GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

November 1, 1991

Benito Garcia
Bureau Chief
New Mexico Environment Department
Hazardous and Radioactive Material
525 Camino De Lo Martuz
P.O. Box 26110
Santa Fe, New Mexico 87502

RE: Annual Ground Water Monitoring Report
Giant Refining Company
Route 3 Box 7
Gallup, New Mexico 87301
Permit No. NMD000333211-2

Dear Mr. Benito:

As required by the indicated permit, the annual ground water monitoring report is attached. The report is organized as follows:

Appendix A: Monitoring Well Identification Report
Appendix B: Ground Water Measurements
Appendix C: Semi-Annual Evaluation of Indicator Parameters
Appendix D: Tabulated Analytical Summary
Appendix E: Original Analytical

The statistical comparisons of specific conductance and pH data were completed for the detection wells and compared to the background data from MW-4. These were also submitted in the semi-annual report dated June 5, 1991.

If you have any questions, contact my office at (505) 722-3833.

Sincerely,

Claud Rosendale
Environmental Manager
Ciniza Refinery

cc w/attachments: Kim Bullerdick
Corporate Counsel
Giant Industries Arizona, Inc.

GIANT REFINING COMPANY
CINIZA REFINERY
NOVEMBER 1, 1991
1991 - ANNUAL GROUND WATER REPOR

RECEIVED
NOV 4 1991

APPENDIX A

MONITORING WELL IDENTIFICATION REPORT

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME Giant Refining Company

EPA I.D. NUMBER NMD000333211-2

COUNTY McKinley

WELL NUMBER MW-1

WELL LOCATION (LONGITUDE) 108° 25' 36"

WELL LOCATION (LATITUDE) 35° 29' 08"

NEW MEXICO STATE PLANE (X) 320,903.76

(Y) 1,636,112.13

AQUIFER NAME Sonsela

AQUIFER CONFINED X UNCONFINED

WELL INSTALLATION DATE 10-14-81

DRILLING METHOD Cable

INNER CASING DIAMETER 5.0"

BOREHOLE DIAMETER 10.0"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT COMPR

ELEV BOTTOM OF BOREHOLE 6745.80

ELEV BOTTOM OF WELL CASING 6745.80

ELEV BOTTOM OF SCREENED INT 6750.80

ELEVATION OF SCREENED INT 6760.80

SURVEYED ELEV OF CASING TOP 6878.52

DATE OF REPORT [illegible] SIGNATURE [illegible]

NAME (TYPED) [illegible]

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME GIANT REFINING COMPANY

EPA I.D. NUMBER NMD000333211-2

COUNTY McKinley

WELL NUMBER MW-2

WELL LOCATION (LONGITUDE) 108° 26' 00"

WELL LOCATION (LATITUDE) 35° 29' 43"

NEW MEXICO STATE PLANE (X) 321,035.35

(Y) 1,636,184.06

AQUIFER NAME Sonsela

AQUIFER CONFINED X UNCONFINED

WELL INSTALLATION DATE 10-15-91

DRILLING METHOD Cable

INNER CASING DIAMETER 5.0"

BOREHOLE DIAMETER 10.0"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT COMPR

ELEV BOTTOM OF BOREHOLE 6741.90

ELEV BOTTOM OF WELL CASING 6741.90

ELEV BOTTOM OF SCREENED INT 6747.90

ELEVATION OF SCREENED INT 6757.90

SURVEYED ELEV OF CASING TOP 6880.84

DATE OF REPORT [illegible] SIGNATURE [illegible]

NAME (TYPED) [illegible]

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME GIANT REFINING COMPANY

EPA I.D. NUMBER NMD000333211-2

COUNTY McKinley

WELL NUMBER MW-4

WELL LOCATION (LONGITUDE) 108° 26' 54"

WELL LOCATION (LATITUDE) 35° 29' 30"

NEW MEXICO STATE PLANE (X) 321,602.07

(Y) 1.635.066.25

AQUIFER NAME Sonsela

AQUIFER CONFINED X UNCONFINED

WELL INSTALLATION DATE 10-16-91

DRILLING METHOD Cable

INNER CASING DIAMETER 5.0"

BOREHOLE DIAMETER 10.0"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT COMPR

ELEV BOTTOM OF BOREHOLE 6761.60

ELEV BOTTOM OF WELL CASING 6761.60

ELEV BOTTOM OF SCREENED INT 6761.60

ELEVATION OF SCREENED INT 6781.60

SURVEYED ELEV OF CASING TOP 6882.54

DATE OF REPORT 11-1-91 SIGNATURE [illegible]

NAME (TYPED) [illegible]

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME	GIANT REFINING COMPANY
EPA I.D. NUMBER	NMD00033211-2
COUNTY	McKinley
WELL NUMBER	MW-5
WELL LOCATION (LONGITUDE)	108° 25' 57"
WELL LOCATION (LATITUDE)	35° 29' 43"
NEW MEXICO STATE PLANE (X)	321,233.03
(Y)	1,636,212.58
AQUIFER NAME	Sonsela
AQUIFER CONFINED	X
UNCONFINED	
WELL INSTALLATION DATE	07-29-86
DRILLING METHOD	HLWAG and AIRRT
INNER CASING DIAMETER	4.0"
BOREHOLE DIAMETER	10.0"
CASING MATERIAL	PVC
METHOD OF DEVELOPMENT	COMPR
ELEV BOTTOM OF BOREHOLE	6746.80
ELEV BOTTOM OF WELL CASING	6753.30
ELEV BOTTOM OF SCREENED INT	6758.30
ELEVATION OF SCREENED INT	6768.80
SURVEYED ELEV OF CASING TOP	6883.32

DATE OF REPORT 11-1-91 SIGNATURE [illegible]

NAME (TYPED) [illegible]

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME	GIANT REFINING COMPANY
EPA I.D. NUMBER	NMD000333211-2
COUNTY	McKinley
WELL NUMBER	OW-11
WELL LOCATION (LONGITUDE)	108° 25' 36"
WELL LOCATION (LATITUDE)	35° 29' 08"
NEW MEXICO STATE PLANE (X)	323,167.68
(Y)	1,632,185.21
AQUIFER NAME	Sonsela
AQUIFER CONFINED	X
UNCONFINED	
WELL INSTALLATION DATE	12-30-80
DRILLING METHOD	Cable
INNER CASING DIAMETER	4.0"
BOREHOLE DIAMETER	8.0"
CASING MATERIAL	PVC
METHOD OF DEVELOPMENT	COMPR
ELEV BOTTOM OF BOREHOLE	6773.
ELEV BOTTOM OF WELL CASING	6773.
ELEV BOTTOM OF SCREENED INT	6858.
ELEVATION OF SCREENED INT	6880.
SURVEYED ELEV OF CASING TOP	6923.89

DATE OF REPORT 11-1-91 SIGNATURE Glenn Koenendale

NAME (TYPED) Glenn Koenendale

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME GIANT REFINING COMPANY

EPA I.D. NUMBER NMD000333211-2

COUNTY McKinley

WELL NUMBER SMW-1

WELL LOCATION (LONGITUDE) _____

WELL LOCATION (LATITUDE) _____

NEW MEXICO STATE PLANE (X) 321,501.32

(Y) 1,635.501.43

AQUIFER NAME Ciniza Sand

AQUIFER CONFINED X UNCONFINED _____

WELL INSTALLATION DATE 10-4-85

DRILLING METHOD HWLAG

INNER CASING DIAMETER 2.0"

BOREHOLE DIAMETER 6.5"

CASING MATERIAL SS304

METHOD OF DEVELOPMENT COMPR

ELEV BOTTOM OF BOREHOLE 6832.73

ELEV BOTTOM OF WELL CASING 6834.23

ELEV BOTTOM OF SCREENED INT 6837.23

ELEVATION OF SCREENED INT 6857.23

SURVEYED ELEV OF CASING TOP 6883.29

DATE OF REPORT 11-1-91 SIGNATURE Oland Rosendale

NAME (TYPED) Oland Rosendale

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME GIANT REFINING COMPANY

EPA I.D. NUMBER NMD000333211-2

COUNTY McKinley

WELL NUMBER SMW-2

WELL LOCATION (LONGITUDE) _____

WELL LOCATION (LATITUDE) _____

NEW MEXICO STATE PLANE (X) 321,542.80

(Y) 1.635,592.65

AQUIFER NAME Ciniza Sand

AQUIFER CONFINED X UNCONFINED _____

WELL INSTALLATION DATE 9-26-85

DRILLING METHOD HLWAG

INNER CASING DIAMETER 2.0"

BOREHOLE DIAMETER 6.5"

CASING MATERIAL SS304

METHOD OF DEVELOPMENT COMPR

ELEV BOTTOM OF BOREHOLE 6826.73

ELEV BOTTOM OF WELL CASING 6827.13

ELEV BOTTOM OF SCREENED INT 6830.13

ELEVATION OF SCREENED INT 6850.13

SURVEYED ELEV OF CASING TOP 6884.44

DATE OF REPORT 11-1-91 SIGNATURE Chand Koundale

NAME (TYPED) Chand Koundale

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME	GIANT REFINING COMPANY
EPA I.D. NUMBER	NMD000333211-2
COUNTY	McKinley
WELL NUMBER	SMW-3
WELL LOCATION (LONGITUDE)	108° 25' 56"
WELL LOCATION (LATITUDE)	35° 29' 40"
NEW MEXICO STATE PLANE (X)	321,397.90
(Y)	1,635,948.75
AQUIFER NAME	Ciniza Sand
AQUIFER CONFINED	X
UNCONFINED	
WELL INSTALLATION DATE	10-1-85
DRILLING METHOD	HLWAG
INNER CASING DIAMETER	2.0"
BOREHOLE DIAMETER	6.5"
CASING MATERIAL	SS304
METHOD OF DEVELOPMENT	COMPR
ELEV BOTTOM OF BOREHOLE	6836.15
ELEV BOTTOM OF WELL CASING	6838.65
ELEV BOTTOM OF SCREENED INT	6841.65
ELEVATION OF SCREENED INT	6861.65
SURVEYED ELEV OF CASING TOP	6884.56

DATE OF REPORT 11-1-91 SIGNATURE Claud Kosendale

NAME (TYPED) Claud Kosendale

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME GIANT REFINING COMPANY

EPA I.D. NUMBER NMD000333211-2

COUNTY McKinley

WELL NUMBER SMW-4

WELL LOCATION (LONGITUDE) 108° 26' 01"

WELL LOCATION (LATITUDE) 35° 29' 44"

NEW MEXICO STATE PLANE (X) 320, 974.85

(Y) 1,636,153.54

AQUIFER NAME Ciniza Sand

AQUIFER CONFINED X UNCONFINED

WELL INSTALLATION DATE 9-25-85

DRILLING METHOD HLWAG

INNER CASING DIAMETER 2.0"

BOREHOLE DIAMETER 6.5"

CASING MATERIAL SS304

METHOD OF DEVELOPMENT COMPR

ELEV BOTTOM OF BOREHOLE 6806.74

ELEV BOTTOM OF WELL CASING 6807.84

ELEV BOTTOM OF SCREENED INT 6810.84

ELEVATION OF SCREENED INT 6830.84

SURVEYED ELEV OF CASING TOP 6877.74

DATE OF REPORT [illegible] SIGNATURE [illegible]

NAME (TYPED) [illegible]

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME	GIANT REFINING COMPANY
EPA I.D. NUMBER	NMD000333211-2
COUNTY	McKinley
WELL NUMBER	SMW-5
WELL LOCATION (LONGITUDE)	108° 26' 03"
WELL LOCATION (LATITUDE)	35° 29' 41"
NEW MEXICO STATE PLANE (X)	320,778.61
(Y)	1,636,054.28
AQUIFER NAME	Ciniza Sand
AQUIFER CONFINED	X
UNCONFINED	
WELL INSTALLATION DATE	9-25-85
DRILLING METHOD	HLWAG
INNER CASING DIAMETER	2.0"
BOREHOLE DIAMETER	6.5"
CASING MATERIAL	SS304
METHOD OF DEVELOPMENT	COMPR
ELEV BOTTOM OF BOREHOLE	6800.68
ELEV BOTTOM OF WELL CASING	6801.78
ELEV BOTTOM OF SCREENED INT	6804.78
ELEVATION OF SCREENED INT	6824.78
SURVEYED ELEV OF CASING TOP	6878.02

DATE OF REPORT 11-1-91 SIGNATURE Claud Rosendale

NAME (TYPED) Claud Rosendale

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DRIVE/HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME	GIANT REFINING COMPANY
EPA I.D. NUMBER	NMD000333211-2
COUNTY	McKinley
WELL NUMBER	SMW-6
WELL LOCATION (LONGITUDE)	108° 26' 02"
WELL LOCATION (LATITUDE)	35° 29' 38"
NEW MEXICO STATE PLANE (X)	320,839.52
(Y)	1,635,867.66
AQUIFER NAME	Ciniza Sand
AQUIFER CONFINED	X
UNCONFINED	
WELL INSTALLATION DATE	10-3-85
DRILLING METHOD	HLWAG
INNER CASING DIAMETER	2.0"
BOREHOLE DIAMETER	6.5"
CASING MATERIAL	SS304
METHOD OF DEVELOPMENT	COMPR
ELEV BOTTOM OF BOREHOLE	6806.35
ELEV BOTTOM OF WELL CASING	6807.55
ELEV BOTTOM OF SCREENED INT	6810.55
ELEVATION OF SCREENED INT	6830.55
SURVEYED ELEV OF CASING TOP	6880.71

DATE OF REPORT 11-1-91 SIGNATURE [illegible]

NAME (TYPED) Claud Kaendale

APPENDIX B

GROUNDWATER MEASUREMENTS

GIANT REFINING COMPANY

GROUND WATER MEASUREMENTS - 1991

Well No.	Date	Casing Elevation	Depth to Water	Ground Water Elevation
MW-1	03-06-91	6878.52	5.07	6873.45
	09-24-91		5.78	6872.74
MW-2	03-07-91	6880.84	7.53	6873.31
	09-24-91		8.10	6872.74
MW-4	03-06-91	6882.54	6.03	6876.51
	09-24-91		6.57	6875.97
MW-5	03-07-91	6883.32	9.60	6873.72
	09-24-91		10.48	6872.84
OW-11	03-06-91	6923.89	18.70	6905.19
	09-24-91		13.93	6909.96
SMW-1	03-04-91	6883.29	22.78	6860.51
	09-23-91		22.54	6860.75
SMW-2	03-04-91	6884.44	30.18	6854.26
	09-23-91		30.22	6854.22
SMW-3	03-04-91	6884.56	32.11	6852.45
	09-23-91		32.52	6852.04
SMW-4	03-04-91	6880.08	30.37	6849.71
	09-23-91		30.56	6849.52
SMW-5	03-04-91	6878.02	30.62	6847.40
	09-23-91		31.54	6846.48
SMW-6	03-04-91	6880.71	30.60	6850.11
	09-23-91		30.70	6850.01

APPENDIX C

SEMI-ANNUAL EVALUATION OF INDICATOR PARAMETERS

Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 24 Oct 91 Parameter: pH

Well Number: MW-1 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 8.51 S_b^2 = 0.015

W_b = .000937 t_b = 2.947

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	8.39	.0001
2.	8.41	.0001
3.	8.41	.0001
4.	8.40	.0000

Total #1: 33.61 Total #2: .0003

$\bar{X}_m$ = (Total #1)/4 = 8.40

t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = .0001

$W_m = S_m^2/n_m$ = .000025

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{8.40 - 8.51}{.000025 + .000937} = 3.55$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{.000937 \times 2.947 + .000025 \times 5.841}{.000937 + .000025} = 3.02$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

Lynn Shelton
please sign here

statqtr.88/bas

Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 24 Oct 91 Parameter: pH

Well Number: MW-2 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 8.51 S_b^2 = 0.015

W_b = .000937 t_b = 2.947

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	8.49	.0001
2.	8.51	.0001
3.	8.50	.0000
4.	8.50	.0000

Total #1: 34.0 Total #2: .0002

$\bar{X}_m$ = (Total #1)/4 = 8.50

t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = .0000666

$W_m = S_m^2/n_m$ = .0000166

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{8.50 - 8.51}{.0000166 + .000937} = .323$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{.000937 \times 2.947 + .0000166 \times 5.841}{.000937 + .0000166} = 2.997$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitorin wells is in assessment, and you must notify EID within 7 days.

Lynn Shelton
please sign here

statqtr.88/bas

Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 24 Oct 91 Parameter: pH

Well Number: MW-4 Up or Downgradient? (U or D): U

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 8.51 S_b^2 = 0.015

W_b = .000937 t_b = 2.947

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	8.42	.0000
2.	8.43	.0001
3.	8.42	.0000
4.	8.41	.0001

Total #1: 33.68 Total #2: .0002

$\bar{X}_m$ = (Total #1)/4 = 8.42 t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = .0000666 $W_m = S_m^2/n_m$ = .0000166

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{8.42 - 8.51}{.0000166 + .000937} = 2.90$$

$$t_a = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{.000937 \times 2.947 + .0000166 \times 5.841}{.000937 + .0000166} = 2.997$$

For pH values, treat the value for t_a as if it is positive in all cases. If the indicator parameters, you must immediately is greater than t_a for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_a, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

Lynn Shelton
please sign here

statqtr.88/bas

Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 24 Oct 91 Parameter: pH

Well Number: MW-5 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 8.51 S_b^2 = 0.015

W_b = .000937 t_b = 2.947

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	8.43	.0000
2.	8.44	.0001
3.	8.42	.0001
4.	8.44	.0001

Total #1: 33.73 Total #2: .0003

$\bar{X}_m$ = (Total #1)/4 = 8.43 t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = .0001 $W_m = S_m^2/n_m$ = .0000333

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{8.43 - 8.51}{.0000333 + .000937} = 2.58$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{.000937 \times 2.947 + .0000333 \times 5.841}{.0000333 + .000937} = 3.04$$

For pH values, treat the value for t_c as if it is positive in all cases. If you must immediately is greater than t_c for any of the indicator parameters, resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitorin wells is in assessment, and you must notify EID within 7 days.

Lynn Shelton
please sign here

statqtr.88/bas

Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 24 Oct 91 Parameter: Specific Conductance

Well Number: MW-1 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 984 S_b^2 = 1487

W_b = 92.9375 t_b = 2.602

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(\text{Value}-X_m)^2$
1.	1200	56.25
2.	1200	56.25
3.	1190	6.25
4.	1180	156.25

Total #1: 4770 Total #2: 275

$\bar{X}_m$ = (Total #1)/4 = 1192.5 t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = 91.6667 $W_m = S_m^2/n_m$ = 22.9167

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{1192.5 - 984}{22.9167 + 92.9375} = 19.38$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{92.9375 \times 2.602 + 22.9167 \times 4.541}{92.9375 + 22.9167} = 2.99$$

For pH values, treat the value for t_c as if it is positive in all cases. If t^* is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 24 Oct 91 Parameter: Specific Conductance

Well Number: MW-2 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 984 S_b^2 = 1487

W_b = 92.9375 t_b = 2.602

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	1200	6.25
2.	1190	56.25
3.	1200	6.25
4.	1200	6.25

Total #1: 4790 Total #2: 75

$\bar{X}_m$ = (Total #1)/4 = 1197.5

t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = 25

$W_m = S_m^2/n_m$ = 6.25

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{1197.5 - 984}{6.25 + 92.9375} = 21.44$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{92.9375 \times 2.602 + 6.25 \times 4.541}{92.9375 + 6.25} = 2.72$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 24 Oct 91 Parameter: Specific Conductance

Well Number: MW-4 Up or Downgradient? (U or D): U

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 984 S_b^2 = 1487

W_b = 92.9375 t_b = 2.602

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	1250	6.25
2.	1250	6.25
3.	1250	6.25
4.	1240	56.25

Total #1: 4490 Total #2: 75

$\bar{X}_m$ = (Total #1)/4 = 1247.5 t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = 25 $W_m = S_m^2/n_m$ = 6.25

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{1247.5 - 984}{6.25 + 92.9375} = 26.46$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{92.9375 \times 2.602 + 6.25 \times 4.541}{92.9375 + 6.25} = 2.72$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 24 Oct 91 Parameter: Specific Conductance

Well Number: MW-5 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 984 S_b^2 = 1487

W_b = 92.9375 t_b = 2.602

Please list the current values for this upgradient or downgradient monitorin well.

	Value	$(Value-X_m)^2$
1.	1220	.0000
2.	1230	100
3.	1210	100
4.	1220	.0000

Total #1: 4880 Total #2: 200

$\bar{X}_m$ = (Total #1)/4 = 1220

t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = 66.667

$W_m = S_m^2/n_m$ = 16.6667

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{1220 - 984}{16.6667 + 92.9375} = 22.54$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{92.9375 \times 2.602 + 16.666 \times 4.541}{92.9375 + 16.6667} = 2.897$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitorin wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Cinza Refinery EPA ID#: NMD000333211-2

Date: 6 March 91 Parameter: pH

Well Number: MW-1 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 8.51 S_b^2 = .015

W_b = .000937 t_b = 2.947

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	8.92	.0001
2.	8.92	.0001
3.	8.94	.0001
4.	8.94	.0001

Total #1: 35.72 Total #2: .0004

$\bar{X}_m$ = (Total #1)/4 = 8.93

t_m (TOC, TOX, S.C) = 4.841
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = .000133

$W_m = S_m^2/n_m$ = .0000333

$$t' = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{8.93 - 8.51}{.0000333 + .000937} = 13.48$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{.000937 \times 2.947 + .0000333 \times 5.841}{.000937 + .0000333} = 3.05$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t' value for the reevaluation is still greater than t_c, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 6 March 91 Parameter: pH

Well Number: MW-2 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 8.51 S_b^2 = .015

W_b = .000937 t_b = 2.947

Please list the current values for this upgradient or downgradient monitorin well.

	Value	$(Value-X_m)^2$
1.	8.83	.0081
2.	8.96	.0016
3.	8.95	.0009
4.	8.95	.0009
Total #1:	35.69	Total #2: .0115

$\bar{X}_m$ = (Total #1)/4 = 8.92

t_m (TOC, TOX, S.C) = 4.841
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = .003833

$W_m = S_m^2/n_m$ = .000958

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{8.92 - 8.51}{.000958 + .000937} = 9.42$$

$$t_d = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{.000937 \times 2.947 + .000958 \times 5.841}{.000937 + .000958} = 4.41$$

For pH values, treat the value for t_d as if it is positive in all cases. If t^* is greater than t_d for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_d, the RCRA unit served by the monitorin wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 6 March 91 Parameter: pH

Well Number: MW-4 Up or Downgradient? (U or D): U

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 8.51 S_b^2 = .015

W_b = .000937 t_b = 2.947

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	8.65	.0009
2.	8.69	.0001
3.	8.69	.0001
4.	8.69	.0001

Total #1: 34.72 Total #2: .0012

$\bar{X}_m$ = (Total #1)/4 = 8.68

t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = .0004

$W_m = S_m^2/n_m$ = .0001

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{8.68 - 8.51}{.0001 + .000937} = 5.28$$

$$t_o = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{.000937 \times 2.947 + .0001 \times 5.841}{.000937 + .0001} = 3.22$$

For pH values, treat the value for t_o as if it is positive in all cases. If t^* is greater than t_o for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_o, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 6 March 91 Parameter: pH

Well Number: MW-5 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 8.51 S_b^2 = .015

W_b = .000937 t_b = 2.947

Please list the current values for this upgradient or downgradient monitorin well.

	Value	$(Value-X_m)^2$
1.	8.87	.0036
2.	8.97	.0196
3.	8.95	.0004
4.	8.94	.0001

Total #1: 35.73 Total #2: .0237

$\bar{X}_m$ = (Total #1)/4 = 8.93

t_m (TOC, TOX, S.C) = 4.841
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = .0079

$W_m = S_m^2/n_m$ = .00197

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{8.93 - 8.51}{.00197 + .000937} = 7.79$$

$$t_o = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{.000937 \times 2.947 + .00197 \times 5.841}{.000937 + .00197} = 4.91$$

For pH values, treat the value for t_o as if it is positive in all cases. If is greater than t_o for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_o, the RCRA unit served by the monitorin wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 6 March 91 Parameter: Specific conductivity

Well Number: MW-1 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 984 S_b^2 = 1487

W_b = 92.9375 t_b = 2.602

Please list the current values for this upgradient or downgradient monitorin well.

	Value	$(Value-X_m)^2$
1.	1080	306.25
2.	1110	156.25
3.	1090	56.25
4.	1110	156.25

Total #1: 4390 Total #2: 675

$\bar{X}_m$ = (Total #1)/4 = 1097.5

t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = 225 $W_m = S_m^2/n_m$ = 56.25

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{1097.5 - 984}{56.25 + 92.9375} = 9.29$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{92.9375 \times 2.602 + 56.25 \times 4.541}{(2.9375 + 56.25} = 3.33$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitorin wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 6 March 91 Parameter: Specific Conductivity

Well Number: MW-2 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 984 S_b^2 = 1487

W_b = 92.9375 t_b = 2.602

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	1120	.0000
2.	1100	400
3.	1130	100
4.	1130	100

Total #1: 4480 Total #2: 600

$\bar{X}_m$ = (Total #1)/4 = 1120

t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = 200

$W_m = S_m^2/n_m$ = 50

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m \div W_b}} = \frac{1120 - 984}{50 \div 92.9375} = 11.38$$

$$t_c = \frac{W_b \times t_b \div W_m \times t_m}{W_b \div W_m} = \frac{92.9375 \times 2.602 + 50 \times 4.541}{92.9375 + 50} = 3.28$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 6 March 91 Parameter: Specific Conductance

Well Number: MW-4 Up or Downgradient? (U or D): _____

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 984 S_b^2 = 1487

W_b = 92.9375 t_b = 2.602

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	1150	306.25
2.	1130	6.25
3.	1150	306.25
4.	1100	1056.25

Total #1: 4530 Total #2: 1675

$\bar{X}_m$ = (Total #1)/4 = 1132.5

t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = 558.333

$W_m = S_m^2/n_m$ = 139.583

$$t^* = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m + W_b}} = \frac{1132.5 - 984}{92.9375 + 139.583} = 9.74$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{92.9375 \times 2.602 + 139.583 \times 4.541}{92.9375 + 139.583} = 3.77$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t^* value for the reevaluation is still greater than t_c, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

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Calculation Sheet for Semi-Annual Evaluation
of Indicator Parameters for Annual Report

Print Your Name: Lynn Shelton Your Telephone #: (505) 722-0227

Facility Name: Ciniza Refinery EPA ID#: NMD000333211-2

Date: 6 March 91 Parameter: Specific Conductance

Well Number: MW-5 Up or Downgradient? (U or D): D

Please list the values calculated for the background parameters on the Background Indicator Parameter Calculation Sheet:

$\bar{X}_b$ = 984 S_b^2 = 1487

W_b = 92.9375 t_b = 2.602

Please list the current values for this upgradient or downgradient monitoring well.

	Value	$(Value-X_m)^2$
1.	1100	1056.25
2.	1160	756.25
3.	1140	56.25
4.	1130	6.25

Total #1: 4530 Total #2: 1875

$\bar{X}_m$ = (Total #1)/4 = 1132.5

t_m (TOC, TOX, S.C) = 4.541
t_m (pH) = 5.841

S_m^2 = (Total #2)/3 = 625

$W_m = S_m^2/n_m$ = 156.25

$$t' = \frac{\bar{X}_m - \bar{X}_b}{\sqrt{W_m \div W_b}} = \frac{1132.5 - 984}{156.25 \div 92.9375} = 9.41$$

$$t_c = \frac{W_b \times t_b + W_m \times t_m}{W_b + W_m} = \frac{92.9375 \times 2.602 + 156.25 \times 4.541}{92.9375 + 156.25} = 3.82$$

For pH values, treat the value for t_c as if it is positive in all cases. If is greater than t_c for any of the indicator parameters, you must immediately resample all monitoring wells for this unit. If the t' value for the reevaluation is still greater than t_c, the RCRA unit served by the monitoring wells is in assessment, and you must notify EID within 7 days.

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APPENDIX D

TABULATED ANALYTICAL SUMMARY

MW-1

TCL Volatile Organics
Method 8240

Parameter	Date: 06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chloromethane	<10	<5	ug/L	10
Bromomethane	<10	<10	ug/L	10
Vinyl chloride	<1	<0.5	ug/L	10
Chloroethane	<1	<0.5	ug/L	10
Methylene chloride	<5	<5	ug/L	5.0
Acetone	<10	<10	ug/L	10
Carbon disulfide	<1	<5	ug/L	5.0
1,1-Dichloroethene	<1	<5	ug/L	5.0
1,1-Dichloroethane	<1	<5	ug/L	5.0
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L	5.0
Chloroform	<1	<5	ug/L	5.0
1,2-Dichloroethane	<1	<5	ug/L	5.0
2-Butanone	<2	<5	ug/L	10
1,1,1-Trichloroethane	<1	<5	ug/L	10
Carbon tetrachloride	<1	<5	ug/L	5.0
Vinyl acetate	<10	<5	ug/L	5.0
Bromodichloromethane	<1	<5	ug/L	10
trans-1,3-Dichloropropene	<1	<5	ug/L	5.0
Trichloroethene	<1	<5	ug/L	5.0
Chlorodibromomethane	<1	<5	ug/L	5.0
1,1,2-Trichloroethane	<1	<5	ug/L	5.0
Benzene	<1	<5	ug/L	5.0
cis-1,3-Dichloropropene	<1	<5	ug/L	5.0
2-Chloroethyl vinyl ether	<10	<5	ug/L	10
Bromoform	<5	<5	ug/L	5.0
4-Methyl-2-pentanone	<10	<5	ug/L	10
2-Hexanone	<10	<5	ug/L	10
1,1,2,2-Tetrachloroethane	<1	<5	ug/L	5.0
Tetrachoroethene	<1	<5	ug/L	5.0
Tolukebe	<1	<5	ug/L	5.0
Chlorobenzene	<1	<5	ug/L	5.0
Ethylbenzene	<1	<5	ug/L	5.0
Stryene	<1	<5	ug/L	5.0
Xylenes (total)	<1	<5	ug/L	5.0
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L	10
1,2-Dibromoethane (EDB)	---	---	ug/L	10
1,2-Dichlorobenzene	---	---	ug/L	5.0
1,3-Dichlorobenzene	---	---	ug/L	5.0
Acrolein	---	<10	ug/L	
Acrylonitrile	---	<20	ug/L	
Dibromomethane	---	<5	ug/L	
Dichlorodiflouromethane	---	<5	ug/L	
Methyl Iodide	---	<5	ug/L	
Trans-1,4-Dichloro-2-Butene	---	<5	ug/L	
Trichloromonoflouromethane	---	<5	ug/L	
1,2,3-Trichloropropane	---	<5	ug/L	
Ethyl Methacrylate	---	<5	ug/L	
Ethanol	---	<100	ug/L	
1,4-Dichloro-2-Butane	---	<5	ug/L	

* Data from Analytical Technologies, Inc.

MW-1 Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	Date: 06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chromium	<0.010	<0.010	mg/L	0.010
Lead	0.010	0.003	mg/L	0.0050
Mercury	<0.0002	---	mg/L	0.00020

* Data from Analytical Technologies, Inc.

MW-1 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	Date: 06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	304	---	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	48	---	mg/L	5.0
Chloride	51	---	mg/L	3.0
pH	8.92	8.39	units	--
pH	8.92	8.41	units	--
pH	8.94	8.41	units	--
pH	8.94	8.40	units	--
Phenolics	<0.02	---	mg/L	0.010
Sulfate	160	---	mg/L	5.0
Specific Conductance at 25 deg.C	1080	1200 ↑	umhos/cm	1.0
Specific Conductance at 25 deg.C	1110	1200 ↑	umhos/cm	1.0
Specific Conductance at 25 deg.C	1090	1190 ↑	umhos/cm	1.0
Specific Conductance at 25 deg.C	1110	1180 ↑	umhos/cm	1.0
Total Organic Carbon	1.9	1.6 ↓	mg/L	1.0
Total Organic Carbon	0.8	1.5 ↓	mg/L	1.0
Total Organic Carbon	0.6	2.7 ↑	mg/L	1.0
Total Organic Carbon	0.7	1.4	mg/L	1.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Dissolved Solids	710	---	mg/L	10.0
Water Elevation	6873.45	6872.74	ft	--

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

MW-2 Giant Refining Gallup, New Mexico

TCL Volatile Organics
Method 8240

Parameter	Date: 06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chloromethane	<10	<5	ug/L	10
Bromomethane	<10	<10	ug/L	10
Vinyl chloride	<1	<0.5	ug/L	10
Chloroethane	<1	<0.5	ug/L	10
Methylene chloride	<5	<5	ug/L	5.0
Acetone	<10	<10	ug/L	10
Carbon disulfide	<1	<5	ug/L	5.0
1,1-Dichloroethene	<1	<5	ug/L	5.0
1,1-Dichloroethane	<1	<5	ug/L	5.0
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L	5.0
Chloroform	<1	<5	ug/L	5.0
1,2-Dichloroethane	<1	<5	ug/L	5.0
2-Butanone	<2	<5	ug/L	10
1,1,1-Trichloroethane	<1	<5	ug/L	5.0
Carbon tetrachloride	<1	<5	ug/L	5.0
Vinyl acetate	<10	<5	ug/L	10
Bromodichloromethane	<1	<5	ug/L	5.0
trans-1,3-Dichloropropene	<1	<5	ug/L	5.0
Trichloroethene	<1	<5	ug/L	5.0
Chlorodibromomethane	<1	<5	ug/L	5.0
1,1,2-Trichloroethane	<1	<5	ug/L	5.0
Benzene	<1	<5	ug/L	5.0
cis-1,3-Dichloropropene	<1	<5	ug/L	5.0
2-Chloroethyl vinyl ether	<1	<5	ug/L	10
Bromoform	<10	<5	ug/L	5.0
4-Methyl-2-pentanone	<5	<5	ug/L	10
2-Hexanone	<10	<5	ug/L	10
1,1,2,2-Tetrachloroethane	<10	<5	ug/L	5.0
Tetrachoroethene	<1	<5	ug/L	5.0
Tolukebe	<1	<5	ug/L	5.0
Chlorobenzene	<1	<5	ug/L	5.0
Ethylbenzene	<1	<5	ug/L	5.0
Stryene	<1	<5	ug/L	5.0
Xylenes (total)	<1	<5	ug/L	5.0
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L	5.0
1,2-Dibromoethane (EDB)	---	---	ug/L	5.0
1,2-Dichlorobenzene	---	---	ug/L	5.0
1,3-Dichlorobenzene	---	---	ug/L	5.0
Acrolein	---	<10	ug/L	
Acrylonitrile	---	<20	ug/L	
Dibromomethane	---	<5	ug/L	
Dichlorodiflouromethane	---	<5	ug/L	
Methyl Iodide	---	<5	ug/L	
Trans-1,4-Dichloro-2-Butene	---	<5	ug/L	
Trichloromonoflouromethane	---	<5	ug/L	
1,2,3-Trichloropropane	---	<5	ug/L	
Ethyl Methacrylate	---	<5	ug/L	
Ethanol	---	<100	ug/L	
1,4-Dichloro-2-Butane	---	<5	ug/L	

* Data from Analytical Technologies, Inc.

MW-2 Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	Date: 06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chromium	<0.010	<0.010	mg/L	0.010
Lead	<0.002	<0.002	mg/L	0.010
Mercury	<0.0002	---	mg/L	0.00020

* Data from Analytical Technologies, Inc.

MW-2 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	Date: 06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	304	---	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	32	---	mg/L	5.0
Chloride	59	---	mg/L	3.0
pH	8.83	8.49	units	--
pH	8.96	8.51	units	--
pH	8.95	8.50	units	--
pH	8.95	8.50	units	--
Phenolics	<0.02	---	mg/L	0.010
Sulfate	160	---	mg/L	5.0
Specific Conductance at 25 deg.C	1120	1200	umhos/cm	1.0
Specific Conductance at 25 deg.C	1100	1190	umhos/cm	1.0
Specific Conductance at 25 deg.C	1130	1200	umhos/cm	1.0
Specific Conductance at 25 deg.C	1130	1200	umhos/cm	1.0
Total Organic Carbon	0.8	1.6	mg/L	1.0
Total Organic Carbon	<0.5	1.9	mg/L	1.0
Total Organic Carbon	1.6	3.4	mg/L	1.0
Total Organic Carbon	0.8	2.8	mg/L	1.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Dissolved Solids	690	---	mg/L	10.0
Water Elevation	6873.31	6872.74	ft	--

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

MW-4 Giant Refining Gallup, New Mexico

TCL Volatile Organics
Method 8240

Parameter	Date: 06 MAR 91 Result*	24 SEP 91 Result*	Units
Chloromethane	<10	<5	ug/L
Bromomethane	<10	<10	ug/L
Vinyl chloride	<1	<0.5	ug/L
Chloroethane	<1	<0.5	ug/L
Methylene chloride	<5	<5	ug/L
Acetone	<10	<10	ug/L
Carbon disulfide	<1	<5	ug/L
1,1-Dichloroethene	<1	<5	ug/L
1,1-Dichloroethane	<1	<5	ug/L
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L
Chloroform	<1	<5	ug/L
1,2-Dichloroethane	<1	<5	ug/L
2-Butanone	<2	<5	ug/L
1,1,1-Trichloroethane	<1	<5	ug/L
Carbon tetrachloride	<1	<5	ug/L
Vinyl acetate	<10	<5	ug/L
Bromodichloromethane	<1	<5	ug/L
trans-1,3-Dichloropropene	<1	<5	ug/L
Trichloroethene	<1	<5	ug/L
Chlorodibromomethane	<1	<5	ug/L
1,1,2-Trichloroethane	<1	<5	ug/L
Benzene	<1	<5	ug/L
cis-1,3-Dichloropropene	<1	<5	ug/L
2-Chloroethyl vinyl ether	<10	<5	ug/L
Bromoform	<5	<3	ug/L
4-Methyl-2-pentanone	<10	<5	ug/L
2-Hexanone	<10	<5	ug/L
1,1,2,2-Tetrachloroethane	<1	<5	ug/L
Tetrachoroethene	<1	<5	ug/L
Tolukebe	<1	<5	ug/L
Chlorobenzene	<1	<5	ug/L
Ethylbenzene	<1	<5	ug/L
Stryene	<1	<5	ug/L
Xylenes (total)	<1	<5	ug/L
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L
1,2-Dibromoethane (EDB)	---	---	ug/L
1,2-Dichlorobenzene	---	---	ug/L
1,3-Dichlorobenzene	---	---	ug/L
Acrolein	---	<10	ug/L
Acrylonitrile	---	<20	ug/L
Dibromomethane	---	<5	ug/L
Dichlorodiflouromethane	---	<5	ug/L
Methyl Iodide	---	<5	ug/L
Trans-1,4-Dichloro-2-Butene	---	<5	ug/L
Trichloromonoflouromethane	---	<5	ug/L
1,2,3-Trichloropropane	---	<5	ug/L
Ethyl Methacrylate	---	<5	ug/L
Ethanol	---	<100	ug/L
1,4-Dichloro-2-Butane	---	<5	ug/L

* Data from Analytical Technologies, Inc.

MW-4 Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chromium	<0.010	<0.010	mg/L	0.010
Lead	0.010	<0.002	mg/L	0.0050
Mercury	<0.0002	---	mg/L	0.00020

* Data from Analytical Technologies, Inc.

MW-4 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	428	---	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	23	---	mg/L	5.0
Chloride	19	---	mg/L	3.0
pH	8.65	8.42	units	--
pH	8.69	8.43	units	--
pH	8.69	8.42	units	--
pH	8.69	8.41	units	--
Phenolics	0.02	---	mg/L	0.010
Sulfate	150	---	mg/L	5.0
Specific Conductance at 25 deg.C	1150	1250	umhos/cm	1.0
Specific Conductance at 25 deg.C	1130	1250	umhos/cm	1.0
Specific Conductance at 25 deg.C	1150	1250	umhos/cm	1.0
Specific Conductance at 25 deg.C	1100	1240	umhos/cm	1.0
Total Organic Carbon	0.5	1.2	mg/L	1.0
Total Organic Carbon	1.5	3.1	mg/L	1.0
Total Organic Carbon	0.9	1.4	mg/L	1.0
Total Organic Carbon	0.6	1.3	mg/L	1.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Dissolved Solids	1100	---	mg/L	10.0
Water Elevation	6876.51	6875.97	ft	--

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

MW-5 Giant Refining Gallup, NM

Parameter	Date: 06 MAR 91 Result*	24 SEP 91 Result*	Units
Chloromethane	<10	<5	ug/L
Bromomethane	<10	<10	ug/L
Vinyl chloride	<1	<0.5	ug/L
Chloroethane	<1	<0.5	ug/L
Methylene chloride	<5	<5	ug/L
Acetone	<10	<10	ug/L
Carbon disulfide	<1	<5	ug/L
1,1-Dichloroethene	<1	<5	ug/L
1,1-Dichloroethane	<1	<5	ug/L
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L
Chloroform	<1	<5	ug/L
1,2-Dichloroethane	<1	<5	ug/L
2-Butanone	<2	<5	ug/L
1,1,1-Trichloroethane	<1	<5	ug/L
Carbon tetrachloride	<1	<5	ug/L
Vinyl acetate	<10	<5	ug/L
Bromodichloromethane	<1	<5	ug/L
trans-1,3-Dichloropropene	<1	<5	ug/L
Trichloroethene	<1	<5	ug/L
Chlorodibromomethane	<1	<5	ug/L
1,1,2-Trichloroethane	<1	<5	ug/L
Benzene	<1	<5	ug/L
cis-1,3-Dichloropropene	<1	<5	ug/L
2-Chloroethyl vinyl ether	<10	<5	ug/L
Bromoform	<5	<3	ug/L
4-Methyl-2-pentanone	<10	<5	ug/L
2-Hexanone	<10	<5	ug/L
1,1,2,2-Tetrachloroethane	<1	<5	ug/L
Tetrachoroethene	<1	<5	ug/L
Tolukebe	<1	<5	ug/L
Chlorobenzene	<1	<5	ug/L
Ethylbenzene	<1	<5	ug/L
Stryene	<1	<5	ug/L
Xylenes (total)	<1	<5	ug/L
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L
1,2-Dibromoethane (EDB)	---	---	ug/L
1,2-Dichlorobenzene	---	---	ug/L
1,3-Dichlorobenzene	---	---	ug/L
Acrolein	---	<10	ug/L
Acrylonitrile	---	<20	ug/L
Dibromomethane	---	<5	ug/L
Dichlorodiflouromethane	---	<5	ug/L
Methyl Iodide	---	<5	ug/L
Trans-1,4-Dichloro-2-Butene	---	<5	ug/L
Trichloromonoflouromethane	---	<5	ug/L
1,2,3-Trichloropropane	---	<5	ug/L
Ethyl Methacrylate	---	<5	ug/L
Ethanol	---	<100	ug/L
1,4-Dichloro-2-Butane	---	<5	ug/L

* Data from Analytical Technologies, Inc.

MW-5 Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chromium	<0.010	<0.010	mg/L	0.010
Lead	<0.002	<0.002	mg/L	0.0050
Mercury	<0.0002	---	mg/L	0.00020

* Data from Analytical Technologies, Inc.

MW-5 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	Date: 06 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	314	---	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	32	---	mg/L	5.0
Chloride	67	---	mg/L	3.0
pH	8.87	8.43	units	--
pH	8.97	8.44	units	--
pH	8.95	8.42	units	--
pH	8.94	8.44	units	--
Phenolics	<0.02	---	mg/L	0.010
Sulfate	160	---	mg/L	5.0
Specific Conductance at 25 deg.C	1100	1220	umhos/cm	1.0
Specific Conductance at 25 deg.C	1160	1230	umhos/cm	1.0
Specific Conductance at 25 deg.C	1140	1210	umhos/cm	1.0
Specific Conductance at 25 deg.C	1130	1220	umhos/cm	1.0
Total Organic Carbon	1.0	1.3	mg/L	1.0
Total Organic Carbon	0.8	1.0	mg/L	1.0
Total Organic Carbon	1.6	1.0	mg/L	1.0
Total Organic Carbon	0.7	2.0	mg/L	1.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30.0
Total Dissolved Solids	700	---	mg/L	10.0
Water Elevation	6873.72	6872.84	ft	--

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

SMW-1 Giant Refining Gallup, New Mexico

TCL Volatile Organics
Method 8240

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chloromethane	<10	<5	ug/L	10
Bromomethane	<10	<10	ug/L	10
Vinyl chloride	<1	<0.5	ug/L	10
Chloroethane	<1	<0.5	ug/L	10
Methylene chloride	<5	<5	ug/L	5.0
Acetone	<10	<10	ug/L	10
Carbon disulfide	<1	<5	ug/L	5.0
1,1-Dichloroethene	<1	<5	ug/L	5.0
1,1-Dichloroethane	<1	<5	ug/L	5.0
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L	5.0
Chloroform	<1	<5	ug/L	5.0
1,2-Dichloroethane	<1	<5	ug/L	5.0
2-Butanone	<2	<5	ug/L	5.0
1,1,1-Trichloroethane	<1	<5	ug/L	10
Carbon tetrachloride	<1	<5	ug/L	5.0
Vinyl acetate	<10	<5	ug/L	5.0
Bromodichloromethane	<1	<5	ug/L	10
trans-1,3-Dichloropropene	<1	<5	ug/L	5.0
Trichloroethene	<1	<5	ug/L	5.0
Chlorodibromomethane	<1	<5	ug/L	5.0
1,1,2-Trichloroethane	<1	<5	ug/L	5.0
Benzene	<1	<5	ug/L	5.0
cis-1,3-Dichloropropene	<1	<3	ug/L	5.0
2-Chloroethyl vinyl ether	<10	<5	ug/L	10
Bromoform	<5	<5	ug/L	5.0
4-Methyl-2-pentanone	<10	<5	ug/L	10
2-Hexanone	<10	<5	ug/L	10
1,1,2,2-Tetrachloroethane	<1	<5	ug/L	5.0
Tetrachloroethene	<1	<5	ug/L	5.0
Toluene	<1	<5	ug/L	5.0
Chlorobenzene	<1	<5	ug/L	5.0
Ethylbenzene	<1	<5	ug/L	5.0
Stryene	<1	<5	ug/L	5.0
Xylenes (total)	<1	<5	ug/L	5.0
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L	10
1,2-Dibromoethane (EDB)	---	---	ug/L	10
1,2-Dichlorobenzene	---	---	ug/L	5.0
1,4-Dichlorobenzene	---	---	ug/L	5.0
Acrolein	---	<20	ug/L	
Acrylonitrile	---	<10	ug/L	
Dibromomethane	---	<5	ug/L	
Dichlorodiflouromethane	---	<5	ug/L	
Methyl Iodide	---	<5	ug/L	
Trans-1,4-dichloro-2-Butene	---	<5	ug/L	
Trichloromonoflouromethane	---	<5	ug/L	
1,2,3-Trichloropropane	---	<5	ug/L	
Ethyl Methacrylate	---	<5	ug/L	
Ethanol	---	<100	ug/L	
1,4-Dichloro-2-Butane	---	<5	ug/L	

* Data from Analytical Technologies, Inc.

SMW-1 Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chromium	0.075	0.058	mg/L	0.010
Lead	0.007	0.008	mg/L	0.0050

* Data from Analytical Technologies, Inc.

SMW-1 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	620	---	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	<1	---	mg/L	5.0
Chloride	1130	---	mg/L	3.0
pH	7.52	7.21	units	---
pH	7.69	7.22	units	---
pH	7.54	7.20	units	---
pH	7.55	7.21	units	---
Average pH			units	---
Sulfate	1300	---	mg/L	5.0
Specific Conductance at 25 deg.C	6320	5610	umhos/cm	1.0
Specific Conductance at 25 deg.C	6170	5590	umhos/cm	1.0
Specific Conductance at 25 deg.C	6180	5580	umhos/cm	1.0
Specific Conductance at 25 deg.C	6240	5586	umhos/cm	1.0
Average Specific Conductance at 25 deg.C			umhos/cm	1.0
Total Organic Carbon	14.0	11.2	mg/L	0.50
Total Organic Carbon	12.8	11.9	mg/L	0.50
Total Organic Carbon	15.8	12.2	mg/L	0.50
Total Organic Carbon	11.4	11.7	mg/L	0.50
Total Organic Halogen as Cl	0.032 (1)	0.076	ug/L	30
Total Organic Halogen as Cl	0.039 (1)	0.058	ug/L	30
Total Organic Halogen as Cl	0.053 (1)	0.071	ug/L	30
Total Organic Halogen as Cl	0.037 (1)	0.052	ug/L	30
Total Dissolved Solids	4700	---	mg/L	10
Water Elevation	6860.51	6860.75	ft	

are these considered high?

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI

SMW-2 Giant Refining Gallup, New Mexico

TCL Volatile Organics
Method 8240

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chloromethane	<10	<5	ug/L	10
Bromomethane	<10	<10	ug/L	10
Vinyl chloride	<1	<0.5	ug/L	10
Chloroethane	<1	<0.5	ug/L	10
Methylene chloride	<5	<5	ug/L	5.0
Acetone	<10	<10	ug/L	10
Carbon disulfide	<1	<5	ug/L	5.0
1,1-Dichloroethene	<1	<5	ug/L	5.0
1,1-Dichloroethane	<1	<5	ug/L	5.0
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L	5.0
Chloroform	<1	<5	ug/L	5.0
1,2-Dichloroethane	<1	<5	ug/L	5.0
2-Butanone	<2	<5	ug/L	5.0
1,1,1-Trichloroethane	<1	<5	ug/L	10
Carbon tetrachloride	<1	<5	ug/L	5.0
Vinyl acetate	<10	<5	ug/L	5.0
Bromodichloromethane	<1	<5	ug/L	10
trans-1,3-Dichloropropene	<1	<5	ug/L	5.0
Trichloroethene	<1	<5	ug/L	5.0
Chlorodibromomethane	<1	<5	ug/L	5.0
1,1,2-Trichloroethane	<1	<5	ug/L	5.0
Benzene	<1	<5	ug/L	5.0
cis-1,3-Dichloropropene	<1	<3	ug/L	5.0
2-Chloroethyl vinyl ether	<10	<5	ug/L	10
Bromoform	<5	<5	ug/L	5.0
4-Methyl-2-pentanone	<10	<5	ug/L	10
2-Hexanone	<10	<5	ug/L	10
1,1,2,2-Tetrachloroethane	<1	<5	ug/L	5.0
Tetrachloroethene	<1	<5	ug/L	5.0
Toluene	<1	<5	ug/L	5.0
Chlorobenzene	<1	<5	ug/L	5.0
Ethylbenzene	<1	<5	ug/L	5.0
Stryene	<1	<5	ug/L	5.0
Xylenes (total)	<1	<5	ug/L	5.0
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L	10
1,2-Dibromoethane (EDB)	---	---	ug/L	10
1,2-Dichlorobenzene	---	---	ug/L	5.0
1,4-Dichlorobenzene	---	---	ug/L	5.0
Acrolein	---	<20	ug/L	
Acrylonitrile	---	<10	ug/L	
Dibromomethane	---	<5	ug/L	
Dichlorodiflouromethane	---	<5	ug/L	
Methyl Iodide	---	<5	ug/L	
Trans-1,4-dichloro-2-Butene	---	<5	ug/L	
Trichloromonoflouromethane	---	<5	ug/L	
1,2,3-Trichloropropane	---	<5	ug/L	
Ethyl Methacrylate	---	<5	ug/L	
Ethanol	---	<100	ug/L	
1,4-Dichloro-2-Butane	---	<5	ug/L	

* Data from Analytical Technologies, Inc.

SMW-2 Giant Refining Gallup, New Mexico

Total Metals

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chromium	0.245	0.168	mg/L	0.010
Lead	0.010	0.010	mg/L	0.0050

* Data from Analytical Technologies, Inc.

SMW-2 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	578	---	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	<1	---	mg/L	5.0
Chloride	---	---	mg/L	3.0
pH	7.7	7.37	units	---
pH	7.65	7.38	units	---
pH	7.68	7.36	units	---
pH	7.69	7.37	units	---
Average pH	7.66		units	---
Sulfate	1600	---	mg/L	5.0
Specific Conductance at 25 deg.C	6940	6140	umhos/cm	1.0
Specific Conductance at 25 deg.C	7030	6130	umhos/cm	1.0
Specific Conductance at 25 deg.C	7100	6140	umhos/cm	1.0
Specific Conductance at 25 deg.C	7100	6130	umhos/cm	1.0
Average Specific Conductance at 25 deg.C			umhos/cm	1.0
Total Organic Carbon	14.3	9.9	mg/L	0.50
Total Organic Carbon	11.6	8.7	mg/L	0.50
Total Organic Carbon	15.2	11.2	mg/L	0.50
Total Organic Carbon	10.2	9.5	mg/L	0.50
Total Organic Halogen as Cl	0.051 (1)	0.040	ug/L	30
Total Organic Halogen as Cl	0.061 (1)	0.031	ug/L	30
Total Organic Halogen as Cl	0.051 (1)	0.040	ug/L	30
Total Organic Halogen as Cl	0.037 (1)	0.038	ug/L	30
Total Dissolved Solids	5000	---	mg/L	10
Water Elevation	6854.26	6854.22	ft	

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

SMW-3 Giant Refining Gallup, New Mexico

TCL Volatile Organics
Method 8240

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chloromethane	<10	<5	ug/L	10
Bromomethane	<10	<10	ug/L	10
Vinyl chloride	<1	<0.5	ug/L	10
Chloroethane	<1	<0.5	ug/L	10
Methylene chloride	<5	<5	ug/L	5.0
Acetone	<10	<10	ug/L	10
Carbon disulfide	<1	<5	ug/L	5.0
1,1-Dichloroethene	<1	<5	ug/L	5.0
1,1-Dichloroethane	<1	<5	ug/L	5.0
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L	5.0
Chloroform	<1	<5	ug/L	5.0
1,2-Dichloroethane	<1	<5	ug/L	5.0
2-Butanone	<2	<5	ug/L	5.0
1,1,1-Trichloroethane	<1	<5	ug/L	10
Carbon tetrachloride	<1	<5	ug/L	5.0
Vinyl acetate	<10	<5	ug/L	5.0
Bromodichloromethane	<1	<5	ug/L	10
trans-1,3-Dichloropropene	<1	<5	ug/L	5.0
Trichloroethene	<1	<5	ug/L	5.0
Chlorodibromomethane	<1	<5	ug/L	5.0
1,1,2-Trichloroethane	<1	<5	ug/L	5.0
Benzene	<1	<5	ug/L	5.0
cis-1,3-Dichloropropene	<1	<3	ug/L	5.0
2-Chloroethyl vinyl ether	<10	<5	ug/L	10
Bromoform	<5	<5	ug/L	5.0
4-Methyl-2-pentanone	<10	<5	ug/L	10
2-Hexanone	<10	<5	ug/L	10
1,1,2,2-Tetrachloroethane	<1	<5	ug/L	5.0
Tetrachloroethene	<1	<5	ug/L	5.0
Toluene	<1	<5	ug/L	5.0
Chlorobenzene	<1	<5	ug/L	5.0
Ethylbenzene	<1	<5	ug/L	5.0
Stryene	<1	<5	ug/L	5.0
Xylenes (total)	<1	<5	ug/L	5.0
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L	10
1,2-Dibromoethane (EDB)	---	---	ug/L	10
1,2-Dichlorobenzene	---	---	ug/L	5.0
1,4-Dichlorobenzene	---	---	ug/L	5.0
Acrolein	---	<20	ug/L	
Acrylonitrile	---	<10	ug/L	
Dibromomethane	---	<5	ug/L	
Dichlorodiflouromethane	---	<5	ug/L	
Methyl Iodide	---	<5	ug/L	
Trans-1,4-dichloro-2-Butene	---	<5	ug/L	
Trichloromonoflouromethane	---	<5	ug/L	
1,2,3-Trichloropropane	---	<5	ug/L	
Ethyl Methacrylate	---	<5	ug/L	
Ethanol	---	<100	ug/L	
1,4-Dichloro-2-Butane	---	<5	ug/L	

* Data from Analytical Technologies, Inc.

SMW-3 Giant Refining Gallup, New Mexico

Total Metals

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chromium	0.038	0.010	mg/L	0.010
Lead	0.010	0.011	mg/L	0.0050

* Data from Analytical Technologies, Inc.

3MW-3 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	664	---	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	<1	---	mg/L	5.0
Chloride	59	---	mg/L	3.0
pH	7.94	7.77	units	---
pH	8.09	7.76	units	---
pH	8.04	7.75	units	---
pH	7.92	7.76	units	---
Average pH	---		units	---
Sulfate	1200	---	mg/L	5.0
Specific Conductance at 25 deg.C	3400	3360	umhos/cm	1.0
Specific Conductance at 25 deg.C	3410	3380	umhos/cm	1.0
Specific Conductance at 25 deg.C	3330	3370	umhos/cm	1.0
Specific Conductance at 25 deg.C	3590	3370	umhos/cm	1.0
Average Specific Conductance at 25 deg.C			umhos/cm	1.0
Total Organic Carbon	3.0	1.1	mg/L	0.50
Total Organic Carbon	5.1	4.1	mg/L	0.50
Total Organic Carbon	2.5	2.7	mg/L	0.50
Total Organic Carbon	3.3	3.4	mg/L	0.50
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Organic Halogen as Cl	0.015 (1)	<0.008	ug/L	30
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Dissolved Solids	5200	---	mg/L	10
Water Elevation	6852.45	6852.04	ft	

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

SMW-4 Giant Refining Gallup, New Mexico

TCL Volatile Organics
Method 8240

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chloromethane	<10	<5	ug/L	10
Bromomethane	<10	<10	ug/L	10
Vinyl chloride	<1	<0.5	ug/L	10
Chloroethane	<1	<0.5	ug/L	10
Methylene chloride	<5	<5	ug/L	5.0
Acetone	<10	<10	ug/L	10
Carbon disulfide	<1	<5	ug/L	5.0
1,1-Dichloroethene	<1	<5	ug/L	5.0
1,1-Dichloroethane	<1	<5	ug/L	5.0
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L	5.0
Chloroform	<1	<5	ug/L	5.0
1,2-Dichloroethane	<1	<5	ug/L	5.0
2-Butanone	<2	<5	ug/L	5.0
1,1,1-Trichloroethane	<1	<5	ug/L	10
Carbon tetrachloride	<1	<5	ug/L	5.0
Vinyl acetate	<10	<5	ug/L	5.0
Bromodichloromethane	<1	<5	ug/L	10
trans-1,3-Dichloropropene	<1	<5	ug/L	5.0
Trichloroethene	<1	<5	ug/L	5.0
Chlorodibromomethane	<1	<5	ug/L	5.0
1,1,2-Trichloroethane	<1	<5	ug/L	5.0
Benzene	<1	<5	ug/L	5.0
cis-1,3-Dichloropropene	<1	<3	ug/L	5.0
2-Chloroethyl vinyl ether	<10	<5	ug/L	10
Bromoform	<5	<5	ug/L	5.0
4-Methyl-2-pentanone	<10	<5	ug/L	10
2-Hexanone	<10	<5	ug/L	10
1,1,2,2-Tetrachloroethane	<1	<5	ug/L	5.0
Tetrachloroethene	<1	<5	ug/L	5.0
Toluene	<1	<5	ug/L	5.0
Chlorobenzene	<1	<5	ug/L	5.0
Ethylbenzene	<1	<5	ug/L	5.0
Stryene	<1	<5	ug/L	5.0
Xylenes (total)	<1	<5	ug/L	5.0
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L	10
1,2-Dibromoethane (EDB)	---	---	ug/L	10
1,2-Dichlorobenzene	---	---	ug/L	5.0
1,4-Dichlorobenzene	---	---	ug/L	5.0
Acrolein	---	<20	ug/L	
Acrylonitrile	---	<10	ug/L	
Dibromomethane	---	<5	ug/L	
Dichlorodiflouromethane	---	<5	ug/L	
Methyl Iodide	---	<5	ug/L	
Trans-1,4-dichloro-2-Butene	---	<5	ug/L	
Trichloromonoflouromethane	---	<5	ug/L	
1,2,3-Trichloropropane	---	<5	ug/L	
Ethyl Methacrylate	---	<5	ug/L	
Ethanol	---	<100	ug/L	
1,4-Dichloro-2-Butane	---	<5	ug/L	

* Data from Analytical Technologies, Inc.

SMW-4 Giant Refining Gallup, New Mexico

Total Metals

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chromium	0.032	<0.010	mg/L	0.010
Lead	0.008	0.005	mg/L	0.0050

* Data from Analytical Technologies, Inc.

SMW-4 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	418	---	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	24	---	mg/L	5.0
Chloride	58	---	mg/L	3.0
pH	8.54	8.42	units	---
pH	8.39	8.42	units	---
pH	8.38	8.42	units	---
pH	8.37	8.41	units	---
Average pH	---		units	---
Sulfate	170	---	mg/L	5.0
Specific Conductance at 25 deg.C	1210	1350	umhos/cm	1.0
Specific Conductance at 25 deg.C	1210	1350	umhos/cm	1.0
Specific Conductance at 25 deg.C	1230	1360	umhos/cm	1.0
Specific Conductance at 25 deg.C	1240	1350	umhos/cm	1.0
Average Specific Conductance at 25 deg.C			umhos/cm	1.0
Total Organic Carbon	2.6	1.4	mg/L	0.50
Total Organic Carbon	2.2	1.3	mg/L	0.50
Total Organic Carbon	1.6	1.1	mg/L	0.50
Total Organic Carbon	1.7	1.2	mg/L	0.50
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Dissolved Solids	860	---	mg/L	10
Water Elevation	6849.71	6849.52	ft	

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

SMW-5 Giant Refining Gallup, New Mexico

TCL Volatile Organics
Method 8240

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chloromethane	<10	<5	ug/L	10
Bromomethane	<10	<10	ug/L	10
Vinyl chloride	<1	<0.5	ug/L	10
Chloroethane	<1	<0.5	ug/L	10
Methylene chloride	<5	<5	ug/L	5.0
Acetone	<10	<10	ug/L	10
Carbon disulfide	<1	<5	ug/L	5.0
1,1-Dichloroethene	<1	<5	ug/L	5.0
1,1-Dichloroethane	<1	<5	ug/L	5.0
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L	5.0
Chloroform	<1	<5	ug/L	5.0
1,2-Dichloroethane	<1	<5	ug/L	5.0
2-Butanone	<2	<5	ug/L	5.0
1,1,1-Trichloroethane	<1	<5	ug/L	10
Carbon tetrachloride	<1	<5	ug/L	5.0
Vinyl acetate	<10	<5	ug/L	5.0
Bromodichloromethane	<1	<5	ug/L	10
trans-1,3-Dichloropropene	<1	<5	ug/L	5.0
Trichloroethene	<1	<5	ug/L	5.0
Chlorodibromomethane	<1	<5	ug/L	5.0
1,1,2-Trichloroethane	<1	<5	ug/L	5.0
Benzene	<1	<5	ug/L	5.0
cis-1,3-Dichloropropene	<1	<3	ug/L	5.0
2-Chloroethyl vinyl ether	<10	<5	ug/L	10
Bromoform	<5	<5	ug/L	5.0
4-Methyl-2-pentanone	<10	<5	ug/L	10
2-Hexanone	<10	<5	ug/L	10
1,1,2,2-Tetrachloroethane	<1	<5	ug/L	5.0
Tetrachloroethene	<1	<5	ug/L	5.0
Toluene	<1	<5	ug/L	5.0
Chlorobenzene	<1	<5	ug/L	5.0
Ethylbenzene	<1	<5	ug/L	5.0
Stryene	<1	<5	ug/L	5.0
Xylenes (total)	<1	<5	ug/L	5.0
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L	10
1,2-Dibromoethane (EDB)	---	---	ug/L	10
1,2-Dichlorobenzene	---	---	ug/L	5.0
1,4-Dichlorobenzene	---	---	ug/L	5.0
Acrolein	---	<20	ug/L	
Acrylonitrile	---	<10	ug/L	
Dibromomethane	---	<5	ug/L	
Dichlorodiflouromethane	---	<5	ug/L	
Methyl Iodide	---	<5	ug/L	
Trans-1,4-dichloro-2-Butene	---	<5	ug/L	
Trichloromonoflouromethane	---	<5	ug/L	
1,2,3-Trichloropropane	---	<5	ug/L	
Ethyl Methacrylate	---	<5	ug/L	
Ethanol	---	<100	ug/L	
1,4-Dichloro-2-Butane	---	<5	ug/L	

* Data from Analytical Technologies, Inc.

SMW-5 Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	05 MAR 91 Result*	24 Sep 91 Result*	Units	Reporting Limit
Chromium	0.042	0.035	mg/L	0.010
Lead	<0.002	0.003	mg/L	0.0050

* Data from Analytical Technologies, Inc.

SMW-5 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	378	---	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	20	---	mg/L	5.0
Chloride	65	---	mg/L	3.0
pH	8.56	8.02	units	---
pH	8.54	8.04	units	---
pH	8.51	8.03	units	---
pH	8.55	8.04	units	---
Average pH	---		units	---
Sulfate	150	---	mg/L	5.0
Specific Conductance at 25 deg.C	1160	1250	umhos/cm	1.0
Specific Conductance at 25 deg.C	1150	1250	umhos/cm	1.0
Specific Conductance at 25 deg.C	1120	1270	umhos/cm	1.0
Specific Conductance at 25 deg.C	1150	1260	umhos/cm	1.0
Average Specific Conductance at 25 deg.C			umhos/cm	1.0
Total Organic Carbon	2.3	2.2	mg/L	0.50
Total Organic Carbon	3.2	2.2	mg/L	0.50
Total Organic Carbon	1.3	1.6	mg/L	0.50
Total Organic Carbon	1.5	1.2	mg/L	0.50
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Organic Halogen as Cl	<0.008 (1)	<0.008	ug/L	30
Total Dissolved Solids	1500	---	mg/L	10
Water Elevation	6847.40	6846.48	ft	

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

SMW-6 Giant Refining Gallup, New Mexico

TCL Volatile Organics
Method 8240

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chloromethane	<10	<5	ug/L	10
Bromomethane	<10	<10	ug/L	10
Vinyl chloride	<1	<0.5	ug/L	10
Chloroethane	<1	<0.5	ug/L	10
Methylene chloride	<5	<5	ug/L	5.0
Acetone	15	<10	ug/L	10
Carbon disulfide	<1	<5	ug/L	5.0
1,1-Dichloroethene	<1	<5	ug/L	5.0
1,1-Dichloroethane	<1	<5	ug/L	5.0
1,2-Dichloroethene (cis/trans)	<1	<5	ug/L	5.0
Chloroform	<1	<5	ug/L	5.0
1,2-Dichloroethane	<1	<5	ug/L	5.0
2-Butanone	<2	<5	ug/L	5.0
1,1,1-Trichloroethane	<1	<5	ug/L	10
Carbon tetrachloride	<1	<5	ug/L	5.0
Vinyl acetate	<10	<5	ug/L	5.0
Bromodichloromethane	<1	<5	ug/L	10
trans-1,3-Dichloropropene	<1	<5	ug/L	5.0
Trichloroethene	<1	<5	ug/L	5.0
Chlorodibromomethane	<1	<5	ug/L	5.0
1,1,2-Trichloroethane	<1	<5	ug/L	5.0
Benzene	<1	<5	ug/L	5.0
cis-1,3-Dichloropropene	<1	<3	ug/L	5.0
2-Chloroethyl vinyl ether	<10	<5	ug/L	10
Bromoform	<5	<5	ug/L	5.0
4-Methyl-2-pentanone	<10	<5	ug/L	10
2-Hexanone	<10	<5	ug/L	10
1,1,2,2-Tetrachloroethane	<1	<5	ug/L	5.0
Tetrachloroethene	<1	<5	ug/L	5.0
Toluene	<1	<5	ug/L	5.0
Chlorobenzene	<1	<5	ug/L	5.0
Ethylbenzene	<1	<5	ug/L	5.0
Stryene	<1	<5	ug/L	5.0
Xylenes (total)	<1	<5	ug/L	5.0
1,1,2 Trichloro-1,2,2-trifluoroethane	---	---	ug/L	
1,2-Dibromoethane (EDB)	---	---	ug/L	
1,2-Dichlorobenzene	---	---	ug/L	
1,4-Dichlorobenzene	---	---	ug/L	
Acrolein	---	<20	ug/L	
Acrylonitrile	---	<10	ug/L	
Dibromomethane	---	<5	ug/L	
Dichlorodiflouromethane	---	<5	ug/L	
Methyl Iodide	---	<5	ug/L	
Trans-1,4-dichloro-2-Butene	---	<5	ug/L	
Trichloromonoflouromethane	---	<5	ug/L	
1,2,3-Trichloropropane	---	<5	ug/L	
Ethyl Methacrylate	---	<5	ug/L	
Ethanol	---	<100	ug/L	
1,4-Dichloro-2-Butane	---	<5	ug/L	

If the limits are <5 but reporting limits are 10 ?

* Data from Analytical Technologies, Inc.

SMW-6 Giant Refining Gallup, New Mexico

Total Metals

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Chromium	<0.010	0.097	mg/L	0.010
Lead	<0.002	0.009	mg/L	0.0050

* Data from Analytical Technologies, Inc.

SMW-6 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	05 MAR 91 Result*	24 SEP 91 Result*	Units	Reporting Limit
Alkalinity, Bicarb. as				10
CaCO3 at pH 4.5	604	---	mg/L	10
Alkalinity, Carb. as				10
CaCO3 at pH 8.3	8	---	mg/L	10
Chloride	82	---	mg/L	5.0
pH	8.41	7.56	units	10
pH	8.20	7.57	units	5.0
pH	8.20	7.57	units	5.0
pH	8.17	7.56	units	5.0
Average pH	---		units	
Sulfate	200	---	mg/L	5.0
Specific Conductance				5.0
at 25 deg.C	1520	1660	umhos/cm	5.0
Specific Conductance				5.0
at 25 deg.C	1540	1670	umhos/cm	10
Specific Conductance				5.0
at 25 deg.C	1500	1690	umhos/cm	5.0
Specific Conductance				10
at 25 deg.C	1490	1670	umhos/cm	5.0
Average Specific				5.0
Conductance at 25 deg.C			umhos/cm	5.0
Total Organic Carbon	2.0	3.2	mg/L	5.0
Total Organic Carbon	1.2	3.0	mg/L	5.0
Total Organic Carbon	1.2	2.6	mg/L	5.0
Total Organic Carbon	1.3	2.4	mg/L	10
Total Organic				5.0
Halogen as Cl	<0.008 (1)	<0.008	ug/L	10
Total Organic				10
Halogen as Cl	<0.008 (1)	<0.008	ug/L	5.0
Total Organic				5.0
Halogen as Cl	<0.008 (1)	<0.008	ug/L	5.0
Total Organic				5.0
Halogen as Cl	<0.008 (1)	<0.008	ug/L	5.0
Total Dissolved				5.0
Solids	1100	---	mg/L	5.0
Water Elevation	6850.11	6850.01	ft	

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

OW-11 Giant Refining Gallup, New Mexico

TCL Volatile Organics
Method 8240

Reporting Limits ? 0

Parameter	06 MAR 91 Result*	24 SEP 91 Result*	Units
1,1-Dichloroethene	<1	<5	ug/L
2-Butanone	<2	<5	ug/L
1,1,1-Trichloroethane	<1	<5	ug/L
Benzene	<1	<5	ug/L
Tetrachloroethene	<1	<5	ug/L
Toluene	<1	<5	ug/L
Ethylbenzene	<1	<5	ug/L
Xylenes (total)	<1	<5	ug/L
Chloromethane	<10	<5	ug/L
Bromomethane	<10	<10	ug/L
Vinyl Chloride	<1	<0.5	ug/L
Chloroethane	<1	<0.5	ug/L
Methylene Chloride	<5	<5	ug/L
Carbon Disulfide	<1	<5	ug/L
1,1-Dichloroethane	<1	<5	ug/L
1,2-Dichloroethene (Total)	<1	<5	ug/L
Chloroform	<1	<5	ug/L
1,2-Dichloroethane	<1	<5	ug/L
Carbon Tetrachloride	<1	<5	ug/L
Vinyl Acetate	<10	<5	ug/L
Bromodichloromethane	<1	<5	ug/L
1,1,2,2-Tetrachloroethane	<1	<5	ug/L
1,2-Dichloropropane	<1	<5	ug/L
Trans-1,3-Dichloropropene	<1	<5	ug/L
Trichloroethene	<1	<5	ug/L
Dibromochloromethane	<1	<5	ug/L
1,1,2-Trichloroethane	<1	<5	ug/L
Cis-1,3-Dichloropropene	<1	<5	ug/L
2-Chloroethylvinylether	<10	<5	ug/L
Bromoform	<5	<3	ug/L
2-Hexanone (MBK)	<10	<5	ug/L
4-Methyl-2-Pentanone (MIBK)	<10	<5	ug/L
Chlorobenzene	<1	<5	ug/L
Styrene	<1	<5	ug/L
Acrolein	---	<20	ug/L
Acrylonitrile	---	<10	ug/L
Dibromomethane	---	<5	ug/L
Dichlorodiflouromethane	---	<5	ug/L
Methyl Iodide	---	<5	ug/L
Trans-1,4-Dichloro-2-Butene	---	<5	ug/L
Trichloromonoflouromethane	---	<5	ug/L
1,2,3-Trichloropropane	---	<5	ug/L
Ethyl Methacrylate	---	<5	ug/L
Ethanol	---	<100	ug/L
1,4-Dichloro-2-Butane	---	<5	ug/L

* Data from Analytical Technologies, Inc.

OW-11 Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	06 MAR 91 Result*	24 SEP 91 Result*	Units
Chromium	<0.010	<0.010	mg/L
Lead	0.003	0.002	mg/L
Mercury	<0.0002	---	mg/L

* Data from Analytical Technologies, Inc.

OW-11 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	06 MAR 91 Result*	24 SEP 91 Result*	Units
Alkalinity, Bicarb. as CaCO3 at pH 4.5	456	---	mg/L
Alkalinity, Carb. as CaCO3 at pH 8.3	<1	---	mg/L
Chloride	140	---	mg/L
pH	8.30	7.79	units
pH	8.18	7.80	units
pH	8.14	7.80	units
pH	8.07	7.79	units
Phenolics	<0.02	---	mg/L
Sulfate	200	---	mg/L
Specific Conductance at 25 deg.C	1760	1800	umhos/cm
Specific Conductance at 25 deg.C	1760	1800	umhos/cm
Specific Conductance at 25 deg.C	1700	1790	umhos/cm
Specific Conductance at 25 deg.C	1720	1790	umhos/cm
Total Organic Carbon	5.9	6.5	mg/L
Total Organic Carbon	5.1	4.4	mg/L
Total Organic Carbon	5.7	4.7	mg/L
Total Organic Carbon	5.5	4.3	mg/L
Total Organic Halogen as Cl	0.013 (1)	0.021	ug/L
Total Organic Halogen as Cl	0.015 (1)	0.032	ug/L
Total Organic Halogen as Cl	0.011 (1)	0.025	ug/L
Total Organic Halogen as Cl	0.010 (1)	0.022	ug/L
Total Dissolved Solids	1100	---	mg/L
Water Elevation	6905.19	6909.96	ft

* Data from Analytical Technologies, Inc.
(1) Total Organic Halide as reported by ATI.

APPENDIX E

ORIGINAL ANALYTICAL

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

MW-1, MW-4, OW-11
3-6-91

ATI I.D. 103598

April 18, 1991

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

Project Name/Number: None Given

Attention: Claud Rosendale

On 03/07/91, 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.

TOC, TOX analyses were performed by ATI, San Diego. Samples 103598-01 and -02, 103598-06 and -07, as well as 103598-11 and -12 are replicates for EPA Method 8240. Total metals results are reported under ATI ID number -01, -06, -11, and -16. Dissolved metals results are reported under ATI ID numbers -02, -07, -12, and -17.

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:dkm
Enclosure

Analytical Technologies, Inc.

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

DATE RECEIVED : 03/07/91
REPORT DATE : 04/10/91

ATI I.D. : 103598

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-1/MW-1-2	AQUEOUS	03/06/91
02	MW-1/MW-1-1	AQUEOUS	03/06/91
03	MW-1	AQUEOUS	03/06/91
04	MW-1	AQUEOUS	03/06/91
05	MW-1	AQUEOUS	03/06/91
06	MW-4/MW-4-2	AQUEOUS	03/06/91
07	MW-4/MW-4-1	AQUEOUS	03/06/91
08	MW-4	AQUEOUS	03/06/91
09	MW-4	AQUEOUS	03/06/91
10	MW-4	AQUEOUS	03/06/91
11	OW-11/OW-11-1	AQUEOUS	03/06/91
12	OW-11/OW-11-2	AQUEOUS	03/06/91
13	OW-11	AQUEOUS	03/06/91
14	OW-11	AQUEOUS	03/06/91
15	OW-11	AQUEOUS	03/06/91
16	EQUIPMENT WASH/EQUIP WASH-2	AQUEOUS	03/06/91
17	EQUIPMENT WASH	AQUEOUS	03/06/91
18	EQUIPMENT WASH	AQUEOUS	03/06/91
19	EQUIPMENT WASH	AQUEOUS	03/06/91
20	TRIP BLANK	AQUEOUS	03/06/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	20

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. : 103598

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

DATE RECEIVED : 03/07/91
REPORT DATE : 04/10/91

PARAMETER	UNITS	01	03	04	05	06
CARBONATE (CACO3)	MG/L	48	-	-	-	28
BICARBONATE (CACO3)	MG/L	304	-	-	-	428
HYDROXIDE (CACO3)	MG/L	<1	-	-	-	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	352	-	-	-	456
CHLORIDE	MG/L	51	-	-	-	19
CONDUCTIVITY, (UMHOS/CM)		1080	1110	1090	1110	1150
PH	UNITS	8.92	8.92	8.94	8.94	8.65
PHENOLICS, TOTAL	MG/L	<0.02	-	-	-	<0.02
SULFATE	MG/L	160	-	-	-	150
TOTAL DISSOLVED SOLIDS	MG/L	710	-	-	-	740
TOTAL ORGANIC CARBON	MG/L	1.9	0.8	0.6	0.7	0.5
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

are these high?
EJH

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103598

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

DATE RECEIVED : 03/07/91
REPORT DATE : 04/10/91

PARAMETER	UNITS	08	09	10	11	13
CARBONATE (CACO3)	MG/L	-	-	-	<1	-
BICARBONATE (CACO3)	MG/L	-	-	-	456	-
HYDROXIDE (CACO3)	MG/L	-	-	-	<1	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	-	-	456	-
CHLORIDE	MG/L	-	-	-	140	-
CONDUCTIVITY, (UMHOS/CM)		1130	1150	1100	1760	1760
PH	UNITS	8.69	8.69	8.69	8.3	8.18
PHENOLICS, TOTAL	MG/L	-	-	-	<0.02	-
SULFATE	MG/L	-	-	-	200	-
TOTAL DISSOLVED SOLIDS	MG/L	-	-	-	1100	-
TOTAL ORGANIC CARBON	MG/L	1.5	0.9	0.6	5.9	5.1
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	0.013	0.015

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103598

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

DATE RECEIVED : 03/07/91
REPORT DATE : 04/10/91

PARAMETER	UNITS	14	15	16	18	19
CARBONATE (CACO3)	MG/L	-	-	<1	-	-
BICARBONATE (CACO3)	MG/L	-	-	5	-	-
HYDROXIDE (CACO3)	MG/L	-	-	<1	-	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	-	5	-	-
CHLORIDE	MG/L	-	-	<0.5	-	-
CONDUCTIVITY, (UMHOS/CM)		1700	1720	1.49	1.63	1.51
PH	UNITS	8.14	8.07	5.66	5.92	5.65
PHENOLICS, TOTAL	MG/L	-	-	<0.02	-	-
SULFATE	MG/L	-	-	<0.3	-	-
TOTAL DISSOLVED SOLIDS	MG/L	-	-	10	-	-
TOTAL ORGANIC CARBON	MG/L	5.7	5.5	0.5	0.5	<0.5
TOTAL ORGANIC HALIDE	MG/L	0.011	0.010	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : (NONE) ATI I.D. : 103598

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	10371505	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		17	17	0	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		17	17	0	NA	NA	NA
CARBONATE	MG/L	10357602	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		150	154	3	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		150	154	3	NA	NA	NA
CARBONATE	MG/L	10365005	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		2	2	0	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		2	2	0	NA	NA	NA
CHLORIDE	MG/L	10359816	<0.5	<0.5	NA	10.9	10.0	109
CONDUCTIVITY(UMHOS/CM)		10359813	1760	1750	0.6	NA	NA	NA
CONDUCTIVITY(UMHOS/CM)		10359819	1.51	1.51	0	NA	NA	NA
CONDUCTIVITY(UMHOS/CM)		10368901	2180	2160	0.9	NA	NA	NA
PH	UNITS	10359816	5.7	5.7	0	NA	NA	NA
PH	UNITS	10357602	8.0	8.0	0	NA	NA	NA
PH	UNITS	10365005	5.1	5.1	0	NA	NA	NA
PH	UNITS	10357306	7.7	7.7	0	NA	NA	NA
PH	UNITS	10499905	8.4	8.4	0	NA	NA	NA
PHENOLICS, TOTAL	MG/L	10359816	<0.02	<0.02	NA	0.26	0.25	104
SULFATE	MG/L	10358401	31	32	3	63	31	103
SULFATE	MG/L	10361901	140	140	0	270	140	93
TOTAL DISSOLVED SOLIDS	MG/L	10357602	550	570	4	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	10359803	0.8	0.6	29	23.2	20.0	112
TOTAL ORGANIC CARBON	MG/L	10359811	5.9	5.1	15	26.6	20.0	104
TOTAL ORGANIC CARBON	MG/L	10499913	0.8	0.8	0	21.7	20.0	105
TOTAL ORGANIC HALIDE	MG/L	10359806	<0.008	<0.008	NA	0.17	0.20	85
TOTAL ORGANIC HALIDE	MG/L	10366006	<0.008	<0.008	NA	0.21	0.20	105

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

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

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 103598

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

DATE RECEIVED : 03/07/91
REPORT DATE : 04/10/91

PARAMETER	UNITS	01	02	06	07	11
SILVER	MG/L	-	<0.010	-	0.016	-
ARSENIC	MG/L	-	<0.005	-	<0.005	-
BARIUM	MG/L	-	<0.010	-	0.019	-
CALCIUM	MG/L	-	1.9	-	2.0	-
CADMIUM	MG/L	-	<0.005	-	<0.005	-
CHROMIUM	MG/L	<0.010	-	<0.010	-	<0.010
MERCURY	MG/L	<0.0002	-	<0.0002	-	<0.0002
POTASSIUM	MG/L	-	<1.0	-	<1.0	-
MAGNESIUM	MG/L	-	0.3	-	0.3	-
MANGANESE	MG/L	-	<0.010	-	0.010	-
SODIUM	MG/L	-	267	-	292	-
LEAD	MG/L	0.010	-	0.005	-	0.003
SELENIUM	MG/L	-	<0.005	-	<0.005	-

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 103598

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

DATE RECEIVED : 03/07/91
REPORT DATE : 04/10/91

PARAMETER	UNITS	12	16	17
SILVER	MG/L	0.028	-	<0.010
ARSENIC	MG/L	<0.005	-	<0.005
BARIUM	MG/L	0.023	-	<0.010
CALCIUM	MG/L	5.0	-	<0.1
CADMIUM	MG/L	<0.005	-	<0.005
CHROMIUM	MG/L	-	<0.010	-
MERCURY	MG/L	-	<0.0002	-
POTASSIUM	MG/L	1.4	-	<1.0
MAGNESIUM	MG/L	0.5	-	<0.1
MANGANESE	MG/L	<0.010	-	<0.010
SODIUM	MG/L	426	-	<0.1
LEAD	MG/L	-	<0.002	-
SELENIUM	MG/L	0.036	-	<0.005

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

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

ATI I.D. : 103598

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	10359802	<0.010	<0.010	NA	0.095	0.100	95
ARSENIC	MG/L	10357001	<0.005	<0.005	NA	0.044	0.050	88
ARSENIC	MG/L	10359906	<0.005	<0.005	NA	0.053	0.050	106
BARIUM	MG/L	10359802	<0.010	<0.010	NA	0.110	0.100	110
CALCIUM	MG/L	10358301	204	203	0.5	260	50.0	112
CADMIUM	MG/L	10360801	<0.005	<0.005	NA	0.102	0.100	102
CHROMIUM	MG/L	10359816	<0.010	<0.010	NA	0.934	1.00	93
MERCURY	MG/L	10355601	<0.0002	<0.0002	NA	0.0047	0.0050	94
POTASSIUM	MG/L	10358301	8.7	8.7	0	60.5	50.0	104
MAGNESIUM	MG/L	10358301	191	190	0.5	413	200	111
MANGANESE	MG/L	10359802	<0.010	<0.010	NA	0.111	0.100	111
SODIUM	MG/L	10358301	223	220	1	275	50.0	104
LEAD	MG/L	10359806	0.005	0.003	50	0.048	0.050	86
SELENIUM	MG/L	10359802	<0.005	<0.005	NA	0.038	0.050	76

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10359801

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-1/MW-1-2	DATE ANALYZED	: 03/14/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BROMOFLUOROBENZENE (%)	108
TOLUENE-D8 (%)	91

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10359801

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10359802

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-1/MW-1-1	DATE ANALYZED	: 03/14/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	89
BROMOFLUOROBENZENE (%)	96
TOLUENE-D8 (%)	104

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10359802

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10359806

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-4/MW-4-2	DATE ANALYZED	: 03/14/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	88
BROMOFLUOROBENZENE (%)	107
TOLUENE-D8 (%)	93

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10359806

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10359807

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-4/MW-4-1	DATE ANALYZED	: 03/14/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	90
BROMOFLUOROBENZENE (%)	99
TOLUENE-D8 (%)	92

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10359807

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10359811

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-11/OW-11-1	DATE ANALYZED	: 03/14/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

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

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10359811

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10359812

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-11/OW-11-2	DATE ANALYZED	: 03/14/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	85
BROMOFLUOROBENZENE (%)	95
TOLUENE-D8 (%)	93

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10359812

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10359816

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: EQUIPMENT WASH/EQUIP WASH-2	DATE ANALYZED	: 03/14/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	89
BROMOFLUOROBENZENE (%)	101
TOLUENE-D8 (%)	98

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10359816

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10359820

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: TRIP BLANK	DATE ANALYZED	: 03/14/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	90
BROMOFLUOROBENZENE (%)	80
TOLUENE-D8 (%)	104

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10359820

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 103598
PROJECT #	: (NONE)	DATE EXTRACTED	: 03/14/91
PROJECT NAME	: (NONE)	DATE ANALYZED	: 03/14/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	93
BROMOFLUOROBENZENE (%)	105
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO. ATI I.D : 103598

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103598

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : (NONE)
REF I.D. : 10399923

DATE ANALYZED : 03/14/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1	50	49	98	49	98	0
TRICHLOROETHENE	<1	50	51	102	49	98	4
CHLOROBENZENE	<1	50	51	102	50	100	2
TOLUENE	<1	50	46	92	47	94	2
BENZENE	<1	50	51	102	49	98	4

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

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

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE _____ PAGE 1 OF 2

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup NM 87301

BILL TO: Claud Rosendale
COMPANY: Same
ADDRESS:

Claud Rosendale — SAMPLERS: (Signature)
(505) 722-0217 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOX - 4 replicates	TOC - 4 replicates	oil and grease - 4 replicates each	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS, Alk, Cl, SO4	~~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~~ Dissolved	Phenol		NUMBER OF CONTAINERS
MW-1 250ml			Water													X													4
250ml																	X												4
250ml																		X											4
1 L.																						X							1
1 L.																							X						1
1 L.																										X			1
1 L.																											X		1
-1 (40ml)															X														2
-2 (40ml)															X														2

PROJECT INFORMATION	
PROJECT NO.: —	
PROJECT NAME: —	
P.O. NO.: 01413	
VIA: FedEx.	
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	20
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	103598

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:
See attached for specific parameter details.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 12:30	Signature: Time:	Signature: Time:
Printed Name: C. Rosendale Date	Printed Name: Date	Printed Name: Date
Company: Giant Refining	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Linda Eshelman Time: 11:00
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Eshelman Date: 3/7/91
Company:	Company:	Analytical Technologies, Inc.

ATI 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

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-6-91 PAGE 3 OF 3

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt. 3 Box 7
Gallup, NM 87301

BILL TO: Claud Rosendale
COMPANY:
ADDRESS: Same

Claud Rosendale — SAMPLERS: (Signature)
(505) 722-0217 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC-4 replicates	TOX-4 replicates	all Cond-4 replicates each	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS Alk Cl-SO4	~~The 13 Priority Pollutant~~ Metals Mg	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~~	Diesel/Gasoline	Phenol		NUMBER OF CONTAINERS
MW-4 250 ml			Water																	X														4
250 ml																					X													4
250 ml																						X												4
1 L																										X								1
1 L																											X							1
1 L																														X				1
1 L																															X			1
40 ml																			X															2
40 ml																			X															2

PROJECT INFORMATION	
PROJECT NO.: —	
PROJECT NAME: —	
P.O. NO.: 01413	
VIA: Fed Ex.	
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	20
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	103598

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments: See attached for specific parameter details.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 12:30	Signature: Time:	Signature: Time:
Printed Name: C Rosendale Date 3-6-91	Printed Name: Date	Printed Name: Date
Company: Giant Refining	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Linda Estelman Time: 4:10
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Estelman Date: 3/7/91
Company:	Company:	Analytical Technologies, Inc.

ATI 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

Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-6 PAGE 5 OF 8

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup, NM 87301

BILL TO: Claud Rosendale
COMPANY:
ADDRESS: Same

SAMPLERS: (Signature) Claud Rosendale
PHONE NUMBER (505) 722-0217

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC - 4 replicates	TOX - 4 replicates	Methanol - 4 replicates each	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS Alk Cl SO4	~~The 13 Priority Pollutant Metals~~ Total	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~~ D. solved	Chloride		NUMBER OF CONTAINERS
OW-11 250 ml			Water													X													4
250 ml																	X												4
250 ml																		X											4
1 L																						X							1
1 L																							X						1
1 L																										X			1
1 L																											X		1
-1 (40 ml)															X														2
-2 40 ml															X														2

PROJECT INFORMATION	
PROJECT NO.: —	
PROJECT NAME: —	
P.O. NO.: 01413	
VIA: Fed Ex	
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	20
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	103598

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:
See attached for specific parameter detail

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 11:30	Signature: Time:	Signature: Time:
Printed Name: Claud Rosendale Date 3-6	Printed Name: Date	Printed Name: Date
Company: Giant Refining	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Linda Eshelman Time: 11:15
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Eshelman Date: 3/7/9
Company:	Company:	Analytical Technologies, Inc.

ATI 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

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-6 PAGE 6 OF 8

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup N.M. 87301

BILL TO: Cloud Rosendale
COMPANY:
ADDRESS: Same

SAMPLERS: (Signature) [signature]
PHONE NUMBER 505 722-0217

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC - Hydrocarbons	TOX - Hydrocarbons	pH/Cond - Hydrocarbons	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS AK Cl SO4	~~The 13 Priority Pollutant Metals~~ Total	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~~ Dissolved	phenol	NUMBER OF CONTAINERS
Equipment Wash			Water													X												4
																	X											9
																		X										4
																						X						1
																							X					1
																									X			1
																										X		1
															X													2

PROJECT INFORMATION	
PROJECT NO.: —	
PROJECT NAME: —	
P.O. NO.: 01413	
VIA: Fed Ex	
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	20
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	103598

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:
See attached for specific parameter detail.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date	Printed Name: Date	Printed Name: Date
Company: Giant Refining	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: [signature] Time: 11:00
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Eshelman Date:
Company:	Company:	Analytical Technologies, Inc.

AnalyticalTechnologies,Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-6 PAGE 8 OF 8

PROJECT MANAGER: Elizabeth Pfaffenbergh

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup N.M. 87301

BILL TO: Claud Rosendale
COMPANY:
ADDRESS: Same

Claud Rosendale — SAMPLERS: (Signature)
(505) 722-0217 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)			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			NUMBER OF CONTAINERS
Trip Blank (MW)			Water																											

PROJECT INFORMATION	
PROJECT NO.: —	
PROJECT NAME: —	
P.O. NO.: 02413	
VIA: Fed Ex	
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	2
CHAIN OF CUSTODY SEALS	N
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	103598

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 12:30	Signature: Time:	Signature: Time:
Printed Name: C.R. Rosendale Date 3-6	Printed Name: Date	Printed Name: Date
Company: Claud Rosendale	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Linda Eshelman Time: 11:00
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Eshelman Date: 3/7/91
Company:	Company:	Analytical Technologies, Inc.

ATI 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

TABLE 1 - GROUNDWATER SAMPLING SCHEDULE
ANNUAL PARAMETERS (MARCH OR APRIL)

WELL #/PARAM	pH	CONDUCT	TOC*	TOX*	TDS	ALKAL. BICARB.	ALKAL. CARB.	CHLORIDE	SULFATE	PHENOL	TCL-VOL ORG(8240)	VOA-BTEX 8020	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Mn	K	Se	Ag	Na
MW-1	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
OW-1	X	X			X	X	X	X	X			X							X	X		X			X
OW-2	X	X			X	X	X	X	X			X							X	X		X			X
OW-3	X	X			X	X	X	X	X			X							X	X		X			X
SMW-1	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-2	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X

SEMI-ANNUAL PARAMETERS (SEPT. OR OCT.)

	pH*	COND*	TOC*	TOX*	TOTAL METALS Cr	Pb	TCL-VOL ORG(8240)
MW-1	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X
SMW-1	X	X	X	X	X	X	X
SMW-2	X	X	X	X	X	X	X
SMW-3	X	X	X	X	X	X	X
SMW-4	X	X	X	X	X	X	X
SMW-5	X	X	X	X	X	X	X
SMW-6	X	X	X	X	X	X	X

* 4 REPLICATES
\+ 2 REPLICATES

Waste Waters

API Effluent
1. BOD
2. COD
3. TOC
4. TDS

Aerated Lagoon Effluent
1. pH
2. BOD
3. COD
4. TOC
5. TDS
6. Sulfide (total)
7. Metals - (As, Cd, Cr, Pb, Hg, Ni, Se)
8. Oil + Grease
9. 8240 (Attached)
10. 8270 (Attached)

TABLE-4

RECOMMENDED ANALYTICAL METHODS

Parameter	Method
pH (Liquid)	221, 9040
Specific Conductance	120.1
Total Organic Carbon (TOC) 4 replicates	505, 9060
Total Organic Halogen (TOX) 4 replicates	9020
Total Dissolved Solids (TDS)	160.1
Alkalinity as Bicarbonate	310.1
Alkalinity as Carbonate	310.1
Chloride	300.0
Sulfate	300.0
Phenol	420.1, 9065
Metals	
Arsenic	303E, 206.2,7060
Barium	303A, 200.7, 6010
Cadmium	200.7, 6010
Calcium	200.7, 6010
Chromium T	303A, 200.7, 6010
Lead T	303A, 239.2, 7421
Magnesium	200.7, 6010
Manganese	200.7, 6010
Mercury T	245.1, 7470
Potassium	200.7, 6010
Selenium	270.2, 7740
Silver	200.7, 6010
Sodium	200.7, 6010
Oil & Grease	413.1, 9071
pH (Solid)	9045
Carbon	9060
Nitrogen	353.2
Phosphorus	365.3
Total Solids (Solids)	160.3
VOA (BTEX) (Liquid & Solid)	8020
Benzene	
Toluene	
Ethyl benzene	
Xylene (m, o & p)	
TCL Volatile Organics (Liquids)	8240 2 replicates for mw-1, mw-4, mw-11
Chloromethane	
Bromomethane	
Vinyl chloride	
Chloroethane	
Methylene chloride	
Acetone	
Carbon disulfide	
1,1 - Dichloroethene	
1,1 - Dichloroethane	
1,2 - Dichloroethene (cis/trans)	

Chloroform	-	
1,2-Dichloroethane	-	
2-Butanone	-	
1,1,1-Trichloroethane	-	
Carbon tetrachloride	-	
Vinyl acetate	-	
Bromodichloromethane	-	
1,2 - Dichloropropane	-	
trans-1,3-Dichloropropene	-	
Trichloroethene	-	
Chlorodibromomethane	-	
1,1,2-Trichloroethane	-	
Benzene	-	
cis-1,3-Dichloropropene	-	
2-Chloroethyl vinyl ether	-	
Bromoform	-	
4-Methyl-2-pentanone	-	
2-Hexanone	-	
1,1,2,2,-Tetrachloroethane	-	
Tetrachloroethene	-	
Toluene	-	
Chlorobenzene	-	
Ethyl benzene	-	
Styrene	-	
Xylenes (total)	-	
1,1,2 Trichloro-1,2,2-trifluorethane	-	
1,2-Dibromomethane	-	
1,2-Dichlorobenzene	-	
1,3-Dichlorobenzene	-	
1,4-Dichlorobenzene	-	
Refinery Hazardous Const. Semivolatiles (Solids)		8270
Benzo(a)pyrene	-	
Chrysene	-	
1-Methylnaphthalene	-	
Phenanthrene	-	
Pyrene	-	
o-Cresol	-	
m & p Cresol	-	

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

MW 2 + MW 5
3-8-91

ATI I.D. 103660

April 18, 1991

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

Project Name/Number: None given

Attention: Claud Rosendale

On 03/09/91, 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.

TOX, TOC analyses were performed by ATI, San Diego. Samples 103660-01 and -02 as well as samples 103660-06 and -07 are replicates for EPA Method 8240. Total metals results are reported under ATI ID numbers -01 and -06. The dissolved metals are reported under ATI ID number -02 and -07.

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 : (NONE)

DATE RECEIVED : 03/09/91
REPORT DATE : 04/18/91

ATI I.D. : 103660

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-5/MW-5-1	AQUEOUS	03/08/91
02	MW-5/MW-5-2	AQUEOUS	03/08/91
03	MW-5	AQUEOUS	03/08/91
04	MW-5	AQUEOUS	03/08/91
05	MW-5	AQUEOUS	03/08/91
06	MW-2/MW-2-2	AQUEOUS	03/08/91
07	MW-2/MW-2-1	AQUEOUS	03/08/91
08	MW-2	AQUEOUS	03/08/91
09	MW-2	AQUEOUS	03/08/91
10	MW-2	AQUEOUS	03/08/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	10

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. : 103660

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

DATE RECEIVED : 03/09/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	01	03	04	05	06
CARBONATE (CACO3)	MG/L	32	-	-	-	48
BICARBONATE (CACO3)	MG/L	314	-	-	-	304
HYDROXIDE (CACO3)	MG/L	<1	-	-	-	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	346	-	-	-	352
CHLORIDE	MG/L	67	-	-	-	59
CONDUCTIVITY, (UMHOS/CM)		1100	1160	1140	1130	1120
PH	UNITS	8.87	8.97	8.95	8.94	8.83
PHENOLICS, TOTAL	MG/L	<0.02	-	-	-	<0.02
SULFATE	MG/L	160	-	-	-	160
TOTAL DISSOLVED SOLIDS	MG/L	700	-	-	-	690
TOTAL ORGANIC CARBON	MG/L	1.0	0.8	1.6	0.7	0.8
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103660

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

DATE RECEIVED : 03/09/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	08	09	10
CONDUCTIVITY, (UMHOS/CM)		1100	1130	1130
PH	UNITS	8.96	8.95	8.95
TOTAL ORGANIC CARBON	MG/L	<0.5	1.6	0.8
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : (NONE) ATI I.D. : 103660

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	10368901	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		456	456	0	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		456	456	0	NA	NA	NA
CHLORIDE	MG/L	10366006	59	60	2	164	100	105
CONDUCTIVITY(UMHOS/CM)		10365903	1280	1290	0.7	NA	NA	NA
CONDUCTIVITY(UMHOS/CM)		10368901	2180	2160	0.9	NA	NA	NA
PH	UNITS	10368901	8.1	8.1	0	NA	NA	NA
PH	UNITS	10361702	8.8	8.8	0	NA	NA	NA
PHENOLICS, TOTAL	MG/L	10371534	<0.02	<0.02	NA	0.28	0.25	112
SULFATE	MG/L	10371505	11	11	0	20	10	90
TOTAL DISSOLVED SOLIDS	MG/L	10370001	710	710	0	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	10366006	0.8	0.8	0	21.7	20.0	105
TOTAL ORGANIC HALIDE	MG/L	10366006	<0.008	<0.008	NA	0.21	0.20	105

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

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

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 103660

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

DATE RECEIVED : 03/09/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	01	02	06	07
SILVER	MG/L	-	<0.010	-	<0.010
ARSENIC	MG/L	-	<0.005	-	<0.005
BARIUM	MG/L	-	0.017	-	0.019
CALCIUM	MG/L	-	1.7	-	1.7
CADMIUM	MG/L	-	<0.005	-	<0.005
CHROMIUM	MG/L	<0.010	-	<0.010	-
MERCURY	MG/L	<0.0002	-	<0.0002	-
POTASSIUM	MG/L	-	<1.0	-	<1.0
MAGNESIUM	MG/L	-	0.2	-	0.2
MANGANESE	MG/L	-	<0.010	-	<0.010
SODIUM	MG/L	-	270	-	270
LEAD	MG/L	<0.002	-	<0.002	-
SELENIUM	MG/L	-	<0.005	-	<0.005

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : (NONE) ATI I.D. : 103660

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	10366002	<0.010	<0.010	NA	0.086	0.100	86
ARSENIC	MG/L	10366007	<0.005	<0.005	NA	0.046	0.050	92
BARIUM	MG/L	10366002	0.017	0.017	0	0.119	0.100	102
CALCIUM	MG/L	10360202	12.4	12.5	0.8	68.0	50.0	111
CADMIUM	MG/L	10366002	<0.005	<0.005	NA	0.104	0.100	104
CHROMIUM	MG/L	10368101	<0.010	<0.010	NA	0.096	0.100	96
MERCURY	MG/L	10362001	<0.0002	<0.0002	NA	0.0050	0.0050	100
POTASSIUM	MG/L	10360202	1.2	1.3	8	54.9	50.0	107
MAGNESIUM	MG/L	10360202	2.4	2.4	0	29.7	25.0	109
MANGANESE	MG/L	10366002	<0.010	<0.010	NA	0.101	0.100	100
SODIUM	MG/L	10360202	3.6	3.7	3	56.1	50.0	105
LEAD	MG/L	10366006	<0.002	<0.002	NA	0.048	0.050	96
SELENIUM	MG/L	10367401	<0.005	<0.005	NA	0.033	0.050	66
SELENIUM	MG/L	10366007	<0.005	<0.005	NA	0.036	0.050	72

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10366001

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/08/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/09/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-5/MW-5-1	DATE ANALYZED	: 03/20/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	80
BROMOFLUOROBENZENE (%)	96
TOLUENE-D8 (%)	97

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10366001

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10366002

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/08/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/09/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-5/MW-5-2	DATE ANALYZED	: 03/20/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	86
BROMOFLUOROBENZENE (%)	87
TOLUENE-D8 (%)	106

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10366002

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10366006

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/08/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/09/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-2/MW-2-2	DATE ANALYZED	: 03/20/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	98
BROMOFLUOROBENZENE (%)	90
TOLUENE-D8 (%)	103

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10366006

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10366007

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/08/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/09/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-2/MW-2-1	DATE ANALYZED	: 03/20/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	89
BROMOFLUOROBENZENE (%)	83
TOLUENE-D8 (%)	104

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10366007

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 103660
PROJECT #	: (NONE)	DATE EXTRACTED	: 03/20/91
PROJECT NAME	: (NONE)	DATE ANALYZED	: 03/20/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	TR
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	92
BROMOFLUOROBENZENE (%)	80
TOLUENE-D8 (%)	103

TR - Compound detected at an unquantifiable trace level

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO. ATI I.D : 103660

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103660

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : (NONE)
REF I.D. : 10399924

DATE ANALYZED : 03/20/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1	50	51	102	50	100	2
TRICHLOROETHENE	<1	50	51	102	51	102	0
CHLOROBENZENE	<1	50	50	100	51	102	2
TOLUENE	<1	50	49	98	50	100	2
BENZENE	<1	50	53	106	50	100	6

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

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

TR - Compound detected at an unquantifiable trace level

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-8-91 PAGE 4 OF 8

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co
ADDRESS: Rt. 3 Box 7
Gallup, NM. 87301

BILL TO: Claud Rosendale
COMPANY:
ADDRESS: Same

Claud Rosendale
SAMPLERS: (Signature)

(505) 722-0217
PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TPC-4 analyzes	TPX-4 analyzes	all fractions per pack	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS, Alk, Cl, SO4	~~The 13 Priority Pollutant~~ Metals Total	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~~ Dissolved	Phenols		NUMBER OF CONTAINERS
MW-5 250ml			Water													X													4
250ml																	X												4
250ml																		X											4
1L																						X							1
1L																							X						1
1L																									X				1
1L																										X			1
40ml															X														2
40ml															X														2

PROJECT INFORMATION	
PROJECT NO.: —	
PROJECT NAME: —	
P.O. NO.: 01413	
VIA: Fed Ex.	
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	20
CHAIN OF CUSTODY SEALS	N
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	103660

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments: See attached for specific parameter details.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: CRosendale Time: 11:00	Signature: Time:	Signature: Time:
Printed Name: Claud Rosendale Date 3-8-91	Printed Name: Date	Printed Name: Date
Company: Giant Refining	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time: 11:00
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Eshelman Date: 3/9/91
Company:	Company:	Analytical Technologies, Inc.

Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-8-91 PAGE 1 OF 2

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup NM 87301

BILL TO: Claud Rosendale
COMPANY: Same
ADDRESS:

Claud Rosendale
SAMPLERS: (Signature)

(505) 722 0217
PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC - 4 replicates	TOX - 4 replicates	pH, Cond - 4 replicates each	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	US Alk Cl, SO4	The 13 Priority Pollutant Metals Total	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~~	Dissolved	Phenols	NUMBER OF CONTAINERS
MW-12 250 ml			Water													X													4
250 ml																	X												4
250 ml																		X											4
1 L																						X							1
1 L																							X						1
1 L																										X			1
1 L																											X		1
40 ml															X														2
40 ml															X														2

PROJECT INFORMATION	
PROJECT NO.: —	
PROJECT NAME: —	
P.O. NO.: 01413	
VIA: Fed Ex	
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	20
CHAIN OF CUSTODY SEALS	N
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	103660

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:
See Attached for specific parameter detail

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 11:00	Signature: Time:	Signature: Time:
Printed Name: Claud Rosendale Date: 3-8-91	Printed Name: Date	Printed Name: Date
Company: Giant Refining	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Linda Eshelman Time: 11:00
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Eshelman Date: 3/9/91
Company:	Company:	Analytical Technologies, Inc.

ATI 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

TABLE 1 - GROUNDWATER SAMPLING SCHEDULE
ANNUAL PARAMETERS (MARCH OR APRIL)

WELL #/PARAM	pH	CONDUCT	TOC*	TOX*	TDS	ALKAL. BICARB.	ALKAL. CARB.	CHLORIDE	SULFATE	PHENOL	TCL-VOL ORG(8240)	VOA-BTEX 8020	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Mn	K	Se	Ag	Na
MW-1	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
OW-1	X	X			X	X	X	X	X			X							X	X		X			X
OW-2	X	X			X	X	X	X	X			X							X	X		X			X
OW-3	X	X			X	X	X	X	X			X							X	X		X			X
SMW-1	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-2	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X

SEMI-ANNUAL PARAMETERS (SEPT. OR OCT.)

	pH*	COND*	TOC*	TOX*	TOTAL METALS Cr	Pb	TCL-VOL ORG(8240)
MW-1	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X
SMW-1	X	X	X	X	X	X	X
SMW-2	X	X	X	X	X	X	X
SMW-3	X	X	X	X	X	X	X
SMW-4	X	X	X	X	X	X	X
SMW-5	X	X	X	X	X	X	X
SMW-6	X	X	X	X	X	X	X

* 4 REPLICATES
\+ 2 REPLICATES

Waste Waters

API Effluent
1. BOD
2. COD
3. TOC
4. TDS

Aerated Lagoon Effluent
1. pH
2. BOD
3. COD
4. TOC
5. TDS
6. Sulfide (total)
7. Metals - (As, Cd, Cr, Pb, Hg, Ni, Se)
8. Oil + Grease
9. 8240 (Attached)
10. 8270 (Attached)

TABLE-4

RECOMMENDED ANALYTICAL METHODS

Parameter	Method
pH (Liquid)	221, 9040
Specific Conductance	120.1
Total Organic Carbon (TOC) 4 replicates	505, 9060
Total Organic Halogen (TOX) 4 replicates	9020
Total Dissolved Solids (TDS)	160.1
Alkalinity as Bicarbonate	310.1
Alkalinity as Carbonate	310.1
Chloride	300.0
Sulfate	300.0
Phenol	420.1, 9065
Metals	-
Arsenic	303E, 206.2,7060
Barium	303A, 200.7, 6010
Cadmium	200.7, 6010
Calcium	200.7, 6010
Chromium T	303A, 200.7, 6010
Lead T	303A, 239.2, 7421
Magnesium	200.7, 6010
Manganese	200.7, 6010
Mercury T	245.1, 7470
Potassium	200.7, 6010
Selenium	270.2, 7740
Silver	200.7, 6010
Sodium	200.7, 6010
Oil & Grease	413.1, 9071
pH (Solid)	9045
Carbon	9060
Nitrogen	353.2
Phosphorus	365.3
Total Solids (Solids)	160.3
VOA (BTEX) (Liquid & Solid)	8020
Benzene	-
Toluene	-
Ethyl benzene	-
Xylene (m, o & p)	-
TCL Volatile Organics (Liquids)	8240 2 replicates for mw-1, m mw-4, m + ow-11
Chloromethane	-
Bromomethane	-
Vinyl chloride	-
Chloroethane	-
Methylene chloride	-
Acetone	-
Carbon disulfide	-
1,1 - Dichloroethene	-
1,1 - Dichloroethane	-
1,2 - Dichloroethene (cis/trans)	-

	-	
Chloroform	-	
1,2-Dichloroethane	-	
2-Butanone	-	
1,1,1-Trichloroethane	-	
Carbon tetrachloride	-	
Vinyl acetate	-	
Bromodichloromethane	-	
1,2 - Dichloropropane	-	
trans-1,3-Dichloropropene	-	
Trichloroethene	-	
Chlorodibromomethane	-	
1,1,2-Trichloroethane	-	
Benzene	-	
cis-1,3-Dichloropropene	-	
2-Chloroethyl vinyl ether	-	
Bromoform	-	
4-Methyl-2-pentanone	-	
2-Hexanone	-	
1,1,2,2,-Tetrachloroethane	-	
Tetrachloroethene	-	
Toluene	-	
Chlorobenzene	-	
Ethyl benzene	-	
Styrene	-	
Xylenes (total)	-	
1,1,2 Trichloro-1,2,2-trifluorethane	-	
1,2-Dibromomethane	-	
1,2-Dichlorobenzene	-	
1,3-Dichlorobenzene	-	
1,4-Dichlorobenzene	-	
Refinery Hazardous Const. Semivolatiles (Solids)		8270
Benzo(a)pyrene	-	
Chrysene	-	
1-Methylnaphthalene	-	
Phenanthrene	-	
Pyrene	-	
o-Cresol	-	
m & p Cresol	-	

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

SMW 1-6
3-5-91

ATI I.D. 103573

April 18, 1991

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

Project Name/Number: None Given

Attention: Claud Rosendale

On 03/06/91, 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.

TOC, TOX analyses were performed by ATI, San Diego. Additional sample for client ID SMW-3 was received on 03/07/91. Total metals results are reported under ATI ID numbers 103573-01,- 06, -11, -16, -21, -26, and -31. Dissolved metals results are reported under ATI ID number -02, -07, -12, -17, -22, and -27.

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. DATE RECEIVED : 03/06/91
PROJECT # : (NONE)
PROJECT NAME : (NONE) REPORT DATE : 04/18/91

ATI I.D. : 103573

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SMW-1	AQUEOUS	03/05/91
02	SMW-1	AQUEOUS	03/05/91
03	SMW-1	AQUEOUS	03/05/91
04	SMW-1	AQUEOUS	03/05/91
05	SMW-1	AQUEOUS	03/05/91
06	SMW-2	AQUEOUS	03/05/91
07	SMW-2	AQUEOUS	03/05/91
08	SMW-2	AQUEOUS	03/05/91
09	SMW-2	AQUEOUS	03/05/91
10	SMW-2	AQUEOUS	03/05/91
11	SMW-3	AQUEOUS	03/05/91
12	SMW-3	AQUEOUS	03/05/91
13	SMW-3	AQUEOUS	03/05/91
14	SMW-3	AQUEOUS	03/05/91
15	SMW-3	AQUEOUS	03/06/91
16	SMW-4	AQUEOUS	03/05/91
17	SMW-4	AQUEOUS	03/05/91
18	SMW-4	AQUEOUS	03/05/91
19	SMW-4	AQUEOUS	03/05/91
20	SMW-4	AQUEOUS	03/05/91
21	SMW-5	AQUEOUS	03/05/91
22	SMW-5	AQUEOUS	03/05/91
23	SMW-5	AQUEOUS	03/05/91
24	SMW-5	AQUEOUS	03/05/91
25	SMW-5	AQUEOUS	03/05/91
26	SMW-6	AQUEOUS	03/05/91
27	SMW-6	AQUEOUS	03/05/91
28	SMW-6	AQUEOUS	03/05/91
29	SMW-6	AQUEOUS	03/05/91
30	SMW-6	AQUEOUS	03/05/91
31	SMW EQUIP WASH	AQUEOUS	03/05/91
32	SMW EQUIP WASH	AQUEOUS	03/05/91
33	SMW EQUIP WASH	AQUEOUS	03/05/91
34	SMW EQUIP WASH	AQUEOUS	03/05/91
35	TRIP BLANK	AQUEOUS	03/05/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	35

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. : 103573

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

DATE RECEIVED : 03/06/91

REPORT DATE : 04/18/91

PARAMETER	UNITS	01	03	04	05	06
CARBONATE (CACO3)	MG/L	<1	-	-	-	<1
BICARBONATE (CACO3)	MG/L	620	-	-	-	578
HYDROXIDE (CACO3)	MG/L	<1	-	-	-	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	620	-	-	-	578
CHLORIDE	MG/L	1130	-	-	-	1240
CONDUCTIVITY, (UMHOS/CM)		6320	6170	6180	6240	6940
PH	UNITS	7.52	7.69	7.54	7.55	7.65
SULFATE	MG/L	1300	-	-	-	1600
TOTAL DISSOLVED SOLIDS	MG/L	4700	-	-	-	5000
TOTAL ORGANIC CARBON	MG/L	14.0	12.8	15.8	11.4	14.3
TOTAL ORGANIC HALIDE	MG/L	0.032	0.039	0.053	0.037	0.051

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	08	09	10	11	13
CARBONATE (CACO3)	MG/L	-	-	-	<1	-
BICARBONATE (CACO3)	MG/L	-	-	-	664	-
HYDROXIDE (CACO3)	MG/L	-	-	-	<1	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	-	-	664	-
CHLORIDE	MG/L	-	-	-	59	-
CONDUCTIVITY, (UMHOS/CM)		7030	7100	7100	3400	3410
PH	UNITS	7.68	7.69	7.66	7.94	8.09
SULFATE	MG/L	-	-	-	1200	-
TOTAL DISSOLVED SOLIDS	MG/L	-	-	-	5200	-
TOTAL ORGANIC CARBON	MG/L	11.6	15.2	10.2	3.0	5.1
TOTAL ORGANIC HALIDE	MG/L	0.061	0.051	0.037	<0.008	0.015

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

DATE RECEIVED : 03/06/91

REPORT DATE : 04/18/91

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

PARAMETER	UNITS	14	15	16	18	19
CARBONATE (CACO3)	MG/L	-	-	24	-	-
BICARBONATE (CACO3)	MG/L	-	-	418	-	-
HYDROXIDE (CACO3)	MG/L	-	-	<1	-	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	-	442	-	-
CHLORIDE	MG/L	-	-	58	-	-
CONDUCTIVITY, (UMHOS/CM)		3330	3590	1210	1210	1230
PH	UNITS	8.04	7.92	8.54	8.39	8.38
SULFATE	MG/L	-	-	170	-	-
TOTAL DISSOLVED SOLIDS	MG/L	-	-	860	-	-
TOTAL ORGANIC CARBON	MG/L	2.5	3.3	2.6	2.2	1.6
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	20	21	23	24	25
CARBONATE (CACO3)	MG/L	-	20	-	-	-
BICARBONATE (CACO3)	MG/L	-	378	-	-	-
HYDROXIDE (CACO3)	MG/L	-	<1	-	-	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	398	-	-	-
CHLORIDE	MG/L	-	65	-	-	-
CONDUCTIVITY, (UMHOS/CM)		1240	1160	1150	1120	1150
PH	UNITS	8.37	8.56	8.54	8.51	8.55
SULFATE	MG/L	-	150	-	-	-
TOTAL DISSOLVED SOLIDS	MG/L	-	1500	-	-	-
TOTAL ORGANIC CARBON	MG/L	1.7	2.3	3.2	1.3	1.5
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91

REPORT DATE : 04/18/91

PARAMETER	UNITS	26	28	29	30	31
CARBONATE (CACO3)	MG/L	8	-	-	-	<1
BICARBONATE (CACO3)	MG/L	604	-	-	-	2
HYDROXIDE (CACO3)	MG/L	<1	-	-	-	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	612	-	-	-	2
CHLORIDE	MG/L	82	-	-	-	<0.5
CONDUCTIVITY, (UMHOS/CM)		1520	1540	1520	1490	1.42
PH	UNITS	8.41	8.20	8.20	8.17	5.71
SULFATE	MG/L	200	-	-	-	<0.3
TOTAL DISSOLVED SOLIDS	MG/L	1100	-	-	-	10
TOTAL ORGANIC CARBON	MG/L	2.0	1.2	1.2	1.3	1.3
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91

REPORT DATE : 04/18/91

PARAMETER	UNITS	32	33	34
CONDUCTIVITY, (UMHOS/CM)		1.28	1.23	1.08
PH	UNITS	6.05	5.92	5.76
TOTAL ORGANIC CARBON	MG/L	0.9	0.6	<0.5
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : (NONE) ATI I.D. : 103573

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	10371505	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		17	17	0	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		17	17	0	NA	NA	NA
CARBONATE	MG/L	10357602	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		150	154	3	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		150	154	3	NA	NA	NA
CHLORIDE	MG/L	10357602	150	150	0	280	125	104
CONDUCTIVITY(UMHOS/CM)		10357313	3410	3410	0	NA	NA	NA
CONDUCTIVITY(UMHOS/CM)		10357326	1520	1530	0.7	NA	NA	NA
CONDUCTIVITY(UMHOS/CM)		10360203	90.7	89.5	1	NA	NA	NA
CONDUCTIVITY(UMHOS/CM)		10357334	1.08	1.10	2	NA	NA	NA
CONDUCTIVITY(UMHOS/CM)		10368901	2180	2160	0.9	NA	NA	NA
PH	UNITS	10357306	7.7	7.7	0	NA	NA	NA
PH	UNITS	10499905	8.4	8.4	0	NA	NA	NA
PH	UNITS	10357602	8.0	8.0	0	NA	NA	NA
PH	UNITS	10357333	5.9	5.9	0	NA	NA	NA
SULFATE	MG/L	10352901	170	170	0	340	170	100
SULFATE	MG/L	10357602	87	87	0	180	93	100
TOTAL DISSOLVED SOLIDS	MG/L	10357321	1500	1500	0	NA	NA	NA
TOTAL DISSOLVED SOLIDS	MG/L	10357331	10	10	0	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	10357314	2.5	3.0	18	26.2	20.0	119
TOTAL ORGANIC CARBON	MG/L	10499914	0.8	0.6	29	23.2	20.0	112
TOTAL ORGANIC CARBON	MG/L	10357328	1.2	1.2	0	22.5	20.0	107
TOTAL ORGANIC HALIDE	MG/L	10357316	<0.008	<0.008	NA	0.19	0.20	95
TOTAL ORGANIC HALIDE	MG/L	10357326	<0.008	<0.008	NA	0.19	0.20	95
TOTAL ORGANIC HALIDE	MG/L	10359806	<0.008	<0.008	NA	0.17	0.20	85

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

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

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	01	02	06	07	11
CALCIUM	MG/L	-	185	-	132	-
CHROMIUM	MG/L	0.075	-	0.245	-	0.038
POTASSIUM	MG/L	-	1.9	-	<1.0	-
MAGNESIUM	MG/L	-	50.6	-	37.8	-
SODIUM	MG/L	-	1390	-	1620	-
LEAD	MG/L	0.007	-	0.010	-	0.010

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	12	16	17	21	22
CALCIUM	MG/L	50.4	-	4.5	-	3.3
CHROMIUM	MG/L	-	0.032	-	0.042	-
POTASSIUM	MG/L	1.3	-	1.3	-	<1.0
MAGNESIUM	MG/L	14.7	-	1.1	-	0.8
SODIUM	MG/L	815	-	306	-	281
LEAD	MG/L	-	0.008	-	<0.002	-

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	26	27	31
CALCIUM	MG/L	-	6.6	-
CHROMIUM	MG/L	0.038	-	<0.010
POTASSIUM	MG/L	-	3.6	-
MAGNESIUM	MG/L	-	1.9	-
SODIUM	MG/L	-	376	-
LEAD	MG/L	0.010	-	<0.002

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

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

ATI I.D. : 103573

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CALCIUM	MG/L	10357602	80.9	80.8	0.1	133	50.0	104
CHROMIUM	MG/L	10357001	0.020	0.020	0	0.932	1.00	91
POTASSIUM	MG/L	10357602	3.6	3.5	3	56.4	50.0	106
MAGNESIUM	MG/L	10357602	48.5	48.3	0.4	74.2	25.0	103
SODIUM	MG/L	10357602	44.3	44.2	0.2	93.8	50.0	99
LEAD	MG/L	10357321	<0.002	<0.002	NA	0.039	0.050	78
LEAD	MG/L	10357331	<0.002	<0.002	NA	0.056	0.050	112

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357301

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-1	DATE ANALYZED	: 03/11/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BROMOFLUOROBENZENE (%)	116
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357301

COMPOUNDS	RESULTS
SULFONATED HYDROCARBON C6	400
UNKNOWN DIOL	700
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357306

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-2	DATE ANALYZED	: 03/11/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	98
BROMOFLUOROBENZENE (%)	116
TOLUENE-D8 (%)	93

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357306

COMPOUNDS	RESULTS
SULFONATED HYDROCARBON C6	400
UNKNOWN DIOL	600
1,2-DIBROMOMETHANE	<2

Please explain JHmck

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357311

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-3	DATE ANALYZED	: 03/11/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	94
BROMOFLUOROBENZENE (%)	88
TOLUENE-D8 (%)	113

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357311

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357316

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-4	DATE ANALYZED	: 03/11/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	88
BROMOFLUOROBENZENE (%)	117
TOLUENE-D8 (%)	97

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357316

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357321

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-5	DATE ANALYZED	: 03/11/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	88
BROMOFLUOROBENZENE (%)	117
TOLUENE-D8 (%)	103

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357321

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357326

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : (NONE)
CLIENT I.D. : SMW-6
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 03/05/91
DATE RECEIVED : 03/06/91
DATE EXTRACTED : N/A
DATE ANALYZED : 03/11/91
UNITS : UG/L
DILUTION FACTOR : 1

ppB ?

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	15
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	94
BROMOFLUOROBENZENE (%)	116
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357326

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357331

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW EQUIP WASH	DATE ANALYZED	: 03/11/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	14
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BROMOFLUOROBENZENE (%)	115
TOLUENE-D8 (%)	103

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357331

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357335

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: TRIP BLANK	DATE ANALYZED	: 03/11/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BROMOFLUOROBENZENE (%)	105
TOLUENE-D8 (%)	99

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357335

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 103573
PROJECT #	: (NONE)	DATE EXTRACTED	: 03/11/91
PROJECT NAME	: (NONE)	DATE ANALYZED	: 03/11/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<2
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
2-CHLOROETHYLVINYLETHER	<10
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BROMOFLUOROBENZENE (%)	107
TOLUENE-D8 (%)	103

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO. ATI I.D : 103573

COMPOUNDS	RESULTS
1,2-DIBROMOMETHANE	<2

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103573

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : (NONE)
REF I.D. : 10399901

DATE ANALYZED : 03/11/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1	50	52	104	51	102	2
TRICHLOROETHENE	<1	50	53	106	47	94	12
CHLOROBENZENE	<1	50	52	104	51	102	2
TOLUENE	<1	50	56	112	56	112	0
BENZENE	<1	50	55	110	49	98	12

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

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

AnalyticalTechnologies,Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-5-91 PAGE 1 OF 7

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co
ADDRESS: Rt 3 Box 7
Gallup, N.M. 87301

BILL TO: Cloud Rosendale
COMPANY:
ADDRESS: Same

Cloud Rosendale — SAMPLERS: (Signature)
(505) 722-0217 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC - 4 replicates	TOX - 4 replicates	pH, Cond - 4 replicates	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS Alk, Cl, SO4	TOH	The 8 EP Tox Metals by EP Tox Prep. (1310)	Dissolved	NUMBER OF CONTAINERS
SMW-1 250ml Amber Sulfuric	3-5	0820	Water													X										4
250ml Amber Sulfuric																	X									4
250ml plastic																		X								4
1 L. Plastic																						X				1
1 L Plastic																							X			1
1 L. Plastic																									X	1
40ml VOA															X											2

PROJECT INFORMATION	
PROJECT NO.: —	
PROJECT NAME: —	
P.O. NO.: 01413	
VIA: Fed Ex	
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	7
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	103513

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments: See attached for specific parameter detail

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Cloud Rosendale Time: 2:15pm	Signature: Time:	Signature: Time:
Printed Name: C Rosendale Date 3-5-91	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Analytical Technologies, Inc. 3/6/91

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Phoenix, Arizona

Chain of Custody

DATE 3-5-91 PAGE 2 OF 7

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup, NM 87301

BILL TO: Claud Rosendale
COMPANY:
ADDRESS: Same

SAMPLERS: (Signature) Claud Rosendale
PHONE NUMBER (505) 722-0217

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC - 4 replicates	TOX - 4 replicates	All Cond - 4 replicates each	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS, Alk, Cl, SO4	The 13 Priority Pollutant Metals Total	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 Dissolved			NUMBER OF CONTAINERS
SMW-2 250 ml Amber Sulfuric	3-5	0930	Water													X													4
250 ml Amber Sulfuric																	X												4
250 ml Plastic																		X											4
1 L. Plastic																						X							1
1 L. Plastic																							X			X			1
1 L. Plastic																										X			1
40 ml VOA															X														2

PROJECT INFORMATION	
PROJECT NO.: —	
PROJECT NAME: —	
P.O. NO.: 01413	
VIA: Fed Ex	
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	17
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	10557

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments: See attached for specific parameter detail.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 3:15	Signature: Time:	Signature: Time:
Printed Name: Claud Rosendale Date 3-5	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Analytical Technologies, Inc. 3/6/91

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AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-5-91 PAGE 3 OF 7

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup, NM 87301

BILL TO: Carol Rosendale
COMPANY: Same
ADDRESS:

Carol Rosendale — SAMPLERS: (Signature)
(505) 722-0217 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC-4 replicates	TOX-4 replicates	pH, Cond, Alkalinities each	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS, Alk, Cl, SO4	The 10 Priority Pollutant Metals Total	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by EP Dissolved			NUMBER OF CONTAINERS
SMW-3 250ml Amber Septum	3-5-91	10:30	Water																X														4
250ml Amber Septum																				X													~~4~~ 3 4
250ml plastic																					X												~~4~~ 3
1 L Plastic																									X								1
1 L Plastic																										X							1
1 L Plastic																													X				1
40ml VOA																		X															2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO.: —		TOTAL NO. OF CONTAINERS	15
PROJECT NAME: —		CHAIN OF CUSTODY SEALS	N
P.O. NO.: 01413		INTACT?	Y
VIA: Fed Ex		RECEIVED GOOD COND./COLD	Y
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS		LAB NUMBER	103573

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:
See attached for specific parameter details, TOX, pH, Cond + Inorganics

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 12:15	Signature: Time:	Signature: Time:
Printed Name: Date: 3-5-91	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Analytical Technologies, Inc. 3/6/91

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Phoenix, Arizona

Chain of Custody

DATE 3-5-91 PAGE 4 OF 7

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup, NM 87301

BILL TO: Clay Rosendale
COMPANY:
ADDRESS: Same

SAMPLERS: (Signature) — PHONE NUMBER: (505)722-0217

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC - 4 replicates	TOX - 4 replicates	all lab - 4 replicates each	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS Alk Cl - SO4	~~The 13 Priority Pollutant~~ Metals Toxic	~~The 8 EP Tox Metals by EP Tox (1310)~~	The 8 EP Tox Metals by Total Digestion	~~The 8 EP Tox Metals by TCLP~~ TCLP 17.5 solid			NUMBER OF CONTAINERS
SMW-4 250 ml Amber Glass	3-5-91	11:15	Water																X														4
250 ml Amber Glass																				X													4
250 ml Plastic																					X												4
1 L Plastic																									X								1
1 L Plastic																										X							1
1 L Plastic																													X				1
40 ml VOA																		X															2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO.: —		TOTAL NO. OF CONTAINERS	17
PROJECT NAME: —		CHAIN OF CUSTODY SEALS	Y
P.O. NO.: 01413		INTACT?	Y
VIA: Fed Ex		RECEIVED GOOD COND./COLD	Y
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS		LAB NUMBER	103573

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:
See attached for specific parameter detail.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 2:15	Signature: Time:	Signature: Time:
Printed Name: Date 03-5-91	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Analytical Technologies, Inc. 3/6/91

ATI 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

Analytical**Technologies,**Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-5-91 PAGE 5 OF 7

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup NM 87301

BILL TO: Claud Rosendale
COMPANY:
ADDRESS: Same

Claud Rosendale — SAMPLERS: (Signature)
505 722-0217 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC - 4 replicates	TOX - 4 replicates	pH Cond - 4 replicates each	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS, Alk, Cl, SO4	The 8 Priority Pollutant Metals Total	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			NUMBER OF CONTAINERS
SMW-5 250 ml Amber Sediment	3-5-91	12:45	Water													X													4
250 ml Amber Sediment	/																X												4
250 ml plastic	/	/																X											4
1 L Plastic		/																				X							1
1 L Plastic	/	/																					X						1
1 L Plastic		/																								X			1
40 ml VOA	/	/													X														2

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT NO.: —	TOTAL NO. OF CONTAINERS	7
PROJECT NAME: —	CHAIN OF CUSTODY SEALS	Y
P.O. NO.: 01413	INTACT?	Y
VIA: Fed Ex	RECEIVED GOOD COND./COLD	Y
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	LAB NUMBER	103573

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments: See Attached for specific parameter detail.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Time: 2:15	Signature: Time:	Signature: Time:
Printed Name: Claud Rosendale Date 3-5-91	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time: 1:15
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Analytical Technologies, Inc. 3/6/91

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AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-5-91 PAGE 6 OF 7

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt. 3 Box 7
Gallup, N.M. 87301

BILL TO: Claud Rosendale
COMPANY:
ADDRESS: Same

Claud Rosendale — SAMPLERS: (Signature)
505 722-0217 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TOC-4 replicates	TOX-4 replicates	Alcohol-4 replicates each	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS All 4 SPL	~~The 13 Priority Pollutant~~ Metals Total	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~~ Dissolved			NUMBER OF CONTAINERS
SMW-6 250ml Amber Sterium	3-5	1:00	Water													X													4
250ml Amber Sterium																	X												4
250ml Plastic																		X											4
1 L. Plastic																						X							1
1 L. Plastic																							X						1
1 L. Plastic																										X			1
40ml VOA															X														2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO.: —		TOTAL NO. OF CONTAINERS	17
PROJECT NAME: —		CHAIN OF CUSTODY SEALS	Y
P.O. NO.: 01413		INTACT?	Y
VIA: Fed Ex		RECEIVED GOOD COND./COLD	Y
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS		LAB NUMBER	103573

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:
See attached for specific parameter detail.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: [signature] Time: 2:15	Signature: Time:	Signature: Time:
Printed Name: Rosendale Date 3-5	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: [signature] Time: 1115
Printed Name: Date:	Printed Name: Date:	Printed Name: [signature] Date:
Company:	Company:	Analytical Technologies, Inc. 3/6/91

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Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-5-91 PAGE 2 OF 2

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt 3 Box 7
Gallup N.M. 87301

BILL TO: Cloud Rosendale
COMPANY:
ADDRESS: Same

Cloud Rosendale
SAMPLERS: (Signature)

(505) 722-0217
PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TCC	TOX	oil and Grease	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TDS Alkalinity 502	~~The 10 Priority Pollutant Metals~~ Tox	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~~ Cl, SO4, Na			NUMBER OF CONTAINERS
SAM Equipment Wash	3-5	0920	Water													X														4
																	X													4
																		X												4
																						X								1
																							X							1
																										~~X~~				~~1~~
															X															2
TRIP BLANKS															X															2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO.: —		TOTAL NO. OF CONTAINERS	15
PROJECT NAME: —		CHAIN OF CUSTODY SEALS	N
P.O. NO.: 01413		INTACT?	Y
VIA: Fed Ex.		RECEIVED GOOD COND./COLD	Y
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS		LAB NUMBER	103573

SAMPLE DISPOSAL INSTRUCTIONS

☒ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:
See attached for specific parameter detail.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 2:15	Signature: Time:	Signature: Time:
Printed Name: Date 3-5	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time: 1115
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Analytical Technologies, Inc. 3/6/91

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AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3-6 PAGE 1 OF 1

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant
ADDRESS: Rt 3 Box 7
Gallup

BILL TO: Same
COMPANY:
ADDRESS:

SAMPLERS: (Signature)
PHONE NUMBER ( ) -

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	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 (625/8270)	Volatile Organics GC/MS (624/8240)	TPH	all Grad	TDS, cl, SO4, Alk	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	NUMBER OF CONTAINERS
SMW3	3-6	12:45	Water	15												X										1
				15													X									1
				11														X								1

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO.:		TOTAL NO. OF CONTAINERS	3
PROJECT NAME:		CHAIN OF CUSTODY SEALS	Y
P.O. NO.:		INTACT?	Y
VIA:		RECEIVED GOOD COND./COLD	Y
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS		LAB NUMBER / 03573	

SAMPLE DISPOSAL INSTRUCTIONS
☐ ATI Disposal ☐ Return ☐ Pickup (will call)

Comments:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 12:45	Signature: Time:	Signature: Time:
Printed Name: Date 3-6-91	Printed Name: Date	Printed Name: Date
Company:	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time: 10:50
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: Linda Eshelman 3/7/91
Company:	Company:	Analytical Technologies, Inc.

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TABLE 1 - GROUNDWATER SAMPLING SCHEDULE
ANNUAL PARAMETERS (MARCH OR APRIL)

WELL #/PARAM	pH	CONDUCT	TOC*	TOX*	TDS	ALKAL. BICARB.	ALKAL. CARB.	CHLORIDE	SULFATE	PHENOL	TCL-VOL ORG(8240)	VOA-BTEX 8020	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Hg	Mn	K	Se	Ag	Na
MW-1	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
OW-1	X	X			X	X	X	X	X			X							X	X		X			X
OW-2	X	X			X	X	X	X	X			X							X	X		X			X
OW-3	X	X			X	X	X	X	X			X							X	X		X			X
SMW-1	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-2	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X

SEMI-ANNUAL PARAMETERS (SEPT. OR OCT.)

	pH*	COND*	TOC*	TOX*	TOTAL METALS Cr	Pb	TCL-VOL ORG(8240)
MW-1	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X
SMW-1	X	X	X	X	X	X	X
SMW-2	X	X	X	X	X	X	X
SMW-3	X	X	X	X	X	X	X
SMW-4	X	X	X	X	X	X	X
SMW-5	X	X	X	X	X	X	X
SMW-6	X	X	X	X	X	X	X

* 4 REPLICATES
\+ 2 REPLICATES

Waste Waters

API Effluent
1. BOD
2. COD
3. TOC
4. TDS

Aerated Lagoon Effluent
1. pH
2. BOD
3. COD
4. TOC
5. TDS
6. Sulfide (total)
7. Metals - (As, Cd, Cr, Pb, Hg, Ni, Se)
8. Oil + Grease
9. 8240 (Attached)
10. 8270 (Attached)

TABLE-4

RECOMMENDED ANALYTICAL METHODS

Parameter	Method
pH (Liquid)	221, 9040
Specific Conductance	120.1
Total Organic Carbon (TOC) 4 replicates	505, 9060
Total Organic Halogen (TOX) 4 replicates	9020
Total Dissolved Solids (TDS)	160.1
Alkalinity as Bicarbonate	310.1
Alkalinity as Carbonate	310.1
Chloride	300.0
Sulfate	300.0
Phenol	420.1, 9065
Metals	-
Arsenic	303E, 206.2,7060
Barium	303A, 200.7, 6010
Cadmium	200.7, 6010
Calcium D	200.7, 6010
Chromium T	303A, 200.7, 6010
Lead T	303A, 239.2, 7421
Magnesium D	200.7, 6010
Manganese	200.7, 6010
Mercury	245.1, 7470
Potassium D	200.7, 6010
Selenium	270.2, 7740
Silver	200.7, 6010
Sodium D	200.7, 6010
Oil & Grease	413.1, 9071
pH (Solid)	9045
Carbon	9060
Nitrogen	353.2
Phosphorus	365.3
Total Solids (Solids)	160.3
VOA (BTEX) (Liquid & Solid)	8020
Benzene	-
Toluene	-
Ethyl benzene	-
Xylene (m, o & p)	-
TCL Volatile Organics (Liquids)	8240 ~~2 replicates for MW-1, MW-4, Field~~
Chloromethane	-
Bromomethane	-
Vinyl chloride	-
Chloroethane	-
Methylene chloride	-
Acetone	-
Carbon disulfide	-
1,1 - Dichloroethene	-
1,1 - Dichloroethane	-
1,2 - Dichloroethene (cis/trans)	-

Chloroform	-	
1,2-Dichloroethane	-	
2-Butanone	-	
1,1,1-Trichloroethane	-	
Carbon tetrachloride	-	
Vinyl acetate	-	
Bromodichloromethane	-	
1,2 - Dichloropropane	-	
trans-1,3-Dichloropropene	-	
Trichloroethene	-	
Chlorodibromomethane	-	
1,1,2-Trichloroethane	-	
Benzene	-	
cis-1,3-Dichloropropene	-	
2-Chloroethyl vinyl ether	-	
Bromoform	-	
4-Methyl-2-pentanone	-	
2-Hexanone	-	
1,1,2,2,-Tetrachloroethane	-	
Tetrachloroethene	-	
Toluene	-	
Chlorobenzene	-	
Ethyl benzene	-	
Styrene	-	
Xylenes (total)	-	
1,1,2 Trichloro-1,2,2-trifluorethane	-	
1,2-Dibromomethane	-	
1,2-Dichlorobenzene	-	
1,3-Dichlorobenzene	-	
1,4-Dichlorobenzene	-	
Refinery Hazardous Const. Semivolatiles (Solids)		8270
Benzo(a)pyrene	-	
Chrysene	-	
1-Methylnaphthalene	-	
Phenanthrene	-	
Pyrene	-	
o-Cresol	-	
m & p Cresol	-	

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

May 7, 1991

Claud Rosendale
Giant Refining Co.
Route 3, P.O. Box 7
Gallup, NM 87301

Dear Claud,

This letter is to inform you that we can provide you with pH results which are read out to the 1/100 decimal place. We have gone back to generate as much data as we could for you. Only two samples will not be able to be further defined, the aerated lagoon effluent will have to be reported as 7.8, one of the OW-11 results was only read as 8.3. For all the reports which you have, the replacement page for pH is enclosed with the following numbers:

Sample ID	ATI ID	Original pH Reported	New pH Result
SMW-1	10357301	7.5	7.52
	10357303	7.7	7.69
	10357304	7.5	7.54
	10357305	7.6	7.55
SMW-2	10357306	7.7	7.65
	10357308	7.7	7.68
	10357309	7.7	7.69
	10357310	7.7	7.66
SMW-3	10357311	7.9	7.94
	10357313	8.1	8.09
	10357314	8.0	8.04
	10357315	7.9	7.92
SMW-4	10357316	8.5	8.54
	10357318	8.4	8.39
	10357319	8.4	8.38
	10357320	8.4	8.37
SMW-5	10357321	8.6	8.56
	10357323	8.5	8.54
	10357324	8.5	8.51
	10357325	8.6	8.55
SMW-6	10357326	8.4	8.41
	10357328	8.2	8.20
	10357329	8.2	8.20
	10357330	8.2	8.17
SMW Equip Wash	10357331	5.7	5.71
	10357332	6.0	6.05
	10357333	5.9	5.92
	10357334	5.8	5.76

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

May 7, 1991
Giant Refining Co.

Sample ID	ATI ID	Original pH Reported	New pH Result
MW-1	10359801	8.9	8.92
	10359803	8.9	8.92
	10359804	8.9	8.94
	10359805	8.9	8.94
MW-4	10359806	8.6	8.65
	10359808	8.7	8.69
	10359809	8.7	8.69
	10359810	8.7	8.69
OW-11	10359811	8.3	8.3
	10359813	8.2	8.18
	10359814	8.1	8.14
	10359815	8.1	8.07
Equip. Wash	10359816	5.7	5.66
	10359818	5.9	5.92
	10359819	5.6	5.65
OW-1	10365901	8.5	8.47
OW-2	10365902	8.0	7.97
OW-3	10365903	8.1	8.06
MW-5	10366001	8.9	8.87
	10366003	9.0	8.97
	10366004	9.0	8.95
	10366005	8.9	8.94
MW-2	10366006	8.8	8.83
	10366008	9.0	8.96
	10366009	9.0	8.95
	10366010	9.0	8.95

It is our standard practice to read out to the 1/100 place and report only out to the 1/10 place, per the method. We appreciate the Giant Refining Company and will try to accommodate all your analytical needs.

Sincerely,

Elizabeth Proffitt

Elizabeth Proffitt
Senior Project Manager

ss

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	01	03	04	05	06
CARBONATE (CACO3)	MG/L	<1	-	-	-	<1
BICARBONATE (CACO3)	MG/L	620	-	-	-	578
HYDROXIDE (CACO3)	MG/L	<1	-	-	-	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	620	-	-	-	578
CHLORIDE	MG/L	1130	-	-	-	1240
CONDUCTIVITY, (UMHOS/CM)		6320	6170	6180	6240	6940
PH	UNITS	7.52	7.69	7.54	7.55	7.65
SULFATE	MG/L	1300	-	-	-	1600
TOTAL DISSOLVED SOLIDS	MG/L	4700	-	-	-	5000
TOTAL ORGANIC CARBON	MG/L	14.0	12.8	15.8	11.4	14.3
TOTAL ORGANIC HALIDE	MG/L	0.032	0.039	0.053	0.037	0.051

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	08	09	10	11	13
CARBONATE (CACO3)	MG/L	-	-	-	<1	-
BICARBONATE (CACO3)	MG/L	-	-	-	664	-
HYDROXIDE (CACO3)	MG/L	-	-	-	<1	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	-	-	664	-
CHLORIDE	MG/L	-	-	-	59	-
CONDUCTIVITY, (UMHOS/CM)		7030	7100	7100	3400	3410
PH	UNITS	7.68	7.69	7.66	7.94	8.09
SULFATE	MG/L	-	-	-	1200	-
TOTAL DISSOLVED SOLIDS	MG/L	-	-	-	5200	-
TOTAL ORGANIC CARBON	MG/L	11.6	15.2	10.2	3.0	5.1
TOTAL ORGANIC HALIDE	MG/L	0.061	0.051	0.037	<0.008	0.015

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	14	15	16	18	19
CARBONATE (CACO3)	MG/L	-	-	24	-	-
BICARBONATE (CACO3)	MG/L	-	-	418	-	-
HYDROXIDE (CACO3)	MG/L	-	-	<1	-	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	-	442	-	-
CHLORIDE	MG/L	-	-	58	-	-
CONDUCTIVITY, (UMHOS/CM)		3330	3590	1210	1210	1230
PH	UNITS	8.04	7.92	8.54	8.39	8.38
SULFATE	MG/L	-	-	170	-	-
TOTAL DISSOLVED SOLIDS	MG/L	-	-	860	-	-
TOTAL ORGANIC CARBON	MG/L	2.5	3.3	2.6	2.2	1.6
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	20	21	23	24	25
CARBONATE (CACO3)	MG/L	-	20	-	-	-
BICARBONATE (CACO3)	MG/L	-	378	-	-	-
HYDROXIDE (CACO3)	MG/L	-	<1	-	-	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	398	-	-	-
CHLORIDE	MG/L	-	65	-	-	-
CONDUCTIVITY, (UMHOS/CM)		1240	1160	1150	1120	1150
PH	UNITS	8.37	8.56	8.54	8.51	8.55
SULFATE	MG/L	-	150	-	-	-
TOTAL DISSOLVED SOLIDS	MG/L	-	1500	-	-	-
TOTAL ORGANIC CARBON	MG/L	1.7	2.3	3.2	1.3	1.5
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	26	28	29	30	31
CARBONATE (CACO3)	MG/L	8	-	-	-	<1
BICARBONATE (CACO3)	MG/L	604	-	-	-	2
HYDROXIDE (CACO3)	MG/L	<1	-	-	-	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	612	-	-	-	2
CHLORIDE	MG/L	82	-	-	-	<0.5
CONDUCTIVITY, (UMHOS/CM)		1520	1540	1520	1490	1.42
PH	UNITS	8.41	8.20	8.20	8.17	5.71
SULFATE	MG/L	200	-	-	-	<0.3
TOTAL DISSOLVED SOLIDS	MG/L	1100	-	-	-	10
TOTAL ORGANIC CARBON	MG/L	2.0	1.2	1.2	1.3	1.3
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103573

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

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	32	33	34
CONDUCTIVITY, (UMHOS/CM)		1.28	1.23	1.08
PH	UNITS	6.05	5.92	5.76
TOTAL ORGANIC CARBON	MG/L	0.9	0.6	<0.5
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103598

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

DATE RECEIVED : 03/07/91
REPORT DATE : 04/10/91

PARAMETER	UNITS	14	15	16	18	19
CARBONATE (CACO3)	MG/L	-	-	<1	-	-
BICARBONATE (CACO3)	MG/L	-	-	5	-	-
HYDROXIDE (CACO3)	MG/L	-	-	<1	-	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	-	5	-	-
CHLORIDE	MG/L	-	-	<0.5	-	-
CONDUCTIVITY, (UMHOS/CM)		1700	1720	1.49	1.63	1.51
PH	UNITS	8.14	8.07	5.66	5.92	5.65
PHENOLICS, TOTAL	MG/L	-	-	<0.02	-	-
SULFATE	MG/L	-	-	<0.3	-	-
TOTAL DISSOLVED SOLIDS	MG/L	-	-	10	-	-
TOTAL ORGANIC CARBON	MG/L	5.7	5.5	0.5	0.5	<0.5
TOTAL ORGANIC HALIDE	MG/L	0.011	0.010	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103598

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

DATE RECEIVED : 03/07/91
REPORT DATE : 04/10/91

PARAMETER	UNITS	08	09	10	11	13
CARBONATE (CACO3)	MG/L	-	-	-	<1	-
BICARBONATE (CACO3)	MG/L	-	-	-	456	-
HYDROXIDE (CACO3)	MG/L	-	-	-	<1	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	-	-	456	-
CHLORIDE	MG/L	-	-	-	140	-
CONDUCTIVITY, (UMHOS/CM)		1130	1150	1100	1760	1760
PH	UNITS	8.69	8.69	8.69	8.3	8.18
PHENOLICS, TOTAL	MG/L	-	-	-	<0.02	-
SULFATE	MG/L	-	-	-	200	-
TOTAL DISSOLVED SOLIDS	MG/L	-	-	-	1100	-
TOTAL ORGANIC CARBON	MG/L	1.5	0.9	0.6	5.9	5.1
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	0.013	0.015

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103598

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

DATE RECEIVED : 03/07/91
REPORT DATE : 04/10/91

PARAMETER	UNITS	01	03	04	05	06
CARBONATE (CACO3)	MG/L	48	-	-	-	28
BICARBONATE (CACO3)	MG/L	304	-	-	-	428
HYDROXIDE (CACO3)	MG/L	<1	-	-	-	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	352	-	-	-	456
CHLORIDE	MG/L	51	-	-	-	19
CONDUCTIVITY, (UMHOS/CM)		1080	1110	1090	1110	1150
PH	UNITS	8.92	8.92	8.94	8.94	8.65
PHENOLICS, TOTAL	MG/L	<0.02	-	-	-	<0.02
SULFATE	MG/L	160	-	-	-	150
TOTAL DISSOLVED SOLIDS	MG/L	710	-	-	-	740
TOTAL ORGANIC CARBON	MG/L	1.9	0.8	0.6	0.7	0.5
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103660

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

DATE RECEIVED : 03/09/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	01	03	04	05	06
CARBONATE (CACO3)	MG/L	32	-	-	-	48
BICARBONATE (CACO3)	MG/L	314	-	-	-	304
HYDROXIDE (CACO3)	MG/L	<1	-	-	-	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	346	-	-	-	352
CHLORIDE	MG/L	67	-	-	-	59
CONDUCTIVITY, (UMHOS/CM)		1100	1160	1140	1130	1120
PH	UNITS	8.87	8.97	8.95	8.94	8.83
PHENOLICS, TOTAL	MG/L	<0.02	-	-	-	<0.02
SULFATE	MG/L	160	-	-	-	160
TOTAL DISSOLVED SOLIDS	MG/L	700	-	-	-	690
TOTAL ORGANIC CARBON	MG/L	1.0	0.8	1.6	0.7	0.8
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103660

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

DATE RECEIVED : 03/09/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	08	09	10
CONDUCTIVITY, (UMHOS/CM)		1100	1130	1130
PH	UNITS	8.96	8.95	8.95
TOTAL ORGANIC CARBON	MG/L	<0.5	1.6	0.8
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103659

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

DATE RECEIVED : 03/09/91
REPORT DATE : 03/28/91

PARAMETER	UNITS	01	02	03
CARBONATE (CACO3)	MG/L	12	<1	<1
BICARBONATE (CACO3)	MG/L	376	656	624
HYDROXIDE (CACO3)	MG/L	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	388	656	624
CHLORIDE	MG/L	41	45	41
CONDUCTIVITY, (UMHOS/CM)		1290	1220	1280
PH	UNITS	8.47	7.97	8.06
SULFATE	MG/L	220	10	17
TOTAL DISSOLVED SOLIDS	MG/L	830	910	840

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

ATI I.D. 109877

October 16, 1991

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

Project Name/Number: Permit

Attention: Claud Rosendale

On 09/25/91, 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.

TOC/TOX analyses were performed by ATI, San Diego.

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

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

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

ATI I.D. : 109901

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-1	AQUEOUS	09/25/91
02	MW-1	AQUEOUS	09/25/91
03	MW-1	AQUEOUS	09/25/91
04	MW-1	AQUEOUS	09/25/91
05	MW-2	AQUEOUS	09/25/91
06	MW-2	AQUEOUS	09/25/91
07	MW-2	AQUEOUS	09/25/91
08	MW-2	AQUEOUS	09/25/91
09	TRIP BLANK	AQUEOUS	09/25/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	9

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. : 109901

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	01	02	03	04	05
CONDUCTIVITY, (UMHOS/CM)		1090	-	-	-	1120
PH	UNITS	8.95	-	-	-	8.95
TOTAL ORGANIC CARBON	MG/L	1.6	1.5	2.7	1.4	1.6
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 109901

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	06	07	08
TOTAL ORGANIC CARBON	MG/L	1.9	3.4	2.8
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109901

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CONDUCTIVITY(UMHOS/CM)		10989905	1720	1730	0.6	NA	NA	NA
PH	UNITS	10989901	8.69	8.70	0.1	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	10989903	1.4	1.3	7	22.2	20.0	104
TOTAL ORGANIC HALIDE	MG/L	10990105	<0.008	<0.008	NA	0.098	0.10	98

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

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 10$$

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 109901

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	01	05
CHROMIUM	MG/L	<0.010	<0.010
LEAD	MG/L	0.003	<0.002

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109901

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHROMIUM	MG/L	10989701	<0.010	<0.010	NA	0.989	1.00	99
LEAD	MG/L	10989702	0.006	0.007	15	0.053	0.050	94

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990101

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/25/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/26/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-1	DATE ANALYZED	: 09/30/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990101

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5
SURROGATE PERCENT RECOVERIES	
1,2-DICHLOROETHANE-D4 (%)	96
BFB (%)	99
TOLUENE-D8 (%)	97

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10990101

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990105

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/25/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/26/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-2	DATE ANALYZED	: 09/30/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990105

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5
SURROGATE PERCENT RECOVERIES	
1,2-DICHLOROETHANE-D4 (%)	97
BFB (%)	99
TOLUENE-D8 (%)	97

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10990105

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990109

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/25/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/26/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: TRIP BLANK	DATE ANALYZED	: 09/30/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990109

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	93
BFB (%)	98
TOLUENE-D8 (%)	97

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10990109

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 109901
PROJECT #	: (NONE)	DATE EXTRACTED	: 09/30/91
PROJECT NAME	: PERMIT	DATE ANALYZED	: 09/30/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
ETHYL METHACRYLATE	<5
ETHANOL	<100

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 109901

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BFB (%)	101
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 109901

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT
REF I.D. : 10999913

DATE ANALYZED : 09/30/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<5	50	47	94	45	90	4
TRICHLOROETHENE	<5	50	49	98	47	94	4
CHLOROBENZENE	<5	50	51	102	49	98	4
TOLUENE	<5	50	49	98	47	94	4
BENZENE	<5	50	41	82	40	80	2

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

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

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 9-25-91 PAGE 1 OF 1

PROJECT MANAGER: Claud Rosendale

COMPANY: Giant Refining Co
ADDRESS: Rt 3 Box 7J
Gallup N.M. 87301

BILL TO:
COMPANY: Same
ADDRESS:

SAMPLERS: (Signature) Claud Rosendale
PHONE NUMBER 505 722-0217

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	pH, E.C.	Total Chromium + Lead	TOX	TOC	8240 Volatiles										NUMBER OF CONTAINERS
MW-1	9-25-91	0800	Water	1-4	X	X	X	X	X										12
																			1
MW-2	9-25-91	0820	Water	5-9	X	X	X	X	X										12
Trip Blank			Water	10					X										1

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO: —		TOTAL NO. OF CONTAINERS	25
PROJECT NAME: Permit		CHAIN OF CUSTODY SEALS	N.A
P.O. NO. 01413		INTACT?	Y
SHIPPED VIA: Fed Ex		RECEIVED GOOD COND./COLD	Y
SAMPLE DISPOSAL INSTRUCTIONS		LAB NUMBER	109901
☒ ATI	☐ RETURN		

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

TAT: (NORMAL) X (RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK

Comments: 8240 See Attached

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 13:00	Signature: Time:	Signature: Time:
Printed Name: Claud Rosendale Date 9-25-91	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: R. Tubeszewski Time: 11:45
Printed Name: Date:	Printed Name: Date:	Printed Name: R. Tubeszewski Date: 9/26
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

TABLE 1 - GROUNDWATER SAMPLING SCHEDULE
ANNUAL PARAMETERS (MARCH OR APRIL)

ELL #/PARAM	pH	CONDUCT	TOC*	TOX*	TDS	ALKAL. BICARB.	ALKAL. CARB.	CHLORIDE	SULFATE	PHENOL	TCL-VOL ORG(8240)	VOA-BTEX 8020	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Mn	K	Se	Ag	Na
W-1	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-2	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-4	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-5	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-11	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-1	X	X			X	X	X	X	X			X							X	X		X			X
W-2	X	X			X	X	X	X	X			X							X	X		X			X
W-3	X	X			X	X	X	X	X			X							X	X		X			X
MW-1	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
MW-2	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
MW-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
MW-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
MW-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X

SEMI-ANNUAL PARAMETERS (SEPT. OR OCT.)

	pH	COND	TOC*	TOX*	TOTAL METALS Cr	Pb	TCL-VOL ORG(8240)
MW-1	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X
SMW-1	X	X	X	X	X	X	X
SMW-2	X	X	X	X	X	X	X
SMW-3	X	X	X	X	X	X	X
SMW-4	X	X	X	X	X	X	X
SMW-5	X	X	X	X	X	X	X
SMW-6	X	X	X	X	X	X	X

* 4 REPLICATES
\+ 2 REPLICATES

12 sets 2 replicates of 6 sets

Annual
Waste Waters

API Effluent
1. BOD
2. COD
3. TOC
4. TDS

Aerated Lagoon Effluent
1. pH
2. BOD
3. COD
4. TOC
5. TDS
6. Sulfide (total)
7. Metals - (As, Cd, Cr, Pb, Hg, Ni, Se)
8. Oil + Grease
9. 8240 (Attached)
10. 8270 (Attached)

TABLE-4

RECOMMENDED ANALYTICAL METHODS

Parameter	Method
pH (Liquid)	221, 9040
Specific Conductance	120.1
Total Organic Carbon (TOC) 4 replicates	505, 9060
Total Organic Halogen (TOX) 4 replicates	9020
Total Dissolved Solids (TDS)	160.1
Alkalinity as Bicarbonate	310.1
Alkalinity as Carbonate	310.1
Chloride	300.0
Sulfate	300.0
Phenol	420.1, 9065
Metals	-
Arsenic	303E, 206.2,7060
Barium	303A, 200.7, 6010
Cadmium	200.7, 6010
Calcium	200.7, 6010
Chromium Total	303A, 200.7, 6010
Lead Total	303A, 239.2, 7421
Magnesium	200.7, 6010
Manganese	200.7, 6010
Mercury	245.1, 7470
Potassium	200.7, 6010
Selenium	270.2, 7740
Silver	200.7, 6010
Sodium	200.7, 6010
Oil & Grease	413.1, 9071
pH (Solid)	9045
Carbon	9060
Nitrogen	353.2
Phosphorus	365.3
Total Solids (Solids)	160.3
VOA (BTEX) (Liquid & Solid)	8020
Benzene	-
Toluene	-
Ethyl benzene	-
Xylene (m, o & p)	-
TCL Volatile Organics (Liquids)	8240
Chloromethane	-
Bromomethane	-
Vinyl chloride	-
Chloroethane	-
Methylene chloride	-
Acetone	-
Carbon disulfide	-
1,1 - Dichloroethene	-
1,1 - Dichloroethane	-
1,2 - Dichloroethene (cis/trans)	-

Chloroform	-	
1,2-Dichloroethane	-	
2-Butanone	-	
1,1,1-Trichloroethane	-	
Carbon tetrachloride	-	
Vinyl acetate	-	
Bromodichloromethane	-	
1,2 - Dichloropropane	-	
trans-1,3-Dichloropropene	-	
Trichloroethene	-	
Chlorodibromomethane	-	
1,1,2-Trichloroethane	-	
Benzene	-	
cis-1,3-Dichloropropene	-	
2-Chloroethyl vinyl ether	-	
Bromoform	-	
4-Methyl-2-pentanone	-	
2-Hexanone	-	
1,1,2,2,-Tetrachloroethane	-	
Tetrachloroethene	-	
Toluene	-	
Chlorobenzene	-	
Ethyl benzene	-	
Styrene	-	
Xylenes (total)	-	
1,1,2 Trichloro-1,2,2-trifluorethane	-	
1,2-Dibromomethane	-	
1,2-Dichlorobenzene	-	
1,3-Dichlorobenzene	-	
1,4-Dichlorobenzene	-	
Refinery Hazardous Const. Semivolatiles (Solids)		8270
Benzo(a)pyrene	-	
Chrysene	-	
1-Methylnaphthalene	-	
Phenanthrene	-	
Pyrene	-	
o-Cresol	-	
m & p Cresol	-	

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO. DATE RECEIVED : 09/26/91
PROJECT # : (NONE)
PROJECT NAME : PERMIT REPORT DATE : 10/16/91
ATI I.D. : 109899

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-4	AQUEOUS	09/25/91
02	MW-4	AQUEOUS	09/25/91
03	MW-4	AQUEOUS	09/25/91
04	MW-4	AQUEOUS	09/25/91
05	OW-11	AQUEOUS	09/25/91
06	OW-11	AQUEOUS	09/25/91
07	OW-11	AQUEOUS	09/25/91
08	OW-11	AQUEOUS	09/25/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	8

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. : 109899

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	01	02	03	04	05
CONDUCTIVITY, (UMHOS/CM)		1120	-	-	-	1720
PH	UNITS	8.69	-	-	-	8.26
TOTAL ORGANIC CARBON	MG/L	1.2	3.1	1.4	1.3	6.5
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	0.021

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 109899

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	06	07	08
TOTAL ORGANIC CARBON	MG/L	4.4	4.7	4.3
TOTAL ORGANIC HALIDE	MG/L	0.032	0.025	0.022

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109899

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CONDUCTIVITY(UMHOS/CM)		10989905	1720	1730	0.6	NA	NA	NA
PH	UNITS	10989901	8.69	8.70	0.1	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	10989903	1.4	1.3	7	22.2	20.0	104
TOTAL ORGANIC HALIDE	MG/L	10989901	<0.008	<0.008	NA	0.091	0.10	91

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

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

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 109899

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	01	05
CHROMIUM	MG/L	<0.010	<0.010
LEAD	MG/L	<0.002	0.002

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109899

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHROMIUM	MG/L	10989701	<0.010	<0.010	NA	0.989	1.00	99
LEAD	MG/L	10989702	0.006	0.007	15	0.053	0.050	94

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10989901

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/25/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/26/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-4	DATE ANALYZED	: 09/30/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10989901

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5
SURROGATE PERCENT RECOVERIES	
1,2-DICHLOROETHANE-D4 (%)	96
BFB (%)	99
TOLUENE-D8 (%)	97

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10989901

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10989905

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/25/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/26/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-11	DATE ANALYZED	: 09/30/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10989905

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5
SURROGATE PERCENT RECOVERIES	
1,2-DICHLOROETHANE-D4 (%)	96
BFB (%)	100
TOLUENE-D8 (%)	98

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10989905

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10989905

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 109899
PROJECT #	: (NONE)	DATE EXTRACTED	: 09/30/91
PROJECT NAME	: PERMIT	DATE ANALYZED	: 09/30/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
ETHYL METHACRYLATE	<5
ETHANOL	<100

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 109899

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BFB (%)	101
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 109899

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT
REF I.D. : 10999913

DATE ANALYZED : 09/30/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<5	50	47	94	45	90	4
TRICHLOROETHENE	<5	50	49	98	47	94	4
CHLOROBENZENE	<5	50	51	102	49	98	4
TOLUENE	<5	50	49	98	47	94	4
BENZENE	<5	50	41	82	40	80	2

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

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

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 9-25-91 PAGE 1 OF 1

PROJECT MANAGER: Claud Rosenbalm

COMPANY: Giant Refining Co
ADDRESS: R-3 Box 7
Gallup, NM 8730

BILL TO:
COMPANY: Same
ADDRESS:

SAMPLERS: (Signature) — PHONE NUMBER: (505) 722-5217

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	pH, EC	Total Chromium, Lead	TOX	TDS	8240 Volatiles									NUMBER OF CONTAINERS
MW-4	9-25-91	0950	Water		X	X	X	X	X									12
MW-11	9-25-91	0930	Water		X	X	X	X	X									12

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO:		TOTAL NO. OF CONTAINERS	32
PROJECT NAME: Form T		CHAIN OF CUSTODY SEALS	NA
P.O. NO. 01413		INTACT?	Y
SHIPPED VIA: Fed Ex		RECEIVED GOOD COND./COLD	Y
SAMPLE DISPOSAL INSTRUCTIONS		LAB NUMBER	109899
☒ ATI	☐ RETURN		

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

TAT: (NORMAL) X (RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK

Comments: 8240 See Attached.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 17:00	Signature: Time:	Signature: Time:
Printed Name: Date 9-25-91	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time: R. Tubesezewski 11:30
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: R. Tubesezewski 9/26
Company:	Company:	Analytical Technologies, Inc.

TABLE 1 - GROUNDWATER SAMPLING SCHEDULE
ANNUAL PARAMETERS (MARCH OR APRIL)

L #/PARAM	pH	CONDUCT	TOC*	TOX*	TDS	ALKAL. BICARB.	ALKAL. CARB.	CHLORIDE	SULFATE	PHENOL	TCL-VOL ORG(8240)	VOA-BTEX 8020	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Mn	K	Se	Ag	Na
1	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
4	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
11	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-1	X	X			X	X	X	X	X			X							X	X		X			X
-2	X	X			X	X	X	X	X			X							X	X		X			X
-3	X	X			X	X	X	X	X			X							X	X		X			X
W-1	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-2	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X

SEMI-ANNUAL PARAMETERS (SEPT. OR OCT.)

	pH#	COND#	TOC*	TOX*	TOTAL METALS Cr	Pb	TCL-VOL ORG(8240)
-1	X	X	X	X	X	X	X
-2	X	X	X	X	X	X	X
-4	X	X	X	X	X	X	X
-5	X	X	X	X	X	X	X
-11	X	X	X	X	X	X	X
W-1	X	X	X	X	X	X	X
W-2	X	X	X	X	X	X	X
W-3	X	X	X	X	X	X	X
W-4	X	X	X	X	X	X	X
W-5	X	X	X	X	X	X	X
W-6	X	X	X	X	X	X	X

* 4 REPLICATES
\+ 2 REPLICATES

12 SITS 2 set sets of 6 sites
2 replicates

Annual
~~Waste Waters~~

API Effluent
1. BOD
2. COD
3. TOC
4. TDS

Aerated Lagoon Effluent
1. pH
2. BOD
3. COD
4. TOC
5. TDS
6. Sulfide (total)
7. Metals - (As, Cd, Cr, Pb, Hg, Ni, Se)
8. Oil + Grease
9. 8240 (Attached)
10. 8270 (Attached)

TABLE-4

RECOMMENDED ANALYTICAL METHODS

Parameter	Method
pH (Liquid)	221, 9040
Specific Conductance	120.1
Total Organic Carbon (TOC) 4 replicates	505, 9060
Total Organic Halogen (TOX) 4 replicates	9020
Total Dissolved Solids (TDS)	160.1
Alkalinity as Bicarbonate	310.1
Alkalinity as Carbonate	310.1
Chloride	300.0
Sulfate	300.0
Phenol	420.1, 9065
Metals	-
Arsenic	303E, 206.2,7060
Barium	303A, 200.7, 6010
Cadmium	200.7, 6010
Calcium	200.7, 6010
Chromium Total	303A, 200.7, 6010
Lead Total	303A, 239.2, 7421
Magnesium	200.7, 6010
Manganese	200.7, 6010
Mercury	245.1, 7470
Potassium	200.7, 6010
Selenium	270.2, 7740
Silver	200.7, 6010
Sodium	200.7, 6010
Oil & Grease	413.1, 9071
pH (Solid)	9045
Carbon	9060
Nitrogen	353.2
Phosphorus	365.3
Total Solids (Solids)	160.3
VOA (BTEX) (Liquid & Solid)	8020
Benzene	-
Toluene	-
Ethyl benzene	-
Xylene (m, o & p)	-
TCL Volatile Organics (Liquids)	8240
Chloromethane	-
Bromomethane	-
Vinyl chloride	-
Chloroethane	-
Methylene chloride	-
Acetone	-
Carbon disulfide	-
1,1 - Dichloroethene	-
1,1 - Dichloroethane	-
1,2 - Dichloroethene (cis/trans)	-

Chloroform	-	
1,2-Dichloroethane	-	
2-Butanone	-	
1,1,1-Trichloroethane	-	
Carbon tetrachloride	-	
Vinyl acetate	-	
Bromodichloromethane	-	
1,2 - Dichloropropane	-	
trans-1,3-Dichloropropene	-	
Trichloroethene	-	
Chlorodibromomethane	-	
1,1,2-Trichloroethane	-	
Benzene	-	
cis-1,3-Dichloropropene	-	
2-Chloroethyl vinyl ether	-	
Bromoform	-	
4-Methyl-2-pentanone	-	
2-Hexanone	-	
1,1,2,2,-Tetrachloroethane	-	
Tetrachloroethene	-	
Toluene	-	
Chlorobenzene	-	
Ethyl benzene	-	
Styrene	-	
Xylenes (total)	-	
1,1,2 Trichloro-1,2,2-trifluorethane	-	
1,2-Dibromomethane	-	
1,2-Dichlorobenzene	-	
1,3-Dichlorobenzene	-	
1,4-Dichlorobenzene	-	
Refinery Hazardous Const. Semivolatiles (Solids)		8270
Benzo(a)pyrene	-	
Chrysene	-	
1-Methylnaphthalene	-	
Phenanthrene	-	
Pyrene	-	
o-Cresol	-	
m & p Cresol	-	

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

ATI I.D. : 109905

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-5	AQUEOUS	09/25/91
02	MW-5	AQUEOUS	09/25/91
03	MW-5	AQUEOUS	09/25/91
04	MW-5	AQUEOUS	09/25/91
05	MW-D	AQUEOUS	09/25/91
06	MW-D	AQUEOUS	09/25/91
07	MW-D	AQUEOUS	09/25/91
08	MW-D	AQUEOUS	09/25/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	8

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. : 109905

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91

REPORT DATE : 10/16/91

PARAMETER	UNITS	01	02	03	04	05
CONDUCTIVITY, (UMHOS/CM)		1110	-	-	-	1120
PH	UNITS	8.99	-	-	-	8.98
TOTAL ORGANIC CARBON	MG/L	1.3	1.0	1.0	2.0	0.9
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 109905

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	06	07	08
TOTAL ORGANIC CARBON	MG/L	0.8	0.8	1.3
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109905

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CONDUCTIVITY(UMHOS/CM)		10989905	1720	1730	0.6	NA	NA	NA
PH	UNITS	10989901	8.69	8.70	0.1	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	10989903	1.4	1.3	7	22.2	20.0	104
TOTAL ORGANIC HALIDE	MG/L	10990501	<0.008	<0.008	NA	0.098	0.10	98

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

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

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 109905

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/26/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	01	05
CHROMIUM	MG/L	<0.010	<0.010
LEAD	MG/L	<0.002	<0.002

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109905

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHROMIUM	MG/L	10989701	<0.010	<0.010	NA	0.989	1.00	99
LEAD	MG/L	10989702	0.006	0.007	15	0.053	0.050	94

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990501

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/25/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/26/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-5	DATE ANALYZED	: 09/27/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990501

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BFB (%)	101
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10990501

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990505

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/25/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/26/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-D	DATE ANALYZED	: 09/27/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10990505

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5
SURROGATE PERCENT RECOVERIES	
1,2-DICHLOROETHANE-D4 (%)	101
BFB (%)	101
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10990505

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 109905
PROJECT #	: (NONE)	DATE EXTRACTED	: 09/27/91
PROJECT NAME	: PERMIT	DATE ANALYZED	: 09/27/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
ETHYL METHACRYLATE	<5
ETHANOL	<100

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 109905

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

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

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 109905

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT
REF I.D. : 10999912

DATE ANALYZED : 09/27/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<5	50	49	98	48	96	2
TRICHLOROETHENE	<5	50	49	98	48	96	2
CHLOROBENZENE	<5	50	51	102	50	100	2
TOLUENE	<5	50	49	98	49	98	0
BENZENE	<5	50	42	84	42	84	0

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

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

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 9-25-91 PAGE ___ OF ___

PROJECT MANAGER: Claud Rosendale

COMPANY: Giant Refining Co
ADDRESS: R-3 Box 7
Gallup, NM 87301

BILL TO:
COMPANY: Same
ADDRESS:

Claud Rosendale
SAMPLERS: (Signature)

(505) 722-0217
PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	pH, E.C.	Total Chromium & Lead	TOX	TOC	8240 Volatiles									NUMBER OF CONTAINERS
MW-5	9-25-91	0730	Water		X	X	X	X	X									12
MW-D	9-25-91	0730	Water		X	X	X	X	X									12

PROJECT INFORMATION	
PROJECT NO:	
PROJECT NAME: Perm. T	
P.O. NO. 01413	
SHIPPED VIA: Fed. Ex.	
SAMPLE DISPOSAL INSTRUCTIONS	
☒ ATI	☐ RETURN

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	24
CHAIN OF CUSTODY SEALS	NA
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	109905

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

TAT: (NORMAL) X (RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK

Comments:
8240 - See Attached

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 1500	Signature: Time:	Signature: Time:
Printed Name: Claud Rosendale Date 9-25-91	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: R. Tubeszewski Time: 2pm
Printed Name: Date:	Printed Name: Date:	Printed Name: R. Tubeszewski Date: 9/26
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

TABLE 1 - GROUNDWATER SAMPLING SCHEDULE
ANNUAL PARAMETERS (MARCH OR APRIL)

ELL #/PARAM	pH	CONDUCT	TOC*	TOX*	TDS	ALKAL. BICARB.	ALKAL. CARB.	CHLORIDE	SULFATE	PHENOL	TCL-VOL ORG(8240)	VOA-BTEX 8020	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Na	K	Se	Ag	Ba
W-1	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-2	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-4	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-5	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-11	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
W-1	X	X			X	X	X	X	X			X							X	X		X			X
W-2	X	X			X	X	X	X	X			X							X	X		X			X
W-3	X	X			X	X	X	X	X			X							X	X		X			X
MW-1	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
MW-2	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
MW-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
MW-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
MW-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X

SEMI-ANNUAL PARAMETERS (SEPT. OR OCT.)

	pH#	COND#	TOC*	TOX*	TOTAL METALS Cr	Pb	TCL-VOL ORG(8240)
MW-1	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X
SMW-1	X	X	X	X	X	X	X
SMW-2	X	X	X	X	X	X	X
SMW-3	X	X	X	X	X	X	X
SMW-4	X	X	X	X	X	X	X
SMW-5	X	X	X	X	X	X	X
SMW-6	X	X	X	X	X	X	X

* 4 REPLICATES
\+ 2 REPLICATES

12 sets - 2 set chain of 6 sets
[illegible]

Annual
~~Waste Waters~~

API Effluent
1. BOD
2. COD
3. TOC
4. TDS

Aerated Lagoon Effluent
1. pH
2. BOD
3. COD
4. TOC
5. TDS
6. Sulfide (total)
7. Metals - (As, Cd, Cr, Pb, Hg, Ni, Se)
8. Oil + Grease
9. 8240 (Attached)
10. 8270 (Attached)

TABLE-4

RECOMMENDED ANALYTICAL METHODS

Parameter	Method
pH (Liquid)	221, 9040
Specific Conductance	120.1
Total Organic Carbon (TOC) 4 replicates	505, 9060
Total Organic Halogen (TOX) 4 replicates	9020
Total Dissolved Solids (TDS)	160.1
Alkalinity as Bicarbonate	310.1
Alkalinity as Carbonate	310.1
Chloride	300.0
Sulfate	300.0
Phenol	420.1, 9065
Metals	-
Arsenic	303E, 206.2,7060
Barium	303A, 200.7, 6010
Cadmium	200.7, 6010
Calcium	200.7, 6010
Chromium Total	303A, 200.7, 6010
Lead Total	303A, 239.2, 7421
Magnesium	200.7, 6010
Manganese	200.7, 6010
Mercury	245.1, 7470
Potassium	200.7, 6010
Selenium	270.2, 7740
Silver	200.7, 6010
Sodium	200.7, 6010
Oil & Grease	413.1, 9071
pH (Solid)	9045
Carbon	9060
Nitrogen	353.2
Phosphorus	365.3
Total Solids (Solids)	160.3
VOA (BTEX) (Liquid & Solid)	8020
Benzene	-
Toluene	-
Ethyl benzene	-
Xylene (m, o & p)	-
TCL Volatile Organics (Liquids)	8240
Chloromethane	-
Bromomethane	-
Vinyl chloride	-
Chloroethane	-
Methylene chloride	-
Acetone	-
Carbon disulfide	-
1,1 - Dichloroethene	-
1,1 - Dichloroethane	-
1,2 - Dichloroethene (cis/trans)	-

Chloroform	-	
1,2-Dichloroethane	-	
2-Butanone	-	
1,1,1-Trichloroethane	-	
Carbon tetrachloride	-	
Vinyl acetate	-	
Bromodichloromethane	-	
1,2 - Dichloropropane	-	
trans-1,3-Dichloropropene	-	
Trichloroethene	-	
Chlorodibromomethane	-	
1,1,2-Trichloroethane	-	
Benzene	-	
cis-1,3-Dichloropropene	-	
2-Chloroethyl vinyl ether	-	
Bromoform	-	
4-Methyl-2-pentanone	-	
2-Hexanone	-	
1,1,2,2,-Tetrachloroethane	-	
Tetrachloroethene	-	
Toluene	-	
Chlorobenzene	-	
Ethyl benzene	-	
Styrene	-	
Xylenes (total)	-	
1,1,2 Trichloro-1,2,2-trifluorethane	-	
1,2-Dibromomethane	-	
1,2-Dichlorobenzene	-	
1,3-Dichlorobenzene	-	
1,4-Dichlorobenzene	-	
Refinery Hazardous Const. Semivolatiles (Solids)		8270
Benzo(a)pyrene	-	
Chrysene	-	
1-Methylnaphthalene	-	
Phenanthrene	-	
Pyrene	-	
o-Cresol	-	
m & p Cresol	-	

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

ATI I.D. : 109877

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SMW-1	AQUEOUS	09/24/91
02	SMW-1	AQUEOUS	09/24/91
03	SMW-1	AQUEOUS	09/24/91
04	SMW-1	AQUEOUS	09/24/91
05	SMW-2	AQUEOUS	09/24/91
06	SMW-2	AQUEOUS	09/24/91
07	SMW-2	AQUEOUS	09/24/91
08	SMW-2	AQUEOUS	09/24/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	8

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. : 109877

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	06	07	08
TOTAL ORGANIC CARBON	MG/L	8.7	11.2	9.5
TOTAL ORGANIC HALIDE	MG/L	0.031	0.040	0.038

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109877

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CONDUCTIVITY(UMHOS/CM)		10987905	1610	1600	0.6	NA	NA	NA
PH	UNITS	10987901	8.75	8.75	0	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	10987605	1.4	1.3	7	22.1	20.0	104
TOTAL ORGANIC HALIDE	MG/L	10987701	0.076	0.080	5	0.284	0.20	104

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

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

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 109877

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	01	05
CHROMIUM	MG/L	0.058	0.168
LEAD	MG/L	0.008	0.010

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109877

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHROMIUM	MG/L	10987601	0.010	<0.010	NA	0.102	0.100	92
LEAD	MG/L	10988201	0.003	0.003	0	0.051	0.050	96

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987701

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/24/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/25/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-1	DATE ANALYZED	: 09/27/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987701

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	98
BFB (%)	101
TOLUENE-D8 (%)	99

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10987701

COMPOUNDS	RESULTS
OXYGENATED HYDROCARBON C5	9
SULFIDE HYDROCARBONS C5-C7	600
HYDROCARBONS C9-C11	900
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987705

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/24/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/25/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-2	DATE ANALYZED	: 09/27/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987705

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BFB (%)	102
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10987705

COMPOUNDS	RESULTS
SULFIDE HYDROCARBONS C5-C7	100
HYDROCARBONS C9-C11	1000
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 109877
PROJECT #	: (NONE)	DATE EXTRACTED	: 09/27/91
PROJECT NAME	: PERMIT	DATE ANALYZED	: 09/27/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
ETHYL METHACRYLATE	<5
ETHANOL	<100

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 109877

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

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

Analytical Technologies, Inc.

QUALITY CONTROL DATA

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 109877

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT
REF I.D. : 10999912

DATE ANALYZED : 09/27/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<5	50	49	98	48	96	2
TRICHLOROETHENE	<5	50	49	98	48	96	2
CHLOROBENZENE	<5	50	51	102	50	100	2
TOLUENE	<5	50	49	98	49	98	0
BENZENE	<5	50	42	84	42	84	0

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

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

Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 9-24-91 PAGE 1 OF 1

PROJECT MANAGER: Claud Rosendale

COMPANY: Giant Refining Co
ADDRESS: R-3 Box 7
Gallup, NM 87301

BILL TO:
COMPANY: Same
ADDRESS:

SAMPLERS: (Signature) — PHONE NUMBER: 505 722-0217

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	pH, E.C.	Total Chromium & Lead	TOX	TOC	8240 Volatiles									NUMBER OF CONTAINERS
SMW-1	9-24-91	8:00 am	Water	1-4	X	X	X	X	X									12
SMW-2	9-24-91	8:40 am	Water	5-8	X	X	X	X	X									12

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO:		TOTAL NO. OF CONTAINERS	24
PROJECT NAME: Permit		CHAIN OF CUSTODY SEALS	Y
P.O. NO. 01413		INTACT?	Y
SHIPPED VIA: Fed Ex.		RECEIVED GOOD COND./COLD	Y
SAMPLE DISPOSAL INSTRUCTIONS		LAB NUMBER 109877	
☒ ATI	☐ RETURN		

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

TAT: (NORMAL) (RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK

Comments: 8240 - See attached

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 13:00	Signature: Time:	Signature: Time:
Printed Name: Claud Rosendale Date: 9-24-91	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Linda Estrelinco Time: 10:00
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Estrelinco Date: 9/25/91
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

TABLE 1 - GROUNDWATER SAMPLING SCHEDULE
ANNUAL PARAMETERS (MARCH OR APRIL)

L #/PARAM	pH	CONDUCT	TOC*	TOX*	TDS	ALKAL. BICARB.	ALKAL. CARB.	CHLORIDE	SULFATE	PHENOL	TCL-VOL ORG(8240)	VOA-BTEX 8020	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Mn	K	Se	Ag	Na
-1	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-2	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-4	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-5	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-11	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-1	X	X			X	X	X	X	X			X							X	X		X			X
-2	X	X			X	X	X	X	X			X							X	X		X			X
-3	X	X			X	X	X	X	X			X							X	X		X			X
W-1	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-2	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X

SEMI-ANNUAL PARAMETERS (SEPT. OR OCT.)

	pH#	COND#	TOC*	TOX*	TOTAL METALS Cr	Pb	TCL-VOL ORG(8240)
-1	X	X	X	X	X	X	X
-2	X	X	X	X	X	X	X
-4	X	X	X	X	X	X	X
-5	X	X	X	X	X	X	X
-11	X	X	X	X	X	X	X
W-1	X	X	X	X	X	X	X
W-2	X	X	X	X	X	X	X
W-3	X	X	X	X	X	X	X
W-4	X	X	X	X	X	X	X
W-5	X	X	X	X	X	X	X
W-6	X	X	X	X	X	X	X

* 4 REPLICATES
\+ 2 REPLICATES

12 SITS 2 [illegible] of 6 SITS [illegible]

Annual / ~~Waste Waters~~

API Effluent
1. BOD
2. COD
3. TOC
4. TDS

Aerated Lagoon Effluent
1. pH
2. BOD
3. COD
4. TOC
5. TDS
6. Sulfide (total)
7. Metals - (As, Cd, Cr, Pb, Hg, Ni, Se)
8. Oil + Grease
9. 8240 (Attached)
10. 8270 (Attached)

TABLE-4

RECOMMENDED ANALYTICAL METHODS

Parameter	Method
pH (Liquid)	221, 9040
Specific Conductance	120.1
Total Organic Carbon (TOC) 4 replicates	505, 9060
Total Organic Halogen (TOX) 4 replicates	9020
Total Dissolved Solids (TDS)	160.1
Alkalinity as Bicarbonate	310.1
Alkalinity as Carbonate	310.1
Chloride	300.0
Sulfate	300.0
Phenol	420.1, 9065
Metals	-
Arsenic	303E, 206.2,7060
Barium	303A, 200.7, 6010
Cadmium	200.7, 6010
Calcium	200.7, 6010
Chromium Total	303A, 200.7, 6010
Lead Total	303A, 239.2, 7421
Magnesium	200.7, 6010
Manganese	200.7, 6010
Mercury	245.1, 7470
Potassium	200.7, 6010
Selenium	270.2, 7740
Silver	200.7, 6010
Sodium	200.7, 6010
Oil & Grease	413.1, 9071
pH (Solid)	9045
Carbon	9060
Nitrogen	353.2
Phosphorus	365.3
Total Solids (Solids)	160.3
VOA (BTEX) (Liquid & Solid)	8020
Benzene	-
Toluene	-
Ethyl benzene	-
Xylene (m, o & p)	-
TCL Volatile Organics (Liquids)	8240
Chloromethane	-
Bromomethane	-
Vinyl chloride	-
Chloroethane	-
Methylene chloride	-
Acetone	-
Carbon disulfide	-
1,1 - Dichloroethene	-
1,1 - Dichloroethane	-
1,2 - Dichloroethene (cis/trans)	-

Chloroform	-	
1,2-Dichloroethane	-	
2-Butanone	-	
1,1,1-Trichloroethane	-	
Carbon tetrachloride	-	
Vinyl acetate	-	
Bromodichloromethane	-	
1,2 - Dichloropropane	-	
trans-1,3-Dichloropropene	-	
Trichloroethene	-	
Chlorodibromomethane	-	
1,1,2-Trichloroethane	-	
Benzene	-	
cis-1,3-Dichloropropene	-	
2-Chloroethyl vinyl ether	-	
Bromoform	-	
4-Methyl-2-pentanone	-	
2-Hexanone	-	
1,1,2,2,-Tetrachloroethane	-	
Tetrachloroethene	-	
Toluene	-	
Chlorobenzene	-	
Ethyl benzene	-	
Styrene	-	
Xylenes (total)	-	
1,1,2 Trichloro-1,2,2-trifluorethane	-	
1,2-Dibromomethane	-	
1,2-Dichlorobenzene	-	
1,3-Dichlorobenzene	-	
1,4-Dichlorobenzene	-	
Refinery Hazardous Const. Semivolatiles (Solids)		8270
Benzo(a)pyrene	-	
Chrysene	-	
1-Methylnaphthalene	-	
Phenanthrene	-	
Pyrene	-	
o-Cresol	-	
m & p Cresol	-	

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

ATI I.D. : 109876

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SMW-3	AQUEOUS	09/24/91
02	SMW-3	AQUEOUS	09/24/91
03	SMW-3	AQUEOUS	09/24/91
04	SMW-3	AQUEOUS	09/24/91
05	SMW-4	AQUEOUS	09/24/91
06	SMW-4	AQUEOUS	09/24/91
07	SMW-4	AQUEOUS	09/24/91
08	SMW-4	AQUEOUS	09/24/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	8

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. : 109876

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	01	02	03	04	05
CONDUCTIVITY, (UMHOS/CM)		3280	-	-	-	1190
PH	UNITS	8.10	-	-	-	8.56
TOTAL ORGANIC CARBON	MG/L	1.1	4.1	2.7	3.4	1.4
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 109876

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	06	07	08
TOTAL ORGANIC CARBON	MG/L	1.3	1.1	1.2
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109876

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CONDUCTIVITY(UMHOS/CM)		10987905	1610	1600	0.6	NA	NA	NA
PH	UNITS	10987901	8.75	8.75	0	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	10987605	1.4	1.3	7	22.1	20.0	104
TOTAL ORGANIC HALIDE	MG/L	10987601	<0.008	0.010	NA	0.10	0.10	100

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

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

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 109876

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	01	05
CHROMIUM	MG/L	0.010	<0.010
LEAD	MG/L	0.011	0.005

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109876

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHROMIUM	MG/L	10987601	0.010	<0.010	NA	0.102	0.100	92
LEAD	MG/L	10985303	0.003	0.003	0	0.047	0.050	88

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987601

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT
CLIENT I.D. : SMW-3
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 09/24/91
DATE RECEIVED : 09/25/91
DATE EXTRACTED : N/A
DATE ANALYZED : 09/26/91
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987601

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	98
BFB (%)	100
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10987601

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987605

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/24/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/25/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-4	DATE ANALYZED	: 09/26/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987605

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5
SURROGATE PERCENT RECOVERIES	
1,2-DICHLOROETHANE-D4 (%)	98
BFB (%)	100
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10987605

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 109876
PROJECT #	: (NONE)	DATE EXTRACTED	: 09/26/91
PROJECT NAME	: PERMIT	DATE ANALYZED	: 09/26/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
ETHYL METHACRYLATE	<5
ETHANOL	<100

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 109876

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BFB (%)	101
TOLUENE-D8 (%)	98

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 109876

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT
REF I.D. : 10999912

DATE ANALYZED : 09/27/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<5	50	49	98	48	96	2
TRICHLOROETHENE	<5	50	49	98	48	96	2
CHLOROBENZENE	<5	50	51	102	50	100	2
TOLUENE	<5	50	49	98	49	98	0
BENZENE	<5	50	42	84	42	84	0

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

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

Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 9-24-91 PAGE 1 OF 1

PROJECT MANAGER: Claud Rosendale

COMPANY: Giant Refining Co
ADDRESS: R-3 Box 7J
Gallup NM 87301

BILL TO:
COMPANY:
ADDRESS: Same

SAMPLERS: (Signature) Claud Rosendale
PHONE NUMBER (505) 722-0217

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	pH	EC	Total Chromium & Lead	TOX	TOC	8240 Volatiles									NUMBER OF CONTAINERS
SMW-3	9-24-91	9:22	Water	1-4	X	X	X	X	X										12
SMW-4	9-24-91	9:22	Water	5-8	X	X	X	X	X										20

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO:		TOTAL NO. OF CONTAINERS	32
PROJECT NAME: Permit		CHAIN OF CUSTODY SEALS	Y
P.O. NO. 01413		INTACT?	Y
SHIPPED VIA: Fed Ex		RECEIVED GOOD COND./COLD	Y
SAMPLE DISPOSAL INSTRUCTIONS		LAB NUMBER	109876
☒ ATI	☐ RETURN		

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

TAT: (NORMAL) X (RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK

Comments: 8240 - See attached SMW-4-QC sample

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosendale Time: 1300	Signature: Time:	Signature: Time:
Printed Name: Claud Rosendale Date 9-24-91	Printed Name: Date	Printed Name: Date
Company: Giant Refining Co	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Linda Eshelman Time: 10:00
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Eshelman Date: 9/25/91
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

TABLE 1 - GROUNDWATER SAMPLING SCHEDULE
ANNUAL PARAMETERS (MARCH OR APRIL)

L #/PARAM	pH	CONDUCT	TOC*	TOX*	TDS	ALKAL. BICARB.	ALKAL. CARB.	CHLORIDE	SULFATE	PHENOL	TCL-VOL ORG(8240)	VOA-BTEX 8020	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Hg	Mn	K	Se	Ag	Na
-1	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-2	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-4	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-5	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-11	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-1	X	X			X	X	X	X	X			X							X	X		X			X
-2	X	X			X	X	X	X	X			X							X	X		X			X
-3	X	X			X	X	X	X	X			X							X	X		X			X
W-1	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-2	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X

SEMI-ANNUAL PARAMETERS (SEPT. OR OCT.)

	pH#	COND#	TOC*	TOX*	TOTAL METALS Cr	Pb	TCL-VOL ORG(8240)
I-1	X	X	X	X	X	X	X
I-2	X	X	X	X	X	X	X
I-4	X	X	X	X	X	X	X
I-5	X	X	X	X	X	X	X
I-11	X	X	X	X	X	X	X
MW-1	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X
MW-3	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X
MW-6	X	X	X	X	X	X	X

* 4 REPLICATES
\# 2 REPLICATES

12 SITS 2 [illegible] of 6 [illegible]
2 [illegible]

Annual
Waste Waters

API Effluent
1. BOD
2. COD
3. TOC
4. TDS

Aerated Lagoon Effluent
1. pH
2. BOD
3. COD
4. TOC
5. TDS
6. Sulfide (total)
7. Metals - (As, Cd, Cr, Pb, Hg, Ni, Se)
8. Oil + Grease
9. 8240 (Attached)
10. 8270 (Attached)

TABLE-4

RECOMMENDED ANALYTICAL METHODS

Parameter	Method
pH (Liquid)	221, 9040
Specific Conductance	120.1
Total Organic Carbon (TOC) 4 replicates	505, 9060
Total Organic Halogen (TOX) 4 replicates	9020
Total Dissolved Solids (TDS)	160.1
Alkalinity as Bicarbonate	310.1
Alkalinity as Carbonate	310.1
Chloride	300.0
Sulfate	300.0
Phenol	420.1, 9065
Metals	-
Arsenic	303E, 206.2,7060
Barium	303A, 200.7, 6010
Cadmium	200.7, 6010
Calcium	200.7, 6010
Chromium Total	303A, 200.7, 6010
Lead Total	303A, 239.2, 7421
Magnesium	200.7, 6010
Manganese	200.7, 6010
Mercury	245.1, 7470
Potassium 5	200.7, 6010
Selenium	270.2, 7740
Silver	200.7, 6010
Sodium	200.7, 6010
Oil & Grease	413.1, 9071
pH (Solid)	9045
Carbon	9060
Nitrogen	353.2
Phosphorus	365.3
Total Solids (Solids)	160.3
VOA (BTEX) (Liquid & Solid)	8020
Benzene	-
Toluene	-
Ethyl benzene	-
Xylene (m, o & p)	-
TCL Volatile Organics (Liquids)	8240
Chloromethane	-
Bromomethane	-
Vinyl chloride	-
Chloroethane	-
Methylene chloride	-
Acetone	-
Carbon disulfide	-
1,1 - Dichloroethene	-
1,1 - Dichloroethane	-
1,2 - Dichloroethene (cis/trans)	-

Chloroform	-	
1,2-Dichloroethane	-	
2-Butanone	-	
1,1,1-Trichloroethane	-	
Carbon tetrachloride	-	
Vinyl acetate	-	
Bromodichloromethane	-	
1,2 - Dichloropropane	-	
trans-1,3-Dichloropropene	-	
Trichloroethene	-	
Chlorodibromomethane	-	
1,1,2-Trichloroethane	-	
Benzene	-	
cis-1,3-Dichloropropene	-	
2-Chloroethyl vinyl ether	-	
Bromoform	-	
4-Methyl-2-pentanone	-	
2-Hexanone	-	
1,1,2,2,-Tetrachloroethane	-	
Tetrachloroethene	-	
Toluene	-	
Chlorobenzene	-	
Ethyl benzene	-	
Styrene	-	
Xylenes (total)	-	
1,1,2 Trichloro-1,2,2-trifluorethane	-	
1,2-Dibromomethane	-	
1,2-Dichlorobenzene	-	
1,3-Dichlorobenzene	-	
1,4-Dichlorobenzene	-	
Refinery Hazardous Const. Semivolatiles (Solids)		8270
Benzo(a)pyrene	-	
Chrysene	-	
1-Methylnaphthalene	-	
Phenanthrene	-	
Pyrene	-	
o-Cresol	-	
m & p Cresol	-	

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

ATI I.D. : 109879

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SMW-5	AQUEOUS	09/24/91
02	SMW-5	AQUEOUS	09/24/91
03	SMW-5	AQUEOUS	09/24/91
04	SMW-5	AQUEOUS	09/24/91
05	SMW-6	AQUEOUS	09/24/91
06	SMW-6	AQUEOUS	09/24/91
07	SMW-6	AQUEOUS	09/24/91
08	SMW-6	AQUEOUS	09/24/91
09	TRIP BLANK	AQUEOUS	09/24/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	9

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. : 109879

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	01	02	03	04	05
CONDUCTIVITY, (UMHOS/CM)		1170	-	-	-	1610
PH	UNITS	8.75	-	-	-	8.28
TOTAL ORGANIC CARBON	MG/L	2.2	2.2	1.6	1.2	3.2
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 109879

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91
REPORT DATE : 10/16/91

PARAMETER	UNITS	06	07	08
TOTAL ORGANIC CARBON	MG/L	3.0	2.6	2.4
TOTAL ORGANIC HALIDE	MG/L	<0.008	<0.008	<0.008

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT ATI I.D. : 109879

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CONDUCTIVITY(UMHOS/CM)		10987905	1610	1600	0.6	NA	NA	NA
PH	UNITS	10987901	8.75	8.75	0	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	10987605	1.4	1.3	7	22.1	20.0	104
TOTAL ORGANIC HALIDE	MG/L	10987905	<0.008	<0.008	NA	0.088	0.10	88

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

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

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 109879

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

DATE RECEIVED : 09/25/91

REPORT DATE : 10/16/91

PARAMETER	UNITS	01	05
CHROMIUM	MG/L	0.035	0.097
LEAD	MG/L	0.003	0.009

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT

ATI I.D. : 109879

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHROMIUM	MG/L	10987601	0.010	<0.010	NA	0.102	0.100	92
LEAD	MG/L	10988201	0.003	0.003	0	0.051	0.050	96

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987901

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/24/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/25/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-5	DATE ANALYZED	: 09/26/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987901

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5
SURROGATE PERCENT RECOVERIES	
1,2-DICHLOROETHANE-D4 (%)	99
BFB (%)	99
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10987901

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987905

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/24/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/25/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-6	DATE ANALYZED	: 09/26/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987905

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5
SURROGATE PERCENT RECOVERIES	
1,2-DICHLOROETHANE-D4 (%)	99
BFB (%)	100
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10987905

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987909

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 09/24/91
PROJECT #	: (NONE)	DATE RECEIVED	: 09/25/91
PROJECT NAME	: PERMIT	DATE EXTRACTED	: N/A
CLIENT I.D.	: TRIP BLANK	DATE ANALYZED	: 09/26/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10987909

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5
SURROGATE PERCENT RECOVERIES	
1,2-DICHLOROETHANE-D4 (%)	96
BFB (%)	99
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 10987909

COMPOUNDS	RESULTS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<5
1,2-DICHLOROBENZENE	<1
1,3-DICHLOROBENZENE	<1
1,4-DICHLOROBENZENE	<1

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 109879
PROJECT #	: (NONE)	DATE EXTRACTED	: 09/26/91
PROJECT NAME	: PERMIT	DATE ANALYZED	: 09/26/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<5
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
TRANS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	<5
DIBROMOCHLOROMETHANE	<5
1,1,2-TRICHLOROETHANE	<5
BENZENE	<5
CIS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<3
2-HEXANONE (MBK)	<5
4-METHYL-2-PENTANONE (MIBK)	<5
TETRACHLOROETHENE	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
ACROLEIN	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
ETHYL METHACRYLATE	<5
ETHANOL	<100

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 109879

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	97
BFB (%)	101
TOLUENE-D8 (%)	98

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 109879

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : PERMIT
REF I.D. : 10999912

DATE ANALYZED : 09/27/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<5	50	49	98	48	96	2
TRICHLOROETHENE	<5	50	49	98	48	96	2
CHLOROBENZENE	<5	50	51	102	50	100	2
TOLUENE	<5	50	49	98	49	98	0
BENZENE	<5	50	42	84	42	84	0

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

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

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 9-24-91 PAGE 1 OF 1

PROJECT MANAGER: Claud Rosenbalm

COMPANY: Giant Refining Co
ADDRESS: Rt 3 Box 7
Gallup NM 87301

BILL TO:
COMPANY: Same
ADDRESS:

Claud Rosenbalm — SAMPLERS: (Signature)
(505) 722 0217 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	pH EC	Total Chromium Lead	TOX	TOC	8240 Volatiles										NUMBER OF CONTAINERS
SMW-5	9-24-91	1050 am	Water		X	X	X	X	X										12
SMW-6	9-24-91	11:15 am	Water		X	X	X	X	X										12
Trip Blank			Water						X										1

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO:		TOTAL NO. OF CONTAINERS	25
PROJECT NAME: Rm 7		CHAIN OF CUSTODY SEALS	Y
P.O. NO. 01413		INTACT?	Y
SHIPPED VIA: Fed Ex		RECEIVED GOOD COND./COLD	Y
SAMPLE DISPOSAL INSTRUCTIONS		LAB NUMBER	109879
☒ ATI	☐ RETURN		

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

TAT: (NORMAL) X (RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK

Comments: 8240 - See attached

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Claud Rosenbalm Time: 1300	Signature: Time:	Signature: Time:
Printed Name: Claud Rosenbalm Date: 9-24-91	Printed Name: Date	Printed Name: Date
Company: Giant	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Linda Eshelman Time: 10:00
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Eshelman Date: 9/25/91
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

TABLE 1 - GROUNDWATER SAMPLING SCHEDULE
ANNUAL PARAMETERS (MARCH OR APRIL)

ELL #/PARAM	pH	CONDUCT	TOC*	TOX*	TDS	ALKAL. BICARB.	ALKAL. CARB.	CHLORIDE	SULFATE	PHENOL	TCL-VOL ORG(8240)	VOA-BTEX 8020	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Mn	K	Se	Ag	Na
-1	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-2	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-4	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-5	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-11	X	X	X	X	X	X	X	X	X	X	X+		X	X	X	X	X	X	X	X	X	X	X	X	X
-1	X	X			X	X	X	X	X			X							X	X		X			X
-2	X	X			X	X	X	X	X			X							X	X		X			X
-3	X	X			X	X	X	X	X			X							X	X		X			X
W-1	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-2	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
W-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X

SEMI-ANNUAL PARAMETERS (SEPT. OR OCT.)

	pH#	COND#	TOC*	TOX*	TOTAL METALS Cr	Pb	TCL-VOL ORG(8240)
W-1	X	X	X	X	X	X	X
W-2	X	X	X	X	X	X	X
W-4	X	X	X	X	X	X	X
W-5	X	X	X	X	X	X	X
W-11	X	X	X	X	X	X	X
SMW-1	X	X	X	X	X	X	X
SMW-2	X	X	X	X	X	X	X
SMW-3	X	X	X	X	X	X	X
SMW-4	X	X	X	X	X	X	X
SMW-5	X	X	X	X	X	X	X
SMW-6	X	X	X	X	X	X	X

* 4 REPLICATES
\+ 2 REPLICATES

12 sets 2 [illegible] of 3 [illegible]

Annual / Waste Waters

API Effluent
1. BOD
2. COD
3. TOC
4. TDS

Aerated Lagoon Effluent
1. pH
2. BOD
3. COD
4. TOC
5. TDS
6. Sulfide (total)
7. Metals - (As, Cd, Cr, Pb, Hg, Ni, Se)
8. Oil + Grease
9. 8240 (Attached)
10. 8270 (Attached)

TABLE-4

RECOMMENDED ANALYTICAL METHODS

Parameter	Method
pH (Liquid)	221, 9040
Specific Conductance	120.1
Total Organic Carbon (TOC) 4 replicates	505, 9060
Total Organic Halogen (TOX) 4 replicates	9020
Total Dissolved Solids (TDS)	160.1
Alkalinity as Bicarbonate	310.1
Alkalinity as Carbonate	310.1
Chloride	300.0
Sulfate	300.0
Phenol	420.1, 9065
Metals	-
Arsenic	303E, 206.2,7060
Barium	303A, 200.7, 6010
Cadmium	200.7, 6010
Calcium	200.7, 6010
Chromium Total	303A, 200.7, 6010
Lead Total	303A, 239.2, 7421
Magnesium	200.7, 6010
Manganese	200.7, 6010
Mercury	245.1, 7470
Potassium	200.7, 6010
Selenium	270.2, 7740
Silver	200.7, 6010
Sodium	200.7, 6010
Oil & Grease	413.1, 9071
pH (Solid)	9045
Carbon	9060
Nitrogen	353.2
Phosphorus	365.3
Total Solids (Solids)	160.3
VOA (BTEX) (Liquid & Solid)	8020
Benzene	-
Toluene	-
Ethyl benzene	-
Xylene (m, o & p)	-
TCL Volatile Organics (Liquids)	8240
Chloromethane	-
Bromomethane	-
Vinyl chloride	-
Chloroethane	-
Methylene chloride	-
Acetone	-
Carbon disulfide	-
1,1 - Dichloroethene	-
1,1 - Dichloroethane	-
1,2 - Dichloroethene (cis/trans)	-

Chloroform	-	
1,2-Dichloroethane	-	
2-Butanone	-	
1,1,1-Trichloroethane	-	
Carbon tetrachloride	-	
Vinyl acetate	-	
Bromodichloromethane	-	
1,2 - Dichloropropane	-	
trans-1,3-Dichloropropene	-	
Trichloroethene	-	
Chlorodibromomethane	-	
1,1,2-Trichloroethane	-	
Benzene	-	
cis-1,3-Dichloropropene	-	
2-Chloroethyl vinyl ether	-	
Bromoform	-	
4-Methyl-2-pentanone	-	
2-Hexanone	-	
1,1,2,2,-Tetrachloroethane	-	
Tetrachloroethene	-	
Toluene	-	
Chlorobenzene	-	
Ethyl benzene	-	
Styrene	-	
Xylenes (total)	-	
1,1,2 Trichloro-1,2,2-trifluorethane	-	
1,2-Dibromomethane	-	
1,2-Dichlorobenzene	-	
1,3-Dichlorobenzene	-	
1,4-Dichlorobenzene	-	
Refinery Hazardous Const. Semivolatiles (Solids)		8270
Benzo(a)pyrene	-	
Chrysene	-	
1-Methylnaphthalene	-	
Phenanthrene	-	
Pyrene	-	
o-Cresol	-	
m & p Cresol	-	