FORMER LAREDO AIR FORCE BASE
(Laredo International Airport)

SAMPLING AND ANALYSIS PLAN

Remedial Investigation of Fire Training Area Burn Pits

Prepared by the U.S. Army Corps of Engineers - Tulsa District
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1.0 Introduction.

In 1942, the U.S. Government built Laredo Air Force Base. In 1974, the base was closed and transferred to the City of Laredo, Texas. The former Laredo Air Force Base now serves as the Laredo International Airport (LIA). Routine airport operations are currently being performed.

The U.S. Army Corps of Engineers (USACE), Tulsa District, has been contacted by the City of Laredo regarding the remedial investigations of Fire Training Area (FTA) Burn Pits built and operated by Laredo Air Force Base personnel in the past. The City of Laredo has operated one of two burn pits for training exercises for the city fire department.

The site is approximately 500' wide by 700' long and comprises approximately 8 acres of open area next to the airport. The site was unsecured prior to the USACE site visit. USACE officials requested city officials to install a fence around the area. Jet and possibly gasoline fuel contamination is suspected to exist at the site.

A preliminary site investigation was previously conducted by TAC Environmental. Surface and subsurface soil samples from five shallow borings were collected from the site. Total petroleum hydrocarbon (TPH) results of 29,900 ppm were detected at the surface. TPH results of 7,340 ppm were detected at a depth of five feet in the soil.

Monitoring well logs from the August, 27, 1992 Quarterly Groundwater Monitoring Report for the Fuel Farm which is located 4500' south of the FTA burn pits indicate the shallow subsurface geology to be fine to medium silty sand with gypsum crystals and partings to a depth of 25' when borings were terminated. The water table at the site is expected to be between 10' to 15'.

The purpose of this remedial investigation is to **detect and delineate the vertical and horizontal extent of any hydrocarbon groundwater plume(s) and soil contamination associated with the FTA burn pits.** The primary investigation will be accomplished with the Site Characterization and Analysis Penetrometer System (SCAPS) and Field Gas Chromatograph operated by USACE Tulsa District crews.

2.0 Field Sampling and Analysis Techniques.

The Site Characterization and Penetrometer System (SCAPS) is capable of determining soil stratigraphy, the collection of soil samples, and the ability to install and grout temporary wells. The SCAPS includes a suite of surface geophysical equipment and special cone penetrometer with screening sensors for contamination detection, and soil and pore fluid penetrometer samplers. The SCAPS screening pentrometers are equipped with sensors that can determine physical and chemical characteristics, i.e., strength, electrical resistivity, spectral properties, and electroactivity, of soil layers through which the penetrometer tip is forced.

The SCAPS is mounted on a Kenworth truck chassis weighing approximately 40,000 lbs. The truck is equipped with two hydraulic rams capable of exerting approximately 38,000 lbs. of force to make a direct push. The weight of the truck is supported by hydraulic jacks while the penetrometer is pushed into the ground with the hydraulic rams.

The portable Gas Chromatograph (GC) is capable of screening soil and groundwater media for a number of volatile aromatic and chlorinated hydrocarbon contaminants at the PBB range. The GC provides semiqualitative and semiquantitative on-site field data. The GC is used to provide quick information regarding volatile organic contamination and directing the investigation activities of the SCAPS at the site. The GC is operated from inside a field trailer parked near the site.

Technical details regarding both of these operations will be provided upon request.

2.1 Field Sampling Strategy. A grid system will be established over an area of 500' by 700' and staked on 50' centers by a survey crew. The SCAPS will be used to analyze the staked locations near the burn pits for hydrocarbon contamination. The SCAPS will also be used to sample subsurface soil locations. The GC will be used to screen soil samples collected from the surface and subsurface locations.

If contamination can be detected by either the GC or SCAPS then further sampling locations will be chosen to delineate the extent of contamination. Additional chemical parameters will be collected to provide more detailed information concerning the site. Temporary wells will be installed by the SCAPS once soil contamination has been adequately delineated. Groundwater samples will be screened on-site by the GC and distributed to a USACE certified laboratory for further analysis.

If no contamination can be detected by either the GC or SCAPS and soil contamination is evident, then a number of surface and subsurface soil samples will be collected. Additionally, a number of temporary wells will be installed and groundwater samples will be collected. All analytical samples will be distributed to a USACE certified laboratory for further analysis. Additional soil and groundwater investigations may be required to further delineate the site once the analytical data has been reviewed and validated.

Soil samples will be taken at 1', 5', and 10' depth intervals from each location. Temporary wells are to be installed at a depth of 20'. Approximately 50 locations will be identified by the survey crew. Dependent upon site conditions and field results, the field manager and technical manager will modify the grid system and sampling methodology when appropriate.

2.2 Sampling Requirements.
Soil, groundwater, and investigative derived waste samples are anticipated to be collected and distributed to USACE certified laboratories for analysis.

2.2.1 Soil Sampling. Soil samples will be taken at 1' depth interval by hand augering. Soil samples will be taken at 5' and 10' depth intervals by the SCAPS. Soil samples will be collected with clean stainless steel spoons, knives, bowls, etc. Equipment blanks will be collected from 20% of the sampling locations. Quality assurance (QA) samples will be collected from 10% of the sampling locations and distributed to USACE certified laboratories. Select QA samples will be collected from high, middle, and low contaminated soil locations.

Soil sample locations will be numbered sequentially and in the order they were drilled. Sampling depths will be incorporated into the sampling identity.

Example 2-2a: A soil sample gathered at a 4- 5' depth from location #44 would be reported as "SL 44 (4-5')"

2.2.2 Groundwater Sampling. Temporary 3/4" diameter PVC wells will be installed and sampled by stainless steel or Teflon bailers. Temporary wells are expected to be installed at a 20' depth. All temporary wells will be sampled within 24 hours of installation. QA samples will be collected from 10%-20% of the well locations and distributed to USACE certified laboratories. Select QA samples will be collected from the high, middle, and low contaminated well locations. Equipment blanks will be collected from 20% of the well locations and analyzed by the field GC.

Temporary well locations will be numbered sequentially. Water level and well depth information from each location will be documented and reported. Water quality parameters such as temperature, pH, and conductivity will be analyzed in the field dependent upon the recharge capability of each well. Water samples will be designated with the letter W as shown below.

Example 2-2b: Well water collected from location #3 will be reported as "3W"

Quality assurance samples will be designated by "-QA" as shown below.

Example 2-2c: Quality assurance sample collected for "SL 44 (4-5')" will be identified as "SL 44 (4-5')QA"

2.2.3 Investigative Derived Waste (IDW) Sampling. Soil cuttings, purge water, and decontamination liquids are expected to be generated during the investigation. Soil and liquid wastes will be managed separately. Soil cuttings will be placed back into the actual burn pit area where the highest contamination is located on the surface unless the USACE is directed otherwise.

If soil cuttings must be containerized, then not more than 20 gallons are expected to be generated. Soil cuttings will be managed in a 55 gallon "open-top" DOT certified drum. Soil cuttings from different locations will be managed together due to the small amount of waste anticipated to be generated.

Purge water and decontamination liquids will be managed together due to the small amount of waste anticipated to be generated. Not more than 100 gallons of liquid are expected to be generated. All liquids will be managed in 55 gallon "bung" DOT certified drums. Drums will be placed on pallets.

All drums will be appropriately labeled and secured on the site. Samples will be designated with the prefix "IDW". Soil and liquid samples will be referred to as "SL" and "DECON" as shown below.

Example 2-3 IDW soil samples collected from a 55 gallon drum will be labeled as "IDW-SL". IDW water samples collected from a 55 gallon drum will be labeled as "IDW-DECON"

The USACE will be responsible for the appropriate disposal of all wastes generated during the field investigation. Results from the IDW sampling will be provided to the City of Laredo officials.

2.3 Analytical Requirements.

2.3.1 Soil and Groundwater. Analytical parameters were chosen to best characterize the site for petroleum hydrocarbon contamination. All soil and groundwater samples will be analyzed for the following parameters:

a. SW846 method 8020 (aromatic hydrocarbons)
b. SW846 method 8015 modified (total petroleum hydrocarbon)
c. SW846 method 6010 (lead)

In case the temporary wells do not sufficiently recharge, groundwater samples will be collected in the order listed above.

If volatile organic analytes are detected by the on-site GC, then SW846 method 8260 (Volatile Organics) may be substituted for SW846 method 8020.

A select number of soil locations will be analyzed for additional soil parameters. These parameters were chosen to characterize the site for unexpected contamination not related to burn pit operations conducted by the Air Force or city officials. These parameters include:

a. SW846 method 8260 (volatile organics)
b. SW846 method 8270 (semivolatile organics)
c. SW846 method 6010, 7740, 7471,7060 (RCRA metals, i.e., arsenic, barium, cadmium, chromium, lead, mercury, silver, and selenium)

2.3.2 Investigative Derived Waste. If required, all IDW soil samples will be analyzed for the following parameters:

a. SW846 method 1311/8260 (volatile organics)
b. SW846 method 1311/8270 (semivolatile organics)
c. SW846 method 1311/6010,7740,7471,7060 (RCRA metals, i.e., arsenic, barium, cadmium, chromium, lead, mercury, silver, and selenium)
d. SW846 method 8020 (aromatic hydrocarbons)
e. SW846 method 8015 modified (total petroleum hydrocarbon)

All IDW liquid samples will be analyzed for the following parameters:

a. SW846 method 1311/8260 (volatile organics)
b. SW846 method 1311/8270 (semivolatile organics)
c. SW846 method 1311/6010,7740,7470,7060 (RCRA metals, i.e., arsenic, barium, cadmium, chromium, lead, mercury, silver, and selenium)
d. SW846 method 8020 (aromatic hydrocarbons)
e. SW846 method 8015 modified (total petroleum hydrocarbon)

SW846 method 1311 denotes the Toxicity Characteristic Leaching Potential (TCLP) extraction procedure used to evaluate the leaching potential of chemical analytes in soil and water matrices.

2.4 Sampling and Shipment Procedures.

2.4.1 Sampling and Shipping Guidance. The USACE follows guidance set forth in several documents, which include but are not limited to:

- EPA/540/P-91/007 "Compendium of ERT Groundwater Sampling Procedures"
- EPA/540/P-91/006 "Compendium of ERT Soil Sampling and Surface Geophysics Procedures"
- EPA/540/P-87/001 "Compendium of Superfund Field Operations Methods"
- EPA/530-R-93-001 "RCRA Groundwater Monitoring Technical Guidance"
- USACE EM-200 volumes I, II, and III (In-house standard operating procedures).

2.4.2 Sample Containers and Preservation. A table describing sample containers and preservations techniques is included below.

Table 2-4 Sample Containers

Medium	Chemical Parameter	Container Type	Number of Containers	Preservation
Soil	Volatile organics	4 oz. Glass jar	1	None
	Semivolatile organics	4 oz. Glass jar	1	None
	RCRA metals	4 oz. Glass jar	1	None
	TCLP volatile organics	16 oz. Glass jar	1	None
	TCLP semivolatile organics	16 oz. Glass jar	1	None
	TCLP RCRA metals	16 oz. Glass jar	1	None
	Total petroleum hydrocarbons	8 oz. Glass jar	1	None
	Aromatic hydrocarbons	4 oz. Glass jar	1	None
Water (liquid)	Volatile organics	40ml glass vial	3	w/ HCl

Table 2-4 Sample Containers				
Medium	Chemical Parameter	Container Type	Number of Containers	Preservation
	Semivolatile organics	1L amber glass bottle	2	None
	RCRA metals	1L HDPE bottle	1	w/ HNO_3
	TCLP volatile organics	40ml glass vials	3	None
	TCLP semivolatile organics	1L amber glass bottle	2	None
	TCLP RCRA metals	1L HDPE bottle	1	None
	Total petroleum hydrocarbon	1L amber glass bottle	2	w/ H_2SO_4
	Aromatic hydrocarbons	40ml glass vials	3	w/ HCl

2.4.3 Shipment Instructions. All analytical samples will be shipped to the USACE Southwestern Division Laboratory at the address given below:

Attention: Randy Smith

U.S. Army Corps Of Engineers
Southwestern Division Laboratory
4815 Cass St.
Dallas, Texas 75235
(214) 905-9130
(214) 905-9135 Fax

Results for all analytical samples will be required to be reported in 30 days from time of arrival at the laboratory.

3.0 Data Quality Objectives and Laboratory Deliverables.

Data quality objectives (DQOs) are qualitative and quantitative statements which specify the quality of data required to support decisions made during the investigative activities of a project. The USACE requires that the DQOs for a project be clearly stated within the text of the project work plan.

Data collected for this investigation will be used to satisfy the purpose discussed in Section 1.0 of this report.

To ensure that the quality of data is adequate for the decision making process, the USACE requires that the following laboratory deliverables be provided:

- Results of field samples, laboratory blanks, surrogate spikes, surrogate recoveries, matrix spikes, laboratory control samples, laboratory duplicates, matrix spike duplicates, relative percent differences, field duplicates, and field blanks.
- The selected analytical methods must be able to adequately detect the analytes of concern. Action levels must be taken into account by the technical staff.
- Sample identification numbers cross-referenced with laboratory identification numbers and quality control sample numbers. Table(s) which cross reference field samples with associated method blanks, matrix spikes, and matrix spike duplicate samples.
- Legible copies of the fully executed chain of custody forms and cooler receipt forms on which the laboratory has documented the condition of the samples on arrival.
- Each analyte will be reported as an actual value or less than a specified quantitation limit. Actual sample results and detection limits will be reported in a tabular format. Data qualifiers will be used to address sample/analytical anomalies associated with an analyte.
- Soil samples will be reported on a dry weight basis with moisture content. Dilution factors, sampling dates, extraction dates, and analysis dates will also be reported.
- ASCII or DBASE format data files, submitted per the "Guidance for Submittal of Data of Electronic Media for the Tulsa District HTRW Project Database."

The analytical details, such as, surrogate and spike recoveries, calibration data, mass spectra, chromatograms, performance standards, and other lab quality control information are available to the Tulsa District upon request.

4.0 USACE Employees.

The following list relates USACE personnel to their assigned duties:

Project Manager:	Lisa Lawson	918-669-7551
Technical Manager:	Frank Martin	918-669-7046
Field Manager:	Steve Brewer	918-832-4122
Driller:	Jeff Lacquement	918-669-4122
Driller's Assistant:	Carl Sloan	918-669-4122
Industrial Hygienist:	Greg Snider	918-669-7073
Chemist:	Chris Kennedy	918-669-7072