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SCIE-COM-289-98

SAMPLING & ANALYSIS PLAN

FOR THE

LANDFILL CLOSURE: REMOVAL AND DISPOSAL OF GROUP "C" AND CENTRAL LANDFILLS FORT WINGATE, NEW MEXICO

December 29, 1998

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for

U. S. Army Corps of Engineers
Fort Worth, Texas

Contract No. DACA 63-98-C-0065

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ACRONYMS

bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, Liability Act
CFR	Code of Federal Regulations
COC	Chain-of-Custody
CQAR	Chemical Quality Assurance Report
CQC	Contractor Quality Control
EI	Environmental Investigation
EPA	Environmental Protection Agency
EPP	Environmental Protection Plan
ERM	Environmental Resource Management
FWDA	Fort Wingate Depot Activity
LCSs	Laboratory Control Standards
MIPR	Military Interdepartmental Purchase Request
NMED	New Mexico Environmental Department
OE	Ordnance or explosives
OVA	Organic Vapor Analyzer
PCB	Polychlorinated Biphenyl
Pb	Lead
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
QAPjP	Quality Assurance Project Plan
RCA	Recommendation for Corrective Action
SAP	Sampling and Analysis Plan
SSHP	Site Safety and Health Plan
SVOC	Semi-Volatile Organic Chemical
SWDL	Southwestern Division Laboratory
USACE	United States Corps of Engineers
UXO	Unexploded Ordnance
VOC	Volatile Organic Compounds

SCIENTECH, INC.
SAMPLING AND ANALYSIS PLAN COVER SHEET
SCIE-COM-289-98

Project Name: Landfill Closure: Removal and Disposal of Group "C" and Central Landfills, Fort Wingate, New Mexico
Project Number: 11507-0004
Revision: 0

Safety Related (S/R) ____X   Non-Safety Related (N/SR): ____
Required Approvals:

SCIENTECH, Inc. Project Manager ____ Date 12/30/98

SCIENTECH, Inc., Group/Program Manager ____ Date 12-29-98

Required Acceptance:

M. R. Tafoya Project Manager ____ Date 12/31/98

Distribution:
U.S. Army Corps of Engineers
M. R. Tafoya
SCIENTECH, Inc.

SAMPLING & ANALYSIS PLAN FOR THE LANDFILL CLOSURE: REMOVAL AND DISPOSAL OF GROUP "C" AND CENTRAL LANDFILLS, FORT WINGATE, NEW MEXICO

1.0 Project Description

This project consists of the Comprehensive Environmental Response, Compensation, Liability Act (CERCLA) remediation of two inactive landfills at Fort Wingate, New Mexico. Both landfills are located in arroyos at the Fort Wingate Depot Activity (FWDA), and both are known to contain unexploded ordnance (UXO). The scope of work includes excavation and sorting of landfill contents, segregation of soils and wastes by type, destruction of ordnance and explosive waste, off-site disposal of contaminated soils and materials, salvage of recyclable waste, replacement of clean soils, and revegetation reclamation of the landfills at completion of the job.

1.1 Site History

The Group "C" and Central Landfills are inactive dumpsites located in the FWDA area. The waste disposal area identified consists of two arroyo banks over which materials were dumped. This arroyo is a tributary to the main surface drainage channels and primarily consists of alluvial deposits with bedrock encountered during a recent Environmental Investigation (EI) trenching activities at approximately 11 to 15 feet below ground surface (bgs). The areas are defined by visible piles of debris. The maximum depth of waste observed in both disposal areas during trenching activities ranges from approximately 5 to 15 feet bgs, although in some areas waste was observed at shallower depths.

1.2 Site Contamination Characterization

In 1996, investigation activities were conducted which included trenching and test pit installations to further evaluate site conditions. During field activities, waste encountered in the Group "C" and Central Landfill Areas were generally solid wastes of the sort typically generated during warehousing and demilitarization of munitions. Empty metal containers (e.g., fuse cans and 3.5-inch rocket canisters) and metal banding (typical of that used to secure pallets of munitions) were common, as were plastic bags and ash. Construction and demolition debris (e.g., metal debris, wood debris, and concrete rubble) was present. Minor amounts of tires, empty paint cans, and household wastes, such as bottles and trash, were encountered.

Unusual materials identified in the Group "C" and Central Landfill Areas included:

- Several 3.5-inch rocket practice projectiles and other UXO related scrap;
- Partially crushed empty drums with associated minor soil staining and organic vapor analyzer (OVA) readings of 3 parts per million or less;
- One corrugated transite panel approximately 2 feet by 4 feet, that was confirmed as an asbestos containing material.

No other soil staining or elevated OVA readings were observed in the Group C Disposal Area. Low concentrations of semi-volatile organic chemicals (SVOCs), pesticides, nitrate/nitrite, and metals exceeding background levels were detected in a number of waste samples collected in 1996. Two native soil samples collected below waste materials contained one chemical constituent of concern each at a concentration exceeding the background level (nitrate/nitrite and zinc). All remaining native soil samples contained no concentrations of chemicals of concern above background levels. Detected chemical constituents of concern are presented in Appendix A "Detected Constituents of Concerns."

Samples taken in 1996 in the Central Landfill Area indicated low concentrations of SVOCs, pesticides, nitrate/nitrite, and metals that exceed background levels in a number of waste samples. Several native soil samples collected below waste materials contained SVOCs, metals, and pesticides above background levels. All remaining native soil samples contained no concentrations of chemicals of concern above background levels. Detected chemicals constituents of concern are presented in Appendix A "Detected Constituents of Concerns."

With the exception of potential UXO-related materials, the results of the historic investigations indicate overall non-hazardous site conditions. However, since these investigations were not totally comprehensive, the potential exists for unknown conditions to be encountered. The M. R. Tafoya Project Team will proceed under the assumption that site conditions may become hazardous.

Sampling and analysis protocols that are available for assessment of the indicated contaminants are described in this plan.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The responsibilities for the successful completion of the tasks prescribed in this plan reside with designated Contractor site personnel and the sub-contracted laboratory. The Sampling and Analysis Program is administered at the project level by the Contractor Quality Control (CQC) System Manager, who oversees preparation and submittal of all required project documentation.

Job-site supervision is performed by the Site Superintendent, who is assisted by team leaders with responsibilities for safety, environmental, and explosives.

The project organization is presented in Figure 1. Project personnel are listed below:

Terry Ortiz	Project Manager/Site Superintendent/Scheduler
Wes Hoover	CQC Systems Manager
Arlo R. Holbrook	Alternate CQC Systems Manager/Environmental Lead
Marry Ann Chillingsworth	Safety & Health Manager
Kory S. Edelmayer	Site Safety & Health Officer
Donald E. Ebersole	UXO Team Leader
David C. Lindsey, Jr.	Second UXO Team Leader
Johnny W. Wade	UXO Team Member
Sidney C. Perryman	UXO Team Member

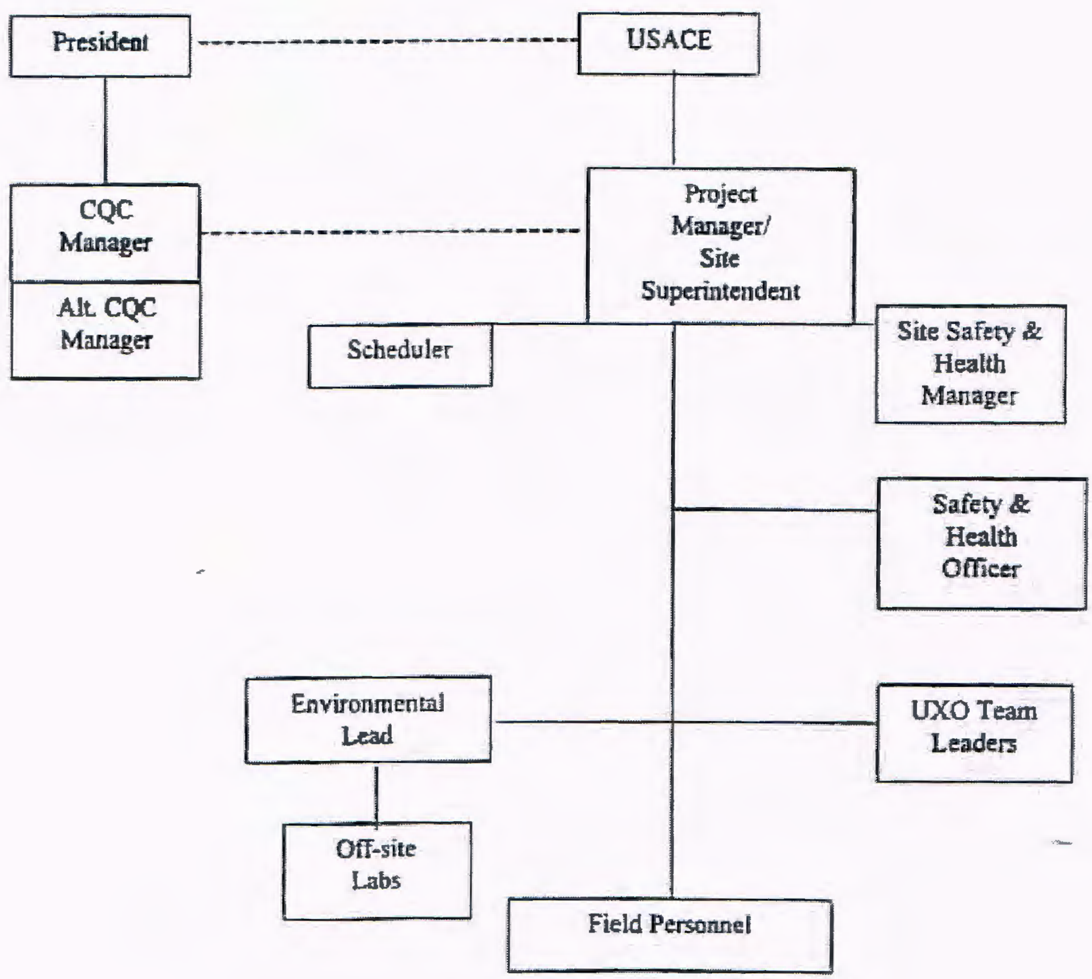

Figure 1. Project Quality Organization.

- Ensuring that all personnel involved in the project work are aware of, understand, and comply with project requirements;
- Performing such surveillance as is required to ensure compliance with project requirements;
- Chairing project quality meetings and preparing separate minutes of these meetings to be attached to the daily CQC report;
- Performing daily checks to assure control activities, including control testing, are providing continuing compliance with contract requirements;
- Preparing and maintaining daily CQC reports;
- Reporting deficiencies to the Project Superintendent, and through the Project Manager to USACE;
- Ensuring that nothing is built upon or conceals non-conforming work;
- Reviewing, approving, and transmitting submittals through the Project Manager in accordance with Section 01300 of the contract;
- Maintaining the submittal register and submitting it through the Project Manager to the Contracting Officer at least every 60 days; and
- Conducting an inspection of the work and developing a "punch list" near the completion of any increment of the work established by a completion time stated in the Special Clause entitled "Commencement, Prosecution, and Completion of Work" or stated elsewhere in the specifications.

Alternate CQC System Manager – Arlo R. Holbrook

Mr. Arlo R. Holbrook, introduced below as Environmental Lead, will serve as the Alternate CQC System Manager. Mr. Holbrook will assume the responsibilities of CQC System Manager in the event of Mr. Hoover's absence from the job site.

Safety and Health Manager – Mary Ann Chillingsworth

Ms. Mary Ann Chillingsworth has been assigned as Safety and Health Manager for this project. Ms. Chillingsworth will be responsible for overall management of the Site Safety and Health Plan (SSHP), including implementation, and will have the authority to act in all safety and health matters for the project team. Ms. Chillingsworth will report directly to the Project Manager/Site Superintendent.

Ms. Chillingsworth's responsibilities include:

- Developing, implementing, overseeing, and enforcing the SSHP;
- Signing and dating the SSHP prior to submittal;
- Overseeing site-specific training;
- Visiting the site as needed throughout the project, to audit the effectiveness of the SSHP;
- Remaining available for emergencies;
- Providing onsite consultation as needed to ensure the SSHP is fully implemented;

- Coordinating any modifications to the SSHP with the Site Superintendent, the Site Safety and Health Officer, and the Contracting Officer;
- Providing continued support for upgrading/downgrading of the level of personal protection.
- Evaluating air monitoring data and recommending changes to engineering controls, work practices, and personal protective equipment (PPE)
- Reviewing accident reports and results of daily inspections; and
- Serving as a member of the Contractor's quality control staff.

Site Safety and Health Officer (SSHO) - Kory S. Edelmayer

Mr. Kory Edelmayer has been designated as the Site Safety and Health Officer for this project.

Mr. Edelmayer's responsibilities include:

- Assisting and representing the Safety and Health Manager in onsite training and the day-to-day onsite implementation and enforcement of the accepted SSHP;
- Remaining on site on a full time basis for the duration of field activities;
- Ensuring site compliance with specified safety and health requirements, Federal , state, and OSHA regulations and all aspects of the SSHP including, but not limited to, activity hazard analyses, air monitoring, use of PPE, decontamination, site control, standard operation procedures used to minimize hazards, spill containment program, and preparing of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log;
- Having authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions;
- Consulting with and coordinating any modifications to the SSHP with the Safety and Health Manager, the Site Superintendent, and the Contracting Officer;
- Serving as a member of the Contractor's QC staff on matters relating to safety and health;
- Conducting accident investigations and preparing accident reports;
- Reviewing results of daily quality control inspections and documenting safety and health findings into the Daily Safety Inspection Log; and
- In coordination with the site management and the Safety and Health Manager, recommending corrective actions for identified deficiencies and overseeing the corrective actions.

UXO Team Leader - Don E. Ebersole

Mr. Don Ebersole has been assigned the responsibilities of UXO Team Leader for this project. He will be physically present at the work site during explosives work. His responsibilities will include:

- Assisting the Safety and Health Manager in onsite training and the day-to-day onsite implementation and enforcement of the SSHP as it applies to the UXO Operations;

Environmental Lead – Arlo R. Holbrook

Mr. Arlo R. Holbrook has been assigned as Environmental Lead on the project. Mr. Holbrook will be responsible for implementation of the Environmental Protection Plan (EPP) for the job site, and will have the authority to act in all environmental protection, sampling, and waste management issues for the project team. He will be present on site during waste management and sampling activities. Mr. Holbrook will report directly to the Project Manager/Site Superintendent. His responsibilities will include:

- Developing, implementing, overseeing, and enforcing the site's EPP;
- Signing and dating the EPP prior to submittal;
- Developing, implementing, overseeing, and enforcing the site's QAPjP;
- Signing and dating the QAPjP prior to submittal;
- Remaining on site as needed for the duration of activities, to implement the EPP and QAPjP;
- Facilitating the sample analysis contract with an accredited analytical laboratory;
- Facilitating the waste soils contract with an acceptable off-site disposal facility;
- Providing sample analysis and waste shipment expediting;
- Remaining available for emergencies;
- Coordinating any modifications to the EPP and QAPjP with the Site Superintendent and the Contracting Officer;
- Serving as a member of the Contractor's quality control staff; and
- Assuming responsibility for Chemical Data Quality Control.

3.0 SCOPE AND OBJECTIVES

The project objective is to ensure that all demolition materials, underlying soils, and generated wastes are sufficiently characterized such that all materials and waste are properly dispositioned and all soil contamination exceeding prescribed screening levels is removed from Central and Group C Landfill areas.

The scope of the sampling and analysis effort is described in Section 4.0, Field Activities, of this plan. Samples will be collected from in-place-soils, subsurface soils, and wastes, and will be analyzed for the materials listed in Appendix A "Detected Constituents of Concern."

4.0 FIELD ACTIVITIES

This section identifies the sampling and analysis rationale (i.e., sample location, sample frequency, required analysis, and QA/QC requirements) and the procedures for sampling and decontamination. The rationale is based on sampling performed at the Group "C" and Central Landfills in 1996 by Environmental Resource Management (ERM) (see report "Debris Piles and Burial Sites Investigation Report, Elin A009" dated 21 March 1997).

4.1 Surface Soil

- Samples will be taken of surface soils from Group "C" and Central Landfills during excavations.
- Samples will be collected on an established and documented grid system that provides for the collection of six samples for every 0.5-acre area, with sample locations determined on a random basis.
- Samples from each 0.5 acres will be physically mixed (homogenized) and one or more composite samples will be drawn from the mixture and analyzed.
- Samples will be laboratory analyzed for explosives, volatile organic compounds (VOCs), SVOC, total metals, pesticides, and polychlorinated biphenyls PCBs, utilizing the methods indicted in Section 5.1, Analytical Procedures, Sample Preservation, and Holding Time.
- QA/QC samples will be collected and analyzed in accordance with the protocols prescribed in Section 5.0, Data Quality Objectives.
- Soil samples will be collected from a depth of 12 inches in accordance with Method II-1 of EPA-600/4-84-076, which is provided in Appendix B.

4.2 Subsurface Soil

Waste at the Group "C" Disposal area is buried at depths of 1 to 10 feet bgs, while waste at the Central Landfill is buried at depths of 1 to 18 feet bgs.

- Samples will be taken of subsurface soils from Group "C" and Central Landfills during excavation.
- Samples will be collected on an established and documented grid system that provides for the collection of six samples for every 0.5-acre of area, with sample locations and depths determined on a random basis.
- Samples from each 0.5 acres will be physically mixed (homogenized) and one or more composite samples will be drawn from the mixture and analyzed.
- Samples will be laboratory analyzed for explosives, VOCs, SVOC, total metals, pesticides, and PCBs utilizing the methods indicted in Section 5.1, Analytical Procedures, Sample Preservation, and Holding Time.

6.0 QUALITY ASSURANCE/QUALITY CONTROL

6.1 Quality Assurance and Quality Control

Quality control samples will be taken as specified below and sent to the approved laboratory for analyses. "Blind" samples, (i.e., there will be no indication on the label or chain of custody that these samples are replicates) will be sent to the laboratory. All sampling and handling will be in accordance with to EPA-600/4-84-076 and EM-200-1-3.

6.2 Quality Control Samples

All quality control samples will be analyzed by the approved laboratory. The following paragraphs define the sample requirements.

Rinsate blanks, consisting of reagent water collected from the final decontamination rinse as prescribed by the sampling equipment decontamination procedure, will be collected and submitted to the laboratory for analysis.

QC replicate samples and QA replicate samples will be collected in accordance with the "triplicate sample methodology." Specifically, one sample will be collected using the method prescribed for the group and will be immediately split as follows:

1. Field sample for submission to the contract laboratory
2. QC replicate sample for submission to the contract laboratory
3. QA replicate sample for submission to the USACE Southwestern Division Laboratory (SWDL).

6.3 QA/QC Samples, Type, Frequency, and Analysis

QA/QC samples, type, frequency, and analyses required are indicated in Table 6-1.

Table 6-1. QA/QC Samples, Type, Frequency, and Analysis.

Sample	Type	Frequency	Analysis
Rinsate blanks	Water	1 blank/20 samples	Analyze per sample group specific requirements
QC replicate	Per sample group	1 replicate/10 samples by group or 1 sample/sample group, minimum	Analyze per sample group specific requirements
QA replicate	Per sample group	1 replicate/10 samples by group or 1 sample/sample group, minimum	Analyze per sample group specific requirements

6.4 Quality Assurance Sample Management

All QA samples will be analyzed by the USACE SWDL. All correspondence and communication with SWDL will be addressed to:

U.S. Army Corps of Engineers
Southwestern Division Laboratory
4815 Cass Street
Dallas, TX 75235-8011
(214) 905-9130
(214) 905-9135 FAX

6.5 Quality Assurance Sample Notification

SWDL will be notified at least 7 days in advance of the transportation of any samples. SWDL will be informed of the project from which the samples are being generated, the expected number of samples to be shipped, the anticipated arrival date of the samples, the Military Interdepartmental Purchase Request (MIPR) number to which costs will be charged (to be provided by the Contracting Officer), and the types of sample matrices and analyses to be performed.

7.0 SAMPLE MANAGEMENT AND DOCUMENTATION

7.1 Field Logbook

Field sampling data will be recorded in a permanently bound notebook using indelible ink, and will consist of the following:

a. Date and time of sampling
b. Sample identification - alphanumeric field sample number
c. Sample location - description of sample location, including depth, if applicable. A hand-drawn sketch of the complex, facility, or building showing sample locations and distances to landmarks will be provided.
d. Depth of sample
e. Observations, including visual descriptions of material sampled, staining (if any), presence of odors, groundwater, etc.
f. Field instrumentation readings, as applicable
g. Weather conditions (e.g., temperature, wind, clouds, and precipitation)
h. Printed name of sampling personnel

The COC records will be placed in a sealable plastic bag and taped to the inside lid of the cooler. If the cooler has a drain, it will be taped shut. The lid of the cooler will be secured by wrapping the entire cooler with strapping tape in at least two locations, ensuring that no labels are covered. Numbered and signed custody seals will then be placed on the front right and back left of the cooler and covered with wide, clear tape.

8.3 Shipping

Following the conclusion of sampling operations on any given day, samples will either be shipped directly to the appropriate laboratories, or be transferred to refrigerated storage space maintained at 4°C (39°F). In every instance, samples will be received at the appropriate laboratories within five days of sample collection, or sooner if required to meet holding times for extraction or analysis. Samples will be maintained in a refrigerated condition at all times, including during sample collection and transportation.

All samples will be packaged and transported in a manner that protects the integrity of the sample and prevents sample leakage. Samples will be packaged and handled in accordance with DOT (49 CFR 171-178), and EPA sample handling, packaging, and shipping methods (40 CFR 262.30 – 262.34).

9.0 CORRECTIVE ACTION

If QA/QC deficiencies are noted during an audit or during any phase of the activity, or if unacceptable analytical results are obtained, the Project Manager will specify corrective actions that verify compliance with the QA/QC procedures of this QAPjP. The CQC Manager is responsible for approving the corrective action.

Corrective action procedures that might be implemented as a result of audits will be developed on a case-by-case basis. Such actions usually relate to altering procedures in the field, laboratory, or office. Corrective actions could involve additional training of field personnel, altering field procedures, using different sample containers, increasing calibration and maintenance schedules of field measurement instruments, requesting that the laboratory adopt additional QC measures, or re-analyzing samples. The Environmental Lead will be responsible for initiating the corrective action. The CQC Manager or designee will be responsible for verifying enactment and effectiveness of any field-related corrective actions. The Laboratory QA Manager is responsible for all aspects of the analytical QA program.

9.1 Corrective Action Report

Problems requiring corrective action in the laboratory are documented by the use of a corrective action report. The laboratory QA coordinator or any other laboratory member can initiate the corrective action request in the event QC results exceed acceptability limits, or upon identification of some other laboratory problem. Corrective actions can include reanalysis of the sample or samples affected, re-sampling and reanalysis, or a change in procedures, depending upon the severity of the problem.

9.2 Corrective Action System

A system for issuing, tracking, and documenting completion of formal Recommendations for Corrective Action (RCA) exists for addressing significant and systematic problems. RCAs are issued only by a member of the laboratory QA group or a designee in a specific QA role. Each RCA addresses a specific problem or deficiency, usually identified during QA audits of laboratory or project operations. An RCA requires a written response from the party to whom the RCA was issued. A summary of unresolved RCAs is included in the monthly QA report to laboratory management. The report lists all RCAs that have been issued, the manager responsible for the work area, and the current status of each RCA. An RCA requires verification by the laboratory QA group that corrective action has been implemented before the RCA is considered resolved. In the event there is no response to an RCA within 30 days, or if the proposed corrective action is disputed, the recommendation and/or conflict is pursued to successively higher management levels until the issue is resolved.

10.0 SAFETY AND HEALTH

All sample collection and handling procedures will be in accordance with the requirements specified in Contract SECTION 01110 - SAFETY, HEALTH, AND EMERGENCY RESPONSE and 29 CFR 1910.120. If ordnance or explosives (OE) are encountered during any portion of work specified herein or detected as a result of laboratory analysis, (i.e., soil which analysis shows to contain 10% or more by dry weight of explosives), work will immediately be suspended in the area and both the UXO team leader and the Contracting Officer will be notified.

11.0 DATA REPORTING

11.1 Results

Results for all samples will be submitted to the Contracting Officer. Depending upon a variety of factors affecting the pace of contract activities, this may result in a series of periodic (e.g., weekly) data submittals. Analytical data will be submitted in both hard copy format and magnetic media format. Data in magnetic media format will be submitted on IBM formatted floppy disks using any of the following software applications: Lotus 2.01, dBase III, WordPerfect 5.1, ASCII, ASCII comma delimited format, or ASCII space delimited format. Deviations from the specified magnetic media format approval of the Contracting Officer.

(5) When run for internal QC, Laboratory Control Standards (LCSs) results will be reported with the corresponding field sample data. Control limits for LCSs will also be specified.

d. Field QC Replicates and Rinsate Blanks - These samples will be identified as such and reported as any other field sample would be. Relative percent differences will be reported for all field duplicate pairs.

All results of sample analyses from the approved laboratory as required by the above paragraph, will be submitted to SWDL, using the submittal letter provided in the contract specification as Appendix A to Section 01410. The submittal will be made as soon as results are available in order for SWDL to prepare a Chemical Quality Assurance Report (CQAR). SWDL will be notified at least 3 days in advance regarding the transmission of these data. Upon return receipt from SWDL, the Contracting Officer will provide a copy of the CQAR to the project team. Any problems or discrepancies identified by the CQAR will be addressed and rectified.

A copy of field log entries and COC forms for each sample will be submitted with the data submittals.

12.0 REFERENCES

Code of Federal Regulations (CFR)

29 CFR 1910.120 - Hazardous Waste Operations and Emergency Response

U.S. Environmental Protection Agency (EPA)

EPA/SW-846 -- Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition (November 1986)

EPA-600/4-84-076 – Characterization of Hazardous Waste Sites – A Methods Manual: Volume II. Available Sampling Methods, Second Edition, NTIS No. PB85-168771 (December 1984)

EPA-540-R-93-071 -- Data Quality Objectives Process for Superfund - Interim Final Guidance (September 1993)

U.S. Army Corps of Engineers (USACE)

EM 200-1-3 -- Requirements for the Preparation of Sampling and Analysis Plans (September 1994)

Detected Constituents of Concern Table

Group C Disposal Area
Fort Wingate Depot Activity
Gallup, New Mexico

TCL PEST/PCB

- alpha-Endosulfan/Endosulfan I
- beta-Endosulfan/Endosulfan II
- Endrin ketone
- Endosulfan sulfate
- Heptachlor epoxide
- 2,2-bis (p-chlorophenyl)-1,1-dichloroethane
- 2,2-bis (p-chlorophenyl)-1,1-dichloroethene
- 2,2-bis (p-chlorophenyl)-1,1-trichloroethane

TCL SVOC

- 2-Methylnaphthalene
- Benzo [A] anthracene
- Chrysene
- Fluoranthene
- Pentachlorophenol
- Phenanthrene
- Pyrene

TAL METALS

- Arsenic
- Selenium
- Lead
- Barium
- Calcium
- Cadmium
- Copper
- Zinc

MISCELLANEOUS

- Nitrite, Nitrate – nonspecific

ASBESTOS

- Chrysotile asbestos

Detected Constituents of Concern Table

Central Landfill Area
Fort Wingate Depot Activity
Gallup, New Mexico

TCL PEST/PCB
- beta-Endosulfan/Endosulfan II
- Endrin aldehyde
- Endrin ketone
- Heptachlor
- Heptachlor epoxide
- 2,2-bis (p-chlorophenyl)-1,1-dichloroethane
- 2,2-bis (p-chlorophenyl)-1,1-dichloroethene
- 2,2-bis (p-chlorophenyl)-1,1-trichloroethane

TCL SVOC
- 2-Methylnaphthalene
- Acenaphthene
- Acenaphthylene
- Anthracene
- Bis (2-ethylhexyl) phthalate
- Benzo [A] anthracene
- Benzo [A] pyrene
- Benzo [B] fluoranthene
- Benzo [G,H,I] perylene
- Benzo [K] fluoranthene
- Chrysene
- Dibenz [A,H] anthracene
- Dimethyl phthalate
- Di-N-butyl phthalate
- Fluoranthene
- Fluorene
- Pentachlorophenol
- Phenanthrene
- Phenol
- Pyrene

TAL METALS
- Arsenic
- Lead
- Silver
- Calcium
- Cadmium
- Chromium
- Copper
- Nickel
- Magnesium
- Manganese
- Mercury
- Zinc

APPENDIX B

SAMPLING METHODS

In-Place Soil

Soil samples will be taken at a depth of 12 inches using a pre-cleaned stainless steel shovel or other sampling device approved by the Contracting Officer, in accordance with Method II-1 of EPA-600/4-84-076. The in-place soil samples consist of samples within the landfill volume, settling basins, and the settling basin troughs. A normal garden spade will be utilized to remove the top cover of soil to the required depth and then a smaller stainless steel scoop will be used to collect the sample.

<u>Method II-1 of EPA-600/4-84-076</u>

1. Carefully remove the top layer of soil to the desired sample depth (12 inches)with a pre-cleaned spade.
2. Using a pre-cleaned stainless steel scoop or trowel, remove and discard a thin layer of soil from the area which comes in contact with the shovel.
3. Transfer sample into an appropriate sample bottle with a stainless steel lab spoon or equivalent.
4. Check that a Teflon liner is present in the cap, if required. Secure the cap tightly. The chemical preservation of solids is generally not recommended. Refrigeration is usually the best approach supplemented by a minimal holding time.
5. Label the sample bottle with the appropriate sample tag. Be sure to label the tag carefully and clearly, addressing all the categories or parameters. Complete all chain-of-custody documents and records in the field log book.
6. Decontaminate equipment after use and between sample locations.

Subsurface Soil

Subsurface soil sampling with auger and thin-wall tube sampler can be applied in a wide variety of soil conditions. It can be used to sample both from the surface, by driving the corer without preliminary boring, or driving the sampler to depths in excess of 19.5 feet. The presence of rock layers and the collapse of the borehole, however, usually prohibit sampling at depths in excess of 6.5 feet. Interchangeable cutting tips on the corer reduce the disturbance to the soil during sampling and aid in maintaining the core in the device during removal from the borehole.

Method II-2 of EPA-600/4-84-076

1. Attach auger bit to a drill rod extension and further attach the "T" handle to the drill rod.

2. Clear the area to be sampled of any surface debris (twigs, rocks, litter). It may be advisable to remove the first 3 to 6 inches of surface soil for an area approximately 6 inches in radius around the drilling location.

3. Begin drilling, periodically removing accumulated soils. This prevents accidentally brushing loose material back down the borehole when removing the auger or adding drill rods.

4. After reaching desired depth, slowly and carefully remove auger from boring. (Note: When sampling directly from auger, collect sample after is auger is removed from boring and proceed to Step 10).

5. Remove auger tip from drill rods and replace with a pre-cleaned thin-wall tube sampler. Install proper cutting tip.

6. Carefully lower corer down borehole. Gradually force corer into soil. Care should be taken to avoid scraping the borehole sides. Hammering the drill rods to facilitate coring should be avoided as the vibrations may cause the boring walls to collapse.

7. Remove cover and unscrew drill rods.

8. Remove cutting tip and remove core from device.

9. Discard top of core (approximately 1 inch), which represents any material collected by the corer before penetration of the layer in question. Place remaining core into sample container.

10. Check that the Teflon liner is present in the cap, if required. Secure the cap tightly. The chemical preservation of solids is generally not recommended. Refrigeration is usually the best approach supplemented by a minimal holding time.

11. Label the sample bottle with the appropriate sample tag. Be sure to label the tag carefully and clearly, addressing all the categories or parameters. Complete all chain-of-custody documents and record in the field logbook.

12. Decontaminate sampling equipment after use and between sampling locations.

Waste Wash Water and Rinsate Waters

Waste wash water will be sampled using either Method III-9 (bucket type bailer) or Method III-10 (peristaltic pump) of EPA-600/4-84-076. An alternative method, Method III-6

EPA-600/4-84-076, sampling containerized wastes using the composite liquid waste sampler (Coliwasa), is also recommended. The decision will be made by the field team leader.

Method III-6 (containerized waste) of EPA-600/4-84-076

1. Make sure that the sampler is clean.
2. Check to make sure the sampler is functioning properly. Adjust the locking mechanisms if necessary to make sure the neoprene rubber stopper provides a tight closure.
3. Wear necessary protective clothing and gear and observe required sampling precautions.
4. Put the sampler in the open position by placing the stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.
5. Slowly lower the sampler into the liquid waste. (Lower the sampler at a rate that permits the levels of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sample tube is lower than that outside the sampler, the sampling rate is too fast and will result in a non-representative sample).
6. When the sampler stopper hits the bottom of the waste container, push the sampler tube downward against the stopper to close the sampler. Lock the sampler in the closed position by turning the T handle until it is upright and one end rests tightly on the locking block.
7. Slowly withdraw the sample into a suitable sample container by slowly pulling the lower end of the T handle away from the locking block while the lower end of the sampler is positioned in a sample container.
8. Cap the sample container with a Teflon-lined cap; attach label and seal; record in field logbook and complete sample analysis request sheet and chain-of-custody.
9. Unscrew the T handle of the sampler and disengage the locking block. Clean sampler onsite or store the contaminated parts of the sampler in a plastic storage tube for subsequent cleaning. Store used rags in plastic bags for subsequent disposal.

Method III-9 (bucket type bailer) of EPA-600/4-84-076

1. Using clean non-contaminated equipment, i.e., an electronic level indicator (avoid indicating paste), determine the water level in the well, then calculate the fluid volume in the casing.
2. Purge well as per Methods III-7 or III-8.
3. Attached pre-cleaned bailer to cable or line for lowering.
4. Lower bailer slowly until it contacts water surface.
5. Allow bailer to sink and fill with a minimum of surface disturbance.
6. Slowly raise bailer to surface. Do not allow bailer line to contact ground.
7. Tip bailer to allow slow discharge from top to flow gently down the side of the sample bottle with minimum entry turbulence.
8. Repeat step 2-5 as needed to acquire sufficient volume.
9. Select sample bottle and preserve the sample, if necessary.

10. Check that a Teflon liner is present in the cap if required. Secure the cap tightly.
11. Label the sample bottle with the appropriate sample tag. Be sure to label the tag carefully and clearly, addressing all the categories or parameters. Complete all chain-of-custody documents and records in the field log book.
12. Decontaminate equipment after use and between sample locations.

Method III-10 (Peristaltic Pump) of EPA-600/4-84-076

1. Using clean non-contaminated equipment, i.e., an electronic level indicator (avoid indicating paste), determine the water level in the sampled vessel, then calculate the fluid volume.
2. Purge well as per Methods III-7 or III-8.
3. If soundings show sufficient level of recovery, prepare pump system. If insufficient recovery is noted, allow additional time to collect samples on a periodic schedule which will allow recovery between samplings.
4. Install clean medical grade silicon tubing in peristaltic pump head.
5. Attach pump to required length of pre-cleaned Teflon suction line and lower to midpoint of intended sample volume or slightly below existing liquid level.
6. Consider the first liter of liquid collected as a system purge/rinse. NOTE: If yield is insufficient for required analysis, this purge volume may be suitable for some less critical analysis.
7. Fill necessary sample bottles by allowing pump discharge to flow gently down the side of bottle with minimal entry turbulence. Cap each bottle as filled.
8. Select sample bottles and preserve the sample, if necessary.
9. Check that a Teflon liner is present in the cap if required. Secure the cap tightly.
10. Label the sample bottle with the appropriate sample tag. Be sure to label the tag carefully and clearly, addressing all the categories or parameters. Complete all chain-of-custody documents and records in the field log book.
11. Decontaminate equipment after use and between sample locations.