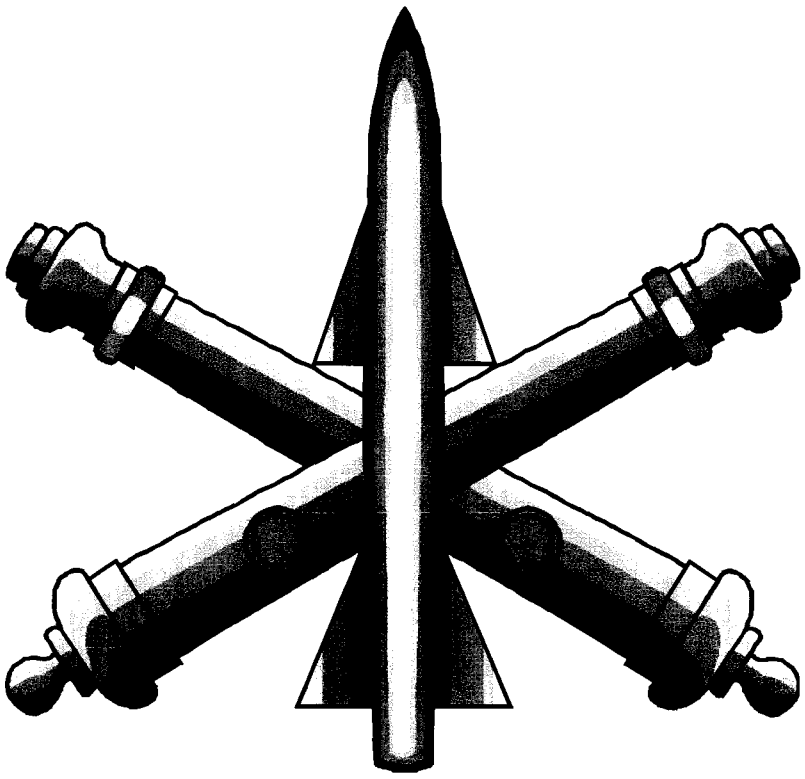
FINAL

2000 COMPLIANCE SAMPLING RESULTS REPORT FOR PART B PERMIT OPEN DETONATION (OD) UNIT



FORT BLISS/McGREGOR RANGE
OTERO COUNTY, NEW MEXICO

JANUARY 2001

FINAL
2000 COMPLIANCE SAMPLING RESULTS REPORT

PART B PERMIT
OPEN DETONATION (OD) TREATMENT UNIT

McGREGOR RANGE
FORT BLISS, NEW MEXICO

Prepared for

United States Army Corps of Engineers
Tulsa District
Tulsa, OK

Delivery Order 35, Modification 1
Contract No. DACA 56-96-D-0011

Submitted by

Roy F. Weston, Inc.
5599 San Felipe, Suite 700
Houston, TX 77056
(713) 985-6700

January 2001

FINAL
2000 COMPLIANCE SAMPLING RESULTS REPORT

PART B PERMIT
OD TREATMENT UNIT INVESTIGATION
FORT BLISS, NEW MEXICO

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SECTION 1
INTRODUCTION

In June 1995, a Final Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Operational Permit (Permit) (NMED, 1995) was issued to the U.S. Army Air Defense Artillery Center, Fort Bliss by the New Mexico Environment Department (NMED). This Permit, EPA ID No. NM4213720101-01, authorizes treatment of hazardous waste (munitions) by open detonation at the Open Detonation Treatment Unit (OD Unit). Roy F. Weston, Inc. (WESTON®) was contracted by the U.S. Army Corps of Engineers (USACE) to perform initial characterization and compliance sampling at the OD Unit according to the requirements of the aforementioned Permit. The 2000 Compliance Sampling Event was authorized by USACE Contract DACA-56-96-D-0011, Delivery Order 35, Modification 01.

This document represents the Final 2000 Compliance Sampling Results Report for the OD Unit and was prepared in accordance with the specifications provided in the USACE Scope of Work (SOW), dated 1 June 2000 (USACE, 2000). An initial OD Unit characterization was conducted in August 1995, and regular compliance monitoring has occurred to date.

1.1 OBJECTIVE OF COMPLIANCE SAMPLING

WESTON provided technical assistance to USACE and Fort Bliss by conducting the OD Unit compliance sampling at Fort Bliss on 25 July 2000. Compliance sampling is required by the Permit to evaluate site conditions with respect to ongoing and future treatment activities conducted at the OD Unit. The compliance sampling results are compared to historical sampling results to determine if changes in the presence, magnitude, or location of site-related contaminants has occurred as a result of continued treatment activities at the Unit.

1.2 SITE BACKGROUND AND DESCRIPTION

The OD Unit is located in the northern portion of the Fort Bliss Military Reservation within the McGregor Firing Range (FAW-10). The location is approximately 7 miles east of the McGregor Range Camp within the impact area for ballistic aerial targets, large-caliber munitions, and guided rockets. There are no structures within approximately four miles of the OD Unit. Operations at the OD Unit are only conducted when McGregor Range is inactive. A location map for the OD Unit is provided as Figure 1-1.

The U.S. Army Air Defense Artillery Center currently operates an Explosive Ordinance Detachment (EOD) that performs work at the OD Unit. This OD Unit has been in operation since 1965. The 741st EOD conducts explosives demolition at the OD Unit approximately 3 to 4 times per year (generally every quarter) or on an as needed emergency basis. The OD Unit was historically operated under RCRA interim status as a hazardous waste thermal treatment facility

until the Operational Permit was granted and issued in 1995. The Unit is now operated and utilized according to the requirements specified in the Part B Permit and subsequent modifications. Quantities of explosives (net explosive weight) that are currently allowed for treatment (detonation) according to the Permit (modification dated 9 May 1996) are 2,500 pounds or 1,135 kilograms (kg) per quarter. Military chemical warfare agents and related compounds or materials contaminated with or suspected of being contaminated with these agents or compounds are not destroyed (treated) at the Unit.

The OD Unit is a manmade excavation and the dimensions are approximately 500 feet by 200 feet by 30 feet deep. All structures at the OD Unit are earthen. Prior to the first compliance sampling event, the bottom of the OD Unit was regraded to remove vegetation and provide for an emergency exit road for trucks that carry the munitions to the OD Unit. A 6-foot chain link fence with lockable gates was constructed around the OD Unit to control access. In June 1996, a storm water diversion and control system was constructed to prevent storm water from entering the Unit. A site plan of the OD Unit is presented as Figure 1-2.

As required by the Permit, WESTON completed an initial site investigation at the OD Unit in September 1995. Surface, near-surface, and subsurface soil samples were collected and submitted for metals, inorganics, and organic compound analyses. Results of the initial characterization revealed the presence of explosives, metals, and nitrate, particularly in the western portion and along the western perimeter of the OD Unit. Once the initial characterization of the OD Unit was completed, semiannual compliance sampling was performed during 1996 and 1997 as required by the Permit. The results of the compliance sampling were compared to those of the initial characterization to evaluate changes in conditions.

A Permit modification was issued by NMED on 22 July 1998 in response to Fort Bliss' petition to reevaluate the compliance monitoring requirements. The Permit modification, the third issued by NMED, was based on results from 2 years of compliance monitoring. Highlights of the 1998 Permit modification include reducing compliance monitoring to annual from semiannual, elimination of the deep soil boring, elimination of several sampling locations (those specifically related to blast pits) in the eastern portion of the Unit where OD activities do not occur, and elimination of some sampling parameters (pH, free liquids, ignitability, and polychlorinated biphenyls) from the monitoring program. The revised compliance monitoring requirements were implemented during the 1999 and 2000 Compliance Monitoring Events. The sampling events that have been conducted in response to the RCRA Permit include:

- Initial OD Unit Characterization—August 1995
- First 1996 Compliance Sampling Event—April 1996
- Second 1996 Compliance Sampling Event—August 1996
- First CY97 Compliance Sampling Event—February 1997
- Second CY97 Compliance Sampling Event—August 1997
- 1998 Compliance Sampling Event—September 1998
- 1999 Compliance Sampling Event—August 1999
- 2000 Compliance Sampling Event—July 2000

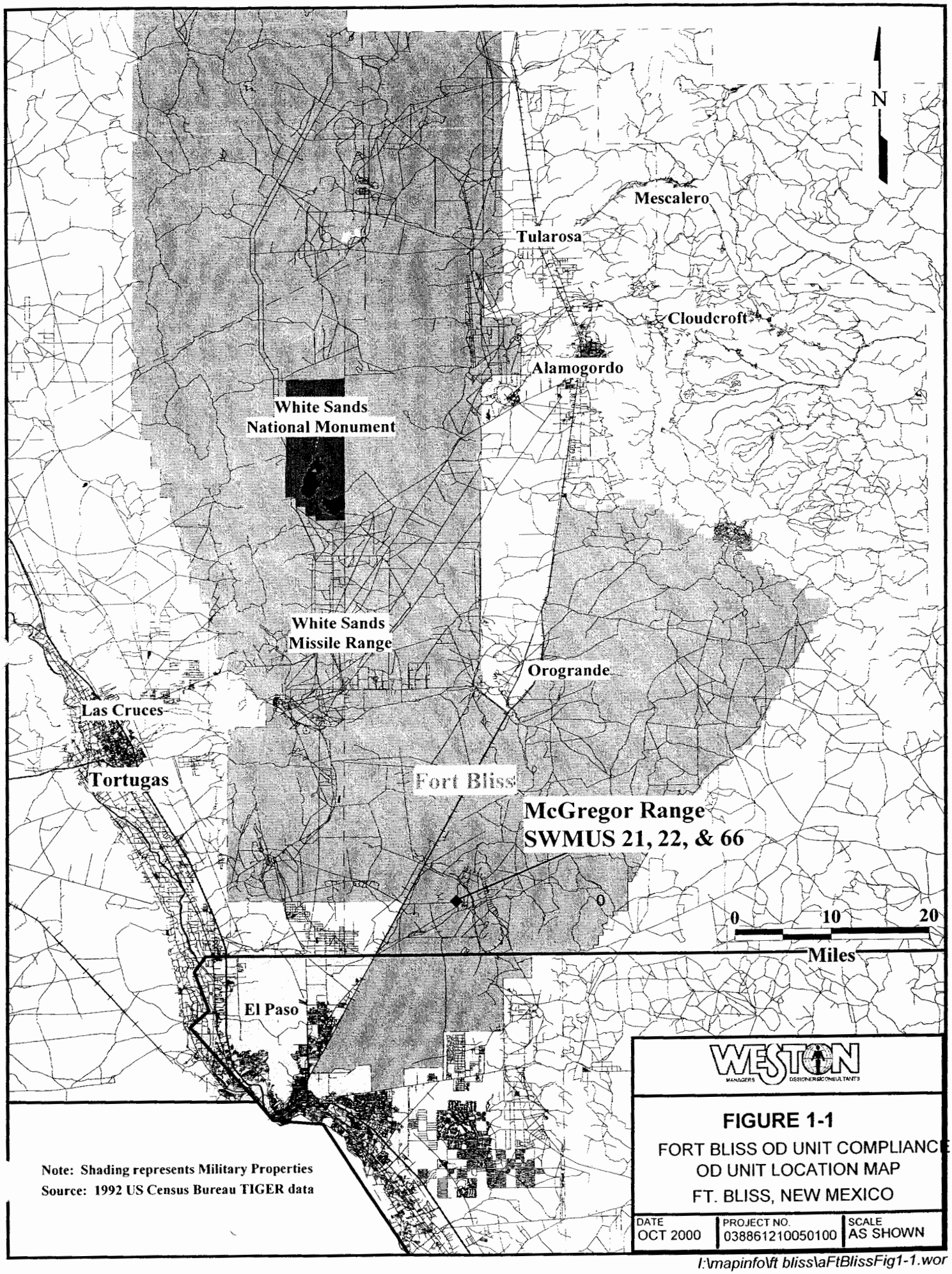
1.3 REPORT FORMAT

The remainder of the 2000 Compliance Sampling Results Report has been organized as follows:

- Section 2—Investigation Activities
- Section 3—Nature and Extent of Contamination
- Section 4—Conclusions and Recommendations
- Section 5—References

Appendices to this Compliance Report include the following:

- Appendix A—Chain-of-Custody Forms and Federal Express Airbill Receipts
- Appendix B— Data Validation Narrative and Exception Reports
- Appendix C—Analytical Data Summary Tables



Note: Shading represents Military Properties

Source: 1992 US Census Bureau TIGER data

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 1-1

FORT BLISS OD UNIT COMPLIANCE
OD UNIT LOCATION MAP
FT. BLISS, NEW MEXICO

DATE	PROJECT NO.	SCALE
OCT 2000	038861210050100	AS SHOWN

I:\mapinfo\ft bliss\aFtBlissFig1-1.wor

NOTE: CONTOURS REPRESENT SURFACE TOPOGRAPHY. CONTOUR INTERVAL = 2 FEET

SOURCE: AERIAL TOPOGRAPHY BY SLI ENGINEERING, EL PASO, TEXAS

WESTON MANAGERS DESIGNERS CONSULTANTS

FIGURE 1-2

U.S. ARMY
CORPS OF ENGINEERS
COMPLIANCE SAMPLING
SITE PLAN
FORT BLISS, NEW MEXICO

DATE	PROJECT NO.	APPROX. SCALE
OCT 00	03886121005	1" = 60'

SECTION 2
COMPLIANCE SAMPLING ACTIVITIES

The OD Unit compliance sampling included the following activities:

- Inspecting the condition of the OD Unit and associated features.
- Collecting surface and near-surface soil samples in and around the OD Unit.

These activities were conducted in accordance with WESTON's approved Final Work Plan for the OD Unit Investigation (WESTON, 1995), the Work Plan Addendum (WESTON, 1996c), and the Letter of Understanding for the 1999 Compliance Sampling Event (WESTON, 1999b). The sampling activities are described in the following subsections. The overall sampling strategy was specified in the Permit (and associated Modifications) and adopted for the Work Plan. The samples collected at the OD Unit were labeled in accordance with the requirements specified in Subsection B2.2.5 (Soil Sample Identification) of the Work Plan (WESTON, 1995). For brevity, samples are identified in this report using only the sample station number (e.g., 001).

2.1 SOIL SAMPLE LOCATIONS

WESTON collected soil samples from 29 previously established stations in and around the OD Unit as shown in Figure 2-1. The stations have not been surveyed, but have been placed on the figure based on measurements from semi-permanent features, such as fence corner posts. The sample stations shown in Figure 2-1 approximate those specified in the Permit (NMED, 1995), the USACE SOW for the Initial Unit Characterization (USACE, 1995), and the Work Plan Addendum (WESTON, 1996c). Wooden stakes identifying historical sampling locations were used for locating sample stations.

One new blast pit was present in the western portion of the Unit as shown in Figure 2-1. The pit was roughly circular, measuring approximately 12 feet in diameter. Sampling stations 600 through 607 were established to investigate the new blast pit. The selection of the sampling stations associated with the new blast pit were consistent with the RCRA Part B Permit.

With a few exceptions noted below, the sample stations utilized during the 2000 compliance sampling event were generally the same as those used previously. A summary of the sample stations and rationale (and corresponding sample station numbers shown on Figure 2-1) are as follows:

- Eight discrete surface soil samples were collected from the new blast pit (top, sides, and bottom). This pit was sampled as originally specified in the Permit and Work Plan, and the sample stations were designated as 600 through 607.

- Eight discrete random surface and near-surface soil samples were collected from the interior of the OD Unit (stations 017, 018, 019, 020, 021, 022, 023, and 024).

- Eight random discrete surface and near-surface soil samples were collected from the OD Unit perimeter (stations 025, 026, 027, 028, 029, 030, 031, and 032).

- Two discrete surface soil samples (stations 001 and 002) were collected from approximately 200 feet west of the OD Unit perimeter for monitoring the area west of sample stations 026, 027, and 028.

- Three discrete outer perimeter (formerly referred to as background) surface soil samples (stations 033, 034, and 035) were collected at previously established locations approximately 700 feet from the center of the OD Unit excavation as specified by the Permit.

2.2 SAMPLING PROCEDURES

2.2.1 Surface and Near-Surface Soil Samples

The Fort Bliss 741st EOD provided UXO clearance and support prior to the sampling activities. The last OD event was reportedly conducted in May 2000, and the EOD personnel cleared the Unit prior to sampling. Soil from each of the surface and near-surface sample stations were collected using disposable plastic scoops. Soil for surface samples was collected from a depth interval of approximately 0 to 6 inches, and soil for near-surface samples was collected from a depth interval of approximately 6 to 12 inches. In the case of the near-surface soil samples, a shovel was used as needed to remove the surface material to the desired depth and then disposable scoops were used to collect the soil sample.

After collection, the sample containers were sealed and labeled with the sample identification number, date, time, and required analyses. The sample containers were then placed in plastic zip bags on ice in a cooler. The analytical approach for the soil samples is discussed below in Subsection 2.3.

2.2.2 Quality Assurance/Quality Control Samples

WESTON collected additional samples during the investigation for quality assurance/quality control (QA/QC) purposes to verify precision (e.g., the degree of reproducibility) of the laboratory results. Three matrix spike/matrix spike duplicate (MS/MSD) analyses were performed for samples 020, 021, and 606. These three samples were collected as twice the normal volume, and the MS/MSD samples were designated on the chain-of-custody (COC) form.

At three of the sample locations (stations 027, 029 and 606), three times the normal sample volume was collected as separate samples for QA/QC purposes. One aliquot represented the normal compliance sample for the particular station. One aliquot was sent as a blind QC

duplicate along with the normal sample to the laboratory. The third aliquot was sent as a QA sample to a USACE contracted laboratory. The USACE QA samples were submitted to:

Applied Physics & Chemistry Lab
13760 Magnolia Ave.
Chino, CA 91710

Since visual contamination was not identified at any of the sample stations, stations historically reported with elevated explosives were selected for QA/QC sampling. The QC samples were collected at a rate of approximately one per twenty (20) normal samples, and soil for the QA/QC samples consisted of replicate splits representing the sampled interval.

2.2.4 Waste Management

All excavated soil was used to backfill depressions from the shovel, and all soil samples were collected with disposable plastic scoops. As such, no soil related wastes were generated during the sampling activities. Used personal protective equipment (gloves) and disposable sampling equipment were bagged and removed to McGregor Camp.

2.3 ANALYTICAL APPROACH

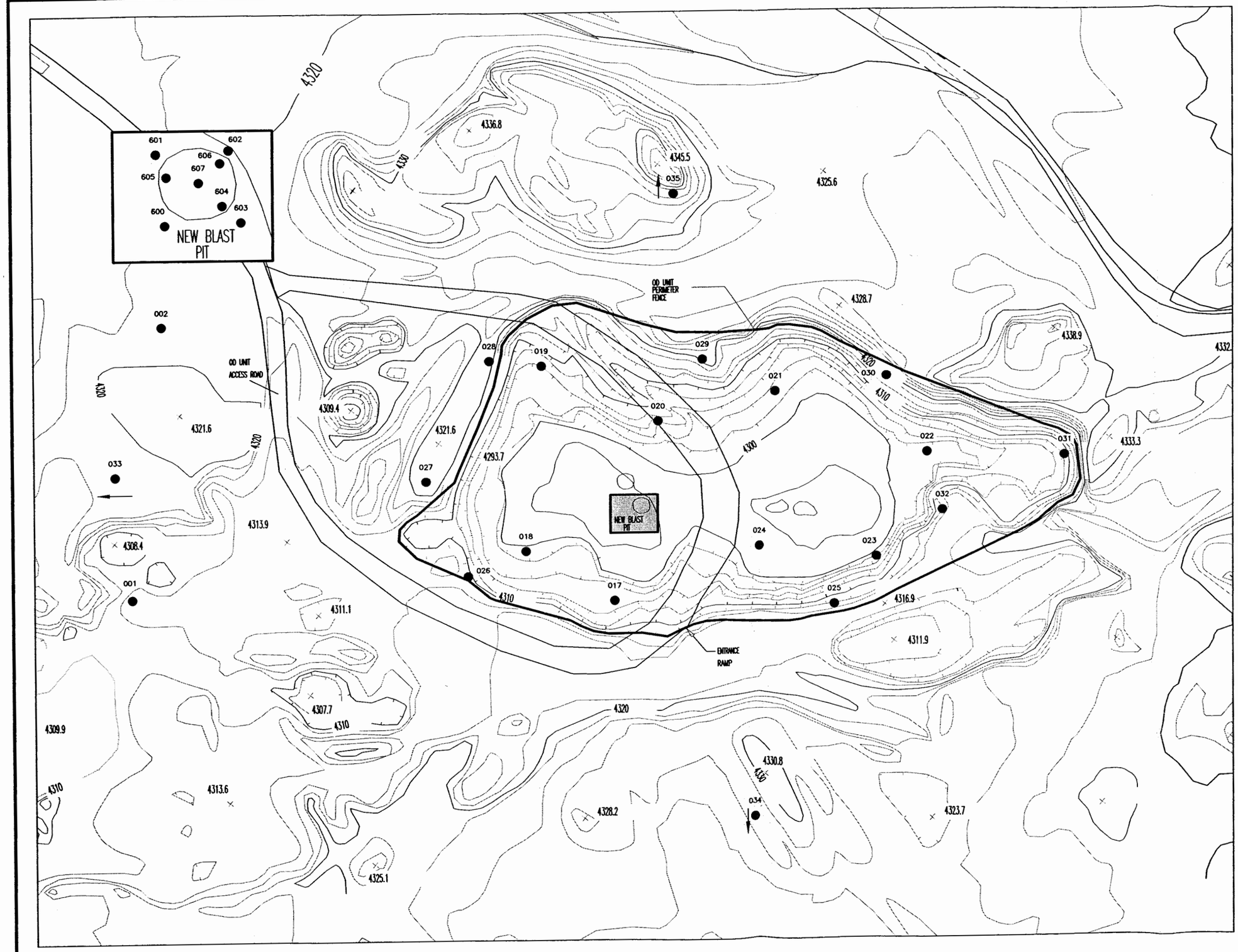
The available data and information used to prepare the Permit application and subsequently contained in the Permit and Permit Modifications dictate the analytical approach utilized for the compliance sampling events. The 1998 Permit Modification also specified the analytical requirements for monitoring. The specified analyses and the associated analytical methods are summarized in Table 2-1. The duplicate (QC) and QA (USACE) samples were submitted requesting the same analyses as the normal samples.

All of the collected soil samples were submitted for inorganic, metals, and explosives analyses. Approximately 10 percent of the total number of sampling stations were sampled for dioxin/furans. The sample stations selected for dioxin/furans analysis included 001, 002, 026, 027, 028, and 607. The sampling stations selected to further characterize the extent of dioxins/furans were selected based on historic sampling results; typically those which exhibited high total explosive concentrations. Dioxin/furan analyses was performed in accordance with EPA SW846 Method 8280A.

2.4 SAMPLE HANDLING AND MANAGEMENT

Samples for chemical analyses were placed in clean sample containers and labeled with information including the date and time of collection, sample identification, and required analysis. The sample containers were then individually bagged, sealed, and placed in a cooler full of ice and packing material. The coolers were then sealed and delivered to Federal Express for overnight shipment to the appropriate laboratories. Proper COC procedures were implemented for all collected samples, and COC documentation accompanied each sample

shipment. Copies of the COC forms and Federal Express airbill receipts for each shipment are included in Appendix A.



N

LEGEND

● SOIL SAMPLE LOCATION

NOTE: CONTOURS REPRESENT SURFACE TOPOGRAPHY.
CONTOUR INTERVAL = 2 FEET

SOURCE: AERIAL TOPOGRAPHY BY SLI ENGINEERING, EL PASO, TEXAS

0 37.5 75
FEET

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 2-1
U.S. ARMY CORPS OF ENGINEERS
2000 COMPLIANCE SAMPLING EVENT
SAMPLE LOCATION MAP
FORT BLISS, NEW MEXICO

DATE	PROJECT NO.
OCTOBER 2000	03886.121.002.0100

FILE: L:\GISKEY30\FORT BLISS\OBOD\2000SAMP.DWG LANDUSE.CBT

TABLE 2-1
ANALYTICAL METHODS AND COLLECTED SAMPLES

2000 OD UNIT COMPLIANCE SAMPLING
FORT BLISS, NEW MEXICO

PARAMETER	ANALYTICAL METHODS[1]	NUMBER OF COLLECTED SAMPLES[2]
INORGANICS		
Antimony	SW846 6010A	48 - Soil
Arsenic	SW846 7060	
Barium	SW846 6010A	
Cadmium	SW846 6010A	
Chromium	SW846 6010A	
Copper	SW846 6010A	
Iron	SW846 6010A	
Lead	SW846 6010A	
Mercury	SW846 7471	
Potassium	SW846 6010A	
Selenium	SW846 7740	
Silver	SW846 6010A	
Strontium	SW846 6010A	
Zinc	SW846 6010A	
Nitrate-Nitrite (as Nitrogen)	EPA 353.2	
ORGANICS		
Picric Acid	SW846 8330	48 – Soil
HMX	SW846 8330	
RDX	SW846 8330	
Nitroglycerin	SW846 8330	
2,4,6-trinitrotoluene (2,4,6-TNT)	SW846 8330	
2,4-dinitrotoluene (2,4-DNT)	SW846 8330	
2,6-dinitrotoluene (2,6-DNT)	SW846 8330	
Dioxins/Furans	SW846 8280	7 - Soil

1 SW846 = "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods," Environmental Protection Agency, SW846.
EPA600 = "Methods for Chemical Analysis of Water and Wastes," Environmental Protection Agency.

2 The sample numbers are maximum values and include QC samples.

SECTION 3
SUMMARY OF RESULTS

A summary of the results of the 2000 Compliance Sampling Event at the OD Unit, is presented in this section. As previously stated, samples are referred to using only the sample station number (e.g., 001). A discussion of evaluation methods, data validation, analytical results, and comparisons to previous sampling events is provided in this section. Data validation reports and analytical data summary tables are provided in Appendices B and C, respectively.

3.1 EVALUATION METHODS

The inorganic (metals and nitrate-nitrite) results from the 2000 Compliance Sampling Event were compared to background values that were previously established for the OD Unit. The background values were established using three times the maximum reported value from three background locations. Published ranges of naturally occurring metal concentrations were also used to evaluate the significance of the metals results that were reported above the defined background values. A table showing naturally occurring concentrations of metals in soils (common range and average concentration) is included in Appendix C (Table C5). Shaded entries in the summary tables indicate concentrations equal to or above the established background values.

The organic results (explosives and dioxins/furans) were compared directly to the laboratory detection limits because reportable concentrations of these constituents were not detected in any of the background samples during previous events. As such, the laboratory detection limit (or practical quantitation limit-PQL) is the background value. Shaded entries in the summary tables indicate concentrations at or greater than the laboratory detection limit.

3.2 DATA VALIDATION

Each of the three sample batches were validated before use in evaluating the conditions at the OD Unit. A data validation narrative is provided in Appendix B, and data qualification has been applied to the results where appropriate. In general, the data are useful for their intended purpose. Two significant findings were noted during the data validation. The holding times for most of the nitrate-nitrite and mercury analyses were exceeded by two and one day, respectively. The associated results have been qualified with R. The nitrate results are similar to previous events and the holding time exceedance is not considered significant. Mercury is not one of the target constituents for the OD Unit, and mercury is rarely reported in samples. Mercury was only reported in two samples collected during the 2000 Compliance Sampling Event.

The other significant finding during the validation were instances of matrix-related effects (particularly metals) that may have imparted some degree of bias (either high or low) to the outcome of the laboratory analyses. Antimony, arsenic, cadmium, copper, and zinc were the

most common constituents where matrix effects (low matrix spike recoveries) were observed. Based on comparisons to other apparent unbiased results, and other QA/QC criteria, the matrix effects do not appear significant and the results as reported from the laboratory have been used to evaluate the conditions at the OD Unit.

A comparability evaluation performed by USACE between the QA and QC samples is currently being completed as an independent analysis of the overall laboratory results. The results will be used to further evaluate the validity and usability of the analytical data, and a copy of the evaluation will be included in the final report.

3.3 ORGANIC RESULTS

Explosive compounds were detected at eight sample stations during the 2000 Compliance Sampling Event. HMX was the most frequently detected compound (at five stations) with concentrations ranging from 0.14 milligrams/kilogram (mg/kg) (station 023) to 0.60 mg/kg (station 017). The compound 2,4-dinitrotoluene (2,4-DNT) was reported at stations 030, 600, and 607 ranging from 0.21 mg/kg (station 030) to 0.52 mg/kg (station 600). Picric acid, 2,6-dinitrotoluene (2,6-DNT), 2,4,6-trinitrotoluene (2,4,6 TNT), and nitroglycerin were not reported in any of the samples collected during the 2000 Compliance Sampling Event. Explosives were not reported in samples collected from stations outside of the OD Unit (001, 002, 033, 034, and 035). The sample stations that contained reported concentrations of explosive compounds are summarized in Table 3-1 and shown on Figure 3-1.

Nitrate-nitrite concentrations ranged from 0.1 mg/kg (607) to 40.3 mg/kg (603). All instances of nitrates exceeding the established background value of 7.5 mg/kg were at stations within the OD Unit or associated with the most recent blast pit. Elevated nitrates were not reported in samples collected from samples outside of the OD Unit. Sample stations reported with nitrate-nitrite exceeding background are shown in Figure 3-2, and the results are presented in Appendix C, Table C-3.

Dioxins/furans were reported above the laboratory detection limit in two of the collected samples (see Table C-4 in Appendix C). Compounds OCDF (octa substituted chlorodibenzo furan) and HpCDF (hepta substituted chlorodibenzo furan) were detected at station 027 in the normal and duplicate samples, respectively. Both samples reported estimated concentrations below laboratory PQL, as represented by the "J" qualifier. Compounds such as OCDD and HpCDD have historically been reported at station 027.

3.4 INORGANIC RESULTS

Metals were detected in the surface and near-surface soil samples at concentrations exceeding the established background values. A summary table containing the metals results and associated sample stations is contained in Table 3-2, and a complete table of results is contained in Appendix C, Table C-2. A condensed summary of the range of concentrations reported in the soil samples for this sampling event, the background values, and published ranges for naturally occurring concentrations for each metal are shown on the following page.

Element	Range of Concentration in Soil Samples (mg/kg)	Background Value (mg/kg)	Naturally Occurring Concentration Range (Lindsey, 1979) (mg/kg)
Cadmium	<0.02 – 2.0	1.38	0.01 - 0.70
Copper	4.6 – 418	124.5	2 – 100
Lead	3.7 – 59.8	31.5	2 – 200
Zinc	18.80 – 255	103.2	10 – 300

Cadmium, copper, lead, and zinc, were detected in several surface and near-surface soil samples greater than the established background comparison values. The instances of elevated metals are associated with sample stations within or at the perimeter of the OD Unit excavation. Elevated metals were not reported in the stations outside of the OD Unit. Lead, zinc, and silver concentrations were reported well below the published ranges for naturally occurring concentrations for these metals in soils and similar to those of previous sampling events as shown in Table 3-2.

3.5 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Three QC samples were collected and sent as blind duplicates to the laboratory. The following are field samples and their corresponding QC duplicates (as listed on the tables in Appendix C):

Field Sample	QC Duplicate Sample
027-51-1	027-52-1
029-51-2	029-52-2
606-51-1	606-51-2

All reportable normal organic and inorganic sample results compared favorably to the corresponding QC duplicate sample results.

Three QA samples were collected and sent to the designated USACE laboratory. USACE is in the process of comparing WESTON's analytical results to its own QA sample results, and a copy of the government-furnished comparability letter detailing this comparison will be included as Appendix D in the final report.

3.6 COMPARISON OF DATA

The results of the Initial OD Unit Characterization, conducted in August 1995, serves as the general baseline from which the compliance sampling results and future sampling results have and will be compared. These baseline results are used to determine whether activities at the OD Unit contribute to buildup of contaminants in the surface and near surface soils that may require action. Because of the regrading activities that altered some of the sampling stations

(particularly those associated with individual blast pits) prior to the First 1996 Compliance Sampling Event (April 1996), an assessment specific to these individual stations can not be made. Rather, the assessment focus has shifted to changes in the overall conditions at the OD Unit.

3.6.1 Organics

Table 3-1 contains results from the initial investigation and six compliance sampling events that have been performed to date. As shown in Table 3-1, the organic results are relatively similar throughout the compliance sampling events with a reduction in detectable concentrations for all constituents. The occurrence of 2,4-DNT during this sampling event was limited to station 030 just inside of the perimeter fence line and two sample locations within the new blast pit. Perimeter sampling station 030 has historically been reported with 2,4-DNT at much higher concentrations.

Explosive compound 2,4,6-TNT was not reported at detectable concentrations in any of the collected samples. This constituent has been reported only three other times during the compliance sampling activities. The presence of TNT is most frequently limited to the most recent blast pits.

Nitroglycerin has been the most frequently reported organic constituent at the OD Unit over the monitoring period following issuance of the Permit. The presence of this compound has been generally limited to sample stations located in the bottom of the OD Unit and stations along the western perimeter. The concentration of nitroglycerin has also remained fairly consistent where reported above the detection limit. During 1999 sampling events nitroglycerin was reported at higher than normal concentrations for sampling station 028 during the 1999 Compliance Sampling Event. Nitroglycerine was not reported in any of the collected samples (including 028) during the 2000 Compliance Sampling Event.

As shown in Table 3-1, results for HMX are relatively similar to 1999 sampling events. HMX was the most frequently reported compound during the 1999 and 2000 sampling events. This compound was encountered at three sample stations in the new blast pit and at station 024, just to the south of the new blast pit. RDX was also reported at sample station 024. The presence of HMX and RDX may be attributable to the recent OD activity, and migration does not appear to have occurred.

The occurrence of nitrate-nitrite is similar to that reported during previous sampling events. The maximum nitrate-nitrite concentration has ranged from 131 mg/kg during the Second 1996 Compliance Sampling Event to 343 mg/kg for the First 1996 Compliance Sampling Event. The highest concentration reported for the 2000 event was 40.3 mg/kg at station 603, which lies immediately adjacent to the most recent blast pit.

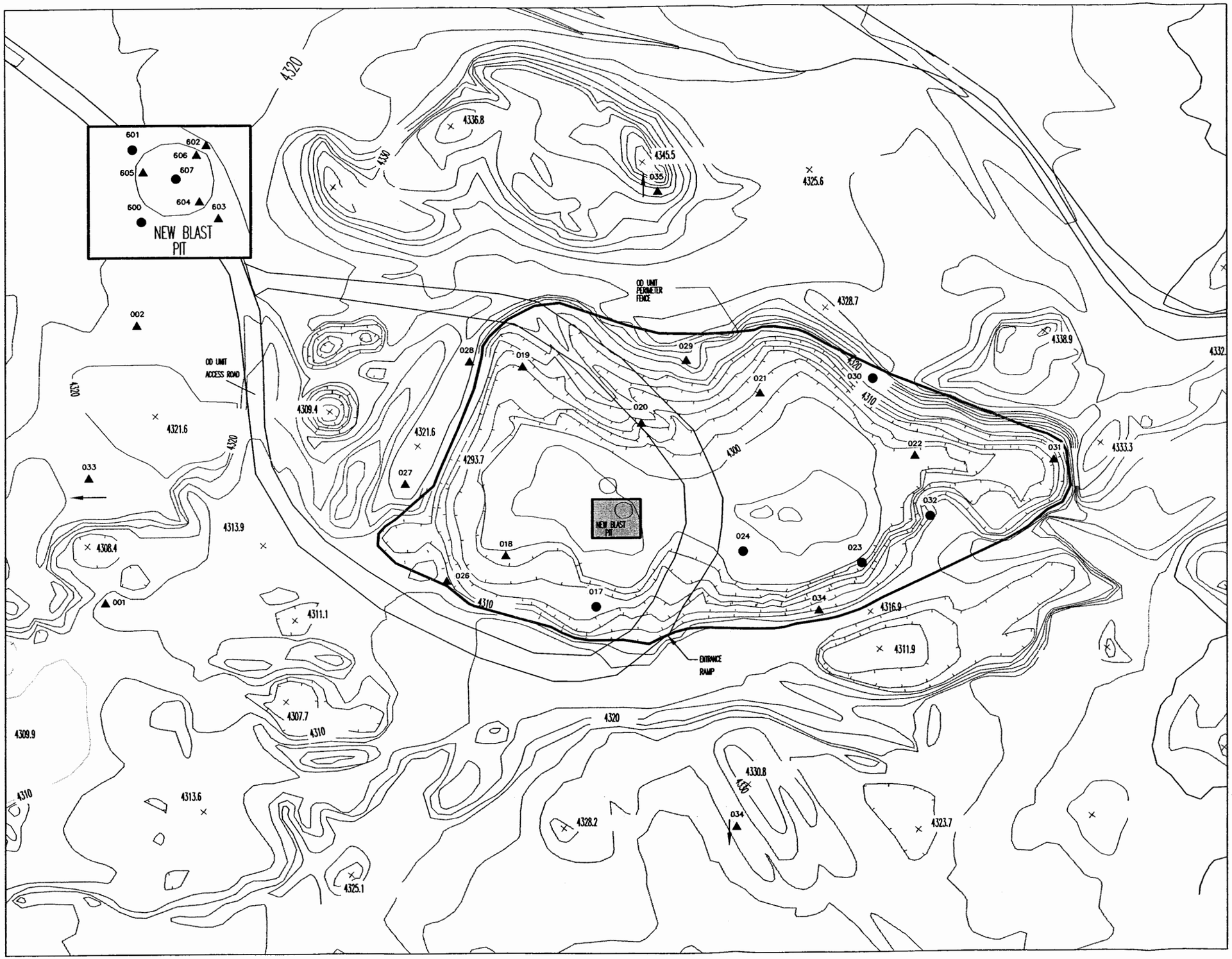
No dioxin/furan compounds were reported above the detection limit in samples collected during 2000 sampling activities. Only two samples reported estimated concentrations below the

laboratory PQL. This finding is slightly different from previous sampling events where some dioxin/furan compounds have been reported at some sample stations.

3.6.2 Metals

The metals results for both the Initial Unit Characterization and compliance sampling events are summarized on Table 3-3. This table includes the range of results from surface and near-surface soil samples. Several metals have been routinely reported in samples above the established background values. The metals (cadmium, copper, lead, and zinc) are consistently reported with ranges of concentrations that are similar between sampling events.

The historical and recent data suggests that the metals results and in particular copper and zinc can be affected by debris (primers, casings, etc.) or elemental metals that may be present in the collected samples and subsequently analyzed. The subsurface soil samples have not shown the same random and elevated nature of the metals suggesting that vertical migration is not occurring and the above theory may account partly for the observed variability in results.



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LEGEND

- ● SOIL SAMPLE LOCATION WHERE EXPLOSIVES WERE DETECTED
- ▲ SOIL SAMPLE LOCATION WHERE NO EXPLOSIVES WERE DETECTED

SAMPLES COLLECTED IN JULY 2000

NOTE: CONTOURS REPRESENT SURFACE TOPOGRAPHY.
CONTOUR INTERVAL = 2 FEET

SOURCE: AERIAL TOPOGRAPHY BY SLI ENGINEERING, EL PASO, TEXAS

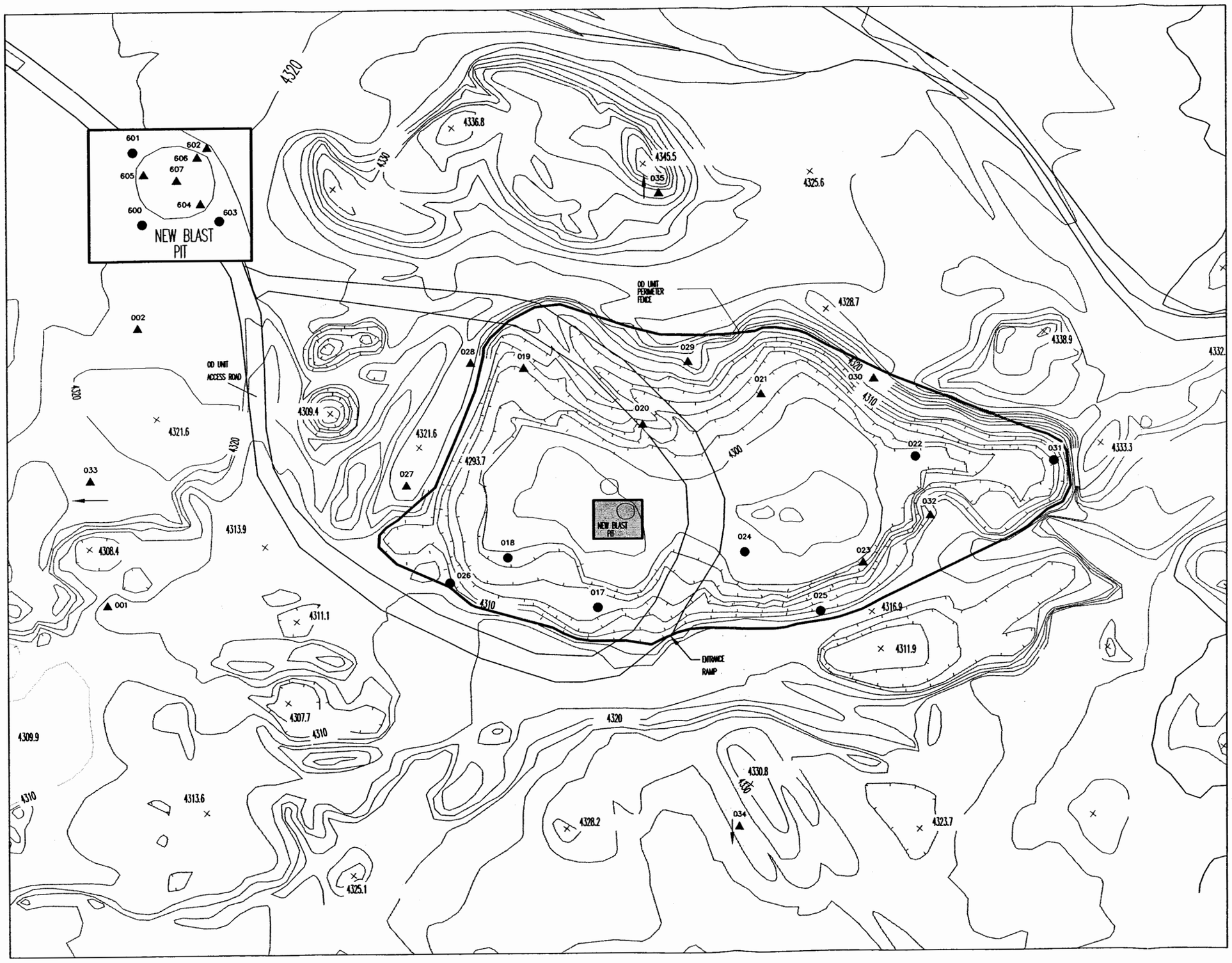
0 37.5 75
FEET

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 3-1
U.S. ARMY CORPS OF ENGINEERS
2000 COMPLIANCE SAMPLING EVENT EXPLOSIVE RESULTS
FORT BLISS, NEW MEXICO

DATE	PROJECT NO.
OCTOBER 2000	03886.121.002.0100

FILE: L:\GISKEY30\FORT BLISS\OBOD\2000EXSAMP.DWG NEWWEST.CBT



N

LEGEND

- ● SAMPLES WITH NITRATE–NITRITE CONCENTRATIONS GREATER THAN 3 TIMES MAX BACKGROUND (7.5 MG/KG)
- ▲ SAMPLES WITH NITRATE–NITRITE CONCENTRATIONS LESS THAN 3 TIMES MAX BACKGROUND (7.5 MG/KG)

SAMPLES COLLECTED IN JULY 2000

NOTE: CONTOURS REPRESENT SURFACE TOPOGRAPHY.
CONTOUR INTERVAL = 2 FEET

SOURCE: AERIAL TOPOGRAPHY BY SLI ENGINEERING, EL PASO, TEXAS

0 37.5 75
FEET

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 3–2
U.S. ARMY CORPS OF ENGINEERS
2000 COMPLIANCE SAMPLING EVENT
NITRATE–NITRITE RESULTS
FORT BLISS, NEW MEXICO

DATE	PROJECT NO.
OCTOBER 2000	03886.121.002.0100

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