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RCRA PERMIT PART B NUMBER HW50289 RCRA FACILITY INVESTIGATION REMEDIATION SOIL REMOVAL PLAN EMERGENCY REMOVAL OF BURIED DRUMS AT SOLID WASTE MANAGEMENT UNIT 24 NAS FORT WORTH TX

6/4/1991

ARMY CORP OF ENGINEERS

File: 17G
A.F.

NAVAL AIR STATION
FORT WORTH JRB
CARSWELL FIELD
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ADMINISTRATIVE RECORD
COVER SHEET

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Contaminated Soil Removal Plan

Texas Water Commission
P.O. Box 13087
Capitol Station
Austin, TX 78711-3087
ATTN: Mr Alan P. Church, P.E.

1. Attached is subject plan for SWMN no. 24, Waste Burial Area, which is submitted per your request 24 May 91.

2. Please direct any questions to Mr Frank G. Grey, 7 CSG/DEEV, (817)782-6265.

ORIGINAL SIGNED BY

CHARLES A. JACKSON, Colonel, USAF
Base Civil Engineer

1 Atch
Soil Removal Plan

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DOC DEEV-193-1

RETURN	FUNC ADDRESS SYM	ORIGINATOR'S NAME AND GRADE	PHONE NO	TYPIST'S INITIALS	DATE TYPED

CARSWELL AIR FORCE BASE, TEXAS

RCRA Permit, Part B, Number HW50289

SOIL REMOVAL PLAN
EMERGENCY REMOVAL OF BURIED DRUMS, SOLID WASTE MANAGEMENT UNIT 24, WASTE BURIAL AREA

Prepared By
U.S. Army Corps Of Engineers
Fort Worth District

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SOIL REMOVAL PLAN
EMERGENCY REMOVAL OF BURIED DRUMS
SOLID WASTE MANAGEMENT UNIT 24
WASTE BURIAL AREA

1.0 BACKGROUND: The buried drums and UST are located at the Waste Burial Area, SWMU No. 24, on Carswell AFB. The suspected locations of the drums and UST are shown in the report prepared by Ecology and Environment Inc., (Appendix A). The site is on the southern part of the base and along the eastern edge of the flightline (Figures 1 and 2). It is within a secured area and appropriate badges and vehicle passes are required for access.

2.0 SCOPE: Contractor shall include the following efforts:

2.1 Contractor shall uncover, drain and remove all buried drums, approximately 12, at SWMU No. 24. It is suspected that the drums contain trichloroethylene (TCE) from previous testing performed on one of the drums (Appendix C). Previously uncovered drums have been badly corroded and leaking. The excavated drums and their contents will be stored in the Base Civil Engineering (CE) Storage Yard, Building 1337.

2.2 Contractor shall uncover, drain (if required) and remove a 5000-gallon UST at SWMU No. 24. The UST was extracted from an unknown location and disposed at site No. 24. The contents of the drum, if any, is unknown. Any remaining liquid in the UST and the UST will be stored in the Base CE Storage Yard, Building 1337.

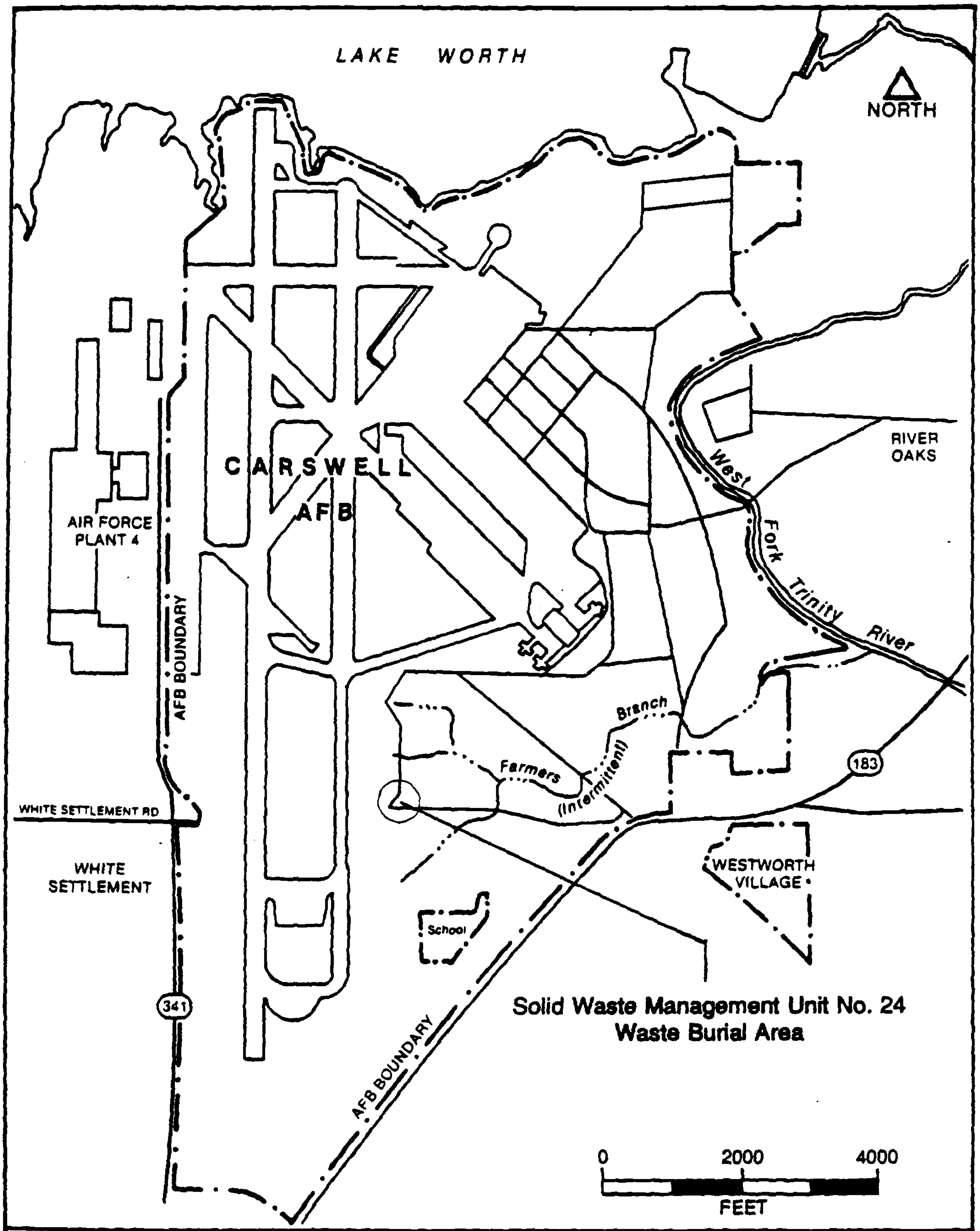
2.3 The contractor shall utilize soil from a stockpile located on base as a source for additional backfill for the excavations resulting from removal of the UST and buried drums.

3.0 TASKS

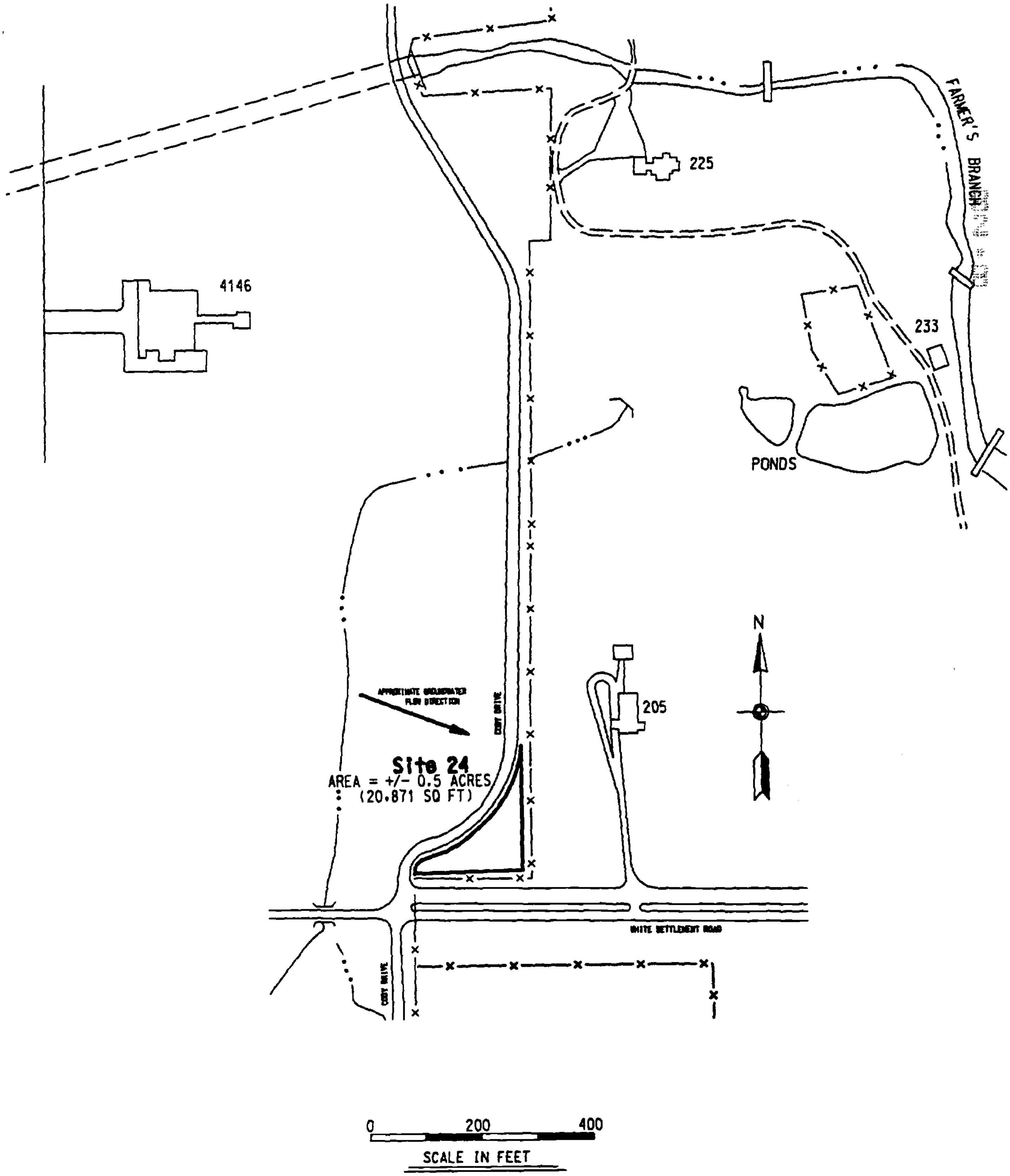
3.1 GENERAL SPECIFICATIONS

The contractor will furnish all labor, tools, materials, transportation, laboratory services and equipment to accomplish the above scope.

A. The contractor shall implement all the necessary safety precautions during preparation for and during removal of the drums and UST and during transportation of the drums, drum contents, the UST and the UST contents (if any). A Health and Safety Plan shall be developed in accordance with 29 CFR 1910.120 and EM 385-1-1, US Army Corps of Engineers Safety and Health Requirements Manual. This plan shall define emergency procedures, discuss any hazards that could be encountered



Carswell Air Force Base, Texas
Figure 1



SWMU No. 24, Waste Burial Area
Site Plan
FIGURE 2

during performance of this scope of work, address accident prevention and present appropriate action levels for any contaminant likely to be encountered.

B. All such work shall be accomplished in accordance with federal and state requirements as well as accepted safety standards. The contractor will obtain all applicable permits before beginning any work. The contractor will conduct all work consistent with Carswell AFB Base Fire Marshal requirements.

C. The contractor, subcontractors, and their employees responsible for the drum and tank removal shall be familiar with:

1. All applicable safety rules and regulations.

2. The use of equipment and procedures for vapor-freeing tanks.

D. The contractor shall possess a valid certificate of registration issued by the Texas Water Commission. A copy of this registration shall be included with the proposal to do this work.

3.2 TECHNICAL SPECIFICATIONS FOR TANK REMOVAL: Removal shall be conducted in accordance with the requirements in API Recommended Practice 1604 dated December 1987, Removal and Disposal of Used Underground Petroleum Storage Tanks, except as modified below.

A. The contractor shall initially excavate to the top of the UST, create an opening and remove any liquids or residues inside the UST. The opening in the top of the tank will not be made using flame or spark producing equipment. The liquids and residues shall be stored in an appropriate container. After the liquid is removed, excavate around the UST as required for removal. Excavation around the tank shall be kept to the minimum amount required for removal of the tank.

B. Excavated soils shall be screened by the contactor for volatile organics by using either a Flame Ionizing Device or a Photo Ionizing Device and stockpiled into separate piles based upon either a positive or negative test results. Stockpiles shall be located on-site only at a work area locations designated by the Contracting Officer. The stockpiled soils may be used to backfill the excavation, if they are free of contamination as determined by the Corps of Engineers, Southwestern Division Laboratory. All open excavations shall be protected by barricades and warning signs.

C. Drainage controls shall be provided around the stockpile and open excavation to prevent run-on/run-off contamination. Stockpiled soils shall be enveloped in plastic ("visqueen") liners or equivalent at the end of each work day and at the threat of precipitation. The liner material shall be compatible with TCE and hydrocarbons.

D. The excavation resulting from tank removal shall be backfilled using materials stockpiled from the excavation of the tank, if the soils are free from contamination as determined by the Corps of Engineers, Southwestern Division Laboratory. Backfill materials required in excess of that available at the site shall be taken from a stockpile located on base. The excavation shall the backfilled to a point 6-inches above original grade at the center of the excavation and slope to drain toward the edges. Backfill material shall be suitable earth or granular material free from organic materials and which can be compacted to the density specified.

1. Backfill material shall be placed and compacted in layers of approximated 12 inches in thickness and smoothed into corners of the backfilled area before the next layer is place. Each layer of backfill shall be compacted to not less than 90 percent of laboratory maximum density with power-driven hand tampers suitable for the material being compacted or by tracking with track or rubber tired equipment.

2. Compaction testing shall be performed by an approved commercial testing laboratory or may be performed by the contractor subject to approval. Field in-place density shall be determined in accordance with ASTM D 1556, D 2167, or D 2922. Not less than two field in-place density tests shall be performed at each tank backfill at the specific location as directed by the Contracting Officer. Laboratory maximum density specified above shall be obtained in accordance with ASTM D 1557, Method D. A laboratory density test shall be performed on each distinctively different type of backfill material or every 3 feet, whichever occurs more frequently.

3.3 TECHNICAL SPECIFICATIONS FOR REMOVAL OF BURIED DRUMS

A. The contractor shall initially excavate an adequate amount of soil to uncover the top of each buried drum. He will then cut an opening in the top of the drum and remove as much of the liquid remaining in the drum as possible and store it in an appropriate container. The opening in the top of the drum will not be made using flame or spark producing equipment. After the liquid is removed the soils around the drum shall be excavated as required to remove the drum. Excavation around the drums shall be kept to the minimum amount required for removal of the drums.

B. Excavated soils shall be screened for volatile organics using either a Flame Ionizing device or Photo Ionizing Device and stockpiled into two separate piles based upon either a positive or negative results. Stockpiles shall be located on-site only at work area locations designated by the Contracting Officer. The stockpiled soils may be used to backfill the excavation, if they are free of contamination as determined by the Corps of Engineers, Southwestern Division Laboratory. All open excavations shall be protected by barricades and warning signs.

C. Drainage controls shall be provided around the stockpiles and open excavations to prevent run-on/run-off contamination. Stockpiled soils shall be enveloped in plastic ("visqueen") liners or equivalent at the end of each work day and at the threat of precipitation. The liner material shall be compatible with TCE.

D. Excavations resulting from removal of the drums shall be backfilled using materials stockpiled from the excavation of the drum, if they are free of contamination as determined by the Corps of Engineers Southwestern Division Laboratory. Backfilling materials required in excess of that available at the site shall be taken from a stockpile located on base. The excavation shall the backfilled to a point 6-inches above original grade at the center of the excavation and slope to drain toward the edges. Backfill material shall be suitable earth or granular material free from organic materials and which can be compacted to the density specified.

1. Backfill material shall be placed and compacted in layers of approximated 12 inches in thickness and smoothed into corners of the backfilled area before the next layer is place. Each layer of backfill shall be compacted to not less than 90 percent of laboratory maximum density with power-driven hand tampers suitable for the material being compacted or by tracking with track or rubber tired equipment.

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3.4 TECHNICAL SPECIFICATIONS FOR HANDLING OF EXCAVATED SOILS

The contractor shall minimize the amount of soils excavated for removal of the UST and the buried drums. The soils shall be stockpiled on site as noted above. The soils will be tested by the Government to determine if they are contaminated. Uncontaminated soils will be used as backfill for the excavations. Contaminated soils shall be placed in clean, steel 55-gallon drums and transported to the CE Storage Yard, Building 1337, as required in paragraph 5.3 G above.

3.5 TESTING

A. SOIL: During excavation soil shall be screened for volatile organics by using either a Flame Ionizing Device of a Photo Ionizing Device and placed on a plastic ("visqueen") surface adjacent to the site. The soil shall be separated and stockpiled based upon the screening as either "contaminated" or "non-contaminated". The "non-contaminated" soil will be allowed to stabilize for a period of not less than 24 hours. After this time soil samples will be drawn per the quality control plan at appendix B. One sample per each fifty cubic yards of soil will be drawn. The soil will be tested for the parameters listed in figure 3 by the Southwestern Division, Corps of Engineers Laboratory.

B. DRUMS: All drums and the UST shall be drained prior to removal from the site. The drums shall be transported to the CE Storage Yard. Prior to disposal, each drum shall be tested to verify the contents being TCE. Samples shall be drawn per the quality control plan at appendix B. Testing shall be conducted by the Southwestern Division, Corps of Engineers Laboratory.

APPENDIX A

"Ground Penetrating and Gravity Survey", Environment and Ecology, Inc., 11 February 91

FC7010

Geophysical Survey
Carswell A.F.B.
Fort Worth, Texas

February 1991

Prepared for

U.S. Army Corps of Engineers
Fort Worth District

ecology and environment, inc.

1509 MAIN STREET, DALLAS, TEXAS 75201, TEL. 214-742-6601

International Specialists in the Environment

INTRODUCTION

Pursuant to a request from the U.S. Army Corps of Engineers, Fort Worth Division, Ecology and Environment, Inc. (E&E) performed a geophysical survey at site 10, a suspected waste burial site at Carswell Air Force Base, Fort Worth, Texas. The nature of the survey was to identify the existence and approximate location of subsurface anomalies, which would indicate the location of suspected buried drums that are thought to contain trichloroethene (TCE).

This report summarizes the field activities, including a description of the geophysical survey and a site map showing the locations of the subsurface anomalies.

SITE DESCRIPTION

The area described as site 10 waste burial site is located in the southern part of Carswell AFB, at the northeast corner of the intersection of White Settlement Road and Cody Drive. It is triangular in shape with dimensions of 200 ft. x 150 ft. x 250 ft., as illustrated in Figure 1.

FIELD INVESTIGATION

E & E technical staff performed the ground-penetrating-radar (GPR) survey on February 11 and the EM-31 conductivity meter survey on February 12, 1991.

The GPR survey was performed with a Geophysical Survey Systems, Inc. Model SIR-3. It provides a continuous profile of the subsurface using high-frequency radio waves to obtain subsurface information. The high-frequency signals are emitted from a transmitter which is pulled along the ground surface. The signals are reflected from various interfaces in the subsurface and are detected by a radar receiver, which is enclosed in the same unit as the transmitter. The information is then passed to a controller and graphic recorder which prints a hard copy of the profile. This allows precision definition of any edges of excavations or metal objects such as tanks, drums or metal utility conduits. However, the actual depth of signal penetration is controlled by various factors, such as the conductivity of the subsurface material and the frequency of the transmitted signal. Consequently, the amount of clay or other highly conductive material may render the subsurface opaque to radar signals, and therefore produce limited results.

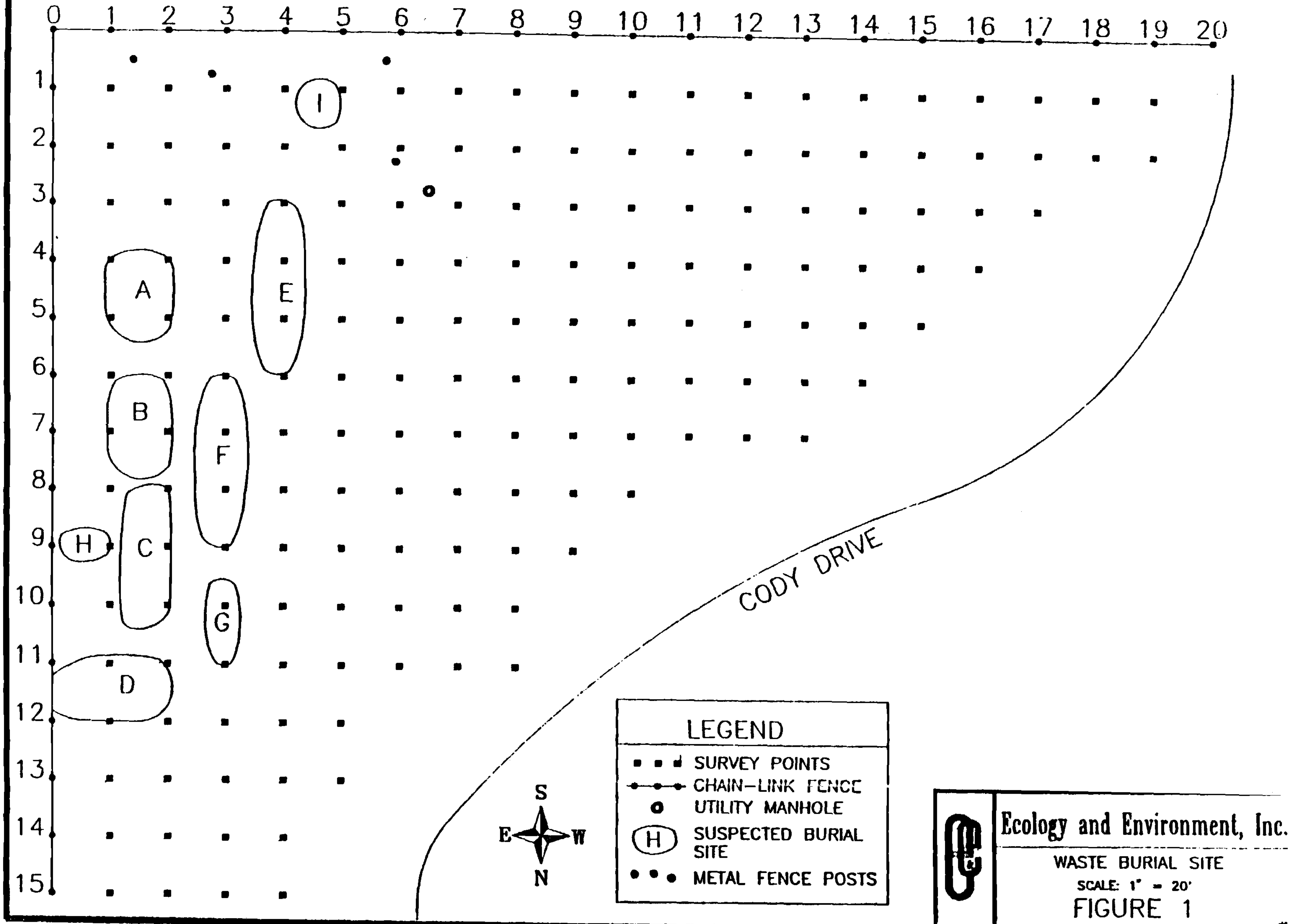
The Geonics EM-31 conductivity meter directly measures the average conductivity of the hemisphere below it. The strength of the signal is affected by material at depths of up to 18 feet, but the greatest part of the signal is generated by material in the uppermost 6 to 9 feet. The

EM-31 can also be used in a metal detection mode to further define the results of the conductivity survey.

Upon arrival, the E&E team measured the site as a basis for the site map and to establish a 10 ft. x 10 ft. grid system to facilitate the geophysical survey, data interpretation and anomaly identification. The grid system was established using the existing chainlink fence posts, which are appproximately 10 ft apart, as reference points, with the southeast corner post being designated line 0, station 0. The lines, 0-19, run south to north, originating at the fence posts along the east-west fenceline, and the stations, 0-15,run east to west originating at the fence posts along the south-north fence line. The grid system is provided in Figure 1.

The GPR unit was assembled using the 100 Hz antenna, then employed across the site. After several unsuccessful attempts at obtaining conclusive data with the 100 Hz antenna, a smaller 30 Hz antenna was employed across the same area. Due to the high clay content of the site soils, which inhibited deep radar penetration, the GPR was not useful for determining the location of the suspected buried drums.

On the following day the E&E team returned to the site with an EM-31 conductivity meter to continue the geophysical survey. Initially, the EM-31 was employed in the conductivity mode across the site and data was recorded using the data logger. After the survey results were analyzed by E&E team members, a background level of 50-65 mS/m was established, and any value below background was identified as an anomaly. The results of the survey (Table 1) indicated anomalies along the east border of the site and along the south border parallel to the fenceline. The latter was subsequently determined to be a utility conduit leading to manhole near line 7, station 3. After completing the conductivity survey, the EM-31 was switched to an inphase mode which allows it to be used as a metal detector. This, along with a Fisher TW-6 Mscope pipe and cable locator were used to detect and identify, more specifically, the subsurface anomalies which would indicate buried metal drums. Once the location was identified, survey pin flags were placed around the perimeter of anomalies. Nine locations were identified and marked as areas A through I as illustrated by Figure 1. The anomalies not detected by metal detection could indicate: A TCE contamination plume migrating downgradient, north; or drums buried deeper than the penetration capabilities of the metal detectors.



Ecology and Environment, Inc.

WASTE BURIAL SITE

SCALE: 1" = 20'

FIGURE 1

TABLE 1

EM-31 CONDUCTIVITY SURVEY RESULTS

Station	Line																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	76.6	78.0	66.2	61.8	65.0	100.6	69.0	79.6	64.2	62.2	62.2	64.0	62.0	61.0	61.6	63.8	64.4	68.6	69.6
2	64.4	59.6	51.2	48.8	56.8	82.4	66.4	68.0	63.2	62.2	61.2	60.1	59.6	59.6	59.2	59.4	59.4	54.0	64.0
3	57.4	51.8	46.6	39.6	46.0	58.2	24.2	35.2	34.8	36.0	34.0	34.0	35.0	35.6	37.0	38.4	39.2		
4	58.0	41.0	42.6	41.4	45.6	53.6	56.8	58.2	57.8	56.4	53.4	59.2	57.8	60.2	62.2				
5	59.0	47.8	43.2	44.4	43.8	53.2	48.6	53.8	52.4	53.2	53.8	58.0	59.4	62.2	62.0				
6	58.0	47.6	36.2	42.0	41.2	48.4	29.4	53.4	47.6	47.8	51.0	55.0	54.6	60.2					
7	60.8	52.0	27.4	44.8	42.0	49.4	32.8	63.8	51.8	51.6	49.8	53.2	59.4						
8	64.6	49.8	35.2	43.8	40.0	46.8	75.2	79.8	52.8	45.8									
9	61.0	48.2	34.6	40.2	38.4	43.2	74.2	60.8	49.8										
10	45.8	47.2	35.6	36.8	35.2	41.4	55.0												
11	49.6	38.0	35.2	37.8	35.4	38.4	44.6												
12	56.6	49.2	41.0	38.2	39.8														
13	60.8	46.2	40.6	40.0	39.8														
14	59.6	47.8	44.0	43.2															
15	60.8	49.8	47.2	46.0															

* CONDUCTIVITY UNITS: mS/m

REFERENCES

Geonics Limited "Theory and Case Histories- Geonics Ground Conductivity Meters (EM 38, EM 31, EM34-3) and Borehole Induction Logger."

Standard Operating Procedure for Overview of Surface Geophysical Techniques used at Hazardous Waste Site Investigations. Ecology and Environment, Inc. SOP- Surface Geophysical Techniques, GEOTECH 5.2. Revised September, 1987.

Standard Operating Procedure for Conducting Ground - Penetrating Radar Surveys at Hazardous Waste Sites. Ecology and Environment, Inc. SOP - Ground-Penetrating Radar, GEOTECH 5.6. Revised January 1990.

APPENDIX B

"Sampling and Analysis, Quality Assurance/Quality Control Plan", U.S. Army Corps of Engineers, Southwestern Division Laboratory, January 1991

U S ARMY CORPS OF ENGINEERS
SOUTHWESTERN DIVISION LABORATORY

Sampling and Analyses Quality Assurance/Quality Control Plan

January 1991

I. Purpose:

The purpose of this QA/QC plan is to describe the quality assurance and quality control procedures followed by the Southwestern Division Laboratory and their contractors when performing analyses of samples from their clients. These procedures are used to ensure that the generation, processing, verification and reporting of the data by the laboratories are reliable, accurate and properly documented.

II. References:

The following references were used in the preparation of this plan:

A. U.S. Environmental Protection Agency, Test Methods for Evaluating Solid Wastes, SW 846, November 1986.

B. American Public Health Association and American Waterworks Association, Standard Methods for the Examination of Water and Wastewater, 16th ed., 1985.

C. U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Wastes, EPA - 600/4-79-020, 1979.

D. U.S. Environmental Protection Agency, Handbook for Sample Preparation of Water and Wastewater, EPA - 600/14-82-029, 1982.

E. U.S. Environmental Protection Agency/Corps of Engineers, Procedures for Handling and Chemical Analysis of Sediment and Water Samples, EPA/CE-81-1, 1981.

F. U.S. Army Corps of Engineers, Chemical Data Quality Management for Hazardous Waste Remedial Activities, ER 1110-1-263, March 1990.

G. Forester and Mason, Journal of Forensic Chemistry, Vol. 19, #1, pages 155 to 162, 1974.

III. Sample Collection:

A. Well Sampling:

All groundwater samples shall be taken using a stainless steel or teflon bailer. Each sample container shall be filled directly from the spout or discharge tube. Samples shall be placed in appropriate containers as detailed in Table I. Labels must be affixed to each container with the following information written with permanent ink: well identification, date, required analysis, methods of preservation, sampler's identification.

B. Soil Sampling:

Soil samples shall be taken by augering with a drill rig. Samples shall be collected in glass liter or half-liter wide-mouthed jars with teflon lined caps. Labels must be affixed to each container with the following information written with permanent ink: well or boring identification, depth, date, required analysis, sampler's identification.

C. Sediment Sampling:

Bottom sediment samples shall be taken using a core or grab sampler, depending on which method provides the most representative sample of the site. Samples will be collected either with a glass or stainless steel sampler, mixed in the field and placed in glass liter or half-liter wide-mouthed jars with teflon lined caps. Labels must be affixed to each container with the following information written with permanent ink: location identification, date, depth, required analysis, sampler's identification.

IV. Cleaning Sampling Equipment:

Water samplers used for collecting inorganic samples may be cleaned with non-phosphate detergent followed by rinses with tap water, dilute hydrochloric acid and distilled water. Water samplers used for collecting organic samples shall be cleaned with non-phosphate detergent followed by rinses with tap water, distilled water, pesticide grade hexane and pesticide grade methanol. The last two rinses should be done under a hood or well ventilated conditions. Drilling rigs and core samplers used for soil and sediment sampling shall be steam cleaned after each sampling or boring.

V. Sample Preparation and Preservation:

A. Preservatives:

Preservatives are listed in Table I. All chemical preservatives shall be of reagent grade quality. Preservatives shall be added dropwise from dedicated containers in order to achieve proper pH or concentration at the sampling site. A calibrated pH meter shall be used to check pHs.

B. Refrigeration:

Keep all samples refrigerated or iced down in coolers if space permits; otherwise, refrigerate those samples needing refrigeration as indicated in Table I.

VI. QA Samples:

There shall be a minimum of one QA field split or duplicate sample taken for every ten samples of each matrix type collected. There shall also be a minimum of one blank sample for each matrix type for every ten samples. Field blanks may consist of clean or background soil samples, water from background wells, sample rinsates, or distilled water as appropriate to the sample type.

VII. Documentation:

A. Fieldbook:

A field book shall be kept of all operations and contain the following: well or boring number, date, water level, well evacuation procedure and rate of recharge, sample method, pH and conductivity readings, any unusual conditions noted (odor, color, well damage, etc.) times of collection, preservation and shipment, sampler's name and any information regarding blank samples.

B. Field Data Form:

The field data form includes selected information from the fieldbook relevant to the analyses of the sample; such as, pH, conductivity, unusual odor or color, water level,etc. This form shall be shipped in the cooler.

C. Chain of Custody Form:

The chain of custody form is required to establish possession of the samples from collection to analyses. This form shall be shipped in the cooler with the samples and must be signed by both the sample collector and the sample preparer.

VIII. __Shipment:__

Samples shall be placed in coolers equipped with inserts to hold containers securely. Samples shall be covered with ice and have accompanying documentation sealed in plastic bags inside the coolers. Coolers shall be sealed with straps or tape and have a minimum of two chain of custody seals placed across the opening. Coolers may be shipped by commercial or government carrier and must be received by SWD Laboratory within 24 hours of the time the samples were collected.

Table I

Sampling and Preservation Procedures

Parameter	Container	Preparation
Volatile Organics	Three 40 ml glass vials	Zero headspace, Refrigeration, HCl to pH<2
pH	One 500 ml plastic	Refrigeration
Conductivity	One 500 ml plastic	Refrigeration
Metals	One liter plastic	Nitric Acid to pH<2, Refrigeration
Hex. Chromium	One liter plastic	Refrigeration
Cyanide	One 500 ml plastic	Sodium Hydroxide to pH>12, Refrigeration
Total Organic Halides	One one-liter amber glass	Sulfuric Acid to pH<2, Refrigeration
Total Organic Carbon	One 40 ml glass vial	Sulfuric Acid to pH<2, Refrigeration
Semivolatile Extractable Organics	Two one-liter amber glass	Refrigeration
Pesticides/PCB's	Two one-liter amber glass	Refrigeration
Herbicides	One one-liter amber glass	Refrigeration
Sulfates	One 250 ml plastic	Refrigeration
Fluoride	One 250 ml plastic	Refrigeration
Chloride	One 250 ml plastic	Refrigeration
Nitrate	One 250 ml plastic	Refrigeration
Phenols	One one-liter amber glass	Sulfuric Acid to pH<2, Refrigeration

Total Petroleum Hydrocarbons	One one-liter amber glass	Hydrochloric Acid to pH<2, Refrigeration
Chemical Oxygen Demand	One 500 ml amber glass	Sulfuric Acid to pH<2, Refrigeration
Oil and Grease	One one-liter amber glass	Hydrochloric Acid to pH<2, Refrigeration
Total Solids -- Dissolved Suspended	One 500 ml plastic	Refrigeration
Alkalinity	One 500 ml plastic	Refrigeration
Explosives	Two one-liter amber glass	Refrigeration
Ignitability	One one-liter amber glass	Refrigeration
Corrosivity	One one-liter plastic	Refrigeration
Reactivity	One one-liter plastic	Refrigeration
Gross Alpha, Beta	One one-liter plastic	Nitric Acid to pH <2, Refrigeration
Total Radium	One one-liter plastic	Nitric acid to pH <2, Refrigeration

Note: The above information applies only to water samples. All soil and sediment samples shall be collected into liter or half-liter wide-mouth glass jars with teflon-lined caps and kept refrigerated.

Table II

Analytical Methods

Water Samples

Volatile Organics	EPA Method 8240
pH	EPA Method 9040
Conductivity	EPA Method 120.1
Metals	
Mercury	EPA Method 7470
Arsenic	EPA Method 7060
Selenium	EPA Method 7740
Others	EPA Method 6010
Cyanide	EPA Method 9010
Total Organic Halides	EPA Method 9020
Total Organic Carbon	EPA Method 9060
Semivolatile Organics	EPA Method 8270/8250
Pesticides/PCB's	EPA Method 8080
Herbicides	EPA Method 8150
Sulfates	EPA Method 300.0
Fluoride	EPA Method 300.0
Chloride	EPA Method 300.0
Nitrate/Nitrite	EPA Method 300.0
Phenols	EPA Method 9065
Total Petroleum Hydrocarbons	EPA Method 418.1
Carbon Oxygen Demand	EPA Method 410.1
Oil and Grease	EPA Method 9070
Total Suspended Solids	EPA Method 160.2
Total Dissolved Solids	EPA Method 160.1
Alkalinity	EPA Method 310.1

Soil Samples

Volatile Organics	EPA Method 8240
Benzene, Toluene, Ethylbenzene, Xylene	EPA Method 8240 or 8020
Semivolatile Organics	EPA Method 8270/8250
Pesticides/PCB's	EPA Method 8080
Herbicides	EPA Method 8150
Metals	
Mercury	EPA Method 7471
Arsenic	EPA Method 7060
Selenium	EPA Method 7740
Others	EPA Method 6010
Flashpoint	EPA Method 1010
pH	EPA Method 9045
Oil and Grease	EPA Method 9071
Total Petroleum Hydrocarbons	EPA Method 9071
Conductivity	EPA Method 120.1
Cyanide	EPA Method 9010
Ignitability	EPA Method 1010
Corrosivity	EPA Method 9045
Total Organic Halides	EPA Method 450.1

U S ARMY CORP OF ENGINEERS
SOUTHWESTERN DIVISION LABORATORY
4815 Cass Street
Dallas, Texas 75235

Chain-of-Custody Form

Location______________________________ Date_____________________

Site__________________________________ Well/Boring Number_______

Number of containers in shipment:

	glass	plastic
liter	________	________
vial	________	________

Parameters sampled:

pH	________
Conductivity	________
Vol. Organics*	________
Metals**	________
Cyanide	________
TOX	________
Tot. Pet. Hyd.	________
Ignitability	________
Pesticides	________
Other Analyses	________
____________________	
____________________	
____________________	

*<u>Volatile Organics:</u>
Regular detection limits ________
0.5 ppb detection limits ________

**<u>Metals:</u> (circle desired analyses)

As, Ba. Be, Ca, Cd, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Se,

Ag, Zn, EP Toxicity Prep.

CUSTODY RECORD
Signature and Title

Relinquished By	Received By	Date	Time

U S ARMY CORPS OF ENGINEERS
SOUTHWESTERN DIVISION LABORATORY
4815 Cass Street
Dallas, Texas 75235

Field Data Sheet

Location____________________ Date____________________

Site____________________ Well/Boring Number__________

Casing Diameter____________________ Casing Type______________

Rate of Recharge____________________

Riser Elevation____________________

Depth of Water____________________ Time of Measurement__________

Measuring Device____

Well Purged Dry____________________ Continuous Recharge__________

pH Measurements

Date____________________

Time____________________

Meter Type/Model____________

____

____

____

____

Spec. Conductance, mhos/cm

Time____________________

Meter Type/Model____________

Temperature______________

____

____

____

____

Notes concerning condition of well, odors, color, etc.:

____

____

Sampler's Signature______________________________

IX. Sample Custody:

A. Sample Receiving and Chain-of-Custody Procedures are designed to track the movement of samples from the time they leave the sampling site to the time they are analyzed.

1. All samples are received in a designated area of SWD Laboratory by a sample custodian. Each sample is thoroughly examined to ensure that proper sampling, preservation, packaging and labeling techniques have been employed.

2. Each sample is assigned a unique SWD Laboratory sample number and recorded in a bound log book which includes lab and field sample numbers, date sampled, date arrived to SWD, Corps of Engineer District or client generating sample, location of sampled area, sample description, and list of analyses requested. This information is also maintained on computer files.

3. The Chain-of-Custody is checked for accuracy and signed and dated. Any significant information concerning samples is recorded on the Chain-of-Custody at this time.

B. Sample Storage:

1. Samples are stored at 4C -- checked and recorded daily -- in six 3'x6'x6' stainless steel refrigerators.

2. Samples are stored for a minimum of six weeks after data has been submitted to client.

3. Volatile samples are stored separately in two, 21 cu. ft., refrigerators.

C. Contract Laboratories:

1. Samples which are to be transferred to a contract laboratory are shipped within twenty-four hours of receipt by SWD Laboratory.

2. Samples are shipped in coolers with form- fitting inserts and covered with ice. Coolers are secured with straps and chain-of-custody seals then shipped for next day delivery by commercial carrier.

3. Sample shipment includes samples, chain-of-custody documentation with explicit instructions concerning sample identification, required analyses, turnaround date and sample collection date.

D. Requirements of Contract Laboratories:

1. Contractor must be validated by the Corps of Engineers Missouri River Division Laboratory.

2. Contractor must have minimum duplicity of all major analytical equipment.

3. Contractor must be certified by the Oklahoma Water Resources Board.

X. Reporting and Recording Data: Analytical data is reported and recorded in the following manner:

A. All raw data is recorded in bound books and/or computer printout.

B. Written reports are submitted to the client after a project is completed or at regular intervals for long-time projects. Each report contains the following information:

1. Identification of samples by the field number and by the SWD number.

2. Minimum detection limits for each constituent reported.

3. Quality control and quality assurance data such as method blanks, surrogate recoveries, duplicates and spikes applicable to the data set.

4. Analytical results.

5. Date analyzed.

6. Date sample collected and date received by SWD.

7. Method of analyses.

C. Data and information concerning analyses is available by telephone, computer interface or modem, or computer disc.

D. Laboratory Director maintains records of all reports submitted to clients.

E. Environmental Services Section maintains records of all raw data, hard copy of all reports, and computer records of all analytical and quality control data.

XI. <u>Preventative Maintenance:</u> In order to prevent instrument down time and costly instrument repairs, SWD uses the following methods of maintenance:

A. Service maintenance contracts are purchased for all major equipment such as both Perkin Elmer Atomic Absorption Spectrophotometers, the ARL ICAP, the Hewlett-Packard GC/MSD, the Hewlett-Packard GC, the Dohrmann TOX Analyzer, the Waters IC/HPLC and the O. I. TOC Analyzer.

B. Specific operator manuals are used to outline preventative maintenance plans for all equipment.

C. Each instrument has an instrument log book in which the daily performance, preventative maintenance activity, problems, etc. are recorded.

XII. <u>Data Validation:</u> Data validation is accomplished by monitoring the precision and accuracy of quality control data, system audits and by utilizing known and blind standards.

A. Initial Calibration: At the beginning of each day, each instrument is calibrated by standard samples according to the prescribed method. This calibration is verified by an analysis of method blank samples immediately after the calibration procedure and immediately before sample analyses.

1. Standards are either bought or prepared using certified chemicals as specified in the methods.

2. Data from standards are accumulated starting from the lowest concentration and ending with the highest.

3. Calibration is verified by an EPA Quality Control Sample at the rate of at least 10%. Calibration curves are generated using at least three data points.

4. Calibration data is recorded on raw data sheets and kept in bound books and/or computer files.

5. Method blanks are prepared for every twenty samples or less containing appropriate amounts of reagents used in sample preparation. Data from the blank is determined and recorded after calibration. If the method blank is above the required detection limit and/or the lowest analyte is less than ten times the blank concentration, the entire sample set will be reanalyzed.

B. Spiked Sample Analyses: Spiked samples are samples altered by the addition of known amounts of analytes. These samples are analyzed along with actual samples. The percentage of analyte recovery is then calculated to ascertain quality of data.

1. Spiked samples are prepared before sample preparation procedures-(digestion, extraction, etc.) and generated at the rate of at least 10% of samples.

2. Individual percent recoveries are calculated as follows:

$$\text{Recovery} = \frac{(SSR - SR) \times 100}{SA}$$

where
SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Added

3. Percent recoveries outside the range of 80 to 120% are considered outliers. Spike recoveries are disregarded for samples in which the concentration is four or more times the spike amount.

C. Duplicate Sample Analyses: A second spiked sample is prepared and analyzed as above. The information generated is used as a check on instrument reliability, operator error, chemical problems, etc.

1. The relative percent difference between the spike sample and the spike sample duplicate is calculated as follows:

$$RPD = \frac{(D1 - D2) \times 100}{(D1 + D2)/2}$$

where
RPD = Relative Percent Difference
D1 = First Spiked Sample Value
D2 = Second Spiked Sample Value

2. Results of duplicate analyses for samples with concentrations greater than five time the required detection limit shall have RPD of less than twenty percent to be acceptable.

D. Corrective Action: If some, but not all, spiked and/or duplicate spiked samples are found to be outliers, the entire sample set is reanalyzed using the sample extract or digestate. If all the spikes and/or duplicate spiked samples are outliers, the entire sample set shall be reanalyzed starting from the initial step (digestion, extraction, etc.). A thorough investigation of reagents, instrument condition and calibration, and any other factors contributing to the problem of accuracy and precision will be conducted in order to correct any problems.

E. External Quality Assurance Program: SWD Laboratory participates in a QA program provided by the U. S. EPA Environmental Monitoring and Support Laboratory of Cincinnati, Ohio, the certification program by the Oklahoma Water Resource Board, and the U. S. Army Corps of Engineers validation program.

XIII. Procedure for Cleaning Glassware:

A. Trace Metals Analyses:

1. Prior to use, glassware for trace metals analyses is rinsed with pesticide grade hexane.

2. After use, glassware is rinsed with tap water, washed with a Liqui-Nox solution, rinsed twice with tap water, and, finally, rinsed with distilled or deionized water.

3. Stained glassware is cleaned with a strong acid solution, then washed and rinsed as above.

B. Organic Analyses:

1. Prior to use, glassware for organic analyses is rinsed with pesticide grade hexane.

2. After use, glassware is rinsed with tap water, then sonicated for fifteen minutes in a solution of Liqui-Nox in a sonication bath. This is followed with a tap water rinse, two distilled water rinses, and an acetone rinse. After glassware is dry, it is placed in the muffle furnace at 550C for four hours.

3. Stained glassware is cleaned with a strong acid solution after sonication, then washed and rinsed as above.

C. Other:

1. Glassware used for phosphate determination is not washed with detergents containing phosphates.

2. Glassware used for ammonia, Kjeldahl nitrogen and nitrate/nitrite is rinsed with ammonia free water.

XIV. Sample Disposal:

A. Samples are stored for a minimum of six weeks after the report is generated. The date a report is issued is put into both the sample log book and the work order book. The sample storage area for completed samples is separate from current samples and inventoried at regular intervals.

B. Hazardous samples are either returned to the client when completed or combined in specially marked containers for proper hazardous disposal.

XV. Safety:

A. Emergency Equipment:

1. The laboratory is equipped with four overhead showers, two eye washers and four fire extinguishers.

2. A Red Cross first aid kit is located on the premises.

3. All safety equipment is checked on a regular basis.

B. Protective Equipment:

1. All personnel are provided with laboratory coats, disposable aprons, gloves, respirators and protective eyewear.

2. All personnel are given a medical examination annually.

C. Ventilation:

1. The laboratory has four ventilation hoods and they are used whenever toxic or flammable materials are used.

XVI. <u>Personnel:</u> At the present time the laboratory is staffed by three chemists and two technicians. Two other chemist positions and two technician positions will be opening by the middle of 1991.

Personnel currently on staff and their responsibilities are as follows:

Catherine Hutchins, Chief, Environmental Services Section

1. Provide work assignments and coordinate projects within the Chemistry section
2. Maintain and upgrade QA/QC program
3. Train personnel
4. Purchase equipment, supplies, and materials necessary for maintaining laboratory
5. Consult engineers, geologists and field personnel
6. Evaluate and contract outside laboratories for overflow work
7. Evaluate laboratory data and write reports
8. Prepare Final QA/QC Reports for major projects

Anhmai Tran, Chemist

1. QA/QC manager
2. Chemical analyses using wet methods
3. Chemical analyses using atomic absorption spectroscopy, spectrophotometry, TOC analyzer, ion analyzer, microprocessor, gas chromatography, TOX analyzer
4. Train personnel
5. Evaluate data

Donald Bradshaw, Chemist

1. Safety officer
2. Chemical analyses using wet methods
3. Chemical analyses using atomic absorption spectroscopy, spectrophotometry, TOC analyzer, microprocessor, TOX analyzer, infrared spectrometer
4. Sample tracking manager

Albert Acosta, Lead Technician

1. Computer operations and data management
2. Sample preparation and analyses for trace metals
3. Sample receiving and tracking
4. Chemical analyses using wet methods
5. Chemical analyses using ICP and AA methods.

Franklin Kelly, Technician

1. Sample preparation and analyses for ions
2. Sample receiving
3. Chemical analyses using wet methods

Resume of Catherine E. Hutchins

1223 Lodema Lane
Duncanville, Texas 75116

Work Experience:

February 1988 to present:
US Army Corp of Engineers, Southwestern Division Laboratory
4815 Cass Street, Dallas, Texas 75235
Position: Chief, Environmental Services Section
Supervisor: Mr. William Tanner
214/905-9130
Duties include: Performing professional analytical and physical testing of water, soil and dredged material received by the laboratory. Primarily use microanalytical techniques such as Atomic Absorption, Gas Chromatography, TOC, colorimetric, volumetric, gravimetric and wet chemistry analyses. Utilize professional knowledge and education covering a wide range of test procedures and theoretical principles to accomplish assignments. Directs work assignments to technicians from the receiving of samples to the writing of comprehensive scientific reports to clients. Extensive work on the IBM XT and AT using Lotus 1-2-3, dBase, Wordstar and Smartware systems.

February 1983 to September 1985:
State of Louisiana, Dept. of Environmental Quality
P.O. Box 44111, Cap. Station, Baton Rouge, Louisiana 70804
Position: Environmental Engineer
Supervisor: Mr. Thomas Bradley
504/838-5365
Duties included: Conducted inspections of complex major and minor industrial and municipal wastewater dischargers having Federal and/or State discharge permits. Conducted compliance assurance portion of major stream surveys. Performed routine surveillance of nonpermitted industries and municipalities. Investigated various environmental complaints and hazardous incidents. Coordinated work assignments of subordinates. Conducted comprehensive field sampling and analyses, oftentimes under extremely hazardous conditions. Conducted Performance Audit Inspections of public and private laboratories to ensure proper sample collection, preservation and analyses procedures were being adhered to. Reviewed and verified provisions or conditions of Wastewater Discharge Permits and Discharge Monitoring Reports for the EPA.

April 1980 to February 1983:

Jefferson Parish Environmental Department
3600 Jefferson Highway, Jefferson, Louisiana 70121
Position: Environmental Engineer
Supervisor: Dr. Michael Loden
504/367-6611

Duties included: Coordinated the Federal Pretreatment Program directives as they applied to Jefferson Parish. This comprised direct collection or supervision of collection by subordinates of water and wastewater samples from industrial and sewage treatment plants. This required interpretation of analytical data for judgmental decisions regarding compliance to Federal, State and Parish law. Duties further entailed preparation of the specific billing format to be assessed violators. In addition, it was required to respond to various environmental complaints and hazardous incidents. Further responsibilities included working closely with sewerage department engineers to upgrade sewerage system, sewage treatment plants and quality of sewage from industries. Also, taught the Certified Sewerage Treatment Plant Operators' course, a Hazardous Materials course to firefighters, and a Hazardous Gases course to plant operators.

June 1979 to April 1980:

Jefferson Parish Water Quality Laboratory
3600 Jefferson Highway, Jefferson, Louisiana 70121
Position: Chemist
Supervisor: Mr. Wayne Koffskey
504/367-6611

Duties included: Collecting and analyzing water and wastewater samples using instrumental and wet techniques. Organic materials were analyzed using TOC, spectrophotometric and gas chromatographic methods. Metals were detected using atomic absorption and atomic fluorescence methods. In addition, conventional wet chemical tests for COD, oil and grease, BOD, total suspended solids, nitrates, sulfates, surfactants, settleable solids and fecal coliform were performed as required. Extensive use of computer was required to record data and perform statistical analysis.

Related Training:

- Sewage Treatment Plant Operators Licenses
  - Activated Sludge Class IV, June 1982.
    - Recertified in June 1985.
  - Biofiltration Class IV, June 1982.
    - Recertified in June 1985.
- Rookie Firefighter School, August 1982.
- Hazardous Materials Course, December 1982.
- Computer Courses:
  - Lotus 1-2-3, June 1988
  - dBase, June 1988
  - Advanced Lotus 1-2-3, May 1989
- ARL ICP School, June 1989
- Hewlett-Packard GC Training, November 1989
- Dohrmann TOX Training, October 1989
- Managing Environmental Compliance at Federal Facilities Course, November 1989
- Hewlett-Packard GC/MS Training, March 1990
- Waters IC/HPLC Training, February 1990
- Environmental Laws and Regulations Course, June 1990
- HTW Overview Training Course, July 1990

Education:

Eastern Illinois University
Charleston, Illinois 61920
Degree: Master of Science, May 1978.
Major: Chemistry -- emphasis on Environmental and Physical
Thesis: Amperometric Determination of Chemical Oxygen Demand

University of Illinois
Champaign, Illinois 61820
Degree: Bachelor of Science, May 1976.
Major: Chemistry
Minors: Physics and Mathematics

Resume of Anhmai Tran

2020 Via Bellena
Carrollton, Texas 75006

Work Experience:

April 1989 to present:
SWD Laboratory, US Army Corps of Engineers
4815 Cass Street, Dallas, Texas 75235
Position: Chemist
Supervisor: Catherine Hutchins
214/905-9130
Duties include: Sample tracking manager. Wet and instrumental chemical analyses. Train personnel.

1988 to April 1989:
Hydrocontrol Corporation
4574 Claire Chennault, Dallas, Texas 75248
Position: Chemist
Duties included: Testing and analyzing water samples. Preparing, testing and standardizing chemical solutions for customers.

1987 to 1988:
Baylor College of Dentistry
3302 Gaston Avenue, Dallas, Texas 75246
Position: Research Technician
Duties included: Prepare chemical reagents, set up laboratory instruments, photograph research pictures.

1981 to 1986:
Hydrocontrol Corporation
3801 South Moulton, Oklahoma City, Oklahoma 73158
Position: Chemist
Duties included: Research and development, test and analyze water samples. Prepare, test and standardize chemical solutions for customers.

1980 to 1981:
Oklahoma State Department of Health
1000 N.E. 10th, Oklahoma City, Oklahoma 73123
Position: Assistant Chemist
Duties included: Wet and instrumental analyses of water samples.

Related Training:

Computer Courses:
- Lotus 1-2-3, May 1989
- dBase III, June 1989

Dohrmann TOX Training, October 1989
Hewlett-Packard GC Training, November 1989
Hewlett-Packard GC/MS Training, March 1990
Waters IC/HPLC Training, May 1990

Education:

Oklahoma University
Norman, Oklahoma
Degree: Bachelor of Science, December 1979
Major: Chemistry
Minor: Physics

Saigon University
Saigon, Viet Nam
Degree: Bachelor of Science, April 1975
Major: Biochemistry

Resume of Donald Bradshaw

2422 North MacArthur Blvd.
Apartment #1236
Irving, Texas
75062

Work Experience:

January 1991 to present:
US Army Corps of Engineers, SWD Laboratory
4815 Cass Street, Dallas Texas 75235
Position: Chemist

June 1988 to December 1990:
City of Olney
201 E. Main Street, Olney, Texas 76374
Position: Wastewater Plant Operator

August 1984 to May 1987:
Professional Food Service Management Co.
3400 Taft Blvd., Wichita Falls, Texas 76308
Position: Assistant Chef

Education:

Midwestern State University, Wichita Falls, Texas
Degree: Bachelor of Science, May 1987
Major: Chemistry
Minor: Biology

Resume of Albert Acosta

3633 Big Horn Trail
Plano, Texas 75075

Work Experience:

April 1989 to present
US Army Corps of Engineers, SWD Laboratory
4815 Cass Street, Dallas, Texas 75235
Position: Chemistry Technician

September 1988 to September 1989
Brookhaven Community College
Farmers Branch, Texas
Position: Physics Teaching Assistant

Education:

University of Texas, Arlington, Texas
Degree: Bachelor of Science, May 1992
Major: Chemistry

Related Training:

ARL ICP Training, December 1990

Resume of Franklin Kelly

206 Bowles Court
Kennedale, Texas
76060

Work Experience:

May 1990 to present:
US Army Corps of Engineers, SWD Laboratory
4815 Cass Street, Dallas, Texas 75235
Position: Chemistry Technician

May 1989 to September 1989
Tarrant County Water Control
Fort Worth, Texas
Position: Technician

March 1987 to May 1989:
US Army
Dallas, Texas
Position: Signal Corps

Education:

Tarrant County Junior College, Fort Worth, Texas
Degree: Associates in Arts, June 1989
Major: Pre-Civil Engineering

XVII. Personnel Training:

A. Full time employees receive periodic outside training in environmental analyses, sampling, hazardous waste management and computer operations.

B. Students and part time employees receive on-the-job training based on needs described in job description, observe slide presentations and films describing use and operation of major equipment, and must demonstrate proficiency before being allowed to analyze samples.

C. New employees are hired for a one year probationary period. During that time the employee's work is constantly reviewed and evaluated for performance and productivity.

D. All employees' performance is reviewed annually.

XVIII. Laboratory Validations and Certifications:

A. The Southwestern Division Laboratory is validated on an annual basis by the Missouri River Division Chemical Review Section to do analyses for metals, pesticides and PCB's under the Corps of Engineers' Hazardous and Toxic Waste Program. Within a year validation to perform petroleum hydrocarbon, purgeable volatile organics, and explosive analyses should be completed.

B. SWD Laboratory is certified bi-annually by the Oklahoma Water Resources Board and annually by the State of Arkansas Water Commission to do a variety of chemical analyses for projects which are under their regulatory control.

C. EPA audit samples are analyzed bi-annually by SWD Laboratory as part of the interlaboratory QA/QC program.

XIX. Equipment:

A. Instrumentation:

Item	Manufacturer	Model	Age, Yr
pH Meter	Cole-Parmer	5986-60	4
Specific Ion Analyzer	Orion	901	11
Conductivity Meter	YSI	32	New
Conductivity Meter	Barnstead	PM 70-CB	3
UV-Visible Spectrophotometer	Milton Roy Co.	20D	3
Atomic Absorption Spectrophotometer	Perkin-Elmer	401	15
Atomic Absorption Spectrophotometer	Perkin-Elmer	5000,HGA 500	5
Total Organic Carbon Analyzer	O. I. Corp.	700	4
Gas Chromatograph	Hewlett-Packard	5890	1
BOD Analyzer	YSI	54A	5
Inductively Coupled Plasma Analyzer	ARL	3410	2
Total Organic Halide Analyzer	Dohrmann	20A	1
HPLC/IC	Waters	510/820/484	New
Gas Chromatograph/ Mass Spectrometer	Hewlett-Packard	5890/5970B	New

Equipment To Be Purchased in Fiscal Year 1991:

Mercury Cold Vapor Analyzer--to replace Perkin Elmer #401 AA

Purge and Trap System for Gas Chromatograph--to enable laboratory to perform purgeable volatile organic analyses

IR Spectrometer--to enable laboratory to perform total petroleum hydrocarbon and oil and grease analyses

LC Automatic Sampler, HPLC Pump, UV/Vis Detector and Control Boards--to upgrade HPLC/IC system in order to perform explosive analyses

B. <u>Major Laboratory Equipment:</u>

Six Refrigerators 3'x6'x6'	Nor-Lake		7
Two Refrigerators 3'x3'x5'	Kenmore	106	9
Radiant Heat Oven	Lab Line	Imperial III	11
Forced Draft Oven	Blue M	OV-18C	1
Furnace	Heavi-Duty		31
Muffle Furnace	Hoskins		31
Three Fume Hoods	Labconco		12
Fume Hood	Allen-Bradley		30
Distillation System	Barnstead	A-1013	5
Distillation System	Barnstead	A-1013	2
Ion Exchange System	Millipore	Milli-Q	10
Centrifuge	IEC	2K	12
Centrifuge	IEC	EXD	25
Centrifuge	Lab Line	Imperial III	11
Centrifuge	Barnstead	1250	11
Balance	Fisher	B-5	22
Balance	Mettler	PC400	12
Balance	Mettler	K-7	22
Balance	Mettler	AE200	3
Balance	Ohaus	B300	4
Balance	Sartorius	1202	4
Ultrasonic Cleaner	Mettler		10
Sonicator	Ultrasonics	W-375	7
Roto-evaporator	Buchi	R110	8
Small Hot Plate	Lindberg		Unk

Large Hot Plate	Lindberg		3
Large Hot Plate	Lindberg		2
Small Water Bath	Blue M		8
Large Water Bath	Blue M		3
Vortex Mixer	S/I	K-550-G	6
Autoclave	Barnstead	1250	9
Ampule Sealer	O. I. Corp.		4
Automatic Digestion Unit	Technicon	BD-40	3
Magnetic Stirrer/ Hot Plate	Corning		1

APPENDIX C

Analysis of Unknown Barrel Contents

DEPARTMENT OF THE AIR FORCE
ROBERT L. THOMPSON STRATEGIC HOSPITAL (SAC)
CARSWELL AIR FORCE BASE, TEXAS 76127-5300

REPLY TO ATTN OF: SGPB (x7111) 5 February 1991

SUBJECT: Analysis of Unknown Barrel Contents

TO: SGP
7 CES/DEEV
IN TURN

1. Attached are copies of the report received from Talem Inc regarding the analysis of the contents of the drum dug up on 17 Jan 91 by a contractor southeast of the jet engine test cell. Although we had requested that the material be analyzed for hazardous waste characteristics, they simply identified the material as being trichloroethylene.

2. Please notify the Spill Response Team of these results and provide them a copy of the attached information.

DOUGLAS R. MARSDEN, TSgt, USAF
Bioenvironmental Engineering

Atch:
TCE Information

BULK MATERIAL SAMPLING DATA

OEHL USE ONLY

(Use this space for mechanical imprint)

WORKPLACE OR SITE IDENTIFIER: 0030 XXXX XXXX

BASE: Carswell AFB

ORGANIZATION: 7BMW

WORKPLACE OR SITE: (See below)

DATE COLLECTED (YYMMDD): 911017

BLDG NO/LOCATION: N/A

ROOM/AREA: N/A

MAIL REPORTS TO (circle if change)		
ORIGINAL	0030	~~Robert L. Thompson Strategic Hosp/SGPB~~ Carswell AFB, Texas 76127-5300
COPY 1		
COPY 2		

SAMPLE COLLECTED BY (Name, Grade, AFSC)

SIGNATURE

~~AUTOVON~~ 817-782-7111

REASON FOR SUBMISSION: A — A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP R-ROUTINE BACKGROUND/PERIODIC SURVEY O-OTHER

OEHL PID

SOURCE BEING SAMPLED: Buried waste barrel SE of Test Cell next to perimeter fence

EXISTING CONTROLS (Personal protective equipment, Engineering, Administrative)

SAMPLE COLLECTION DATA

OEHL SAMPLE NUMBER				
BASE SAMPLE NUMBER			GT910016	GT910017
ANALYSES REQUESTED	A	CHECK FOR	[X] MAJOR COMPONENTS	[ ] MAJOR COMPONENTS
	B	NAME		
		NIOSH NO		
	C	NAME		
		NIOSH NO		
	D	NAME		
		NIOSH NO		
	E	CHECK FOR	[ ] HAZARDOUS/TOXIC WASTE	[X] HAZARDOUS/TOXIC WASTE
MATERIAL NAME				
LOT NUMBER				
NSN (FSN)				
SPECIFICATION (MIL or FED)				
MANUFACTURER'S NAME				
DESCRIPTION OF MATERIAL USAGE (Heated, brushed, sprayed, etc)				
SUPPORTING SAMPLES		OEHL SAMPLE NO		
		BASE SAMPLE NO		
		SAMPLE TYPE		

COMMENTS: Contents totally unknown - possibly TCE waste ??

AF FORM JAN 81 2751

TALEM, INC.

306 West Broadway Avenue
Fort Worth, Texas 76104
817/335-1186
Metro/654-0443

Mailing Address:
P.O. Box 3270
Fort Worth, Texas 76113

Attention: Sergeant Marsden
Reported to: Carswell AFB
7CSG/DEEV
Carswell AFB, TX 76127-5000

Date of Report: 01/28/91

Lab ID.: 302 01/18/91 A

Date Received: 01/18/91
Collected by: CST
Date Collected: 01/17/91

Identification: GT910016 and GT910017

Fourier Transform Infrared Spectrometer
NIC. MAN.
General FTIR screen for
qualitative presence of or-
ganic analytes; ad hoc method
using Nicolet 5DXB spectrmtr.

See attached
01/23

Distribution of Report:
Carswell Air Force Base
Robert L Thompson

TALEM, INC.

Per: James G. Tarter, Ph.D.
Director of Laboratory Services

SAMPLE IDENTIFICATION

Date: 01/23/91

Analyst: T.R. Porter / C.B. Thompson

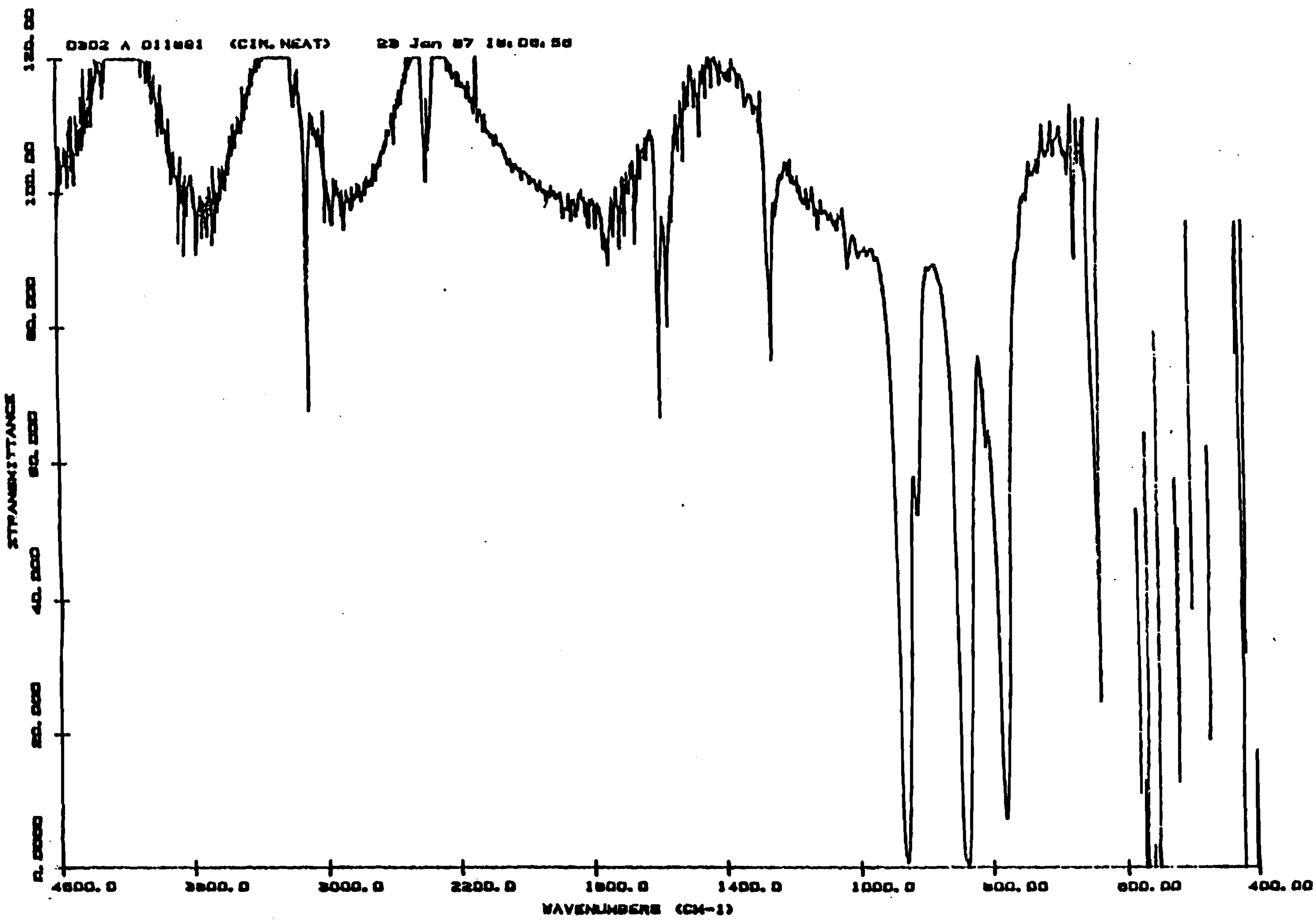
Account Number: 0302

Customer: Carswell Air Force Base

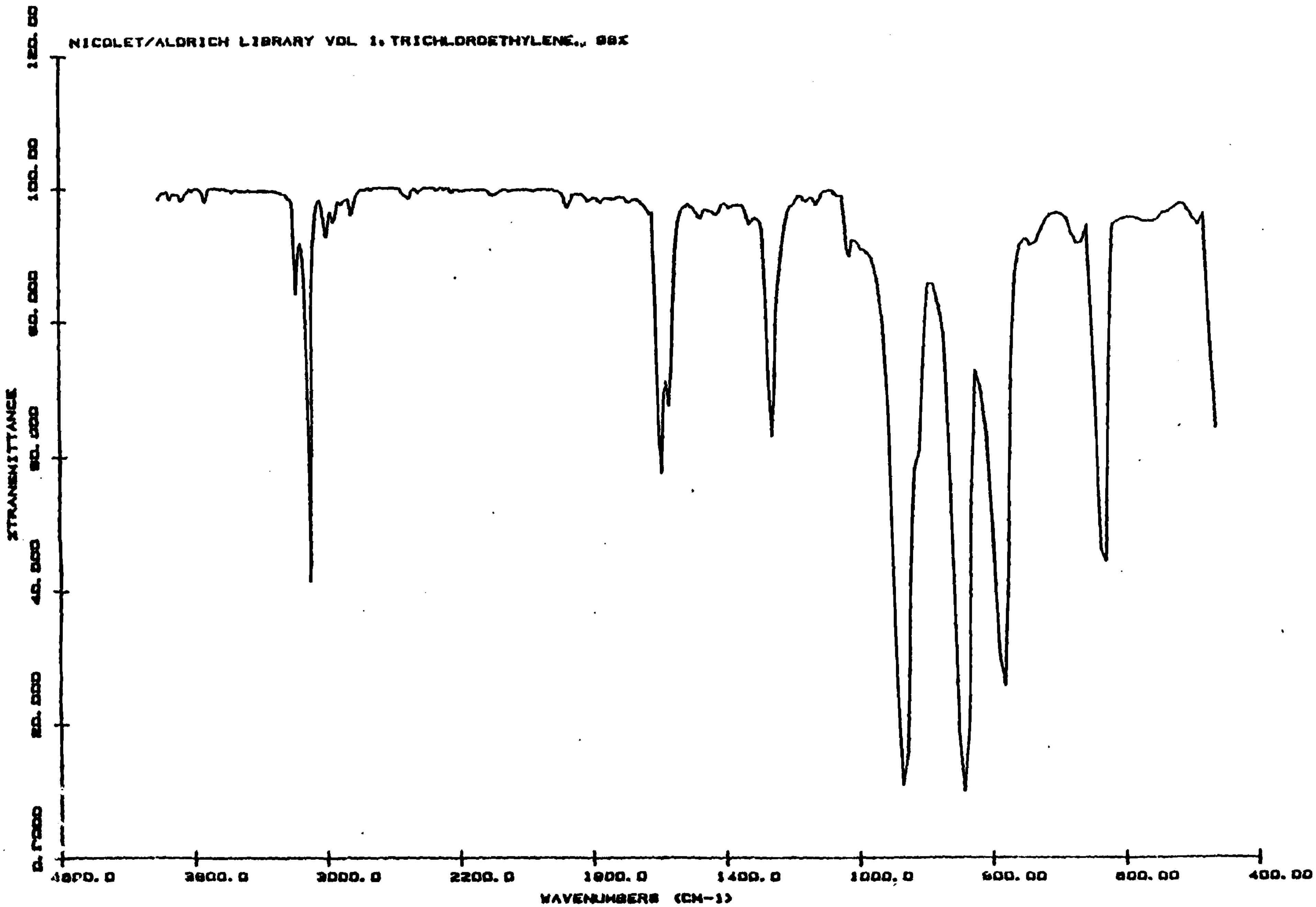
Sample: Lab ID:	Customer Description:
0302 A 01/18/91	GT910016 and GT910017

Analytical Requirements: Identify the sample.

Results: Sample was identified by library search as Trichloroethene. See attached.



0302 A 011001 (CIN. NEAT) 23 Jan 87 10:00:50
%TRANSMITTANCE
0.0000
20.000
40.000
60.000
80.000
100.00
120.00
4600.0
3800.0
3000.0
2200.0
1800.0
1400.0
1000.0
800.00
600.00
400.00
WAVENUMBERS (CM-1)


NICOLET/ALDRICH LIBRARY VOL 1, TRICHLOROETHYLENE., 99%
%TRANSMITTANCE
0.0000
20.000
40.000
60.000
80.000
100.00
120.00
4000.0
3600.0
3000.0
2200.0
1800.0
1400.0
1000.0
600.00
800.00
400.00
WAVENUMBERS (CM-1)

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

FINAL PAGE

ADMINISTRATIVE RECORD

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