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INSTALLATION RESTORATION OIL WATER SEPARATOR ASSESSMENT WORK PLAN
ADDENDUM NAS FORT WORTH TX
4/1/1994
LAW ENGINEERING AND ENVIRONMENTAL

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**NAVAL AIR STATION
FORT WORTH JRB
CARSWELL FIELD
TEXAS**

**ADMINISTRATIVE RECORD
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INSTALLATION RESTORATION PROGRAM (IRP)
OIL/WATER SEPARATOR ASSESSMENT

WORK PLAN ADDENDUM

Carswell Air Force Base, Fort Worth, Texas

April 1994

Final



PREPARED FOR

AIR FORCE BASE CONVERSION AGENCY (AFBCA/OL-H)
CARSWELL AIR FORCE BASE, TEXAS 76127

UNITED STATES AIR FORCE
AIR FORCE CENTER FOR ENVIRONMENTAL EXCELLENCE
BASE CLOSURE RESTORATION DIVISION (HQ AFCEE/ERB)
BROOKS AIR FORCE BASE, TEXAS 78235-5328



LAW

ENGINEERING AND ENVIRONMENTAL SERVICES

219012

April 15, 1994

Air Force Center for Environmental Excellence
HQ AFCEE/ERB
8001 Inner Circle Drive, Suite 2
Brooks Air Force Base, TX 78235-5328

Attention: Mr. Chris Hobbins (Team Chief)

Subject: **Carswell Air Force Base
Oil/Water Separator Assessment
Final Work Plan Addendum
Contract No. F33615-90-D-4008
Delivery Order No. 0021
Law Project No. 11-3517-0121**

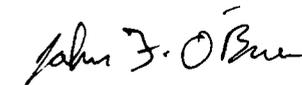
Dear Mr. Hobbins:

Law Environmental, Inc., Government Services Division is pleased to submit the enclosed eight (8) copies of the Oil/Water Separator Assessment Draft Work Plan Addendum to the Air Force Center for Environmental Excellence (AFCEE) for approval.

If you have questions or comments, please contact us at (404) 499-6800.

Sincerely,

LAW ENVIRONMENTAL, INC.


John F. O'Brien
Project Manager


E. Fred Sharpe, Jr., P.E.
Principal

JFO/EFS:dcl

3517-0121.09

**LAW ENVIRONMENTAL, INC.
GOVERNMENT SERVICES DIVISION**

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REPORT DOCUMENTATION PAGE

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13. ABSTRACT (Maximum 200 words) LAW ENVIRONMENTAL INC., (LAW), WILL, CONDUCT AN OIL/WATER SEPARATOR ASSESSMENT AT 11 SITES AT CARSWELL AIR FORCE BASE, TEXAS, UNDER THE AIR FORCE INSTALLATION RESTORATION PROGRAM (IRP). THE PROJECT FOLLOWS THE REQUIREMENTS OF IRP, AND THE WORK DESCRIBED IN THIS WORK PLAN ADDENDUM IS DESIGNED TO EVALUATE THE PRESENCE OR ABSENCE OF CONTAMINANTS.				
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			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL	

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INSTALLATION RESTORATION PROGRAM (IRP)
OIL/WATER SEPARATOR ASSESSMENT
FINAL WORK PLAN ADDENDUM

FOR

CARSWELL AFB
FORT WORTH, TEXAS 76127-5000

APRIL 1994

Prepared by:

Law Environmental, Inc.
114 TownPark Drive
Kennesaw, Georgia 30144

CONTRACTOR CONTRACT NO. F33615-90-D-4008 DELIVERY ORDER NO. 0021

United States Air Force
Air Force Center for Environmental Excellence
Base Closure Restoration Division (HQ AFCEE/ERB)
Brooks Air Force Base, Texas 78235-5328
Mr. Chris Hobbins (Team Chief)

**WORK PLAN
DISCLAIMER NOTICE**

This work plan addendum has been prepared for the United States Air Force by Law Environmental, Inc. for the purpose of aiding in the implementation of a final remedial action plan under the Air Force Installation Restoration Program (IRP). As the report relates to actual or possible releases of potentially hazardous substances, its release prior to an Air Force final decision on remedial action may be in the public's interest. The limited objectives of this work plan and the ongoing nature of the IRP, along with the evolving knowledge of site conditions and chemical effects on the environment and health, must be considered when evaluating this work plan addendum, since subsequent facts may become known which may make this work plan addendum premature or inaccurate. Acceptance of this work plan addendum in performance of the contract under which it is prepared does not mean that the United States Air Force adopts the conclusions, recommendations or other views expressed herein, which are those of the contractor only and do not necessarily reflect the official position of the United States Air Force. Copies of this work plan addendum may be purchased from:

Government agencies and their contractors registered with Defense Technical Information Center (DTIC) should direct their requests for copies of this report to:

Defense Technical Information Center
Cameron Station
Alexandria, VA 22304-6145

Non-Government agencies may purchase copies of this document from:

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161

PURPOSE OF DOCUMENT

219006

This work plan addendum has been developed for the Oil/Water Separator Assessment Project activities at Carswell Air Force Base (Carswell AFB). Procedures outlined in this plan are designed to describe the work to be performed, explain the project objectives, and present the rationale for conducting specific project activities. The plan will be effective upon final approval by the Air Force Center For Environmental Excellence (AFCEE).

Every effort will be made to fully comply with this plan. The success of Carswell AFB's Installation Restoration Program depends on team effort and total dedication from the various parties involved. Therefore, efforts will be focused on achieving and maintaining compliance with this work plan and pertinent regulations.

The point of contact for this investigation is as follows:

Mr. Chris Hobbins
Team Chief (TC)
HQ AFCEE/ERB
8001 Inner Circle Drive, Suite 2
Brooks AFB, Texas 78235-5328
Phone: (210) 536-5261

PREFACE

Law Environmental, Inc. (Law) was contracted by the U.S. Air Force Center For Environmental Excellence (AFCEE) to perform eleven Oil/Water Separator Assessments at Carswell AFB, Texas. The eleven Oil/Water Separators to be investigated are located in association with the following buildings:

1. Unnamed Stream (Building 38A)
2. Truck Re-Fuel Station (Building 1064)
3. Machine Shop (Building 1060)
4. Aircraft Wash Rack (Building 1027)
5. Engine Test Cell (Building 1015)
6. Bomb Assembly (Building 4210)
7. Generator Maintenance (Building 1414)
8. Auto Hobby Shop (Building 1145)
9. Hazardous Waste Storage Area (Building 1190)
10. Vehicle Maintenance Shop (Building 1191)
11. Fuel Truck Repair (Building 1194)

The primary objectives of this field investigation are to:

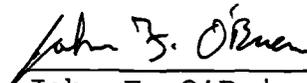
1. Assess the presence or absence of contamination and assess the types and quantities of detected contamination;
2. Evaluate the operational status of each oil/water separator under study and recommend any repair and/or replacement needs; and
3. Provide a written report discussing the evaluation and recommended future use of each oil/water separator under study by this delivery order.

219006

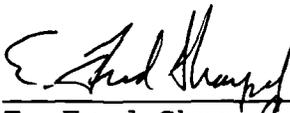
Project objectives will be achieved through the use of soil borings and hand auger borings; in combination with soil samples for field screening and laboratory analyses.

Mr. John O'Brien is the Project Manager for the oil/water separator assessment. Members of the field team will be selected prior to commencement of field activities.

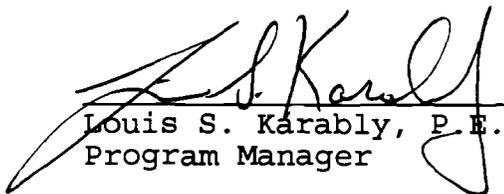
This work plan addendum was prepared by Mr. Tom McComb and reviewed by Mr. John O'Brien and Mr. E. Fred Sharpe, Jr. The efforts of Mr. Chris Hobbins (AFCEE Team Chief) and personnel at Carswell AFB are greatly appreciated.



John F. O'Brien
Project Manager



E. Fred Sharpe, Jr., P.E.
Principal



Louis S. Karably, P.E.
Program Manager

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1-1
1.1 HISTORY OF PAST IRP WORK AT CARSWELL AFB	1-1
1.2 DESCRIPTION OF CURRENT STUDY	1-1
1.2.1 Project Objectives	1-3
1.2.2 Scoping Documents	1-3
1.2.3 Identify Subcontractors and Their Roles	1-4
2.0 SUMMARY OF EXISTING INFORMATION	2-1
3.0 INVESTIGATION TASKS	3-1
3.1 SITE OBJECTIVES	3-1
3.2 FIELD INVESTIGATION	3-1
3.2.1 Field Tasks	3-1
3.2.2 Sampling and Analysis Activities	3-20
3.3 LITERATURE SEARCH	3-20
3.4 RECORD KEEPING	3-20
3.5 DATA ASSESSMENT	3-20
4.0 REPORTING REQUIREMENTS	4-1
5.0 PROJECT SCHEDULE	5-1

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1-1	Location of Oil/Water Separators Basewide	1-2
3-1	Proposed Soil Boring Locations Oil/Water Separator Building 384	3-3
2-2	Proposed Soil Boring Locations Oil/Water Separator Building 1064	3-4
2-3	Proposed Soil Boring Locations Oil/Water Separator Building 1060	3-5
2-4	Proposed Soil Boring Locations Oil/Water Separator Building 1027	3-6
2-5	Proposed Soil Boring Locations Oil/Water Separator Building 1015	3-7
2-6	Proposed Soil Boring Locations Oil/Water Separator Building 4210	3-8
2-7	Proposed Soil Boring Locations Oil/Water Separator Building 1414	3-9
2-8	Proposed Soil Boring Locations Oil/Water Separator Building 1145	3-10
2-9	Proposed Soil Boring Locations Oil/Water Separator Building 1190	3-11
2-10	Proposed Soil Boring Locations Oil/Water Separator Building 1191	3-12
2-11	Proposed Soil Boring Locations Oil/Water Separator Building 1194	3-13
2-12	Soil Boring Log	3-17

LIST OF TABLES

<u>Table</u>		<u>Page</u>
3-1	Oil/Water Separator Assessment Proposed Soil Boring Technique	3-15
3-2	Background Boring Sample for Oil/Water Separators	3-16
3-3	Sampling and Analysis Plan Summary - Sub-Surface Soil from Borings near Oil/Water Separators . . .	3-21

1.0 INTRODUCTION

This addendum to the Installation Restoration Program (IRP) RCRA Facility Investigation Final Work Plan for the Carswell Air Force Base, prepared by Law Environmental, Inc., dated December 1993, has been developed for additional work at the Carswell Air Force Base (Carswell AFB), in Fort Worth, Texas. This addendum was prepared by Law Environmental, Inc., Government Services Division (Law), in response to Delivery Order 0021 dated August 3, 1993, under Contract No. F33615-90-D-4008 issued by the Air Force Center for Environmental Excellence (AFCEE).

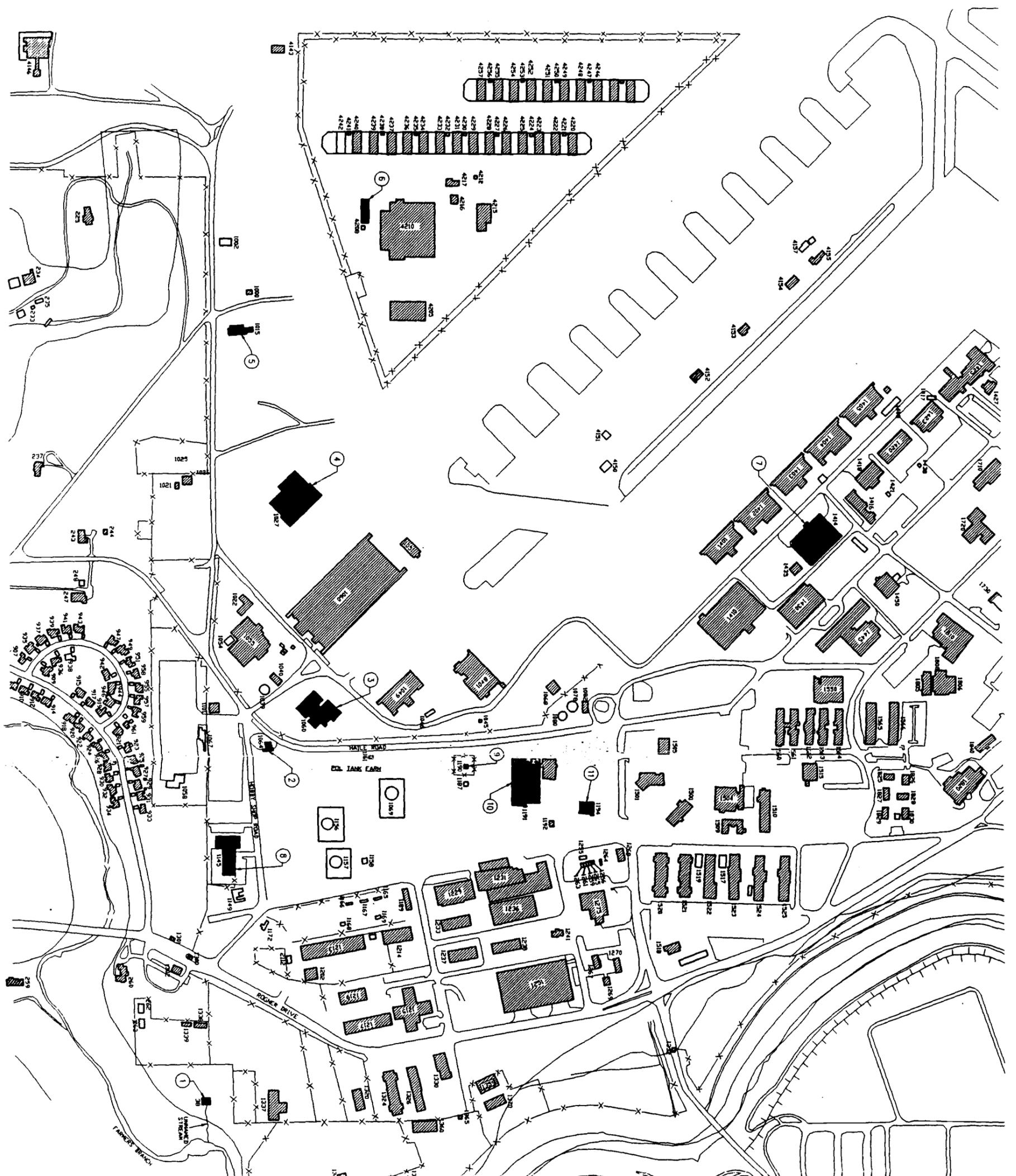
This addendum to the work plan summarizes waste characterization activities to be performed at Carswell AFB to assess the presence or absence of contamination, and if contamination is present, to assess the types and quantities of contamination from eleven oil/water separators located on the facility (Figure 1-1).

1.1 HISTORY OF PAST IRP WORK AT CARSWELL AFB

Refer to Section 1.1 of the Installation Restoration Program (IRP) RCRA Facility Investigation Final Work Plan for the Carswell Air Force Base, prepared by Law Environmental, Inc., dated December 1993.

1.2 DESCRIPTION OF CURRENT STUDY

This section describes project objectives, scoping documents, and the role of subcontractors.



11 OIL/WATER SEPARATORS

LEGEND

- 1. UNNAMED STREAM (BLDG. 38A)
- 2. TRUCK RE-FUEL STATION (BLDG. 1064)
- 3. MACHINE SHOP (BLDG. 1060)
- 4. AIRCRAFT WASH RACK (BLDG. 1027)
- 5. ENGINE TEST CELL (BLDG. 1015)
- 6. BOMB ASSEMBLY (BLDG. 4210)
- 7. GENERATOR MAINTENANCE (BLDG. 1414)
- 8. AUTO HOBBY SHOP (BLDG. 1145)
- 9. HAZARDOUS WASTE STORAGE AREA (BLDG. 1190)
- 10. VEHICLE MAINTENANCE SHOP (BLDG. 1191)
- 11. FUEL TRUCK REPAIR (BLDG. 1194)

UNITED STATES AIR FORCE
 CARSWELL AIR FORCE BASE
 FORT WORTH, TEXAS

LOCATION OF
 OIL/WATER SEPARATORS

SOURCE MAP: BASE COMPREHENSIVE PLAN

DATE: 19 NOVEMBER 93

PROJECT No: 11-3517-0121

FIGURE 1-1

1.2.1 Project Objectives

The objectives of this oil/water separator assessment are to:

1. Assess the presence or absence of contamination and assess the types and quantities of detected contamination;
2. Evaluate the operational status of each oil/water separator under study and recommend any repair and/or replacement needs; and
3. Provide a written report discussing the evaluation and recommended future use of each oil/water separator under study by this delivery order.

Assessment of each oil/water separator's operational status will be based on review of available information obtained during previous site visits conducted by Law Environmental. Information covering the operation of each separator unit was obtained from Carswell AFB maintenance files and from interviews with cognizant facility maintenance personnel. Evaluation of the oil/water separators will be based on visual observations and review of available information. Capacity studies and studies designed to verify effluent points are beyond the scope of this assessment.

1.2.2 Scoping Documents

Addenda to the following documents have been prepared to reflect the scope of services requested by AFCEE, Delivery Order 0021, in the Modification of Contract, dated August 3, 1993.

- Installation Restoration Program (IRP) RCRA Facility Investigation Final Work Plan for the Carswell Air Force

Base, prepared by Law Environmental, Inc., dated December 1993.

- Installation Restoration Program (IRP) RCRA Facility Investigation Final Sampling and Analysis Plan for Carswell Air Force Base, prepared by Law Environmental, Inc., dated December 1993.
- Installation Restoration Program (IRP) RCRA Facility Investigation Final Health and Safety Plan for Carswell Air Force Base, prepared by Law Environmental Inc., dated December 1993.

1.2.3 Identify Subcontractors and Their Roles

Law will manage the project and provide services related to field sampling, data analysis, site characterization, and reporting. At this stage of the investigation the following subcontractors have been identified.

ATEC Environmental Services of Dallas, Texas, will be the subcontractor to perform the drilling services.

Law Environmental National Laboratories of Pensacola (LENL) is the Law Environmental, Inc. production chemical testing laboratory. LENL will provide sample shipping containers, chain of custody documentation, chemical analysis and reporting, and laboratory quality assurance/quality control (QA/QC). LENL has integrated QA/QC Procedures into their laboratory design and standard operating procedures. LENL has been approved for USAF analytical work by the MITRE Corporation.

Details of the project organization, personnel, and subcontractor responsibility are provided in the Sampling and Analysis Plan (SAP) Addendum for this project.

2.0 SUMMARY OF EXISTING INFORMATION

219016

The description of the environmental setting for Carswell AFB and site-specific environmental setting is included in the Installation Restoration Program (IRP) RCRA Facility Investigation Final Work Plan for the Carswell Air Force Base, prepared by Law Environmental Inc., dated December 1993.

3.0 INVESTIGATION TASKS

3.1 SITE OBJECTIVES

The objective of the scope of services for the oil/water separator assessment is to collect assessment data on the soils in the vicinity of eleven oil/water separators located at Carswell AFB. The findings will be used to assess the presence or absence of contamination in the soils in the vicinity of the oil/water separators.

3.2 FIELD INVESTIGATION

3.2.1 Field Tasks

This section describes the field tasks which will be conducted as part of this assessment. Activities will include the following:

- Site Reconnaissance and Preparation
- Soil Borings and Soil Sampling
- Surveying
- Equipment Decontamination
- Waste Handling

In the following sections the methods and procedures to be adopted for each of the activities are described.

Site Reconnaissance, Preparation, and Restoration

The locations of the oil/water separators were observed during two site visits, June 30 and October 1, 1993 by representatives of Law Environmental, AFCEE, and Carswell AFB. During the site visit Carswell AFB representatives outlined the conditions found at each

oil/water separator. Also during the site visits, Law noted likely soil boring locations and potential access problems.

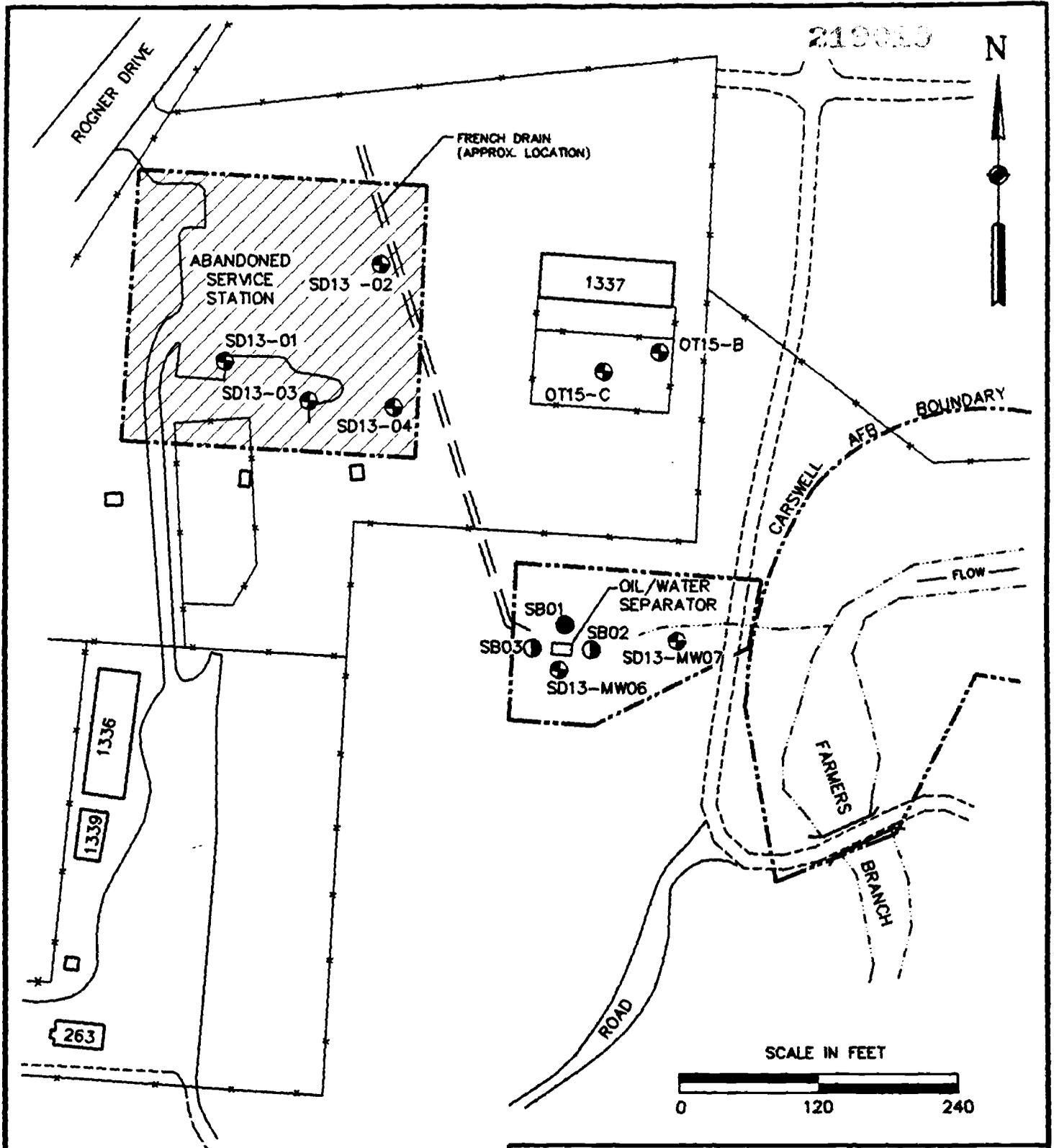
Prior to commencement of operations at each of the sites, the Law Site Manager will conduct additional site reconnaissance to determine requirements for site preparation and clearance. Site preparation will include clearance of brush and other obstructions. After utilities are located and required site preparation is complete, proposed drilling and sampling locations (Figures 3-1 to 3-11) will be clearly staked and marked. Clearance for utilities at drilling locations will then be conducted by liaison with base operations and maintenance staff and/or civilian utility operators where appropriate. Drilling locations will, if necessary, be relocated to avoid utilities. The new locations will be chosen in order to achieve the same objectives as were intended for the original location. No intrusive activities will be conducted until clearance for utilities has been completed.

The Law Site Manager will also discuss the locations of the decontamination area, emergency equipment and a drum staging area prior to commencement of operations, with the relevant personnel on base.

Following the completion of drilling and sampling at each location, the Law Site Manager will visit the location and will verify that the site has been cleared and restored as closely as possible to the same condition as it was prior to the commencement of operations.

Soil Boring and Soil Sampling

Each soil boring will be drilled from the ground surface to the saturated zone or to auger refusal via hollow stem auger or hand auger techniques to allow the collection of sub-surface soil samples and to provide subsurface information on the site

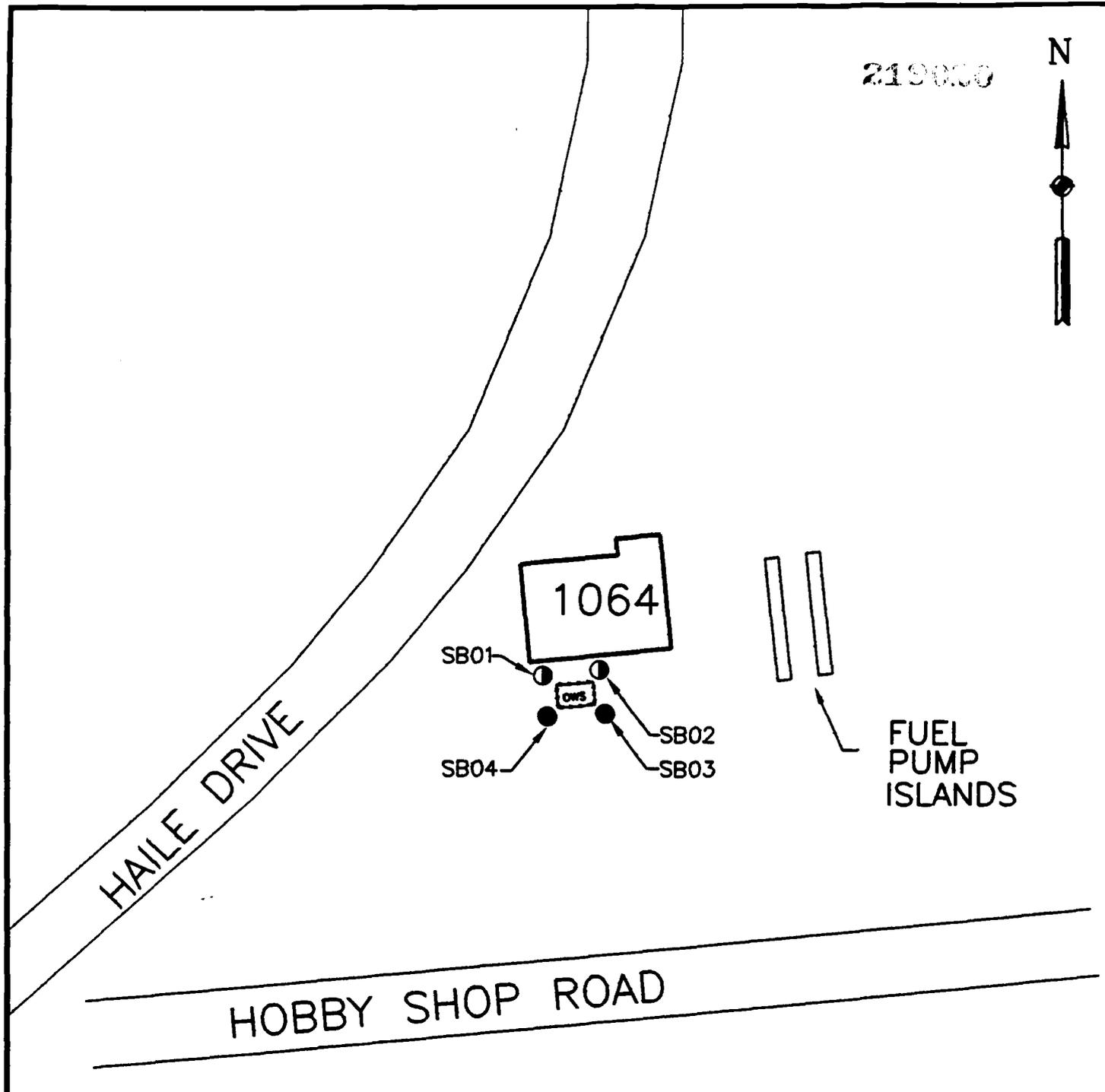


LEGEND

- PROPOSED HAND AUGER BORING LOCATION
- ⊙ PROPOSED SOIL BORING LOCATION
- ⊕ MONITORING WELL LOCATION
- *— FENCE

UNITED STATES AIR FORCE CARSWELL AIR FORCE BASE FORT WORTH, TEXAS		
RCRA FACILITY INVESTIGATION		
PROPOSED SOIL BORING LOCATION OIL/WATER SEPARATOR BUILDING 38A		
PREPARED BY/DATE:	FIGURE NUMBER: 3-1	FILE DATE: 20.JANUARY.94
CHECKED BY/DATE:		PLOT DATE: 14 APRIL.94
APPROVED BY/DATE:		FILE NAME: CARSWELL\BLDG38A

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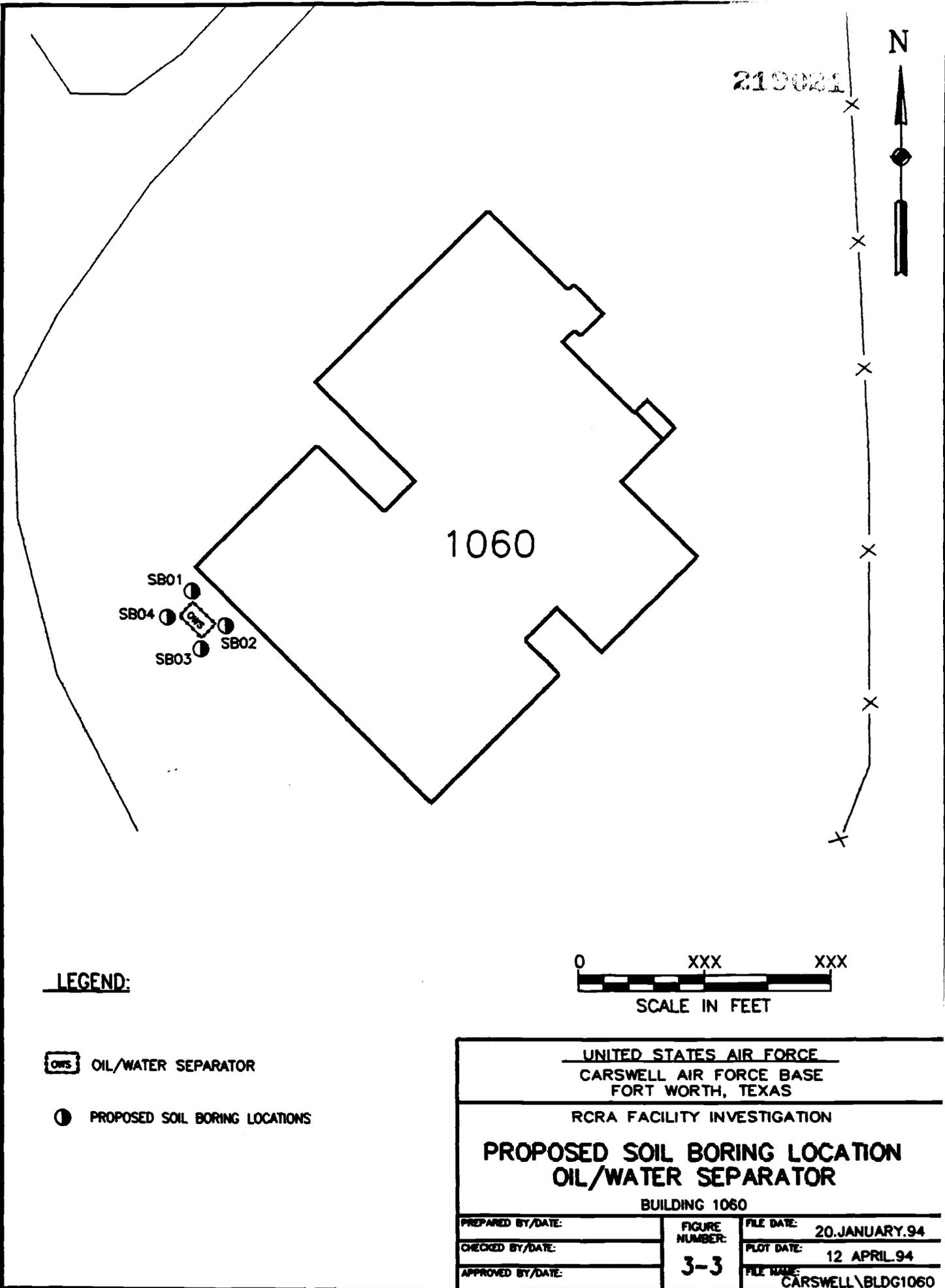


LEGEND:

-  OIL/WATER SEPARATOR
-  PROPOSED SOIL BORING LOCATIONS
-  PROPOSED HAND AUGER BORING LOCATION

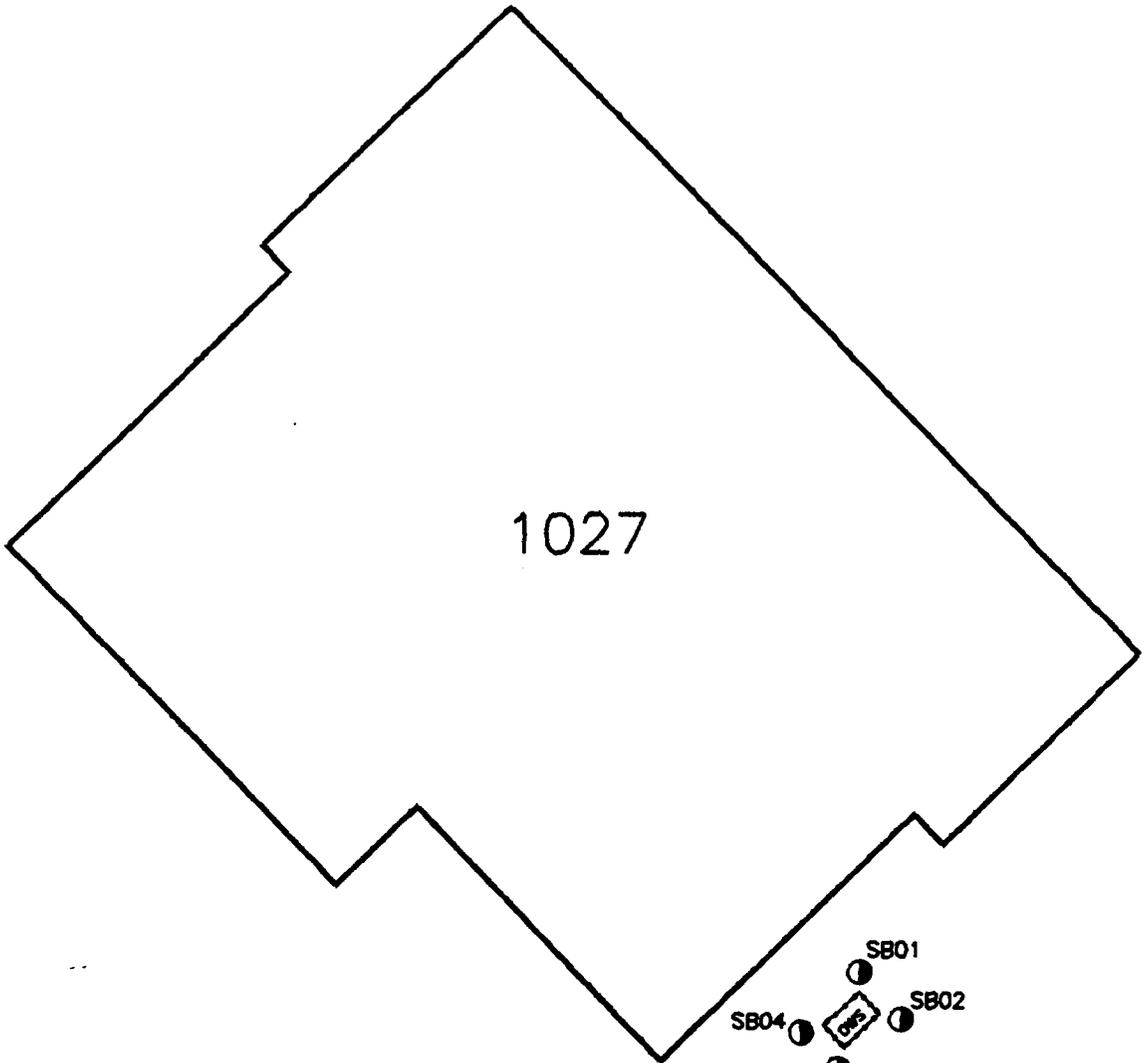
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UNITED STATES AIR FORCE CARSWELL AIR FORCE BASE FORT WORTH, TEXAS		
RCRA FACILITY INVESTIGATION		
PROPOSED SOIL BORING LOCATION OIL/WATER SEPARATOR BUILDING 1064		
PREPARED BY/DATE:	FIGURE NUMBER:	FILE DATE: 20 JANUARY 94
CHECKED BY/DATE:	3-2	PLOT DATE: 13 APRIL 94
APPROVED BY/DATE:		FILE NAME: CARSWELL\BLDG1064



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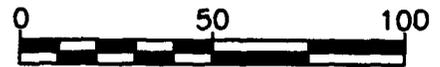
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OIL/WATER SEPARATOR



PROPOSED SOIL BORING LOCATIONS



SCALE IN FEET

UNITED STATES AIR FORCE CARSWELL AIR FORCE BASE FORT WORTH, TEXAS		
RCRA FACILITY INVESTIGATION PROPOSED SOIL BORING LOCATION OIL/WATER SEPARATOR BUILDING 1027		
PREPARED BY/DATE:	FIGURE NUMBER: 3-4	FILE DATE: 20 JANUARY 94
CHECKED BY/DATE:		PLOT DATE: 12 APRIL 94
APPROVED BY/DATE:		FILE NAME: CARSWELL\BLDG1027

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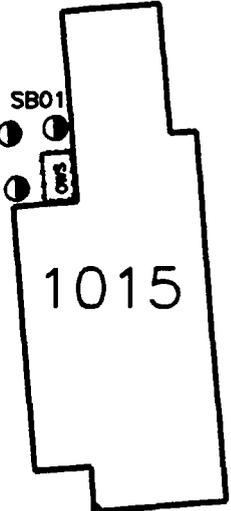


1000



ROARING SPRINGS ROAD

SB01
SB03
SB02



1015

LEGEND:



OIL/WATER SEPARATOR



PROPOSED SOIL BORING LOCATIONS



SCALE IN FEET

UNITED STATES AIR FORCE
CARSWELL AIR FORCE BASE
FORT WORTH, TEXAS

RCRA FACILITY INVESTIGATION

**PROPOSED SOIL BORING LOCATION
OIL/WATER SEPARATOR**

BUILDING 1015

PREPARED BY/DATE:

CHECKED BY/DATE:

APPROVED BY/DATE:

FIGURE
NUMBER:

3-5

FILE DATE:

20 JANUARY 94

PLOT DATE:

12 APRIL 94

FILE NAME:

CARSWELL\BLDG1015.DWG

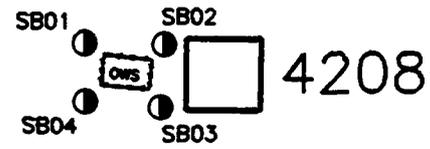
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BUILDING 4210



PAVED ROAD



TAXIWAY C 190

LEGEND:

-  OIL/WATER SEPARATOR
-  PROPOSED SOIL BORING LOCATIONS

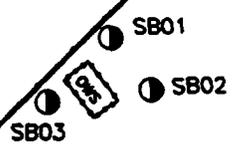
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UNITED STATES AIR FORCE CARSWELL AIR FORCE BASE FORT WORTH, TEXAS		
RCRA FACILITY INVESTIGATION PROPOSED SOIL BORING LOCATION OIL/WATER SEPARATOR BUILDING 4208		
PREPARED BY/DATE:	3-6	FILE DATE: 20 JANUARY 94
CHECKED BY/DATE:		PLOT DATE: 12 APRIL 94
APPROVED BY/DATE:		FILE NAME: CARSWELL\BLDG4208

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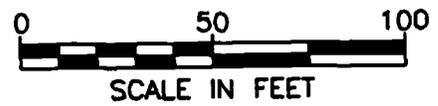
1414



LEGEND:

-  OIL/WATER SEPARATOR
-  PROPOSED SOIL BORING LOCATIONS

NOTE: PROPOSED SOIL BORING LOCATION WILL REQUIRE CONCRETE CORING

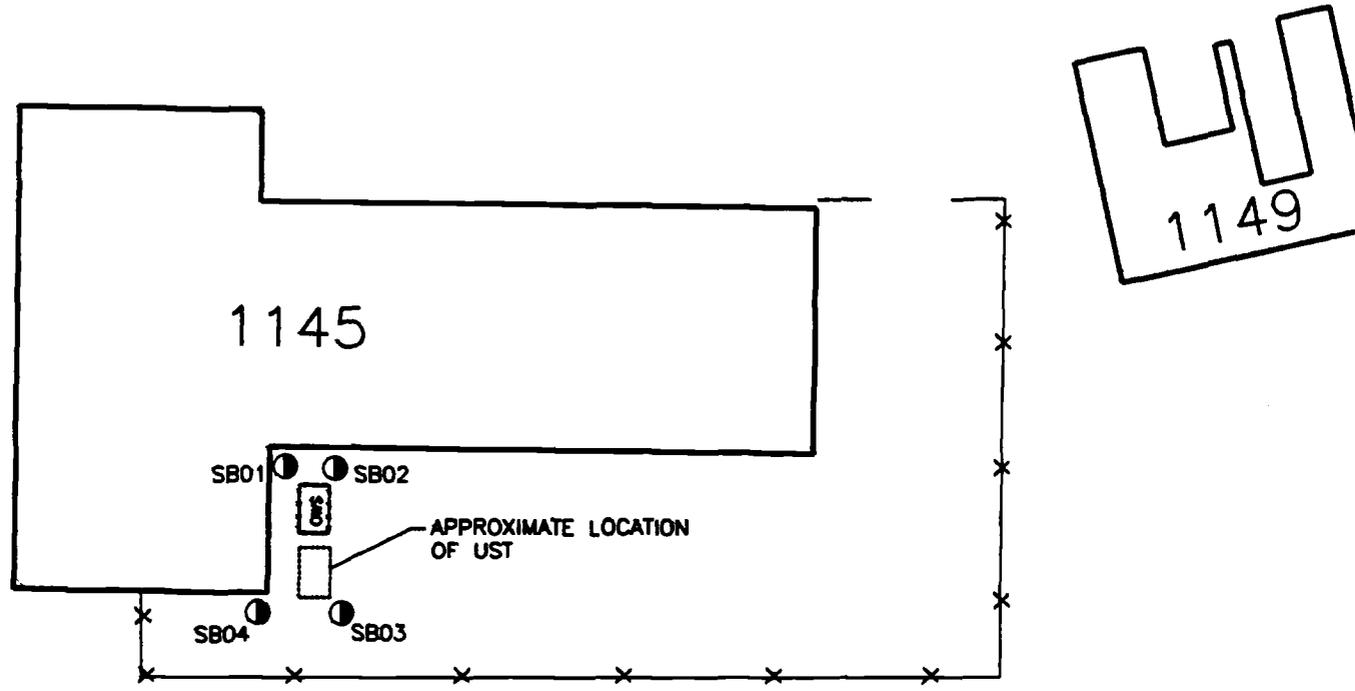


UNITED STATES AIR FORCE CARSWELL AIR FORCE BASE FORT WORTH, TEXAS		
RCRA FACILITY INVESTIGATION		
PROPOSED SOIL BORING LOCATION OIL/WATER SEPARATOR		
BUILDING 1414		
PREPARED BY/DATE:	FIGURE NUMBER: 3-7	FILE DATE: 20.JANUARY.94
CHECKED BY/DATE:		PLOT DATE: 12 APRIL.94
APPROVED BY/DATE:		FILE NAME: CARSWELL\BLDG1414

219025



HOBBYSHOP ROAD



LEGEND:



OIL/WATER SEPARATOR



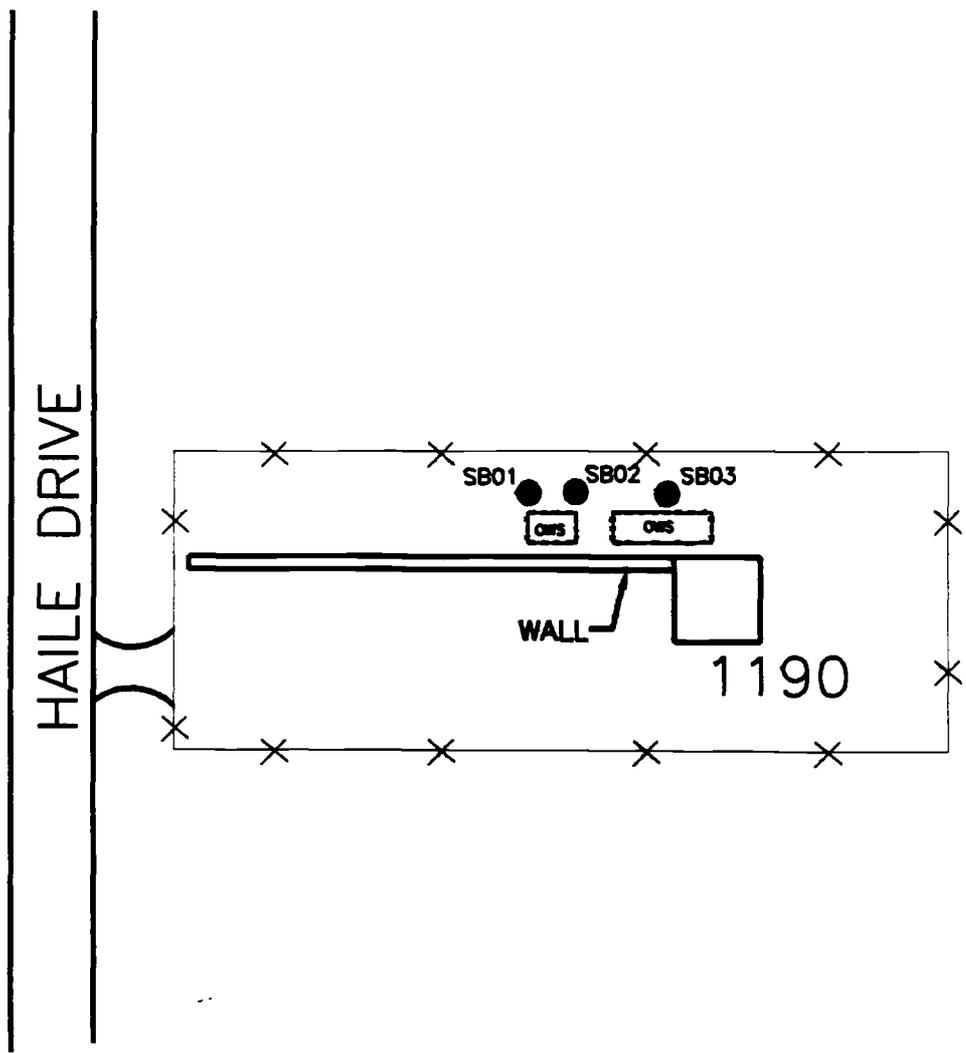
PROPOSED SOIL BORING LOCATIONS

NOTE: PROPOSED SOIL BORING LOCATIONS SB01, SB02, AND SB03 WILL REQUIRE CONCRETE CORING

SCALE: NTS

UNITED STATES AIR FORCE CARSWELL AIR FORCE BASE FORT WORTH, TEXAS		
RCRA FACILITY INVESTIGATION		
PROPOSED SOIL BORING LOCATION OIL/WATER SEPARATOR		
BUILDING 1145		
PREPARED BY/DATE:	FIGURE NUMBER: 3-8	FILE DATE: 20 JANUARY 94
CHECKED BY/DATE:		PLOT DATE: 14 APRIL 94
APPROVED BY/DATE:		FILE NAME: CARSWELL\BLDG1145

210027



LEGEND:

-  OIL/WATER SEPARATOR
-  PROPOSED HAND AUGER BORING LOCATION

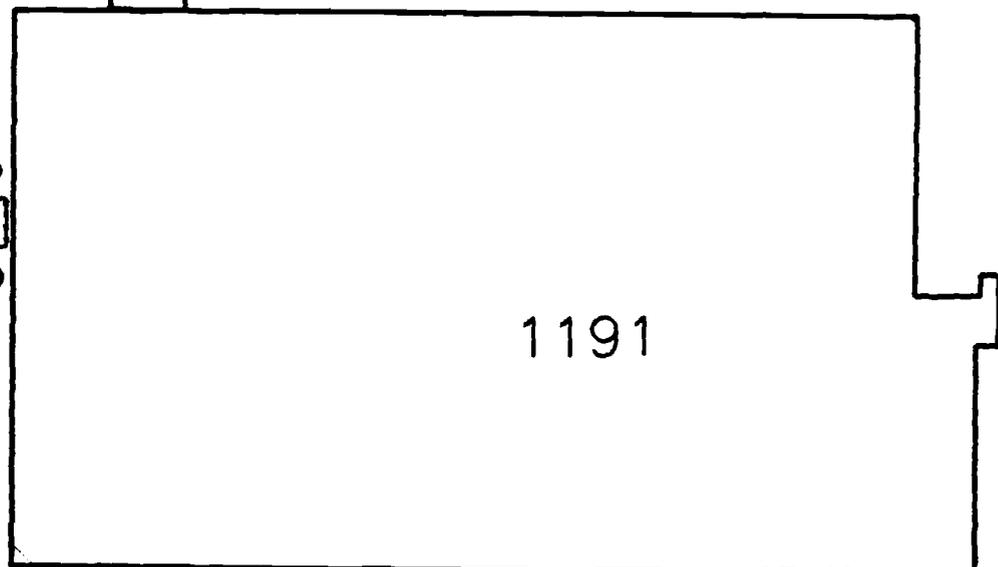
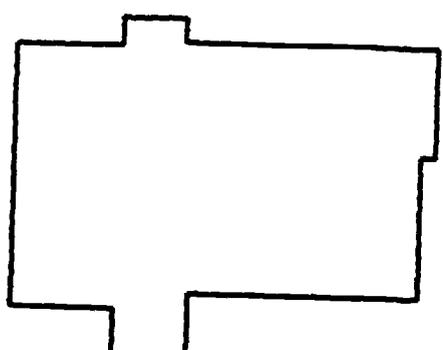
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UNITED STATES AIR FORCE CARSWELL AIR FORCE BASE FORT WORTH, TEXAS		
RCRA FACILITY INVESTIGATION		
PROPOSED SOIL BORING LOCATION OIL/WATER SEPARATORS		
BUILDING 1190		
PREPARED BY/DATE:	FIGURE NUMBER: 3-9	FILE DATE: 20 JANUARY 94
CHECKED BY/DATE:	APPROVED BY/DATE:	PLOT DATE: 14 APRIL 94
		FILE NAME: CARSWELL\BLDG1190

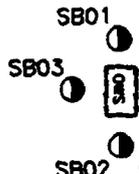
210026



HAILE DRIVE



1191



PAVED ROAD

LEGEND:

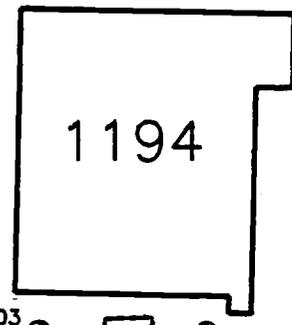
-  OIL/WATER SEPARATOR
-  PROPOSED SOIL BORING LOCATIONS

SCALE: NTS

UNITED STATES AIR FORCE CARSWELL AIR FORCE BASE FORT WORTH, TEXAS		
RCRA FACILITY INVESTIGATION PROPOSED SOIL BORING LOCATION OIL/WATER SEPARATOR BUILDING 1191		
PREPARED BY/DATE:	FIGURE NUMBER: 3-10	FILE DATE: 20 JANUARY 94
CHECKED BY/DATE:		PLOT DATE: 14 APRIL 94
APPROVED BY/DATE:		FILE NAME: CARSWELL\BLDG1191



JENNINGS DRIVE



1194

SB03

OWS

SB01



SB02

KNIGHTS LAKE ROAD

LEGEND:

-  OIL/WATER SEPARATOR
-  PROPOSED SOIL BORING LOCATIONS
-  EXISTING MONITORING WELL

NOTE: PROPOSED SOIL BORING LOCATION WILL REQUIRE CONCRETE CORING

SCALE: NTS

UNITED STATES AIR FORCE CARSWELL AIR FORCE BASE FORT WORTH, TEXAS		
RCRA FACILITY INVESTIGATION PROPOSED SOIL BORING LOCATION OIL/WATER SEPARATOR BUILDING 1194		
PREPARED BY/DATE:	FIGURE NUMBER: 3-11	FILE DATE: 20 JANUARY 94
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APPROVED BY/DATE:		FILE NAME: CARSWELL\BLDG1194

stratigraphy. Prior to advancing soil borings, the depth of each oil/water separator will be measured. Soil borings will be terminated either at the saturated zone or at a depth 2 feet below the oil/water separator, whichever is shallower. Drill rig access is available at most proposed soil boring locations, however some concrete coring and hand augering will be required due to access difficulties. Sites with difficult access requiring concrete coring or hand augering will be investigated by advancing three instead of four soil borings. Table 3-1 presents the number of proposed boring and drilling techniques to be used at each oil/water separator. Those borings which are deleted in areas of difficult access will be relocated and utilized as background samples at locations to be determined in the field. Background locations will be selected at areas representative of background conditions, but which also exhibit the least potential for site-related contamination. Background samples are for this initial assessment to allow for a first time comparison of the oil/water separator data. Background samples are to aid in giving a range of metals concentrations in the specific soil types within the facility. Locations for these samples will be selected from the available information and field observations prior to sample collection. Table 3-2 denotes background boring samples grouped with respective oil/water separator sites.

The drilling operations will be monitored by a qualified geologist or geotechnical engineer. The geologist/engineer will log the subsurface conditions encountered in each boring, and record the information on a soil boring log. An example of a soil boring log is shown on Figure 3-12. Soils will be classified using the Unified Soil Classification System (ASTM D 2488-69). Upon completion of the soil sampling activities, the boring will be sealed from the boring termination depth to the ground surface with a cement-bentonite grout. The cement grout will consist of Portland cement (ASTM-C150), with water added in the proportion of no less than five gallons to no more than seven gallons per 94-

TABLE 3-1

OIL/WATER SEPARATOR ASSESSMENT
 PROPOSED SOIL BORING TECHNIQUE
 RCRA FACILITY INVESTIGATION - CARSWELL AIR FORCE BASE, TEXAS

OIL/WATER SEPARATOR	DRILL RIG SOIL BORINGS	CONCRETE CORES	HAND AUGER SOIL BORINGS	TOTAL ANALYTICAL SOIL BORINGS	BACKGROUND * SOIL BORINGS	TOTAL SOIL BORINGS
1. Unnamed Stream (Bldg. 38A)	2**	0	1	3	0	3
2. Truck Re-Fuel Station (Bldg. 1064)	2	0	2	4	0	4
3. Machine Shop (Bldg. 1060)	4	0	0	4	0	4
4. Aircraft Wash Rack (Bldg. 1027)	4	0	0	4	0	4
5. Engine Test Cell (Bldg. 1015)	3	0	0	3	1	4
6. Bomb Assembly (Bldg. 4210)	4	0	0	4	0	4
7. Generator Maintenance (Bldg. 1414)	3	3	0	3	1	4
8. Auto Hobby Shop (Bldg. 1145)	4	3	0	3	1	4
9. Hazardous Waste Storage Area (Bldg. 1190)	0	0	3	3	1	4
10. Vehicle Maintenance Shop (Bldg. 1191)	3	0	0	4	0	4
11. Fuel Truck Repair (Bldg. 1194)	3	3	0	3	1	4
TOTALS	32	9	6	38	5	43

* Background soil boring locations will be determined in the field.

** Soil sampling from monitoring well SD13 - MW06 has replaced one soil boring.

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TABLE 3-2

**BACKGROUND BORING SAMPLE FOR OIL/WATER SEPARATORS
RCRA FACILITY INVESTIGATION - CARSWELL AIR FORCE BASE, TEXAS**

BACKGROUND BORING SAMPLE*	ASSOCIATED OIL/WATER SEPARATOR(S)
Background Sample No. 1	Oil/Water Separator Bldg. 38A
Background Sample No. 2	Oil/Water Separator Bldg. 1145 Oil/Water Separator Bldg. 1064 Oil/Water Separator Bldg. 1060
Background Sample No. 3	Oil/Water Separator Bldg. 1027 Oil/Water Separator Bldg. 1015 Oil/Water Separator Bldg. 4210
Background Sample No. 4	Oil/Water Separator Bldg. 1190 Oil/Water Separator Bldg. 1191 Oil/Water Separator Bldg. 1194
Background Sample No. 5	Oil/Water Separator Bldg. 1414

* Boring location and designation to be decided.

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CHECKED BY/DATE: <u>LFO / 14 APR 94</u>
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pound bag of cement. Additionally, three percent, by weight, of bentonite powder will be added to the mixture to reduce shrinkage. The grout will be placed into the boring using a tremie pipe equipped with a side discharge.

Hollow Stem Auger/Split Spoon Sampling

At locations that afford drill rig access, soil borings will be advanced using hollow-stem augering techniques. Hollow-stem augers were selected because they provide a sufficiently stable hole for soil sampling. The augers will have a minimum inside diameter of 6.25 inches to allow collection of soil samples with a split barrel sampler. It is not anticipated that drilling fluids will be required for drilling the soil borings; however, if drilling fluids are utilized, a sample of the fluids will be analyzed to evaluate potential constituents introduced into the boring.

Hand Auger Soil Sample Collection

Hand augers will be used at boring locations (see Table 3-1) which are not accessible to a truck mounted drill rig and in areas where the proximity of underground and overhead utilities and above ground structures preclude the use of a drill rig.

The soil sampling procedure using a hand auger will involve the following steps:

1. Discard the initial six inches of soil from the hand auger; as with the top brass ring, this typically represented soil fall-in.
2. Remove the second hand auger bucket and use immediately to collect a sample for volatile organics. Soils removed for volatile organic analysis will be immediately placed into two 2-ounce glass jars and held on ice until boring completion.

3. Empty the third and fourth buckets into decontaminated stainless steel bowls, and cover with aluminum foil and hold until sample determination has been made. Soils were removed from the third and fourth buckets for headspace analysis.

Prior to advancing soil borings, the depth of each oil/water separator will be measured. The hand auger soil borings will be terminated either at the saturated zone or at a depth 2 feet below the oil/water separator, whichever is shallower, due to the difficulty involved with advancing soil borings with hand augers. The same sample determination strategy used to determine the depth of the sample for analysis by the split-spoon borings will also be followed for the hand auger borings.

Surveying

Soil borings associated with the oil/water separator assessment will be located using compass bearings and taped measurements from buildings and other landmarks.

Equipment Decontamination

Refer to Section 2.1.8 of the Installation Restoration Program (IRP) RCRA Facility Investigation Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated December 1993, prepared by Law Environmental.

Waste Handling

Refer to Section 2.1.9 of the Installation Restoration Program (IRP) RCRA Facility Investigation Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated December 1993, prepared by Law Environmental.

3.2.2 Sampling and Analysis Activities

The samples and analyses to be performed for the scope of services in this addendum are summarized in Table 3-3.

3.3 LITERATURE SEARCH

Refer to Section 3.3 of the Installation Restoration Program (IRP) RCRA Facility Investigation Final Work Plan for the Carswell Air Force Base, prepared by Law Environmental Inc., dated December 1993.

3.4 RECORD KEEPING

Refer to Section 3.4 of the Installation Restoration Program (IRP) RCRA Facility Investigation Final Work Plan for the Carswell Air Force Base, prepared by Law Environmental Inc., dated December 1993.

3.5 DATA ASSESSMENT

Refer to Section 3.5 of the Installation Restoration Program (IRP) RCRA Facility Investigation Final Work Plan for the Carswell Air Force Base, prepared by Law Environmental Inc., dated December 1993.

TABLE 3-3

SAMPLING AND ANALYSIS PLAN SUMMARY: SUB-SURFACE SOIL FROM BORINGS NEAR OIL/WATER SEPARATORS
RCRA FACILITY INVESTIGATION - CARSWELL AIR FORCE BASE, TEXAS

PARAMETER	TOTAL NO. FIELD LOCATION	SAMPLES PER LOCATION	FIELD DUPLICATE	EQUIPMENT BLANK(a)	AMB COND BLANK(b)	TRIP BLANK(c)	TOTAL NO. FIELD SAMPLES	MSD DUPLICATE	LAB DUPLICATE	SPIKED BLANK(d)	2ND (e) COLUMN CONFIRM. ANALYSES	TOTAL NO. LAB SAMPLES
<u>Oil/Water Separators</u>												
ICP Screen for Metals SW 3050/SW 6010	44	2	9	10	0	0	107	6	6	6	0	125
<u>Oil/Water Separators</u>												
Volatile Organic Compo SW 8240	44	2	9	10	10	10	127	7	7	7	0	148
<u>Containerized Waste Material</u>												
TCLP SW1311	11	1	0	0	0	0	11	0	0	0	0	11

- (a) Estimated; number to be determined by number of days to drill and sample 11 oil/water separators.
- (b) Estimated; number to be determined by site activities on the day of sampling. Ambient conditions blanks shall be collected when samples are collected downwind of possible volatile organic sources such as active runways or engine test cells. If such conditions warrant that an ambient conditions blank be taken, it will be analyzed for volatile organics only.
- (c) Volatile organics only; number to be initiated will depend upon number of shipments.
- (d) Estimated; number to be determined by batch preparation.
- (e) Method SW8240 will have 2nd column confirmation performed on all samples exhibiting positive results.

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4.0 REPORTING REQUIREMENTS

Refer to Section 4.0 of the Installation Restoration Program (IRP) RCRA Facility Investigation Final Work Plan for the Carswell Air Force Base, prepared by Law Environmental Inc., dated December 1993.

5.0 PROJECT SCHEDULE

The summary schedule for the Carswell AFB Oil/Water Separator Assessment will be updated on a quarterly basis and submitted with the respective R&D Status Report to show any changes for each of the projected tasks for the work plan, field activities and reports.

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE