

GW - 32

REPORTS

YEAR(S):

1991 RCRA Book 3

INVESTIGATION

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OIL CONSERVATION DIV.
SANTA FE

RCRA FACILITY INVESTIGATION
PHASE II - DRAFT
GIANT REFINING COMPANY
GALLUP, NEW MEXICO
OCTOBER 21, 1991

BOOK 3

TABLE -1
BACKGROUND METALS

Total Metals

<u>Parameter</u>	<u>Analytical Method</u>	<u>Reporting Limit mg/kg</u>
Antimony	6010	6.0
Arsenic	7060- <i>graphite</i>	0.5 <i>3</i>
Barium	6010	1.0
Beryllium	6010	0.2
Cadmium	6010	0.5
Chromium	6010	1.0
Cobalt	6010	1.0
Copper	6010	2.0
Lead	6010	5.0
Mercury	7471	0.2
Nickel	6010	4.0
Potassium	6010	500
Selenium	7740 <i>Graphite</i>	0.5 <i>3</i>
Vanadium	6010	1.0
Zinc	6010	2.0

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TABLE-4
SKINNER LIST

METHOD 8240

<u>Parameter</u>	<u>Reporting Limit (ug/kg)</u>
Benzene	500
Carbon disulfide	500
Chlorobenzene	500
2-Chloroethylvinyl ether	1,000
1,2-Dibromomethane	1,000
1,2-Dichloroethane	500
1,4-Dioxane	50,000
Ethyl Benzene	500
Methyl ethyl ketone (2-butanone)	1,000
Styrene	500
Toluene	500
Xylenes	500

METHOD 8270

Anthracene	5,000
Benzenethiol	-
Benzo(a)anthracene	5,000
Benzo(b)fluoranthene	5,000
Benzo(k)fluoranthene	5,000
Benzo(a)pyrene	5,000
Bis(2-ethylhexyl)phthalate	5,000
Butyl benzyl phthalate	5,000
Chrysene	5,000
Dibenzo(a,X)acridine	-
Dibenzo(a,h)anthracene	5,000
Di-n-butylphthalate	5,000
1,2-Dichlorobenzene	5,000
1,3-Dichlorobenzene	5,000
1,4-Dichlorobenzene	5,000
Diethyl phthalate	5,000
7,12-Dimethylbenz(a)anthracene	5,000
2,4-Dimethylphenol	5,000
Dimethyl phthalate	5,000
2,4-Dinitrophenol	25,000
Di-n-octyl phthalate	5,000
Fluoranthene	5,000
Indene	5,000
Methylchrysene	-
1-Methylnaphthalene	5,000
2-Methylphenol	5,000
3-Methylphenol	5,000
4-Methylphenol	5,000
Naphthalene	5,000
4-Nitrophenol	25,000
Phenanthrene	5,000

TABLE-4 Continued

Phenol.	5,000
Pyrene	5,000
Pyridine	10,000
Quinoline	25,000

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SECTION 8.0

SUMMARY AND COMMENTS

SECTION 8.1

SWMU #1 - AERATION BASIN

This Solid Waste Management Unit (SWMU) consists of Aeration Lagoon #1, Aeration Lagoon #2 and Evaporation Pond #1. The methodology for assessment of this SWMU was based on the collection of soil samples around the parameter of these lagoons. Samples were collected from four (4) vertical and two (2) angle excavations. The actual angle for the collection of samples from the angle excavations was approximately 50° from vertical. Samples were collected from the following vertical intervals; 4-4½ ft., 9-9½ ft., 11-11½ ft., and 14-14½ ft.. This resulted in the collection of 24 soil samples, excluding quality control samples.

The vertical samples were collected by using a backhoe to excavate to the beginning depth of each sample interval. A hand auger was then used to collect each six (6) inch core sample. The angle samples were collected by using the backhoe to excavate a hole to approximately fifteen (15) feet deep. A large culvert was placed upright in the hole. A hand auger was inserted through pre-cut holes and horizontal borings were made to the distance to achieve the 50° angle for each vertical boring. The sample was dumped into an aluminum pan, mixed and composited for collection. The samples were collected, labeled and shipped as required by Sections 3.4, 4.0 and 6.0 respectively of the Generic Sampling Plan.

These samples were analyzed for the EPA 8240 and 8270 priority pollutants and background metals as outlined in Section 7.0 of the Generic Sampling Plan. All samples were sent to Analytical Technologies Inc., (ATI) in Phoenix, Arizona for the required analysis. A copy of the analytical from ATI has been included as Section 7.0 of this report. Section 6.0 includes a computerized tabulated summary of all the analytical results from the Phase II RFI. Section 5.0 includes the statistical calculations for the metals from the soil samples.

The specific sampling equipment was decontaminated as required by Section 5.0 of the Generic Sampling Plan. The backhoe was decontaminated between each sample interval with a tap water wash followed by a steam cleaning.

All the analytical results from the 8240 volatile organics and the 8270 semi-volatile organics for SWMU #1 was below the detection limits of each of the individual parameters. Of the twenty four (24) soil samples collected, there was six different metals that exceeded background levels. The highest concentration and the highest percent exceedance of the upper tolerance limit for each of these six metals are as follows:

<u>Metal</u>	<u>Concentration (mg/kg)</u>	<u>Exceedance (%)</u>
Barium	767.0	99.16
Chromium	52.1	523.95
Cobalt	5.8	15.77
Copper	7.6	15.50
Potassium	2270.0	8.52
Zinc	34.6	38.90

Chromium is the only metal listed above that indicates substantial exceedance of the background levels. Chromium is also the only one of these six (6) metals that is listed in the July 27, 1990 Federal Register "Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities; Proposed Rule". The proposed corrective action level for chromium is 400 mg/kg; well above the 52.1 mg/kg which was detected in one individual sample. This sample was at the four (4) foot level of sample boring number five (5). The nine (9), eleven (11), and fourteen (14) foot samples each contained chromium levels below the background levels. The next highest chromium concentration for SWMU #1 was 14.2 mg/kg.

This sample boring was the only boring from SWMU #1 that contained any photoionization detector (PID) readings above background. These readings were all very low and are as follows:

<u>Sample Depth (ft)</u>	<u>PID (ppm)</u>
4-4½	8.2
9-9½	2.4
11-11½	0.8
14-14½	0.0

As a result of the Data Management Logs in Section 4.0 (contains PID recordings and soil characteristics) and the analytical data, Giant does not believe any corrective action is required for SWMU #1. Giant proposes to continue to use these three lagoons for storage and evaporation of the treated process waste water from the refinery and waste water from Giant's associated Travel Center.

FIGURE 8.1

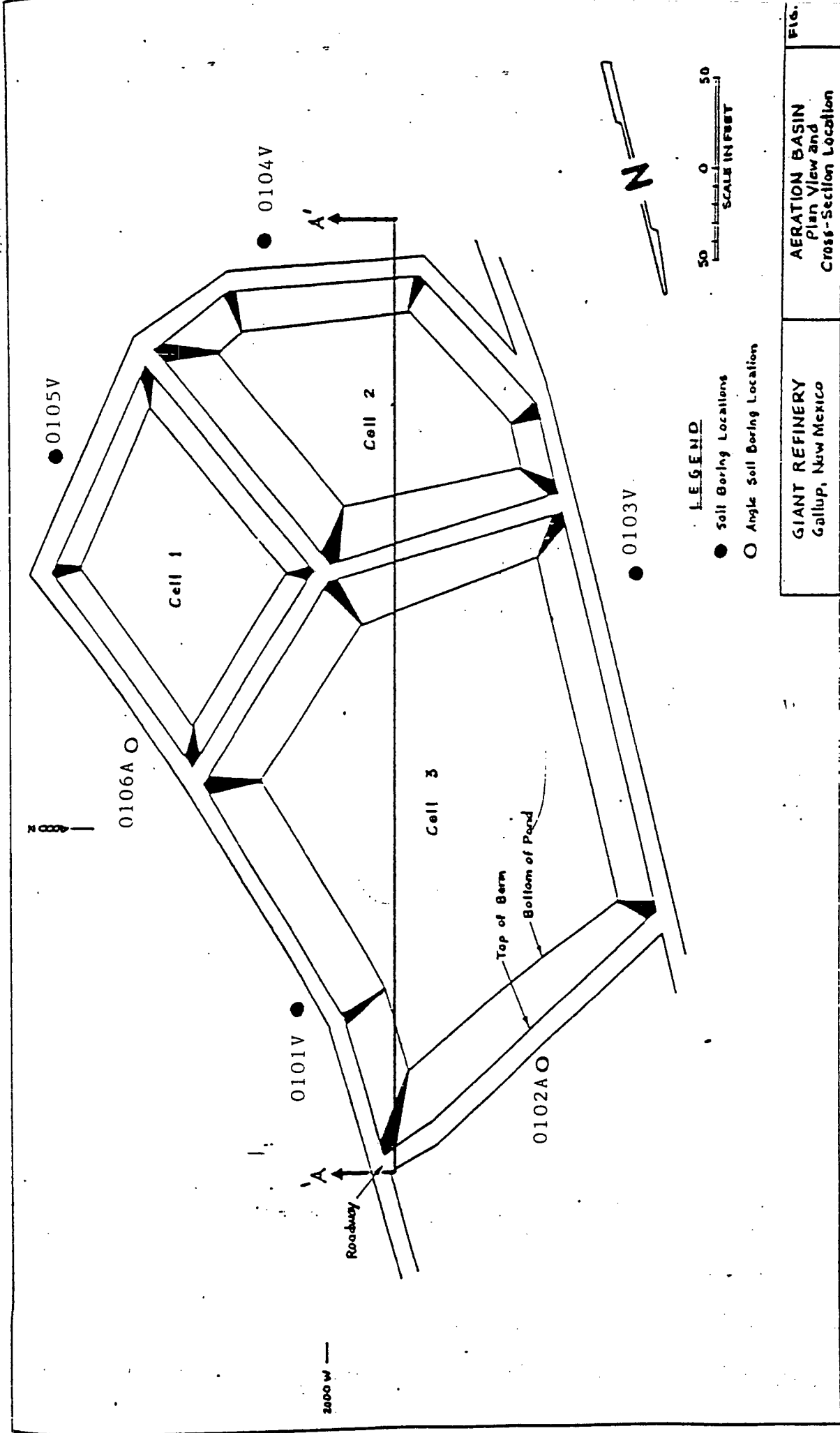


FIG.	AERATION BASIN Plan View and Cross-Section Location
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GIANT REFINERY
Gallup, New Mexico

SECTION 8.2

SWMU #2 - EVAPORATION PONDS

This Solid Waste Management Unit (SWMU) consists of Evaporation Ponds #2, #3, #4, #5, #6A, #6B, #7, #8, #9A, #9B, #9C, #9D, #11, #12A and #12B. The methodology for assessment of this SWMU was based on the collection of both soil samples and ground water samples from specified locations around the lagoons.

Soil samples were collected from twelve (12) vertical and six (6) angle excavations. The actual angle for the collection of samples from the angle excavations was approximately 50° from vertical. Samples were collected from the following vertical intervals: 3½-4 feet, 5-5½ feet and 6½-7 feet. This resulted in the collection of 54 soil samples, excluding quality control sample. Both the vertical and angle samples were collected by the same methodology outlined in Section 8.1. Ground water samples were collected from seven (7) existing wells. These wells are listed as MW-4, OW-1, OW-2, OW-5, OW-7, OW-9 and OW-10. The original Workplan did not include OW-2 however, the May 31, 1990 EPA memo and enclosures specified seven (7) ground water samples. OW-2 was included as the seventh well per telephone discussions between Richard Mayer of EPA and Claud Rosendale of Giant.

All of the wells were evacuated by using a submersible pump powered by a portable generator. The water that was evacuated was collected and transported to the active land treatment unit for disposal. The pump and hose were decontaminated between each well by a tap water wash followed by a distilled water wash. The samples were collected by using stainless steel bailers equipped with teflon ball valves. The sampling procedures outlined in Section 3.3 of the Generic Sampling Plan was followed for collection of the samples.

Both the soil and ground water samples were labeled and shipped as required by Section 4.0 and 6.0 of the Generic Sampling Plan. the samples were analyzed for pH and the Skinner list constituents (including metals) as outlined in Section 7.0 of the Generic Sampling Plan. All samples were sent to ATI for the required analysis. The analytical is included in this report in Section 5.0 - Statistical Information, Section 6.0 - Tabulated Analytical and Section 7.0 - Original Analytical Data.

All sampling equipment was decontaminated as required by Section 5.0 of the Generic Sampling Plan.

The only constituent detected in the soil samples from the 8240 volatile screen was Toluene. There were trace levels of Toluene in eight of the samples. These are outlined below:

Sampling Boring	Sample Depth (ft)	Toluene (mg/kg)
1	6.5	5.000
7	6.5	0.011
8	3.5	0.009
8	5.0	0.013
9	6.5	0.007
10	5.0	0.005
10	6.5	0.005
13	6.5	0.500

Only one sample included trace levels of the 8270 semi-volatile Butylbenzylphthalate. This was sample boring number one (1) at the three and one half (3½) foot level with a concentration of 0.3 mg/kg.

Of the fifty four (54) soil samples collected, there was eight (8) different metals that exceeded background levels. The highest concentration and the highest percent exceedance of the upper tolerance limit for each of these eight (8) metals are as follows:

<u>Metal</u>	<u>Concentration (mg/kg)</u>	<u>Exceedance (%)</u>
Barium	590.0	53.20
Chromium	14.1	68.86
Cobalt	8.3	49.70
Copper	7.5	10.94
Nickel	15.6	24.60
Potassium	5360.0	103.66
Vanadium	22.6	21.76
Zinc	28.3	46.33

None of these metals substantially exceed the background levels. Chromium and Nickel is the only metals listed above that is included in the July 27, 1990 Federal Register "Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities Proposed Rule". The proposed corrective action levels for Chromium and Nickel is 400 mg/kg and 2,000 mg/kg respectively. This is well above the highest levels of Chromium (14.1 mg/kg) and Nickel (15.6 mg/kg) that was detected in SWMU #2.

The 8240 and 8270 constituents of the Skinner list for all the groundwater samples was below the detection levels. The pH of OW-5 (6.98) was slightly below the pH of the other wells but is not low enough to raise any concern. The metals results from the wells were also well within the anticipated ranges.

As a result of the Data Management Logs, Ground Water Monitoring Sample Record and the analytical, Giant does not believe any corrective action is required for SWMU #2. Giant proposes to continue to use these lagoons for storage and evaporation of the treated process waste water from the refinery and waste water from Giant's associated Travel Center.

FIGURE 8.2

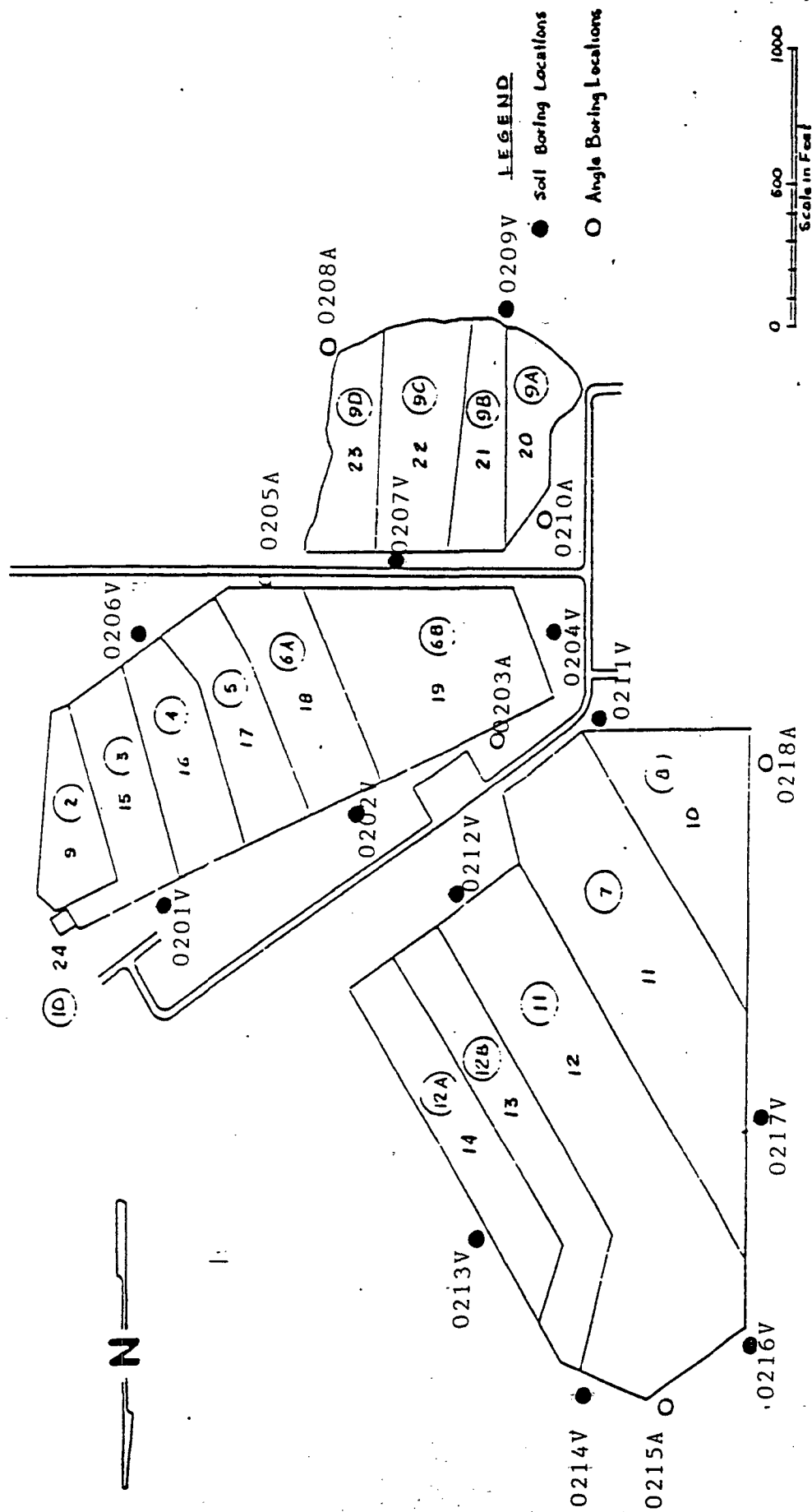
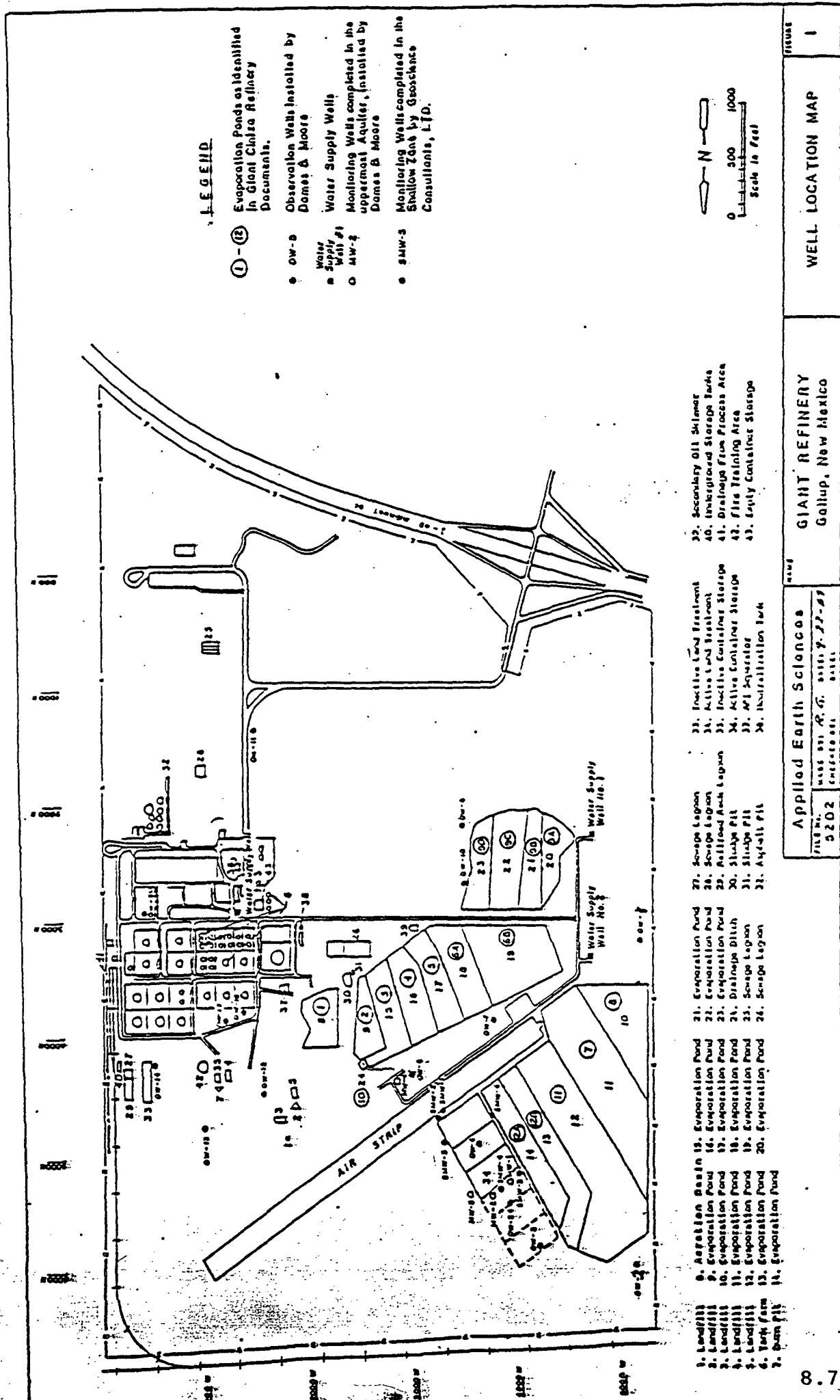


FIGURE 8.3



SECTION 8.3

SWMU #13 - DRAINAGE DITCH BETWEEN APIS EVAPORATION PONDS AND NEUTRALIZATION TANK EVAPORATION PONDS

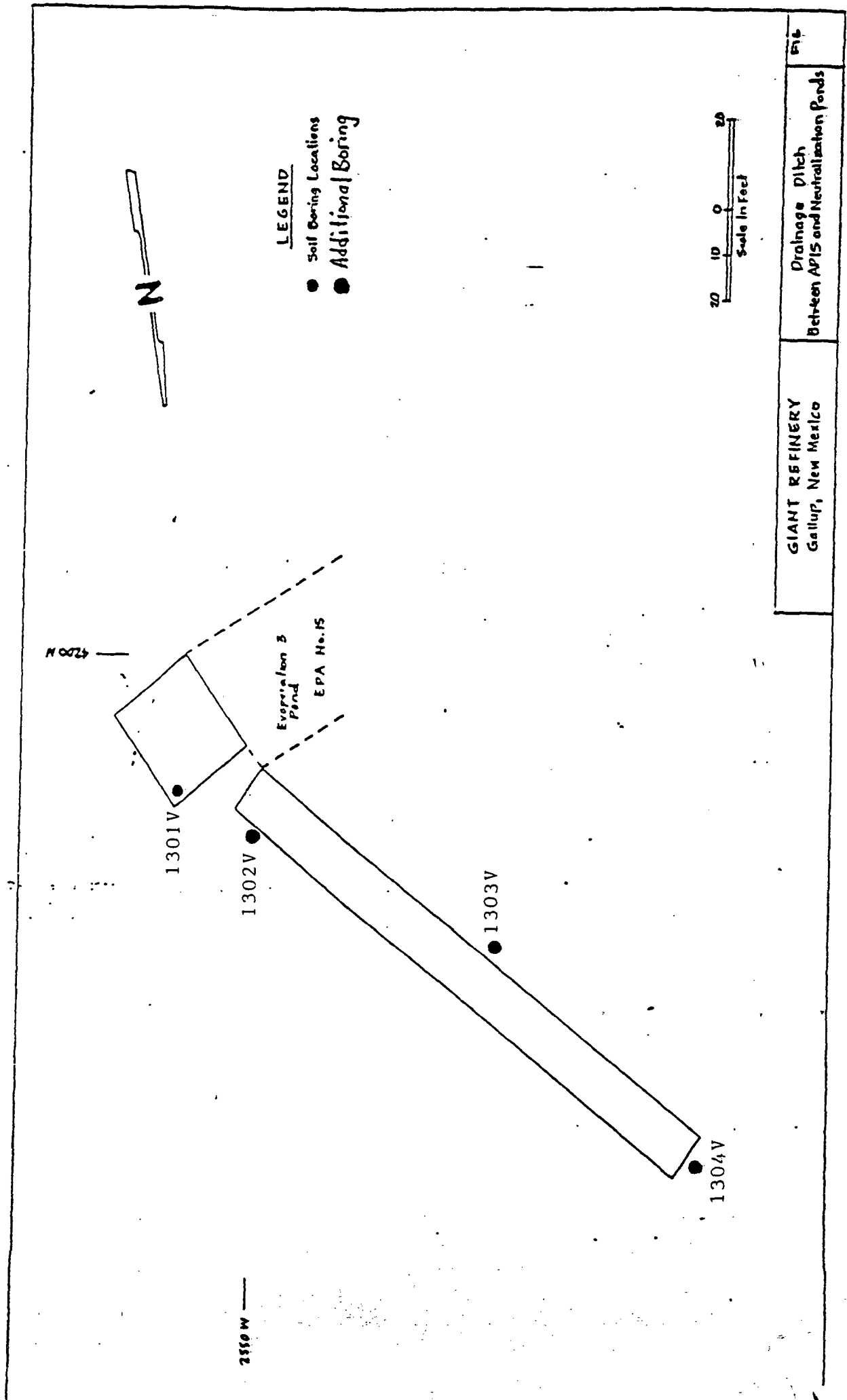
This Solid Waste Management Unit (SWMU) consist of the small overflow lagoon from Evaporation Pond #2 and the associated drainage ditch. The methodology for assessment of this SWMU was based on the collection of soil samples around the parameter of these drainage areas. The original site specific Workplan was modified, as requested by the May 31, 1990 EPA memo, to require the drilling of four (4) vertical borings. Samples were collected from the four (4) vertical borings at intervals of 2-2½ feet and 3½-4 feet. This resulted in the collection of eight (8) samples, excluding the quality control samples.

The samples were collected by using a hand auger. The sample collection, sample shipment and equipment decontamination were conducted as required in the Generic Sampling Plan. The samples were analyzed for the Skinner list constituents outlined in Section 7.0 of the Generic Sampling Plan. The samples were analyzed by ATI with the data included in this report as specified in Sections 8.1 and 8.2.

All of the analytical results from the 8240 volatiles and 8270 semi-volatiles outlined in the Skinner list were below the detection limits of each individual parameters. None of the metals were above the background limits.

As a result of the Data Management Logs and the analytical data, Giant does not believe any corrective action is required for SWMU #13. Giant proposes to continue to use this drainage channel when diverting water from the center series of lagoons to the north series of lagoons.

FIGURE 8.4



SECTION 8.4

BERYLLIUM CONCLUSIONS

Section 5.0 outlines the basic issues associated with the discrepancies between the two different laboratories for the beryllium analysis. Enseco-Rocky Mountain Analytical Laboratories (RMAL) analyzed all of the original background samples from 1987 and 1988 as well as last years Phase I RFI samples. All soil samples sent to RMAL for the above sampling events had beryllium results of 1.3 ppm or less with most of the results being less than 1.0 ppm. Analytical Technologies Inc., (ATI) analyzed all of the samples for the Phase II RFI sampling event. The analytical results varied from 1.0 ppm to 18.2 ppm.

Giant collected additional samples from the background plot and sent to ATI for analysis. This allows the following comparison for samples that were collected from almost identical locations:

BERYLLIUM COMPARISONS

<u>Depth (ft)</u>	<u>ATI (mg/kg)</u>	<u>RMAL (mg/kg)</u>
0-5	2.3	1.0
5-6	3.2	1.2

The above sample locations are outlined in FIGURES 5-2, 5-3 and 5-4.

Giant has also included two different sets of analytical which includes beryllium analysis for the pond waste waters from two different laboratories. The analytical is included as TABLES 5-3 and 5-4. The waste water beryllium concentrations are as follows:

<u>Location</u>	<u>Laboratory</u>	<u>Beryllium (ppm)</u>
Pond #2	RMAL	<0.006
Pond #2	Assaigai Lab	0.27

Giant's waste water does not include concentrations of beryllium that would create potential contamination to the soils surrounding the lagoons. There are also major discrepancies between RMAL and ATI in their analytical testing for beryllium. Due to these discrepancies and the overall low concentrations of beryllium in the soils, Giant does not believe that beryllium is an issue of concern.

Since beryllium was discussed in this section, it was not duplicated in Section 8.1, 8.2 and 8.3 which includes the discussion for each individual SWMU.



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105695
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : UG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<2.5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	105
BROMOFLUOROBENZENE (%)	103
TOLUENE-D8 (%)	106



GCMS - RESULTS

ATI I.D. : 10569505

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1302 E 2.0
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/25/91
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHYLPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO(a)ANTHRACENE	<5
BIS(2-ETHYLHEXYL)PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO(b)FLUORANTHENE	<5
BENZO(k)FLUORANTHENE	<5
BENZO(a)PYRENE	<5
DIBENZO(a,h)ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO(A,J)ACRIDINE	<5
7,12-DIMETHYLBENZ(a)ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	46
2-FLUOROBIPHENYL (%)	49
TERPHENYL (%)	66
PHENOL-D6 (%)	36
2-FLUOROPHENOL (%)	43
2,4,6-TRIBROMOPHENOL (%)	38



Analytical Technologies, Inc.

QUALITY CONTROL DATA

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

ATI I.D. : 105695

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699904

DATE ANALYZED : 05/28/91

SAMPLE MATRIX : AQUEOUS

UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP. DUP.		RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,1-DICHLOROETHENE	<5	50	41	82	43	86	5
TRICHLOROETHENE	<5	50	47	94	48	96	2
CHLOROBENZENE	<5	50	45	90	46	92	2
TOLUENE	<5	50	44	88	44	88	0
BENZENE	<5	50	41	82	42	84	2

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105695
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/25/91
UNITS : UG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHYLPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO(a)ANTHRACENE	<5
BIS(2-ETHYLHEXYL)PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO(b)FLUORANTHENE	<5
BENZO(k)FLUORANTHENE	<5
BENZO(a)PYRENE	<5
DIBENZO(a,h)ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO(A,J)ACRIDINE	<5
7,12-DIMETHYLBENZ(a)ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	58
2-FLUOROBIPHENYL (%)	47
TERPHENYL (%)	68
PHENOL-D6 (%)	28
2-FLUOROPHENOL (%)	38

(CONTINUED NEXT PAGE)



Analytical **Technologies**, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105695

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

COMPOUNDS

RESULTS

2,4,6-TRIBROMOPHENOL (%)

34



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105695

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699904

DATE ANALYZED : 05/25/91

SAMPLE MATRIX : AQUEOUS

UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED	% SPIKED	DUP.		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,2,4-TRICHLOROBENZENE	<5	50	23	46	23	46	0
ACENAPHTHENE	<5	50	24	48	22	44	9
2,4-DINITROTOLUENE	<5	50	30	60	25	50	18
PYRENE	<5	50	37	74	33	66	11
N-NITROSO-DI-N-PROPYL AMINE	<5	50	26	52	23	46	12
1,4-DICHLOROBENZENE	<5	50	24	48	23	46	4
PENTACHLOROPHENOL	<25	100	98	98	102	102	4
PHENOL	<5	100	60	60	60	60	0
2-CHLOROPHENOL	<5	100	59	59	62	62	5
4-CHLORO-3-METHYLPHENOL	<5	100	72	72	72	72	0
4-NITROPHENOL	<25	100	57	57	63	63	10

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

5-9-91
DATE

PAGE 2 OF

PROJECT MANAGER:				ANALYSIS REQUEST												RELINQUISHED BY: 1				RELINQUISHED BY: 2				RELINQUISHED BY: 3							
COMPANY: GIANT REFINING CO				DATE: 5-9-91				PHONE NUMBER: 1505 1722-0227				The 13 Priority Pollutant Metals				The 8 EP Tox Metals by EP Tox Prep. (1310)				The 8 EP Tox Metals by Total Digestion				The 8 EP Tox Metals by TCLP (1311)				NUMBER OF CONTAINERS			
ADDRESS: 2+3 BOX 7																															
GALLUP NM 87301																															
BILL TO: (Same)																															
COMPANY:																															
ADDRESS:																															
SAMPLERS: (Signature)																															
SAMPLE ID				DATE				TIME				MATRIX				LAB ID															
RFI 1301 V 2.0				5-9-91				10:50				SOIL				1															
RFI 1301 V 3.5				5-9-91				11:05				SOIL				2															
RFI 1302 V 2.0				5-9-91				11:55				SOIL				3															
RFI 1302 V 3.5				5-9-91				1:05				SOIL				4															
RFI 1302 E 2.0				5-9-91				12:45				WATER				5															
RFI 1303 V 2.0				5-9-91				1:50				SOIL				6															
RFI 1303 V 3.5				5-9-91				2:05				SOIL				7															
RFI 1304 V 2.0				5-9-91				3:10				SOIL				8															
RFI 1304 V 3.5				5-9-91				3:25				SOIL				9															

PROJECT INFORMATION				SAMPLE RECEIPT			
PROJECT NO: 34				TOTAL NO. OF CONTAINERS			
PROJECT NAME: 24 SE 2 RFI				CHAIN OF CUSTODY SEALS			
P.O. NO: 01909				INTACT?			
SHIPPED VIA: FED EXP				RECEIVED GOOD COND / COLD			
SAMPLE DISPOSAL INSTRUCTIONS				LAB NUMBER			
☒ ATI ☐ RETURN				105695			
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS							
TAT: (NORMAL) X				(RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK			
Comments: SEE ATTACHMENTS FOR ANALYTICAL PARAMETERS							

RELINQUISHED BY: 1				RELINQUISHED BY: 2				RELINQUISHED BY: 3			
Signature: [Signature]				Signature: [Signature]				Signature: [Signature]			
Printed Name: LARRY SHELTON				Printed Name: [Name]				Printed Name: [Name]			
Date: 5-10-91				Date: [Date]				Date: [Date]			
Company: GIANT REFINING CO				Company: [Company]				Company: [Company]			
Signature: [Signature]				Signature: [Signature]				Signature: [Signature]			
Printed Name: [Name]				Printed Name: [Name]				Printed Name: [Name]			
Date: [Date]				Date: [Date]				Date: [Date]			
Company: [Company]				Company: [Company]				Company: [Company]			

RELINQUISHED BY: 1				RELINQUISHED BY: 2				RELINQUISHED BY: 3			
Signature: [Signature]				Signature: [Signature]				Signature: [Signature]			
Printed Name: [Name]				Printed Name: [Name]				Printed Name: [Name]			
Date: [Date]				Date: [Date]				Date: [Date]			
Company: [Company]				Company: [Company]				Company: [Company]			

RELINQUISHED BY: 1				RELINQUISHED BY: 2				RELINQUISHED BY: 3			
Signature: [Signature]				Signature: [Signature]				Signature: [Signature]			
Printed Name: [Name]				Printed Name: [Name]				Printed Name: [Name]			
Date: [Date]				Date: [Date]				Date: [Date]			
Company: [Company]				Company: [Company]				Company: [Company]			



Chain of Custody

DATE 5-9-91 PAGE 2 OF 2

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ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001

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Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105695

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699918

DATE ANALYZED : 05/23/91

SAMPLE MATRIX : NON-AQUEOUS

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,1-DICHLOROETHENE	<0.5	2.5	2.1	84	2.1	84	0
TRICHLOROETHENE	<0.5	2.5	2.1	84	2.2	88	5
CHLOROBENZENE	<0.5	2.5	2.3	92	2.4	96	4
TOLUENE	<0.5	2.5	2.4	96	2.5	100	4
BENZENE	<0.5	2.5	2.1	84	2.1	84	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



GCMS - RESULTS

ATI I.D. : 10569501

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1301 V 2.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	94
2-FLUOROBIPHENYL (%)	80
TERPHENYL (%)	110
PHENOL-D6 (%)	78
2-FLUOROPHENOL (%)	80
2,4,6-TRIBROMOPHENOL (%)	80



GCMS - RESULTS

ATI I.D. : 10569502

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1301 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	80
2-FLUOROBIPHENYL (%)	75
TERPHENYL (%)	105
PHENOL-D6 (%)	76
2-FLUOROPHENOL (%)	79
2,4,6-TRIBROMOPHENOL (%)	74



GCMS - RESULTS

ATI I.D. : 10569503

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1302 V 2.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	81
2-FLUOROBIPHENYL (%)	75
TERPHENYL (%)	101
PHENOL-D6 (%)	75
2-FLUOROPHENOL (%)	77
2,4,6-TRIBROMOPHENOL (%)	73



GCMS - RESULTS

ATI I.D. : 10569504

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1302 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	73
2-FLUOROBIPHENYL (%)	71
TERPHENYL (%)	110
PHENOL-D6 (%)	65
2-FLUOROPHENOL (%)	66
2,4,6-TRIBROMOPHENOL (%)	75

GCMS - RESULTS

ATI I.D. : 10569506

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1303 V 2.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	84
2-FLUOROBIPHENYL (%)	79
TERPHENYL (%)	115
PHENOL-D6 (%)	78
2-FLUOROPHENOL (%)	81



GCMS - RESULTS

ATI I.D. : 10569507

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1303 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/25/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	62
2-FLUOROBIPHENYL (%)	51
TERPHENYL (%)	81
PHENOL-D6 (%)	53
2-FLUOROPHENOL (%)	61
2,4,6-TRIBROMOPHENOL (%)	41



GCMS - RESULTS

ATI I.D. : 10569508

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1304 V 2.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/25/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	62
2-FLUOROBIPHENYL (%)	54
TERPHENYL (%)	83
PHENOL-D6 (%)	51
2-FLUOROPHENOL (%)	57
2,4,6-TRIBROMOPHENOL (%)	20



GCMS - RESULTS

ATI I.D. : 10569509

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1304 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/25/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	60
2-FLUOROBIPHENYL (%)	47
TERPHENYL (%)	77
PHENOL-D6 (%)	50
2-FLUOROPHENOL (%)	55
2,4,6-TRIBROMOPHENOL (%)	36



GCMS - RESULTS

ATI I.D. : 10569511

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1304 D 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/25/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	TR
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	55
2-FLUOROBIPHENYL (%)	44
TERPHENYL (%)	66
PHENOL-D6 (%)	45
2-FLUOROPHENOL (%)	51
2,4,6-TRIBROMOPHENOL (%)	34



GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105695
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	84
2-FLUOROBIPHENYL (%)	75
TERPHENYL (%)	107
PHENOL-D6 (%)	78
2-FLUOROPHENOL (%)	81

(CONTINUED NEXT PAGE)



Analytical **Technologies**, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105695

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

COMPOUNDS

RESULTS

2,4,6-TRIBROMOPHENOL (%)

73



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105695

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699918

DATE ANALYZED : 05/25/91

SAMPLE MATRIX : NON-AQUEOUS

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	0.7	41	0.8	47	13
ACENAPHTHENE	<0.17	1.7	0.8	47	0.9	53	12
2,4-DINITROTOLUENE	<0.17	1.7	0.9	53	1.0	59	11
PYRENE	<0.17	1.7	1.2	71	1.3	77	8
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	0.9	53	1.0	59	11
1,4-DICHLOROBENZENE	<0.17	1.7	0.7	41	0.8	47	13
PENTACHLOROPHENOL	<0.85	3.3	2.2	67	2.6	79	17
PHENOL	<0.17	3.3	2.1	64	2.3	70	9
2-CHLOROPHENOL	<0.17	3.3	1.8	55	2.0	61	11
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	2.2	67	2.4	73	9
4-NITROPHENOL	<0.85	3.3	2.0	61	2.4	73	18

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



GCMS - RESULTS

ATI I.D. : 10569505

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1302 E 2.0
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : N/A
DATE ANALYZED : 05/23/91
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<2.5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	104
BROMOFLUOROBENZENE (%)	105
TOLUENE-D8 (%)	102



GCMS - RESULTS

ATI I.D. : 10569510

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : TRIP BLANK
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/06/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : N/A
DATE ANALYZED : 05/23/91
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<2.5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	108
BROMOFLUOROBENZENE (%)	101
TOLUENE-D8 (%)	104



GCMS - RESULTS

ATI I.D. : 10569504

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO..
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1302 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	110
BROMOFLUOROBENZENE (%)	103
TOLUENE-D8 (%)	103



GCMS - RESULTS

ATI I.D. : 10569506

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1303 V 2.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	110
BROMOFLUOROBENZENE (%)	102
TOLUENE-D8 (%)	103



GCMS - RESULTS

ATI I.D. : 10569507

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1303 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	111
BROMOFLUOROBENZENE (%)	103
TOLUENE-D8 (%)	103



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10569508

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1304 V 2.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	111
BROMOFLUOROBENZENE (%)	102
TOLUENE-D8 (%)	106



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10569509

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1304 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	113
BROMOFLUOROBENZENE (%)	104
TOLUENE-D8 (%)	101



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10569511

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1304 D 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	113
BROMOFLUOROBENZENE (%)	103
TOLUENE-D8 (%)	101



GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105695
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/20/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLEETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	111
BROMOFLUOROBENZENE (%)	103
TOLUENE-D8 (%)	110



Analytical **Technologies, Inc.**

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105695

June 12, 1991

Giant Refining Company
Route 3, P.O. Box 7
Gallup, NM 87301

Project Name/Number: Phase II RFI

Attention: Claud Rosendale

On 05/13/91, Analytical Technologies, Inc. received a request to analyze soil and aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Antimony and Vanadium spike recoveries for sample RFI 1301 V 2.0 do not meet ATI criteria. The analyses were rerun, confirming matrix interferences. The laboratory control standard was within acceptable criteria. Barium for the sample had to be spiked at a high level to bring it into the acceptable recovery range.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

Lorraine Davis
QA Coordinator

RVW:clf
Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/13/91

REPORT DATE : 06/05/91

ATI I.D. : 105695

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI 1301 V 2.0	SOIL	05/09/91
02	RFI 1301 V 3.5	SOIL	05/09/91
03	RFI 1302 V 2.0	SOIL	05/09/91
04	RFI 1302 V 3.5	SOIL	05/09/91
05	RFI 1302 E 2.0	AQUEOUS	05/09/91
06	RFI 1303 V 2.0	SOIL	05/09/91
07	RFI 1303 V 3.5	SOIL	05/09/91
08	RFI 1304 V 2.0	SOIL	05/09/91
09	RFI 1304 V 3.5	SOIL	05/09/91
10	TRIP BLANK	AQUEOUS	05/06/91
11	RFI 1304 D 3.5	SOIL	05/09/91

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	9
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105695

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/13/91

PROJECT # : (NONE)

REPORT DATE : 06/05/91

PROJECT NAME : PHASE II RFI

PARAMETER	UNITS	05
ARSENIC	MG/L	<0.005
BARIUM	MG/L	<0.010
BERYLLIUM	MG/L	<0.005
CADMIUM	MG/L	<0.005
COBALT	MG/L	<0.010
CHROMIUM	MG/L	<0.010
COPPER	MG/L	<0.010
MERCURY	MG/L	<0.0002
POTASSIUM	MG/L	<1.0
NICKEL	MG/L	<0.020
LEAD	MG/L	<0.002
ANTIMONY	MG/L	<0.05
SELENIUM	MG/L	<0.005
VANADIUM	MG/L	<0.010
ZINC	MG/L	0.014



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105695

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/13/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/05/91

PARAMETER	UNITS	01	02	03	04	06
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	281	287	244	377	244
BERYLLIUM	MG/KG	2.4	3.6	4.3	3.2	4.1
CADMIUM	MG/KG	<0.3	0.3	<0.3	<0.3	<0.3
COBALT	MG/KG	4.4	5.5	5.1	5.0	5.2
CHROMIUM	MG/KG	4.5	5.2	6.0	5.1	6.0
COPPER	MG/KG	4.6	4.1	4.4	5.4	5.3
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	1080	1200	1720	1190	1680
NICKEL	MG/KG	8.5	8.9	9.0	9.2	10.9
LEAD	MG/KG	10	10	12	10	11
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<0.3	<0.3	<0.3	<0.3	<0.3
VANADIUM	MG/KG	10.0	11.5	12.3	9.3	12.1
ZINC	MG/KG	9.7	12.4	14.3	13.0	14.6



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105695

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/13/91

REPORT DATE : 06/05/91

PARAMETER	UNITS	07	08	09	11
ARSENIC	MG/KG	<3	<3	<3	<3
BARIUM	MG/KG	312	266	250	262
BERYLLIUM	MG/KG	4.3	4.3	4.6	4.9
CADMIUM	MG/KG	0.3	0.3	<0.3	0.4
COBALT	MG/KG	5.1	5.9	5.3	5.2
CHROMIUM	MG/KG	5.3	7.1	6.4	6.5
COPPER	MG/KG	4.9	5.5	4.9	5.1
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	1270	1830	2370	2190
NICKEL	MG/KG	8.9	11.3	9.6	9.1
LEAD	MG/KG	12	10	9	11
ANTIMONY	MG/KG	<3	<3	<3	<3
SELENIUM	MG/KG	<0.3	<0.3	<0.3	<0.3
VANADIUM	MG/KG	12.0	10.0	12.2	12.6
ZINC	MG/KG	12.6	16.1	15.3	14.1



Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
 PROJECT # : (NONE)
 PROJECT NAME : PHASE II RFI

ATI I.D. : 105695

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ARSENIC	MG/L	10564401	0.009	0.007	25	0.051	0.050	84
ARSENIC	MG/KG	10569504	<3	<3	NA	23	25	92
BARIUM	MG/L	10569505	<0.010	<0.010	NA	0.098	0.100	98
BARIUM	MG/KG	10569501	281	289	3	762	500	96
BERYLLIUM	MG/L	10569505	<0.005	<0.005	NA	0.095	0.100	95
BERYLLIUM	MG/KG	10569501	2.4	2.6	8	25.1	25.0	91
CADMIUM	MG/L	10569505	<0.005	<0.005	NA	0.106	0.100	106
CADMIUM	MG/KG	10569501	<0.3	<0.3	NA	24.8	25.0	99
COBALT	MG/L	10569505	<0.010	<0.010	NA	0.102	0.100	102
COBALT	MG/KG	10569501	4.4	4.5	2	52.4	50.0	96
CHROMIUM	MG/L	10570801	0.466	0.466	0	1.42	1.00	95
CHROMIUM	MG/KG	10569501	4.5	4.1	9	52.1	50.0	95
COPPER	MG/L	10570801	4.08	4.03	1	4.50	0.50	84
COPPER	MG/KG	10569501	4.6	4.6	0	29.2	25.0	98
MERCURY	MG/L	10572301	<0.0002	<0.0002	NA	0.0045	0.0050	90
MERCURY	MG/KG	10569511	<0.02	<0.02	NA	0.48	0.50	96
POTASSIUM	MG/L	10572301	1.2	1.5	22	55.6	50.0	109
POTASSIUM	MG/KG	10569501	1080	1050	3	3800	2500	109
NICKEL	MG/L	10570801	0.031	0.028	10	0.980	1.00	95
NICKEL	MG/KG	10569501	8.5	7.7	10	52.6	50.0	88
LEAD	MG/L	10569401	0.006	0.006	0	0.061	0.050	110
LEAD	MG/KG	10569501	10	10	0	59	50	98
ANTIMONY	MG/L	10569505	<0.05	<0.05	NA	0.99	1.00	99
ANTIMONY	MG/KG	10569501	<3	<3	NA	11.7	50.0	23*
SELENIUM	MG/L	10564401	<0.005	<0.005	NA	0.042	0.050	84
SELENIUM	MG/KG	10567205	<0.3	<0.3	NA	MSA	CC=	.999
SELENIUM	MG/KG	10569504	<0.3	<0.3	NA	MSA	CC=	.999
VANADIUM	MG/L	10569505	<0.010	<0.010	NA	0.101	0.100	101
VANADIUM	MG/KG	10569501	10.0	11.5	14	44.2	50.0	68*
ZINC	MG/L	10570801	11.4	11.5	1	11.9	0.500	100
ZINC	MG/KG	10569501	9.7	10.9	12	39.2	25.0	118

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

* Result out of limits due to sample matrix interference



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10569501

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1301 V 2.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	110
BROMOFLUOROBENZENE (%)	103
TOLUENE-D8 (%)	103



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10569502

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1301 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLEETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	107
BROMOFLUOROBENZENE (%)	106
TOLUENE-D8 (%)	102



GCMS - RESULTS

ATI I.D. : 10569503

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 1302 V 2.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/09/91
DATE RECEIVED : 05/13/91
DATE EXTRACTED : 05/14/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	107
BROMOFLUOROBENZENE (%)	103
TOLUENE-D8 (%)	103



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105817

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

DATE ANALYZED : 06/03/91

PROJECT NAME : PHASE II RFI

SAMPLE MATRIX : NON-AQUEOUS

REF I.D. : 10699923

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP. SPIKED %		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	1.1	65	1.0	59	10
ACENAPHTHENE	<0.17	1.7	1.0	59	1.1	65	10
2,4-DINITROTOLUENE	<0.17	1.7	1.1	65	1.1	65	0
PYRENE	<0.17	1.7	0.9	53	0.9	53	0
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	1.3	76	1.3	76	0
1,4-DICHLOROBENZENE	<0.17	1.7	1.0	59	1.0	59	0
PENTACHLOROPHENOL	<0.85	3.3	2.9	88	2.8	85	4
PHENOL	<0.17	3.3	2.2	67	2.3	70	4
2-CHLOROPHENOL	<0.17	3.3	2.3	70	2.3	70	0
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	2.4	73	2.4	73	0
4-NITROPHENOL	<0.85	3.3	2.7	82	2.7	82	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105817

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

DATE ANALYZED : 06/04/91

PROJECT NAME : PHASE II RFI

SAMPLE MATRIX : SOIL

REF I.D. : 10581715

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP. SPIKED %		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	1.1	65	1.1	65	0
ACENAPHTHENE	<0.17	1.7	1.1	65	1.1	65	0
2,4-DINITROTOLUENE	<0.17	1.7	1.2	71	1.1	65	9
PYRENE	<0.17	1.7	0.9	53	0.9	53	0
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	1.3	76	1.2	71	8
1,4-DICHLOROBENZENE	<0.17	1.7	1.1	65	1.0	59	10
PENTACHLOROPHENOL	<0.85	3.3	2.2	67	2.2	67	0
PHENOL	<0.17	3.3	2.1	64	2.1	64	0
2-CHLOROPHENOL	<0.17	3.3	2.3	70	2.2	67	4
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	2.2	67	2.1	64	5
4-NITROPHENOL	<0.85	3.3	2.3	70	2.4	73	4

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105817

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699920

DATE ANALYZED : 06/05/91

SAMPLE MATRIX : NON-AQUEOU

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED RESULT	SPIKED SAMPLE	% REC.	DUP. SPIKED	DUP. %	RPD
	RESULT	SPIKED				SAMPLE	REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	1.0	59	1.0	59	0	
ACENAPHTHENE	<0.17	1.7	1.0	59	1.1	65	10	
2,4-DINITROTOLUENE	<0.17	1.7	1.0	59	1.1	65	10	
PYRENE	<0.17	1.7	0.9	53	0.9	53	0	
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	1.1	65	1.2	71	9	
1,4-DICHLOROBENZENE	<0.17	1.7	0.9	53	1.0	59	11	
PENTACHLOROPHENOL	<0.85	3.3	2.6	79	2.8	85	7	
PHENOL	<0.17	3.3	2.0	61	2.3	70	14	
2-CHLOROPHENOL	<0.17	3.3	2.0	61	2.2	67	10	
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	2.1	64	2.3	70	9	
4-NITROPHENOL	<0.85	3.3	2.2	67	2.6	79	17	

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Chain of Custody

DATE 5-16-91 PAGE 1 OF 3

PROJECT MANAGER: <u>E. PROFFITT</u>				ANALYSIS REQUEST																															
COMPANY: <u>GIANT REFINING CO.</u> ADDRESS: <u>Rt 3 Box 7</u> <u>GALLUP, NM 87301</u> BILL TO: _____ COMPANY: <u>SANME</u> ADDRESS: _____				SAMPLES: (Signature) <u>[Signature]</u> PHONE NUMBER <u>(505) 722-0227</u>																															
PROJECT INFORMATION		SAMPLE RECEIPT				RELINQUISHED BY: 1.										RELINQUISHED BY: 2.										RELINQUISHED BY: 3.									
PROJECT NO:		TOTAL NO. OF CONTAINERS				Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:						
PROJECT NAME:	<u>PHASE II RFI</u>	CHAIN OF CUSTODY SEALS				Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:						
P.O. NO.	<u>01909</u>	INTACT?				Company: <u>GIANT REFINING CO</u>				Company:				Company:				Company:				Company:				Company:									
SHIPPED VIA:	<u>FED EXPRESS</u>	RECEIVED GOOD COND./COLD				Signature: <u>[Signature]</u>				Signature:				Signature:				Signature:				Signature:				Signature:									
SAMPLE DISPOSAL INSTRUCTIONS		LAB NUMBER		<u>105817</u>		RECEIVED BY: 1.				RECEIVED BY: 2.				RECEIVED BY: 3.				RECEIVED BY: 4.				RECEIVED BY: 5.													
☒ ATU ☐ RETURN						Time:				Time:				Time:				Time:				Time:													
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS																																			
TAT: (NORMAL) ☒ (RUSH) ☐		☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK																																	
Comments:																																			
SEE ATTACHED LIST FOR PARAMETERS																																			

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001
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Analytical Technologies, Inc.

Phoenix, Arizona

Chain of Custody

DATE 5-16-91 PAGE 2 OF 3

PROJECT MANAGER: <u>E. PROFFIT</u>				ANALYSIS REQUEST															
COMPANY: <u>GIANT REFINING CO</u>																			
ADDRESS: <u>Rt 3 Box 7</u>																			
BILL TO: <u>GALLUP, NM 87301</u>																			
COMPANY: <u>STATE</u>																			
ADDRESS: <u></u>																			
SAMPLERS: (Signature) <u>Lynn S. Blt</u> PHONE NUMBER <u>(505) 722-0227</u>																			
SAMPLERS: (Signature)																			
SAMPLE ID				DATE				TIME				MATRIX				LAB ID			
RFE 0214 A 3.5				5-16-91				2:55 PM				SOIL				10			
RFE 0214 A 5.0				5-16-91				3:10 PM				SOIL				11			
RFE 0214 A 6.5				5-16-91				3:35 PM				SOIL				12			
RFE 0214 D 6.5				5-16-91				3:35 PM				SOIL				13			
RFE 0215 A 3.5				5-17-91				8:45 AM				SOIL				14			
RFE 0215 A 5.0				5-17-91				7:00 PM				SOIL				15			
RFE 0215 A 6.5				5-17-91				9:15 AM				SOIL				16			
RFE 0216 V 3.5				5-17-91				10:20 AM				SOIL				17			
RFE 0216 V 5.0				5-17-91				10:35 AM				SOIL				18			
PETROLEUM HYDROCARBONS (418.1)																			
(MOD 8015) Gas/Diesel																			
Diesel/Gasoline/BTXE (MOD 8015/8020)																			
BTXE (8020)																			
Chlorinated Hydrocarbons (601/8010)																			
Aromatic Hydrocarbons (602/8020)																			
MTBE																			
Pesticides/PCB (608/8080)																			
Herbicides (615/8150)																			
Base/Neutral/Acid Compounds GC/MS (805/8270)																			
Volatile Organics GC/MS (804/8240)																			
SDWA Primary Standards																			
SDWA Secondary Standards																			
SDWA Volatiles (502.1/503.1)																			
The 13 Priority Pollutant Metals																			
The 8 EP Tox Metals by EP Tox Prep. (1310)																			
The 8 EP Tox Metals by TCLP (1311)																			
SEE ATTACHED LIST																			
SEE ATTACHED LIST																			
NUMBER OF CONTAINERS																			

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO:		TOTAL NO. OF CONTAINERS	27
PROJECT NAME: <u>PHASE II RFI</u>		CHAIN OF CUSTODY SEALS	
P.O. NO. <u>01909</u>		INTACT?	
SHIPPED VIA: <u>FED EXPRESS</u>		RECEIVED GOOD COND./COLD	
SAMPLE DISPOSAL INSTRUCTIONS		LAB NUMBER	105817
☒ ATI ☐ RETURN			
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS			
TAT: (NORMAL) ☒ (RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK			
Comments:	SEE ATTACHED LIST FOR PARAMETERS		

RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
Signature: <u>Lynn S. Blt</u>	Time:	Signature:	Time:	Signature:	Time:
Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
Company:		Company:		Company:	
RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB)	
Signature:	Time:	Signature:	Time:	Signature:	Time:
Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
Company:		Company:		Company:	

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Phoenix, Arizona

Chain of Custody

DATE 5-17-91 PAGE 3 OF 3

PROJECT INFORMATION				SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
PROJECT NO:	TOTAL NO. OF CONTAINERS	CHAIN OF CUSTODY SEALS	INTACT?	RECEIVED GOOD COND./GOLD	LAB NUMBER	Signature:	Time:	Signature:	Time:	Signature:	Time:
PROJECT NAME: PHASE II REF						<i>Ann S. Lister</i>					
P.O. NO. 01909						Lynn Shelton 5-17-91					
SHIPPED VIA: FED EXPRESS						GIANT REFINING CO					
SAMPLE DISPOSAL INSTRUCTIONS						Signature:	Time:	Signature:	Time:	Signature:	Time:
☒ ATI ☐ RETURN											
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS											
TAT: (NORMAL) ☒ (RUSH) ☐	☐ 24	☐ 48	☐ 72	☐ 1 WEEK							
Comments: SEE ATTACHED LIST FOR PARAMETERS											

ANALYSIS REQUEST																									
SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE (MOD 8015/8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (65/8270)	Volatile Organics GC/MS (65/8240)	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by TCLP (1311)	PH & BACKGROUNDMETALS	NUMBER OF CONTAINERS		
RFI 0216 V 6.5	5-17-91	10:50 AM	SOIL	19																				3	
RFI 0217 V 3.5	5-17-91	11:05	SOIL	20																					3
RFI 0217 V 5.0	5-17-91	11:20	SOIL	21																					3
RFI 0217 V 6.5	5-17-91	11:30	SOIL	22																					3
RFI 0218 A 3.5	5-17-91	11:35	SOIL	23																					3
RFI 0218 A 5.0	5-17-91	11:45	SOIL	24																					3
RFI 0218 A 6.5	5-17-91	11:55	SOIL	25																					3

PROJECT MANAGER: E. PROFFITT	
COMPANY: GIANT REFINING CO.	
ADDRESS: RT 3 BOX 7	
GALLUP NM 87301	
BILL TO: .	
COMPANY: SAME	
ADDRESS: .	
SAMPLERS: (Signature) <i>Lynn Shelton</i>	
PHONE NUMBER: (505) 722-0227	

TABLE -1
BACKGROUND METALS

Total Metals

<u>Parameter</u>	<u>Analytical Method</u>	<u>Reporting Limit mg/kg</u>
Antimony	6010	6.0
Arsenic	7060	0.5
Barium	6010	1.0
Beryllium	6010	0.2
Cadmium	6010	0.5
Chromium	6010	1.0
Cobalt	6010	1.0
Copper	6010	2.0
Lead	6010	5.0
Mercury	7471	0.2
Nickel	6010	4.0
Potassium	6010	500
Selenium	7740	0.5
Vanadium	6010	1.0
Zinc	6010	2.0

PH

TABLE-4
SKINNER LIST

METHOD 8240

<u>Parameter</u>	<u>Reporting Limit (ug/kg)</u>
Benzene	500
Carbon disulfide	500
Chlorobenzene	500
2-Chloroethylvinyl ether	1,000
1,2-Dibromomethane	1,000
1,2-Dichloroethane	500
1,4-Dioxane	50,000
Ethyl Benzene	500
Methyl ethyl ketone (2-butanone)	1,000
Styrene	500
Toluene	500
Xylenes	500

METHOD 8270

Anthracene	5,000
Benzenethiol	-
Benzo(a)anthracene	5,000
Benzo(b)fluoranthene	5,000
Benzo(k)fluoranthene	5,000
Benzo(a)pyrene	5,000
Bis(2-ethylhexyl)phthalate	5,000
Butyl benzyl phthalate	5,000
Chrysene	5,000
Dibenzo(a,X)acridine	-
Dibenzo(a,h)anthracene	5,000
Di-n-butylphthalate	5,000
1,2-Dichlorobenzene	5,000
1,3-Dichlorobenzene	5,000
1,4-Dichlorobenzene	5,000
Diethyl phthalate	5,000
7,12-Dimethylbenz(a)anthracene	5,000
2,4-Dimethylphenol	5,000
Dimethyl phthalate	5,000
2,4-Dinitrophenol	25,000
Di-n-octyl phthalate	5,000
Fluoranthene	5,000
Indene	5,000
Methylchrysene	-
1-Methylnaphthalene	5,000
2-Methylphenol	5,000
3-Methylphenol	5,000
4-Methylphenol	5,000
Naphthalene	5,000
4-Nitrophenol	25,000
Phenanthrene	5,000

TABLE-4 Continued

Phenol.	5,000
Pyrene	5,000
Pyridine	10,000
Quinoline	25,000



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GCMS - RESULTS

ATI I.D. : 10581721

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0217 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	68
2-FLUOROBIPHENYL (%)	62
TERPHENYL (%)	54
PHENOL-D6 (%)	59
2-FLUOROPHENOL (%)	60



GCMS - RESULTS

ATI I.D. : 10581722

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0217 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	71
2-FLUOROBIPHENYL (%)	67
TERPHENYL (%)	58
PHENOL-D6 (%)	60
2-FLUOROPHENOL (%)	60



GCMS - RESULTS

ATI I.D. : 10581723

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0218 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	67
2-FLUOROBIPHENYL (%)	62
TERPHENYL (%)	58
PHENOL-D6 (%)	60
2-FLUOROPHENOL (%)	61
2,4,6-TRIBROMOPHENOL (%)	52



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10581724

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0218 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	68
2-FLUOROBIPHENYL (%)	63
TERPHENYL (%)	58
PHENOL-D6 (%)	61
2-FLUOROPHENOL (%)	62



GCMS - RESULTS

ATI I.D. : 10581725

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0218 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	66
2-FLUOROBIPHENYL (%)	61
TERPHENYL (%)	58
PHENOL-D6 (%)	57
2-FLUOROPHENOL (%)	57



GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105817
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	0.47
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	60
2-FLUOROBIPHENYL (%)	60
TERPHENYL (%)	58
PHENOL-D6 (%)	57
2-FLUOROPHENOL (%)	58

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GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105817

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

COMPOUNDS

RESULTS

2,4,6-TRIBROMOPHENOL (%)

55



GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 105817
PROJECT #	: (NONE)	DATE EXTRACTED	: 05/24/91
PROJECT NAME	: PHASE II RFI	DATE ANALYZED	: 06/03/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: MG/KG
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
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PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	0.7
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	64
2-FLUOROBIPHENYL (%)	61
TERPHENYL (%)	57
PHENOL-D6 (%)	59
2-FLUOROPHENOL (%)	59

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Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105817

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

COMPOUNDS

RESULTS

2,4,6-TRIBROMOPHENOL (%)

46



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105817

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699919

DATE ANALYZED : 06/01/91

SAMPLE MATRIX : NON-AQUEOUS

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED	% SPIKED	DUP.		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	0.9	53	0.8	47	12
ACENAPHTHENE	<0.17	1.7	1.0	59	0.9	53	11
2,4-DINITROTOLUENE	<0.17	1.7	1.2	71	1.0	59	18
PYRENE	<0.17	1.7	1.0	59	0.9	53	11
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	1.2	71	1.0	59	18
1,4-DICHLOROBENZENE	<0.17	1.7	0.9	53	0.8	47	12
PENTACHLOROPHENOL	<0.85	3.3	3.8	115	3.4	103	11
PHENOL	<0.17	3.3	2.2	67	1.9	58	15
2-CHLOROPHENOL	<0.17	3.3	2.1	64	1.9	58	10
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	2.3	70	2.0	61	14
4-NITROPHENOL	<0.85	3.3	2.8	85	2.5	76	11

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



GCMS - RESULTS

ATI I.D. : 10581710

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0214 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	62
2-FLUOROBIPHENYL (%)	62
TERPHENYL (%)	57
PHENOL-D6 (%)	56
2-FLUOROPHENOL (%)	53
2,4,6-TRIBROMOPHENOL (%)	47



GCMS - RESULTS

ATI I.D. : 10581711

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0214 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	61
2-FLUOROBIPHENYL (%)	58
TERPHENYL (%)	50
PHENOL-D6 (%)	55
2-FLUOROPHENOL (%)	51



GCMS - RESULTS

ATI I.D. : 10581712

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0214 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	66
2-FLUOROBIPHENYL (%)	64
TERPHENYL (%)	58
PHENOL-D6 (%)	58
2-FLUOROPHENOL (%)	55



GCMS - RESULTS

ATI I.D. : 10581713

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0214 D 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	62
2-FLUOROBIPHENYL (%)	59
TERPHENYL (%)	54
PHENOL-D6 (%)	55
2-FLUOROPHENOL (%)	53
2,4,6-TRIFLUOROPHENOL (%)	40



GCMS - RESULTS

ATI I.D. : 10581714

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0215 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	59
2-FLUOROBIPHENYL (%)	57
TERPHENYL (%)	51
PHENOL-D6 (%)	57
2-FLUOROPHENOL (%)	55
2,4,6-TRIBROMOPHENOL (%)	49



GCMS - RESULTS

ATI I.D. : 10581715

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0215 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	66
2-FLUOROBIPHENYL (%)	61
TERPHENYL (%)	54
PHENOL-D6 (%)	55
2-FLUOROPHENOL (%)	56



GCMS - RESULTS

ATI I.D. : 10581716

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0215 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	71
2-FLUOROBIPHENYL (%)	63
TERPHENYL (%)	55
PHENOL-D6 (%)	43
2-FLUOROPHENOL (%)	45



GCMS - RESULTS

ATI I.D. : 10581717

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0216 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	63
2-FLUOROBIPHENYL (%)	58
TERPHENYL (%)	50
PHENOL-D6 (%)	54
2-FLUOROPHENOL (%)	55
2,4,6-TRICHLOROPHENOL (%)	55



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10581718

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0216 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	68
2-FLUOROBIPHENYL (%)	65
TERPHENYL (%)	54
PHENOL-D6 (%)	60
2-FLUOROPHENOL (%)	61

GCMS - RESULTS

ATI I.D. : 10581719

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0216 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	68
2-FLUOROBIPHENYL (%)	63
TERPHENYL (%)	57
PHENOL-D6 (%)	56
2-FLUOROPHENOL (%)	55



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10581720

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0217 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/04/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	71
2-FLUOROBIPHENYL (%)	65
TERPHENYL (%)	56
PHENOL-D6 (%)	60
2-FLUOROPHENOL (%)	60



Analytical Technologies, Inc.

QUALITY CONTROL DATA

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10581707

DATE ANALYZED : 05/24/91

SAMPLE MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED %		DUP. %		RPD
	RESULT	SPIKED	SAMPLE	REC.	SAMPLE	REC.	
1,1-DICHLOROETHENE	<0.5	0.050	0.048	96	0.050	100	4
TRICHLOROETHENE	<0.5	0.050	0.049	98	0.055	110	12
CHLOROBENZENE	<0.5	0.050	0.045	91	0.046	92	2
TOLUENE	<0.5	0.050	0.067	108	0.069	111	2
BENZENE	<0.5	0.050	0.045	91	0.048	97	6

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105817

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10581725

DATE ANALYZED : 05/28/91

SAMPLE MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,1-DICHLOROETHENE	<0.5	0.050	0.040	81	0.046	93	14
TRICHLOROETHENE	<0.5	0.050	0.041	82	0.048	95	15
CHLOROBENZENE	<0.5	0.050	0.047	94	0.047	93	1
TOLUENE	<0.5	0.050	0.052	104	0.058	116	11
BENZENE	<0.5	0.050	0.050	100	0.046	92	8

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

QUALITY CONTROL DATA

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10581720

DATE ANALYZED : 05/28/91

SAMPLE MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED	% SPIKED	DUP.		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,1-DICHLOROETHENE	<0.5	0.050	0.050	99	0.047	94	5
TRICHLOROETHENE	<0.5	0.050	0.054	108	0.056	112	4
CHLOROBENZENE	<0.5	0.050	0.046	92	0.048	95	4
TOLUENE	<0.5	0.050	0.059	118	0.061	122	4
BENZENE	<0.5	0.050	0.047	94	0.049	98	5

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



GCMS - RESULTS

ATI I.D. : 10581701

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0211 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/02/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	55
2-FLUOROBIPHENYL (%)	55
TERPHENYL (%)	56
PHENOL-D6 (%)	50
2-FLUOROPHENOL (%)	48
2,4,6-TRIFLUOROPHENOL (%)	45



GCMS - RESULTS

ATI I.D. : 10581702

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0211 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/02/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	60
2-FLUOROBIPHENYL (%)	59
TERPHENYL (%)	59
PHENOL-D6 (%)	53
2-FLUOROPHENOL (%)	52
2,4,6-TRIBROMOPHENOL (%)	47



GCMS - RESULTS

ATI I.D. : 10581703

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0211 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/02/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	58
2-FLUOROBIPHENYL (%)	55
TERPHENYL (%)	53
PHENOL-D6 (%)	49
2-FLUOROPHENOL (%)	45



GCMS - RESULTS

ATI I.D. : 10581704

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0212 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/02/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	63
2-FLUOROBIPHENYL (%)	60
TERPHENYL (%)	52
PHENOL-D6 (%)	55
2-FLUOROPHENOL (%)	55



GCMS - RESULTS

ATI I.D. : 10581705

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0212 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	66
2-FLUOROBIPHENYL (%)	66
TERPHENYL (%)	64
PHENOL-D6 (%)	60
2-FLUOROPHENOL (%)	58
2,4,6-TRIBROMOPHENOL (%)	54

GCMS - RESULTS

ATI I.D. : 10581706

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0212 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	67
2-FLUOROBIPHENYL (%)	67
TERPHENYL (%)	59
PHENOL-D6 (%)	58
2-FLUOROPHENOL (%)	51
2,4,6-TRIBROMOPHENOL (%)	42



GCMS - RESULTS

ATI I.D. : 10581707

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0213 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	65
2-FLUOROBIPHENYL (%)	61
TERPHENYL (%)	51
PHENOL-D6 (%)	58
2-FLUOROPHENOL (%)	58
2,4,6-TRIBROMOPHENOL (%)	44



GCMS - RESULTS

ATI I.D. : 10581708

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0213 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	68
2-FLUOROBIPHENYL (%)	68
TERPHENYL (%)	63
PHENOL-D6 (%)	64
2-FLUOROPHENOL (%)	61



GCMS - RESULTS

ATI I.D. : 10581709

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0213 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/03/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	70
2-FLUOROBIPHENYL (%)	68
TERPHENYL (%)	57
PHENOL-D6 (%)	60
2-FLUOROPHENOL (%)	58
2,4,6-TRIBROMOPHENOL (%)	47



GCMS - RESULTS

ATI I.D. : 10581720

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0217 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/28/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	102
BROMOFLUOROBENZENE (%)	84
TOLUENE-D8 (%)	116



GCMS - RESULTS

ATI I.D. : 10581721

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0217 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYL VINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BROMOFLUOROBENZENE (%)	80
TOLUENE-D8 (%)	106



GCMS - RESULTS

ATI I.D. : 10581722

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0217 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	81
TOLUENE-D8 (%)	104



GCMS - RESULTS

ATI I.D. : 10581723

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0218 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	82
TOLUENE-D8 (%)	100



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10581724

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0218 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	96
BROMOFLUOROBENZENE (%)	81
TOLUENE-D8 (%)	117



GCMS - RESULTS

ATI I.D. : 10581725

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0218 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/28/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	85
TOLUENE-D8 (%)	115



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105817
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	96
TOLUENE-D8 (%)	102



GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105817
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	92
TOLUENE-D8 (%)	106



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105817
DATE EXTRACTED : 05/28/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
-----------	---------

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLEETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	94
BROMOFLUOROBENZENE (%)	87
TOLUENE-D8 (%)	112



GCMS - RESULTS

ATI I.D. : 10581708

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0213 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BROMOFLUOROBENZENE (%)	79
TOLUENE-D8 (%)	117



GCMS - RESULTS

ATI I.D. : 10581709

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0213 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BROMOFLUOROBENZENE (%)	74
TOLUENE-D8 (%)	116



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GCMS - RESULTS

ATI I.D. : 10581710

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0214 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BROMOFLUOROBENZENE (%)	82
TOLUENE-D8 (%)	116



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GCMS - RESULTS

ATI I.D. : 10581711

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0214 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	87
TOLUENE-D8 (%)	112



GCMS - RESULTS

ATT I.D. : 10581712

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0214 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	96
BROMOFLUOROBENZENE (%)	82
TOLUENE-D8 (%)	116



GCMS - RESULTS

ATI I.D. : 10581713

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0214 D 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	94
BROMOFLUOROBENZENE (%)	83
TOLUENE-D8 (%)	116



GCMS - RESULTS

ATI I.D. : 10581714

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0215 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	78
TOLUENE-D8 (%)	116



GCMS - RESULTS

ATI I.D. : 10581715

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0215 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	93
BROMOFLUOROBENZENE (%)	79
TOLUENE-D8 (%)	115



GCMS - RESULTS

ATI I.D. : 10581716

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0215 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	96
BROMOFLUOROBENZENE (%)	81
TOLUENE-D8 (%)	115



GCMS - RESULTS

ATI I.D. : 10581717

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0216 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BROMOFLUOROBENZENE (%)	79
TOLUENE-D8 (%)	117



GCMS - RESULTS

ATI I.D. : 10581718

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0216 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLEETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	94
BROMOFLUOROBENZENE (%)	82
TOLUENE-D8 (%)	114



GCMS - RESULTS

ATI I.D. : 10581719

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0216 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/17/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	77
TOLUENE-D8 (%)	111



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METALS RESULTS

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/20/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	21	22	23	24	25
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	333	260	228	241	281
BERYLLIUM	MG/KG	2.9	3.7	4.3	4.6	4.3
CADMIUM	MG/KG	0.5	<0.3	0.3	0.6	0.5
COBALT	MG/KG	7.0	6.2	6.3	6.8	6.5
CHROMIUM	MG/KG	11.5	8.5	11.1	12.9	11.1
COPPER	MG/KG	3.2	3.5	3.6	3.1	4.0
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	3770	2920	3440	4260	3320
NICKEL	MG/KG	14.2	12.4	12.8	14.0	3.1
LEAD	MG/KG	6	8	7	8	8
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<3	<3	<3	<3	<0.3
VANADIUM	MG/KG	17.6	16.4	16.8	19.3	17.4
ZINC	MG/KG	22.5	18.6	19.2	21.4	21.0



METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

ATI I.D. : 105817

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ARSENIC	MG/KG	10581705	<3	<3	NA	21	25	84
ARSENIC	MG/KG	10581712	<3	<3	NA	26	25	104
ARSENIC	MG/KG	10581722	<3	<3	NA	23	25	92
BARIUM	MG/KG	10581705	216	225	4	262	50.0	92
BARIUM	MG/KG	10581712	280	251	11	338	50.0	116
BARIUM	MG/KG	10581722	260	245	6	320	50.0	120
BERYLLIUM	MG/KG	10581705	2.2	2.5	13	24.4	25.0	89
BERYLLIUM	MG/KG	10581712	3.2	3.0	6	24.1	25.0	84
BERYLLIUM	MG/KG	10581722	3.7	4.1	10	24.7	25.0	84
CADMIUM	MG/KG	10581705	<0.3	<0.3	NA	22.8	25.0	91
CADMIUM	MG/KG	10581712	0.3	<0.3	NA	21.9	25.0	86
CADMIUM	MG/KG	10581722	<0.3	0.3	NA	22.2	25.0	89
COBALT	MG/KG	10581705	5.3	5.7	7	48.7	50.0	87
COBALT	MG/KG	10581712	6.0	6.0	0	47.5	50.0	83
COBALT	MG/KG	10581722	6.2	6.4	3	48.1	50.0	84
CHROMIUM	MG/KG	10581705	7.3	8.2	12	51.7	50.0	89
CHROMIUM	MG/KG	10581712	9.0	8.2	9	51.4	50.0	85
CHROMIUM	MG/KG	10581722	8.5	9.8	14	52.5	50.0	88
COPPER	MG/KG	10581705	4.2	3.7	13	25.5	25.0	85
COPPER	MG/KG	10581712	3.0	3.1	3	25.4	25.0	90
COPPER	MG/KG	10581722	3.5	3.6	3	26.2	25.0	91
MERCURY	MG/KG	10578416	<0.02	<0.02	NA	0.50	0.50	100
MERCURY	MG/KG	10581710	<0.02	<0.02	NA	0.47	0.50	94
MERCURY	MG/KG	10581713	<0.02	<0.02	NA	0.48	0.50	96
MERCURY	MG/KG	10581722	<0.02	<0.02	NA	0.47	0.50	94
POTASSIUM	MG/KG	10581705	2880	3130	8	4720	2500	74*
POTASSIUM	MG/KG	10581712	3300	2780	17	5880	2500	103
POTASSIUM	MG/KG	10581722	2920	3440	16	5350	2500	97
NICKEL	MG/KG	10581705	11.1	11.5	4	53.0	50.0	84
NICKEL	MG/KG	10581712	12.6	12.3	2	52.1	50.0	79
NICKEL	MG/KG	10581722	12.4	12.6	2	53.1	50.0	81
LEAD	MG/KG	10581705	7	6	15	55	50	96
LEAD	MG/KG	10581712	8	8	0	50	50	84
LEAD	MG/KG	10581722	8	8	0	52	50	88
ANTIMONY	MG/KG	10581705	<3	<3	NA	16	50.0	32 *
ANTIMONY	MG/KG	10581712	<3	<3	NA	15	50	30 *
ANTIMONY	MG/KG	10581722	<3	<3	NA	13	50	26 *
SELENIUM	MG/KG	10578416	<0.3	<0.3	NA	MSA	CC=	.997
SELENIUM	MG/KG	10581705	<0.3	<0.3	NA	MSA	CC=	.999
SELENIUM	MG/KG	10581712	<3	<3	NA	MSA	CC=	.999
SELENIUM	MG/KG	10581722	<3	<3	NA	MSA	CC=	.999
VANADIUM	MG/KG	10581705	15.4	16.9	9	40.7	50.0	51 *
VANADIUM	MG/KG	10581712	15.3	15.9	4	48.5	50.0	66*
VANADIUM	MG/KG	10581722	16.4	16.7	2	44.8	50.0	57*
ZINC	MG/KG	10581705	16.5	17.3	5	40.1	25.0	94

(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

ATI I.D. : 105817

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ZINC	MG/KG	10581712	19.0	17.8	6	40.3	25.0	85
ZINC	MG/KG	10581722	18.6	19.9	7	41.5	25.0	92

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

* Result out of limits due to sample matrix interference



GCMS - RESULTS

ATI I.D. : 10581701

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0211 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYL VINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	98
BROMOFLUOROBENZENE (%)	83
TOLUENE-D8 (%)	113



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10581702

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0211 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	96
BROMOFLUOROBENZENE (%)	87
TOLUENE-D8 (%)	116



GCMS - RESULTS

ATI I.D. : 10581703

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0211 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	83
TOLUENE-D8 (%)	117



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10581704

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0212 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	82
TOLUENE-D8 (%)	116



GCMS - RESULTS

ATI I.D. : 10581705

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0212 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BROMOFLUOROBENZENE (%)	80
TOLUENE-D8 (%)	117



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10581706

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0212 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	109
BROMOFLUOROBENZENE (%)	80
TOLUENE-D8 (%)	114



GCMS - RESULTS

ATI I.D. : 10581707

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0213 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/20/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BROMOFLUOROBENZENE (%)	82
TOLUENE-D8 (%)	116



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/20/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	21	22	23	24	25
PH	UNITS	7.93	8.36	7.72	7.76	7.82



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II REI

ATI I.D. : 105817

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
PH	UNITS	10578411	7.49	7.47	0.3	NA	NA	NA
PH	UNITS	10581705	7.56	7.71	2	NA	NA	NA
PH	UNITS	10581715	8.43	8.38	0.6	NA	NA	NA
PH	UNITS	10581725	7.82	7.75	0.9	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D.: 105817

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/20/91

REPORT DATE : 06/29/91

PARAMETER	UNITS	01	02	03	04	05
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	266	203	199	251	216
BERYLLIUM	MG/KG	3.6	3.0	3.6	3.2	2.2
CADMIUM	MG/KG	0.4	0.4	0.4	0.4	<0.3
COBALT	MG/KG	6.4	6.3	5.9	5.9	5.3
CHROMIUM	MG/KG	9.6	9.2	8.8	8.7	7.3
COPPER	MG/KG	3.2	3.6	4.7	2.7	4.2
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	3290	3110	2760	2780	2880
NICKEL	MG/KG	13.2	13.4	12.6	12.1	11.1
LEAD	MG/KG	6	8	9	7	7
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<0.3	<0.3	<0.3	<0.3	<0.3
VANADIUM	MG/KG	16.4	15.6	15.5	15.7	15.4
ZINC	MG/KG	19.4	19.2	18.0	18.2	16.5



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

DATE RECEIVED : 05/20/91

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	06	07	08	09	10
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	254	204	281	305	276
BERYLLIUM	MG/KG	3.0	2.9	2.8	3.2	2.1
CADMIUM	MG/KG	0.3	<0.3	<0.3	0.3	0.3
COBALT	MG/KG	5.6	5.8	5.3	5.9	3.9
CHROMIUM	MG/KG	7.4	8.1	7.6	8.2	5.5
COPPER	MG/KG	2.8	3.1	2.9	3.4	2.1
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	2650	2560	2530	1980	1620
NICKEL	MG/KG	10.0	11.8	10.7	11.0	7.6
LEAD	MG/KG	7	9	9	8	6
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<0.3	<0.3	<3	<0.3	<3
VANADIUM	MG/KG	13.3	15.7	10.7	14.4	11.7
ZINC	MG/KG	15.8	17.6	17.3	16.3	12.0



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II REI

DATE RECEIVED : 05/20/91

REPORT DATE : 06/29/91

PARAMETER	UNITS	11	12	13	14	15
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	223	280	278	231	327
BERYLLIUM	MG/KG	1.9	3.2	2.6	3.7	4.0
CADMIUM	MG/KG	<0.3	0.3	0.3	0.3	<0.3
COBALT	MG/KG	3.6	6.0	5.2	6.0	6.6
CHROMIUM	MG/KG	4.0	9.0	7.2	9.6	10.0
COPPER	MG/KG	3.2	3.0	2.9	3.2	3.7
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	947	3300	2500	3100	3220
NICKEL	MG/KG	6.9	12.6	10.5	11.5	13.1
LEAD	MG/KG	7	8	6	7	9
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<0.3	<3	<3	<0.3	<3
VANADIUM	MG/KG	10.9	15.3	17.3	16.9	17.3
ZINC	MG/KG	9.2	19.0	16.0	18.7	20.2



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/20/91

REPORT DATE : 06/29/91

PARAMETER	UNITS	16	17	18	19	20
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	260	138	249	302	260
BERYLLIUM	MG/KG	3.8	1.5	4.5	2.0	3.1
CADMIUM	MG/KG	0.4	<0.3	0.4	0.3	0.5
COBALT	MG/KG	6.0	2.5	7.0	4.1	6.4
CHROMIUM	MG/KG	9.4	2.8	11.8	4.8	10.8
COPPER	MG/KG	3.4	2.0	3.9	2.9	3.9
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	3020	930	4050	1460	3170
NICKEL	MG/KG	11.3	5.3	13.9	8.0	12.3
LEAD	MG/KG	9	11	9	10	9
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<3	<3	<3	<0.3	<3
VANADIUM	MG/KG	16.1	7.2	21.6	9.8	18.4
ZINC	MG/KG	18.1	7.9	21.3	11.5	19.3

TABLE-4 Continued

Phenol.	5,000
Pyrene	5,000
Pyridine	10,000
Quinoline	25,000



Analytical Technologies, Inc.

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105817

July 5, 1991

Giant Refining Company
Route 3, P.O. Box 7
Gallup, NM 87301

Project Name/Number: Phase II RFI

Attention: Claud Rosendale

On 05/20/91, Analytical Technologies, Inc. received a request to analyze soil sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Method 8240 analyses were performed by ATI, Fort Collins, whose detection limit for EDB is 1.0 mg/Kg. The spike recoveries for potassium, antimony, and vanadium are below ATI acceptance criteria, due to matrix problems.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

Lorraine Davis
QA Coordinator

RVW:sdd
Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/20/91

REPORT DATE : 06/29/91

ATI I.D. : 105817

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI 0211 V 3.5	SOIL	05/16/91
02	RFI 0211 V 5.0	SOIL	05/16/91
03	RFI 0211 V 6.5	SOIL	05/16/91
04	RFI 0212 V 3.5	SOIL	05/16/91
05	RFI 0212 V 5.0	SOIL	05/16/91
06	RFI 0212 V 6.5	SOIL	05/16/91
07	RFI 0213 V 3.5	SOIL	05/16/91
08	RFI 0213 V 5.0	SOIL	05/16/91
09	RFI 0213 V 6.5	SOIL	05/16/91
10	RFI 0214 A 3.5	SOIL	05/16/91
11	RFI 0214 A 5.0	SOIL	05/16/91
12	RFI 0214 A 6.5	SOIL	05/16/91
13	RFI 0214 D 6.5	SOIL	05/16/91
14	RFI 0215 A 3.5	SOIL	05/17/91
15	RFI 0215 A 5.0	SOIL	05/17/91
16	RFI 0215 A 6.5	SOIL	05/17/91
17	RFI 0216 V 3.5	SOIL	05/17/91
18	RFI 0216 V 5.0	SOIL	05/17/91
19	RFI 0216 V 6.5	SOIL	05/17/91
20	RFI 0217 V 3.5	SOIL	05/17/91
21	RFI 0217 V 5.0	SOIL	05/17/91
22	RFI 0217 V 6.5	SOIL	05/17/91
23	RFI 0218 A 3.5	SOIL	05/17/91
24	RFI 0218 A 5.0	SOIL	05/17/91
25	RFI 0218 A 6.5	SOIL	05/17/91

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	25

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/20/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	01	02	03	04	05
PH	UNITS	7.60	7.89	8.06	7.47	7.56



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/20/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	06	07	08	09	10
PH	UNITS	7.80	7.96	7.91	8.27	8.08



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/20/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	11	12	13	14	15
PH	UNITS	8.55	8.57	8.54	8.03	8.43



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105817

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/20/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	16	17	18	19	20
PH	UNITS	7.87	8.20	8.51	8.59	7.61



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105732

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

COMPOUNDS

RESULTS

2,4,6-TRIBROMOPHENOL (%)

42



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105732

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

DATE ANALYZED : 05/30/91

PROJECT NAME : PHASE II RFI

SAMPLE MATRIX : SOIL

REF I.D. : 10573201

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	1.0	59	1.0	59	0
ACENAPHTHENE	<0.17	1.7	1.1	65	1.1	65	0
2,4-DINITROTOLUENE	<0.17	1.7	1.3	76	1.2	71	8
PYRENE	<0.17	1.7	1.9	112	1.8	105	5
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	1.2	71	1.2	71	0
1,4-DICHLOROBENZENE	<0.17	1.7	1.0	59	1.1	65	10
PENTACHLOROPHENOL	<0.85	3.3	2.6	79	2.6	79	0
PHENOL	<0.17	3.3	2.5	76	2.5	76	0
2-CHLOROPHENOL	<0.17	3.3	2.6	79	2.5	76	4
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	2.7	82	2.5	76	8
4-NITROPHENOL	<0.85	3.3	3.0	91	2.5	76	18

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

QUALITY CONTROL DATA

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D.

: 105732

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

DATE ANALYZED : 05/31/91

PROJECT NAME : PHASE II REI

SAMPLE MATRIX : SOIL

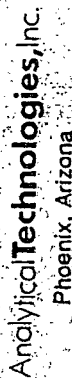
REF I.D. : 10573212

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED	% SPIKED	DUP.		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	1.3	76	1.3	76	0
ACENAPHTHENE	<0.17	1.7	1.3	76	1.2	71	8
2,4-DINITROTOLUENE	<0.17	1.7	1.2	71	1.2	71	0
PYRENE	<0.17	1.7	1.5	88	1.5	88	0
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	1.3	76	1.3	76	0
1,4-DICHLOROBENZENE	<0.17	1.7	1.3	76	1.2	71	8
PENTACHLOROPHENOL	<0.85	3.3	1.5	45	1.6	48	6
PHENOL	<0.17	3.3	2.6	79	2.5	76	4
2-CHLOROPHENOL	<0.17	3.3	2.5	76	2.5	76	0
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	2.7	82	2.7	82	0
4-NITROPHENOL	<0.85	3.3	2.2	67	2.2	67	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Chain of Custody

5-13-91

DATE 1 PAGE 2 OF 2

PROJECT MANAGER: <u>E. PRATT</u>		ANALYSIS REQUEST			
COMPANY: <u>GIANT REFINING CO</u>					
ADDRESS: <u>RT 3 BOX 7</u>					
ADDRESS: <u>GALLUP NM 87301</u>					
BILL TO: <u>(NAME)</u>					
COMPANY: <u>(NAME)</u>					
ADDRESS: <u>(NAME)</u>					
SAMPLERS: (Signature) <u>R. Shetter</u>		PHONE NUMBER <u>(505) 722-0227</u>			
SAMPLE ID	DATE	TIME	MATRIX	LAB ID	
RFE 0207 V 3.5	5-13-91	8:17	SOIL	1	
RFE 0207 V 5.0	5-13-91	8:30	SOIL	2	
RFE 0207 V 6.5	5-13-91	8:55	SOIL	3	
RFE 0210 A 3.5	5-13-91	9:25	SOIL	4	
RFE 0210 A 5.0	5-13-91	10:10	SOIL	5	
RFE 0210 A 6.5	5-13-91	10:30	SOIL	6	
RFE 0209 V 3.5	5-13-91	11:00	SOIL	7	
RFE 0209 V 5.0	5-13-91	11:20	SOIL	8	
RFE 0209 V 6.5	5-13-91	11:40	SOIL	9	

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO:		TOTAL NO. OF CONTAINERS	77
PROJECT NAME: <u>PHASE II RFI</u>		CHAIN OF CUSTODY SEALS	4
P.O. NO. <u>021309</u>		INTACT?	4
SHIPPED VIA: <u>FED EXPRESS</u>		RECEIVED GOOD COND./COLD	4
SAMPLE DISPOSAL INSTRUCTIONS		LAB NUMBER	105732
☒ AT ☐ RETURN			
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS			
TAT: (NORMAL) ☒ (RUSH) ☐		24 ☐ 48 ☐ 72 ☐ 1 WEEK	
Comments: <u>SEE ATTACHED LIST FOR PARAMETERS</u>			

RELINQUISHED BY: 1		RELINQUISHED BY: 2		RELINQUISHED BY: 3	
Signature: <u>Shetter</u>	Time:	Signature:	Time:	Signature:	Time:
Printed Name: <u>Lynn Shetter</u>	Date: <u>5-14-91</u>	Printed Name:	Date:	Printed Name:	Date:
Company: <u>GIANT REFINING</u>		Company:		Company:	
RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: 3			
Signature:	Signature:	Signature:			
Printed Name:	Printed Name:	Printed Name:			
Date:	Date:	Date:			
Company:	Company:	Company:			

ANALYSIS REQUEST		RELINQUISHED BY: 1		RELINQUISHED BY: 2		RELINQUISHED BY: 3	
Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:
Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
Company:		Company:		Company:		Company:	
RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: 3					
Signature:	Signature:	Signature:					
Printed Name:	Printed Name:	Printed Name:					
Date:	Date:	Date:					
Company:	Company:	Company:					

ANALYSIS REQUEST		RELINQUISHED BY: 1		RELINQUISHED BY: 2		RELINQUISHED BY: 3	
Signature:	Time:	Signature:	Time:	Signature:	Time:	Signature:	Time:
Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
Company:		Company:		Company:		Company:	
RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: 3					
Signature:	Signature:	Signature:					
Printed Name:	Printed Name:	Printed Name:					
Date:	Date:	Date:					
Company:	Company:	Company:					

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Pensacola (904)474-1001
DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR



Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 5-13-91 PAGE 2 OF 2

PROJECT MANAGER: <u>E. PROFFIT</u>		ANALYSIS REQUEST																																																																													
COMPANY: <u>GIANT REFINING CO.</u>	<table border="1"> <tr> <th colspan="4">ANALYSIS REQUEST</th> </tr> <tr> <th>TEST</th> <th>DATE</th> <th>TIME</th> <th>LAB ID</th> </tr> <tr> <td>Petroleum Hydrocarbons (418.1)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Diesel/Gasoline/BTEX (MOD 8015/8020)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>BTEX (8020)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Chlorinated Hydrocarbons (601/8010)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Aromatic Hydrocarbons (602/8020)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>MTBE</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pesticides/PCB (608/8080)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Herbicides (615/8150)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Base/Neutral/Acid Compounds GC/MS (824/8270)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Volatile Organics GC/MS (824/8240)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>SDWA Primary Standards</td> <td></td> <td></td> <td></td> </tr> <tr> <td>SDWA Secondary Standards</td> <td></td> <td></td> <td></td> </tr> <tr> <td>SDWA Volatiles (502.1/503.1)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>The 13 Priority Pollutant Metals</td> <td></td> <td></td> <td></td> </tr> <tr> <td>The 8 EP Tox Metals by EP Tox Prep. (1310)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>The 8 EP Tox Metals by TCLP (1311)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>PH + BACKGROUND METALS</td> <td></td> <td></td> <td></td> </tr> </table>			ANALYSIS REQUEST				TEST	DATE	TIME	LAB ID	Petroleum Hydrocarbons (418.1)				Diesel/Gasoline/BTEX (MOD 8015/8020)				BTEX (8020)				Chlorinated Hydrocarbons (601/8010)				Aromatic Hydrocarbons (602/8020)				MTBE				Pesticides/PCB (608/8080)				Herbicides (615/8150)				Base/Neutral/Acid Compounds GC/MS (824/8270)				Volatile Organics GC/MS (824/8240)				SDWA Primary Standards				SDWA Secondary Standards				SDWA Volatiles (502.1/503.1)				The 13 Priority Pollutant Metals				The 8 EP Tox Metals by EP Tox Prep. (1310)				The 8 EP Tox Metals by TCLP (1311)				PH + BACKGROUND METALS			
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REF 0209 D 6.5	5-13-91	11:10 AM	SOIL																																																																												
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REF 0208 A 5.0	5-13-91	1:10 PM	SOIL																																																																												
REF 0208 A 6.5	5-13-91	1:22 PM	SOIL																																																																												
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TABLE -1
BACKGROUND METALS

Total Metals

<u>Parameter</u>	<u>Analytical Method</u>	<u>Reporting Limit mg/kg</u>
Antimony	6010	6.0
Arsenic	7060	0.5
Barium	6010	1.0
Beryllium	6010	0.2
Cadmium	6010	0.5
Chromium	6010	1.0
Cobalt	6010	1.0
Copper	6010	2.0
Lead	6010	5.0
Mercury	7471	0.2
Nickel	6010	4.0
Potassium	6010	500
Selenium	7740	0.5
Vanadium	6010	1.0
Zinc	6010	2.0

PH

TABLE-4
SKINNER LIST

METHOD 8240

<u>Parameter</u>	<u>Reporting Limit (ug/kg)</u>
Benzene	500
Carbon disulfide	500
Chlorobenzene	500
2-Chloroethylvinyl ether	1,000
1,2-Dibromomethane	1,000
1,2-Dichloroethane	500
1,4-Dioxane	50,000
Ethyl Benzene	500
Methyl ethyl ketone (2-butanone)	1,000
Styrene	500
Toluene	500
Xylenes	500

METHOD 8270

Anthracene	5,000
Benzenethiol	-
Benzo(a)anthracene	5,000
Benzo(b)fluoranthene	5,000
Benzo(k)fluoranthene	5,000
Benzo(a)pyrene	5,000
Bis(2-ethylhexyl)phthalate	5,000
Butyl benzyl phthalate	5,000
Chrysene	5,000
Dibenzo(a,h)acridine	-
Dibenzo(a,h)anthracene	5,000
Di-n-butylphthalate	5,000
1,2-Dichlorobenzene	5,000
1,3-Dichlorobenzene	5,000
1,4-Dichlorobenzene	5,000
Diethyl phthalate	5,000
7,12-Dimethylbenz(a)anthracene	5,000
2,4-Dimethylphenol	5,000
Dimethyl phthalate	5,000
2,4-Dinitrophenol	25,000
Di-n-octyl phthalate	5,000
Fluoranthene	5,000
Indene	5,000
Methylchrysene	-
1-Methylnaphthalene	5,000
2-Methylphenol	5,000
3-Methylphenol	5,000
4-Methylphenol	5,000
Naphthalene	5,000
4-Nitrophenol	25,000
Phenanthrene	5,000



GCMS - RESULTS

ATI I.D. : 10573212

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0208 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	58
2-FLUOROBIPHENYL (%)	48
TERPHENYL (%)	73
PHENOL-D6 (%)	49
2-FLUOROPHENOL (%)	56



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10573213

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0208 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	50
2-FLUOROBIPHENYL (%)	44
TERPHENYL (%)	70
PHENOL-D6 (%)	40



GCMS - RESULTS

ATI I.D. : 10573207

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0209 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	60
2-FLUOROBIPHENYL (%)	52
TERPHENYL (%)	81
PHENOL-D6 (%)	52
2-FLUOROPHENOL (%)	57



GCMS - RESULTS

ATI I.D. : 10573208

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0209 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	70
2-FLUOROBIPHENYL (%)	60
TERPHENYL (%)	71
PHENOL-D6 (%)	53
2-FLUOROPHENOL (%)	61
	48



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10573209

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0209 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	53
2-FLUOROBIPHENYL (%)	46
TERPHENYL (%)	66
PHENOL-D6 (%)	42
2-FLUOROPHENOL (%)	48



GCMS - RESULTS

ATI I.D. : 10573210

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0209 D 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	54
2-FLUOROBIPHENYL (%)	45
TERPHENYL (%)	64
PHENOL-D6 (%)	47
2-FLUOROPHENOL (%)	53



GCMS - RESULTS

ATI I.D. : 10573204

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0210 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	68
2-FLUOROBIPHENYL (%)	57
TERPHENYL (%)	83
PHENOL-D6 (%)	55
2-FLUOROPHENOL (%)	66



GCMS - RESULTS

ATI I.D. : 10573205

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0210 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	63
2-FLUOROBIPHENYL (%)	53
TERPHENYL (%)	86
PHENOL-D6 (%)	52
2-FLUOROPHENOL (%)	61
2,4,6-TRIBROMOPHENOL (%)	38



GCMS - RESULTS

ATI I.D. : 10573206

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0210 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	57
2-FLUOROBIPHENYL (%)	49
TERPHENYL (%)	79
PHENOL-D6 (%)	46
2-FLUOROPHENOL (%)	52



GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105732
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	0.9
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	59
2-FLUOROBIPHENYL (%)	52
TERPHENYL (%)	88
PHENOL-D6 (%)	47
2-FLUOROPHENOL (%)	56

(CONTINUED NEXT PAGE)



GCMS - RESULTS

ATI I.D. : 10573209

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0209 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	0.007
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	77
TOLUENE-D8 (%)	121



GCMS - RESULTS

ATI I.D. : 10573210

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0209 D 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYL VINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	79
TOLUENE-D8 (%)	118



GCMS - RESULTS

ATI I.D. : 10573204

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0210 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	98
BROMOFLUOROBENZENE (%)	81
TOLUENE-D8 (%)	117



GCMS - RESULTS

ATI I.D. : 10573205

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0210 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYL VINYLETHER	<0.5
TOLUENE	0.005
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BROMOFLUOROBENZENE (%)	83
TOLUENE-D8 (%)	115



GCMS - RESULTS

ATI I.D. : 10573206

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0210 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	0.005
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BROMOFLUOROBENZENE (%)	79
TOLUENE-D8 (%)	119



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105732
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	96
TOLUENE-D8 (%)	102



Analytical Technologies, Inc.

QUALITY CONTROL DATA

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

ATI I.D. : 105732

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
REF I.D. : 10699922

DATE ANALYZED : 05/23/91
SAMPLE MATRIX : NON-AQUEOUS
UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED RESULT	SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED				SPIKED SAMPLE	% REC.	
1,1-DICHLOROETHENE	<0.005	0.050	0.048	96	0.049	98	1	
TRICHLOROETHENE	<0.005	0.050	0.058	115	0.060	119	3	
CHLOROBENZENE	<0.005	0.050	0.050	100	0.049	99	1	
TOLUENE	0.005	0.050	0.063	116	0.064	119	2	
BENZENE	<0.005	0.050	0.049	99	0.052	103	4	

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

GCMS - RESULTS

ATI I.D. : 10573201

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0207 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	63
2-FLUOROBIPHENYL (%)	53
TERPHENYL (%)	85
PHENOL-D6 (%)	51
2-FLUOROPHENOL (%)	60
2,4,6-TRIFLUOROPHENOL (%)	42



GCMS - RESULTS

ATI I.D. : 10573202

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0207 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	67
2-FLUOROBIPHENYL (%)	55
TERPHENYL (%)	94
PHENOL-D6 (%)	54
2-FLUOROPHENOL (%)	62
2,4,6-TRIFLUOROPHENOL (%)	12



GCMS - RESULTS

ATI I.D. : 10573203

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0207 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	67
2-FLUOROBIPHENYL (%)	55
TERPHENYL (%)	90
PHENOL-D6 (%)	55
2-FLUOROPHENOL (%)	63



GCMS - RESULTS

ATI I.D. : 10573211

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0208 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/29/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	55
2-FLUOROBIPHENYL (%)	49
TERPHENYL (%)	72
PHENOL-D6 (%)	45
2-FLUOROPHENOL (%)	50



GCMS - RESULTS

ATI I.D. : 10573202

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0207 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/22/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	118
BROMOFLUOROBENZENE (%)	83
TOLUENE-D8 (%)	121



GCMS - RESULTS

ATI I.D. : 10573203

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0207 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/22/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	0.011
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	122
BROMOFLUOROBENZENE (%)	82
TOLUENE-D8 (%)	120



GCMS - RESULTS

ATI I.D. : 10573211

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0208 A 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	0.009
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	98
BROMOFLUOROBENZENE (%)	77
TOLUENE-D8 (%)	120



GCMS - RESULTS

ATI I.D. : 10573212

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0208 A 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLEETHER	<0.5
TOLUENE	0.013
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	98
BROMOFLUOROBENZENE (%)	77
TOLUENE-D8 (%)	121



GCMS - RESULTS

ATI I.D. : 10573213

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0208 A 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	78
TOLUENE-D8 (%)	120



GCMS - RESULTS

ATI I.D. : 10573207

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0209 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	96
BROMOFLUOROBENZENE (%)	79
TOLUENE-D8 (%)	119



GCMS - RESULTS

ATI I.D. : 10573208

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0209 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	103
BROMOFLUOROBENZENE (%)	79
TOLUENE-D8 (%)	118



Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

ATI I.D. : 105732

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ZINC	MG/KG	10573205	16.4	14.1	15	45.7	25.0	117
ZINC	MG/KG	10573213	13.5	15.5	14	41.6	25.0	112

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

* Result out of limits due to sample matrix interference



GCMS - RESULTS

ATI I.D. : 10573214

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0208 E 6.5
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : N/A
DATE ANALYZED : 05/24/91
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDSRESULTS

CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<10

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	93
TOLUENE-D8 (%)	104



GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105732
DATE EXTRACTED : 05/24/91
DATE ANALYZED : 05/24/91
UNITS : UG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<10

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	96
TOLUENE-D8 (%)	102



QUALITY CONTROL DATA

ATI I.D. : 105732

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699909

DATE ANALYZED : 05/24/91

SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	DUP.		RPD
	RESULT	SPIKED	REC.	SPIKED	REC.	
1,1-DICHLOROETHENE	<5	50	47	94	45	4
TRICHLOROETHENE	<5	50	56	112	54	4
CHLOROBENZENE	<5	50	50	100	48	4
TOLUENE	<5	50	52	104	49	6
BENZENE	<5	50	48	96	48	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



GCMS - RESULTS

ATI I.D. : 10573214

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0208 E 6.5
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : N/A
DATE ANALYZED : 05/30/91
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHYLPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO(a)ANTHRACENE	<5
BIS(2-ETHYLHEXYL)PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO(b)FLUORANTHENE	<5
BENZO(k)FLUORANTHENE	<5
BENZO(a)PYRENE	<5
DIBENZO(a,h)ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO(A,J)ACRIDINE	<5
7,12-DIMETHYLBENZ(a)ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	67
2-FLUOROBIPHENYL (%)	58
TERPHENYL (%)	76
PHENOL-D6 (%)	51
2-FLUOROPHENOL (%)	52
2,4,6-TRIFLUOROPHENOL (%)	25



GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 105732
PROJECT #	: (NONE)	DATE EXTRACTED	: 05/20/91
PROJECT NAME	: PHASE II RFI	DATE ANALYZED	: 05/30/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHYLPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO(a)ANTHRACENE	<5
BIS(2-ETHYLHEXYL)PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO(b)FLUORANTHENE	<5
BENZO(k)FLUORANTHENE	<5
BENZO(a)PYRENE	<5
DIBENZO(a,h)ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO(A,J)ACRIDINE	<5
7,12-DIMETHYLBENZ(a)ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	68
2-FLUOROBIPHENYL (%)	65
TERPHENYL (%)	86
PHENOL-D6 (%)	57
2-FLUOROPHENOL (%)	60

(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105732

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699905

DATE ANALYZED : 05/31/91

SAMPLE MATRIX : AQUEOUS

UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP. SPIKED %		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,2,4-TRICHLOROBENZENE	<5	50	32	64	30	60	6
ACENAPHTHENE	<5	50	35	70	33	66	6
2,4-DINITROTOLUENE	<5	50	38	76	37	74	3
PYRENE	<5	50	31	62	31	62	0
N-NITROSO-DI-N-PROPYL AMINE	<5	50	37	74	34	68	8
1,4-DICHLOROBENZENE	<5	50	35	70	35	70	0
PENTACHLOROPHENOL	<25	100	70	70	68	68	3
PHENOL	<5	100	72	72	75	75	4
2-CHLOROPHENOL	<5	100	82	82	83	83	1
4-CHLORO-3-METHYLPHENOL	<5	100	77	77	69	69	11
4-NITROPHENOL	<25	100	79	79	78	78	1

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



GCMS - RESULTS

ATI I.D. : 10573201

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0207 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/23/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BROMOFLUOROBENZENE (%)	84
TOLUENE-D8 (%)	118



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105732

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/15/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER

UNITS

11

12

13

PH

UNITS

8.09

8.31

8.60



Analytical**Technologies**, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105732

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/15/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	14
PH	UNITS	5.69



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

ATI I.D. : 105732

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
PH	UNITS	10572301	8.2	8.2	0	NA	NA	NA
PH	UNITS	10568116	8.2	8.2	0	NA	NA	NA
PH	UNITS	10573202	7.71	7.73	0.3	NA	NA	NA
PH	UNITS	10573209	7.90	7.85	0.6	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



METALS RESULTS

ATI I.D. : 105732

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/15/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	01	02	03	04	05
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	235	172	284	260	267
BERYLLIUM	MG/KG	7.7	7.8	7.4	8.3	5.6
CADMIUM	MG/KG	0.5	0.3	0.3	<0.3	0.3
COBALT	MG/KG	6.7	6.9	6.9	7.0	5.1
CHROMIUM	MG/KG	11.4	10.9	9.5	11.9	8.1
COPPER	MG/KG	5.5	5.4	7.5	5.4	5.2
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	3770	3620	2190	3790	2090
NICKEL	MG/KG	12.5	12.4	12.1	13.2	9.2
LEAD	MG/KG	12	11	10	10	10
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<0.3	<0.3	<3	<3	<0.3
VANADIUM	MG/KG	20.0	17.5	17.1	17.3	12.4
ZINC	MG/KG	25.3	20.8	17.9	19.9	16.4



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105732

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/15/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	06	07	08	09	10
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	285	220	226	269	350
BERYLLIUM	MG/KG	9.5	9.5	7.8	9.3	8.3
CADMIUM	MG/KG	<0.3	0.3	<0.3	<0.3	<0.3
COBALT	MG/KG	7.5	8.3	5.8	6.8	6.2
CHROMIUM	MG/KG	12.0	14.1	8.8	11.5	9.1
COPPER	MG/KG	6.0	4.5	5.1	5.5	5.4
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	3460	4260	2920	4110	3260
NICKEL	MG/KG	12.9	15.6	11.2	12.4	11.4
LEAD	MG/KG	11	12	10	11	10
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<0.3	<3	<3	<3	<3
VANADIUM	MG/KG	18.1	21.7	15.0	18.0	14.8
ZINC	MG/KG	21.1	21.0	18.2	21.1	18.6



METALS RESULTS

ATI I.D. : 105732

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/15/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	11	12	13
ARSENIC	MG/KG	<3	<3	<3
BARIUM	MG/KG	395	590	344
BERYLLIUM	MG/KG	18.2	9.3	6.1
CADMIUM	MG/KG	<0.6	<0.3	<0.3
COBALT	MG/KG	7.8	7.1	4.5
CHROMIUM	MG/KG	13.4	9.9	5.7
COPPER	MG/KG	7.3	5.8	3.4
MERCURY	MG/KG	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	5360	3150	1390
NICKEL	MG/KG	12.0	11.2	7.6
LEAD	MG/KG	10	12	10
ANTIMONY	MG/KG	<6	<3	<3
SELENIUM	MG/KG	<3	<3	<0.3
VANADIUM	MG/KG	22.6	15.9	12.0
ZINC	MG/KG	28.3	20.2	13.5



METALS RESULTS

ATI I.D. : 105732

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/15/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	14
ARSENIC	MG/L	<0.005
BARIUM	MG/L	<0.010
BERYLLIUM	MG/L	<0.005
CADMIUM	MG/L	<0.005
COBALT	MG/L	<0.010
CHROMIUM	MG/L	<0.010
COPPER	MG/L	<0.010
MERCURY	MG/L	<0.0002
POTASSIUM	MG/L	<1.0
NICKEL	MG/L	<0.020
LEAD	MG/L	<0.002
ANTIMONY	MG/L	<0.05
SELENIUM	MG/L	<0.010
VANADIUM	MG/L	<0.010
ZINC	MG/L	0.012



METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

ATI I.D. : 105732

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ARSENIC	MG/L	10572301	<0.005	<0.005	NA	0.049	0.050	98
ARSENIC	MG/KG	10573103	<3	<3	NA	23	25	92
ARSENIC	MG/KG	10573205	<3	<3	NA	22	25	88
ARSENIC	MG/KG	10573213	<3	<3	NA	21	25	84
BARIUM	MG/L	10573214	<0.010	<0.010	NA	0.100	0.100	100
BARIUM	MG/KG	10573205	267	256	4	748	500	96
BARIUM	MG/KG	10573213	344	401	15	389	50.0	90
BERYLLIUM	MG/L	10573214	<0.005	<0.005	NA	0.092	0.100	92
BERYLLIUM	MG/KG	10573205	5.6	7.2	25*	29.8	25.0	97
BERYLLIUM	MG/KG	10573213	6.1	6.3	3	28.0	25.0	88
CADMIUM	MG/L	10573214	<0.005	<0.005	NA	0.107	0.100	107
CADMIUM	MG/KG	10573205	0.3	0.3	0	21.3	25.0	84
CADMIUM	MG/KG	10573213	<0.3	<0.3	NA	22.9	25.0	92
COBALT	MG/L	10573214	<0.010	<0.010	NA	0.106	0.100	106
COBALT	MG/KG	10573205	5.1	5.8	13	52.5	50.0	95
COBALT	MG/KG	10573213	4.5	4.6	2	51.4	50.0	94
CHROMIUM	MG/L	10573214	<0.010	<0.010	NA	0.105	0.100	105
CHROMIUM	MG/KG	10573205	8.1	6.4	23*	58.6	50.0	101
CHROMIUM	MG/KG	10573213	5.7	5.7	0	53.8	50.0	96
COPPER	MG/L	10573214	<0.010	<0.010	NA	0.094	0.100	94
COPPER	MG/KG	10573205	5.2	5.4	4	29.0	25.0	95
COPPER	MG/KG	10573213	3.4	3.6	6	27.3	25.0	96
MERCURY	MG/L	10572301	<0.0002	<0.0002	NA	0.0045	0.0050	90
MERCURY	MG/KG	10569511	<0.02	<0.02	NA	0.48	0.50	96
MERCURY	MG/KG	10576604	<0.02	<0.02	NA	0.47	0.50	94
MERCURY	MG/KG	10573210	<0.02	<0.02	NA	0.48	0.50	96
POTASSIUM	MG/L	10573214	<1.0	<1.0	NA	49.4	50.0	99
POTASSIUM	MG/KG	10573205	2090	2520	19	4790	2500	108
POTASSIUM	MG/KG	10573213	1390	1410	1	4040	2500	106
NICKEL	MG/L	10573214	<0.020	<0.020	NA	0.111	0.100	111
NICKEL	MG/KG	10573205	9.2	10.8	16	55.5	50.0	93
NICKEL	MG/KG	10573213	7.6	7.9	4	50.6	50.0	86
LEAD	MG/L	10569401	0.006	0.006	0	0.061	0.050	110
LEAD	MG/KG	10573205	10	10	0	58	50	96
LEAD	MG/KG	10573213	10	11	10	55	50	90
ANTIMONY	MG/L	10573214	<0.05	<0.05	NA	0.97	1.00	97
ANTIMONY	MG/KG	10573205	<3	<3	NA	20.7	50.0	41*
ANTIMONY	MG/KG	10573213	<3	<3	NA	20.4	50.0	41*
SELENIUM	MG/L	10564401	<0.005	<0.005	NA	0.042	0.050	84
SELENIUM	MG/KG	10573205	<0.3	<0.3	NA	MSA	CC=	.998
SELENIUM	MG/KG	10573213	<0.3	<0.3	NA	MSA	CC=	.997
VANADIUM	MG/L	10573214	<0.010	<0.010	NA	0.104	0.100	104
VANADIUM	MG/KG	10573205	12.4	15.1	20	66.8	50.0	109
VANADIUM	MG/KG	10573213	12.0	11.6	3	58.9	50.0	94
ZINC	MG/L	10573214	0.012	0.012	0	0.120	0.100	108

(CONTINUED NEXT PAGE)

TABLE -1
BACKGROUND METALS

Total Metals

<u>Parameter</u>	<u>Analytical Method</u>	<u>Reporting Limit mg/kg</u>
Antimony	6010	6.0
Arsenic	7060	0.5
Barium	6010	1.0
Beryllium	6010	0.2
Cadmium	6010	0.5
Chromium	6010	1.0
Cobalt	6010	1.0
Copper	6010	2.0
Lead	6010	5.0
Mercury	7471	0.2
Nickel	6010	4.0
Potassium	6010	500
Selenium	7740	0.5
Vanadium	6010	1.0
Zinc	6010	2.0

PH

TABLE-4
SKINNER LIST

METHOD 8240

<u>Parameter</u>	<u>Reporting Limit (ug/kg)</u>
Benzene	500
Carbon disulfide	500
Chlorobenzene	500
2-Chloroethylvinyl ether	1,000
1,2-Dibromomethane	1,000
1,2-Dichloroethane	500
1,4-Dioxane	50,000
Ethyl Benzene	500
Methyl ethyl ketone (2-butanone)	1,000
Styrene	500
Toluene	500
Xylenes	500

METHOD 8270

Anthracene	5,000
Benzenethiol	-
Benzo(a)anthracene	5,000
Benzo(b)fluoranthene	5,000
Benzo(k)fluoranthene	5,000
Benzo(a)pyrene	5,000
Bis(2-ethylhexyl)phthalate	5,000
Butyl benzyl phthalate	5,000
Chrysene	5,000
Dibenzo(a,X)acridine	-
Dibenzo(a,h)anthracene	5,000
Di-n-butylphthalate	5,000
1,2-Dichlorobenzene	5,000
1,3-Dichlorobenzene	5,000
1,4-Dichlorobenzene	5,000
Diethyl phthalate	5,000
7,12-Dimethylbenz(a)anthracene	5,000
2,4-Dimethylphenol	5,000
Dimethyl phthalate	5,000
2,4-Dinitrophenol	25,000
Di-n-octyl phthalate	5,000
Fluoranthene	5,000
Indene	5,000
Methylchrysene	-
1-Methylnaphthalene	5,000
2-Methylphenol	5,000
3-Methylphenol	5,000
4-Methylphenol	5,000
Naphthalene	5,000
4-Nitrophenol	25,000
Phenanthrene	5,000

TABLE-4 Continued

Phenol.	5,000
Pyrene	5,000
Pyridine	10,000
Quinoline	25,000



Analytical **Technologies, Inc.**

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105732

July 2, 1991

Giant Refining Company
Route 3, P.O. Box 7
Gallup, NM 87301

Project Name/Number: Phase II RFI

Attention: Claud Rosendale

On 05/15/91, Analytical Technologies, Inc. received a request to analyze soil and aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Method 8240 analyses were performed by ATI, Fort Collins, whose detection limit for EDB is 1.0 ppm for soil. For Selenium analyses, samples 3, 4, and 7-12 had to be diluted by ten times due to matrix interferences.

Detection limits for sample 11 had to be doubled for Ba, Be, Cd, Co, Cr, Cu, K, Ni, Pb, Sb, V, and Zn due to matrix interferences. The RPD for Be and Cr QC performed on sample 5 is outside ATI criteria, because the sample is inhomogeneous. Samples 5 and 13 have spike recoveries below the acceptable range for Sb and V due to matrix problems. The water sample number 14 had to be diluted for Se analysis.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

Lorraine Davis
QA Coordinator

RVW:sdd
Enclosure

Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/15/91

REPORT DATE : 06/29/91

ATI I.D. : 105732

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI 0207 V 3.5	SOIL	05/13/91
02	RFI 0207 V 5.0	SOIL	05/13/91
03	RFI 0207 V 6.5	SOIL	05/13/91
04	RFI 0210 A 3.5	SOIL	05/13/91
05	RFI 0210 A 5.0	SOIL	05/13/91
06	RFI 0210 A 6.5	SOIL	05/13/91
07	RFI 0209 V 3.5	SOIL	05/13/91
08	RFI 0209 V 5.0	SOIL	05/13/91
09	RFI 0209 V 6.5	SOIL	05/13/91
10	RFI 0209 D 6.5	SOIL	05/13/91
11	RFI 0208 A 3.5	SOIL	05/13/91
12	RFI 0208 A 5.0	SOIL	05/13/91
13	RFI 0208 A 6.5	SOIL	05/13/91
14	RFI 0208 E 6.5	AQUEOUS	05/13/91

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	13
AQUEOUS	1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105732

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/15/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	01	02	03	04	05
PH	UNITS	7.51	7.71	7.85	7.47	7.39



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105732

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/15/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

PARAMETER	UNITS	06	07	08	09	10
PH	UNITS	7.82	7.62	7.73	7.90	7.88



GCMS - RESULTS

ATI I.D. : 10578415

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0206V5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/01/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	51
2-FLUOROBIPHENYL (%)	52
TERPHENYL (%)	48
PHENOL-D6 (%)	47
2-FLUOROPHENOL (%)	45

GCMS - RESULTS

ATI I.D. : 10578416

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 05/16/91
PROJECT #	: (NONE)	DATE RECEIVED	: 05/17/91
PROJECT NAME	: PHASE II RFI	DATE EXTRACTED	: 05/23/91
CLIENT I.D.	: RFI0206V6.5	DATE ANALYZED	: 06/01/91
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
-----------	---------

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	56
2-FLUOROBIPHENYL (%)	54
TERPHENYL (%)	47
PHENOL-D6 (%)	52
2-FLUOROPHENOL (%)	53



GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 105784
PROJECT #	: (NONE)	DATE EXTRACTED	: 05/23/91
PROJECT NAME	: PHASE II RFI	DATE ANALYZED	: 05/31/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: MG/KG
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	0.3
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	58
2-FLUOROBIPHENYL (%)	51
TERPHENYL (%)	54
PHENOL-D6 (%)	56
2-FLUOROPHENOL (%)	55

(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105784

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

COMPOUNDS

RESULTS

2,4,6-TRIBROMOPHENOL (%)

47



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105784

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

DATE ANALYZED : 06/01/91

PROJECT NAME : PHASE II RFI

SAMPLE MATRIX : NON-AQUEOUS

REF I.D. : 10699919

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED	% SPIKED	DUP.		RPD
	RESULT	SPIKED			SAMPLE REC.	SAMPLE REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	0.9	53	0.8	47	12
ACENAPHTHENE	<0.17	1.7	1.0	59	0.9	53	11
2,4-DINITROTOLUENE	<0.17	1.7	1.2	71	1.0	59	18
PYRENE	<0.17	1.7	1.0	59	0.9	53	11
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	1.2	71	1.0	59	18
1,4-DICHLOROBENZENE	<0.17	1.7	0.9	53	0.8	47	12
PENTACHLOROPHENOL	<0.85	3.3	3.8	115	3.4	103	11
PHENOL	<0.17	3.3	2.2	67	1.9	58	15
2-CHLOROPHENOL	<0.17	3.3	2.1	64	1.9	58	10
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	2.3	70	2.0	61	14
4-NITROPHENOL	<0.85	3.3	2.8	85	2.5	76	11

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105784

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10578403

DATE ANALYZED : 06/02/91

SAMPLE MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	0.8	47	0.9	53	12
ACENAPHTHENE	<0.17	1.7	0.9	53	1.0	59	11
2,4-DINITROTOLUENE	<0.17	1.7	1.0	59	1.1	65	10
PYRENE	<0.17	1.7	0.8	47	1.0	59	22
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	1.1	65	1.2	71	9
1,4-DICHLOROBENZENE	<0.17	1.7	0.9	53	0.9	53	0
PENTACHLOROPHENOL	<0.85	3.3	3.1	94	3.8	115	20
PHENOL	<0.17	3.3	1.8	55	2.0	61	11
2-CHLOROPHENOL	<0.17	3.3	1.9	58	2.1	64	10
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	1.8	55	2.1	64	15
4-NITROPHENOL	<0.85	3.3	2.2	67	2.7	82	20

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 5-15-91 PAGE 1 OF 2

PROJECT MANAGER: <u>E. P. ZOFFIT</u>		ANALYSIS REQUEST																						
COMPANY: <u>GIANT REFINING CO</u>																								
ADDRESS: <u>243 BOX 7</u>																								
GALLUP, NM 87301																								
BILL TO: <u>SAME</u>																								
COMPANY: <u>SAME</u>																								
ADDRESS: <u>SAME</u>																								
SAMPLERS: (Signature) <u>Lynn Shelton</u>		PHONE NUMBER <u>(505) 722-0227</u>																						
SAMPLE ID	DATE	TIME	MATRIX	LAB ID	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE (MOD 8015/8020)	BTXE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (8270)	Volatile Organics GC/MS (8240)	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by TCLP (1311)	PH & BACKGROUNDMETALS (SEE ATTACHED LIST)	NUMBER OF CONTAINERS	
RFI 0202 V 3.5	5-15-91	12:55PM	SOIL	1																				3
RFI 0202 V 5.0	5-15-91	1:10PM	SOIL	2																				3
RFI 0202 V 6.5	5-15-91	1:25PM	SOIL	3																				3
RFI 0203 A 3.5	5-15-91	1:50PM	SOIL	4																				3
RFI 0203 A 5.0	5-15-91	1:55PM	SOIL	5																				3
RFI 0203 A 6.5	5-15-91	2:40PM	SOIL	6																				3
RFI 0204 V 3.5	5-15-91	3:20PM	SOIL	7																				3
RFI 0204 V 5.0	5-15-91	3:30PM	SOIL	8																				3
RFI 0204 V 6.5	5-15-91	3:45PM	SOIL																					3

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1		RELINQUISHED BY: 2		RELINQUISHED BY: 3	
PROJECT NO:	TOTAL NO. OF CONTAINERS	CHAINED BY:	DATE	Signature:	Time:	Signature:	Time:	Signature:	Time:
PROJECT NAME: <u>PHASE II RFI</u>	<u>27</u>	CHAINED BY: <u>Lynn Shelton</u>	<u>5-15-91</u>	<u>Lynn Shelton</u>	<u>11:00AM</u>				
P.O. NO. <u>01909</u>	CHAIN OF CUSTODY SEALS	INTACT?		Printed Name: <u>LYNN SHELTON</u>	Date: <u>5-16-91</u>				
SHIPPED VIA: <u>FED EXPRESS</u>	RECEIVED GOOD COND/COLD			Company: <u>GIANT REFINING</u>					
SAMPLE DISPOSAL INSTRUCTIONS	LAB NUMBER			RECEIVED BY: 1	Time:	RECEIVED BY: 2	Time:	RECEIVED BY: (LAB)	Time:
☒ ATI ☐ RETURN	<u>105784</u>			Signature: <u>[Signature]</u>		Signature: <u>[Signature]</u>		Signature: <u>[Signature]</u>	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS				Printed Name: <u>[Name]</u>	Date: <u>[Date]</u>	Printed Name: <u>[Name]</u>	Date: <u>[Date]</u>	Printed Name: <u>[Name]</u>	Date: <u>[Date]</u>
TAT: (NORMAL) ☒ (RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK				Company: <u>Analytical Technologies, Inc.</u>		Company: <u>Analytical Technologies, Inc.</u>		Company: <u>Analytical Technologies, Inc.</u>	
Comments: <u>SEE ATTACHED LIST FOR PARAMETERS</u>									

ATT Labs: San Diego (619) 458-9141 • Phoenix (602) 438-1530 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. Pink - ORIGINATOR



DATE 5-15-91 PAGE 2 OF 2

7.391



GCMS - RESULTS

ATI I.D. : 10578407

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0204V3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/31/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	63
2-FLUOROBIPHENYL (%)	56
TERPHENYL (%)	52
PHENOL-D6 (%)	57
2-FLUOROPHENOL (%)	67



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578408

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 05/15/91
PROJECT #	: (NONE)	DATE RECEIVED	: 05/17/91
PROJECT NAME	: PHASE II RFI	DATE EXTRACTED	: 05/23/91
CLIENT I.D.	: RFI0204V5.0	DATE ANALYZED	: 05/31/91
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	68
2-FLUOROBIPHENYL (%)	55
TERPHENYL (%)	51
PHENOL-D6 (%)	54
2-FLUOROPHENOL (%)	60



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578409

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0204V6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/31/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	65
2-FLUOROBIPHENYL (%)	55
TERPHENYL (%)	56
PHENOL-D6 (%)	58
2-FLUOROPHENOL (%)	67



GCMS - RESULTS

ATI I.D. : 10578410

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 05/15/91
PROJECT #	: (NONE)	DATE RECEIVED	: 05/17/91
PROJECT NAME	: PHASE II RFI	DATE EXTRACTED	: 05/23/91
CLIENT I.D.	: RFI0204D6.5	DATE ANALYZED	: 06/01/91
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	58
2-FLUOROBIPHENYL (%)	56
TERPHENYL (%)	52
PHENOL-D6 (%)	55
2-FLUOROPHENOL (%)	53



GCMS - RESULTS

ATI I.D. : 10578411

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
 PROJECT # : (NONE)
 PROJECT NAME : PHASE II RFI
 CLIENT I.D. : RFI0205A3.5
 SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
 DATE RECEIVED : 05/17/91
 DATE EXTRACTED : 05/23/91
 DATE ANALYZED : 06/01/91
 UNITS : MG/KG
 DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	58
2-FLUOROBIPHENYL (%)	55
TERPHENYL (%)	53
PHENOL-D6 (%)	53
2-FLUOROPHENOL (%)	54
2,4,6-TRIMETHYLBENZENE (%)	57



GCMS - RESULTS

ATI I.D. : 10578412

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0205A5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/01/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	61
2-FLUOROBIPHENYL (%)	58
TERPHENYL (%)	55
PHENOL-D6 (%)	55
2-FLUOROPHENOL (%)	55



GCMS - RESULTS

ATI I.D. : 10578413

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0205A6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/01/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	55
2-FLUOROBIPHENYL (%)	53
TERPHENYL (%)	50
PHENOL-D6 (%)	48
2-FLUOROPHENOL (%)	46
2,4,6-TRIFLUOROPHENOL (%)	32



GCMS - RESULTS

ATI I.D. : 10578414

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0206V3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 06/01/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	58
2-FLUOROBIPHENYL (%)	62
TERPHENYL (%)	54
PHENOL-D6 (%)	53
2-FLUOROPHENOL (%)	53
2,4,6-TRICHLOROPHENOL (%)	42

GCMS - RESULTS

ATI I.D. : 10578413

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0205A6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BROMOFLUOROBENZENE (%)	95
TOLUENE-D8 (%)	94



GCMS - RESULTS

ATI I.D. : 10578414

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0206V3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	96
TOLUENE-D8 (%)	93



GCMS - RESULTS

ATI I.D. : 10578415

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0206V5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BROMOFLUOROBENZENE (%)	97
TOLUENE-D8 (%)	93



GCMS - RESULTS

ATI I.D. : 10578416

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0206V6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BROMOFLUOROBENZENE (%)	90
TOLUENE-D8 (%)	93



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105784
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	98
TOLUENE-D8 (%)	94



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105784

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699923

DATE ANALYZED : 05/28/91

SAMPLE MATRIX : NON-AQUEOUS

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,1-DICHLOROETHENE	<0.5	2.5	1.9	76	1.9	76	0
TRICHLOROETHENE	<0.5	2.5	2.2	88	2.2	88	0
CHLOROBENZENE	<0.5	2.5	2.3	92	2.2	88	4
TOLUENE	<0.5	2.5	2.2	88	2.1	84	5
BENZENE	<0.5	2.5	2.0	80	2.0	80	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105784

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699924

DATE ANALYZED : 05/28/91

SAMPLE MATRIX : NON-AQUEOUS

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED	% SPIKED	DUP.		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,1-DICHLOROETHENE	<0.5	2.5	2.1	84	2.5	100	17
TRICHLOROETHENE	<0.5	2.5	2.5	100	2.6	104	4
CHLOROBENZENE	<0.5	2.5	2.3	92	2.3	92	0
TOLUENE	<0.5	2.5	2.2	88	2.3	92	4
BENZENE	<0.5	2.5	2.1	84	2.1	84	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



GCMS - RESULTS

ATI I.D. : 10578401

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0202V3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/31/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	60
2-FLUOROBIPHENYL (%)	54
TERPHENYL (%)	56
PHENOL-D6 (%)	59
2-FLUOROPHENOL (%)	59



GCMS - RESULTS

ATI I.D. : 10578402

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0202V5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/31/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	59
2-FLUOROBIPHENYL (%)	52
TERPHENYL (%)	50
PHENOL-D6 (%)	57
2-FLUOROPHENOL (%)	58



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GCMS - RESULTS

ATI I.D. : 10578403

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0202V6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/31/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	69
2-FLUOROBIPHENYL (%)	60
TERPHENYL (%)	60
PHENOL-D6 (%)	58
2-FLUOROPHENOL (%)	58



GCMS - RESULTS

ATI I.D. : 10578404

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0203A3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/31/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	70
2-FLUOROBIPHENYL (%)	61
TERPHENYL (%)	60
PHENOL-D6 (%)	66
2-FLUOROPHENOL (%)	71



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578405

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0203A5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/31/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	64
2-FLUOROBIPHENYL (%)	53
TERPHENYL (%)	49
PHENOL-D6 (%)	54
2-FLUOROPHENOL (%)	58



GCMS - RESULTS

ATI I.D. : 10578406

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0203A6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/23/91
DATE ANALYZED : 05/31/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	67
2-FLUOROBIPHENYL (%)	56
TERPHENYL (%)	52
PHENOL-D6 (%)	54
2-FLUOROPHENOL (%)	58



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GCMS - RESULTS

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ATI I.D. : 105784

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

COMPOUNDS

RESULTS

2,4,6-TRIBROMOPHENOL (%)

40



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105784

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699905

DATE ANALYZED : 05/31/91

SAMPLE MATRIX : AQUEOUS

UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,2,4-TRICHLOROBENZENE	<5	50	32	64	30	60	6
ACENAPHTHENE	<5	50	35	70	33	66	6
2,4-DINITROTOLUENE	<5	50	38	76	37	74	3
PYRENE	<5	50	31	62	31	62	0
N-NITROSO-DI-N-PROPYL AMINE	<5	50	37	74	34	68	8
1,4-DICHLOROBENZENE	<5	50	35	70	35	70	0
PENTACHLOROPHENOL	<25	100	70	70	68	68	3
PHENOL	<5	100	72	72	75	75	4
2-CHLOROPHENOL	<5	100	82	82	83	83	1
4-CHLORO-3-METHYLPHENOL	<5	100	77	77	69	69	11
4-NITROPHENOL	<25	100	79	79	78	78	1

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578401

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0202V3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BROMOFLUOROBENZENE (%)	104
TOLUENE-D8 (%)	99



GCMS - RESULTS

ATI I.D. : 10578402

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0202V5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	102
BROMOFLUOROBENZENE (%)	105
TOLUENE-D8 (%)	97



GCMS - RESULTS

ATI I.D. : 10578403

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0202V6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	106
BROMOFLUOROBENZENE (%)	103
TOLUENE-D8 (%)	96



GCMS - RESULTS

ATI I.D. : 10578404

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0203A3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	106
BROMOFLUOROBENZENE (%)	110
TOLUENE-D8 (%)	97



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578405

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0203A5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	108
BROMOFLUOROBENZENE (%)	112
TOLUENE-D8 (%)	92



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578406

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0203A6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	109
BROMOFLUOROBENZENE (%)	103
TOLUENE-D8 (%)	92



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578407

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0204V3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYL VINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	104
BROMOFLUOROBENZENE (%)	106
TOLUENE-D8 (%)	92



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578408

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0204V5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYL VINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	106
BROMOFLUOROBENZENE (%)	105
TOLUENE-D8 (%)	91



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578409

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0204V6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BROMOFLUOROBENZENE (%)	98
TOLUENE-D8 (%)	98



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578410

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0204D6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/15/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/26/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLEETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BROMOFLUOROBENZENE (%)	99
TOLUENE-D8 (%)	99



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578411

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0205A3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BROMOFLUOROBENZENE (%)	97
TOLUENE-D8 (%)	92



GCMS - RESULTS

ATI I.D. : 10578412

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0205A5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : 05/21/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<0.25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	94
BROMOFLUOROBENZENE (%)	97
TOLUENE-D8 (%)	94



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	11	12	13	14	15
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	191	526	237	327	158
BERYLLIUM	MG/KG	1.1	0.6	0.9	0.9	0.6
CADMIUM	MG/KG	<0.3	<0.3	<0.3	<0.3	<0.3
COBALT	MG/KG	3.7	1.8	3.4	2.8	2.2
CHROMIUM	MG/KG	4.4	1.2	3.8	3.3	2.6
COPPER	MG/KG	4.2	2.9	3.6	3.0	3.4
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	1690	327	1420	685	531
NICKEL	MG/KG	7.0	3.1	5.4	4.3	3.9
LEAD	MG/KG	7	<5	6	6	7
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<0.3	<0.3	<0.3	<0.3	<0.3
VANADIUM	MG/KG	13.2	8.4	11.6	12.6	10.9
ZINC	MG/KG	11.7	4.3	11.3	8.3	7.1



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	16
ARSENIC	MG/KG	<3
BARIUM	MG/KG	176
BERYLLIUM	MG/KG	0.5
CADMIUM	MG/KG	<0.3
COBALT	MG/KG	1.7
CHROMIUM	MG/KG	1.7
COPPER	MG/KG	2.4
MERCURY	MG/KG	<0.02
POTASSIUM	MG/KG	338
NICKEL	MG/KG	2.6
LEAD	MG/KG	<5
ANTIMONY	MG/KG	<3
SELENIUM	MG/KG	<0.3
VANADIUM	MG/KG	6.7
ZINC	MG/KG	5.2



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	17
ARSENIC	MG/L	<0.005
BARIUM	MG/L	<0.010
BERYLLIUM	MG/L	<0.005
CADMIUM	MG/L	<0.005
COBALT	MG/L	<0.010
CHROMIUM	MG/L	<0.010
COPPER	MG/L	<0.010
MERCURY	MG/L	<0.0002
POTASSIUM	MG/L	<1.0
NICKEL	MG/L	<0.020
LEAD	MG/L	<0.002
ANTIMONY	MG/L	<0.05
SELENIUM	MG/L	<0.005
VANADIUM	MG/L	<0.010
ZINC	MG/L	0.020



Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

ATI I.D. : 105784

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ARSENIC	MG/L	10583201	<0.005	<0.005	NA	0.043	0.050	86
ARSENIC	MG/KG	10573213	<3	<3	NA	21	25	84
ARSENIC	MG/KG	10578406	<3	<3	NA	21	25	84
ARSENIC	MG/KG	10578416	<3	<3	NA	22	25	88
BARIUM	MG/L	10578417	<0.010	<0.010	NA	0.098	0.100	98
BARIUM	MG/KG	10578403	268	265	1	324	50.0	112
BARIUM	MG/KG	10578406	286	290	1	775	500	98
BERYLLIUM	MG/L	10578417	<0.005	<0.005	NA	0.094	0.100	94
BERYLLIUM	MG/KG	10578403	1.3	1.1	17	22.7	25.0	86
BERYLLIUM	MG/KG	10578406	1.4	1.5	7	23.4	25.0	88
CADMIUM	MG/L	10578417	<0.005	<0.005	NA	0.104	0.100	104
CADMIUM	MG/KG	10578403	<0.3	<0.3	NA	22.5	25.0	90
CADMIUM	MG/KG	10578406	<0.3	<0.3	NA	23.2	25.0	93
COBALT	MG/L	10578417	<0.010	<0.010	NA	0.104	0.100	104
COBALT	MG/KG	10578403	3.1	3.7	18	47.8	50.0	89
COBALT	MG/KG	10578406	4.4	4.5	2	49.3	50.0	90
CHROMIUM	MG/L	10578417	<0.010	<0.010	NA	0.088	0.100	88
CHROMIUM	MG/KG	10578403	3.0	3.5	15	46.8	50.0	88
CHROMIUM	MG/KG	10578406	4.4	4.6	4	48.2	50.0	88
COPPER	MG/L	10578417	<0.010	<0.010	NA	0.086	0.100	86
COPPER	MG/KG	10578403	4.2	4.1	2	27.2	25.0	92
COPPER	MG/KG	10578406	5.9	6.2	5	30.0	25.0	96
MERCURY	MG/L	10579501	<0.0002	<0.0002	NA	0.0047	0.0050	94
MERCURY	MG/KG	10578402	<0.02	<0.02	NA	0.46	0.50	92
MERCURY	MG/KG	10578416	<0.02	<0.02	NA	0.50	0.50	100
POTASSIUM	MG/L	10585901	7.3	7.2	1	55.7	50.0	97
POTASSIUM	MG/KG	10578403	1100	1290	16	3650	2500	102
POTASSIUM	MG/KG	10578406	1470	1510	3	4100	2500	105
NICKEL	MG/L	10578417	<0.020	<0.020	NA	0.103	0.100	103
NICKEL	MG/KG	10578403	4.6	4.1	11	48.3	50.0	87
NICKEL	MG/KG	10578406	6.8	7.1	4	50.8	50.0	88
LEAD	MG/L	10577501	<0.002	<0.002	NA	0.047	0.050	94
LEAD	MG/KG	10578403	9	11	20	53	50	88
LEAD	MG/KG	10578406	10	10	0	54	50	88
ANTIMONY	MG/L	10578417	<0.05	<0.05	NA	1.02	1.00	102
ANTIMONY	MG/KG	10578403	<3	<3	NA	11	50	22*
ANTIMONY	MG/KG	10578406	<3	<3	NA	13	50	26*
SELENIUM	MG/L	10579301	<0.005	<0.005	NA	0.033	0.050	66
SELENIUM	MG/KG	10578406	<3	<3	NA	MSA	CC=	.99
SELENIUM	MG/KG	10578416	<0.3	<0.3	NA	MSA	CC=	.99
VANADIUM	MG/L	10578417	<0.010	<0.010	NA	0.092	0.100	92
VANADIUM	MG/KG	10578403	13.3	14.3	7	52.9	50.0	79
VANADIUM	MG/KG	10578406	15.0	13.7	9	55.6	50.0	81
ZINC	MG/L	10578417	0.020	0.018	10	0.122	0.100	102
ZINC	MG/KG	10578403	8.0	9.7	19	30.8	25.0	91

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Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

ATI I.D. : 105784

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ZINC	MG/KG	10578406	11.3	11.6	3	32.8	25.0	86

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

* Result out of limits due to sample matrix interference



GCMS - RESULTS

ATI I.D. : 10578417

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0206E6.5
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : N/A
DATE ANALYZED : 05/26/91
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<2.5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BROMOFLUOROBENZENE (%)	98
TOLUENE-D8 (%)	98



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105784
DATE EXTRACTED : 05/26/91
DATE ANALYZED : 05/26/91
UNITS : UG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<2.5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BROMOFLUOROBENZENE (%)	97
TOLUENE-D8 (%)	96



Analytical Technologies, Inc.

QUALITY CONTROL DATA

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699914

DATE ANALYZED : 05/28/91

SAMPLE MATRIX : AQUEOUS

UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED %		DUP.	DUP.	RPD
	RESULT	SPIKED	SAMPLE	REC.	SAMPLE	REC.	
1,1-DICHLOROETHENE	<5	50	41	82	43	86	5
TRICHLOROETHENE	<5	50	47	94	48	96	2
CHLOROBENZENE	<5	50	45	90	46	92	2
TOLUENE	<5	50	44	88	44	88	0
BENZENE	<5	50	41	82	42	84	2

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10578417

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI0206E6.5
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/16/91
DATE RECEIVED : 05/17/91
DATE EXTRACTED : N/A
DATE ANALYZED : 05/30/91
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHYLPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO(a)ANTHRACENE	<5
BIS(2-ETHYLHEXYL)PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO(b)FLUORANTHENE	<5
BENZO(k)FLUORANTHENE	<5
BENZO(a)PYRENE	<5
DIBENZO(a,h)ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO(A,J)ACRIDINE	<5
7,12-DIMETHYLBENZ(a)ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	52
2-FLUOROBIPHENYL (%)	52
TERPHENYL (%)	67
PHENOL-D6 (%)	50



GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105784
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/30/91
UNITS : UG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
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PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHYLPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO(a)ANTHRACENE	<5
BIS(2-ETHYLHEXYL)PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO(b)FLUORANTHENE	<5
BENZO(k)FLUORANTHENE	<5
BENZO(a)PYRENE	<5
DIBENZO(a,h)ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO(A,J)ACRIDINE	<5
7,12-DIMETHYLBENZ(a)ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	68
2-FLUOROBIPHENYL (%)	65
TERPHENYL (%)	86
PHENOL-D6 (%)	57
2-FLUOROPHENOL (%)	60

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Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	11	12	13	14	15
PH	UNITS	7.49	7.63	7.78	8.20	8.12



Analytical **Technologies**, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	16
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PH	UNITS	8.23
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Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	17
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PH	UNITS	5.29
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Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

ATI I.D. : 105784

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
PH	UNITS	10587910	5.32	5.27	1	NA	NA	NA
PH	UNITS	10578401	7.54	7.56	0.3	NA	NA	NA
PH	UNITS	10578411	7.49	7.47	0.3	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	01	02	03	04	05
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	234	204	268	410	243
BERYLLIUM	MG/KG	2.2	1.4	1.3	1.0	1.1
CADMIUM	MG/KG	<0.3	<0.3	<0.3	<0.3	<0.3
COBALT	MG/KG	4.9	3.6	3.1	2.9	4.0
CHROMIUM	MG/KG	6.1	4.2	3.0	3.3	4.4
COPPER	MG/KG	5.7	4.3	4.2	3.2	4.6
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	1620	1730	1100	624	1780
NICKEL	MG/KG	9.0	6.5	4.6	5.1	4.6
LEAD	MG/KG	9	8	9	7	8
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<3	<3	<3	<3	<3
VANADIUM	MG/KG	13.3	13.9	13.3	11.4	12.3
ZINC	MG/KG	13.2	10.6	8.0	12.0	11.9



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	06	07	08	09	10
ARSENIC	MG/KG	<3	<3	<3	<3	<3
BARIUM	MG/KG	286	216	245	296	236
BERYLLIUM	MG/KG	1.4	1.6	2.1	1.5	1.6
CADMIUM	MG/KG	<0.3	<0.3	0.4	<0.3	<0.3
COBALT	MG/KG	4.4	4.6	6.4	4.4	4.9
CHROMIUM	MG/KG	4.4	6.4	10.1	4.8	5.4
COPPER	MG/KG	5.9	4.7	4.9	5.7	6.0
MERCURY	MG/KG	<0.02	<0.02	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	1470	2210	3490	1350	1220
NICKEL	MG/KG	6.8	8.9	12.4	7.6	6.0
LEAD	MG/KG	10	10	9	9	11
ANTIMONY	MG/KG	<3	<3	<3	<3	<3
SELENIUM	MG/KG	<3	<3	<3	<0.3	<0.3
VANADIUM	MG/KG	15.0	16.6	20.0	10.6	15.0
ZINC	MG/KG	11.3	14.1	19.2	12.2	12.5



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105731

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699917

DATE ANALYZED : 05/30/91

SAMPLE MATRIX : NON-AQUEOUS

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,2,4-TRICHLOROBENZENE	<0.17	1.7	1.0	59	1.0	59	0
ACENAPHTHENE	<0.17	1.7	1.1	65	1.1	65	0
2,4-DINITROTOLUENE	<0.17	1.7	1.3	76	1.2	71	8
PYRENE	<0.17	1.7	1.9	112	1.8	105	5
N-NITROSO-DI-N-PROPYL AMINE	<0.17	1.7	1.2	71	1.2	71	0
1,4-DICHLOROBENZENE	<0.17	1.7	1.0	59	1.1	65	10
PENTACHLOROPHENOL	<0.85	3.3	2.6	79	2.6	79	0
PHENOL	<0.17	3.3	2.5	76	2.5	76	0
2-CHLOROPHENOL	<0.17	3.3	2.6	79	2.5	76	4
4-CHLORO-3-METHYLPHENOL	<0.17	3.3	2.7	82	2.5	76	8
4-NITROPHENOL	<0.85	3.3	3.0	91	2.5	76	18

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



DATE _____ PAGE _____ OF _____

7.324

LABS: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. PI&K - ORIGINATOR

TABLE -1
BACKGROUND METALS

Total Metals

<u>Parameter</u>	<u>Analytical Method</u>	<u>Reporting Limit mg/kg</u>
Antimony	6010	6.0
Arsenic	7060	0.5
Barium	6010	1.0
Beryllium	6010	0.2
Cadmium	6010	0.5
Chromium	6010	1.0
Cobalt	6010	1.0
Copper	6010	2.0
Lead	6010	5.0
Mercury	7471	0.2
Nickel	6010	4.0
Potassium	6010	500
Selenium	7740	0.5
Vanadium	6010	1.0
Zinc	6010	2.0

PH

TABLE-4
SKINNER LIST

METHOD 8240

<u>Parameter</u>	<u>Reporting Limit (ug/kg)</u>
Benzene	500
Carbon disulfide	500
Chlorobenzene	500
2-Chloroethylvinyl ether	1,000
1,2-Dibromomethane	1,000
1,2-Dichloroethane	500
1,4-Dioxane	50,000
Ethyl Benzene	500
Methyl ethyl ketone (2-butanone)	1,000
Styrene	500
Toluene	500
Xylenes	500

METHOD 8270

Anthracene	5,000
Benzenethiol	-
Benzo(a)anthracene	5,000
Benzo(b)fluoranthene	5,000
Benzo(k)fluoranthene	5,000
Benzo(a)pyrene	5,000
Bis(2-ethylhexyl)phthalate	5,000
Butyl benzyl phthalate	5,000
Chrysene	5,000
Dibenzo(a,X)acridine	-
Dibenzo(a,h)anthracene	5,000
Di-n-butylphthalate	5,000
1,2-Dichlorobenzene	5,000
1,3-Dichlorobenzene	5,000
1,4-Dichlorobenzene	5,000
Diethyl phthalate	5,000
7,12-Dimethylbenz(a)anthracene	5,000
2,4-Dimethylphenol	5,000
Dimethyl phthalate	5,000
2,4-Dinitrophenol	25,000
Di-n-octyl phthalate	5,000
Fluoranthene	5,000
Indene	5,000
Methylchrysene	-
1-Methylnaphthalene	5,000
2-Methylphenol	5,000
3-Methylphenol	5,000
4-Methylphenol	5,000
Naphthalene	5,000
4-Nitrophenol	25,000
Phenanthrene	5,000

TABLE-4 Continued

Phenol.	5,000
Pyrene	5,000
Pyridine	10,000
Quinoline	25,000



Analytical **Technologies**, Inc.

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105784

July 5, 1991

Giant Refining Company
Route 3, P.O. Box 7
Gallup, NM 87301

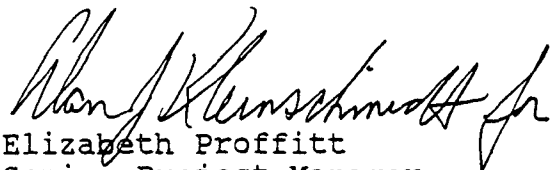
Project Name/Number: Phase II RFI

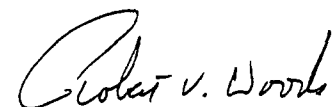
Attention: Claud Rosendale

On 05/17/91, Analytical Technologies, Inc. received a request to analyze soil and aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Antimony Spike Recoveries are above ATI acceptance criteria due to matrix interferences. The RPD for Pyrene in soils for Method 8270 is above ATI criteria. Because no Pyrene is detected, the quality of the data should be acceptable.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.


Elizabeth Proffitt
Senior Project Manager


Robert V. Woods
Laboratory Manager


Lorraine Davis
QA Coordinator

RVW:sdd
Enclosure

Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/17/91

REPORT DATE : 07/01/91

ATI I.D. : 105784

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI0202V3.5	SOIL	05/15/91
02	RFI0202V5.0	SOIL	05/15/91
03	RFI0202V6.5	SOIL	05/15/91
04	RFI0203A3.5	SOIL	05/15/91
05	RFI0203A5.0	SOIL	05/15/91
06	RFI0203A6.5	SOIL	05/15/91
07	RFI0204V3.5	SOIL	05/15/91
08	RFI0204V5.0	SOIL	05/15/91
09	RFI0204V6.5	SOIL	05/15/91
10	RFI0204D6.5	SOIL	05/15/91
11	RFI0205A3.5	SOIL	05/16/91
12	RFI0205A5.0	SOIL	05/16/91
13	RFI0205A6.5	SOIL	05/16/91
14	RFI0206V3.5	SOIL	05/16/91
15	RFI0206V5.0	SOIL	05/16/91
16	RFI0206V6.5	SOIL	05/16/91
17	RFI0206E6.5	AQUEOUS	05/16/91

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	16
AQUEOUS	1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	01	02	03	04	05
PH	UNITS	7.54	7.54	7.53	8.14	7.44



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105784

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/17/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 07/01/91

PARAMETER	UNITS	06	07	08	09	10
PH	UNITS	7.63	7.48	7.60	7.93	7.83



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10573102

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0201 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	115
BROMOFLUOROBENZENE (%)	87
TOLUENE-D8 (%)	122



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10573103

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0201 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	120
BROMOFLUOROBENZENE (%)	87
TOLUENE-D8 (%)	107



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105731
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	108
BROMOFLUOROBENZENE (%)	98
TOLUENE-D8 (%)	107



Analytical Technologies, Inc.

QUALITY CONTROL DATA

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

ATI I.D. : 105731

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10573103

DATE ANALYZED : 05/22/91

SAMPLE MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED	% SPIKED	DUP.		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,1-DICHLOROETHENE	<0.5	50	48	96	49	98	1
TRICHLOROETHENE	<0.5	50	58	116	60	120	3
CHLOROBENZENE	<0.5	50	50	100	49	98	1
TOLUENE	5	50	63	116	64	118	2
BENZENE	<0.5	50	49	98	52	104	6

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10573101

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0201 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	0.3
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	64
2-FLUOROBIPHENYL (%)	54
TERPHENYL (%)	84
PHENOL-D6 (%)	51
2-FLUOROPHENOL (%)	61



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10573102

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0201 V 5.0
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	70
2-FLUOROBIPHENYL (%)	58
TERPHENYL (%)	91
PHENOL-D6 (%)	55
2-FLUOROBIPHENYL (%)	65



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10573103

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0201 V 6.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/20/91
DATE ANALYZED : 05/28/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	<0.17
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	73
2-FLUOROBIPHENYL (%)	61
TERPHENYL (%)	93
PHENOL-D6 (%)	58
2-FLUOROPHENOL (%)	69



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 105731
PROJECT #	: (NONE)	DATE EXTRACTED	: 05/20/91
PROJECT NAME	: PHASE II RFI	DATE ANALYZED	: 05/28/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: MG/KG
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
-----------	---------

PHENOL	<0.17
1,3-DICHLOROBENZENE	<0.17
1,4-DICHLOROBENZENE	<0.17
1,2-DICHLOROBENZENE	<0.17
2-METHYLPHENOL	<0.17
4-METHYLPHENOL	<0.17
2,4-DIMETHYLPHENOL	<0.17
NAPHTHALENE	<0.17
DIMETHYLPHTHALATE	<0.17
2,4-DINITROPHENOL	<0.85
4-NITROPHENOL	<0.85
DIETHYLPHTHALATE	<0.17
PHENANTHRENE	<0.17
ANTHRACENE	<0.17
DI-N-BUTYLPHTHALATE	0.9
FLUORANTHENE	<0.17
PYRENE	<0.17
BUTYLBENZYLPHTHALATE	<0.17
BENZO(a)ANTHRACENE	<0.17
BIS(2-ETHYLHEXYL)PHTHALATE	<0.17
CHRYSENE	<0.17
DI-N-OCTYLPHTHALATE	<0.17
BENZO(b)FLUORANTHENE	<0.17
BENZO(k)FLUORANTHENE	<0.17
BENZO(a)PYRENE	<0.17
DIBENZO(a,h)ANTHRACENE	<0.17
BENZENETHIOL	<0.17
DIBENZO(A,J)ACRIDINE	<0.17
7,12-DIMETHYLBENZ(a)ANTHRACENE	<0.17
INDENE	<0.17
METHYLCHRYSENE	<0.17
1-METHYLNAPHTHALENE	<0.17
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<0.85

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	59
2-FLUOROBIPHENYL (%)	52
TERPHENYL (%)	88
PHENOL-D6 (%)	47
2-FLUOROPHENOL (%)	56

(CONTINUED NEXT PAGE)



Analytical **Technologies**, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105731

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

COMPOUNDS

RESULTS

2,4,6-TRIBROMOPHENOL (%)

42

TABLE -1
BACKGROUND METALS

Total Metals

<u>Parameter</u>	<u>Analytical Method</u>	<u>Reporting Limit mg/kg</u>
✓Antimony	6010	6.0
✓Arsenic	7060	0.5
✓Barium	6010	1.0
✓Beryllium	6010	0.2
✓Cadmium	6010	0.5
✓Chromium	6010	1.0
✓Cobalt	6010	1.0
✓Copper	6010	2.0
✓Lead	6010	5.0
✓Mercury	7471	0.2
✓Nickel	6010	4.0
✓Potassium	6010	500
✓Selenium	7740	0.5
✓Vanadium	6010	1.0
✓Zinc	6010	2.0

TABLE-4
SKINNER LIST

METHOD 8240

<u>Parameter</u>	<u>Reporting Limit (ug/kg)</u>
Benzene	500
Carbon disulfide	500
Chlorobenzene	500
2-Chloroethylvinyl ether	1,000
1,2-Dibromomethane	1,000
1,2-Dichloroethane	500
1,4-Dioxane	50,000
Ethyl Benzene	500
Methyl ethyl ketone (2-butanone)	1,000
Styrene	500
Toluene	500
Xylenes	500

METHOD 8270

Anthracene	5,000
Benzenethiol	-
Benzo(a)anthracene	5,000
Benzo(b)fluoranthene	5,000
Benzo(k)fluoranthene	5,000
Benzo(a)pyrene	5,000
Bis(2-ethylhexyl)phthalate	5,000
Butyl benzyl phthalate	5,000
Chrysene	5,000
Dibenzo(a,X)acridine	-
Dibenzo(a,h)anthracene	5,000
Di-n-butylphthalate	5,000
1,2-Dichlorobenzene	5,000
1,3-Dichlorobenzene	5,000
1,4-Dichlorobenzene	5,000
Diethyl phthalate	5,000
7,12-Dimethylbenz(a)anthracene	5,000
2,4-Dimethylphenol	5,000
Dimethyl phthalate	5,000
2,4-Dinitrophenol	25,000
Di-n-octyl phthalate	5,000
Fluoranthene	5,000
Indene	5,000
Methylchrysene	-
1-Methylnaphthalene	5,000
2-Methylphenol	5,000
3-Methylphenol	5,000
4-Methylphenol	5,000
Naphthalene	5,000
4-Nitrophenol	25,000
Phenanthrene	5,000

TABLE-4 Continued

Phenol.	5,000
Pyrene	5,000
Pyridine	10,000
Quinoline	25,000



Analytical **Technologies, Inc.**

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105731

July 2, 1991

Giant Refining Company
Route 3, P.O. Box 7
Gallup, NM 87301

Project Name/Number: Phase II RFI

Attention: Claud Rosendale

On 05/15/91, Analytical Technologies, Inc. received a request to analyze soil sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

This report is being reissued to correct the detection limits for EDB by EPA Method 8240.

The EPA Method 8240 analyses were performed by ATI, Ft. Collins. Antimony and Vanadium recoveries are low due to matrix interferences. Because the sample used for Beryllium and Chromium QA/QC was not homogeneous, the RPD is above ATI acceptance criteria.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

RVW:clf
Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/15/91

REPORT DATE : 06/05/91

ATI I.D. : 105731

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	RFI 0201 V 3.5	SOIL	05/13/91
02	RFI 0201 V 5.0	SOIL	05/13/91
03	RFI 0201 V 6.5	SOIL	05/13/91

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	3

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical **Technologies**, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105731

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/15/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/05/91

PARAMETER	UNITS	01	02	03
PH	UNITS	7.78	7.76	7.66



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

ATI I.D. : 105731

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
PH	UNITS	10568116	8.2	8.2	0	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105731

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/15/91

REPORT DATE : 06/05/91

PARAMETER	UNITS	01	02	03
ARSENIC	MG/KG	<3	<3	<3
BARIUM	MG/KG	256	225	326
BERYLLIUM	MG/KG	5.8	6.0	5.9
CADMIUM	MG/KG	0.3	<0.3	<0.3
COBALT	MG/KG	5.7	5.6	5.8
CHROMIUM	MG/KG	7.3	6.4	7.4
COPPER	MG/KG	5.2	5.0	5.3
MERCURY	MG/KG	<0.02	<0.02	<0.02
POTASSIUM	MG/KG	1820	1780	2270
NICKEL	MG/KG	10.9	9.8	10.4
LEAD	MG/KG	13	13	11
ANTIMONY	MG/KG	<3	<3	<3
SELENIUM	MG/KG	<0.3	<0.3	<0.3
VANADIUM	MG/KG	15.4	15.3	15.4
ZINC	MG/KG	15.0	14.2	15.6



Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

ATI I.D. : 105731

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ARSENIC	MG/KG	10569504	<3	<3	NA	23	25	92
ARSENIC	MG/KG	10573103	<3	<3	NA	23	25	92
BARIUM	MG/KG	10569501	281	289	3	762	500	96
BARIUM	MG/KG	10573205	267	256	4	748	500	96
BERYLLIUM	MG/KG	10569501	2.4	2.6	8	25.1	25.0	91
BERYLLIUM	MG/KG	10573205	5.6	7.2	25*	29.8	25.0	97
CADMIUM	MG/KG	10569501	<0.3	<0.3	NA	24.8	25.0	99
CADMIUM	MG/KG	10573205	0.3	0.3	0	21.3	25.0	84
COBALT	MG/KG	10569501	4.4	4.5	2	52.4	50.0	96
COBALT	MG/KG	10573205	5.1	5.8	13	52.5	50.0	95
CHROMIUM	MG/KG	10569501	4.5	4.1	9	52.1	50.0	95
CHROMIUM	MG/KG	10573205	8.1	6.4	23*	58.6	50.0	101
COPPER	MG/KG	10569501	4.6	4.6	0	29.2	25.0	98
COPPER	MG/KG	10573205	5.2	5.4	4	29.0	25.0	95
MERCURY	MG/KG	10575701	0.03	0.03	0	0.45	0.50	84
POTASSIUM	MG/KG	10569501	1080	1050	3	3800	2500	109
POTASSIUM	MG/KG	10573205	2090	2520	19	4790	2500	108
NICKEL	MG/KG	10569501	8.5	7.7	10	52.6	50.0	88
NICKEL	MG/KG	10573205	9.2	10.8	16	55.5	50.0	93
LEAD	MG/KG	10569501	10	10	0	59	50	98
LEAD	MG/KG	10573205	10	10	0	58	50	96
ANTIMONY	MG/KG	10569501	<3	<3	NA	11.7	50.0	23*
ANTIMONY	MG/KG	10573205	<3	<3	NA	20.7	50.0	41*
SELENIUM	MG/KG	10569504	<0.3	<0.3	NA	MSA	CC=	.99
VANADIUM	MG/KG	10569501	10.0	11.5	14	44.2	50.0	68*
VANADIUM	MG/KG	10573205	12.4	15.1	20	66.8	50.0	109
ZINC	MG/KG	10569501	9.7	10.9	12	39.2	25.0	118
ZINC	MG/KG	10573205	16.4	14.1	15	45.7	25.0	117

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 10$$

* Result out of limits due to sample matrix interference



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10573101

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PHASE II RFI
CLIENT I.D. : RFI 0201 V 3.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/13/91
DATE RECEIVED : 05/15/91
DATE EXTRACTED : 05/15/91
DATE ANALYZED : 05/22/91
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CARBON SULFIDE	<0.5
1,2-DICHLOROETHANE	<0.5
2-BUTANONE (MEK)	<0.5
BENZENE	<0.5
2-CHLOROETHYLVINYLETHER	<0.5
TOLUENE	<0.5
CHLOROBENZENE	<0.5
ETHYLBENZENE	<0.5
STYRENE	<0.5
TOTAL XYLENES	<0.5
1,4-DIOXANE	<7.5
1,2-DIBROMOETHANE (EDB)	<1.0

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	121
BROMOFLUOROBENZENE (%)	84
TOLUENE-D8 (%)	109



Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10553401

COMPOUNDS

RESULTS

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	53
2-FLUOROBIPHENYL (%)	58
TERPHENYL (%)	114
PHENOL-D6 (%)	36
2-FLUOROPHENOL (%)	51
2,4,6-TRIBROMOPHENOL (%)	35



GCMS - RESULTS

ATI I.D. : 10553402

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 05/01/91
PROJECT #	: (NONE)	DATE RECEIVED	: 05/02/91
PROJECT NAME	: RFI	DATE EXTRACTED	: 05/06/91
CLIENT I.D.	: EQUIP WASH #2	DATE ANALYZED	: 05/15/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS

RESULTS

PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHYLPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO(a)ANTHRACENE	<5
BIS(2-ETHYLHEXYL)PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO(b)FLUORANTHENE	<5
BENZO(k)FLUORANTHENE	<5
BENZO(a)PYRENE	<5
DIBENZO(a,h)ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO(A,J)ACRIDINE	<5 *
7,12-DIMETHYLBENZ(a)ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10553402

COMPOUNDS

RESULTS

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	56
2-FLUOROBIPHENYL (%)	59
TERPHENYL (%)	128
PHENOL-D6 (%)	38
2-FLUOROPHENOL (%)	54
2,4,6-TRIBROMOPHENOL (%)	34



GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 105534
PROJECT #	: (NONE)	DATE EXTRACTED	: 05/06/91
PROJECT NAME	: RFI	DATE ANALYZED	: 05/15/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
-----------	---------

PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHYLPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO (a) ANTHRACENE	<5
BIS (2-ETHYLHEXYL) PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO (b) FLUORANTHENE	<5
BENZO (k) FLUORANTHENE	<5
BENZO (a) PYRENE	<5
DIBENZO (a, h) ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO (A, J) ACRIDINE	<5 *
7,12-DIMETHYLBENZ (a) ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 105534

COMPOUNDS

RESULTS

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	67
2-FLUOROBIPHENYL (%)	67
TERPHENYL (%)	107
PHENOL-D6 (%)	45
2-FLUOROPHENOL (%)	56
2,4,6-TRIBROMOPHENOL (%)	38



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105534

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : RFI

REF I.D. : 10599915

DATE ANALYZED : 05/15/91

SAMPLE MATRIX :

UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED RESULT	SPIKED SAMPLE	DUP. %		RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,2,4-TRICHLOROBENZENE	<10	50	31	62	33	66	6
ACENAPHTHENE	<10	50	32	64	37	74	14
2,4-DINITROTOLUENE	<25	50	26	52	31	62	18
PYRENE	<5	50	52	104	55	110	6
N-NITROSO-DI-N-PROPYL AMINE	<10	50	26	52	29	58	11
1,4-DICHLOROBENZENE	<5	50	37	74	38	76	3
PENTACHLOROPHENOL	<50	100	61	61	65	65	6
PHENOL	<5	100	50	50	52	104	4
2-CHLOROPHENOL	<10	100	52	52	58	58	11
4-CHLORO-3-METHYLPHENOL	<10	100	47	47	47	47	0
4-NITROPHENOL	<50	100	40	40	41	41	2

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 5-1-91 PAGE 1 OF 1

PROJECT MANAGER: <u>Elizabeth Poffner</u>				ANALYSIS REQUEST																			
COMPANY: <u>Giant Refining Co.</u>																							
ADDRESS: <u>Box 7</u>																							
ADDRESS: <u>Callup, A.H. 87301</u>																							
BILL TO: <u>Sam</u>																							
COMPANY: <u>Sam</u>																							
ADDRESS: <u>Sam</u>																							
SAMPLE ID: <u>1505 722-0217</u>																							
SAMPLERS: (Signature) <u>[Signature]</u>																							
SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	Diesel/Gasoline/BTXE (MOD 8015/8020)	BTXE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (8270)	Volatile Organics GC/MS (8240)	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by TCLP (1311)	The 8 EP Tox Metals by Total Digestion	NUMBER OF CONTAINERS	
Oil-2	5-1	0910	Water	1	X								X	X									1
Equip Wash #2	5-1	0950	Water	2	X								X	X									1

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
PROJECT NO:	<u>12</u>	TOTAL NO. OF CONTAINERS	<u>12</u>	Signature:	<u>[Signature]</u>	Signature:		Signature:	
PROJECT NAME:	<u>RFT</u>	CHAIN OF CUSTODY SEALS	<u>Y</u>	Printed Name:	<u>Chandrasekhar 5-1-91</u>	Printed Name:		Printed Name:	
P.O. NO.	<u>019029</u>	INTACT?	<u>Y</u>	Date:	<u>5-1-91</u>	Date:		Date:	
SHIPPED VIA:	<u>Fed. Ex.</u>	RECEIVED GOOD COND./COLD	<u>Y</u>	Company:	<u>Giant Refining Co.</u>	Company:		Company:	
SAMPLE DISPOSAL INSTRUCTIONS	<u>ATI</u>	LAB NUMBER	<u>105534</u>	RECEIVED BY: 1.	<u>[Signature]</u>	RECEIVED BY: 2.	<u>[Signature]</u>	RECEIVED BY: (LAB)	<u>[Signature]</u>
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS				Signature:		Signature:		Signature:	
TAT: (NORMAL)	<u>X</u>	(RUSH)	<u>24</u>	Date:		Date:		Date:	
Comments:	<u>See attached for specific analysis</u>			Printed Name:	<u>Linda Eshelmer</u>	Printed Name:	<u>Linda Eshelmer</u>	Printed Name:	<u>Linda Eshelmer</u>
ATI Labs:	San Diego (619) 458-9141	Phoenix (602) 438-1530	Seattle (206) 228-8335	Company:	Analytical Technologies, Inc.	Company:	Analytical Technologies, Inc.	Company:	Analytical Technologies, Inc.

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. - PINK - ORIGINATOR



Analytical**Technologies**, Inc.

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105534

June 10, 1991

Giant Refining Company
Route 3, P.O. Box 7
Gallup, NM 87301

Project Name/Number: RFI

Attention: Claud Rosendale

On 05/02/91, Analytical Technologies, Inc. received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Due to matrix interferences, sample OW-1 had to be diluted for Selenium analysis, causing the detection limit to be raised.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

RVW:clf
Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : RFI

DATE RECEIVED : 05/02/91

REPORT DATE : 05/29/91

ATI I.D. : 105534

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OW-2	AQUEOUS	05/01/91
02	EQUIP WASH #2	AQUEOUS	05/01/91

----- TOTALS -----

MATRIX	# SAMPLES
-----	-----
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105534

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/02/91

PROJECT # : (NONE)

PROJECT NAME : RFI

REPORT DATE : 05/29/91

PARAMETER	UNITS	01	02
PH	UNITS	8.50	5.79



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : RFI

ATI I.D. : 105534

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
PH	UNITS	10553702	8.36	8.37	0.1	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105534

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : RFI

DATE RECEIVED : 05/02/91

REPORT DATE : 05/29/91

PARAMETER	UNITS	01	02
ARSENIC	MG/L	0.006	<0.005
BARIUM	MG/L	0.497	0.057
BERYLLIUM	MG/L	0.007	<0.005
CADMIUM	MG/L	<0.005	<0.005
COBALT	MG/L	<0.010	<0.010
CHROMIUM	MG/L	0.023	<0.010
COPPER	MG/L	0.044	0.017
MERCURY	MG/L	<0.0002	<0.0002
POTASSIUM	MG/L	2.7	<1.0
NICKEL	MG/L	<0.020	<0.020
LEAD	MG/L	0.026	<0.002
ANTIMONY	MG/L	<0.05	<0.05
SELENIUM	MG/L	<0.010	<0.005
VANADIUM	MG/L	0.051	<0.010
ZINC	MG/L	0.063	0.014



Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : RFI

ATI I.D. : 105534

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ARSENIC	MG/L	10554901	<0.005	<0.005	NA	0.052	0.050	104
BARIUM	MG/L	10553106	<0.010	<0.010	NA	0.098	0.100	98
BERYLLIUM	MG/L	10553401	0.007	0.007	0	0.105	0.100	98
CADMIUM	MG/L	10553701	<0.005	<0.005	NA	0.500	0.500	100
COBALT	MG/L	10553701	<0.010	<0.010	NA	1.00	1.00	100
CHROMIUM	MG/L	10553106	<0.010	<0.010	NA	0.088	0.100	88
COPPER	MG/L	10553106	<0.010	<0.010	NA	0.090	0.100	90
COPPER	MG/L	10553701	0.014	0.014	0	0.504	0.500	98
MERCURY	MG/L	10557001	<0.0002	<0.0002	NA	0.0048	0.0050	96
POTASSIUM	MG/L	10551101	2.6	2.6	0	56.4	50.0	108
NICKEL	MG/L	10553701	<0.020	<0.020	NA	0.960	1.00	96
LEAD	MG/L	10551103	<0.002	<0.002	NA	0.047	0.050	94
ANTIMONY	MG/L	10553701	<0.05	<0.05	NA	0.93	1.00	93
SELENIUM	MG/L	10490101	<0.005	<0.005	NA	0.030	0.050	60
VANADIUM	MG/L	10553701	0.012	0.011	9	0.990	1.00	98
ZINC	MG/L	10553106	0.015	0.016	6	0.123	0.100	108

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



GCMS - RESULTS

ATI I.D. : 10553401

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 05/01/91
PROJECT #	: (NONE)	DATE RECEIVED	: 05/02/91
PROJECT NAME	: RFI	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-2	DATE ANALYZED	: 05/13/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
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CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<2.5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	108
BROMOFLUOROBENZENE (%)	81
TOLUENE-D8 (%)	108



GCMS - RESULTS

ATI I.D. : 10553402

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 05/01/91
PROJECT #	: (NONE)	DATE RECEIVED	: 05/02/91
PROJECT NAME	: RFI	DATE EXTRACTED	: N/A
CLIENT I.D.	: EQUIP WASH #2	DATE ANALYZED	: 05/13/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS

RESULTS

CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<2.5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	108
BROMOFLUOROBENZENE (%)	86
TOLUENE-D8 (%)	102



GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 105534
PROJECT #	: (NONE)	DATE EXTRACTED	: 05/13/91
PROJECT NAME	: RFI	DATE ANALYZED	: 05/13/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS

RESULTS

CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<2.5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	106
BROMOFLUOROBENZENE (%)	101
TOLUENE-D8 (%)	105



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105534

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : RFI

REF I.D. : 10599906

DATE ANALYZED : 05/13/91

SAMPLE MATRIX : SOIL

UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED	% SPIKED	DUP.		RPD
	RESULT	SPIKED			SAMPLE	REC.	
1,1-DICHLOROETHENE	<1	50	59	118	53	106	11
TRICHLOROETHENE	<1	50	47	94	51	102	8
CHLOROBENZENE	<5	50	49	98	53	106	8
TOLUENE	<5	50	53	106	58	116	9
BENZENE	<5	50	51	102	51	102	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

TR - Compound detected at an unquantifiable trace level



GCMS - RESULTS

ATI I.D. : 10553401

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : RFI
CLIENT I.D. : OW-2
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/01/91
DATE RECEIVED : 05/02/91
DATE EXTRACTED : 05/06/91
DATE ANALYZED : 05/15/91
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHYLPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO(a)ANTHRACENE	<5
BIS(2-ETHYLHEXYL)PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO(b)FLUORANTHENE	<5
BENZO(k)FLUORANTHENE	<5
BENZO(a)PYRENE	<5
DIBENZO(a,h)ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO(A,J)ACRIDINE	<5 *
7,12-DIMETHYLBENZ(a)ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.