIUM	=	0.46	MG/KG
	4/29/98	SW6010	CHROMIUM	=	20.4	MG/KG
	4/29/98	SW6010	COPPER	=	6.4	MG/KG
	4/29/98	SW6010	NICKEL	=	6.6	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.6	MG/KG
	4/29/98	SW7421	LEAD	=	4.5	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.34	MG/KG
OBU01S15						
	4/29/98	A303A	STRONTIUM	=	1400	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	80.4	MG/KG
	4/29/98	SW6010	BERYLLIUM	=	0.55	MG/KG
	4/29/98	SW6010	CHROMIUM	=	20.8	MG/KG
	4/29/98	SW6010	COPPER	=	10.2	MG/KG
	4/29/98	SW6010	NICKEL	=	8	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.8	MG/KG
	4/29/98	SW7421	LEAD	=	5.7	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.34	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	4/29/98	SW7421	LEAD	=	5.6	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.36	MG/KG
OBU01S22						
	4/29/98	A303A	STRONTIUM	=	2000	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	62.5	MG/KG
	4/29/98	SW6010	CHROMIUM	=	17.5	MG/KG
	4/29/98	SW6010	COPPER	=	5.8	MG/KG
	4/29/98	SW6010	NICKEL	=	6.4	MG/KG
	4/29/98	SW7060	ARSENIC	=	2.4	MG/KG
	4/29/98	SW7421	LEAD	=	3.6	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.35	MG/KG
	4/29/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	350	UG/KG
OBU01S23						
	4/29/98	A303A	STRONTIUM	=	1600	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	46.7	MG/KG
	4/29/98	SW6010	CHROMIUM	=	15	MG/KG
	4/29/98	SW6010	COPPER	=	3.7	MG/KG
	4/29/98	SW6010	NICKEL	=	4.6	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.4	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	4/29/98	SW7421	LEAD	=	3.1	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.35	MG/KG
	4/29/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	180	UG/KG
OBU01S24						
	4/29/98	A303A	STRONTIUM	=	1700	MG/KG
	4/29/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	4/29/98	SW6010	BARIUM	=	54.3	MG/KG
	4/29/98	SW6010	CHROMIUM	=	16.1	MG/KG
	4/29/98	SW6010	COPPER	=	4.6	MG/KG
	4/29/98	SW6010	NICKEL	=	5.3	MG/KG
	4/29/98	SW7060	ARSENIC	=	1.3	MG/KG
	4/29/98	SW7421	LEAD	=	3.5	MG/KG
	4/29/98	SW8260	BENZENE	LT	0.35	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

H. man Air Force Base
Trench 2
Closure Samples

Location	*Sample Date*	*Method*	*Parameter*	*flag*	*Value*	*Units*
OBU02S01						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S02						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S03						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S04						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S05						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S06						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
OBU02S07						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
OBU02S08						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S09						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S10						
	9/11/98	M8015D	PHC AS DIESEL FUEL	=	60	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
OBU02S11						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S12						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	35	MG/KG
OBU02S13						
	9/11/98	M8015D	PHC AS DIESEL FUEL	=	790	MG/KG
OBU02S14						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S15						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S16						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S17						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S18						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S19						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU02S20						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

H. oman Air Force Base
Trench 3
Closure Samples

Location	*Sample Date*	*Method*	*Parameter*	*flag*	*Value*	*Units*
OBU03S01						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	27	MG/KG
OBU03S02						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU03S03						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	35	MG/KG
OBU03S04						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	27	MG/KG
OBU03S05						
	9/11/98	M8015D	PHC AS DIESEL FUEL	=	210	MG/KG
OBU03S06						
	9/11/98	M8015D	PHC AS DIESEL FUEL	=	73	MG/KG
OBU03S07						
	9/11/98	M8015D	PHC AS DIESEL FUEL	=	40	MG/KG
OBU03S08						
	9/11/98	M8015D	PHC AS DIESEL FUEL	=	33	MG/KG
OBU03S09						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU03S10						

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	32	MG/KG
OBU03S11						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	31	MG/KG
OBU03S12						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
OBU03S13						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	35	MG/KG
OBU03S14						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	31	MG/KG
OBU03S15						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
OBU03S16						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	34	MG/KG
OBU03S17						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	34	MG/KG
OBU03S18						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	33	MG/KG
OBU03S19						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	34	MG/KG
OBU03S20						
	9/11/98	M8015D	PHC AS DIESEL FUEL	LT	36	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Holloman Air Force Base
Trench 4
Closure Samples

Location	Sample Date	Method	Parameter	flag	Value	Units
OBU04S01						
	3/9/98	A303A	STRONTIUM	=	430	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
	3/9/98	SW6010	BARIUM	=	45.7	MG/KG
	3/9/98	SW6010	CHROMIUM	=	13.9	MG/KG
	3/9/98	SW6010	COPPER	=	13.5	MG/KG
	3/9/98	SW6010	NICKEL	=	3.4	MG/KG
	3/9/98	SW7060	ARSENIC	=	0.88	MG/KG
	3/9/98	SW7421	LEAD	=	6.1	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.34	MG/KG
	3/9/98	SW8270	2,4-DINITROTOLUENE	=	1.1	MG/KG
	3/9/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.1	MG/KG
	3/9/98	SW8270	DI-N-BUTYL PHTHALATE	=	0.28	MG/KG
	3/9/98	SW8270	N-NITROSODIPHENYLAMINE	=	0.099	MG/KG
OBU04S02						
	3/9/98	A303A	STRONTIUM	=	710	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	30	MG/KG
	3/9/98	SW6010	BARIUM	=	37.2	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/9/98	SW6010	CHROMIUM	=	16.9	MG/KG
	3/9/98	SW6010	COPPER	=	3	MG/KG
	3/9/98	SW6010	NICKEL	=	2.9	MG/KG
	3/9/98	SW7060	ARSENIC	=	0.83	MG/KG
	3/9/98	SW7421	LEAD	=	2	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.36	MG/KG
	3/9/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.055	MG/KG
OBU04S03						
	3/9/98	A303A	STRONTIUM	=	540	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	3/9/98	SW6010	BARIUM	=	39.5	MG/KG
	3/9/98	SW6010	CHROMIUM	=	16.3	MG/KG
	3/9/98	SW6010	COPPER	=	41.5	MG/KG
	3/9/98	SW6010	NICKEL	=	3	MG/KG
	3/9/98	SW7060	ARSENIC	=	0.76	MG/KG
	3/9/98	SW7421	LEAD	=	4	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.35	MG/KG
	3/9/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.043	MG/KG
OBU04S04						
	3/9/98	A303A	STRONTIUM	=	710	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	30	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/9/98	SW6010	BARIUM	=	38.7	MG/KG
	3/9/98	SW6010	CHROMIUM	=	18.7	MG/KG
	3/9/98	SW6010	COPPER	=	5.2	MG/KG
	3/9/98	SW6010	NICKEL	=	2.6	MG/KG
	3/9/98	SW7060	ARSENIC	=	0.55	MG/KG
	3/9/98	SW7421	LEAD	=	1.7	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.36	MG/KG
	3/9/98	SW8260	METHYLENE CHLORIDE	=	0.36	MG/KG
	3/9/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	2.8	MG/KG
OBU04S05						
	3/9/98	A303A	STRONTIUM	=	840	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	31	MG/KG
	3/9/98	SW6010	BARIUM	=	30	MG/KG
	3/9/98	SW6010	CHROMIUM	=	17.7	MG/KG
	3/9/98	SW6010	COPPER	=	2.8	MG/KG
	3/9/98	SW6010	NICKEL	=	2.3	MG/KG
	3/9/98	SW7060	ARSENIC	=	3.2	MG/KG
	3/9/98	SW7421	LEAD	=	0.8	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.37	MG/KG
	3/9/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.067	MG/KG
OBU04S06						

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/9/98	A303A	STRONTIUM	=	500	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	30	MG/KG
	3/9/98	SW6010	BARIUM	=	41	MG/KG
	3/9/98	SW6010	CHROMIUM	=	18.2	MG/KG
	3/9/98	SW6010	COPPER	=	3.5	MG/KG
	3/9/98	SW6010	NICKEL	=	4.2	MG/KG
	3/9/98	SW7060	ARSENIC	=	0.69	MG/KG
	3/9/98	SW7421	LEAD	=	1.2	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.36	MG/KG
	3/9/98	SW8260	METHYLENE CHLORIDE	=	0.43	MG/KG
	3/9/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.11	MG/KG
OBU04S07						
	3/9/98	A303A	STRONTIUM	=	130	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	26	MG/KG
	3/9/98	SW6010	BARIUM	=	61.6	MG/KG
	3/9/98	SW6010	CHROMIUM	=	6.4	MG/KG
	3/9/98	SW6010	COPPER	=	7.8	MG/KG
	3/9/98	SW6010	NICKEL	=	4.4	MG/KG
	3/9/98	SW7060	ARSENIC	=	1.1	MG/KG
	3/9/98	SW7421	LEAD	=	9.8	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.31	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/9/98	SW8260	METHYLENE CHLORIDE	=	0.42	MG/KG
	3/9/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.056	MG/KG
OBU04S08						
	3/9/98	A303A	STRONTIUM	=	390	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	27	MG/KG
	3/9/98	SW6010	BARIUM	=	71.7	MG/KG
	3/9/98	SW6010	CADMIUM	=	1.1	MG/KG
	3/9/98	SW6010	CHROMIUM	=	13.6	MG/KG
	3/9/98	SW6010	COPPER	=	10.2	MG/KG
	3/9/98	SW6010	NICKEL	=	4.7	MG/KG
	3/9/98	SW7060	ARSENIC	=	1.3	MG/KG
	3/9/98	SW7421	LEAD	=	7.1	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.33	MG/KG
	3/9/98	SW8260	METHYLENE CHLORIDE	=	0.55	MG/KG
OBU04S09						
	3/9/98	A303A	STRONTIUM	=	340	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	3/9/98	SW6010	BARIUM	=	89.3	MG/KG
	3/9/98	SW6010	CHROMIUM	=	13.9	MG/KG
	3/9/98	SW6010	COPPER	=	9.9	MG/KG
	3/9/98	SW6010	NICKEL	=	6.9	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/9/98	SW7060	ARSENIC	=	2.3	MG/KG
	3/9/98	SW7421	LEAD	=	5	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.34	MG/KG
	3/9/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.05	MG/KG
	3/9/98	SW8270	DIETHYL PHTHALATE	=	0.077	MG/KG
OBU04S10						
	3/9/98	A303A	STRONTIUM	=	360	MG/KG
	3/9/98	M8015D	PHC AS DIESEL FUEL	LT	32	MG/KG
	3/9/98	SW6010	BARIUM	=	112	MG/KG
	3/9/98	SW6010	CHROMIUM	=	12.9	MG/KG
	3/9/98	SW6010	COPPER	=	6	MG/KG
	3/9/98	SW6010	NICKEL	=	5.6	MG/KG
	3/9/98	SW7060	ARSENIC	=	2.1	MG/KG
	3/9/98	SW7421	LEAD	=	3.6	MG/KG
	3/9/98	SW8260	BENZENE	LT	0.38	MG/KG
	3/9/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.052	MG/KG
	3/9/98	SW8270	DIETHYL PHTHALATE	=	0.54	MG/KG
OBU04S11						
	3/10/98	A303A	STRONTIUM	=	830	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
	3/10/98	SW6010	BARIUM	=	209	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/10/98	SW6010	CHROMIUM	=	15.6	MG/KG
	3/10/98	SW6010	COPPER	=	5	MG/KG
	3/10/98	SW6010	NICKEL	=	4.5	MG/KG
	3/10/98	SW7060	ARSENIC	=	2.3	MG/KG
	3/10/98	SW7421	LEAD	=	1.9	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.34	MG/KG
	3/10/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.044	MG/KG
	3/10/98	SW8270	DI-N-BUTYL PHTHALATE	=	0.053	MG/KG
OBU04S12						
	3/10/98	A303A	STRONTIUM	=	370	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	3/10/98	SW6010	BARIUM	=	50.8	MG/KG
	3/10/98	SW6010	CHROMIUM	=	14.8	MG/KG
	3/10/98	SW6010	COPPER	=	3.5	MG/KG
	3/10/98	SW6010	NICKEL	=	3.2	MG/KG
	3/10/98	SW7060	ARSENIC	=	1.4	MG/KG
	3/10/98	SW7421	LEAD	=	1.8	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.35	MG/KG
	3/10/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.13	MG/KG
OBU04S13						
	3/10/98	A303A	STRONTIUM	=	310	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
	3/10/98	SW6010	BARIUM	=	340	MG/KG
	3/10/98	SW6010	CHROMIUM	=	18.5	MG/KG
	3/10/98	SW6010	COPPER	=	5.8	MG/KG
	3/10/98	SW6010	NICKEL	=	5.6	MG/KG
	3/10/98	SW7060	ARSENIC	=	2.8	MG/KG
	3/10/98	SW7421	LEAD	=	1.6	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.34	MG/KG
	3/10/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.064	MG/KG
OBU04S14						
	3/10/98	A303A	STRONTIUM	=	380	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
	3/10/98	SW6010	BARIUM	=	136	MG/KG
	3/10/98	SW6010	CADMIUM	=	1.5	MG/KG
	3/10/98	SW6010	CHROMIUM	=	15.6	MG/KG
	3/10/98	SW6010	COPPER	=	11.8	MG/KG
	3/10/98	SW6010	NICKEL	=	4.7	MG/KG
	3/10/98	SW7060	ARSENIC	=	2	MG/KG
	3/10/98	SW7421	LEAD	=	4.6	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.34	MG/KG
	3/10/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.039	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/10/98	SW8270	DI-N-BUTYL PHTHALATE	=	2.1	MG/KG
OBU04S15						
	3/10/98	A303A	STRONTIUM	=	320	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	27	MG/KG
	3/10/98	SW6010	BARIUM	=	92.7	MG/KG
	3/10/98	SW6010	CADMIUM	=	5.9	MG/KG
	3/10/98	SW6010	CHROMIUM	=	13.6	MG/KG
	3/10/98	SW6010	COPPER	=	59.4	MG/KG
	3/10/98	SW6010	NICKEL	=	9.2	MG/KG
	3/10/98	SW7060	ARSENIC	=	1.9	MG/KG
	3/10/98	SW7421	LEAD	=	17.2	MG/KG
	3/10/98	SW7471	MERCURY	=	0.06	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.33	MG/KG
	3/10/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.079	MG/KG
OBU04S16						
	3/10/98	A303A	STRONTIUM	=	370	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	29	MG/KG
	3/10/98	SW6010	BARIUM	=	45.8	MG/KG
	3/10/98	SW6010	CHROMIUM	=	14.6	MG/KG
	3/10/98	SW6010	COPPER	=	14.6	MG/KG
	3/10/98	SW6010	NICKEL	=	3.7	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/10/98	SW7060	ARSENIC	=	1.2	MG/KG
	3/10/98	SW7421	LEAD	=	2.9	MG/KG
	3/10/98	SW7471	MERCURY	=	0.06	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.35	MG/KG
OBU04S17						
	3/10/98	A303A	STRONTIUM	=	570	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
	3/10/98	SW6010	BARIUM	=	92.7	MG/KG
	3/10/98	SW6010	CHROMIUM	=	15.8	MG/KG
	3/10/98	SW6010	COPPER	=	8.6	MG/KG
	3/10/98	SW6010	NICKEL	=	4.7	MG/KG
	3/10/98	SW7060	ARSENIC	=	1.9	MG/KG
	3/10/98	SW7421	LEAD	=	2.6	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.33	MG/KG
OBU04S18						
	3/10/98	A303A	STRONTIUM	=	570	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
	3/10/98	SW6010	BARIUM	=	43.5	MG/KG
	3/10/98	SW6010	CHROMIUM	=	14.2	MG/KG
	3/10/98	SW6010	COPPER	=	9.6	MG/KG
	3/10/98	SW6010	NICKEL	=	3.3	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/10/98	SW7060	ARSENIC	=	2.2	MG/KG
	3/10/98	SW7421	LEAD	=	3.5	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.34	MG/KG
	3/10/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.046	MG/KG
OBU04S19						
	3/10/98	A303A	STRONTIUM	=	170	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	26	MG/KG
	3/10/98	SW6010	BARIUM	=	97.7	MG/KG
	3/10/98	SW6010	BERYLLIUM	=	0.48	MG/KG
	3/10/98	SW6010	CADMIUM	=	2.2	MG/KG
	3/10/98	SW6010	CHROMIUM	=	10.9	MG/KG
	3/10/98	SW6010	COPPER	=	9.2	MG/KG
	3/10/98	SW6010	NICKEL	=	9.1	MG/KG
	3/10/98	SW7060	ARSENIC	=	2	MG/KG
	3/10/98	SW7421	LEAD	=	4.7	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.31	MG/KG
	3/10/98	SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	=	0.041	MG/KG
OBU04S20						
	3/10/98	A303A	STRONTIUM	=	300	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
	3/10/98	SW6010	BARIUM	=	67.5	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/10/98	SW6010	BERYLLIUM	=	0.29	MG/KG
	3/10/98	SW6010	CHROMIUM	=	25	MG/KG
	3/10/98	SW6010	COPPER	=	14	MG/KG
	3/10/98	SW6010	NICKEL	=	5.5	MG/KG
	3/10/98	SW7060	ARSENIC	=	1.4	MG/KG
	3/10/98	SW7421	LEAD	=	5.1	MG/KG
	3/10/98	SW7471	MERCURY	=	0.09	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.34	MG/KG
	3/10/98	SW8270	DIETHYL PHTHALATE	=	0.5	MG/KG
OBU04S21						
	3/10/98	A303A	STRONTIUM	=	310	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	28	MG/KG
	3/10/98	SW6010	BARIUM	=	58.2	MG/KG
	3/10/98	SW6010	BERYLLIUM	=	0.26	MG/KG
	3/10/98	SW6010	CHROMIUM	=	10.8	MG/KG
	3/10/98	SW6010	COPPER	=	8.7	MG/KG
	3/10/98	SW6010	NICKEL	=	3.9	MG/KG
	3/10/98	SW7060	ARSENIC	=	1.4	MG/KG
	3/10/98	SW7421	LEAD	=	13.2	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.33	MG/KG
	3/10/98	SW8270	2,4-DINITROTOLUENE	=	0.74	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

Location	Sample Date	Method	Parameter	flag	Value	Units
	3/10/98	SW8270	N-NITROSODIPHENYLAMINE	=	0.57	MG/KG
OBU04S22						
	3/10/98	A303A	STRONTIUM	=	290	MG/KG
	3/10/98	M8015D	PHC AS DIESEL FUEL	LT	27	MG/KG
	3/10/98	SW6010	BARIUM	=	72.9	MG/KG
	3/10/98	SW6010	BERYLLIUM	=	0.3	MG/KG
	3/10/98	SW6010	CHROMIUM	=	12.9	MG/KG
	3/10/98	SW6010	COPPER	=	21.3	MG/KG
	3/10/98	SW6010	NICKEL	=	4.5	MG/KG
	3/10/98	SW6010	SILVER	=	26.5	MG/KG
	3/10/98	SW7060	ARSENIC	=	1.3	MG/KG
	3/10/98	SW7421	LEAD	=	15.4	MG/KG
	3/10/98	SW8260	BENZENE	LT	0.33	MG/KG
	3/10/98	SW8270	DI-N-BUTYL PHTHALATE	=	0.12	MG/KG

Notes: Clean Closure applies to TRPH and Benzene
LT = less than
MG/KG = milligrams per kilogram

APPENDIX K
Analytical Results for the Decontamination Water Sample

1

INORGANICS ANALYSIS DATA SHEET

Lab Name: Laucks Testing Labs Sample ID : OBUDW-081398
SDG No. : OBU13 Lab Sample ID: 9808376-01
Matrix : WATER Date Received: 08/14/98

Analyte	Result	Units	Prepped	Analyzed	Limit	Method
Reactivity, per SW 846 7.3	No.	Reactive? Y/N	08/26/98	08/26/98	-	SW 846, 7.3

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.: OBUDW0

Lab Name: LAUCKS TESTING LABS, INC. Contract: _____

Lab Code: LAUCKS Case No.: ___ SAS No.: ___ SDG No.: OBU13

Matrix (soil/water): WATER Lab Sample ID: 08376-01

Level (low/med): LOW Date Received: 08/14/98

% Solids: 0.0

ConcentrationUnits (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	10.	U		F
7440-38-2	Arsenic	5.	U	S	F
7440-39-3	Barium	74.4			P
7440-41-7	Beryllium	5.	U		P
7440-43-9	Cadmium	10.	U		P
7440-70-2	Calcium				
7440-47-3	Chromium	47.		*	P
7440-48-4	Cobalt				
7440-50-8	Copper	177.			P
7439-89-6	Iron				
7439-92-1	Lead	50.7		NS	F
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury	0.2	U		AV
7440-02-0	Nickel	20.	U		P
7440-09-7	Potassium				
7782-49-2	Selenium	100.	U	NS	F
7440-22-4	Silver	10.	U		P
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				

Color Before: COLORLESS Clarity Before: CLOUDY Texture: ___

Color After: YELLOW Clarity After: CLEAR Artifacts: ___

Comments:

CLIENT ID: OBUDW-081398

FORM I - IN

1

INORGANICS ANALYSIS DATA SHEET

Lab Name: Laucks Testing Labs Sample ID : OBUDW-081398

SDG No. : OBU13 Lab Sample ID: 9808376-01

Matrix : WATER Date Received: 08/14/98

Analyte	Result	Units	Prepped	Analyzed	Limit	Method
Strontium (3500.SRB)	4.9	mg/L	08/19/98	08/29/98	0.1	3500.SRB

OBUDW-081398DL1

Lab Name: LAUCKS TESTING LABS
Matrix: (soil/water) WATER
Sample wt/vol: 770 (g/ml) ml
% Moisture: N/A
Extraction: SALTING OUT
Concentrated Extract Volume: 3600 (uL)
Dilution Factor: 20.0

SDG No.: OBU13
Lab Sample ID: 9808376-01DL1
Lab File ID: 3824809.D
Date Collected: 08/13/98
Date Received: 08/14/98
Date Prepared: 08/20/98
Date Analyzed: 08/24/98

CONCENTRATION UNITS:

CAS NO.	COMPOUND	ug/L	Q	SDL
2691-41-0	HMX	4.7	U	4.7
121-82-4	RDX	4.7	U	4.7
99-35-4	1,3,5-Trinitrobenzene	4.7	U	4.7
99-65-0	1,3-Dinitrobenzene	4.7	U	4.7
479-45-8	Tetryl	4.7	U	4.7
98-95-3	Nitrobenzene	4.7	U	4.7
118-96-7	2,4,6-Trinitrotoluene	4.7	U	4.7
1946-51-0	4-Amino-2,6-Dinitrotoluene	4.7	U	4.7
35572-78-2	2-Amino-4,6-Dinitrotoluene	4.7	U	4.7
606-20-2	2,6-Dinitrotoluene	4.7	U	4.7
121-14-2	2,4-Dinitrotoluene	4.7	U	4.7
88-72-2	2-Nitrotoluene	4.7	U	4.7
99-99-0	4-Nitrotoluene	4.7	U	4.7
99-08-1	3-Nitrotoluene	4.7	U	4.7

APPENDIX L
Trench Excavation and Materials Summary

Trench Excavation and Materials Summary Table

Trench ID	(1) Contaminated Soil	(2) Soil-Ash (cy)	(3) UXO/OEW/ Metallic Debris[1] (cy)	(4) Redeposited "Clean" Trench Soil (cy)	(5) Imported Backfill (Base Course Material) (cy)	(6) Actual Excavation Volume = (1) + (2) + (3) + (4) and = (4) + (5) (cy)	(7) Anticipated Excavation Volume (cy)	(8) Volume of Over Excavation (cy)
Trench 1	130	20	50	500	200	700	50	650
Trench 2	250	35	45	890	330	1220	50	1170
Trench 3	205	55	90	855	350	1205	50	1155
Trench 4	60	15	30	250	105	355	160	195
Total	**645**	**125**	**215**	**2495**	**985**	**3480**	**310**	**3170**

[1] Column (3) - UXO/OEW/Metallic Debris includes approximately 15 cy of 20 mm munitions casings and BDUs for Trench 1 and 15 cy of 20 mm munitions casings and BDUs for Trench 2. Trenches 3 and 4 did not contain significant amounts of these materials.