

GR0004



June 6, 1994

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

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

RE: Land Treatment Unit Characterization/Closure
Giant Refining Company - Ciniza

Dear Ms. Hoditschek:

Attached is the modified Characterization/Closure Plan for the Hazardous Waste Treatment Unit at Ciniza Refinery. A 3½" diskette with the changes to the original Plan is included.

The following is a list of changes made in the original submittal. Per your request, page and paragraph numbers are provided.

1. Table of Contents:

Insert - New section titles and page numbers
Delete - Section titles

2. Page 1, Paragraph 1:

Delete - /Post-Closure.
Insert - ...within the Treatment Zone and...

3. Page 1, Paragraph 2:

Insert - Although
Delete - The period
Insert - ...chromium and lead concentrations within the Treatment Zone must be characterized.

4. Page 1, Paragraph 3:

Delete - /Post-Closure.

5. Page 1, Paragraph 5:

Insert - Entire paragraph

6. Page 1 & 2, Paragraph 6:

Delete - Entire paragraph

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Page 2

7. Page 2, Title:
 - Insert - ...and analysis:
8. Page 2, Paragraph 2:
 - Insert - ...,#2,
 - Insert - #3
 - Insert - ...the presence...
 - Delete - migration
 - Delete - ...in cell #3 to determine if horizontal migration of hazardous constituents has occurred.
9. Page 2, Paragraph 3:
 - Insert - ...analyzed for the constituents shown in Table 2.
 - Delete - ...composited into two samples (three points each) for analysis of help constituents, Table 2. TCLP constituents analysis...
 - Insert - Analysis of constituents in Table 2...
 - Delete - TCLP constituents are shown in Table 2.
 - Insert - ZOI Samples will also be sampled for oil and grease and total petroleum hydrocarbon.
10. Page 2, Paragraph 4:
 - Delete - Entire paragraph
11. Page 2, Paragraph 5:
 - Insert - Entire paragraph
12. Page 2, Paragraph 6:
 - Insert - ...Constituents shown in Table 3, which includes the modified Skinner List as well as all volatile and semi-volatile constituents observed in past sampling events.
 - Delete - Remainder of paragraph
13. Page 2, Paragraph 8:
 - Insert - (ATI)
14. Page 3, Paragraph 1:
 - Delete - ...their...
 - Insert - ATI's

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Page 3

15. Page 3, Groundwater Sampling
Insert - Entire section titled "Groundwater Sampling"
16. Page 3, Paragraph 6:
Insert - Entire paragraph
17. Page 3, Paragraph 7:
Delete - Entire paragraph
18. Page 4 & 5, Closure:
Insert - Entire section titled "Closure"
19. Page 5 & 6, Risk Assessment
Insert - Entire section titled "Risk Assessment"
20. Page 7, Figure 1:
Insert - New drawing of LTU
21. Page 8, Table 1:
Modified to show new sampling depths and analyses
22. Page 9, Table 2:
Insert - Complete table
23. Page 10, Table 3:
Modified table to show new constituents
24. Page 11, Table 3, continued:
Modified table to show new constituents
25. Page 12, Table 3, continued:
Insert - New table (metals)
26. Sampling Plan, Table of Contents:
Delete - 10.3 Sample Depth Intervals
Insert - Table 3 Analytical Data and Parameters

27. Sampling Plan, Section 3.1:

Insert - A minimum of two weeks notice shall be given to the Hazardous and Radioactive Materials Bureau (HRMB) of the New Mexico Environment Department.

28. Sampling Plan, Section 3.3.1:

Insert - The period

Delete - ... other than the ZOI samples.

Insert - The sample must be transferred to the sample container in a timely manner in order to maintain the integrity of the sample and to prevent the loss of volatile organic constituents (VOCs). Only after the sample has been collected should field observation and measurements (such as PID readings) be completed.

29. Sampling Plan, Section 3.3.3:

Insert - Lithologic logs of the entire core shall be used. Samples for volatile organic constituents shall be obtained before logging to preclude potential loss of VOCs.

30. Sampling Plan, Section 7.1:

Insert - and 3.

31. Sampling Plan, Section 7.2:

Delete - 2

Insert - 3

32. Sampling Plan, Section 7.3:

Delete - 2

Insert - 3

33. Sampling Plan, Tables 2 and 3:

Insert - Tables 2 and 3

34. Sampling Plan, Section 10.3:

Delete - all of Section 10.3

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35. Sampling Plan, Figure 1:

Insert - New Figure 1

The changes included in the attached Plan will provide the necessary information to achieve closure of the Land Treatment Unit. If you have any questions regarding this submittal or if we can be of further assistance, please do not hesitate to contact Lynn Shelton or me at (505) 722-3833.

Sincerely,



David C. Pavlich
Manager, Health/Safety/Environment

DCP:smb

(DCP\LANDTR)

**LAND TREATMENT UNIT
CHARACTERIZATION**

**GIANT REFINING COMPANY
CINIZA**

JUNE, 1994

PREPARED BY:

LYNN SHELTON

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GIANT REFINING COMPANY - CINIZA
LAND TREATMENT UNIT
CHARACTERIZATION PLAN

Introduction:

A requirement of closure/post-closure of the Land Treatment Unit (LTU) is characterization of the migration of hazardous constituents within the Treatment Zone and Below the Treatment Zone (BTZ) and the presence of hazardous constituents, if any, in the Zone of Incorporation (ZOI). Loading density of hydrocarbons in the ZOI shall be determined and reported as oil and grease.

Although characterization of chromium and lead migration below the Treatment Zone has been adequately addressed by previous sampling events, - chromium and lead concentrations within the Treatment Zone must be characterized. Migration of organics has been observed to seven and one-half feet (Report on the Special Sampling Activities at the Land Treatment Unit, November 10, 1993).

To fully characterize the extent of possible contamination by organics, additional coring and sampling is necessary. This document outlines the procedures that Giant will implement to complete the coring, sampling, and analysis to fully satisfy the information requirements of closure/post-closure.

Coring:

Giant proposes to core twelve additional points in Cells #1, #2, and #3 to a total depth of ten feet. Coring will be performed by Precision Engineering, Inc. (2001 Copper Avenue, Suite 1, Las Cruces, NM, 88004) following the protocol set forth in the attached sampling plan. The sampling plan calls for the inclusion of the boring lithology of each hole.

Giant shall randomly select four coring points in Cell #1, four points in Cell #2 and four points in Cell #3. This exceeds the requirements of the Part B Permit, Attachment F, Closure and Post-Closure Plan, Section 1.2.2.1.2., Soil Core Monitoring. A total of twelve coring points in Cells #1, #2 and #3 will be sufficient, when combined with data obtained from other sampling events, to adequately address the presence, if any, of hazardous constituents in the ZOI, within the Treatment Zone and in the BTZ.

Sample-coring locations in Cells #1 and #2 were chosen to represent a cross-section of the LTU and to include areas in which hazardous constituents have been observed at the seven and one-half foot depth--as--well--as--areas--without--observations--of--hazardous

Handwritten notes on the right margin, including "All sites..." and "10' depth..."

Handwritten notes on the right margin, including "10' depth..." and "needs site map to show where core holes..."

constituents. Sample coring locations in Cell #3 are distributed equally along the interface of Cells #2 and #3.

Sampling and Analysis:

Soil samples will be taken at predetermined depths in Cells #1, #2, and #3 to characterize the presence migration of hazardous constituents and in Cell #3 to determine if horizontal migration of hazardous constituents has occurred. The depths are included in Table 1.

Samples taken within the ZOI will be analyzed for the constituents shown in Table 2, composited into two samples (three points each) for analysis of TCLP constituents, Table 2. TCLP constituent analysis of constituents in Table 2 will indicate the presence and concentrations of hazardous constituents within the ZOI and will be instrumental in developing treatment practices, if necessary, for the LTU surface. TCLP constituents are shown in Table 2. ZOI samples will also be sampled for oil and grease and total petroleum hydrocarbon.

A soil sample from each ZOI coring location will be archived for additional individual analysis, if it is determined, within the holding time, to be necessary.

Samples taken within the Treatment Zone will be analyzed for the constituents shown in Table 3.

Samples taken from the BTZ interval will be analyzed for the constituents shown in Table 3, which includes the modified Skinner List as well as all volatile and semi-volatile constituents observed in past sampling events, refinery hazardous constituents list (included in Tables 3 and 4). Although samples will be collected at the ten, fifteen, twenty, and twenty-five foot depths, the fifteen-foot samples will be analyzed first. If no hazardous constituents are observed at the fifteen-foot depth, then the ten-foot depth sample will be analyzed. If hazardous constituents are observed at the fifteen-foot depth, archived samples from the twenty and twenty-five foot depths will be analyzed. As no hazardous constituents have been observed in the Ciniza sand lens (30' ± 2'), these sample analyses will adequately characterize the migration of hazardous constituents beneath the treatment zone.

Duplicate samples will be taken from various corings at various depths in a number large enough to satisfy QA/QC requirements. Two equipment rinsate samples will be taken from drilling auger flights to verify that decontamination procedures are adequate.

All samples will be analyzed by Analytical Technologies, Inc. (ATI) (2709-D Pan American Freeway, NE, Albuquerque, NM 87107) using EPA approved methodology and their ATI's QA-QC protocol which meets or exceeds the QA/QC guidelines included in the sampling plan (NMED:

Components of an Adequate Quality Assurance/Quality Control Program).

Groundwater Sampling:

Groundwater sampling requirements have been met by the annual groundwater sampling event required by Attachment G, Section 2.A and 2.B of the Part B Permit.

The pre-detection wells, screened across the "Ciniza Sand" and numbered SMW-3 through SMW-6, are used to detect migration from the Land Treatment Unit and would allow remediation to commence long before the uppermost aquifer, the "Sonsela", would be impacted.

As the clay interval between the Ciniza Sands and the Sonsela Aquifer is from 40 to 60 feet thick and water in the Ciniza Sand is believed to be fed by artesian flow from the Sonsela Aquifer, Giant proposes to sample the Ciniza Sands semi-annually as required by Attachment G, Section 2.A and 2.B during closure. If hazardous constituents were to be detected in the Ciniza Sands, then semi-annual sampling of the detection wells (OW-11, MW-1, MW-2, MW-4 and MW-5) would be required, in addition to the semi-annual sampling of the pre-detection wells.

Constituents analyzed would remain those that are listed in Tables G-2 and G-3 of Attachment G, groundwater monitoring plan of the Part B Permit.

General:

Statistical evaluation of the samples taken from the corings will include the statistical test most appropriate for those specific samples. Samples taken from the ZOI will be tested using the coefficient of variation to determine normal or non-normal distribution of constituents in the ZOI. The mean of all samples will be included to determine the total contamination remaining in the ZOI interval. Samples taken from within the Treatment Zone will be tested using Cochran's approximation of the Behrens-Fisher Student's T Test at the 95% confidence interval. Data from the background plot of the LTA will be used as the control data for this test. Samples taken from the BTZ will be tested using the tolerance interval as used and presented in other sampling events (Report on the Special Sampling Activities at the Land Treatment Unit, November, 1993).

No background data for hazardous constituents (organics at the ten, fifteen, twenty and twenty-five foot depths) is available for statistical comparison with samples taken from those depths. As Giant is characterizing the migration of hazardous constituents from below the BTZ, any observation of constituents will be used for characterization only and will stand alone. If it is determined that statistical comparison is required, Giant assumes that the levels, if any, of organics at the deeper depths are

Handwritten notes:
All right, that's
by following
The interval test
will have to
be explained
to the
for the
current
change
...

normally-distributed-and-that-background-data-for-organics-at-the
0-5'-depth-interval-will-be-utilized-

The sampling number sequence has been changed for this sampling event to reflect samples being collected from the ZOI as well as the BTZ. The sequence is:

LTA - C - 1 - 10.0 - D
(1) (2) (3) (4) (5)

- (1) LTA = Land Treatment Area (Unit)
- (2) C = Characterization
- (3) 1 = Core Number
- (4) 10.0 = Depth of Sample (Feet)
- (5) D = Duplicate
- E = Equipment Rinsate
- = If blank, this is an original sample

All bore holes will be backfilled with a cement/bentonite slurry to prevent migration of contamination along the bore hole. ✓

Closure:

Closure of the Land Treatment Unit requires a certain series of events to fully satisfy regulatory requirements. These are:

- 1) Discontinuance of waste application to the LTU
- 2) Characterization of hazardous constituents within the ZOI, Treatment Zone, and BTZ through soil and soil pore moisture sampling
- 3) Remediation, if necessary ✓
- 4) Documentation of degradation within the ZOI ✓
- 5) Establishment of vegetative cover
- 6) Groundwater monitoring ✓

Application of hazardous wastes was discontinued in November, 1990 and application of non-hazardous wastes to Cells #1 and #2 was discontinued on February 19, 1994.

Soil sample characterization of hazardous constituents is addressed in this plan. Soil pore moisture monitoring has continued on a weekly basis, but, in the absence of water from the lysimeters, no analytical work is done on a routine basis. A small amount of water was recovered on April 31, 1994 and was analyzed for volatile organic compounds. No VOC constituents were detected.

Soil pore monitoring (that is, attempts to recover water from lysimeters) will continue until 30 days after acceptance of this Plan. If high levels of hazardous constituents are found to be present in the ZOI, soil pore monitoring will continue until 90 days after acceptance of this Plan or until it is determined that a vegetative cover can be planted.

NO
good
file
want to
see
data for
file

Soil sampling will commence promptly after acceptance of this Plan. In addition to the analysis for hazardous constituents, an optimum carbon: nitrogen: phosphorous ratio will be determined and applications of chemicals to maintain that ratio, as well as soil pH, will be implemented.

* 2 !!

ZOI soil samples will be analyzed for Table 1 constituents after 30 days. If constituent levels are low enough, a vegetative cover will be planted. If constituent levels are too high, remedial activities (tilling, fertilizing and watering) will continue for 60 additional days or until constituent levels have degraded enough to plant a vegetative cover.

Acceptable constituent levels to establish a vegetative cover are:

TPH	<200 ppm
Volatile Organic Compounds	<100 ppm
Semi-Volatile Organic Compounds	<500 ppm
pH	6.0-8.0

Pre-detection wells (SMW-3 through SMW-6) will be sampled for constituents in Table 3 on a semi-annual basis for five years, and then on an annual basis for five years. The wells will be sampled one additional time during the fifteenth year after closure. If no statistically significant levels of hazardous constituents are observed at that time, groundwater monitoring will be discontinued.

Remediation of the Land Treatment Unit will include leveling to optimize precipitation distribution and surveying to establish location and elevation measurements.

Due to low levels of hazardous constituents, Giant proposes no additional remediation beyond enhancement of microbial destruction of hydrocarbon in the ZOI.

Risk Assessment:

Typically, risk assessment of a site includes the following important factors:

- 1) Degree to which human health, safety, or welfare may be affected by exposure to chemical constituents
- 2) Effects of contamination on the environment
- 3) Site specific characteristics including access / exposure potential
- 4) Current or future beneficial uses of the affected land and subsurface resources
- 5) Application of appropriate regulatory standards

Fortunately, enough information is available for the Land Treatment Unit to make a reasonable risk assessment for closure.

Danger to human receptors from exposure is negligible due to the isolated location of the site, with no human population along the path of release of potentially hazardous fugitive emissions. Personnel working within the site are exposed to extremely low levels of hazardous constituents and are fully protected by the requirements of personal protective equipment. Dust minimization is already a requirement of operation and closure of the Land Treatment Unit.

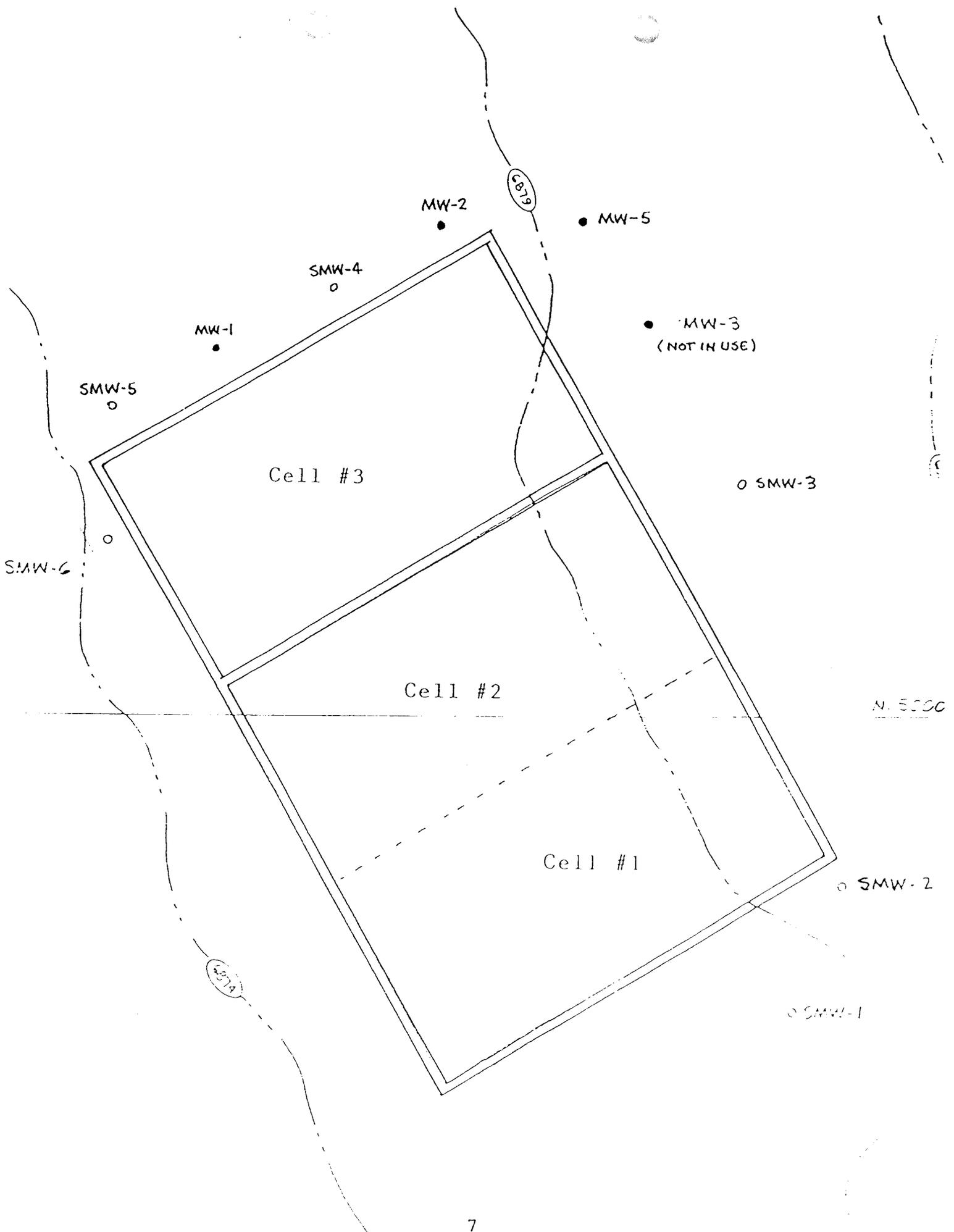
Danger to the environment is minimal due to the limited application of hazardous material, low precipitation to act as a carrier through percolation, extremely low permeability of the native clay layer and the depth to the uppermost potential aquifer. These site specific characteristics, coupled with the demonstration of minimal migration of hazardous constituents, show that the hazardous constituents within the site pose no threat to groundwater or future beneficial use of the site. Other site specific characteristics, such as the pre-detection monitor wells in the Ciniza Sands, provide early indicators of possible hazards to the environment that can be addressed on a timely basis to prevent actual contamination from taking place.

Due to the conditions presented above and the fact that there is no need for remediation, the risks associated with closure of the Land Treatment Unit are minimal and require no special considerations.

Current

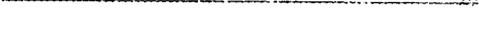
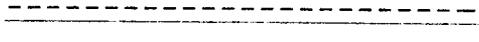
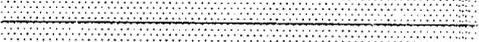
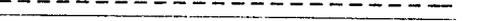
may change future

what about soils??



7
FIGURE 1

TABLE 1

	Borehole	
ZOI Samples - PEBP Table 2		0.0'
		1.0'
Original-Soil-Surface		2.0'
Treatment Zone Table 3		3.0'
		5.0'
BTZ Refinery-Constituent List Table 3 6.0'		10.0'
BTZ Table 3		10.0'
BPZ-Refinery-Constituent List		15.0'
BPZ-Refinery-Constituent List		20.0'
BPZ-Refinery-Constituent List		25.0'

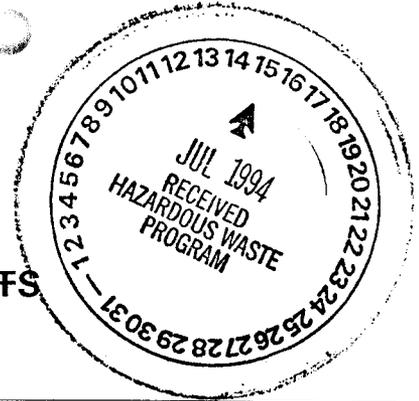
Out?

TABLE 2
SOIL SAMPLING PROGRAM

Parameters	ZOI	
	Event 1	Event 1 + 60 Days
pH	*	*
Oil %	*	*
Moisture %	*	*
Total Nitrogen	*	*
Total Phosphorous	*	*
Table 3 Constituents	*	**

** = Not required if Event 1 data shows levels below standards.

TABLE 4
TABLE 3, CONTINUED
MODIFIED SKINNER LIST
REFINERY HAZARDOUS CONSTITUENTS
8240 VOLATILE ORGANICS



PARAMETER	EPA METHOD SW-846	DESCRIPTION	CONTAINER	PRESERVATIVE	HOLDING TIME/DAYS	DETECTION LIMIT	UNITS
Benzene	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
2-Butanone (MEK)	8240	GC/MS	GLASS	4°C	14	10.0	ug/kg
Carbon Disulfide	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Chlorobenzene	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Chloroform *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Chloromethane *	8240	GC/MS	GLASS	4°C	14	10.0	ug/kg
1,2-Dibromoethane (EDB)	8240	GC/MS	GLASS	4°C	14	10.0	ug/kg
1,1-Dichloroethene *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
1,2-Dichloroethane *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
1,2-Dichloroethane (Total)	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
1,4-Dioxane	8240	GC/MS	GLASS	4°C	14	500	ug/kg
Ethylbenzene	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
<u>Methylene Chloride *</u>	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Styrene	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
1,1,2,2-Tetrachloroethane *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Tetrachloroethene *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Toluene	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
1,1,1-Trichloroethane	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
<u>1,1,2,2-Tetrachloroethane</u>	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Trichloroethene *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Xylenes (Total)	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
2-Chlorophenol *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
1,1-Dichloroethene *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Ethylene Dibromide *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Acetone	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg
Dichloromethane *	8240	GC/MS	GLASS	4°C	14	5.0	ug/kg

= MeCl (Dichloromethane)

* Additional Constituents

Table must include
~~1,1,1-Trichloroethane (oc)~~
~~1,1,2,2-Tetrachloroethane~~
 in soil (see B02)
 + Benzyl alcohol
 + 1,1,1-Trichloroethane (detected in 1990, see B02)
 + 1,1,2,2-Tetrachloroethane (detected in 1990, see B02)

TABLE 4- TABLE 3, CONTINUED
MODIFIED SKINNER LIST
REFINERY HAZARDOUS CONSTITUENTS
8270 SEMI-VOLATILE ORGANICS

PARAMETER	EPA METHOD		DESCRIPTION	CONTAINER	PRESERVATIVE	HOLDING TIME/DAYS	DETECTION LIMIT	UNITS
	SW-846							
Anthracene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Benzo(A)Anthracene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Benzo(B)Fluoranthene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Benzo(K)Fluoranthene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Benzo(A)Pyrene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Butyl Benzyl Phthalate	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Chrysene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Dibenz(A,H)Anthracene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Di-N-Butyl-Phthalate	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
1,2-Dichlorobenzene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
1,3-Dichlorobenzene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
1,4-Dichlorobenzene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Diethyl Phthalate	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
7,12-Dimethylbenz (A)-Anthracene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Dimethyl Phthalate	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Di-N-Octyl Phthalate	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Fluoranthene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Indeno(1,2,3-CD)Pyrene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
1-Methylnaphthalene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
2-Methylphenol (Cresol)	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
3/4-Methylphenol (Cresol)	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Naphthalene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
4-Nitrophenol	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Phenanthrene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Pyrene	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Pyridine	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Quinoline	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Benzenethiole	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Phenol	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Dis(2-Ethylhexyl)phthalate *	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Dibenz(a,h)acridine *	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Dichlorobenzene *	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
Methyl Naphthalene *	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
2,4-Dimethylphenol	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg
2,4-Dinitrophenol *	8270		GC/MS	GLASS	4°C	14	10.0	ug/kg

* Additional Constituents

Note: This list is a modification of Table 4, Part B Permit, Attachment F, Closure and Post-Closure Plan

Bis(2 ethylhexyl) phthalate

→ correct!

TABLE 3, CONTINUED

MODIFIED SKINNER LIST
METALS
ICP 6010

PARAMETER	EPA METHOD SW-846	DESCRIPTION	CONTAINER	PRESERVATIVE
Chromium	6010	-	GLASS	4°C
Lead	6010	-	GLASS	4°C

APPENDIX 1

SAMPLING PLAN

**LAND TREATMENT UNIT CHARACTERIZATION
GIANT REFINING COMPANY
CINIZA**

JUNE, 1994

PREPARED BY:

LYNN SHELTON

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- Appendix 1 NMED: Components of an Adequate Quality Assurance / Quality Control Program

1.0 INTRODUCTION

It is essential to assure that data generated during the land treatment unit sampling event is 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 a 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 the sampling event
- Develop a QA\QC report for submission to management
- Specify analytical methods to be used

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 (storage at 4°C constitutes preservation for this sampling event)
- 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 chain of custody documents upon 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 the anticipated sampling date, if possible, to assure that the sampling can proceed in an organized and efficient manner. A minimum of two weeks notice shall be given to the Hazardous and Radioactive Materials Bureau (HRMB) of the New Mexico Environment Department. OK

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 photoionization detector (PID) should be checked for fully charged battery and calibrated with hexane standard. This step may be eliminated if use of the 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)
- 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 be recorded concerning site conditions. These include:

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

TABLE 1

Field Equipment Checklist
Soil Sampling

<u>ITEM</u>	<u>REMARKS</u>
_____ 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	

3.3 Soil Sampling Locations and Techniques

The purpose of the soil sampling plan is to characterize the extent of the migration of hazardous constituents.

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

3.3.1 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, ~~other than the ZOI samples.~~ Core samplers are used in conjunction with hollow-stem augers to collect soil samples. A five foot, 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. The sample must be transferred to the sample container in a timely manner in order to maintain the integrity of the sample and to prevent the loss of volatile organic constituents (VOCs). Only after the sample has been collected should field observation and measurements (such as PID readings) be completed. Split core barrels will be used for obtaining samples of consolidated soil and to penetrate some types of rock. Measurements will be taken to the nearest 0.1 inch with an engineers tape measure.

3.3.2 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.

3.3.3 Lithologic Logging

Detailed logs will be maintained for each boring. Listed below is a general description of terms to be used to describe the soil characteristics for each boring.

- 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

Lithologic logs of the entire core shall be used. Samples for volatile organic constituents shall be obtained before logging to preclude potential loss of VOCs.

3.3.4 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 split spoon with bio-degradable soap and brush. Rinse with potable water.
- Steam augers and split spoon
- 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) Sampler's Signature
- 9) Signatures of All Individuals Involved in the Chain of Possession
- 10) Inclusive Dates and Times of Possession

A sample form is shown in Figure 1. The original chain of custody form 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 them in a cooler with ice to maintain the samples at 4°C. The information regarding date and time of sample preparation is entered on the chain of custody form 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 change shall be 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 Tables 2 and 3.

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 3.

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 3.

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.

7.5 Laboratory QA/QC

A copy of the laboratory's QA/QC program as submitted to Giant is kept on file. The recommended QA/QC program submitted to Giant by the New Mexico Environment Department is attached as Appendix 1. If necessary, Giant requests that the laboratory's QA/QC be modified to conform to the NMED QA/QC program.

TABLE 2
SOIL SAMPLING PROGRAM

ZOI

Parameters	Event 1	Event 1 + 60 Days
pH	*	*
Oil %	*	*
Moisture %	*	*
Total Nitrogen	*	*
Total Phosphorous	*	*
Table 3 Constituents	*	**

** = Not required if Event 1 data shows levels below standards.

TABLE 3

MODIFIED SKINNER LIST
REFINERY HAZARDOUS CONSTITUENTS
8240 VOLATILE ORGANICS

PARAMETER	EPA METHOD		CONTAINER	PRESERVATIVE	HOLDING TIME/DAYS	DETECTION LIMIT	UNITS
	SW-846	DESCRIPTION					
benzene	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
Acetone	8240	GC/MS	G GLASS	4°C	14	10.0	ug/kg
Carbon Disulfide	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
Chlorobenzene	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
Chloroform	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
Chloromethane	8240	GC/MS	G GLASS	4°C	14	10.0	ug/kg
1,2-Dibromoethane (EDB)	8240	GC/MS	G GLASS	4°C	14	10.0	ug/kg
1,1-Dichloroethane	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,2-Dichloroethane	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,2-Dichloroethane (Total)	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,4-Dioxane	8240	GC/MS	G GLASS	4°C	14	500	ug/kg
Styrene	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
Ethylene Chloride	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
Toluene	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,2,2-Tetrachloroethane *	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,1,2-Trichloroethane *	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,1,1-Trichloroethane	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,1,2,2-Tetrachloroethane	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,1,1-Trichloroethane	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,1,2,2-Tetrachloroethane (Total)	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1-Chlorophenol	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,1-Dichloroethene	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
1,2-Dibromoethane *	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
Acetone	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg
Chloromethane *	8240	GC/MS	G GLASS	4°C	14	5.0	ug/kg

Additional Compounds Constituents

~~TABLE 4~~ TABLE 3, CONTINUED
MODIFIED SKINNER LIST
 REFINERY HAZARDOUS CONSTITUENTS
 8270 SEMI-VOLATILE ORGANICS

PARAMETER	EPA METHOD		CONTAINER	PRESERVATIVE	HOLDING TIME/DAYS	DETECTION LIMIT	UNITS
	SW-846	DESCRIPTION					
thracene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
nzo(A)Anthracene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
nzo(B)Fluoranthene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
nzo(K)Fluoranthene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
nzo(A)Pyrene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
tyl Benzyl Phthalate	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
rysene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
enz(A,H)Anthracene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
N-Butyl-Phthalate	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
Dichlorobenzene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
Dichlorobenzene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
Dichlorobenzene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
ethyl Phthalate	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
2-Dimethylbenz (A)-Anthracene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
nethyl Phthalate	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
N-Octyl Phthalate	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
oranthene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
eno(1,2,3-CD)Pyrene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
4ethylnaphthalene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
4ethylphenol (Cresol)	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
Methylphenol (Cresol)	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
phthalene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
nitrophenol	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
nanthrene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
ene	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
idine	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
inoline	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
zenethiole	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
anol	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
(2-Ethylhexyl)phthalate *	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
enz(a,h)acridine *	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
lorobenzene *	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
thyl Naphthalene *	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
Dimethylphenol	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg
Dinitrophenol *	8270	GC/MS	G GLASS	4°C	14	10.0	ug/kg

Additional Constituents

Note: This list is a modification of Table 4, Part B Permit, Attachment F, Closure and Post-Closure Plan

TABLE 3, CONTINUED

MODIFIED SKINNER LIST
METALS
ICP 6010

PARAMETER	EPA METHOD SW-846	DESCRIPTION	CONTAINER	PRESERVATIVE
Chromium	6010	-	GLASS	4°C
Lead	6010	-	GLASS	4°C

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 EPA 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 blanks and reagent blanks.
- Check calibration using a blank and two standards.
- Check calibration every ten samples and at the end of each run by analyzing the blank and check standard. The standard should be within 10% of the expected result. If not, terminate the analysis, correct the problem and re-calibrate. The calibration blank should be within three standard deviations of the mean blank. If not, terminate the analysis, correct the problem, re-calibrate, and reanalyze the previous ten samples.
- Analyze the 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 run at a frequency of 20%. The relative percent difference (RPD) shall be $\pm 20\%$ for sample values greater than ten times the detection limit. Spike recovery is to be $\pm 20\%$ of the actual value.
- Serial dilution checks should be done 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, and samples.
- Blank and standard calibration verification should be performed at the end of 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. The RPD calculation is as follows:

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

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 Method Detection Limit (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 migration of contamination beneath the treatment zone.

10.2 Sample Identification Numbering System

The sample identification numbering system is used to identify individual samples. Sample numbers may include a code number or letter attached to the end to identify the type of sample.

Sample numbers for the 1994 sampling event are labeled as:

LTA - C - 11 - 5.0 - D
(1) (2) (3) (4) (5)

- (1) LTA = Land Treatment Area
- (2) C = Characterization
- (3) 11 = Core Number
- (4) 5.0 = Depth of Sample
- (5) 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. The interval and constituents of each sample point are as follows:~~

Borehole

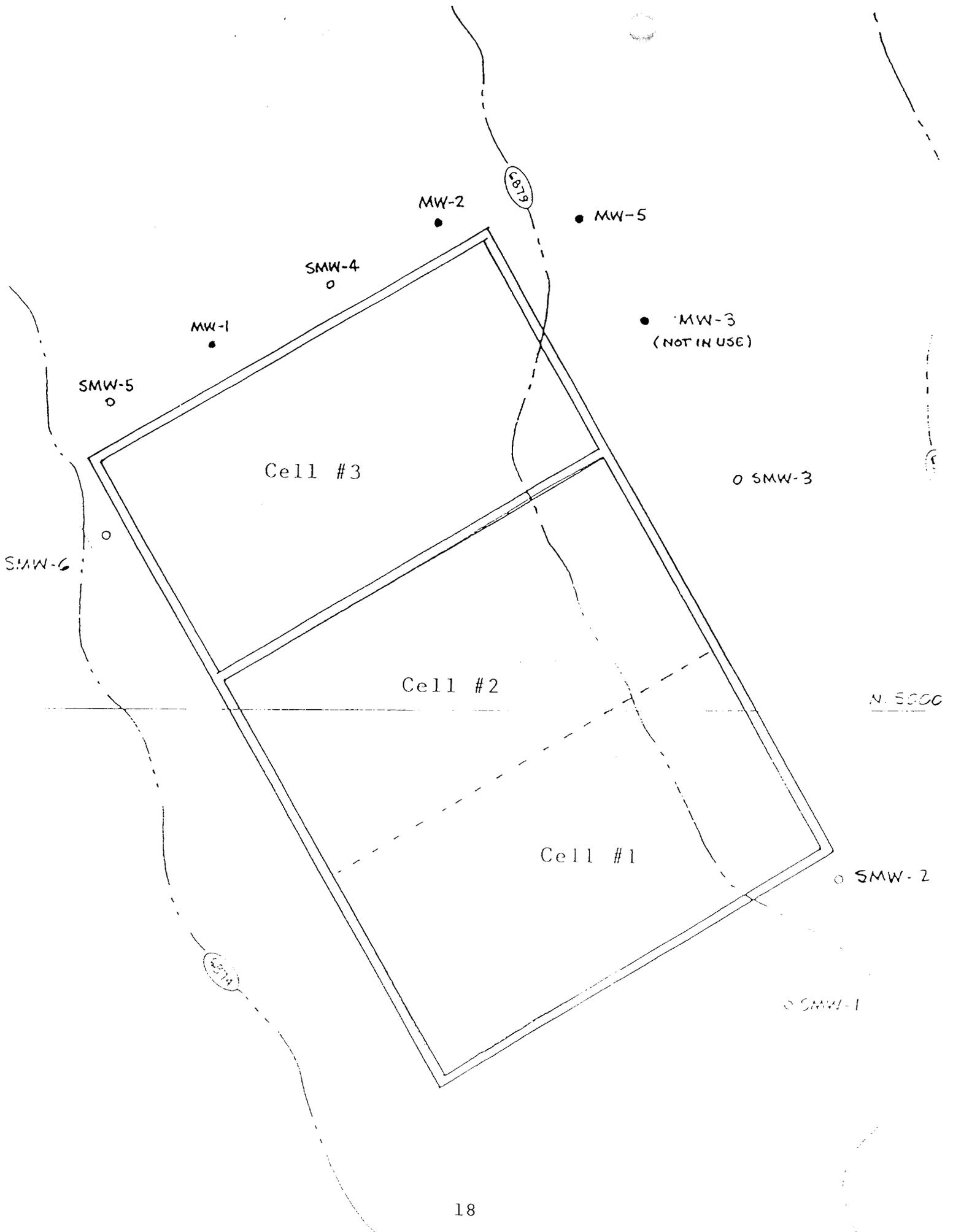
~~ZOI-Sample---TCBP-----0.0'~~

~~Original-Soil-Surface-----2.0'~~

~~BTZ-Sample---Refinery-----10.0'~~
~~Constituent-List~~

~~BTZ-Sample---Refinery-----15.0'~~
~~Constituent-List~~

~~BTZ-Sample---Refinery-----25.0'~~
~~Constituent-List~~



APPENDIX 1

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 mg 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 mg 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
