GIANT
REFINING CO.

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June 7, 1993

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HAZARDOUS WASTE
PROGRAM

Ms. Barbara Hoditschek
Permit Program Manager
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
525 Camino De Los Marquez
P.O. Box 26110
Santa Fe, NM 87502

RE: Soil Sampling Program

Dear Ms. Hoditschek:

Giant Refining Company is submitting the enclosed Sampling Plan as part of the previously submitted application for a permit modification. The Sampling Plan outlines the protocol for obtaining the samples to make the determination in section III of Attachment H.

Giant understands that the Bureau has decided to schedule the public notification, comment period, and meeting when the Bureau deems the application for a permit modification complete.

Should you have any questions, please contact me at (505) 722-3833.

Respectfully yours,

Zeke Sherman
Environmental Manager
Ciniza Refinery

cc: Kim Bullerdick
John Stokes
L. Shelton
B. Driscoll, EPA, Region VI
Roger Anderson, NMOCD
Marc Sides, NMED
Jane Cramer, NMED

SAMPLING PLAN

LAND TREATMENT UNIT
GIANT REFINING COMPANY
CINIZA

MAY 19, 1993

PREPARED BY:

LYNN SHELTON

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1.0 INTRODUCTION

It is essential to assure that data generated during the land treatment unit sampling event are valid. For data to be valid, it must be supported by documented procedures so that it can be used with the appropriate level of confidence to support decisions regarding the need for, and design of, subsequent characterization and remediation activities.

Through the development and implementation of a comprehensive sample plan, all parties involved can consistently strive to achieve data of known and acceptable quality. This sampling plan includes specific Quality Assurance (QA) and Quality Control (QC) procedures to:

- Define the sampling team responsibilities
- Define sampling and analytical techniques
- Specify sample identity
- Establish precision and accuracy of reported data
- Establish detection limits for constituents of concern
- Identify any potential bias arising from sampling or analytical activities

The QA/QC program outlined in this plan must be adhered to during all data collection activities. It is important to remember that QA/QC is a dynamic process and that this plan is subject to periodic updates. This plan outlines QA/QC procedures designed to meet or exceed U.S. EPA and New Mexico Environment Department guidelines.

2.0 RESPONSIBILITIES

The importance of defining responsibilities for the implementation of the procedures must be stressed. Each individual involved with the sampling program must clearly understand their responsibilities so the procedures detailed in this plan will be conducted successfully and efficiently.

2.1 Project Manager

- Maintain information for the collection of data
- Set up sampling program that complies with regulatory requirements
- Schedule analysis and shipment of samples
- Review analytical and statistical data for completeness and validity
- Supervise contractors involved in sampling event
- Develop a QA\QC report to management
- Specify analytical methods

2.2 Sampling Personnel

2.2.1 General

- Follow all procedures in this plan to prevent contamination of samples and procedural errors,
- Collect samples as prescribed in this plan
- Inventory and prepare sample bottles and preservatives
- Maintain all sampling equipment
- Calibrate field instruments (if applicable)

2.2.2 Soil Sampling

- Collect site specific soil samples
- Verify and document all sampling points (to include depth and parameters)
- Follow prescribed decontamination procedures

2.2.3 Sample Transfer

- Verify all entries into chain of custody
- Assure proper storage and preservation (preservation - 4°C)
- Verify proper transfer of samples to laboratory
- Input sample results into data base

2.3 Contract Laboratory

- Provide high quality analytical services
- Assure that all data generated is supported by adequate documentation that meet NMED and USEPA QA/QC requirements
- Provide sample bottles, coolers, labels and chains of custody on request
- Maintain standard operating procedures (S.O.P.'s) for all analytical methods performed
- Use only USEPA approved methods for all analyses
- Assure that technical personnel performing analyses are qualified and adequately trained
- Provide feedback to Giant regarding analytical method limitations and quality control data pertinent to the sampling program

3.0 SAMPLING PROCEDURES

Sampling can be divided into the following stages.

3.1 Preparation

Preparation for a sampling event should be initiated at least two weeks prior to anticipated sampling date, if possible, to assure that the sampling can proceed in an organized and efficient manner. Proper preparation may define the scope of the sampling event.

The contract laboratory should be notified of the proposed sampling schedule so that they may schedule both personnel and equipment to meet the demands of the sample analyses. The lab should provide adequate materials (i.e. coolers, bottles) for the sampling event at that time.

Sampling personnel will inventory the bottles upon receipt and notify the laboratory of any discrepancies.

The day before sampling, sampling personnel should review the field checklist (Table 1, soil sampling) to assure that all equipment is available and operational.

3.2 Pre-Sampling Operations

These steps should be taken immediately prior to sampling activities.

3.2.1 Calibration of Field Instruments

The photo ionization detector (PID) should be checked for fully charged battery and calibrated with .54 hexane standard. This step may be eliminated if use of PID is not warranted.

3.2.2 Ice

One gallon bags of ice will be obtained and placed into the coolers before sampling begins.

3.2.3 Sample Record

A sample record will be kept in the LTU operations log book. The following information should be recorded in the field notes:

- Location of Sample (include drawing of site)

TABLE 1

Field Equipment Checklist
Soil Sampling

	ITEM		REMARKS
_____	PID Meter (Optional)	_____	Calibrated
_____	Site Map with Sample Locations		
_____	Sample Bottles		
_____	Ice Chests		
_____	Trip Blanks		
_____	Methanol		
_____	Deionized Water		
_____	Squeeze Bottles		
_____	Personal Protective Equipment		
_____	Chain of Custody and Sample Record Forms		
_____	Plastic Bags (to provide clean surfaces)		
_____	Disposable Gloves		
_____	Paper Towels		
_____	Tape (for labels and dispenser		
_____	Sharpie, Pens, Pencils		
_____	Blue Ice or Ice		
_____	Zip-Lock Bags, 1 Gallon		
_____	Tape Measure		

- Sample Identification Number System
- Date and Time of Sampling
- Sample Collection Method
- Field Measurements
- Comments and Observations
- Sampling Personnel

It is important that specific observations must be recorded concerning sit conditions, to include:

- Weather Conditions
- Physical Surrounding (Water, Plant Growth)
- Evidence of Contamination
- Odors or Color Abnormalities

3.3 Soil Sampling Locations and Techniques

The purpose of the soil sampling plan is to determine if migration of certain constituents below the treatment zone has occured and if so, to characterize the extent of the migration.

Soil sampling locations will be selected in order to adequately determine if migration has occurred. The number and depth of samples in this plan has been selected to be what Giant believes to adequately characterize potential migration of certain constituents.

3.3.1 Surface Preparation

Fill soil will be scraped away with a backhoe to reveal the original surface of the land treatment unit at each sample location. This will establish a measurement base with which to determine critical sample depths with accuracy. It also removes the ZOI material which is contaminated.

3.3.2 Boreholes / Core Samples

Boreholes for samples will be advanced by a drilling rig employing hollow-stem augers. There will be no compositing of soil samples. Core samplers are used in conjunction with hollow-stem augers to collect soil samples. A five foot CME tube, 2 1/2" diameter, split core barrel will be placed in the lead auger. The tube is pushed into the soil at the same drilling rate as the augers. After the tube is pulled from the soil, it is detached from the drill rod and opened to remove the soil core. CME tubes will be used for obtaining samples of consolidated soil and used to penetrate some types of rock. Measurements will be taken to the .1 inch with an

engineers tape measure.

3.3.3 Soil Sampling Screening

Should visual inspection, or detection of odors, warrant its use, a photo-ionization detector will be used to screen for volatiles. Since prior sampling has not shown significant contamination, the use of a PID is not expected. If the PID is used, all readings will be recorded in the log book.

3.3.4 Lithologic Logging

Detailed logs will be maintained for each boring. Listed below is a general description of soils to be used to describe their physical characteristics:

1) Lithology
2) Color (i.e. light, dark, mottled, mixed)
3) Size (fine, medium, coarse)
4) Moisture (dry, moist, wet)
5) Odor (or no odor)
6) Other Descriptive Terms:
   a. Lens <1 inch
   b. Layer >1 inch
   c. Interbedded
   d. Slickensided - Soils having inclined planes of weakness, glossy in appearance

3.3.5 Disposition of Soils

All drill cuttings generated by borehole advancement for soil samples will be spread within the land treatment unit.

4.0 SAMPLE LABELING

As soon as the sample containers have been properly filled with sample material, the bottle labels should be completed with the following information:

- Sample Identification Number
- Location
- Date/Time of Collection
- Preservation Technique
- Analytical Parameters

The label will be filled out with waterproof, indelible ink. All information except sample number and date/time of collection shall be completed prior to going into the field. The sample number and date/time will be completed when the sample is taken.

5.0 DECONTAMINATION PROCEDURES

The following procedures are applicable to decontamination of:

- Drilling Equipment and Vehicles
- Sampling Equipment

5.1 Drilling Equipment and Vehicles

Decontamination of large drilling equipment and vehicles is required to prevent cross contamination of boreholes from which samples will be retrieved for chemical analysis. This procedure also provides for the protection of personnel subsequent to demobilization from the land treatment unit.

- Wash and mechanically clean augers and CME tube with bio-degradable soap and brush. Rinse with potable water.
- Steam augers and CME tube
- Protect equipment if necessary, when transporting drilling equipment between boreholes, by covering or shielding.

During decontamination of drilling equipment and accessories, it is especially critical to clean the inside of hollow-stem auger flights, drill rods and bits. Decontamination can be limited to those parts that may come into direct contact with soil sample surfaces.

5.2 Sampling Equipment

Sampling equipment includes all sampling devices and containers which are used to collect or contain a sample prior to final sample analysis. Before its use, all sampling equipment which may contribute to the contamination of a sample must be thoroughly cleaned.

Sampling equipment can generally be cleaned by hand. The following procedure will be used for sampling equipment:

- Scrub with bio-degradable soap and potable water
- Rinse with deionized water followed by propanol
- Allow to air dry
- Protect if necessary to prevent contamination while transporting from borehole to borehole by covering

or shielding

6.0 Sample Custody

Assuring the integrity of a sample from the time of collection to data reporting is essential. Chain of custody procedures are intended to document sample possession from the time of collection to final disposition.

A sample is considered to be under a person's custody if it is in a person's physical possession, in view of the person after taking possession, secured by that person so that no one may tamper with it, or secured by that person in an area that is restricted to authorized personnel.

6.1 Chain of Custody Record

The chain of custody record shall include the following information:

1) Facility Name
2) Type and Number of Samples
3) Sample Location and ID
4) Collection Dates/Times
5) Analysis Required
6) Number of Containers for Each Sample
7) Additional Remarks or Comments as Needed
8) Samplers Signature
9) Signatures of All Individuals Involved in the Chain of Possession
10) Inclusive Dates and Time of Possession

A sample form is shown in Figure 1. The original chain of custody from must accompany the samples. One copy of the chain of custody should be kept in the project files.

6.2 Transfer of Custody

This section describes the disposition of the samples after collection.

6.2.1 On-Site Custody

The sample collector will prepare the samples by placing in a cooler with ice to maintain 4°C. The information regarding date and time of sample preparation of the chain of custody at this time.

6.2.2 Contract Laboratory Custody

The delivery person will relinquish the samples to the laboratory. The laboratory will notify Giant of samples receipt and condition.

The laboratory will be responsible for documenting custody within their laboratory. If a subcontractor is used for any or all analysis, Giant shall be informed and custody documented.

7.0 ANALYTICAL PROCEDURES

7.1 Methods

In order to adequately evaluate analytical data, certain methodologies were selected. These USEPA approved methods listed in Giant's Part B Permit shall be used for analyses of soil samples.

The list of constituents and methods are listed in Table 2.

7.2 Detection Limits

It is imperative that the analytical procedures chosen have detection limits appropriate to the intended use of the data and which are consistent with previous sampling events in the land treatment unit. Detection limits for this plan are included in Table 2.

7.3 Sample Container, Preservation and Holding Times

Sample container selection, preservation techniques and holding times must be addressed for every sampling activity. This is to assure that the sample does not deteriorate or become contaminated. Sample deterioration can occur through biological degradation or chemical precipitation. Sample contamination can occur through adsorption, absorption, or leaching effects due to the interaction of the sample and the container material. Sample container selection, preservation techniques and holding times are listed in Table 2.

7.4 Sample Preparation

Proper sample preparation is an integral part of any analytical program. Any additional preparation above and beyond normal S.O.P.'s should be confirmed with Giant's project manager.

TABLE 2

METALS
METHOD 6010

PARAMETER	EPA METHOD SW-846	DESCRIPTION	CONTAINER	PRESERVATIVE	HOLDING TIME,DAYS	DETECTION LIMIT	UNITS
CHROMIUM	6010	ICP	G	4 DEGREES C	180	1.0	mg/kg
LEAD	6010	ICP	G	4 DEGREES C	180	5.0	mg/kg

APPENDIX IX
8240 VOLATILE ORGANICS

PARAMETER	EPA METHOD SW-846	DESCRIPTION	CONTAINER	PRESERVATIVE	HOLDING TIME,DAYS	DETECTION LIMIT	UNITS
ACETONE	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
ACETONITRILE	8240	GC/MS	G	4 DEGREES C	14	200	ug/kg
ACROLEIN	8240	GC/MS	G	4 DEGREES C	14	100	ug/kg
ACRYLONITRILE	8240	GC/MS	G	4 DEGREES C	14	100	ug/kg
ALLYL CHLORIDE	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
BENZENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
BROMODICHLOROMETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
BROMOFORM	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
BROMOMETHANE	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-BUTANONE (MEK)	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
CARBON DISULFIDE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
CARBON TETRACHLORIDE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
CHLOROBENZENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
CHLOROETHANE	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
CHLOROFORM	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
CHLOROMETHANE	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
CHLOROPRENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
DIBROMOCHLOROMETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,2-DIBROMO-3-CHLORO-^PROPANE (DBCP)	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
1,2-DIBROMOETHANE (EDB)	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
DIBROMOETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
TRANS-1,4-DICHLORO-^2-BUTENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
DICHLORODIFLUOROMETHANE	8240	GC/MS	G	4 DEGREES C	14	20	ug/kg
1,2-DICHLOROETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,2-DICHLOROETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,2-DICHLOROETHENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,2-DICHLOROETHENE ^ (TOTAL)	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,2-DICHLOROPROPANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
CIS-1,3-DICHLOROPROPENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
TRANS-1,3-DICHLOROPROPENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,4-DIOXANE	8240	GC/MS	G	4 DEGREES C	14	500	ug/kg
ETHYLBENZENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
ETHYL METHACRYLATE	8240	GC/MS	G	4 DEGREES C	14	20	ug/kg
2-HEXANONE	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
IDOMETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
ISOBUTANOL	8240	GC/MS	G	4 DEGREES C	14	200	ug/kg
METHACRYLONITRILE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
METHYLENE CHLORIDE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
METHYL METHACRYLATE	8240	GC/MS	G	4 DEGREES C	14	20	ug/kg
4-METHYL-2-PENTANONE ^(MIBK)	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
PROPIONITRILE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
STRYRENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,1,1,2-TETRACHLOROETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,1,2,2-TETRACHLOROETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
TETRACHLOROETHENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
TOLUENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,1,1-TRICHLOROETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,1,2,2-TETRACHLOROETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
TRICHLOROETHENE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
TRICHLOROFLUOROMETHANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
1,2,3-TRICHLOROPROPANE	8240	GC/MS	G	4 DEGREES C	14	5.0	ug/kg
VINYL ACETATE	8240	GC/MS	G	4 DEGREES C	14	10	ug/kg
		GC/MS	G	4 DEGREES C	14	10	ug/kg

TABLE 2, CONT.

8270 SEMIVOLATILE ORGANICS

PARAMETER	EPA METHOD SW-846	DESCRIPTION	CONTAINER	PRESERVATIVE	HOLDING TIME,DAYS	DETECTION LIMIT	UNITS
ACENAPHTHENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
ACENAPHTHYLENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
ACETOPHENONE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-ACETYLAMINOFLUORENE	8270	GC/MS	G	4 DEGREES C	14	100	ug/kg
4-AMINOBIPHENYL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
ANILINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
ANTHRACENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
ARAMITE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BENZO (A) ANTHRACENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BENZO (B) FLUORANTHENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BENZO (K) FLUROANTHENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BENZO (G,H,I) PERYLENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BENZO (A) PYRENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BENZYL ALCOHOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
4-BROMOPHENYL ^PHENYL ETHER	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BUTYL BENZYL PHTHALATE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-SEC-BUTYL-4,6-DINITRO-^PHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
4-CHLOROANILINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BIS (2-CHLOROETHOXY)-^METHANE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BIS (2-CHLOROETHYL) ETHER	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
BIS (2-CHLOROISOPROPYL)-^ETHER	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
4-CHLORO-3-METHYL PHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-CHLORONAPHTHALENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-CHLOROPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
4-CHLOROPHENYL ^PHENYL ETHER	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
CHRYSENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
DIBENZ (A,H) ANTHRACENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
DI-N-BUTYL- PHTHALATE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
1,2-DICHLOROBENZENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
1,3-DICHLOROBENZENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
1,4-DICHLOROBENZENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
3,3-DICHLOROBENZIDINE	8270	GC/MS	G	4 DEGREES C	14	20	ug/kg
2,4-DICHLOROPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2,6-DICHLOROPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
DIETHYL PHTHALATE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
DIMETHOATE	8270	GC/MS	G	4 DEGREES C	14	--	ug/kg
P-DIMETHYLAMINOAZOBENXENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
7,12-DIMETHYLBENZ (A)-^ANTHRACENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
3,3'-DIMETHYLBENZIDINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
A,A-DIMETHYLPHENETHYL-^AMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2,4DIMETHYLPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
DIMETHYL PHTHALATE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
1,3-DINITROBENZENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
4,6DINITRO-^2-METHYLPHENOL	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
2,4-DINITROPHENOL	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
2,4-DINITROTOLUENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2,6-DINITROTOLUENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
DI-N-OCTYL PHTHALATE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
DIPHENYLAMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
DISULFOTON	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
BIS (2-ETHYLHEXYL) ^PHTHALATE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
ETHYL METHANESULFONATE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
FAMPHUR	8270	GC/MS	G	4 DEGREES C	14	--	ug/kg
FLUORANTHENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
FLUORENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
HEXACHLOROBENZENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
HEXACHLOROBUTADIENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
HEXACHLOROCYCLOPENTADIENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
HEXACHLOROETHANE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
HEXACHLOROPHENE	8270	GC/MS	G	4 DEGREES C	14	--	ug/kg
HEXACHLOROPROPENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
INDENO (1,2,3-CD) PYRENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
ISOPHORONE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
ISOSAFROLE	8270	GC/MS	G	4 DEGREES C	14	20	ug/kg
METHAPYRILENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg

TABLE 2. CONT.

8270 SEMIVOLATILE ORGANICS

PARAMETER	EPA METHOD SW-846	DESCRIPTION	CONTAINER	PRESERVATIVE	HOLDING TIME,DAYS	DETECTION LIMIT	UNITS
3-METHYLCHOLANTHRENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
METHYL METHANESULFONATE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-METHYLNAPHTHALENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
METHYL PARATHION	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
2-METHYLPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
3/4-METHYLPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
NAPHTHALENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
1,4-NAPHTHOQUINONE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
1-NAPHTHYLAMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-NAPHTHYLAMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-NITROANILINE	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
3-NITROANILINE	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
4-NITROANILINE	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
NITROBENZENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-NITROPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
4-NITROPHENOL	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
4-NITROQUINOLINE-1-OXIDE	8270	GC/MS	G	4 DEGREES C	14	--	ug/kg
N-NITROSO-DI-N-BUTYLAMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
N-NITROSODIETHYLAMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
N-NITROSODIMETHYLAMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
N-NITROSODIPHENYLAMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
N-NITROSO-DI-^N-PROPYLAMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
N-NITROSOMETHYLETHYLAMINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
N-NITROSOMORPHOLINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
N-NITROSOPIPERIDINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
N-NITROSOPURROLIDINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
5-NITRO-O-TOLUIDINE	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
PARATHION	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
PENTACHLOROBENZENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
PENTACHLOROETHANE	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
PENTACHLORONITROBENZENE	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
PENTACHLOROPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
PHENACETIN	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
PHENANTHRENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
PHENOL	8270	GC/MS	G	4 DEGREES C	14	---	ug/kg
4-PHENYLENEDIAMINE	8270	GC/MS	G	4 DEGREES C	14	100	ug/kg
PHORATE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-PICOLINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
PRONAMIDE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
PYRENE	8270	GC/MS	G	4 DEGREES C	14	20	ug/kg
PYRIDINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
SAFROLE	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
SULFOTEPP	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
1,2,4,5-TETRACHLORL-^BENZENE	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
2,3,4,6-TETRACHLOROPHENOL	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
THIONAZIN	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2-TOLUIDINE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
1,2,4-TRICHLOROBENZENE	8270	GC/MS	G	4 DEGREES C	14	50	ug/kg
2,4,5-TRICHLOROPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
2,4,6-TRICHLOROPHENOL	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
0,0,0-TRIETHYLPHOSPHORE-^THIOTE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg
1,3,5-TRINITROBENZENE	8270	GC/MS	G	4 DEGREES C	14	10	ug/kg

7.5 Laboratory QA/QC

A copy of the laboratory's QA/QC program as submitted to Giant is attached as Appendix I. The recommended QA/QC program submitted to Giant by the New Mexico Environment Department is attached as Appendix II. If necessary, Giant requests that the laboratory's QA/QC be modified to conform to the NMED QA/QC program.

8.0 CALIBRATION PROCEDURES AND FREQUENCY

8.1 Laboratory Instrumentation

It is recognized that instrument calibration procedures vary from instrument to instrument. Manufacturer's guidelines should be followed. The frequency of calibration for a number of instruments is addressed below. This information is obtained from SW-846, Third Edition, Test Methods For Evaluating Solid Waste. This section is not intended to be comprehensive in nature. The laboratory is responsible for detailing its own QA/QC protocol in addition to the items listed here.

8.1.1 ICP

- Calibrate the instrument according to manufacturer's recommended procedures.
- Two types of blanks are required: calibration blank and reagent blank.
- Check calibration using a blank and two standards.
- Check calibration every ten samples and at the end of each run by analyzing blank and check standard. Standard should be within 10% of expected result. If not, terminate analysis, correct problem and re-calibrate. The calibration blank should be within three standard deviations of the mean blank. If not, terminate analysis, correct problem, re-calibrate, and reanalyze previous ten samples.
- Analyze interference check sample at the beginning and end of an analytical run or twice during every 8-hour work shift.
- Replicate samples and spiked samples should be urn at a frequency of 20%. The relative percent difference (RPD) shall be ± 20% for sample values greater than ten times the detection limit. Spike recovery is to be ± 20% of the actual value.
- Serial dilution checks where applicable.

8.1.2 GC / MS

- Initial demonstration of capability.
- Meet tuning criteria per SW-846, Third Edition.
- Internal and surrogate standards added to blank, standards, samples.
- Blank and standard calibration verification each run.

9.0 INTERNAL QUALITY CONTROL CHECKS

9.1 Equipment Blanks

Equipment blanks will be analyzed to check for contamination due to improper/insufficient decontamination procedures. These blanks will be used for non-dedicated boring and sampling equipment.

To assure equipment has been sufficiently decontaminated, deionized water will be poured over and through the sampling equipment, caught in a clean stainless steel bowl, and poured into the sample bottles. Two equipment blanks will be taken randomly during this sampling event.

9.2 Trip Blanks

A trip blank will be analyzed to check for container contamination. The trip blank will be prepared and labeled by the laboratory. One 40 ml septum vial will be filled with reagent grade water, transported to the site with the empty sample bottles, carried with the sample bottles during all sampling activities, and returned to the lab for analysis. The trip blank shall not be opened at any time prior to analysis.

9.3 Field Duplicates

To measure the precision of the sampling activities, duplicate samples will be collected and analyzed. Duplicates will be collected at a frequency of 5% of the total number of samples taken (i.e. 100 samples total, 5 duplicates). One duplicate will be analyzed for Appendix IX volatile and semi-volatile constituents, the remainder for ICP chromium and lead.

In order to evaluate the precision of the analysis, it is necessary to calculate the relative percent deviation (RPD) between the two results of the duplicate analysis. Calculate RPD:

$$RPD = \frac{(S1 - S2)}{(S1 + S2)/2} \times 100\%$$

Where S1 = Sample Result 1

Where S2 = Sample Result 2

RPD should be less than or equal to 10% for values five times greater than the MDL and plus or minus the detection limit for values less than five times the MDL.

10.0 EXPLANATION OF SAMPLE POINTS

10.1 Sample Location Criteria

Proposed sample points were selected to best characterize the potential of migration of contamination beneath the treatment zone. The areas of interest were selected, Figure 1, on the basis of concentration of application (yellow area on drawing) and because of pooling of water due to accumulation of precipitation during the winter months that eventually require management activities (pink area on drawing). Giant feels that these two areas pose the greatest possibility of migration. Two additional sample points were selected to augment the other selections within cells one and two of the land treatment unit. This brings the total number of samples in the LTU to 20. 20

Two sample points were selected within the background plot adjacent to the land treatment unit, Figure 2. These samples will be collected in the same manner and to the same interval and depth as the samples in the land treatment area and will be used as a benchmark for comparing analytical data. 2

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10.2 Sample Identification Numbering System

The sample identification numbering system (SINS) is a continuation of the system used in the initial characterization program during July, 1992. Those samples were numbered BTZ-C 1 through BTZ-C 8. Each sample number included a code number or letter attached to the end to identify the type of sample. Since all samples in 1992 were the same depth interval, no distinction was made for depth.

Sample numbers for the June, 1993 sampling event will include an additional number denoting depth. An example of a sample identification number would be:

BTZ-C	-	11	-	5.0	-	D
(1)		(2)		(3)		(4)

1) Below Treatment Zone Characterization
2) Sample Number
3) Depth in Feet
4) D - Duplicate
   E - Equipment Wash
   If no letter appears here, it is the original sample

10.3 Sample Depth Intervals

At each sample point, samples will be collected at specific depths below the original soil surface of the land treatment

area. The interval and constituents of each sample point are as follows:

Borehole

1) Existing soil surface

2) Original soil surface

3) 5.0' Chromium, Lead

4) 7.5' Chromium, Lead
Modified Appendix IX
Volatile and Semi-Volatiles

5) 10.0' Chromium, Lead

6) 15.0' Chromium, Lead

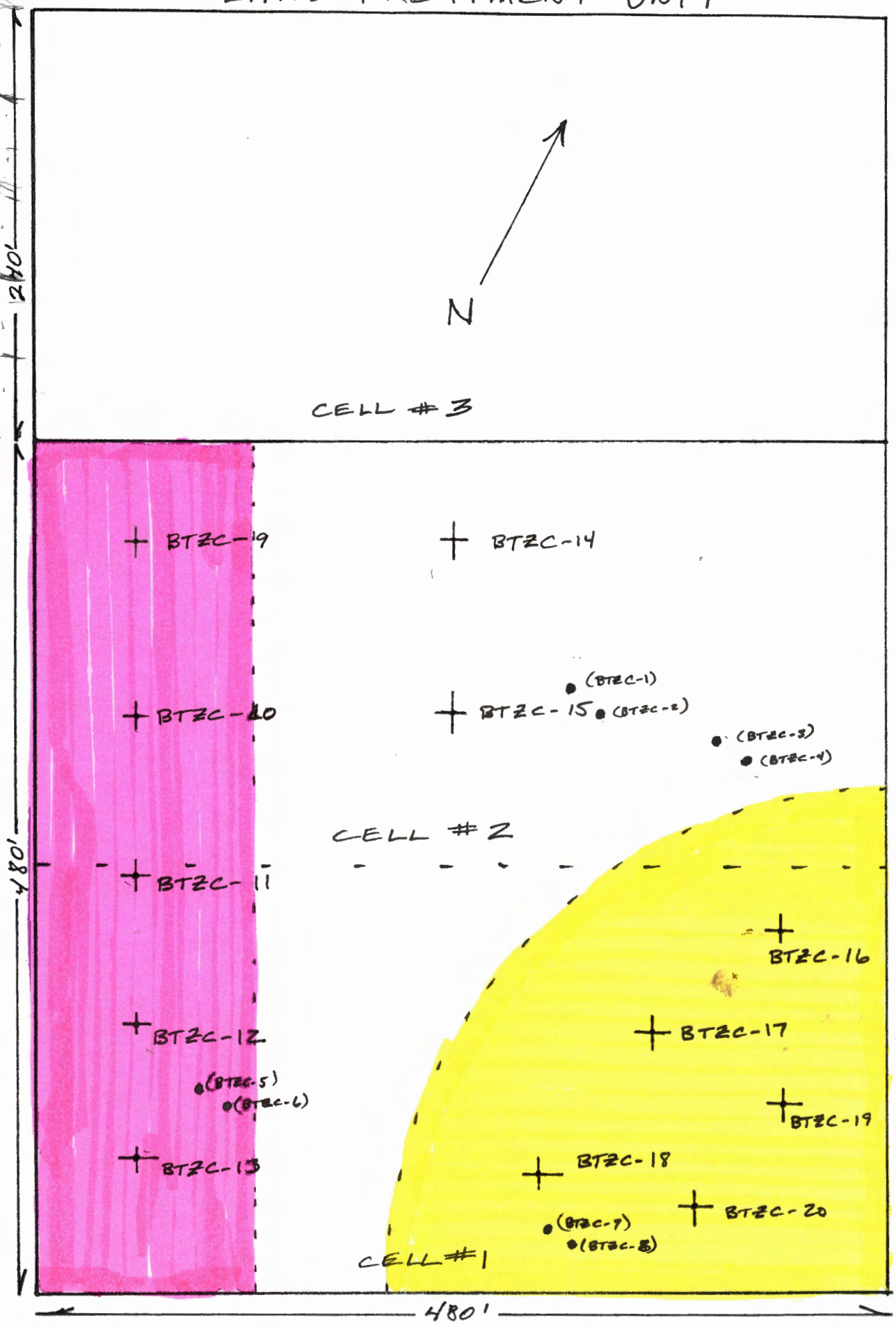
7) 20.0' Chromium, Lead

8) 25.0' Chromium, Lead

9) 30.0' Chromium, Lead

FIGURE 1

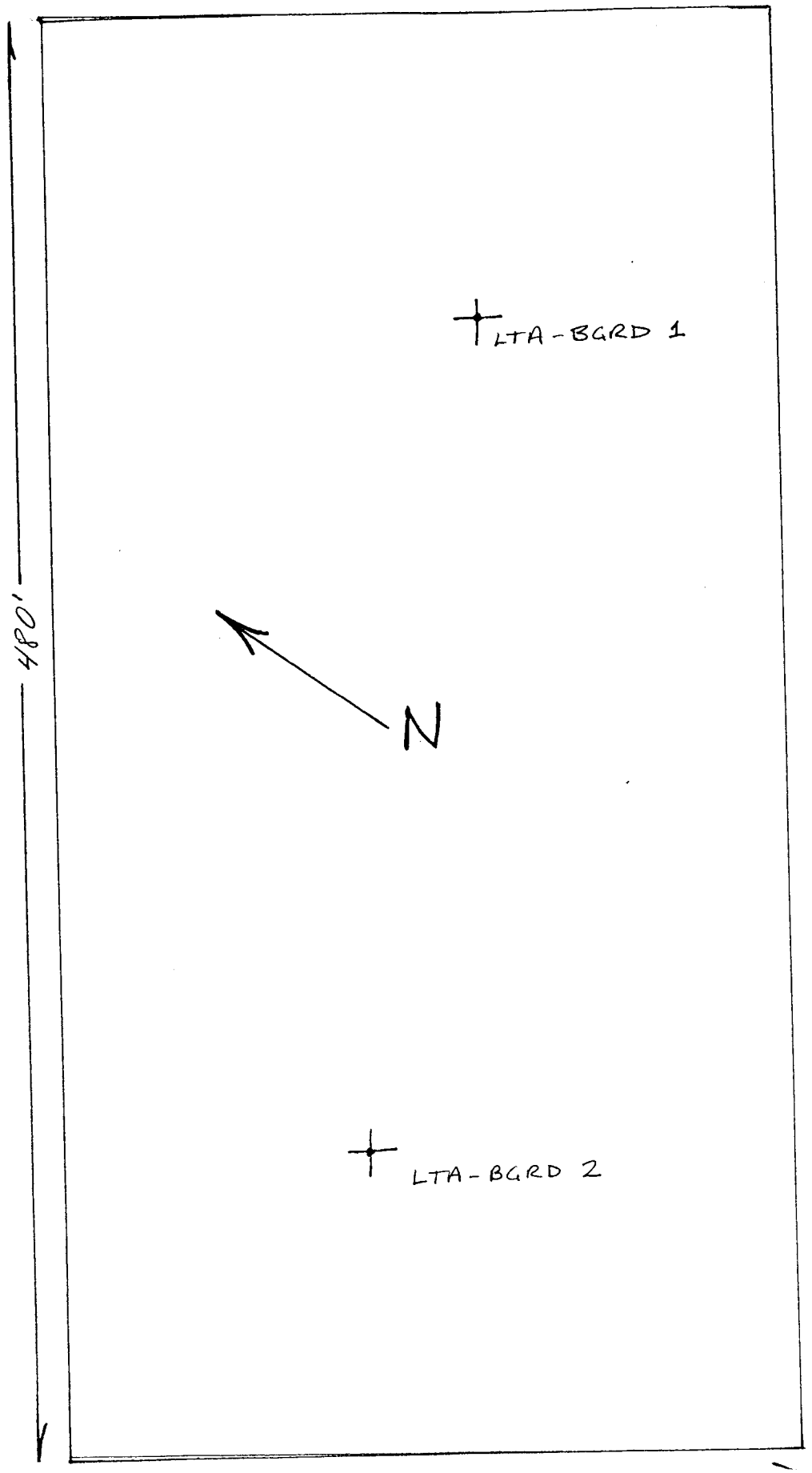
LAND TREATMENT UNIT



AMPAD 22-141 50 SHEETS 22-142 100 SHEETS 22-144 200 SHEETS

FIGURE 2

LTU BACKGROUND PLOT



AMPAD 22-141 50 SHEETS 22-142 100 SHEETS 22-144 200 SHEETS

T25-5-95

APPENDIX I

The QA/QC document as supplied by Core Laboratories is on file at the Refinery.

APPENDIX II

Components of an Adequate Laboratory
Quality Assurance/Quality Control Plan

New Mexico Hazardous and Radioactive Materials Bureau
Technical Support Group
(505) 827-4300

1. All constituents identified above the Method Detection Limit (MDL) must be reported.

   The MDL is defined as the estimated concentration at which the signal generated by a known constituent is three standard deviations above the signal generated by a blank, and represents the 99% confidence level that the constituent does exist in the sample.

2. The "tune" of the GC/MS for volatile organic constituents must be checked and adjusted (if necessary) each twelve (12) hour shift by purging 50 ng of a 4-bromofluorobenzene (BFB) standard. The resultant mass spectra must meet the criteria given in Table 1 before sample analysis proceeds.

3. The "tune" of the GC/MS for semi-volatile organic constituents must be checked and adjusted (if necessary) each twelve (12) hour shift by injecting 50 ng of a Decafluorotriphenylphosphine (DFTPP) standard. The resultant mass spectra must meet the criteria given in Table 2 before analysis proceeds.

4. For every 20 samples perform and report:

   A. Duplicate spike for organics.
   B. Duplicate sample analysis for inorganics.
   C. Reagent blank, results provided for organic work.
   D. Surrogate and spike recoveries. See item 10.
   E. One check sample at or near the Practical Quantitation Limit for a subset of the parameters.

5. Analytical results must not be "blank corrected".

6. Any deviation from EPA-approved methodology must have a Written Standard Operating Procedure and NMED approval.

7. Detection limits must be generally in line with those listed in Appendix IX of §264.

8. The laboratory must document:

   A. That all samples were extracted, distilled, digested, or prepared (if appropriate) and analyzed within specified holding times.

B. That if a sample for volatile analysis is received with headspace, this is reported.

C. The date of sample receipt, extraction and analysis for each sample.

D. Any problems or anomalies with the analysis should be documented.

E. That all solids were analyzed dry or that the reported results are corrected to reflect dry weight equivalence.

9. The name and signature of the lab manager must appear on each report.

10. The reported surrogate and spike recoveries must fall within: (1) the historical (statistically based) acceptance limits, generated at the laboratory or, (2) the limits tabulated by the appropriate method from the current edition of SW-846, whichever limit is narrower. The actual historical recoveries must be submitted to HRMB with the analysis.

TABLE 1

BFB KEY IONS AND ABUNDANCE CRITERIA

Mass	Ion Abundance Criteria
50	15.0 - 40.0 percent of the base peak
75	30.0 - 60.0 percent of the base peak
95	base peak, 100 percent relative abundance
96	5.0 - 9.0 percent of the base peak
173	less than 2.0 percent of mass 174
174	greater than 50.0 percent of the base peak
175	5.0 -9.0 percent of mass 174
176	greater than 95.0 percent but less than 101.0 percent of mass 174
177	5.0 - 9.0 percent of mass 176

TABLE 2

BFB KEY IONS AND ABUNDANCE CRITERIA

Mass	Ion Abundance Criteria
51	30.0 - 60.0 percent of mass 198
68	less than 2.0 percent of mass 69
70	less than 2.0 percent of mass 69
127	40.0 - 60.0 percent of mass 198
197	less than 1.0 percent of mass 198
198	base peak, 100 percent relative abundance
199	5.0 - 9.0 percent of mass 198
275	10.0 - 30.0 percent of mass 198
365	greater than 1.00 percent of mass 198
441	present but less than mass 443
442	greater than 40.0 percent of mass 198
443	17.0 - 23.0 percent of mass 442