AFB RED 92 Steph

DEPARTMENT OF THE AIR FORCE

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

file HAFB red (92)

FROM: 49 CES/CEV
550 Tabosa Avenue
Holloman AFB, New Mexico 88330-8458

29 SEP 1992

SUBJ: JP-4 Fuel Spill

TO: New Mexico Environment Department
Attn: Benito Garcia
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

1. In response to your 9 September 92 letter regarding the JP-4 Fuel Spill, Remediation of 9 July 92 JP-4 Fuel Spill: 11 August 92 Letter from Hensel Phelps Construction Company, Holloman is submitting a revised sampling plan in order to comply with NMED permit requirements and better ascertain the areal and vertical extent of contamination.

2. In order to comply with all aspects of the permit, Holloman requires additional information regarding qualification requirements for the person conducting the soil gas survey. Further clarification would assist Holloman in ensuring that the soil gas survey is conducted properly. Any additional information should be forwarded to Roger Wilkson at (505) 479-3931.

2. If you have any questions regarding the revised sampling plan or the qualifications issue, please contact Roger Wilkson at (505) 479-3931.

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

1 Atch
Sampling Plan

cc: w/Atch
David Morgan, NMED

OCT - 2 1992

Global Power for America

PROPOSED SAMPLING PLAN
FOR
JP-4 SPILL SITE

Prepared by
49 CES/CEV
Holloman AFB, New Mexico

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1.0 PROJECT DESCRIPTION

1.1 Background

On 8 July 1992, Hensel Phelps (HP) Construction Co. was testing a newly installed fueling system for the F-117A Stealth Fighter. A valve was left open on the fuel system and approximately 6000 gallons of fuel were released to the environment (Figure 1-1). Approximately 2000 gallons of fuel were recovered from a fuel line manhole and the remaining fuel was released to the ground surface. A limited soil gas survey was performed on 21 July 1992. Several shallow (2 to 4 inches in depth) test holes were dug and tested using an HNU photoionization detector (PID) with a 10.2 eV probe. Readings were 1 to 1-1/2 times above background. On 23 July 1992, two background readings were taken following calibration of the HNU. The instrument was calibrated with Isobutylene to 40 ppm at 9.8 Span. One reading (3.9 ppm) was taken at the HP main office, approximately 1 mile from the spill site. Nine holes were dug to 12 inches in depth and tested using the HNU PID. Two were dug at the manhole where the fuel was released to the ground surface and seven others were dug along the centerline of the spill area. Two of the readings were above background; 9 ppm was acheived at sample point number 4 and 6.2 ppm was recorded at sample point 8 (Figure 1-2).

On 27 July 1992, Danley Construction Company started building the bermed area for the land farming of the removed soil. The bermed area was constructed on top of an abandoned road. The bermed area is approximately 30 x 80 feet. A plastic liner was placed on the bottom of the bermed area and extended over the top of the berm. On 27 July 1992, Danley Contruction Co. removed 7500 cubic feet of contaminated soil and gravel from the site. The removed soil was transported to the bermed area and placed in 12 inch lifts. On 28 July 1992, Danley Construction Co. removed additional soil at the manhole area. The area was tested with the HNU PID and a reading of non-detect was recorded.

1.2 Objective

The objective of this work effort is to investigate the JP-4 Fuel Spill Area at Holloman AFB, New Mexico, and to make recommendations regarding site remediation where contaminants exceed the accepted safe level for humans and/or environment. Data gathered in

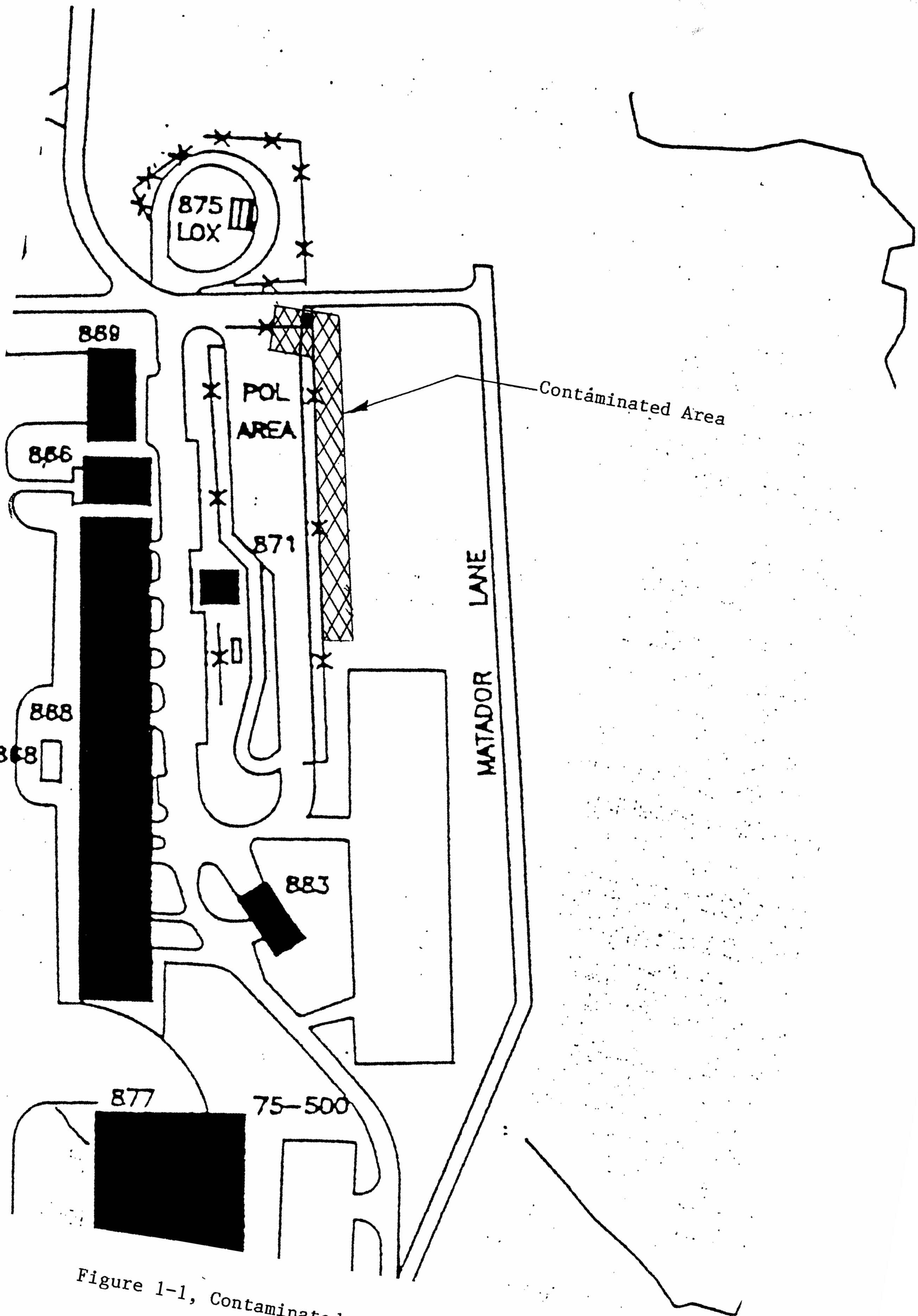

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Figure 1-1, Contaminated Area

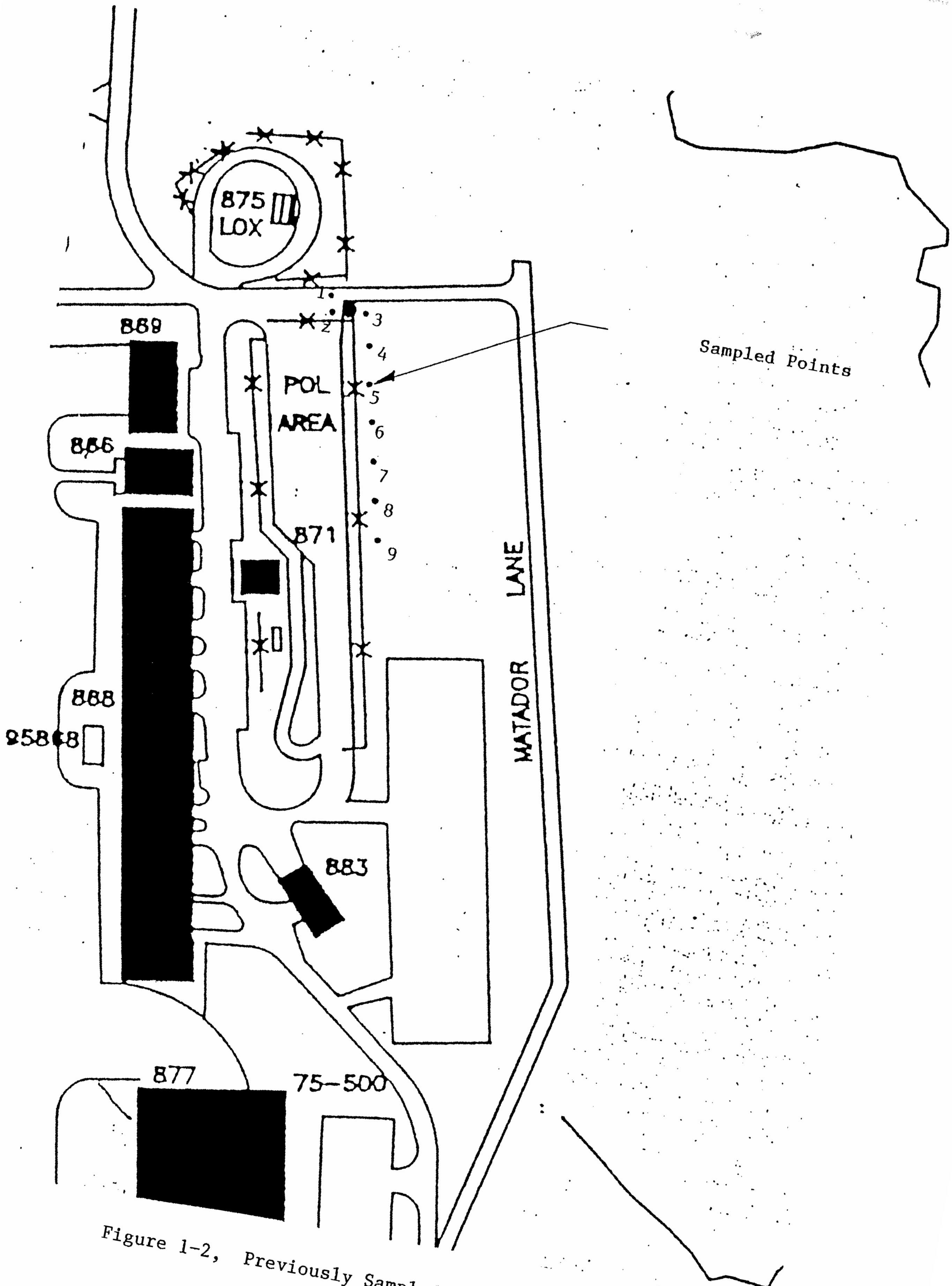

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Figure 1-2, Previously Sampled Points

this investigation will form the basis for a contamination evaluation report. The following activities will be completed for this Investigation:

- Collection and chemical analysis of surficial soil samples (less than two feet below ground surface) from five sites;

- Soil gas survey to locate a potential fuel spill at one site

1.3 Environmental Setting

The following discussion of the meteorology, physical geography, soils, geology, and hydrology are from previous reports such as the Holloman AFB Records Search (CH2M Hill, August 1983) and the Holloman AFB RCRA Facility Assessment Report (A.T. Kearney, September 1988).

1.3.1 Meteorology

Holloman AFB is located in the Tularosa Basin with mountain ranges to the east and west. The climate is arid with low annual rainfall and low relative humidity. The mountain ranges to the east and to the west have a dramatic influence on the local weather; they provide orographic lifting to produce summer thunderstorms and modify approaching weather systems. Holloman AFB receives most of its total annual rainfall from thunderstorm activity during the May through October period. The winter season is generally dry, characterized by clear skies and erratic snowfall from year to year. The period from March through May is characterized by a strong southerly wind flow and periods of blowing dust and sand. Meteorological data for Holloman AFB is presented in Table 1-1. Mean annual precipitation is 7.9 inches. The mean annual lake evaporation rate, commonly used to estimate the mean annual evapotranspiration rate, is an estimated 67 inches per year. Therefore, the annual net precipitation (mean annual precipitation minus mean annual evapotranspiration) for the Holloman AFB area is approximately minus 59 inches per year. As a result, site soils are generally dry.

TABLE 1-1

Meteorological Data for Holloman AFB[a]

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Average or Extreme
Temperature (°F)													
Monthly mean	41	46	52	61	69	81	79	73	62	49	49	42	61
Mean daily high	54	60	66	76	84	93	91	86	76	63	63	55	75
Mean daily low	28	31	37	45	54	68	66	60	48	35	35	26	47
Record high	78	80	90	94	103	108	106	102	92	82	82	75	109
Record low	-11	0	9	23	26	52	54	38	26	3	3	2	-11
Precipitation (in)													
Monthly mean	0.5	0.4	0.3	0.2	0.4	0.7	1.2	1.3	1.2	0.9	0.3	0.5	7.9
Record maximum	1.9	1.4	3.0	0.8	2.9	3.6	3.7	4.4	3.9	4.2	2.5	2.4	4.4
Record minimum	0	T[b]	0	0	0	T	T	0.2	T	0	0	0	0
Relative humidity (%)													
4 a.m. mean	66	61	52	40	42	42	60	66	68	61	61	63	57
1 p.m. mean	42	35	27	19	20	19	31	35	38	34	34	37	31
Surface wind													
Mean velocity (Kt)	4	4	6	7	6	6	5	5	4	4	4	4	5
Prevailing direction	N	N	S	S	S	S	S	S	S	S	S	S	S

[a]Source: Holloman Air Force Base Installation Program Records Search; CH2M Hill; August 1983.
Period of record: September 1942 to December 1981.

[b]T = trace.

1.3.2 Physical Geography

Holloman AFB is located in the southern part of New Mexico in the Tularosa Basin, as shown in Figure 1-3. The basin is approximately 120 miles long and 35 miles wide, extending from the southern end of Chupadera Mesa almost to the Texas border. The Tularosa Basin is part of a structural basin which is more than 200 miles long and 24 to 60 miles wide, extending from southeastern Socorro County, New Mexico, southward to Chihuahua, Mexico. In the vicinity of the base, the Tularosa Basin is bounded 8 miles to the east by the Sacramento Mountains and 20 miles to the west by the San Andres Mountains.

Elevations within the Tularosa Basin range from 4,400 feet above mean sea level (ft-msl) at the northeast corner to 4,000 ft-msl in the southwest corner, sloping downward to the southwest. Elevations at the base range from 4,100 to 4,028 ft-msl, excluding Tularosa Peak. Elevations in the Sacramento Mountains reach 12,000 ft-msl and range from 7,000 to 9,000 ft-msl within the San Andres Mountains.

The Tularosa Basin is a closed basin with regard to surface drainage. No surface water leaves the basin. Surface water is either lost to evaporation and infiltration or collects in the lowest point in the basin at or near Lake Lucero. This lake is located at the southwest edge of the gypsum dune field, known as White Sands National Monument, west of the base. Surface water within the basin ultimately flows to Lake Lucero. Here, also a discharge point for groundwater, sulfate salts are concentrated by evaporation. The prevailing southwest winds then pick up and transport the salts, primarily gypsum, in a northeasterly direction to continue building the dune field of the White Sands National Monument.

The base is crossed by several southwest trending "arroyos" or intermittent stream beds including Lost River (the largest), Dillard Draw, Malone Draw, and several smaller tributaries such as Red Arroyo and Arroyo Cavacita. Lost River is fed by groundwater seeps or springs. The river appears and disappears along its course as springs add water and evapotranspiration and infiltration recapture it.

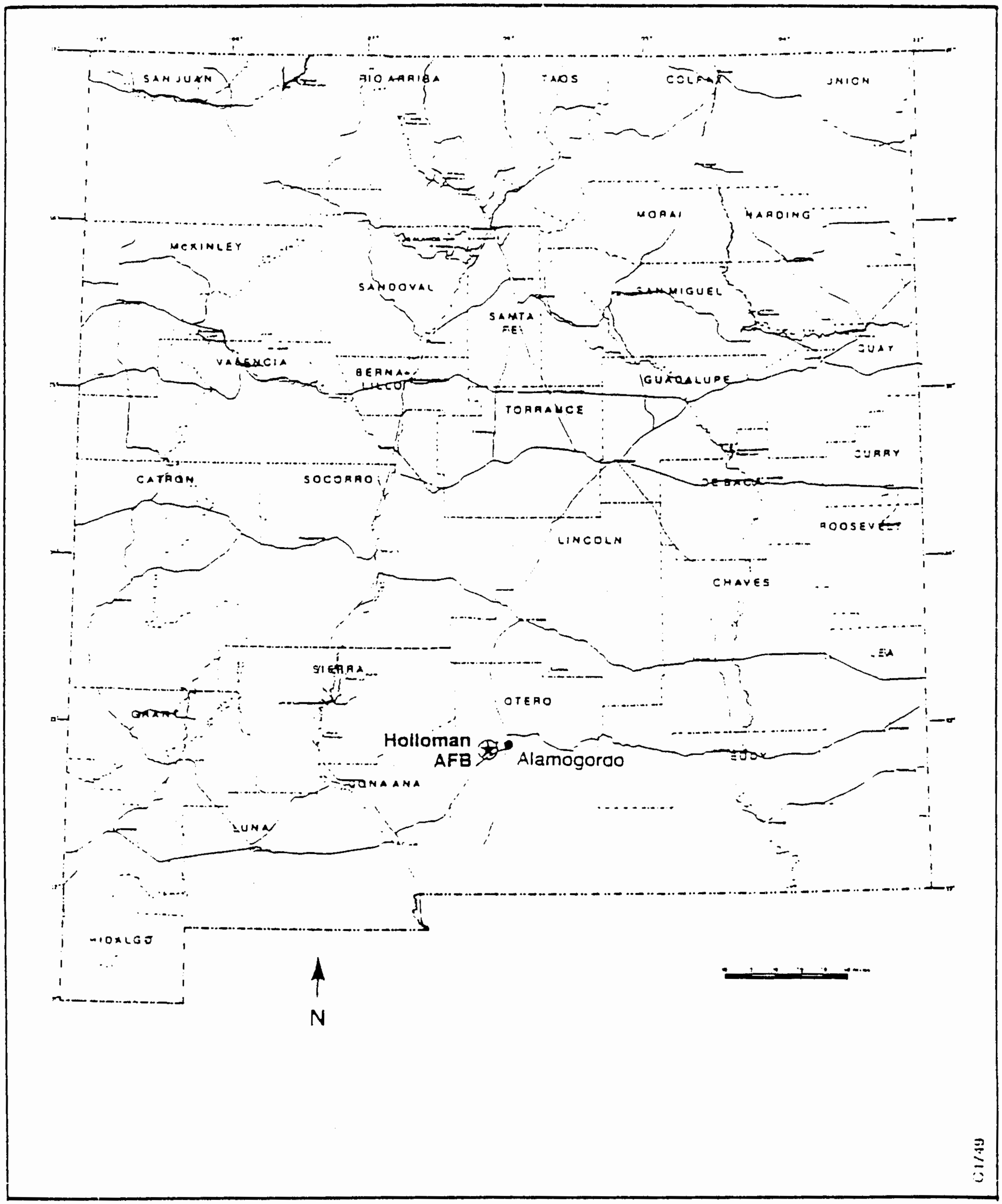

Figure 1-3 Location Map of Holloman AFB, New Mexico

1.3.4 Soils and Geology

Most of the base is covered with well drained soils (fine sandy loam) formed in gypsiferous sediments of eolian (wind blown) or alluvial (stream deposition) origin. The soils are thin and overlie discontinuous beds of gypsum. The surface soils are nearly level with slopes ranging from 0 to 5 percent. Permeability of the soil horizons ranges from 4 x 10^{-4} to 1 x 10^{-3} cm/sec (moderately permeable).

Geologically, the Tularosa Basin is a graben structure, bounded on the east and west by mountains which are actually tilted fault blocks. The basin had its beginning over 270 million years ago when most of southern New Mexico was covered by a shallow sea. During the succeeding years, there were periods of inundation and each cycle left behind successive layers of sediments. Then, approximately 70 million years ago, a major mountain building episode occurred creating the Rocky Mountains. This upheaval caused the Tularosa area to be uplifted, forming a broad, gentle arch. As time passed, tectonic adjustments to the mountain building event took place and the top of this arch or dome collapsed (approximately 10 million years ago) along nearly vertical fault planes. The large area, which collapsed or settled, formed what is now the Tularosa Basin.

The fault planes have produced steep scarps clearly visible on the west side of the Sacramento Mountains. The basin, itself, is underlain mostly by unconsolidated bolson deposits more than 4,000 feet thick in the vicinity of Holloman AFB. A bolson is a basin which has no surface drainage outlet. Bolson deposits refer to sediments carried by water into the closed basin or bolson. Only the uppermost bolson deposits are of significance to this investigation at this point in time.

1.3.5 Hydrology

Surface water resources within the Tularosa Basin are limited by the high evapotranspiration rate and low annual rainfall. Perennial streams occur in the mountainous regions surrounding the basin including Rio Tularosa, Rio Bonita, and Eagle Creek. Rio Bonita, located northeast of Tularosa and approximately 60 miles from Holloman AFB, discharges to Bonita Lake which in turn is tapped for water supply, some of which is transmitted by pipeline to the base.

The intermittent streams and arroyos occurring within the basin are important drainage features only during the infrequent heavy rainfall, conveying surface water southwest to the basin's lowest elevation point (Lake Lucero).

Man-made and/or modified surface water features have some significance in an area otherwise devoid of lakes, rivers, and streams. The wastewater treatment system at Holloman AFB consists of six aeration/evaporation lagoons located in the southwest corner of the Base. Just southwest of these lagoons, a natural playa occurs, which receives discharge from the Base as well as seepage from the sewage lagoons. The inundated portion of the playa is referred to as Lake Holloman. Surface drainage within the undeveloped parts of the Base is controlled by the major arroyos, including Lost River and Dillard Draw and their tributaries. Surface flows are directed southwest toward the White Sands National Monument. Drainage within the developed portion of the Base flows by way of ditches and culverts to the southwest corner of the Base, in the vicinity of the wastewater treatment lagoons.

Groundwater occurs within the unconsolidated bolson fill at Holloman AFB. The Base obtains most of its water supply from wells installed in the fill. The Base well fields (Boles, Douglas, and San Andres) are located off-Base at the foot of the Sacramento Mountains just south of Alamogordo. Groundwater beneath Holloman AFB is highly mineralized containing dissolved solids in excess of 10,000 parts per million.

At the base of the Sacramento Mountains, the hydraulic gradient is quite steep but then flattens out quickly. In the vicinity of Holloman AFB, the ground surface slopes to the southwest gently but at a slightly higher rate than the water table. Depth to water table at the well fields near the mountains is 270 feet or more below land surface (bls), while at Holloman AFB the water table is 5 to 10 feet bls. Like surface drainage, groundwater flows predominately to the southwest, discharging by evapotranspiration. However, local groundwater flow direction appears to be influenced by the arroyos and draws. Potentiometric surface maps from the Holloman AFB Remedial Investigation (Walk, Haydel & Associates, Inc., 1989) indicate that groundwater flow is to the southeast at sites 10 and 31, which are located northwest of Dillard Draw. The extent that the arroyos may effect groundwater flow throughout the Base is unknown.

The bolson fill is derived from limestone, dolomite and gypsum from the surrounding mountains. Fresh water recharges the bolson fill at the base of the mountains, which contains highly soluble materials such as gypsum. Groundwater quickly dissolves these formation minerals, and groundwater quality degrades with increased contact time. Therefore, groundwater under Holloman AFB is non-potable. The only potable groundwater in the vicinity is near the recharge area near the base of the mountains.

2.0 CHEMICAL DATA QUALITY OBJECTIVES

The objective of this work effort is to investigate the JP-4 Fuel Spill Area at Holloman AFB, New Mexico, and to make recommendations regarding site remediation where contaminants exceed the accepted safe level for humans and/or environment. The scope of work for this site is discussed in detail in Section 3. The presence or absence of chemical contamination will be determined by detection, or non-detection, of chemicals in subsurface soil samples and a soil gas survey. Results of chemical analyses will be compared to federal guidelines. Recommendations regarding site remediation will be made where contaminants exceed accepted safe levels for humans and/or the environment. Data quality objectives (DQOs) are to:

- Collect the samples specified in Section 3 to adequately determine the presence or absence of contamination at the Holloman AFB sites;
- Ensure data comparability through the use of standard methods and controlled systems to collect and analyze samples;
- Provide analytical results of known and acceptable precision and accuracy.

Measurement data representativeness is a function of a sampling strategy and will be achieved using the procedures discussed in Section 3, Field Activities. Imprecision and bias in natural matrix samples will be estimated by standard QC methods such as matrix spikes, field duplicates, and field and trip blanks. Confirmation of identity will be performed using second column confirmation procedures for samples with detected compounds using GC and HPLC analytical methods.

A quality assurance/quality control (QA/QC) program will be used to ensure that data quality objectives are met for the Holloman AFB project. QA/QC efforts are twofold. First, they provide the mechanism for ongoing control and evaluation of measurement data quality throughout the course of the project (i.e., system capability). Second, they specify quality control data to be used to define natural-matrix data quality for various measurement parameters, in terms of precision and accuracy. Control of measurement data quality (i.e., control of error sources that affect data quality) is possible for sample collection and analysis. However, matrix interference, or non-homogeneity, is not amenable to control and thus imprecision or bias due to these natural sources of error must be estimated from QC samples. For this project, sample collection error will be controlled through the use of standard sample collection methods and field logbooks. Natural matrix error will be estimated by standard QC methods such as matrix spikes, field duplicates, and field and trip blanks.

2.1 Analytical Capability

Efforts to control measurement error require that the analytical system be capable, in control, and appropriately sensitive for all analyses. System capability, in terms of accuracy and precision, may be documented by reporting system QC data (e.g., continuing calibration, quality control check samples (QCCS), and method spikes). System capability, in terms of sensitivity, may be documented through the use of maximum detection limits for system blanks (e.g., reagent, system and method blanks) and calibration standards. System control may be documented through the use of control charts or other statistical methods that indicate system performance over time.

2.2 Definition of Quality Assurance (QA) Samples

External QA samples will consist of field duplicates and field blanks collected in similar sample containers and handled in the same manner as field samples. Field duplicate samples and field blanks will each be collected at a minimum frequency of 5% of all field samples collected. Trip blanks will be submitted at a frequency of one trip blank for every two coolers containing samples, or a minimum of one per day, to be analyzed for volatile organics.

2.2.1 Field Duplicates

Collection procedures for field duplicates will depend on the matrix. For the soil matrix, split samples will be used as a field duplicate sample for all analyses except volatile organics. Split samples will be a homogenized soil sample, divided into two or more splits, and identified as unique samples. Analyses of split soil samples will be confined to analyses for non-volatile species since homogenization would increase variability or completely lose volatiles. Field duplicates of non-homogenized soil will be collected for volatile organics.

Duplicate samples are analyzed for the purpose of assessing precision, including variability associated with both the laboratory analysis and the sample collection process. Duplicate samples will be collected in immediate succession, using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis.

2.3 Definitions of Laboratory Quality Control (QC) Samples

The following quality control samples will be used to control and assess data quality:

- System blank - deionized water analyzed after calibration to assess system contamination.

- Reagent blank - reagent water taken through the digestion/extraction process as though it were an actual sample.

- Calibration check sample - a standard used to verify instrument calibration.

- QC check sample (QCCS) - known concentration of alternate-source reference materials spiked into an aliquot of deionized water. This sample is taken through the digestion/extraction process as though it were an actual sample. The purpose of a QCCS analysis is to determine whether failure to meet QC acceptance criteria for a matrix spike is due to matrix interference in the sample, or to an out-of-control condition associated with the analytical system.

- Method spike - known concentration of standard materials (i.e., materials used for calibration purposes) spiked into an aliquot of deionized water. This sample is processed (i.e., extracted, digested) like all natural matrix samples. The purpose of a method spike, or blank spike, is to determine if the analytical system is in control, and capable, per method specifications.

- Matrix spike/matrix spike duplicates (MS/MSD) - splits from field samples spiked with known concentrations of reference materials and taken through the entire digestion/extraction process. The matrix spike allows the laboratory to assess the efficiency of extraction, accuracy of the analysis, and possible matrix effects. Analysis of a duplicate matrix spike, another aliquot of the sample spiked at the same concentration as the MS, allows the laboratory to assess precision at known concentrations.

- Surrogate spikes - For GC and GC/MS analyses, identifiable compounds not present in the sample matrix are added to every field sample.

- Duplicate analyses - samples split in the lab and treated as two independent samples. For Holloman AFB, approximately 5% of each sample batch will be analyzed in duplicate for the water quality parameters, as required by the appropriate method.

- ICPES interference check sample - an ICPES QC check sample which contains interferents and analyte concentrations at levels specified by EPA. Analyzed at the beginning and end of each sample analysis sequence, results are used to verify inter-element and background correction factors.

3.0 FIELD ACTIVITIES

In order to achieve the objectives of this investigation, the contractor will perform a series of field tasks at Holloman AFB. These activities were developed according to this workplan for Holloman AFB. The activities include: 1) utility clearance; 2) soil gas survey in spill area; 3) soil sampling of remediated soil. Each of these activities is discussed in detail in this section.

3.1 List of Equipment, Containers, and Supplies

The implementation of the field activities will require specific equipment, containers, and supplies for the collection of field samples as summarized below.

Sampling Equipment

- Auger accessories

Sampling Bottles

- 500 ml wide-mouth glass with Teflon cap
- 1 quart plastic freezer bags, (for transporting bottles and ice).

Miscellaneous Field Gear and Instrumentation

- Photoionization detector
- Latex gloves;
- First aid kit.

3.2 Sampling Locations

One site is addressed in this CDAP. Information regarding the site location and past disposal practices will be collected and documented. In addition to site descriptions, the field activities, sampling rationale, sample locations and chemical analyses are discussed for the site. The location of the JP-4 Fuel Spill Area is shown in Figure 3-1. Soil gas survey and soil samples will be the methods used to investigate the site.

3.2.1 JP-4 Fuel Spill Area

3.2.1.1 Site Description

The JP-4 Fuel Spill Area is located east of Building 869 adjacent to the West Area Petroluem, Oil and Lubricants (POL) Storage Area (Figure 3-1).

On 8 July 1992, Hensel Phelps Construction Company was performing a fuel system check for the F-117A Stealth Fighter. A valve was accidently left open and, as a result, approximately 4000 gallons of fuel were released to the environment. The fuel leak occured in a manhole and the fuel was released to the surface through the manhole. Approximately 2000 gallons of fuel were recovered. It was believed, at first, that only 500 gallons of fuel were released to the surface but, upon review of fuel records, it was determined that 2000 gallons were accounted for.

3.2.1.2 Site Investigation

Field activities and chemical analyses for theJP-4 Fuel Spill Area are discussed in the following paragraphs. Figure 3-2 illustrates the proposed soil gas survey and soil sample locations.

A total of six soil samples will be collected in the bermed area for chemical analysis. The sampling locations can be viewed in Figure 3-2. Hand augered samples will be collected down to a depth of 3 to 6 inches. For all soil samples, the soil analyses will include TCLP volatile organics and TCLP lead.

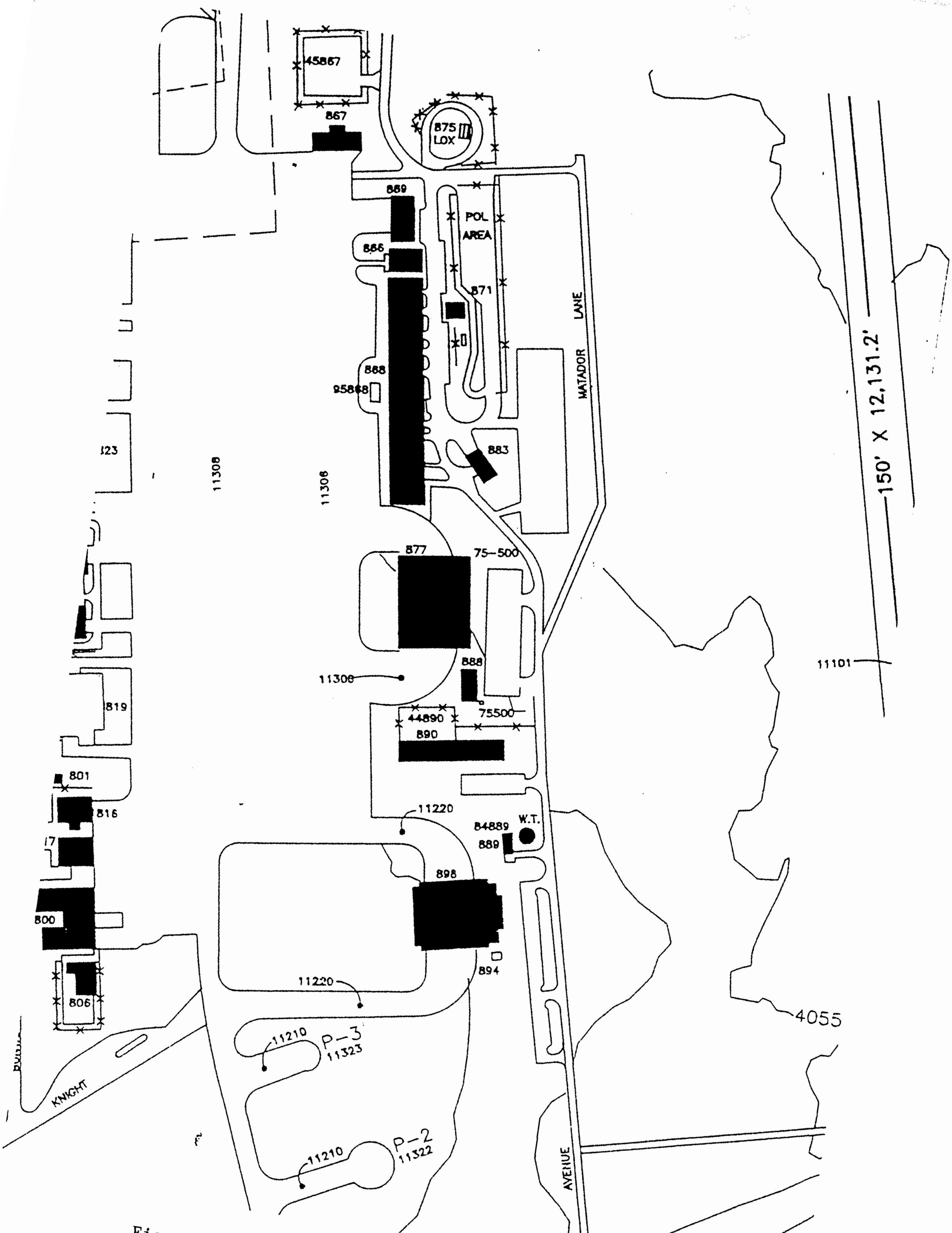

Figure 3-1, JP-4 Spill Area

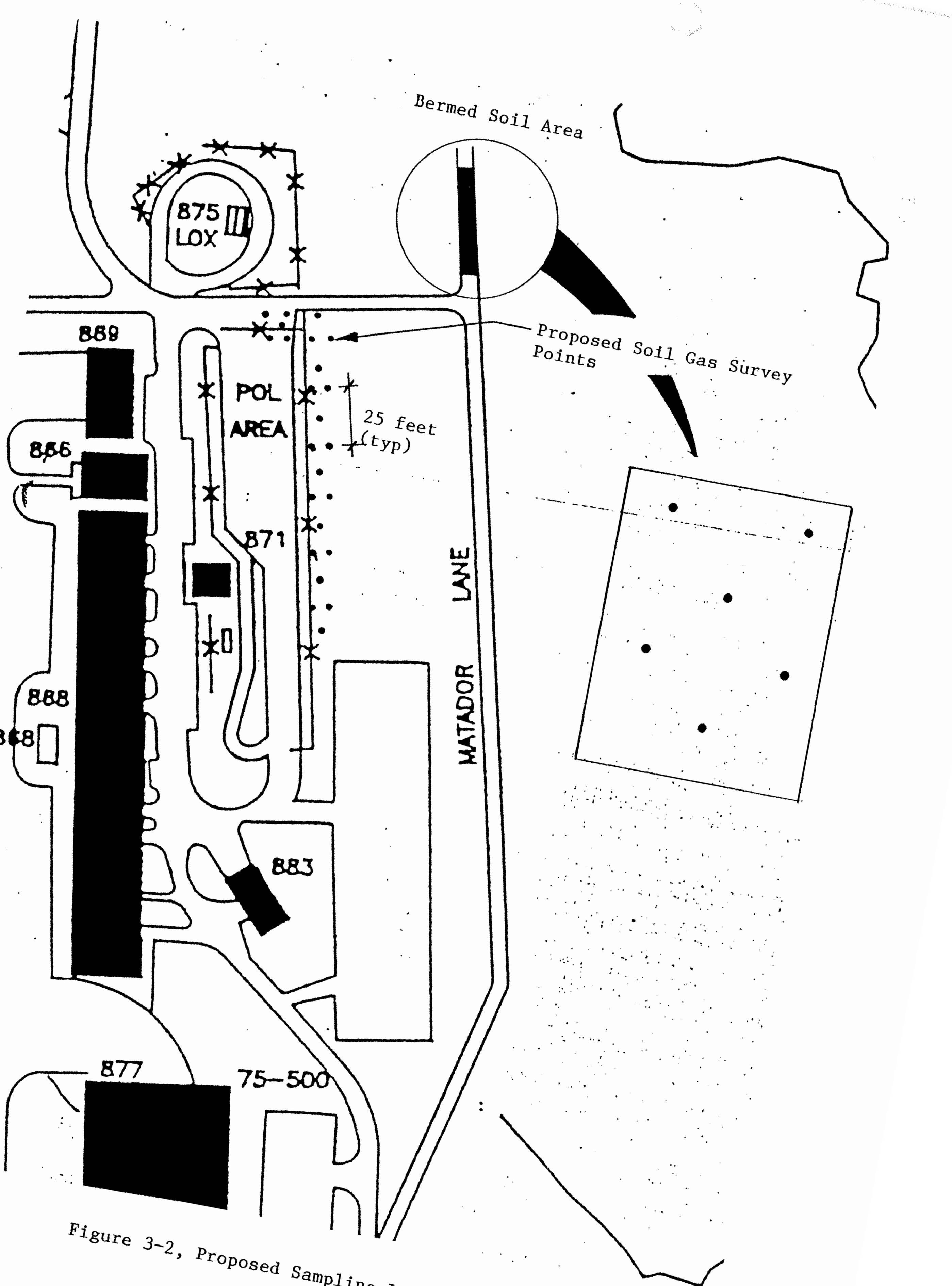

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Figure 3-2, Proposed Sampling Locations

3.3 General Information and Definitions

3.3.1 Laboratory Information

3.3.1.1 Contractor Laboratories

All chemical analyses will be conducted by EPA certified laboratories.

3.3.2 Decontamination Procedures for Sampling Equipment

To ensure that soil sampling equipment is not contaminated or cross-contaminated by materials and equipment used in the course of the investigation, the following procedures will be used to decontaminate hand auger and other sampling equipment between and before usage:

- Wash with ALCONOX® detergent;
- Rinse with potable water;
- Rinse with laboratory reagent grade water; and
- Allow to air dry.

The hand augers will be decontaminated between each boring. Wash and rinse water used during all decontamination activities will be tested for TCLP volatile organics and lead and disposed of in accordance with DOT and RCRA regulations.

3.4 Sampling and Preservation Procedures

Sampling and analytical efforts to be completed for this investigation are to characterize the soil at the site. The following section discusses the sampling methodologies and field documentation procedures. For each sampling methodology, the following are discussed: sample locations; sampling and QA/QC procedures; analyses; and sample containers, preservation, and holding times. Figure 3-2 shows the site and the proposed soil and gas survey sampling locations selected for the investigation.

3.4.1 Hand Auger Samples

Samples will be collected by hand auger in the bermed area. The sampling methodology and field screening techniques are discussed in detail in the following section.

3.4.2.1 Location

Samples will be collected from the proposed sampling grid for each site.

3.4.2.2 Sampling Procedures

A stainless steel hand auger will be used for sample collection. The hand auger will be advanced to the appropriate depth, decontaminated and then sampling will occur. The sample will be collected from 0.5 to 1 foot below the surface. The sample will then be removed from the hand auger and placed in a stainless steel bowl for homogenization. All sample handling activities will be accomplished with a stainless steel tool and minimum contact with decontaminated gloves. Additional samples will be necessary for the required QA/QC.

After samples are collected, visual, physical and other characteristics will be recorded on the sampling logs.

3.4.2.3 Quality Assurance/Quality Control Sample Procedures

The following paragraphs discuss the field QA/QC samples for analytical samples and their collection and procedures.

QA and QC Split Samples - QA and QC samples (duplicates) will be collected for all analyses for each analyte. The soil will be divided equally among all containers for both standard and duplicate samples.

Matrix Spike and Matrix Spike Duplicate (MS/MSD) - QC MS/MSD samples will be collected for each analysis.

Trip Blanks - QA and QC trip blanks consist of 40 mL VOA vials filled by the laboratory with Type I reagent water. Trip blanks will accompany all ice chests that contain volatile organic samples during both the sampling activities and the shipping procedures.

3.4.2.4 Analysis

Soil samples for laboratory analysis will be analyzed by an EPA certified laboratory for all chemical analysis. Soil samples will be analyzed for TCLP lead and TCLP volatile organics.

3.4.2.5 Sample Containers, Preservation, and Holding Times

The sample containers, preservation measures, and holding times for soil analyses to be conducted in accordance with EPA protocol.

3.4.3 Field Documentation

3.4.3.1 Field Log Book and Other Documentation

A Field Log Book is kept by the contractor. All other personnel involved in field activities will be required to keep a similar log book. The Field Log Book will serve primarily as a daily log of activities carried out during the investigation. Any observations during sampling activities will be recorded in this book. Other observations may be included as the situation dictates for a thorough record to reconstruct the events concerning all field activities. The Field Log Book is a bound book with sequentially numbered pages and a unique document control number.

A separate log book will also be used during sampling activities to record sampling locations and the unique number assigned to the corresponding samples collected from that particular soil sampling location. This will be done in addition to the required chain-of-custody forms.

3.4.3.2 Photographs

Field activities will be visually documented by the contractor with 35-mm color slides. The contractor will record photographs with a brief description of each in the Field

Log Book. At a minimum, photos will be taken of each site before and after the field investigation to document site restoration.

4.0 SAMPLE CHAIN OF CUSTODY, PACKING, AND TRANSPORTATION

A sample label (Figure 4-1) will be affixed to all sampling containers submitted for laboratory analysis. Sample labels identify the sample by documenting the sample type, sampler(s) initials, sampling locations, depth, time, and date. The unique number assigned to each sample is also noted on the sample label. Indelible ink will be used to complete all sample labels.

A chain-of-custody form (Figure 4-2) will be used to record the number of samples collected and the corresponding laboratory analyses; indelible ink will be used. Information on this form includes time and date of sample, sample number, type of sample, sampler's name, preservatives used, and any special instructions. Samples collected for matrix spike/matrix spike duplicate analysis will be identified on the chain-of-custody form. A copy of the chain-of-custody form will be retained by the sampler, and will be maintained in a file of field documentation.

All samples will be kept cool during collection and shipment with regular ice in a plastic bag. The samples will be stored upright in a durable ice chest. Sufficient packing material (i.e., vermiculite) will be used to separate the bottles, filling any intervening voids.

The ice will be placed above and around the top of the sample containers. The remaining space will be filled with additional packing material. The chain-of-custody form will be sealed in a plastic Zip-loc® bag and affixed to the top lid of the cooler. The cooler will be secured by completely wrapping it with strapping tape around both ends. If there is a drain on the cooler, it will be taped shut. The cooler will be labeled with "This Side Up" arrows on two opposing sides. Custody seals will also be affixed to coolers to indicate tampering.

Groundwater and soil samples will be shipped to the laboratory by overnight courier on a daily basis.

ATTENTION: BEFORE OPENING NOTE IF CONTAINER WAS TAMPERED WITH.	CUSTODY # ______________________	**ATTENTION:** BEFORE OPENING NOTE IF CONTAINER WAS TAMPERED WITH. 8-90-12896

Field Number ______________________

Sample Type: ______________________

Client: ______________________

Location: ______________________

Preservative: ______________________

Sampler: ______________________

Date: ______________________

Comment: ______________________

6-89-31426

Figure 4-1 Example Sample Label and Custody Seal

Chain of Custody Record

Page ______ of ______

PROJECT		
SITE		
COLLECTED BY *(Signature)*		

FIELD SAMPLE I D	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	ANALYSES								REMARKS	SAM ID NO. *(for lab use only)*

REMARKS									RELINQUISHED BY:	DATE	TIME
RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY:	DATE	TIME	TEMP°C	SEAL #	CONDITION
REMARKS:									

Figure 4-2 Sample Chain-of-Custody Record