

Kirtland Air Force Base Albuquerque, New Mexico

**Installation Restoration Program
RCRA Facility Investigation
Appendix III Phase 2
Addendum to Sampling and Analysis Plan
(May 1996)**

Final Draft - October 24, 1997



**377 ABW/EMR
2000 Wyoming Blvd. SE
Kirtland AFB, New Mexico 87117-5659**

Kirtland Air Force Base Albuquerque, New Mexico

Installation Restoration Program

RCRA Facility Investigation

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**INSTALLATION RESTORATION PROGRAM
KIRTLAND AIR FORCE BASE
ALBUQUERQUE, NEW MEXICO**

**INSTALLATION RESTORATION PROGRAM
RCRA FACILITY INVESTIGATION
APPENDIX III PHASE 2
ADDENDUM TO
SAMPLING AND ANALYSIS PLAN
(MAY 1996)**

FINAL DRAFT

October 24, 1997

Prepared For
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DSN: 240-5288 COMM: (210) 536-5288
USAF CONTRACT NO. F41624-94-D-8053 DELIVERY ORDER NO. 0092

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This Sampling and Analysis Plan Addendum has been prepared for the U.S. Air Force by CH2M HILL for the purpose of aiding in the implementation of a final remedial action plan under the Installation Restoration Program (IRP). As the plan 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 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 plan, since subsequent facts may become known which may make this plan premature or inaccurate.

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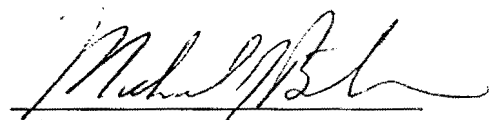
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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, Virginia 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, D.C. 20503.				
1. AGENCY USE ONLY		2. REPORT DATE	3. REPORT TYPE AND DATES COVERED	
		October 1997	Sampling and Analysis Plan Addendum, October 1997	
4. TITLE AND SUBTITLE			5. FUNDING NUMBERS	
Kirtland Air Force Base Albuquerque, New Mexico RFI Appendix III Phase 2 Addendum to Sampling and Analysis Plan			USAF Contract No. F41624-94-D-8053 Delivery Order No. 0092	
6. AUTHOR(S)				
Amy R. Halloran, CH2M HILL, and Jeffrey W. Johnston, Brown & Root Environmental				
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9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
Air Force Center for Environmental Excellence (AFCEE) Environmental Restoration Division (AFCEE/ERDM) 3207 North Road Brooks Air Force Base, Texas 78235-5363				
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words)				
This Sampling and Analysis Plan (SAP) specifies the field sampling activities that will be performed during 1997 at SWMU 10-21, Trestle Site Septic Tank and Leach Field (ST-346) in the RCRA Part B Permit for Kirtland AFB, New Mexico.				
14. SUBJECT TERMS			15. NUMBER OF PAGES	
Final Draft, Sampling and Analysis Plan Addendum			11	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION	20. LIMITATION OF ABSTRACT	
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	SAR	

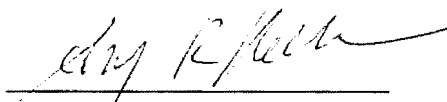
PREFACE

This Addendum to the Appendix III, Phase 2 RFI Sampling and Analysis Plan (SAP) specifies the field sampling activities that will be performed during 1997 at one recently discovered septic tank and leach field that is part of solid waste management (SWMU) 10-21, Trestle Site Septic Tank and Leach Field (ST-346) of the RCRA Part B Permit for Kirtland Air Force Base (AFB). The plan addresses the requirements of the U.S. Air Force (USAF) statement of work, dated March 6, 1997.

This SAP addendum was prepared by CH2M HILL in October 1997. Mr. Bassim D. Shebaro of the Air Force Center for Environmental Excellence was the Restoration Team Chief and Mr. Rodney Arnold served as the Contracting Officer's Representative.



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ACRONYMS

AFB	Air Force Base
bgs	below ground surface
CLP	Contract Laboratory Program
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
GRO	gasoline range organics
HHRB	human health risk-based (EPA Region 6 Human Health Media-Specific Screening Levels)
ICM	Interim Corrective Measure
NMED	New Mexico Environment Department
OWS	oil water separator
PID	photoionization detector
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SSHP	Site Safety and Health Plan
SWMU	solid waste management unit
SVOCs	semi-volatile organic compounds
TAL	target analyte list
TPH	total petroleum hydrocarbon
USAF	U.S. Air Force
UTL	upper tolerance limit
VOCs	volatile organic compounds

EXECUTIVE SUMMARY

This Sampling and Analysis Plan (SAP) was prepared to support the continued assessment at solid waste management unit (SWMU) 10-21, Trestle Site Septic Tank and Leach Field (ST-346) at Kirtland Air Force Base (AFB), New Mexico. This area requires a RCRA Facility Investigation (RFI) to determine the presence or absence of contaminant releases to the environment as a result of site activities. This SAP addendum was developed to serve as a guide in the field and contains site descriptions, results of previous investigations, and site-specific work plans and rationale.

Two abandoned sites within SWMU 10-21, which were identified at ST-66, the Vehicle Pit and the Aircraft Pit, were investigated during the Appendix V RFI (USAF, 1996). This SAP is intended to determine the presence or absence of contaminant releases associated with the Trestle Site Septic Tank and Leach Field (ST-346), a previously undocumented septic tank and leach field in this area that was identified in June 1997. This SAP will also investigate possible improper waste disposal practices in the area.

Eight boreholes will be advanced using a direct-push drill rig (Geoprobe) to a depth of approximately 12 ft bgs, or until refusal is met. Soil samples will be collected every five feet and field-screened with a photoionization detector (PID) and submitted to an analytical laboratory for analysis for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, cyanide, and total petroleum hydrocarbons (TPH). At least three surface samples will also be collected from areas at the site that may have been used for the improper disposal of chemical wastes and analyzed for the same parameters.

1. INTRODUCTION

This Sampling and Analysis Plan (SAP) addendum was prepared to support the continued assessment at solid waste management unit (SWMU) 10-21, Trestle Site Septic Tank and Leach Field (ST-346) at Kirtland Air Force Base (AFB), New Mexico. This assessment is mandated under the Kirtland AFB Resource Conservation and Recovery Act (RCRA) Part B Permit. The location of SWMU 10-21, Trestle Site Septic Tank and Leach Field (ST-346) is shown in Figure 1-1. This site at the Trestle Facility includes an undocumented septic tank and drain field near Tijeras Arroyo, which once received septic wastes from temporary work trailers and a designated latrine trailer onsite. Based on the previous activities at these work trailers, the potential exists for hazardous materials to have been disposed of into the septic tank and subsequently into the drain field. The site also includes an area of suspected surface disposal. An anonymous past employee has suggested that they saw improper waste disposal activities at this site. This area requires an RFI to determine the presence or absence of contaminant releases to the environment as a result of site activities. This SAP addendum was developed to serve as a guide in the field and contains site descriptions, results of previous investigations, and site-specific work plans and rationale.

1.1 Investigation Objectives

The objective of this RFI is to determine the presence or absence of contaminant releases to the environment. The investigation results will provide information to determine the need for any additional site characterization or corrective action.

1.2 Scoping Documents

Field activities will comply with the following document:

- *Kirtland AFB Base-Wide Plans for Installation Restoration Program (IRP)* (U.S. Air Force [USAF], 1995a)

Field activities include, but are not limited to, sample handling and shipping, decontamination procedures, equipment calibration, and investigation-derived waste handling.

Exceptions to the above-mentioned document are documented in this site-specific SAP Addendum, and the site-specific Site Safety and Health Plan (SSHP) addendum.

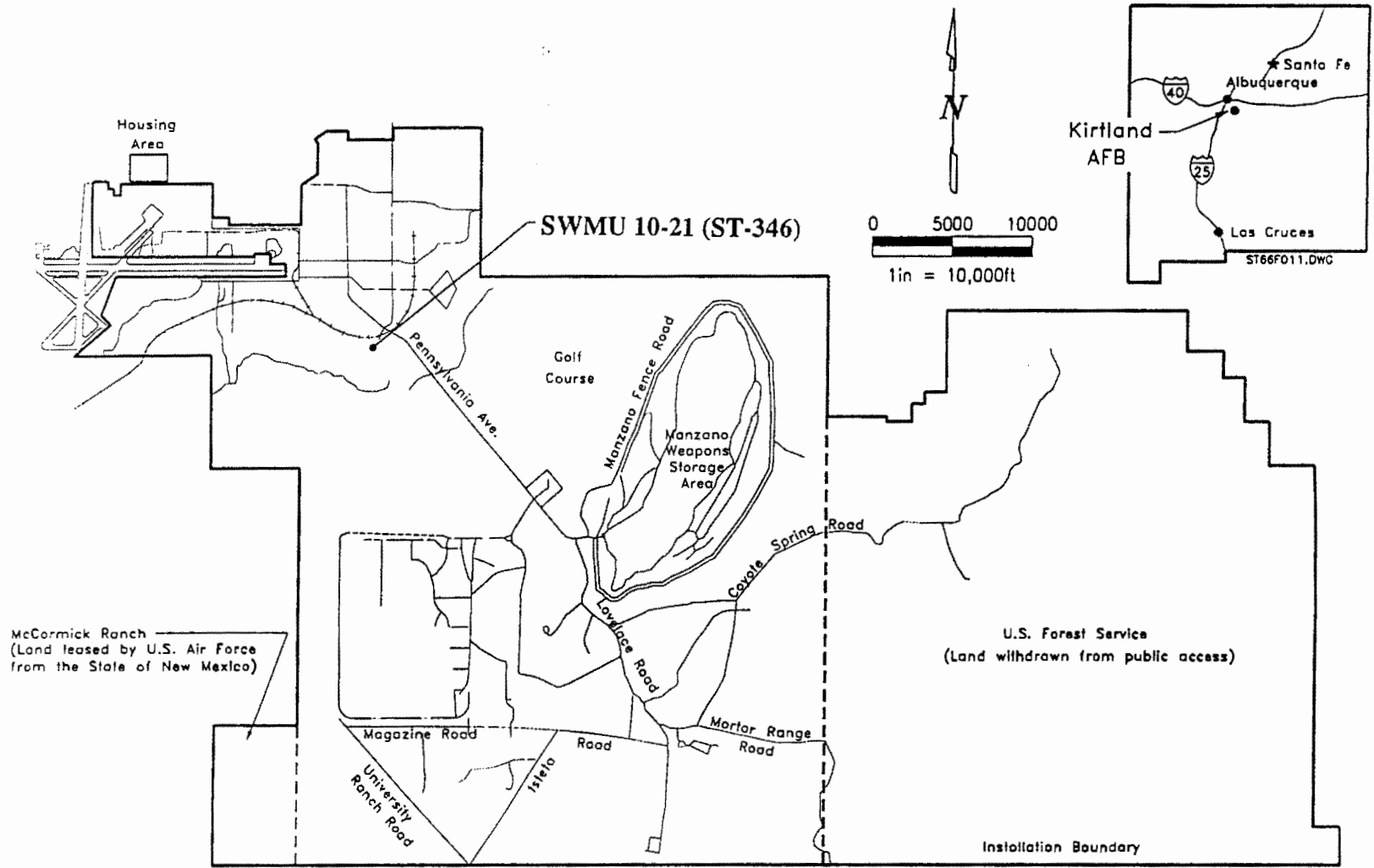


Figure 1 -1. Location of SWMU 10-21, Trestle Site Septic Tank and Leach Field (ST-346)

2. SWMU 10-21, TRESTLE SITE SEPTIC TANK AND LEACH FIELD (ST-346)

The Trestle Facility is located in the northwest portion of Kirtland AFB, off Trestle Tow Road, near Tijeras Arroyo (Figure 2-1). Phillips Laboratory used the trestle for electromagnetic pulse testing of aircraft; the trestle is currently operated by Orion International Technologies, Inc., in caretaker status for the U.S. Army at White Sands Missile Range. No future electromagnetic pulse tests are planned at this facility.

2.1 Results of Previous Investigations

Two abandoned sites within SWMU 10-21, which were specifically identified at ST-66, the Vehicle Pit and the Aircraft Pit, were investigated during the Appendix V RCRA Facility Investigation (RFI) (USAF, 1996).

2.1.1 Physical Inspection of Vehicle Pit Area (ST-66)

The Trestle Facility Vehicle Pit is concrete, 5 ft deep, and has inside dimensions of 5.3 ft x 28 ft and outside dimensions of 9.3 ft x 32 ft with a service entrance on the east side (Figure 2-1). Visual staining is evident inside and immediately adjacent to the pit. A defunct oil water separator (OWS) containing a mixture of water and petroleum, oil, and lubricant was located 11.5 ft north of the pit. The OWS was removed in June 1997. Visual staining was evident at the separator outfall, 50 ft north of the pit. The outfall discharges into a drainage ditch, which is connected to the Tijeras Arroyo.

2.1.2 Physical Inspection of Aircraft Pit Area (ST-66)

The concrete aircraft pit is 25 ft x 25 ft x 6 ft and drains to the Tijeras Arroyo (Figure 2-1). An asphalt apron directed fuel spills into the pit. During a records search and interviews, it was determined that fuel trucks were used for refueling the aircraft; therefore, an underground storage tank was not present at the site. This pit shows no obvious contamination (i.e., no staining or obvious drain pipes). It is unknown whether the spill pit was ever used for its intended purpose.

2.1.3 Appendix V RFI (ST-66)

The Vehicle Pit and Aircraft Pit were investigated in May and June 1995. The objective of the investigation was to determine the presence or absence of contaminants in the soil underlying and surrounding both pits and associated outfalls. Two boreholes (ST66-01 and ST66-02) were manually driven through cored access holes in the bottom of the Vehicle Pit to a depth of 12 ft below the bottom of the pit (approximately 15 ft belowgrade) (Figure 2-1). Three soil samples were collected from each borehole: one at the surface, one at 5 ft belowgrade, and one at 10 ft belowgrade. Borehole ST66-01 was drilled on the west side of the vehicle pit; borehole ST66-02 was drilled on the east side of the vehicle pit.

Four boreholes (ST66-03 to ST66-06) were drilled and sampled with a Geoprobe at visibly stained areas adjacent to the Vehicle Pit, OWS, and OWS outfall. Five samples were collected from each boring at 5-ft intervals starting at the surface and continuing to 22 ft belowgrade. A final sample was collected from the 25- to 27-ft interval. Borehole ST66-03 was drilled outside of the concrete containment near the

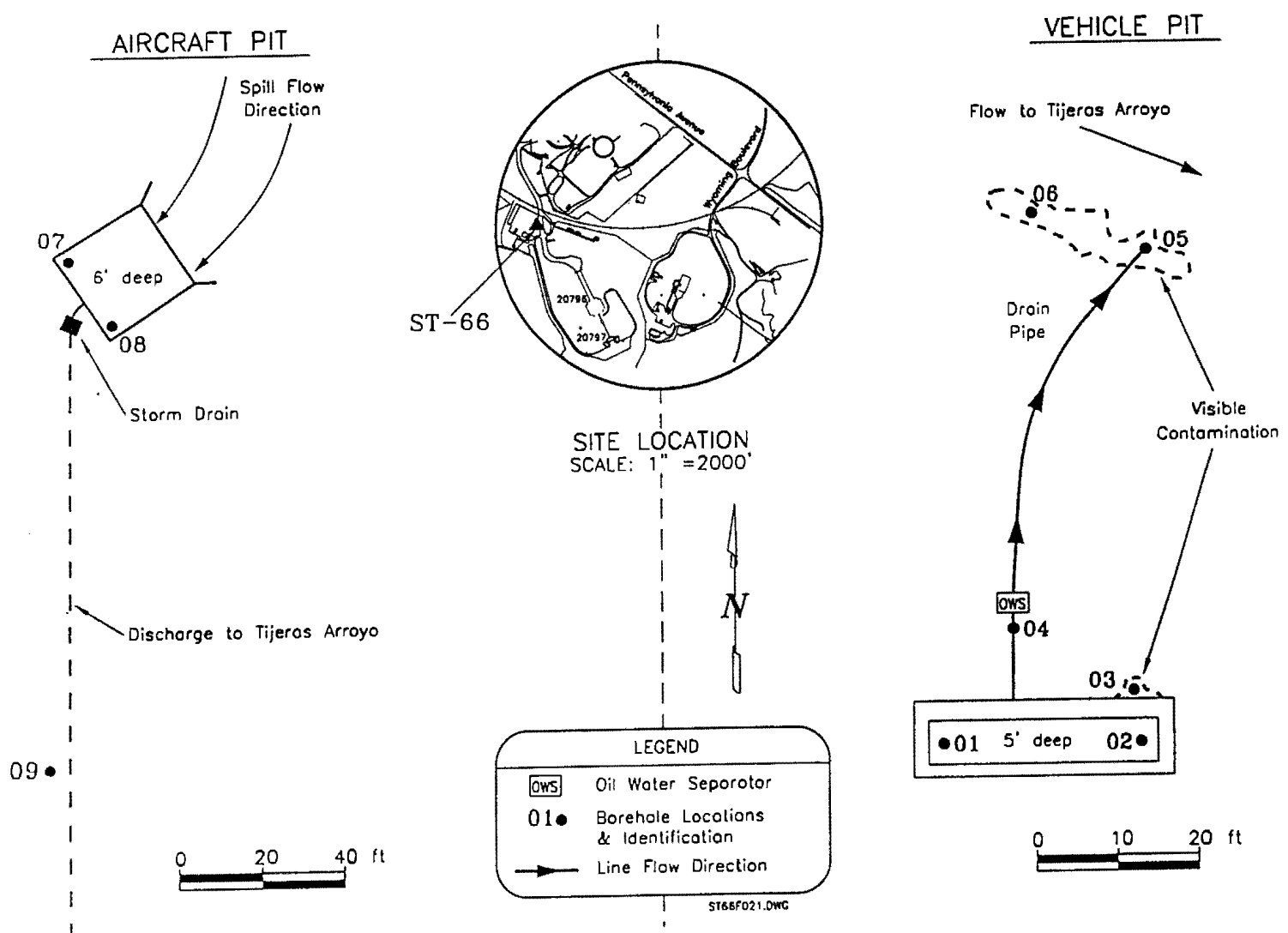


Figure 2-1. Previous Soil Sample Locations at SWMU ST-66, Trestle Facility, Vehicle Pit and Aircraft Pit

Vehicle Pit. Borehole ST66-04 was drilled near the OWS. A drain pipe runs northeast from the Vehicle Pit to a drainage ditch approximately 40 ft to the north of the OWS. Samples from borehole ST66-05 were collected at the outflow for the drain pipe and samples from borehole ST66-06 were collected in the northwest portion of the drainage ditch; both locations exhibited surficial staining.

Two boreholes (ST66-07 and ST66-08) were drilled and sampled with a Geoprobe through cored access holes in the bottom of the Aircraft Pit. Three soil samples were collected from each borehole: one at 2 ft belowgrade, one at 5 ft belowgrade, and one at 10 to 12 ft belowgrade. Borehole ST66-07 was located on the west side of the Aircraft Pit. Borehole ST66-08 was located on the south side of the Aircraft Pit. In addition, two surface sediment samples (ST66-09 and ST66-10) were collected from the outfall approximately 50 ft south of the Aircraft Pit.

Review of preliminary analytical results indicated elevated total petroleum hydrocarbon (TPH) concentrations in the 25- to 27-ft interval from ST66-03 and the 10- to 12-ft and 25- to 27-ft interval from ST66-05. To confirm these TPH concentrations and to characterize the vertical extent of potential contamination, the boreholes were resampled and advanced further with samples collected at 25 ft, 35 ft (ST66-03), and 50 ft (ST66-05) belowgrade. The resample holes were located within 6 in of the original location.

Thirty-seven samples were collected and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, TPH (gasoline range organics [GRO] and diesel range organics [DRO]), soil moisture, and pH. The additional soil samples collected from ST66-03 and ST-66-05 were analyzed for TPH with amino-based field testing kits. However, a selected number of soil samples were sent to the fixed-base laboratory to confirm the results obtained from the amino-based testing kits used in the field.

2.1.3.1 Organic Compounds Appendix V RFI Results

There were no VOCs detected in any of the soil samples collected at SWMU ST-66.

Two SVOCs were detected in soil samples submitted for analysis at SWMU ST-66. Di-n-butylphthalate (1.4 to 3.6 milligrams per kilograms [mg/kg]) was detected in all samples from boreholes ST66-03 and ST66-04 and bis(2-ethylhexyl)phthalate (0.35 to 0.7 mg/kg) was detected in only three samples. All concentrations were below the EPA Region 6 human health risk-based (HHRB) residential screening levels (EPA Region 6 Human Health Media-Specific Screening Levels).

2.1.3.2 Petroleum Hydrocarbons Appendix V RFI Results

No GRO was detected in any of the soil samples submitted for analysis at SWMU ST-66.

Diesel range hydrocarbons (4.7 to 2,100 mg/kg) were detected at concentrations above the New Mexico Environment Department (NMED) action level of 100 mg/kg in three samples—ST66-03 (25 to 27 ft at 2,100 mg/kg) and ST66-05 (10 to 12 ft at 420 mg/kg and 25 to 27 ft at 720 mg/kg) (NMED, 1995). Because these detections appeared to be anomalous relative to field instrument readings and there was a lack of detections of TPH in adjacent samples, confirmatory samples were collected from the same intervals and analyzed. The original TPH detection of 2,100 mg/kg in the 25- to 27-ft sample from boring ST66-03 was not confirmed in the sample from the same interval or the field replicate taken. The original detections in boring ST66-05 were also not confirmed. The anomalous detections are believed

to be the result of matrix interference in the original analyses or that the sample integrity was somehow compromised in the field.

2.1.3.3 Metals Appendix V RFI Results

Three metals—arsenic, beryllium, and manganese—were detected above the HHRB action levels. Arsenic (0.49 to 3.3 mg/kg) was detected in 34 samples and three field replicates above the HHRB action level of 0.37 mg/kg. Beryllium (0.3 to 0.43 mg/kg) was detected in seven samples above its HHRB action level of 0.15 mg/kg. Manganese (399 mg/kg) was detected in the 5- to 7-ft sample from ST66-06 above its HHRB action level of 390 mg/kg. The concentrations of arsenic, beryllium, and manganese appear to be naturally occurring throughout Kirtland AFB (USAF, 1995b).

Three metals—copper, zinc, and lead—were detected above the Sandia National Laboratories (SNL/NM, 1996) upper tolerance limits (UTL) in soil samples from SWMU ST-66. Copper (224 to 453 mg/kg) was detected in four samples and one field replicate above the SNL/NM calculated UTL. The site is within what is classified as the North Super Group of the SNL study, although it is very close to the boundary with the Tijeras Super Group. Zinc (146 to 174 mg/kg) was detected in two samples above the SNL/NM calculated UTLs (North Super Group UTL of 82.4 mg/kg, Tijeras Super Group UTL of 117 mg/kg). Lead (100 mg/kg) was detected in the grab sample ST66-09 above the SNL/NM calculated subsurface UTL of 11.2 mg/kg, but was not detected above the UTL in the field replicate (The SNL/NM calculated UTL for lead is the same for the North and Tijeras Super Groups).

2.1.4 Interim Corrective Measure (ICM) (SWMU 10-21)

An ICM to remove the OWS and contaminated soil was completed in June 1997, and an ICM Completion Report was submitted in July 1997.

2.2 Site-Specific Work Plan and Rationale

During the removal of the OWS in June 1997, an area west of the Trestle Facility main structure near Tijeras Arroyo was identified to contain a previously undocumented septic tank and leach field. This septic tank and leach field, designated SWMU 10-21, Trestle Site Septic Tank and Leach Field (ST-346), received septic wastes from temporary work trailers. Based on the previous activities at these work trailers, the potential exists for hazardous materials to have been disposed in the septic tanks and subsequently into the leach field. Also during this time frame, an anonymous employee suggested that they saw improper waste disposal activities near this site.

The proposed scope of work at SWMU 10-21, Trestle Site Septic Tank and Leach Field (ST-346) is summarized in Tables 2-1 and 2-2. The field program is designed to determine the presence or absence of contamination resulting from previous site activities. Soil sampling locations for the septic tank and leach field are shown on Figure 2-2. During the field investigation a visual survey will be made to see if there is any soil staining or other evidence of improper disposal practices. At least three locations will be selected for the collection of soil samples.

Eight boreholes will be advanced at the locations shown on Figure 2-2. Borehole ST346-1 will be located approximately 500 ft north of the leach field, outside the Trestle Facility fence and upslope of the railroad tracks, and serve as the background location. Six boreholes (ST346-2 through -7) will be located throughout the suspected leach field. One borehole, ST346-8, will be located downslope (south) of the site.

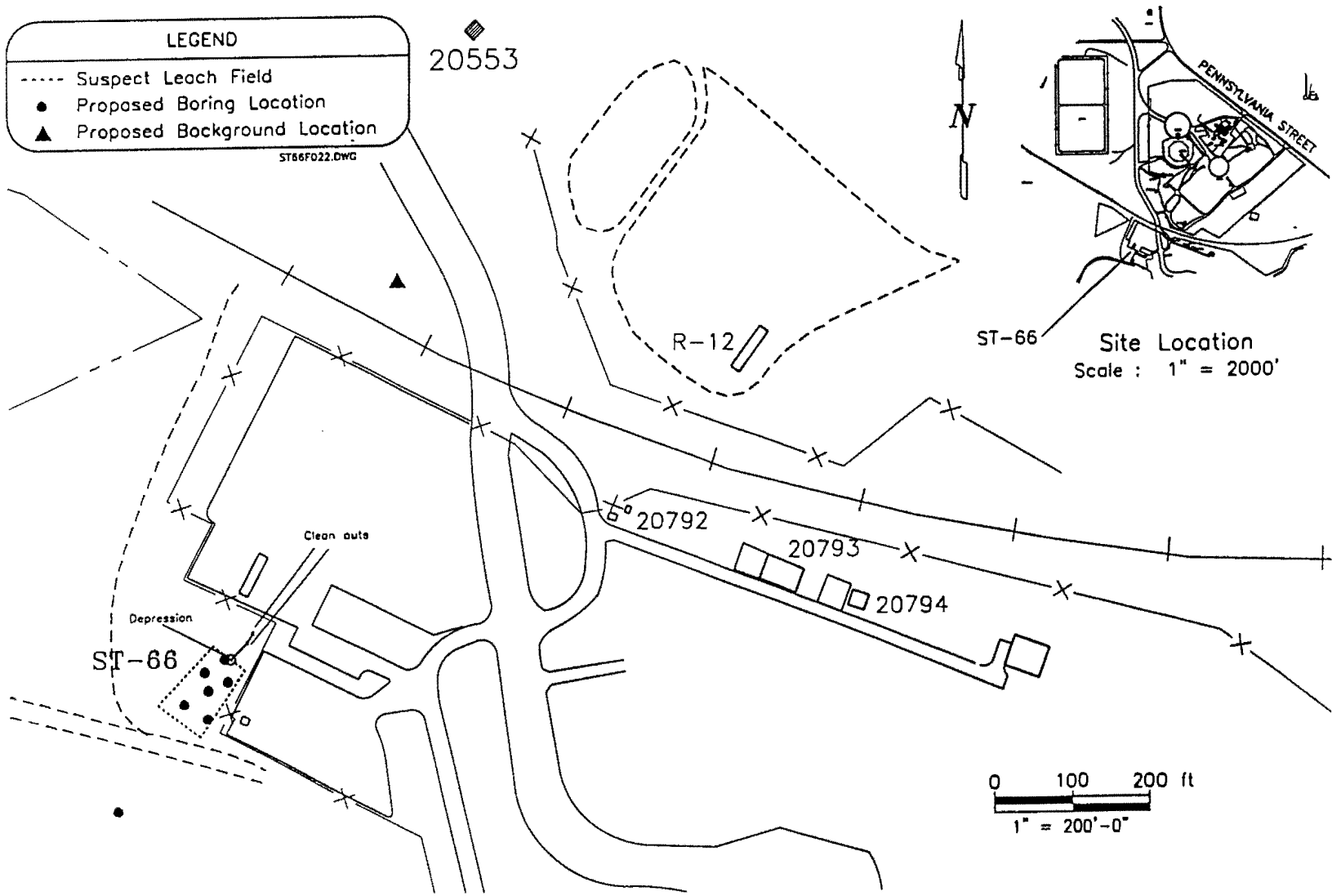


Figure 2 - 2. Proposed Sampling Locations at SWMU 10-21, Trestle Site Septic Tank and Leach Field (ST-346)

Boreholes will be advanced using a direct-push drill rig (Geoprobe) to a depth of approximately 12 ft below ground surface (bgs), or refusal. Soil samples will be collected and field-screened with a photoionization detector (PID) at the following intervals: 0 to 2 ft, 5 to 7 ft, and 10 to 12 ft bgs. Drilling will terminate at 12 ft if field-screening indicates no contamination. Based on experience at other sites at Kirtland AFB (ST-295, ST-311), the base of septic tanks and accompanying leach fields are typically found at depths of approximately 5 ft bgs. Therefore, sampling to a depth of 10 to 12 ft bgs should delineate the vertical extent of any contamination. If field-screening indicates the presence of contamination in the 10 to 12 ft bgs sample, drilling and sampling will continue at 5-ft intervals until field screening indicates no contamination in two consecutive 5-ft intervals.

At least three samples will be collected from areas at the site that may have been used for the improper disposal of chemical wastes. If soil staining or other signs are found in more than three areas, then each area will be sampled. Surface soil samples (0- to 1-ft bgs) will be collected using a hand auger because the anonymous employee indicated that the disposal activities took place in an area of steep terrain, which would be inaccessible by a drill rig.

2.2.1 Chemical Analyses

Soil samples will be submitted and analyzed for VOCs (U.S. Environmental Protection Agency [EPA] Method 8260), SVOCs (EPA Method 8270), TPH (GRO and DRO) (EPA Method 8015 modified), TAL metals (EPA Methods 6010 and 7000 series), cyanide (EPA Method 9010A), and soil pH (EPA Method 9045). Tables 2-1 and 2-2 summarize the number of site and quality control samples required for the field investigation.

**Table 2-1. Proposed Sampling Scheme for SWMU 10-21,
Trestle Site Septic Tank and Leach Field (ST-346)**

Data Needs	Investigative Technique	Location	Number of Samples	Analyses	Selected Analytical Options^a
Determine the presence/absence of contaminants in soil from septic tank	Collect soil samples using direct-push technique	Drill 8 Geoprobe boreholes to 12 ft, or refusal	24 soil samples (3 per borehole) at: 0 to 2 ft 5 to 7 ft 10 to 12 ft	VOCs SVOCs TPH (GRO/DRO) TAL metals ^b Cyanide pH	Level II Level II Level II Level II Level II Level II
Determine the presence/absence of contaminants in soil from improper disposal actions	Collect soil samples using a hand auger	Collect at least 3 samples as indicated by soil staining	3 surface soil samples	VOCs SVOCs TPH (GRO/DRO) TAL metals Cyanide pH	Level II Level II Level II Level II Level II
Quality Control (QC) Samples					
			3 duplicate samples	VOCs SVOCs TPH (GRO/DRO) TAL metals Cyanide pH	Level II Level II Level II Level II Level II
			5 trip blanks	VOCs	Level II
			2 MS/MSD sample	VOCs SVOCs TPH (GRO/DRO) TAL metals Cyanide pH	Level II Level II Level II Level II Level II
			5 equipment blank samples	VOCs SVOCs TPH (GRO/DRO) TAL metals Cyanide pH	Level II Level II Level II Level II Level II

^a Refers to the type of data package from the analytical laboratory. Level II data packages are defined by the *Kirtland AFB Base-Wide Plan for IRP*, Volume II, Data Collection Quality Assurance Plan (USAF, 1995a). Level II report is equivalent to an EPA Contract Laboratory Program (CLP) report.

^b TAL — Target Analyte List.

Table 2-2. Summary of Analytical Parameters for SWMU 10-21, Trestle Site Septic Tank and Leach Field (ST-346)

Sample Number ^a	TCL VOCs EPA Method 8260A	TCL SVOCs EPA Method 8270	TPH (GRO/DRO) EPA Method 8015 (mod)	TAL Metals EPA Methods 6010 and 7000 series	Cyanide EPA Method 9010A	Soil pH EPA Method 9045
ST346-01-0002	•	•	•	•	•	•
ST346-01-0507	•	•	•	•	•	•
ST346-01-1012	•	•	•	•	•	•
ST346-02-0002	•	•	•	•	•	•
ST346-02-0507	•	•	•	•	•	•
ST346-02-1012	•	•	•	•	•	•
ST346-03-0002	•	•	•	•	•	•
ST346-03-0507	•	•	•	•	•	•
ST346-03-1012	•	•	•	•	•	•
ST346-04-0002	•	•	•	•	•	•
ST346-04-0507	•	•	•	•	•	•
ST346-04-1012	•	•	•	•	•	•
ST346-05-0002	•	•	•	•	•	•
ST346-05-0507	•	•	•	•	•	•
ST346-05-1012	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters for SWMU 10-21, Trestle Site Septic Tank and Leach Field (ST-346) (Concluded)

Sample Number ^a	TCL VOCs EPA Method 8260A	TCL SVOCs EPA Method 8270	TPH (GRO/DRO) EPA Method 8015 (mod)	TAL Metals EPA Methods 6010 and 7000 series	Cyanide EPA Method 9010A	Soil pH EPA Method 9045
ST346-06-0002	•	•	•	•	•	•
ST346-06-0507	•	•	•	•	•	•
ST346-06-1012	•	•	•	•	•	•
ST346-07-0002	•	•	•	•	•	•
ST346-07-0507	•	•	•	•	•	•
ST346-07-1012	•	•	•	•	•	•
ST346-08-0002	•	•	•	•	•	•
ST346-08-0507	•	•	•	•	•	•
ST346-08-1012	•	•	•	•	•	•
ST346-09-0001	•	•	•	•	•	•
ST346-10-0001	•	•	•	•	•	•
ST346-11-0001	•	•	•	•	•	•
<i>QC Samples^b</i>						
Field Duplicate Samples ^c	3	3	3	3	3	3
Trip Blanks ^d	5	—	—	—	—	—
Equipment Rinsate Blanks ^e	5	5	5	5	5	5
MS/MSD ^f	2	2	2	2	2	2
Total Samples	42	37	37	37	37	37

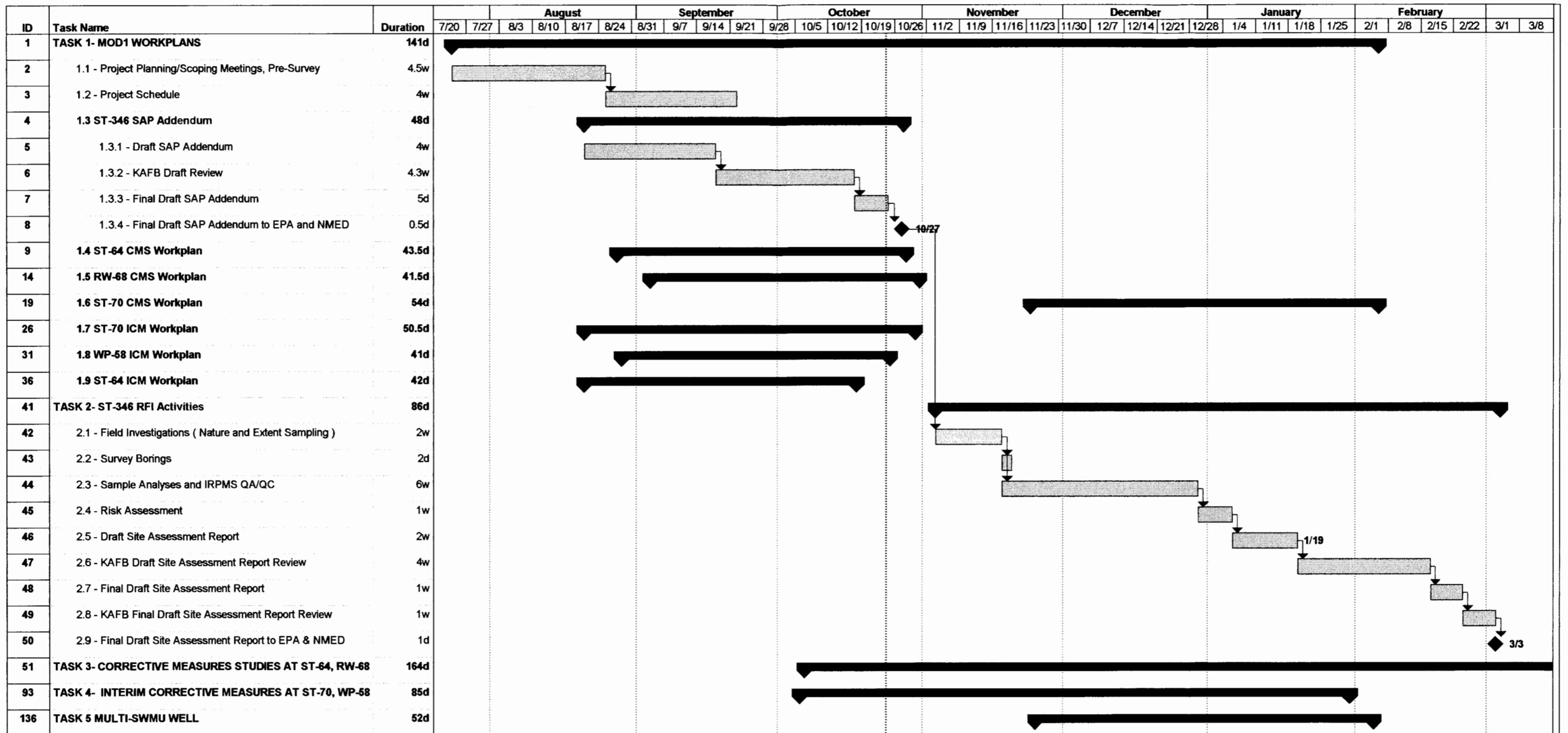
FOOTNOTES FOR TABLE 2-2

- ^a *Sample Number* denotes site designation—borehole number—sampling interval relative to ft bgs (i.e., sample number ST346-02-0507 would be the soil sample collected at the Trestle Site Septic Tank and Leach Field, from borehole 02 at a sampling interval of 5 to 7 ft bgs).
- ^b Estimated field QC samples.
- ^c *Field Duplicates*—A single sample split into two portions during a single act of sampling. Assesses the overall precision of the sampling and analysis program. Collected at a frequency of 10 percent of the total number of samples for chemical analyses and analyzed for the same parameters as equivalent samples.
- ^d *Trip Blanks*—Samples that originate from analyte-free water taken from the laboratory to the sampling site and returned to the laboratory with the VOC samples. One trip blank per cooler containing VOC samples. Trip blanks are analyzed for VOCs only.
- ^e *Equipment Rinsate Blanks*—Collected for each type of nondedicated sampling equipment used and analyzed for the same parameters as the samples they are used to collect. Equipment blanks will be collected and sent to the laboratory on a daily basis.
- ^f *MS/MSD*—Samples for laboratory quality control, collected 1 in 20 samples (5 percent frequency).

2.3 RFI Schedule

A summary of the expected schedule for conducting the RFI activities and providing deliverable reports is presented below. A more detailed graphic schedule also is attached (Figure 2-3).

Submittal of Final Draft Addendum to RFI SAP	October 24, 1997
Site Assessment Field Activities	November 3 through November 18, 1997
Submittal of Draft ICM Report	January 19, 1998
Submittal of Final Draft ICM Report	One week after receipt of Kirtland AFB comments on Draft ICM Report
Submittal of Final ICM Report	60 days after receipt of comments on Final Draft Report from EPA, New Mexico Environment Department, and the public



Kirtland AFCEE DO 92 MOD1 Project Schedule
Revised 10/24/97



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