



May 13, 1996

Route 3, Box 7  
Gallup, New Mexico  
87301

Mr. Benito J. Garcia  
Bureau Chief  
Hazardous and Radioactive Materials Bureau  
New Mexico Environment Department  
2044 Galisteo  
P. O. Box 26110  
Santa Fe, New Mexico 87502

505  
722-3833

Dear Mr. Garcia:

SUBJECT: SEMI-ANNUAL GROUNDWATER REPORT - 1996  
GIANT REFINING COMPANY - CINIZA  
PERMIT NO. NMD000333211-2

Pursuant to the requirements of the captioned permit, the Semi-Annual Groundwater Report for sampling performed in 1996 is enclosed.

If you require additional information or have any questions on this matter, please contact me at (505) 722-0227.

Sincerely,

Edward L. Horst  
Environmental Manager  
Giant Refining Company  
CINIZA Refinery



cc: w/enclosures  
Pat Sanchez, Petroleum Engineer, NMOCD  
David Pavlich, Health, Safety and Environmental Manager, Giant Refining Co.  
Kim Bullerdick, Corporate Counsel, Giant Industries Arizona, Inc.

w/o enclosures  
Barbara Hoditscheck, Program Manager-Permitting, NMED  
Ron Kern, Program Manager-Technical, NMED  
Coby Muckelroy, Program Manager-Enforcement, NMED

**SEMI-ANNUAL GROUNDWATER REPORT - 1996**  
**GIANT REFINING COMPANY - CINIZA**  
**PERMIT NO. NMD000333211-2**

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

Prepared by:	Edward L. Horst	Telephone: (505)722-0227
Facility Name:	GIANT CINIZA	EPA ID #: NMD000333211-2
Date:	SPRING, 96	Parameter pH
Well Number:	MW-1	Up or Down Gradient: Down

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

X(b)=	8.627312	S(b) <sup>2</sup> =	0.564782	t(b)=	2.042
W(b)=	0.015688	n(b)=	36		

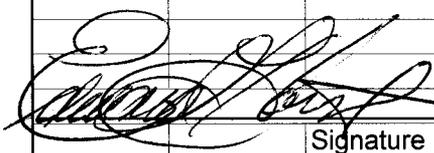
Please list the current values for this monitoring well:

	Value	(Value-X(m)) <sup>2</sup>
1	9.52	0.034225
2	9.33	2.5E-05
3	9.23	0.011025
4	9.26	0.005625
<b>Total 1</b>	<b>37.34</b>	<b>Total 2</b> 0.012725

Mean Value X(m)	9.335	t(m)=	5.814
Variance S(m) <sup>2</sup>	0.013283	W(m)=	0.003321

t(*)=	4.157722
t(c)=	2.700956

If t(\*) absolute is less than t(c) there has not been an increase in the value.



Signature

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters			
Prepared by:	Edward L. Horst		Telephone: (505)722-0227
Facility Name:	GIANT CINIZA		EPA ID #: NMD000333211-2
Date:	spring, 96		Parameter pH
Well Number:	MW-2		Up or Down Gradient: Down
Please list the values calculated for the background parameters on the Background Indicator parameter Calculation Sheet:			
X(b)=	8.627312	S(b) <sup>2</sup> =	0.564782
W(b)=	0.015688	n(b)=	36
		t(b)=	2.042
Please list the current values for this monitoring well:			
	Value	(Value-X(m)) <sup>2</sup>	
1	9.4	0.007225	
2	9.32	2.5E-05	
3	9.29	0.000625	
4	9.25	0.004225	
Total 1	37.26	Total 2	0.003025
Mean Value X(m)	9.315	t(m)=	5.814
Variance S(m) <sup>2</sup>	0.003817	W(m)=	0.000954
t(*)=	4.924048	If t(*) absolute is less than t(c) there has not been an increase in the value.	
t(c)=	2.258265		
			
Signature			

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

Prepared by:	Edward L. Horst	Telephone: (505)722-0227
Facility Name:	GIANT CINIZA	EPA ID #: NMD000333211-2
Date:	SPRING, 96	Parameter pH
Well Number:	MW-4	Up or Down Gradient: Down

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

X(b)=	8.627312	S(b) <sup>2</sup> =	0.564782	t(b)=	2.042
W(b)=	0.015688	n(b)=	36		

Please list the current values for this monitoring well:

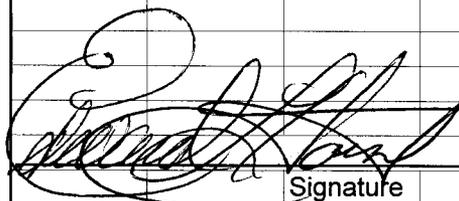
	Value	(Value-X(m)) <sup>2</sup>
1	9.12	0.0169
2	8.99	3.16E-30
3	8.94	0.0025
4	8.91	0.0064
<b>Total 1</b>	<b>35.96</b>	<b>Total 2</b> 0.00645

Mean Value X(m)	8.99	t(m)=	5.814
Variance S(m) <sup>2</sup>	0.007767	W(m)=	0.001942

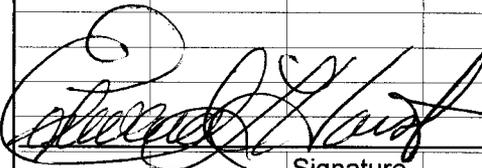
t(\*)= 2.368202

If t(\*) absolute is less than t(c) there has not been an increase in the value.

t(c)= 2.457434



Signature

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters			
Prepared by:	Edward L. Horst	Telephone:	(505)722-0227
Facility Name:	GIANT CINIZA	EPA ID #:	NMD000333211-2
Date:	SPRING, 96	Parameter	pH
Well Number:	MW-5	Up or Down Gradient:	Down
Please list the values calculated for the background parameters on the Background Indicator parameter Calculation Sheet:			
X(b)=	8.627312	S(b) <sup>2</sup> =	0.564782
W(b)=	0.015688	n(b)=	36
		t(b)=	2.042
Please list the current values for this monitoring well:			
	Value	(Value-X(m)) <sup>2</sup>	
1	9.65	0.054056	
2	9.42	6.25E-06	
3	9.32	0.009506	
4	9.28	0.018906	
Total 1	37.67	Total 2	0.020619
Mean Value X(m)	9.4175	t(m)=	5.814
Variance S(m) <sup>2</sup>	0.024321	W(m)=	0.00608
t(*)=	3.950504	If t(*) absolute is less than t(c) there has not been an increase in the value.	
t(c)=	3.09558		
 Signature			

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

Prepared by:	Edward L. Horst	Telephone: (505)722-0227
Facility Name:	GIANT CINIZA	EPA ID #: NMD000333211-2
Date:	SPRING, 96	Parameter: SPEC. COND.
Well Number:	MW-1	Up or Down Gradient: Down

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

X(b)=	2012.829	S(b) <sup>2</sup> =	291.6405	t(b)=	1.684
W(b)=	7.113183	n(b)=	41		

Please list the current values for this monitoring well:

	Value	(Value-X(m)) <sup>2</sup>
1	2610	18906.25
2	2460	156.25
3	2420	2756.25
4	2400	5256.25
Total 1	9890	Total 2 6768.75

Mean Value X(m)	2472.5	t(m)=	4.541
Variance S(m) <sup>2</sup>	8054.167	W(m)=	2013.542

t(*)=	5.119707	If t(*) absolute is less than t(c) there has not been an increase in the value.
t(c)=	4.530943	

Edward L. Horst

Signature

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

Prepared by:	Edward L. Horst	Telephone: (505)722-0227
Facility Name:	GIANT CINIZA	EPA ID #: NMD000333211-2
Date:	SPRING, 96	Parameter: SPEC. COND.
Well Number:	MW-2	Up or Down Gradient: Down

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

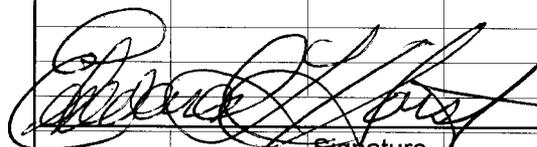
X(b)=	2012.829	S(b)=	291.6405	t(b)=	1.684
W(b)=	7.113183	n(b)=	41		

Please list the current values for this monitoring well:

	Value	(Value-X(m)) <sup>2</sup>
1	1110	85.5625
2	1097	14.0625
3	1102	1.5625
4	1094	45.5625
Total 1	4403	Total 2 36.6875

Mean Value X(m)	1100.75	t(m)=	4.541
Variance S(m) <sup>2</sup>	43.70833	W(m)=	10.92708

t(*)=	-127.941	If t(*) absolute is less than t(c) there has not been an increase in the value.
t(c)=	3.4145	

  
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 Signature

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

Prepared by:	Edward L. Horst	Telephone: (505)722-0227
Facility Name:	GIANT CINIZA	EPA ID #: NMD000333211-2
Date:	SPRING, 96	Parameter: SPEC. COND.
Well Number:	MW-4	Up or Down Gradient: Down

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

X(b)=	2012.829	S(b) <sup>2</sup> =	291.6405	t(b)=	1.684
W(b)=	7.113183	n(b)=	41		

Please list the current values for this monitoring well:

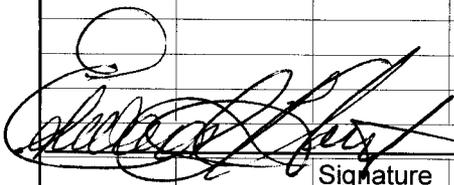
	Value	(Value-X(m)) <sup>2</sup>	
1	1144	115.5625	
2	1125	68.0625	
3	1129	18.0625	
4	1135	3.0625	
<b>Total 1</b>	<b>4533</b>	<b>Total 2</b>	<b>51.1875</b>

Mean Value X(m)	1133.25	t(m)=	5.814
Variance S(m) <sup>2</sup>	39.54167	W(m)=	9.885417

t(\*)= -128.773

If t(\*) absolute is less than t(c) there has not been an increase in the value.

t(c)= 4.085773



Signature

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

Prepared by:	Edward L. Horst	Telephone: (505)722-0227
Facility Name:	GIANT CINIZA	EPA ID #: NMD000333211-2
Date:	SPRING, 96	Parameter: SPEC. COND.
Well Number:	MW-5	Up or Down Gradient: Down

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

X(b)=	2012.829	S(b) <sup>2</sup> =	291.6405	t(b)=	1.684
W(b)=	7.113183	n(b)=	41		

Please list the current values for this monitoring well:

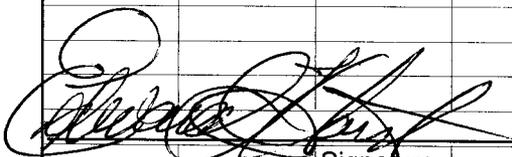
	Value	(Value-X(m)) <sup>2</sup>	
1	1111	10.5625	
2	1110	18.0625	
3	1118	14.0625	
4	1118	14.0625	
<b>Total 1</b>	<b>4457</b>	<b>Total 2</b>	<b>14.1875</b>

Mean Value X(m)	1114.25	t(m)=	5.814
Variance S(m) <sup>2</sup>	8.208333	W(m)=	2.052083

t(\*)= -229.565

If t(\*) absolute is less than t(c) there has not been an increase in the value.

t(c)= 2.608698

  
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 Signature

**TOLERANCE INTERVAL**

**1996**

**LEAD**

**SMW-3**

3-96 MEAN- 0.0224 SD 0.0803

DATE RESULT TOL LIMIT UNITS  
35125 0.0025 \* 0.183 ppm Does not exceed the tolerance limit.

**SMW-4**

3-96 MEAN- 0.002 SD 0.0012

DATE RESULT TOL LIMIT UNITS  
3-96 0.0025 \* 0.004 ppm Does not exceed the tolerance limit.

**SMW-5**

3-96 MEAN- 0.0022 SD 0.0017

DATE RESULT TOL LIMIT UNITS  
3-96 0.0025 \* 0.006 ppm Does not exceed the tolerance limit.

**SMW-6**

3-96 MEAN- NO SAMP SD NO SAMPLE

DATE RESULT TOL LIMIT UNITS

\* 1/2 of Reporting Limit.  
ELH/96

**TOLERANCE INTERVAL**

**1996**

**CHROME**

**SMW-3**    3-96    MEAN-    0.0436    SD    0.1556

DATE    RESULT    TOL LIMIT    UNITS  
3-96    0.005 \*    0.355    ppm    Does not exceed the tolerance limit.

**SMW-4**    3-96    MEAN-    0.0062    SD    0.0058

DATE    RESULT    TOL LIMIT    UNITS  
3-96    0.005 \*    0.018    ppm    Does not exceed the tolerance limit.

**SMW-5**    3-96    MEAN-    0.0113    SD    0.0223

DATE    RESULT    TOL LIMIT    UNITS  
3-96    0.005    0.056    ppm    Does not exceed the tolerance limit.

**SMW-6**    3-96    MEAN-    NO SAMP    SD

DATE    RESULT    TOL LIMIT    UNITS  
3-96    NO SAMPLE WAS TAKEN DURING THIS SAMPLING EVENT DUE TO THE LACK O

\* 1/2 of reporting limit.  
ELH/96

**TOLERANCE INTERVAL**

**1996**

**pH**

**SMW-3**

3-96 MEAN- 7.8446 SD 0.1551

DATE RESULT TOL LIMIT UNITS  
3-96 7.86 8.155 --- Does not exceed the tolerance limit.

**SMW-4**

3-96 MEAN- 8.335 SD 0.1924

DATE RESULT TOL LIMIT UNITS  
3-96 8.77 8.720 --- Does exceed the tolerance limit 0.57%  
NOTE: LABORATORY TESTS SHOW RESULT

**SMW-5**

3-96 MEAN- 8.20 SD 1.696

DATE RESULT TOL LIMIT UNITS  
3-96 8.85 11.596 --- Does not exceed the tolerance limit.

**SMW-6**

3-96 MEAN- SD  
No Sample

DATE RESULT TOL LIMIT UNITS  
3-96 NO SAMPLE WAS TAKEN DURING THIS SAMPLING EVENT DUE TO THE LACK O

ELH/96

**TOLERANCE INTERVAL**

**1996**

**EC**

**SMW-3**

3-96 MEAN- 3225.28 SD 313.86

DATE RESULT TOL LIMIT UNITS  
3-96 2905 3853.000 --- Does not exceed the tolerance limit.

**SMW-4**

3-96 MEAN- 1301.59 SD 175.13

DATE RESULT TOL LIMIT UNITS  
3-96 1269.75 1651.850 --- Does not exceed the tolerance limit.

**SMW-5**

3-96 MEAN- 1135.15 SD 68.09

DATE RESULT TOL LIMIT UNITS  
3-96 1130.25 1271.330 --- Does not exceed the tolerance limit.

**SMW-6**

3-96 MEAN- NO SAMP SD

DATE RESULT TOL LIMIT UNITS  
3-96 NO SAMPLE WAS TAKEN DURING THIS SAMPLING EVENT DUE TO THE LACK O

ELH/96

**TOLERANCE INTERVAL**

**1996**

**TEMPERATURE**

**SMW-3**

3-96 MEAN- 55.17 SD 2.48

DATE RESULT TOL LIMIT UNITS  
3-96 54 60.13 degrees Does not exceed the tolerance limit.

**SMW-4**

3-96 MEAN- 55.62 SD 2.6

DATE RESULT TOL LIMIT UNITS  
3-96 53.5 60.82 degrees Does not exceed the tolerance limit.

**SMW-5**

3-96 MEAN- 54.77 SD 2.8

DATE RESULT TOL LIMIT UNITS  
3-96 53 60.37 degrees Does not exceed the tolerance limit.

**SMW-6**

3-96 MEAN- NO SAMP SD

DATE RESULT TOL LIMIT UNITS  
3-96 NO SAMPLE WAS TAKEN DURING THIS SAMPLING EVENT DUE TO THE LACK O

**TOLERANCE INTERVAL**

**1996**

**WATER LEVEL**

**SMW-3**

3-96 MEAN- 6852.09 SD 2.16

DATE RESULT TOL LIMIT UNITS  
3-96 6854.56 6856.41 feet Does not exceed the tolerance limit.

**SMW-4**

3-96 MEAN- 6849.03 SD 1.27

DATE RESULT TOL LIMIT UNITS  
3-96 6849.98 6851.57 feet Does not exceed the tolerance limit.

**SMW-5**

3-96 MEAN- 6847.49 SD 1.02

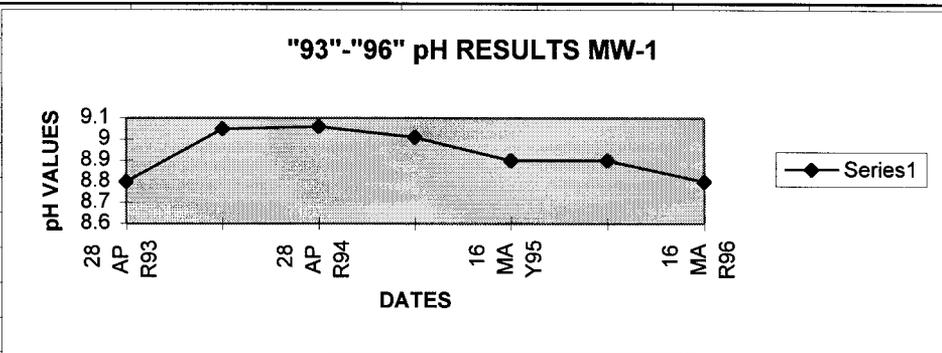
DATE RESULT TOL LIMIT UNITS  
3-96 6847.82 6849.53 feet Does not exceed the tolerance limit.

**SMW-6**

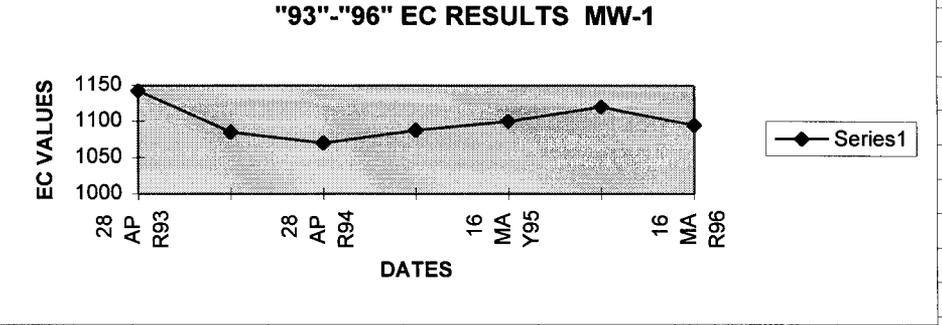
3-96 MEAN- NO SAMP SD

DATE RESULT TOL LIMIT UNITS  
3-96 ELEVATION WAS NOT TAKEN DUE TO THE LACK OF WATER IN THE WELL

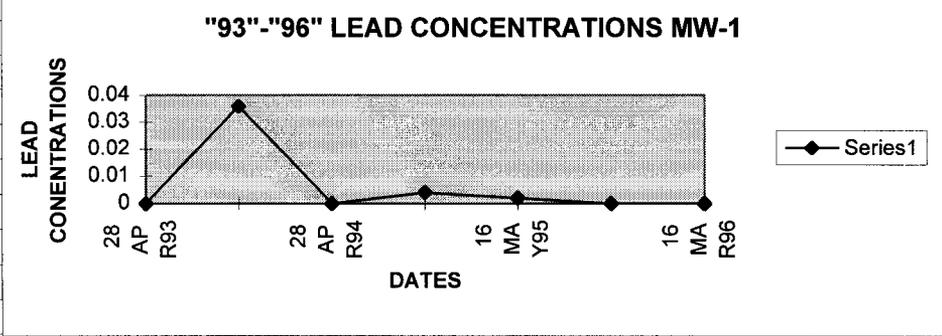
28APR93	8.8
29OCT93	9.05
28APR94	9.06
19OCT94	9.01
16MAY95	8.9
28OCT95	8.9
16MAR96	8.8



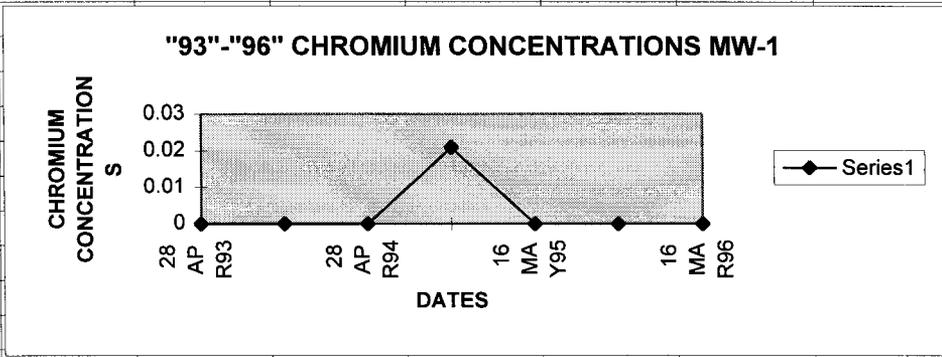
28APR93	1142.5
29OCT93	1085
28APR94	1070
19OCT94	1087.5
16MAY95	1100
28OCT95	1120
16MAR96	1094.75



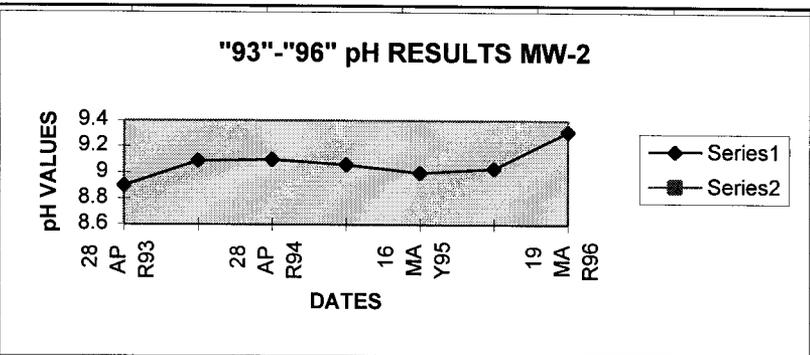
28APR93	0
29OCT93	0.036
28APR94	0
19OCT94	0.004
16MAY95	0.002
28OCT95	0
16MAR96	0



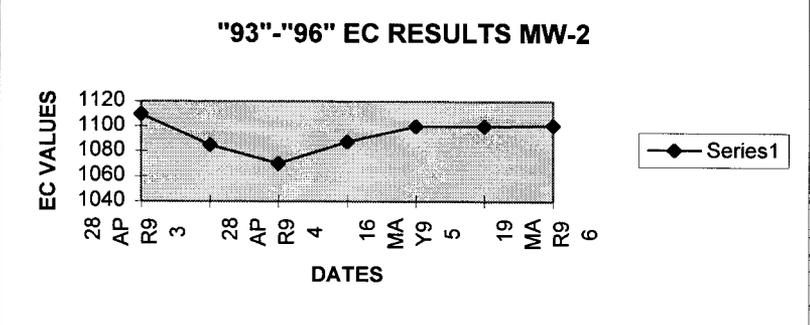
28APR93	0
29OCT93	0
28APR94	0
19OCT94	0.021
16MAY95	0
28OCT95	0
16MAR96	0



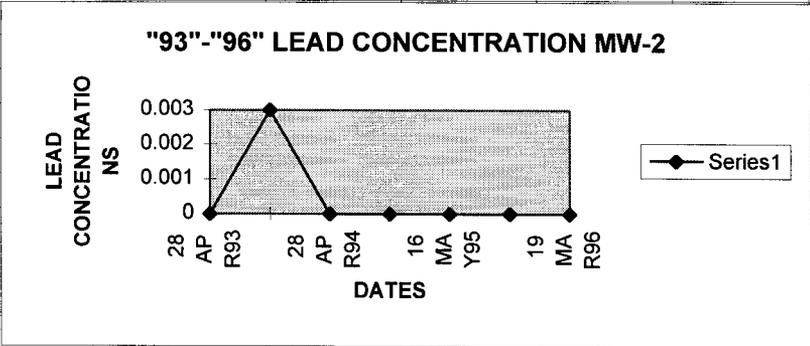
28APR93	8.9
29OCT93	9.09
28APR94	9.1
19OCT94	9.06
16MAY95	9
28OCT95	9.03
19MAR96	9.315



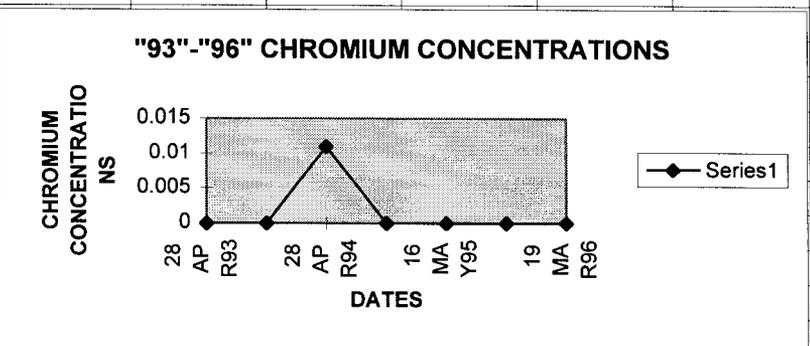
28APR93	1110
29OCT93	1085
28APR94	1070
19OCT94	1087.5
16MAY95	1100
28OCT95	1100
19MAR96	1100.75



28APR93	0
29OCT93	0.003
28APR94	0
19OCT94	0
16MAY95	0
28OCT95	0
19MAR96	0



28APR93	0
29OCT93	0
28APR94	0.011
19OCT94	0
16MAY95	0
28OCT95	0
19MAR96	0



SMW-3

GIANT REFINING - CINIZA

Volatile Organics (8240)

Parameter	30 NOV 93 Result	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	15 MAR 96 Result	Units	Reporting Limit
Chloromethane	ND	ND	ND	ND	ND	ND	ug/L	10
Bromomethane	ND	ND	ND	ND	ND	ND	ug/L	10
Vinyl chloride	ND	ND	ND	ND	ND	ND	ug/L	10
Chloroethane	ND	ND	ND	ND	ND	ND	ug/L	10
Methylene chloride	ND	ND	ND	ND	ND	ND	ug/L	5.0
Acetone	ND	ND	ND	ND	ND	ND	ug/L	10
Carbon disulfide	ND	ND	ND	ND	ND	ND	ug/L	5.0
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ug/L	5.0
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ND	ND	ND	ug/L	5.0
Chloroform	ND	ND	ND	ND	ND	ND	ug/L	5.0
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/L	5.0
2-Butanone	---	---	---	---	---	---	ug/L	5.0
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/L	10
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ug/L	5.0
Vinyl acetate	ND	ND	ND	ND	ND	ND	ug/L	5.0
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ug/L	10
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/L	5.0
Trichloroethene	ND	ND	ND	ND	ND	ND	ug/L	5.0
Chlorodibromomethane	---	---	---	---	---	---	ug/L	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/L	5.0
Benzene	ND	ND	ND	ND	ND	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/L	5.0
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND	ug/L	10
Bromoform	ND	ND	ND	ND	ND	ND	ug/L	5.0
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ug/L	10
2-Hexanone	ND	ND	ND	ND	ND	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ug/L	5.0
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ug/L	5.0
Toluene	ND	ND	ND	ND	ND	ND	ug/L	5.0
Chlorobenzene	ND	ND	ND	ND	ND	ND	ug/L	5.0
Ethylbenzene	ND	ND	ND	ND	ND	ND	ug/L	5.0
Stryene	ND	ND	ND	ND	ND	ND	ug/L	5.0
Xylenes (total)	ND	ND	6.0	ND	ND	ND	ug/L	5.0
Acetonitrile	---	---	ND	---	---	---	ug/L	10.0
Acrolein	---	---	ND	ND	ND	ND	ug/L	20.0
Acrylonitrile	---	---	ND	ND	ND	ND	ug/L	10.0

SMW-3

GIANT REFINING - CINIZA

Volatile Organics (8240)

Parameter	30 NOV 93 Result	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	15 MAR 96 Result	Units	Reporting Limit
1,2-Dibromoethane	---	---	ND	ND	ND		ug/L	5.0
Dibromomethane	---	---	ND	ND	ND	ND	ug/L	5.0
Dichlorodiflouromethane	---	---	ND	ND	ND	ND	ug/L	5.0
Methyl Iodide	---	---	ND	ND	ND	ND	ug/L	5.0
Trans-1,4-Dichloro-2-Butene	---	---	ND	ND	ND	ND	ug/L	5.0
Trichloromonoflouromethane	---	---	ND	ND	ND	ND	ug/L	5.0
1,2,3-Trichloropropane	---	---	ND	ND	ND	ND	ug/L	5.0
Ethyl Methacrylate	---	---	ND	ND	ND	ND	ug/L	5.0

SMW-3

GIANT REFINING - CINIZA

Dissolved Metals

Parameter	29 APR 93 Result	29 APR 94 Result	15 MAY 95 Result	26 OCT 95 Result	15 MAR 96 Result	Units	Reporting Limit
Calcium	43.5	45	37.7	---	47	mg/L	0.40
Magnesium	15.6	13.9	12.1	---	14	mg/L	0.40
Potassium	ND	ND	ND	---	0.78	mg/L	10.0
Sodium	820	744	564	---	669	mg/L	10.0

SMW-3

GIANT REFINING - CINIZA

Total Metals

Parameter	30 NOV 93 Result	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	15 MAR 96 Result	Units	Reporting Limit
Chromium	ND	0.062	.718	0.01	0.08	<0.01	mg/L	0.010
Lead	ND	ND	.043	ND	ND	<0.005	mg/L	0.05

SMW-3

GIANT REFINING - CINIZA

General Inorganics

Parameter	30 NOV 93 Result	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	15 MAR 96 Result	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	---	660	---	590	---	644	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	---	ND	---	3	---		mg/L	5.0
Chloride	---	83	---	69	---	91	mg/L	3.0
pH	7.66	7.81	7.63	7.80	7.77	8.00	units	---
pH	7.68	---	7.68	---	7.74	7.87	units	---
pH	7.71	---	7.7	---	7.73	7.8	units	---
pH	7.72	---	7.79	---	7.74	7.77	units	---
Average pH	7.6925		7.7	7.80	7.75	7.86	units	---
Sulfate	---	1000	---	680	---	844	mg/L	5.0
Specific Conductance at 25 deg.C	3220	3160	3360	2700	2890	2830	umhos/cm	1.0
Specific Conductance at 25 deg.C	3250	---	3340	---	2880	2830	umhos/cm	1.0
Specific Conductance at 25 deg.C	3190	---	3500	---	2900	2870	umhos/cm	1.0
Specific Conductance at 25 deg.C	3230	---	3520	---	2890	3090	umhos/cm	1.0
Average Specific Conductance at 25 deg.C	3222.5		3430	2700	2890	2905	umhos/cm	1.0
Total Organic Carbon	2	2	5	5	14.9	3.2	mg/L	0.50
Total Organic Carbon	2	2	5	5	---	---	mg/L	0.50
Total Organic Carbon	---	---	---	---	---	---	mg/L	0.50
Total Organic Carbon	---	---	---	---	---	---	mg/L	0.50
Total Organic Halogen as Cl	30	30	20	80	60		ug/L	30
Total Organic Halogen as Cl	30	30	20	70	---	---	ug/L	30
Total Organic Halogen as Cl	---	---	---	---	---	---	ug/L	30
Total Organic Halogen as Cl	---	---	---	---	---	---	ug/L	30
Total Dissolved Solids	---	2300	---	1900	---	2040	mg/L	10
Water Elevation	6852.43	6855.35	6852.76	6853.16	6853	6854.56	ft	

SMW-4

GIANT REFINING - CINIZA

Volatile Organics (8240)

Parameter	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	15 MAR 96 Result	Units	Reporting Limit
Chloromethane	ND	ND	ND	ND	ND	ug/L	10
Bromomethane	ND	ND	ND	ND	ND	ug/L	10
Vinyl chloride	ND	ND	ND	ND	ND	ug/L	10
Chloroethane	ND	ND	ND	ND	ND	ug/L	10
Methylene chloride	ND	ND	ND	3	ND	ug/L	3
Acetone	ND	ND	ND	54	ND	ug/L	10
Carbon disulfide	ND	ND	ND	ND	ND	ug/L	5.0
1,1-Dichloroethene	ND	ND	ND	ND	ND	ug/L	5.0
1,1-Dichloroethane	ND	ND	ND	ND	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ND	ND	ug/L	5.0
Chloroform	ND	ND	ND	ND	ND	ug/L	5.0
1,2-Dichloroethane	ND	ND	ND	ND	ND	ug/L	5.0
2-Butanone	---	---	---	---	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ug/L	10
Carbon tetrachloride	ND	ND	ND	ND	ND	ug/L	5.0
Vinyl acetate	ND	ND	ND	ND	ND	ug/L	5.0
Bromodichloromethane	ND	ND	ND	ND	ND	ug/L	10
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ug/L	5.0
Trichloroethene	ND	ND	ND	ND	ND	ug/L	5.0
Chlorodibromomethane	---	---	---	---	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ug/L	5.0
Benzene	ND	ND	ND	ND	ND	ug/L	5.0
Bromoform	ND	ND	ND	ND	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ug/L	10
2-Hexanone	ND	ND	ND	ND	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ug/L	10
Tetrachloroethene	ND	ND	ND	ND	ND	ug/L	10
Toluene	ND	ND	ND	ND	ND	ug/L	5.0
Chlorobenzene	ND	ND	ND	ND	ND	ug/L	5.0
Ethylbenzene	ND	ND	ND	ND	ND	ug/L	5.0
Styrene	ND	ND	ND	ND	ND	ug/L	5.0
Xylenes (Total)	ND	ND	ND	ND	ND	ug/L	5.0
Acetonitrile	ND	ND	---	---	---	ug/L	10.0
Acrolein	ND	ND	ND	ND	ND	ug/L	20.0
Acrylonitrile	---	ND	ND	ND	ND	ug/L	10.0
1,2-Dibromoethane	---	ND	ND	ND	---	ug/L	5.0

SMW-4

GIANT REFINING - CINIZA

Volatile Organics (8240)

Parameter	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	15 MAR 96 Result	Units	Reporting Limit
Dichlorodifluoromethane	---	ND	ND	ND	ND	ug/L	5.0
Methyl Iodide	---	ND	ND	ND	ND	ug/L	5.0
Trans-1,4-Dichloro-2-Butene	---	ND	ND	ND	ND	ug/L	5.0
Trichloromonofluoromethane	---	ND	ND	2	ND	ug/L	1
1,2,3-Trichloropropane	---	ND	ND	ND	ND	ug/L	5.0
Ethyl Methacrylate	---	ND	ND	ND	ND	ug/L	5.0

**SMW-4****GIANT REFINING - CINIZA****Dissolved Metals**

Parameter	29 APR 93 DUP	29 APR 94 Result	15 MAY 95 Result	26 OCT 95 Result	15 MAR 96 Result	Units	Reporting Limit
Calcium	4.6	2.6	3.3	---	3.01	mg/L	0.40
Magnesium	1.5	0.7	0.7	---	0.97	mg/L	0.40
Potassium	ND	ND	ND	---	0.78	mg/L	10.0
Sodium	321	286	266	---	292	mg/L	10.0

**SMW-4**

**GIANT REFINING - CINIZA**

**Total Metals**

Parameter	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 Oct 95 Result	15 MAR 96 Result	Units	Reporting Limit
Chromium	ND	0.03	ND	0.01	<0.01	mg/L	0.010
Lead	ND	ND	ND	ND	<0.005	mg/L	0.0050

**SMW-4**

**GIANT REFINING - CINIZA**

General Inorganics

Parameter	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	15 MAR 96 Result	Units
Alkalinity, Bicarb. as CaCO3 at pH 4.5	393	---	380	---	398	mg/L
Alkalinity, Carb. as CaCO3 at pH 8.3	18	---	11	---		mg/L
Chloride	56	---	53	---	61	mg/L
pH	8.49	8.53	8.50	8.47	8.88	units
pH	---	8.48		8.40	8.69	units
pH	---	8.51		8.35	8.55	units
pH	---	8.48		8.34	8.95	units
Average pH		8.5	8.50	8.39	8.77	units
Sulfate	160	---	220	---	170	mg/L
Specific Conductance at 25 deg.C	1190	1270	1300	1280	1255	umhos/cm
Specific Conductance at 25 deg.C	---	1280	---	1280	1278	umhos/cm
Specific Conductance at 25 deg.C	---	1250	---	1280	1273	umhos/cm
Specific Conductance at 25 deg.C	---	1230	---	1280	1273	umhos/cm
Average Specific Conductance at 25 deg.C		1257.5	1300	1280	1269.75	umhos/cm
Total Organic Carbon	3	ND	ND	1	1	mg/L
Total Organic Carbon	3	ND	ND	---		mg/L
Total Organic Carbon	---	---	---	---		mg/L
Total Organic Carbon	---	---	---	---		mg/L
Total Organic Halogen as Cl	80	ND	30	110		ug/L
Total Organic Halogen as Cl	50	ND	20	---		ug/L
Total Organic Halogen as Cl	---	---	---	---		ug/L
Total Organic Halogen as Cl	---	---	---	---		ug/L
Total Dissolved Solids	760	---	790	---	740	mg/L
Water Elevation	6850.29	6849.88	6849.30	6848.52	6849.98	ft

SMW-5

## GIANT REFINING - CINIZA

Volatile Organics (8240)

Parameter	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	14 MAR 96 Result	Units	Reporting Limit
Chloromethane	ND	ND	ND	ND	ND	ug/L	10
Bromomethane	ND	ND	ND	ND	ND	ug/L	10
Vinyl chloride	ND	ND	ND	ND	ND	ug/L	10
Chloroethane	ND	ND	ND	ND	ND	ug/L	10
Methylene chloride	ND	ND	ND	ND	ND	ug/L	5.0
Acetone	ND	ND	ND	ND	ND	ug/L	10
Carbon disulfide	ND	ND	ND	ND	ND	ug/L	5.0
1,1-Dichloroethene	ND	ND	ND	ND	ND	ug/L	5.0
1,1-Dichloroethane	ND	ND	ND	ND	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ND	ND	ug/L	5.0
Chloroform	ND	ND	ND	ND	ND	ug/L	5.0
1,2-Dichloroethane	ND	ND	ND	ND	ND	ug/L	5.0
2-Butanone	---	---	---	---	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ug/L	10
Carbon tetrachloride	ND	ND	ND	ND	ND	ug/L	5.0
Vinyl acetate	ND	ND	ND	ND	ND	ug/L	5.0
Bromodichloromethane	ND	ND	ND	ND	ND	ug/L	10
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ug/L	5.0
Trichloroethene	ND	ND	ND	ND	ND	ug/L	5.0
Chlorodibromomethane	---	---	---	---	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ug/L	5.0
Benzene	ND	ND	ND	ND	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ug/L	5.0
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ug/L	10
Bromoform	ND	ND	ND	ND	ND	ug/L	5.0
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ug/L	10
2-Hexanone	ND	ND	ND	ND	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ug/L	5.0
Tetrachloroethene	ND	ND	ND	ND	ND	ug/L	5.0
Toluene	ND	ND	ND	ND	ND	ug/L	5.0
Chlorobenzene	ND	ND	ND	ND	ND	ug/L	5.0
Ethylbenzene	ND	ND	ND	ND	ND	ug/L	5.0
Stryene	ND	ND	ND	ND	ND	ug/L	5.0
Xylenes (total)	ND	ND	ND	ND	ND	ug/L	5.0
Acetonitrile	---	---	---	---	---	ug/L	10.0
Acrolein	---	---	---	---	ND	ug/L	20.0
Acrylonitrile	---	---	---	---	ND	ug/L	10.0

SMW-5

GIANT REFINING - CINIZA

Volatile Organics (8240)

Parameter	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	14 MAR 96 Result	Units	Reporting Limit
1,2-Dibromoethane	---	---	---	---	ND	ug/L	5.0
Dibromomethane	---	---	---	---	ND	ug/L	5.0
Dichlorodifluoromethane	---	---	---	---	ND	ug/L	5.0
Methyl iodide	---	---	---	---	ND	ug/L	5.0
Trans-1,4-Dichloro-2-Butene	---	---	---	---	ND	ug/L	5.0
Trichloromonofluoromethane	---	---	---	---	ND	ug/L	5.0
1,2,3-Trichloropropane	---	---	---	---	ND	ug/L	5.0
Ethyl Methacrylate	---	---	---	---	ND	ug/L	5.0

SMW-5

GIANT REFINING - CINIZA

Dissolved Metals

Parameter	29 APR 94 Result	15 MAY 95 Result	Result	26 OCT 95 Result	14 MAR 96 Result	Reporting Units	Limit
Calcium	3.4	1.6	2.2	---	2.2	mg/L	0.40
Magnesium	1.5	0.7	0.5	---	1.82	mg/L	0.40
Potassium	1.3	ND	ND	---	1.96	mg/L	10.0
Sodium	256	267	250	---	276	mg/L	10.0

SMW-5

GIANT REFINING - CINIZA

Total Metals

Parameter	29 APR 94 Result	19 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	14 MAR 96 Result	Units	Reporting Limit
Chromium	0.094	.076	0.01	0.02	<0.01	mg/L	0.010
Lead	ND	.008	ND	ND	<0.005	mg/L	0.0050

SMW-5

GIANT REFINING - CINIZA

General Organics

Parameter	29 APR 94 Result	18 OCT 94 Result	15 MAY 95 Result	26 OCT 95 Result	14 MAR 96 Result	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	349	---	350	---	366	mg/L	5.0
Alkalinity, Carb. as CaCO3 at pH 8.3	24	---	21	---		mg/L	5.0
Chloride	67	---	54	---	66.6	mg/L	3.0
pH	8.85	8.58	8.80	8.69	8.60	units	---
pH	---	8.6		8.69	9.01	units	---
pH	---	8.6		8.69	8.90	units	---
pH	---	8.64		8.70	8.89	units	---
Average pH		8.605	8.80	8.69	8.85	units	---
Sulfate	150	---	1800	---	160	mg/L	5.0
Specific Conductance at 25 deg.C	1130	1120	1100	1170	1126	umhos/cm	1.0
Specific Conductance at 25 deg.C	---	1130	---	1160	1123	umhos/cm	1.0
Specific Conductance at 25 deg.C	---	1120	---	1170	1146	umhos/cm	1.0
Specific Conductance at 25 deg.C	---	1150	---	1170	1126	umhos/cm	1.0
Average Specific Conductance at 25 deg.C		1130	1100	1167.5	1130.25	umhos/cm	1.0
Total Organic Carbon	2	8	ND	1.2	1	mg/L	0.50
Total Organic Carbon	2	8	ND	---		mg/L	0.50
Total Organic Carbon	---	---	---	---		mg/L	0.50
Total Organic Carbon	---	---	---	---		mg/L	0.50
Total Organic Halogen as Cl	30	ND	16	15		ug/L	30
Total Organic Halogen as Cl	ND	ND	30	---		ug/L	30
Total Organic Halogen as Cl	---	---	---	---		ug/L	30
Total Organic Halogen as Cl	---	---	---	---		ug/L	30
Total Dissolved Solids	720	---	790	---	704	mg/L	10
Water Elevation	6848.13	6848.02	6848.38	6847.47	6847.82	ft	

**MW-1 GIANT REFINING - CINIZA**

Volatile Organics (8240)

**Parameter**

	29-Oct-93 Result	28-Apr-94 Result	19-Oct-94 Result	16-May-95 Result	26-Oct-95 Result	16-Apr-96 Result	Units
Chloromethane	ND	ND	ND	ND	ND	ND	ug/l
Bromonethane	ND	ND	ND	ND	ND	ND	ug/l
Vinyl chloride	ND	ND	ND	ND	ND	ND	ug/l
Chloroethane	ND	ND	ND	ND	ND	ND	ug/l
Methylene chloride	ND	ND	ND	ND	ND	ND	ug/l
Acetone	ND	ND	ND	ND	ND	ND	ug/l
Carbon disulfide	ND	ND	ND	ND	ND	ND	ug/l
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ug/l
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/l
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ND	ND	ND	ug/l
Chloroform	ND	ND	ND	ND	ND	ND	ug/l
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/l
2-Butanone	ND	ND	ND	ND	ND	ND	ug/l
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/l
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ug/l
Vinyl acetate	ND	ND	ND	ND	ND	ND	ug/l
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ug/l
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/l
Trichloroethene	ND	ND	ND	ND	ND	ND	ug/l
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ug/l
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/l
Benzene	ND	ND	ND	ND	ND	ND	ug/l
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/l
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND	ug/l
Bromoform	ND	ND	ND	ND	ND	ND	ug/l
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ug/l

Sheet1

2-Hexanone  
 1,1,2,2-Tetrachloroethane  
 Tetrachoroethene  
 Toluene  
 Chorobenzene  
 Ethylbenzene  
 Stryene  
 Xylenes (total)

ND	ND	ND	ND	ND	ND	ug/l
ND	ND	ND	ND	ND	ND	ug/l
ND	ND	ND	ND	ND	ND	ug/l
ND	ND	ND	ND	ND	ND	ug/l
ND	ND	ND	ND	ND	ND	ug/l
ND	ND	ND	ND	ND	ND	ug/l
ND	ND	ND	ND	ND	ND	ug/l

## MW-1 GIANT REFINING - CINIZA

Dissolved Metals

**Parameter**

Arsenic
Barium
Cadmium
Calcium
Magnesium
Manganese
Potassium
Selenium
Silver
Sodium

23-Apr-92 Result	28-Apr-93 Result	28-Apr-94 Result	16-May-95 Result	16-Mar-96 Result	Result
ND	ND	ND	ND	<0.005	mg/l
0.09	ND	0.016	0.01	<0.01	mg/l
0.0012	ND	ND	ND	<0.001	mg/l
1.8	1.1	1.2	1.8	1	mg/l
0.26	0.2	0.3	0.2	0.12	mg/l
0.1	ND	0.016	ND	<0.02	mg/l
ND	ND	ND	ND	0.39	mg/l
ND	ND	ND	ND	0.005	mg/l
ND	ND	ND	ND	0.01	mg/l
72		254	242	264	mg/l

**MW-1 GIANT REFINING - CINIZA**

Total Metals

**Parameter**

Chromium
Lead
Mercury

29-Oct-93 Result	28-Apr-94 Result	19-Oct-94 Result	16-May-95 Result	26-Oct-95 Result	16-Mar-96 Result	Unit
ND	ND	0.021	ND	---	<0.01	mg/l
0.36	ND	0.004	0.002	---	<0.005	mg/l
ND	ND	---	---	---	<0.001	mg/l

**MW-1 GIANT REFINING COMPANY - CINIZA**

General Inorganics

Parameter	29-Oct-93 Result	28-Apr-94 Result	19-Oct-94 Result	16-May-95 Result	26-Oct-95 Result	16-Apr-96 Result	Units
Alkalinity, Bicarb. as CaCO3 at ph 4.5	---	301	---	320	---	342	mg/l
Alkalinity, Carb. as CaCO3 at pH 8.3	---	48	---	23	---	---	mg/l
Chloride	---	52	---	47	---	55.4	mg/l
pH	9.05	9.06	8.97	8.9	8.91	9.52	units
pH	9		9		8.88	9.33	units
pH	9.08		9.03		8.88	9.23	units
pH	9.08		9.05		8.9	9.26	units
pH Average	9.0525	9.06	9.0125	8.9	8.8925	9.335	units
Phenolics	NLD						mg/l
Sulfate	---						mg/l
Specific Conductance at 25 deg. C	1090	1070	1090	1100	1110	1099	umhos/cm
Specific Conductance at 25 deg. C	1080		1080		1130	1094	umhos/cm
Specific Conductance at 25 deg. C	1080		1080		1120	1095	umhos/cm
Specific Conductance at 25 deg. C	1090		1100		1120	1091	umhos/cm
Specific Conductance at 25 deg. C Average	1085	1070	1087.5	1100	1120	1094.75	umhos/cm
Total Organic Carbon	ND	ND	1	36	1	<1.0	mg/l
Total Organic Carbon	ND	ND	1	36	1	<1.0	mg/l
Total Organic Carbon	---	---	---	---	---	---	mg/l
Total Organic Carbon	---	---	---	---	---	---	mg/l
Total Organic Halogen as Cl	ND	ND	ND	30			ug/l

Total Organic  
Halogen as Cl  
Total Organic  
Halogen as Cl  
Total Organic  
Halogen as Cl  
Total Dissolved  
Solids  
Water Elevation

ND	20	ND	30	69		ug/l
---	---	---	---	---		ug/l
---	---	---	---	---		ug/l
---	720	---	---	---		mg/l
6864.61	6873.34	6872.97	6870.66	6872.4	6872.52	feet

**MW-2 GIANT REFINING - CINIZA**

Volatile Organics (8240)

<b>Parameter</b>	<b>29-Oct-93 Result</b>	<b>28-Apr-94 Result</b>	<b>19-Oct-94 Result</b>	<b>16-May-95 Result</b>	<b>28-Oct-95 Result</b>	<b>16-Apr-96 Result</b>	<b>Units</b>
Chloromethane	ND	ND	ND	ND	ND	ND	ug/l
Bromonethane	ND	ND	ND	ND	ND	ND	ug/l
Vinyl chloride	ND	ND	ND	ND	ND	ND	ug/l
Chloroethane	ND	ND	ND	ND	ND	ND	ug/l
Methylene chloride	ND	ND	ND	ND	7	ND	ug/l
Acetone	ND	ND	ND	ND	ND	ND	ug/l
Carbon disulfide	ND	ND	ND	ND	ND	ND	ug/l
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ug/l
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/l
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ug/l
(cis/trans)	ND	ND	ND	ND	ND	ND	ug/l
Chloroform	ND	ND	ND	ND	ND	ND	ug/l
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/l
2-Butanone	ND	ND	ND	ND	ND	ND	ug/l
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/l
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ug/l
Vinyl acetate	ND	ND	ND	ND	ND	ND	ug/l
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ug/l
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/l
Trichloroethene	ND	ND	ND	ND	ND	ND	ug/l
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ug/l
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/l
Benzene	ND	ND	ND	ND	ND	ND	ug/l
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/l
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND	ug/l
Bromoform	ND	ND	ND	ND	ND	ND	ug/l
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ug/l

Sheet1

2-Hexanone	ND	ND	ND	ND	ND	ug/l
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ug/l
Tetrachloroethene	ND	ND	ND	ND	ND	ug/l
Toluene	ND	ND	ND	ND	ND	ug/l
Chorobenzene	ND	ND	ND	ND	ND	ug/l
Ethylbenzene	ND	ND	ND	ND	ND	ug/l
Stryene	ND	ND	ND	ND	ND	ug/l
Xylenes (total)	ND	ND	ND	ND	ND	ug/l

## MW-2 GIANT REFINING - CINIZA

Dissolved Metals

**Parameter**

Arsenic
Barium
Cadmium
Calcium
Magnesium
Manganese
Potassium
Selenium
Silver
Sodium

29-Oct-93 Result	28-Apr-94 Result	19-Oct-94 Result	16-May-95 Result	28-Oct-95 Result	16-Mar-96 Result	Units
ND	ND	ND	ND	NR	<0.005	mg/l
ND	0.015	0.021	0.02	NR	<0.01	mg/l
ND	ND	ND	ND	NR	<0.001	mg/l
1.6	0.9	0.6	1.4	NR	1	mg/l
0.18	0.1	ND	0.1	NR	0.12	mg/l
ND	ND	ND	ND	NR	<0.02	mg/l
ND	ND	ND	ND	NR	0.39	mg/l
ND	ND	ND	ND	NR	0.005	mg/l
ND	ND	ND	ND	NR	0.01	mg/l
78		257	246	NR	264	mg/l

**MW-2 GIANT REFINING - CINIZA**

Total Metals

**Parameter**

Chromium
Lead
Mercury

29-Oct-93 Result	28-Apr-94 Result	19-Oct-94 Result	16-May-95 Result	26-Oct-95 Result	16-Apr-96 Result	Units
ND	0.011	ND	ND	NR	<0.01	mg/l
0.003	ND	ND	ND	NR	<0.005	mg/l
	ND		ND	NR	<0.001	mg/l

## MW-2 GIANT REFINING COMPANY - CINIZA

## General Inorganics

Parameter	29-Oct-93 Result	28-Apr-94 Result	19-Oct-94 Result	16-May-95 Result	28-Oct-95 Result	16-Apr-96 Result	Units
Alkalinity, Bicarb. as CaCO3 at ph 4.5	---	294	---	320	---	331	mg/l
Alkalinity, Carb. as CaCO3 at pH 8.3	---	42	---	ND	---	---	mg/l
Chloride	---	61	---	58	---	62.9	mg/l
pH	9.09	9.1	9.06	9	9.01	9.4	s.u
pH	9.08	---	9.07	---	9.04	9.32	s.u
pH	9.1	---	9.06	---	9.03	9.29	s.u
pH	9.07	---	9.08	---	9.05	9.25	s.u
pH Average	9.085	9.1	9.0675	9	9.0325	9.315	s.u
Phenolics	---	ND	---	ND	---	<0.01	mg/l
Sulfate	---	160	---	170	---	175	mg/l
Specific Conductance at 25 deg. C	1100	1120	1130	1100	1080	1110	umhos/cm
Specific Conductance at 25 deg. C	1110	---	1100	---	1100	1092	umhos/cm
Specific Conductance at 25 deg. C	1090	---	1110	---	1100	1102	umhos/cm
Specific Conductance at 25 deg. C	1090	---	1110	---	1100	1094	umhos/cm
Specific Conductance at 25 deg. C Average	1097.5	1120	1112.5	1100	1095	1099.5	umhos/cm
Total Organic Carbon	ND	ND	ND	ND	1.3	<1.0	mg/l
Total Organic Carbon	ND	ND	ND	ND	---	---	
Total Organic Carbon	---	---	---	---	---	---	
Total Organic Carbon	---	---	---	---	---	---	
Total Organic Halogen as Cl	ND	20	ND	40	22	ND	mg/l

Sheet4

Total Organic Halogen as Cl
Total Organic Halogen as Cl
Total Organic Halogen as Cl
Total Dissolved Solids
Water Elevation

ND	20	ND	20	---	ND	mg/l
---	---	---	---	---	---	
---	---	---	---	---	---	
---	700	---	---	---	676	mg/l
6872.656	6873.62	6870.01	6873.13	6872.34	6867.54	feet

**MW-4 GIANT REFINING - CINIZA**

Volatile Organics (8240)

**Parameter**

	<b>29-Oct-93</b>	<b>28-Apr-94</b>	<b>19-Oct-94</b>	<b>16-May-95</b>	<b>28-Oct-95</b>	<b>16-Apr-96</b>	
	<b>Result</b>	<b>Result</b>	<b>Result</b>	<b>Result</b>	<b>Result</b>	<b>Result</b>	<b>Units</b>
Chloromethane	ND	ND	ND	ND	ND	ND	ug/l
Bromonethane	ND	ND	ND	ND	ND	ND	ug/l
Vinyl chloride	ND	ND	ND	ND	ND	ND	ug/l
Chloroethane	ND	ND	ND	ND	ND	ND	ug/l
Methylene chloride	ND	ND	ND	ND	5	ND	ug/l
Acetone	ND	ND	ND	ND	14	ND	ug/l
Carbon disulfide	ND	ND	ND	ND	ND	ND	ug/l
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ug/l
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/l
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ND	ND	ND	ug/l
Chloroform	ND	ND	ND	ND	ND	ND	ug/l
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/l
2-Butanone	ND	ND	ND	ND	ND	ND	ug/l
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/l
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ug/l
Vinyl acetate	ND	ND	ND	ND	ND	ND	ug/l
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ug/l
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/l
Trichloroethene	ND	ND	ND	ND	ND	ND	ug/l
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ug/l
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/l
Benzene	ND	ND	ND	ND	ND	ND	ug/l
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/l
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND	ug/l
Bromoform	ND	ND	ND	ND	ND	ND	ug/l
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ug/l

Sheet1

2-Hexanone	ND	ND	ND	ND	ND	ug/l
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ug/l
Tetrachloroethene	ND	ND	ND	ND	ND	ug/l
Toluene	ND	ND	ND	ND	ND	ug/l
Chorobenzene	ND	ND	ND	ND	ND	ug/l
Ethylbenzene	ND	ND	ND	ND	ND	ug/l
Stryene	ND	ND	ND	ND	ND	ug/l
Xylenes (total)	ND	ND	ND	ND	ND	ug/l

**MW-4 GIANT REFINING - CINIZA**

Dissolved Metals

**Parameter**

Arsenic
Barium
Cadmium
Calcium
Magnesium
Manganese
Potassium
Selenium
Silver
Sodium

23-Apr-92 Result	28-Apr-93 Result	28-Apr-94 Result	16-May-95 Result	16-Mar-96 Result	Unit
ND	ND	ND	ND	<0.005	mg/l
0.06	0.015	0.019	0.02	0.02	mg/l
ND	ND	ND	ND	<0.002	mg/l
1.5	1.5	0.8	1.7	2	mg/l
0.24	0.3	0.8	0.2	0.24	mg/l
0.08	ND	0.01	ND	<0.02	mg/l
ND	ND	ND	ND	0.78	mg/l
ND	ND	ND	ND	<0.005	mg/l
ND	ND	ND	ND	<0.01	mg/l
78	295	283	257	290	mg/l

**MW-4 GIANT REFINING - CINIZA**

Total Metals

**Parameter**

Chromium
Lead
Mercury

29-Oct-93 Result	28-Apr-94 Result	19-Oct-94 Result	16-May-95 Result	19-Oct-95 Result	16-Mar-96 Result	Unit
ND	ND	0.013	ND	---	<0.01	mg/l
ND	ND	ND	ND	---	<0.005	mg/l
---	ND	---	---	---	<0.001	mg/l

**MW-4 GIANT REFINING COMPANY - CINIZA**

General Inorganics

Parameter

Alkalinity, Bicarb. as

CaCO3 at ph 4.5

Alkalinity, Carb. as

CaCO3 at pH 8.3

Chloride

pH

pH

pH

pH

pH Average

Phenolics

Sulfate

Specific Conductance

at 25 deg. C

Specific Conductance

at 25 deg. C Average

Total Organic Carbon

Total Organic Carbon

Total Organic Carbon

Total Organic Carbon

Total Organic

Halogen as Cl

	29-Oct-93 Result	28-Apr-94 Result	19-Oct-94 Result	16-May-94 Result	26-Oct-95 Result	16-Apr-96 Result	Units
Alkalinity, Bicarb. as CaCO3 at ph 4.5	---	431	---	440	---	446	mg/l
Alkalinity, Carb. as CaCO3 at pH 8.3	---	33	---	21	---	---	mg/l
Chloride	---	17	---	180	---	20.6	mg/l
pH	8.82	8.76	8.77	8.7	9.02	9.12	units
pH	8.83		8.77		9.01	8.99	units
pH	8.8		8.78		9.02	8.94	units
pH	8.8		8.77		9	8.91	units
pH Average	8.8125	8.76	8.7725	8.7	9.0125	8.99	units
Phenolics	ND	ND	---	ND	---	<0.01	mg/l
Sulfate	---	150	---	180	---	160	mg/l
Specific Conductance at 25 deg. C	1140	1140	1140	1200	1100	1144	umhos/cm
Specific Conductance at 25 deg. C	1130		1150		1110	1125	umhos/cm
Specific Conductance at 25 deg. C	1130		1150		1100	1129	umhos/cm
Specific Conductance at 25 deg. C	1150		1160		1090	1135	umhos/cm
Specific Conductance at 25 deg. C Average	1137.5	1140	1150	1200	1100	1133.25	umhos/cm
Total Organic Carbon	ND	ND	ND	ND	1.8	1.1	mg/l
Total Organic Carbon	ND	ND	ND	ND	---	---	mg/l
Total Organic Carbon	---	---	---	---	---	---	mg/l
Total Organic Carbon	---	---	---	---	---	---	mg/l
Total Organic Halogen as Cl	ND	20	ND	20	<8.0	20.6	ug/l

Sheet4

Total Organic  
Halogen as Cl  
Total Organic  
Halogen as Cl  
Total Organic  
Halogen as Cl  
Total Dissolved  
Solids  
Water Elevation

ND	40	ND	20	---	---	ug/l
---	---	---	---	---	---	ug/l
---	---	---	---	---	---	ug/l
---	740	---	---	---	741	mg/l
6877.1	6876.76	6876.06	6872.71	6875.93	6876.04	feet

**MW-5 GIANT REFINING - CINIZA**

Volatile Organics (8240)

**Parameter**

	<b>29-Oct-93</b>	<b>28-Apr-94</b>	<b>19-Oct-94</b>	<b>16-May-95</b>	<b>28-Oct-95</b>	<b>16-Apr-96</b>	<b>Units</b>
	<b>Result</b>	<b>Result</b>	<b>Result</b>	<b>Result</b>	<b>Result</b>	<b>Result</b>	
Chloromethane	ND	ND	ND	ND	ND	ND	ug/l
Bromonethane	ND	ND	ND	ND	ND	ND	ug/l
Vinyl chloride	ND	ND	ND	ND	ND	ND	ug/l
Chloroethane	ND	ND	ND	ND	ND	ND	ug/l
Methylene chloride	ND	ND	ND	ND	5	ND	ug/l
Acetone	ND	ND	ND	ND	14	ND	ug/l
Carbon disulfide	ND	ND	ND	ND	ND	ND	ug/l
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ug/l
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/l
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ND	ND	ND	ug/l
Chloroform	ND	ND	ND	ND	ND	ND	ug/l
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ug/l
2-Butanone	ND	ND	ND	ND	ND	ND	ug/l
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/l
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ug/l
Vinyl acetate	ND	ND	ND	ND	ND	ND	ug/l
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ug/l
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/l
Trichloroethene	ND	ND	ND	ND	ND	ND	ug/l
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ug/l
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ug/l
Benzene	ND	ND	ND	ND	ND	ND	ug/l
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ug/l
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND	ug/l
Bromoform	ND	ND	ND	ND	ND	ND	ug/l
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ug/l

Sheet1

2-Hexanone	ND	ND	ND	ND	ND	ug/l
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ug/l
Tetrachloroethene	ND	ND	ND	ND	ND	ug/l
Toluene	ND	ND	ND	ND	ND	ug/l
Chorobenzene	ND	ND	ND	ND	ND	ug/l
Ethylbenzene	ND	ND	ND	ND	ND	ug/l
Stryene	ND	ND	ND	ND	ND	ug/l
Xylenes (total)	ND	ND	ND	ND	ND	ug/l

## MW-5 GIANT REFINING - CINIZA

Dissolved Metals

**Parameter**

Arsenic
Barium
Cadmium
Calcium
Magnesium
Manganese
Potassium
Selenium
Silver
Sodium

23-Apr-92 Result	28-Apr-93 Result	28-Apr-94 Result	16-May-95 Result	16-Mar-96 Result	Unit
ND	ND	ND	ND	<0.005	mg/l
ND	0.015	0.018	0.02	0.02	mg/l
ND	ND	ND	ND	<0.002	mg/l
1.1	1.4	1.4	1.5	1.6	mg/l
0.24	0.2	0.1	0.1	0.24	mg/l
0.15	ND	ND	ND	<0.02	mg/l
ND	1.5	ND	ND	0.78	mg/l
ND	ND	ND	ND	<0.005	mg/l
ND	ND	0.01	ND	<0.01	mg/l
64	269	263	246	275	mg/l

**MW-5 GIANT REFINING - CINIZA**

Total Metals

**Parameter**

Chromium
Lead
Mercury

28-Apr-93 Result	29-Oct-93 Result	27-Apr-94 Result	19-Oct-94 Result	16-May-95 Result	19-Oct-95 Result	13-Mar-96 Result	Unit
ND	ND	ND	ND	ND	---	<0.01	mg/l
ND	0.002	ND	ND	ND	---	<0.005	mg/l
ND	---	ND	---	ND	---	<0.001	mg/l

**MW-5 GIANT REFINING COMPANY - CINIZA**

General Inorganics

**Parameter**

Alkalinity, Bicarb. as

CaCO3 at pH 4.5

Alkalinity, Carb. as

CaCO3 at pH 8.3

Chloride

pH

pH

pH

pH

pH Average

Phenolics

Sulfate

Specific Conductance

at 25 deg. C

Specific Conductance

at 25 deg. C Average

Total Organic Carbon

Total Organic Carbon

Total Organic Carbon

Total Organic Carbon

Total Organic

Halogen as Cl

	29-Oct-93 Result	28-Apr-94 Result	19-Oct-94 Result	16-May-94 Result	26-Oct-95 Result	16-Apr-96 Result	Units
Alkalinity, Bicarb. as CaCO3 at pH 4.5	---	289	---	330	---	322	mg/l
Alkalinity, Carb. as CaCO3 at pH 8.3	---	42	---	ND	---	---	mg/l
Chloride	---	66	---	63	---	65.7	mg/l
pH	8.96	9.1	9.09	9	9.01	9.65	units
pH	8.96		9.09		9.03	9.42	units
pH	9		9.09		9.06	9.32	units
pH	8.97		9.11		9.06	9.28	units
pH Average	8.9725	9.1	9.095	9	9.04	9.4175	units
Phenolics	---	ND	ND	ND	---	<0.01	mg/l
Sulfate	---	170	ND	190	---	175	mg/l
Specific Conductance at 25 deg. C	1110	1260	1120	1100	1120	1111	umhos/cm
Specific Conductance at 25 deg. C	1130		1130		1100	1110	umhos/cm
Specific Conductance at 25 deg. C	1120		1130		1110	1118	umhos/cm
Specific Conductance at 25 deg. C	1130		1120		1120	1118	umhos/cm
Specific Conductance at 25 deg. C Average	1122.5	1260	1125	1100	1112.5	1114.25	umhos/cm
Total Organic Carbon	ND	---	ND	ND	1.7	<1.0	mg/l
Total Organic Carbon	ND	---	ND	ND	---	---	mg/l
Total Organic Carbon	---	---	---	---	---	---	mg/l
Total Organic Carbon	---	---	---	---	---	---	mg/l
Total Organic Halogen as Cl	ND	---	ND	20	14	ND	ug/l

Sheet4

Total Organic  
Halogen as Cl  
Total Organic  
Halogen as Cl  
Total Organic  
Halogen as Cl  
Total Dissolved  
Solids  
Water Elevation

ND	---	ND	20	---	---	ug/l
---	---	---	---	---	---	ug/l
---	---	---	---	---	---	ug/l
---	700	---	---	---	714	mg/l
6873.53	6873.83	6869.39	6877.32	6874	6870.82	feet

**Inter-Mountain Laboratories, Inc.**

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refinery**  
 Project: Not given  
 Sample ID: OW1-032596  
 Laboratory ID: 0396W00503  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/17/96  
 Date Sampled: 03/25/96  
 Time Sampled: 13:00  
 Date Received: 04/01/96

Parameter	Analytical			
	Result	Units	Units	
Lab pH.....	8.6	s.u.		
Lab Conductivity @ 25° C.....	1,380	umhos/cm		
Total Dissolved Solids @ 180°C.....	832	mg/L		
Total Dissolved Solids (Calc).....	813	mg/L		
Total Alkalinity as CaCO3.....	407	mg/L		
Total Hardness as CaCO3.....	8	mg/L		
Bicarbonate as HCO3.....	467	mg/L	7.66	meq/L
Carbonate as CO3.....	14	mg/L	0.48	meq/L
Hydroxide.....	<1	mg/L	<0.01	meq/L
Chloride.....	49	mg/L	1.38	meq/L
Sulfate.....	216	mg/L	4.51	meq/L
Calcium.....	2.6	mg/L	0.13	meq/L
Magnesium.....	0.2	mg/L	0.02	meq/L
Potassium.....	0.8	mg/L	0.02	meq/L
Sodium.....	299	mg/L	13.02	meq/L
Cations.....			13.19	meq/L
Anions.....			14.03	meq/L
Cation/Anion Difference.....			3.09	%

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

Reported by WM

Reviewed by CSA

**VOLATILE AROMATIC HYDROCARBONS**

Giant Refining Co.

Project ID: Not Given  
 Sample ID: OW1-032596  
 Lab ID: 0396W00503  
 Sample Matrix: Water  
 Condition: Cool/Intact

Report Date: 04/11/96  
 Date Sampled: 03/25/96  
 Date Received: 04/01/96  
 Date Extracted: NA  
 Date Analyzed: 04/04/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Bromofluorobenzene	103.0	75 -125%

**Reference:** Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

**Comments:**

  
 Analyst

  
 Review

**Inter-Mountain Laboratories, Inc.**

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refinery**  
Project: Not given  
Sample ID: OW1-032596  
Laboratory ID: 0396W00503  
Sample Matrix: Water  
Condition: Cool/Intact

Date Reported: 04/17/96  
Date Sampled: 03/25/96  
Time Sampled: 13:00  
Date Received: 04/01/96

Parameter	Analytical			
	Result	Units	Units	
Lab pH.....	8.6	s.u.		
Lab Conductivity @ 25° C.....	1,380	umhos/cm		
Total Dissolved Solids @ 180°C.....	832	mg/L		
Total Dissolved Solids (Calc).....	813	mg/L		
Total Alkalinity as CaCO3.....	407	mg/L		
Total Hardness as CaCO3.....	8	mg/L		
Bicarbonate as HCO3.....	467	mg/L	7.66	meq/L
Carbonate as CO3.....	14	mg/L	0.48	meq/L
Hydroxide.....	<1	mg/L	<0.01	meq/L
Chloride.....	49	mg/L	1.38	meq/L
Sulfate.....	216	mg/L	4.51	meq/L
Calcium.....	2.6	mg/L	0.13	meq/L
Magnesium.....	0.2	mg/L	0.02	meq/L
Potassium.....	0.8	mg/L	0.02	meq/L
Sodium.....	299	mg/L	13.02	meq/L
Cations.....			13.19	meq/L
Anions.....			14.03	meq/L
Cation/Anion Difference.....			3.09	%

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
"Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

Reported by LJM

Reviewed by CH

**Inter-Mountain Laboratories, Inc.**

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refinery**  
 Project: NMED-LTA  
 Sample ID: OW3-031896  
 Laboratory ID: 0396W00422  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/10/96  
 Date Sampled: 03/18/96  
 Time Sampled: 13:15  
 Date Received: 03/20/96

Parameter	Analytical			
	Result	Units	Units	
Lab pH.....	8.0	s.u.		
Lab Conductivity @ 25° C.....	1,340	umhos/cm		
Total Dissolved Solids @ 180°C.....	844	mg/L		
Total Dissolved Solids (Calc).....	798	mg/L		
Total Alkalinity as CaCO3.....	665	mg/L		
Total Hardness as CaCO3.....	36.0	mg/L		
Bicarbonate as HCO3.....	811	mg/L	13.3	meq/L
Carbonate as CO3.....	<1	mg/L	<0.01	meq/L
Hydroxide.....	<1	mg/L	<0.01	meq/L
Chloride.....	42.2	mg/L	1.19	meq/L
Sulfate.....	26.3	mg/L	0.55	meq/L
Calcium.....	9.42	mg/L	0.47	meq/L
Magnesium.....	3.04	mg/L	0.25	meq/L
Potassium.....	0.78	mg/L	0.02	meq/L
Sodium.....	317	mg/L	13.8	meq/L
Cations.....			14.6	meq/L
Anions.....			15.0	meq/L
Cation/Anion Difference.....			1.65	%

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

Reported by OB

Reviewed by WM

**VOLATILE AROMATIC HYDROCARBONS**

Giant Refining Co.

Project ID:	NMED-LTA	Report Date:	04/02/96
Sample ID:	OW3 031896	Date Sampled:	03/18/96
Lab ID:	0396W00422	Date Received:	03/20/96
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	03/27/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

<b>Quality Control:</b>	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	100.8	75 -125%

**Reference:** Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

**Comments:**

  
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Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refinery**  
 Project: NMED-LTA  
 Sample ID: OW2-031896  
 Laboratory ID: 0396W00421  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/10/96  
 Date Sampled: 03/18/96  
 Time Sampled: 15:00  
 Date Received: 03/20/96

Parameter	Analytical			
	Result	Units	Units	
Lab pH.....	7.9	s.u.		
Lab Conductivity @ 25° C.....	1,340	umhos/cm		
Total Dissolved Solids @ 180°C.....	840	mg/L		
Total Dissolved Solids (Calc).....	786	mg/L		
Total Alkalinity as CaCO3.....	664	mg/L		
Total Hardness as CaCO3.....	35.5	mg/L		
Bicarbonate as HCO3.....	810	mg/L	13.3	meq/L
Carbonate as CO3.....	<1	mg/L	<0.01	meq/L
Hydroxide.....	<1	mg/L	<0.01	meq/L
Chloride.....	42.4	mg/L	1.20	meq/L
Sulfate.....	12.3	mg/L	0.26	meq/L
Calcium.....	9.02	mg/L	0.45	meq/L
Magnesium.....	3.16	mg/L	0.26	meq/L
Potassium.....	0.39	mg/L	0.01	meq/L
Sodium.....	320	mg/L	13.9	meq/L
Cations.....			14.6	meq/L
Anions.....			14.7	meq/L
Cation/Anion Difference.....			0.32	%

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

Reported by JB

Reviewed by WM

**VOLATILE AROMATIC HYDROCARBONS**

Giant Refining Co.

Project ID: NMED-LTA  
Sample ID: OW2 031896  
Lab ID: 0396W00421  
Sample Matrix: Water  
Condition: Cool/Intact

Report Date: 04/02/96  
Date Sampled: 03/18/96  
Date Received: 03/20/96  
Date Extracted: NA  
Date Analyzed: 03/27/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control: Surrogate Percent Recovery Acceptance Limits  
Bromofluorobenzene 120.8 75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Review



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Organics Laboratory  
3304 Longmire Drive College Station, Texas 77845  
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**TOX**  
**TOTAL ORGANIC HALIDES**

Client: **GIANT REFINING COMPANY**  
Project Location: Unknown  
Sample ID: SMW3-031596  
Sample Number: 0396W00439/0696G00549  
Sample Matrix: Water  
Condition: Intact, Cool, pH=7

Report Date: 04/09/96  
Date Sampled: 03/15/96  
Date Received: 03/26/96  
Date Analyzed: 04/08/96

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	30
Concentration is the average of the replicates reported below		
Replicate #1	ND	30
Replicate #2	ND	30

ND - Analyte not detected at stated detection limit.

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

DG/RRD  
Analyst

Not 7 mpm  
Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refining Company**  
 Project: Ciniza  
 Sample ID: SMW3-031596  
 Laboratory ID: 0396W00439  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/22/96  
 Date Sampled: 03/15/96  
 Time Sampled: 1:05 PM  
 Date Received: 03/21/96

Parameter	Analytical			
	Result	Units		Units
Lab pH.....	7.7	s.u.		
Lab Conductivity @ 25° C.....	3,090	umhos/cm		
Total Dissolved Solids @ 180°C.....	2,040	mg/L		
Phenols.....	<0.01	mg/L		
Total Alkalinity as CaCO3.....	644	mg/L		
Total Hardness as CaCO3.....	176	mg/L		
Total Organic Carbon.....	3.2	mg/L		
Bicarbonate as HCO3.....	786	mg/L	12.9	meq/L
Carbonate as CO3.....	<1	mg/L	<0.01	meq/L
Hydroxide as OH.....	<1	mg/L	<0.01	meq/L
Chloride.....	91.0	mg/L	2.57	meq/L
Sulfate.....	844	mg/L	17.57	meq/L
Calcium.....	47	mg/L	2.36	meq/L
Magnesium.....	14	mg/L	1.19	meq/L
Potassium.....	0.78	mg/L	0.02	meq/L
Sodium.....	669	mg/L	29.1	meq/L
Cations.....			32.7	meq/L
Anions.....			33.0	meq/L
Cation/Anion Difference.....			0.54	%

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by CHall

Inter-Mountain Laboratories, Inc.

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refining Company**  
Subject: Ciniza  
Sample ID: SMW3-031596  
Laboratory ID: 0396W00439  
Sample Matrix: Water  
Condition: Cool/Intact

Date Reported: 04/22/96  
Date Sampled: 03/15/96  
Time Sampled: 1:05 PM  
Date Received: 03/21/96

Parameter	Total Analytical Result	Units
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**Trace Metals**

Chromium.....	<0.01	mg/L
Lead.....	<0.005	mg/L

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
"Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by *[Signature]*



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**EPA Method 8260**  
**VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Project: NA  
Sample ID: SMW3-031596  
Laboratory ID: 0396G00439 / 0696G00538  
Sample Matrix Water  
Preservative: HCl  
Condition: Intact, pH < 2

Report Date: 03/25/96  
Date Sampled: 03/15/96  
Date Received: 03/22/96  
Date Extracted: 03/22/96  
Date Analyzed: 03/23/96  
Time Analyzed: 1:21 AM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: SMW3-031596  
Laboratory ID: 0396G00439 / 0696G00538  
Matrix: Water

Report Date: 03/25/96  
Date Sampled: 03/15/96  
Date Analyzed: 03/23/96  
Time Analyzed: 1:21 AM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

Quality Control:

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	100%	86 - 118%
Toluene-d8	99%	88 - 110%
Bromofluorobenzene	99%	86 - 117%



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**EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Sample ID: **SMW3-031596**  
Laboratory ID: **0396G00439 / 0696G00538**  
Matrix: **Water**

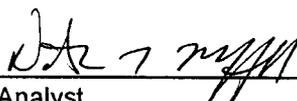
Report Date: **03/25/96**  
Date Sampled: **03/15/96**  
Date Analyzed: **03/23/96**  
Time Analyzed: **1:21 AM**

<b>Tentative Identification</b>	<b>Retention Time (Minutes)</b>	<b>Concentration * (mg/L)</b>
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

**Reference:** Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

**Comments:**

  
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Analyst

  
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Review



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**EPA Method 8260**  
**VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Project: **NMED-LTA**  
Sample ID: **OW-11 031396**  
Laboratory ID: **0396W00420 / 0696G00478**  
Sample Matrix **Water**  
Preservative: **HCl**  
Condition: **Intact, pH < 2**

Report Date: **04/01/96**  
Date Sampled: **03/13/96**  
Date Received: **03/21/96**  
Date Extracted: **03/27/96**  
Date Analyzed: **03/27/96**  
Time Analyzed: **1:20 AM**

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Sample ID: **OW-11 031396**  
Laboratory ID: **0396W00420 / 0696G00478**  
Matrix: **Water**

Report Date: **04/01/96**  
Date Sampled: **03/13/96**  
Date Analyzed: **03/27/96**  
Time Analyzed: **1:20 AM**

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	101%	86 - 118%
Toluene-d8	98%	88 - 110%
Bromofluorobenzene	98%	86 - 117%

Client:	<b>Giant Refining</b>	Date Reported:	04/26/96
Project:	NMED-LTA	Date Sampled:	03/13/96
Sample ID:	OW11-031396	Time Sampled:	2:05 PM
Laboratory ID:	0396W00420	Date Received:	03/20/96
Sample Matrix:	Water		
Condition:	Cool/Intact		

Parameter	Analytical		Units
	Result	Units	
Lab pH.....	8.3	s.u.	
Lab Conductivity @ 25° C.....	2,510	umhos/cm	
Total Dissolved Solids @ 180°C.....	1,630	mg/L	
Total Dissolved Solids (Calc).....	1,610	mg/L	
Phenols.....	<0.01	mg/L	
Total Alkalinity as CaCO3.....	348	mg/L	
Total Hardness as CaCO3.....	28.0	mg/L	
Total Organic Carbon.....	2.8	mg/L	
Bicarbonate as HCO3.....	420	mg/L	6.88 meq/L
Carbonate as CO3.....	2.4	mg/L	0.08 meq/L
Hydroxide as OH.....	<1	mg/L	<0.01 meq/L
Chloride.....	108	mg/L	3.05 meq/L
Sulfate.....	708	mg/L	14.7 meq/L
Calcium.....	9.42	mg/L	0.47 meq/L
Magnesium.....	1.09	mg/L	0.09 meq/L
Potassium.....	1.56	mg/L	0.04 meq/L
Sodium.....	575	mg/L	25.0 meq/L
Cations.....			25.6 meq/L
Anions.....			24.8 meq/L
Cation/Anion Difference.....			1.74 %

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
"Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by JB

Reviewed by MS

Client: **Giant Refining**  
 Project: **NMED-LTA**  
 Sample ID: **OW11-031396**  
 Laboratory ID: **0396W00420**  
 Sample Matrix: **Water**  
 Condition: **Cool/Intact**

Date Reported: **04/26/96**  
 Date Sampled: **03/13/96**  
 Time Sampled: **2:05 PM**  
 Date Received: **03/20/96**

Parameter	Dissolved	Units	Total	Units
	Analytical		Analytical	
	Result		Result	

**Trace Metals**

Arsenic.....	<0.005	mg/L		
Barium.....	0.01	mg/L		
Cadmium.....	<0.002	mg/L		
Chromium.....	NA	mg/L	<0.01	mg/L
Lead.....	NA	mg/L	<0.005	mg/L
Manganese.....	<0.02	mg/L		
Mercury.....	NA	mg/L	<0.001	mg/L
Selenium.....	<0.005	mg/L		
Silver.....	<0.01	mg/L		

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by JB

Reviewed by AS



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**TOX**  
**TOTAL ORGANIC HALIDES**

Client:	<b>GIANT REFINING COMPANY</b>	Report Date:	04/09/96
Project Location:	Unknown	Date Sampled:	03/13/96
Sample ID:	DW11-031396	Date Received:	03/26/96
Sample Number:	0396W00420/0696G00548	Date Analyzed:	04/08/96
Sample Matrix:	Water		
Condition:	Intact, Cool, pH=7		

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	30
Concentration is the average of the replicates reported below		
Replicate #1	ND	30
Replicate #2	ND	30

ND - Analyte not detected at stated detection limit.

**Reference:** Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

**Comments:**

DG/RPS  
Analyst

AT 7 mpp  
Review



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: OW-11 031396  
Laboratory ID: 0396W00420 / 0696G00478  
Matrix: Water

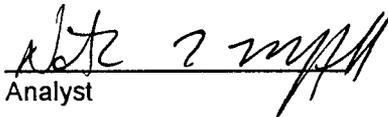
Report Date: 04/01/96  
Date Sampled: 03/13/96  
Date Analyzed: 03/27/96  
Time Analyzed: 1:20 AM

Tentative Identification	Retention Time (Minutes)	Concentration * (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

Reference: Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

Comments:

  
Analyst

  
Review



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Project: NA  
Sample ID: SMW4-031596  
Laboratory ID: 0396G00440 / 0696G00539  
Sample Matrix Water  
Preservative: HCl  
Condition: Intact, pH < 2

Report Date: 03/25/96  
Date Sampled: 03/15/96  
Date Received: 03/22/96  
Date Extracted: 03/22/96  
Date Analyzed: 03/23/96  
Time Analyzed: 2:04 AM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: SMW4-031596  
Laboratory ID: 0396G00440 / 0696G00539  
Matrix: Water

Report Date: 03/25/96  
Date Sampled: 03/15/96  
Date Analyzed: 03/23/96  
Time Analyzed: 2:04 AM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

Quality Control:

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	100%	86 - 118%
Toluene-d8	99%	88 - 110%
Bromofluorobenzene	99%	86 - 117%



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: SMW4-031596  
Laboratory ID: 0396G00440 / 0696G00539  
Matrix: Water

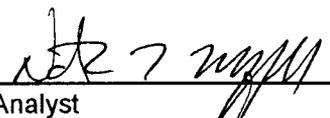
Report Date: 03/25/96  
Date Sampled: 03/15/96  
Date Analyzed: 03/23/96  
Time Analyzed: 2:04 AM

Tentative Identification	Retention Time (Minutes)	Concentration * (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

Reference: Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

Comments:

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Review

**Inter-Mountain Laboratories, Inc.**

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refining Company**  
 Project: Ciniza  
 Sample ID: SMW4-031596  
 Laboratory ID: 0396W00440  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/22/96  
 Date Sampled: 03/15/96  
 Time Sampled: 10:38 AM  
 Date Received: 03/21/96

Parameter	Analytical			
	Result	Units		Units
Lab pH.....	8.4	s.u.		
Lab Conductivity @ 25° C.....	1,300	umhos/cm		
Total Dissolved Solids @ 180°C.....	740	mg/L		
Phenols.....	<0.01	mg/L		
Total Alkalinity as CaCO3.....	398	mg/L		
Total Hardness as CaCO3.....	11	mg/L		
Total Organic Carbon.....	1.0	mg/L		
Bicarbonate as HCO3.....	461	mg/L	7.56	meq/L
Carbonate as CO3.....	12	mg/L	0.40	meq/L
Hydroxide as OH.....	<1	mg/L	<0.01	meq/L
Chloride.....	61.0	mg/L	1.72	meq/L
Sulfate.....	170	mg/L	3.53	meq/L
Calcium.....	3.01	mg/L	0.15	meq/L
Magnesium.....	0.97	mg/L	0.08	meq/L
Potassium.....	0.78	mg/L	0.02	meq/L
Sodium.....	292	mg/L	12.7	meq/L
Cations.....			13.0	meq/L
Anions.....			13.2	meq/L
Cation/Anion Difference.....			1.01	%

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by CDH

Client: **Giant Refining Company**  
Subject: Ciniza  
Sample ID: SMW4-031596  
Laboratory ID: 0396W00440  
Sample Matrix: Water  
Condition: Cool/Intact

Date Reported: 04/22/96  
Date Sampled: 03/15/96  
Time Sampled: 10:38 AM  
Date Received: 03/21/96

Parameter	Total Analytical Result	Units
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**Trace Metals**

Chromium.....	<0.01	mg/L
Lead.....	<0.005	mg/L

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
"Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by CB Hall



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**TOX**  
**TOTAL ORGANIC HALIDES**

Client: **GIANT REFINING COMPANY**  
Project Location: Unknown  
Sample ID: SMW4-031596  
Sample Number: 0396W00440/0696G00550  
Sample Matrix: Water  
Condition: Intact, Cool, pH=7

Report Date: 04/09/96  
Date Sampled: 03/15/96  
Date Received: 03/26/96  
Date Analyzed: 04/08/96

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	30
Concentration is the average of the replicates reported below		
Replicate #1	ND	30
Replicate #2	ND	30

ND - Analyte not detected at stated detection limit.

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

DG/RRD  
Analyst

WAT 7/2/96  
Review



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## Inter-Mountain Laboratories, Inc.

Organics Laboratory  
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### EPA Method 8260 VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Project: NA  
Sample ID: SMW5-031496  
Laboratory ID: 0396G00441 / 0696G00540  
Sample Matrix: Water  
Preservative: HCl  
Condition: Intact, pH < 2

Report Date: 03/25/96  
Date Sampled: 03/15/96  
Date Received: 03/22/96  
Date Extracted: 03/22/96  
Date Analyzed: 03/23/96  
Time Analyzed: 2:45 AM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Sample ID: SMW5-031496  
Laboratory ID: 0396G00441 / 0696G00540  
Matrix: Water

Report Date: 03/25/96  
Date Sampled: 03/15/96  
Date Analyzed: 03/23/96  
Time Analyzed: 2:45 AM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	101%	86 - 118%
Toluene-d8	98%	88 - 110%
Bromofluorobenzene	100%	86 - 117%

InterMountain Laboratories, Inc.

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refining Company**  
Subject: Ciniza  
Sample ID: SMW5-031496  
Laboratory ID: 0396W00441  
Sample Matrix: Water  
Condition: Cool/Intact

Date Reported: 04/22/96  
Date Sampled: 03/14/96  
Time Sampled: 1:08 PM  
Date Received: 03/21/96

Parameter	Total Analytical Result	Units
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**Trace Metals**

Chromium.....	<0.01	mg/L
Lead.....	<0.005	mg/L

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
"Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by ashell

**Inter-Mountain Laboratories, Inc.**

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refining Company**

Project: Ciniza

Sample ID: SMW5-031496      Date Reported: 04/22/96

Laboratory ID: 0396W00441      Date Sampled: 03/14/96

Sample Matrix: Water      Time Sampled: 1:08 PM

Condition: Cool/Intact      Date Received: 03/21/96

Parameter	Analytical		Units
	Result	Units	
Lab pH.....	8.6	s.u.	
Lab Conductivity @ 25° C.....	1,230	umhos/cm	
Total Dissolved Solids @ 180°C.....	704	mg/L	
Phenols.....	<0.01	mg/L	
Total Alkalinity as CaCO3.....	366	mg/L	
Total Hardness as CaCO3.....	9.0	mg/L	
Total Organic Carbon.....	1.0	mg/L	
Bicarbonate as HCO3.....	427	mg/L	7.00 meq/L
Carbonate as CO3.....	9.6	mg/L	0.32 meq/L
Hydroxide as OH.....	<1	mg/L	<0.01 meq/L
Chloride.....	66.6	mg/L	1.88 meq/L
Sulfate.....	160	mg/L	3.34 meq/L
Calcium.....	2.20	mg/L	0.11 meq/L
Magnesium.....	1.82	mg/L	0.15 meq/L
Potassium.....	1.96	mg/L	0.05 meq/L
Sodium.....	276	mg/L	12.0 meq/L
Cations.....			12.3 meq/L
Anions.....			12.5 meq/L
Cation/Anion Difference.....			0.93 %

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
"Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by CSHollace



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**TOX**  
**TOTAL ORGANIC HALIDES**

Client: **GIANT REFINING COMPANY**  
Project Location: Unknown  
Sample ID: SMW5-031496  
Sample Number: 0396W00441/0696G00551  
Sample Matrix: Water  
Condition: Intact, Cool, pH=7

Report Date: 04/09/96  
Date Sampled: 03/14/96  
Date Received: 03/26/96  
Date Analyzed: 04/09/96

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	30
Concentration is the average of the replicates reported below		
Replicate #1	ND	30
Replicate #2	ND	30

ND - Analyte not detected at stated detection limit.

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

DG/RRS  
Analyst

Not ? [Signature]  
Review



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: SMW5-031496  
Laboratory ID: 0396G00441 / 0696G00540  
Matrix: Water

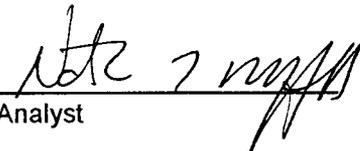
Report Date: 03/25/96  
Date Sampled: 03/15/96  
Date Analyzed: 03/23/96  
Time Analyzed: 2:45 AM

Tentative Identification	Retention Time (Minutes)	Concentration* (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

Reference: Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

Comments:

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Review



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Project: NA  
Sample ID: MW-1 - 031696  
Laboratory ID: 0396G00443 / 0696G00542  
Sample Matrix: Water  
Preservative: HCl  
Condition: Intact, pH < 2

Report Date: 04/01/96  
Date Sampled: 03/16/96  
Date Received: 03/22/96  
Date Extracted: 03/26/96  
Date Analyzed: 03/26/96  
Time Analyzed: 11:19 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: MW-1 - 031696  
Laboratory ID: 0396G00443 / 0696G00542  
Matrix: Water

Report Date: 04/01/96  
Date Sampled: 03/16/96  
Date Analyzed: 03/26/96  
Time Analyzed: 11:19 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

Quality Control:

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	100%	86 - 118%
Toluene-d8	99%	88 - 110%
Bromofluorobenzene	98%	86 - 117%

Client: **Giant Refining Company**  
 Project: Ciniza  
 Sample ID: MW1-031696  
 Laboratory ID: 0396W00443  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/22/96  
 Date Sampled: 03/16/96  
 Time Sampled: 1:00 PM  
 Date Received: 03/21/96

Parameter	Analytical		Units	
	Result	Units		Units
Lab pH.....	8.8	s.u.		
Lab Conductivity @ 25° C.....	1,200	umhos/cm		
Total Dissolved Solids @ 180°C.....	670	mg/L		
Total Dissolved Solids (Calc).....	702			
Phenols.....	<0.01	mg/L		
Total Alkalinity as CaCO3.....	342	mg/L		
Total Hardness as CaCO3.....	3.00	mg/L		
Total Organic Carbon.....	<1	mg/L		
Bicarbonate as HCO3.....	373	mg/L	6.12	meq/L
Carbonate as CO3.....	22	mg/L	0.72	meq/L
Hydroxide as OH.....	<1	mg/L	<0.01	meq/L
Chloride.....	55.4	mg/L	1.56	meq/L
Sulfate.....	175	mg/L	3.65	meq/L
Calcium.....	1.00	mg/L	0.05	meq/L
Magnesium.....	0.12	mg/L	0.01	meq/L
Potassium.....	0.39	mg/L	0.01	meq/L
Sodium.....	264	mg/L	11.5	meq/L
Cations.....			11.6	meq/L
Anions.....			12.1	meq/L
Cation/Anion Difference.....			2.05	%

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by CBHolland

Client: **Giant Refining Company**  
 Project: Ciniza  
 Sample ID: MW1-031696  
 Laboratory ID: 0396W00443  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/22/96  
 Date Sampled: 03/16/96  
 Time Sampled: 1:00 PM  
 Date Received: 03/21/96

Parameter	Dissolved	Units	Total	Units
	Analytical		Analytical	
	Result		Result	

**Trace Metals**

Arsenic.....	<0.005	mg/L		
Barium.....	<0.01	mg/L		
Cadmium.....	<0.001	mg/L		
Chromium.....	NA	mg/L	<0.01	mg/L
Lead.....	NA	mg/L	<0.005	mg/L
Manganese.....	<0.02	mg/L		
Mercury.....	NA	mg/L	<0.001	mg/L
Selenium.....	<0.005	mg/L		
Silver.....	<0.01	mg/L		

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by Chital



# Inter-Mountain Laboratories, Inc.

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## TOX TOTAL ORGANIC HALIDES

Client:	GIANT REFINING COMPANY	Report Date:	04/09/96
Project Location:	Unknown	Date Sampled:	03/16/96
Sample ID:	MW1-031696	Date Received:	03/26/96
Sample Number:	0396W00443/0696G00553	Date Analyzed:	04/09/96
Sample Matrix:	Water		
Condition:	Intact, Cool, pH=7		

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	30
Concentration is the average of the replicates reported below		
Replicate #1	ND	30
Replicate #2	ND	30

ND - Analyte not detected at stated detection limit.

**Reference:** Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

**Comments:**

DG / PPS  
Analyst

Not a MPA  
Review



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: MW-1 - 031696  
Laboratory ID: 0396G00443 / 0696G00542  
Matrix: Water

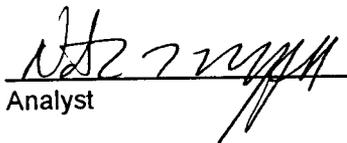
Report Date: 04/01/96  
Date Sampled: 03/16/96  
Date Analyzed: 03/26/96  
Time Analyzed: 11:19 PM

Tentative Identification	Retention Time (Minutes)	Concentration* (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

Reference: Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

Comments:

  
Analyst

  
Review



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**EPA Method 8260**  
**VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Project: NA  
Sample ID: MW-2 - 031696  
Laboratory ID: 0396G00442 / 0696G00541  
Sample Matrix Water  
Preservative: HCl  
Condition: Intact, pH < 2

Report Date: 04/01/96  
Date Sampled: 03/16/96  
Date Received: 03/22/96  
Date Extracted: 03/26/96  
Date Analyzed: 03/26/96  
Time Analyzed: 10:38 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Sample ID: MW-2 - 031696  
Laboratory ID: 0396G00442 / 0696G00541  
Matrix: Water

Report Date: 04/01/96  
Date Sampled: 03/16/96  
Date Analyzed: 03/26/96  
Time Analyzed: 10:38 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	100%	86 - 118%
Toluene-d8	99%	88 - 110%
Bromofluorobenzene	99%	86 - 117%

**InterMountain Laboratories, Inc.**

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refining Company**  
 Project: Ciniza  
 Sample ID: MW2-031696  
 Laboratory ID: 0396W00442  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/22/96  
 Date Sampled: 03/16/96  
 Time Sampled: 9:00 AM  
 Date Received: 03/21/96

Parameter	Analytical		Units	Units
	Result	Units		
Lab pH.....	8.8	s.u.		
Lab Conductivity @ 25° C.....	1,210	umhos/cm		
Total Dissolved Solids @ 180°C.....	676	mg/L		
Phenols.....	<0.01	mg/L		
Total Alkalinity as CaCO3.....	331	mg/L		
Total Hardness as CaCO3.....	3.00	mg/L		
Total Organic Carbon.....	<1	mg/L		
Bicarbonate as HCO3.....	365	mg/L	5.98	meq/L
Carbonate as CO3.....	19	mg/L	0.64	meq/L
Hydroxide as OH.....	<1	mg/L	<0.01	meq/L
Chloride.....	62.9	mg/L	1.77	meq/L
Sulfate.....	175	mg/L	3.65	meq/L
Calcium.....	1.00	mg/L	0.05	meq/L
Magnesium.....	0.12	mg/L	0.01	meq/L
Potassium.....	0.78	mg/L	0.01	meq/L
Sodium.....	269	mg/L	11.7	meq/L
Cations.....			11.8	meq/L
Anions.....			12.0	meq/L
Cation/Anion Difference.....			1.24	%

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by CSH

**InterMountain Laboratories, Inc.**

2506 W. Main Street  
Farmington, New Mexico 87401

Client: **Giant Refining Company**  
 Subject: Ciniza  
 Sample ID: MW2-031696  
 Laboratory ID: 0396W00442  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/22/96  
 Date Sampled: 03/16/96  
 Time Sampled: 9:00 AM  
 Date Received: 03/21/96

Parameter	Dissolved Analytical Result	Units	Total Analytical Result	Units
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**Trace Metals**

Arsenic.....	<0.005	mg/L		
Barium.....	0.02	mg/L		
Cadmium.....	<0.001	mg/L		
Chromium.....	NA	mg/L	<0.01	mg/L
Lead.....	NA	mg/L	<0.005	mg/L
Manganese.....	<0.02	mg/L		
Mercury.....	NA	mg/L	<0.001	mg/L
Selenium.....	<0.005	mg/L		
Silver.....	<0.01	mg/L		

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by WM

Reviewed by CSHilal



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**TOX**  
**TOTAL ORGANIC HALIDES**

Client: **GIANT REFINING COMPANY**  
Project Location: Unknown  
Sample ID: MW2-031696  
Sample Number: 0396W00442/0696G00552  
Sample Matrix: Water  
Condition: Intact, Cool, pH=7

Report Date: 04/09/96  
Date Sampled: 03/16/96  
Date Received: 03/26/96  
Date Analyzed: 04/09/96

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	30
Concentration is the average of the replicates reported below		
Replicate #1	ND	30
Replicate #2	ND	30

ND - Analyte not detected at stated detection limit.

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

DG/RRS  
Analyst

NT 7/11/96  
Review



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: MW-2 - 031696  
Laboratory ID: 0396G00442 / 0696G00541  
Matrix: Water

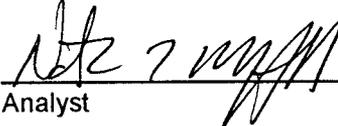
Report Date: 04/01/96  
Date Sampled: 03/16/96  
Date Analyzed: 03/26/96  
Time Analyzed: 10:38 PM

Tentative Identification	Retention Time (Minutes)	Concentration * (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

Reference: Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

Comments:

  
Analyst

  
Review



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**EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Project: **NMED-LTA**  
Sample ID: **MW4-031396**  
Laboratory ID: **0396W00418 / 0696G00476**  
Sample Matrix **Water**  
Preservative: **HCl**  
Condition: **Intact, pH < 2**

Report Date: **04/01/96**  
Date Sampled: **03/13/96**  
Date Received: **03/21/96**  
Date Extracted: **03/22/96**  
Date Analyzed: **03/22/96**  
Time Analyzed: **10:33 PM**

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Sample ID: MW4-031396  
Laboratory ID: 0396W00418 / 0696G00476  
Matrix: Water

Report Date: 04/01/96  
Date Sampled: 03/13/96  
Date Analyzed: 03/22/96  
Time Analyzed: 10:33 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	100%	86 - 118%
Toluene-d8	100%	88 - 110%
Bromofluorobenzene	98%	86 - 117%

Client: **Giant Refining**  
 Project: NMED-LTA  
 Sample ID: MW4-031396  
 Laboratory ID: 0396W00418  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/10/96  
 Date Sampled: 03/13/96  
 Time Sampled: 1:00 PM  
 Date Received: 03/20/96

Parameter	Analytical			
	Result	Units		Units
Lab pH.....	8.7	s.u.		
Lab Conductivity @ 25° C.....	1,220	umhos/cm		
Total Dissolved Solids @ 180°C.....	766	mg/L		
Total Dissolved Solids (Calc).....	741	mg/L		
Phenols.....	<0.01	mg/L		
Total Alkalinity as CaCO3.....	446	mg/L		
Total Hardness as CaCO3.....	6.00	mg/L		
Total Organic Carbon.....	1.1	mg/L		
Bicarbonate as HCO3.....	528	mg/L	8.65	meq/L
Carbonate as CO3.....	8.4	mg/L	0.28	meq/L
Hydroxide as OH.....	<1	mg/L	<0.01	meq/L
Chloride.....	20.6	mg/L	0.58	meq/L
Sulfate.....	160	mg/L	3.33	meq/L
Calcium.....	2.00	mg/L	0.10	meq/L
Magnesium.....	0.24	mg/L	0.02	meq/L
Potassium.....	0.78	mg/L	0.02	meq/L
Sodium.....	290	mg/L	12.6	meq/L
Cations.....			12.7	meq/L
Anions.....			12.8	meq/L
Cation/Anion Difference.....			0.37	%

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by LB

Reviewed by WM

Client: **Giant Refining**  
 Project: NMED-LTA  
 Sample ID: MW4-031396  
 Laboratory ID: 0396W00418  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/10/96  
 Date Sampled: 03/13/96  
 Time Sampled: 1:00 PM  
 Date Received: 03/20/96

Parameter	Dissolved		Total	
	Analytical Result	Units	Analytical Result	Units

**Trace Metals**

Arsenic.....	<0.005	mg/L		
Barium.....	0.02	mg/L		
Cadmium.....	<0.002	mg/L		
Chromium.....	NA	mg/L	<0.01	mg/L
Lead.....	NA	mg/L	<0.005	mg/L
Manganese.....	<0.02	mg/L		
Mercury.....	NA	mg/L	<0.001	mg/L
Selenium.....	<0.005	mg/L		
Silver.....	<0.01	mg/L		

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:** none

Reported by SB

Reviewed by WM



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**TOX**  
**TOTAL ORGANIC HALIDES**

Client: **GIANT REFINING COMPANY**  
Project Location: Unknown  
Sample ID: MW4-031396  
Sample Number: 0396W00418/0696G00546  
Sample Matrix: Water  
Condition: Intact, Cool, pH=7

Report Date: 04/09/96  
Date Sampled: 03/13/96  
Date Received: 03/26/96  
Date Analyzed: 04/08/96

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	30
Concentration is the average of the replicates reported below		
Replicate #1	ND	30
Replicate #2	ND	30

ND - Analyte not detected at stated detection limit.

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

DG/RRD  
Analyst

NTZ 7 msp/ll  
Review



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: MW4-031396  
Laboratory ID: 0396W00418 / 0696G00476  
Matrix: Water

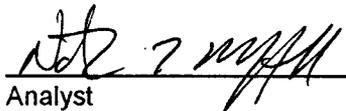
Report Date: 04/01/96  
Date Sampled: 03/13/96  
Date Analyzed: 03/22/96  
Time Analyzed: 10:33 PM

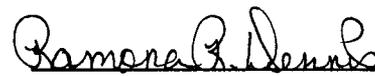
Tentative Identification	Retention Time (Minutes)	Concentration * (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

Reference: Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

Comments:

  
Analyst

  
Review



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**EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Project: **NMED-LTA**  
Sample ID: **MW5-031396**  
Laboratory ID: **0396W00419 / 0696G00477**  
Sample Matrix **Water**  
Preservative: **HCl**  
Condition: **Intact, pH < 2**

Report Date: **04/01/96**  
Date Sampled: **03/13/96**  
Date Received: **03/21/96**  
Date Extracted: **03/22/96**  
Date Analyzed: **03/22/96**  
Time Analyzed: **11:15 PM**

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Sample ID: MW5-031396  
Laboratory ID: 0396W00419 / 0696G00477  
Matrix: Water

Report Date: 04/01/96  
Date Sampled: 03/13/96  
Date Analyzed: 03/22/96  
Time Analyzed: 11:15 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	100%	86 - 118%
Toluene-d8	99%	88 - 110%
Bromofluorobenzene	99%	86 - 117%

Client: **Giant Refining**  
 Project: NMED-LTA  
 Sample ID: MW5-031396 Date Reported: 04/10/96  
 Laboratory ID: 0396W00419 Date Sampled: 03/13/96  
 Sample Matrix: Water Time Sampled: 9:00 AM  
 Condition: Cool/Intact Date Received: 03/20/96

Parameter	Analytical			
	Result	Units		Units
Lab pH.....	8.9	s.u.		
Lab Conductivity @ 25° C.....	1,200	umhos/cm		
Total Dissolved Solids @ 180°C.....	714	mg/L		
Total Dissolved Solids (Calc).....	712	mg/L		
Phenols.....	<0.01	mg/L		
Total Alkalinity as CaCO3.....	322	mg/L		
Total Hardness as CaCO3.....	5.00	mg/L		
Total Organic Carbon.....	<1	mg/L		
Bicarbonate as HCO3.....	339	mg/L	5.56	meq/L
Carbonate as CO3.....	26	mg/L	0.88	meq/L
Hydroxide as OH.....	<1	mg/L	<0.01	meq/L
Chloride.....	65.7	mg/L	1.85	meq/L
Sulfate.....	175	mg/L	3.65	meq/L
Calcium.....	1.60	mg/L	0.08	meq/L
Magnesium.....	0.24	mg/L	0.02	meq/L
Potassium.....	0.78	mg/L	0.02	meq/L
Sodium.....	275	mg/L	12.0	meq/L
Cations.....			12.1	meq/L
Anions.....			11.9	meq/L
Cation/Anion Difference.....			0.52	%

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by LB

Reviewed by WJM

Client: **Giant Refining**  
 Project: NMED-LTA  
 Sample ID: MW5-031396  
 Laboratory ID: 0396W00419  
 Sample Matrix: Water  
 Condition: Cool/Intact

Date Reported: 04/10/96  
 Date Sampled: 03/13/96  
 Time Sampled: 9:00 AM  
 Date Received: 03/20/96

Parameter	Dissolved Analytical Result	Units	Total Analytical Result	Units
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**Trace Metals**

Arsenic.....	<0.005	mg/L		
Barium.....	0.02	mg/L		
Cadmium.....	<0.002	mg/L		
Chromium.....	NA	mg/L	<0.01	mg/L
Lead.....	NA	mg/L	<0.005	mg/L
Manganese.....	<0.02	mg/L		
Mercury.....	NA	mg/L	<0.001	mg/L
Selenium.....	<0.005	mg/L		
Silver.....	<0.01	mg/L		

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:**

Reported by JB

Reviewed by WM



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**TOX**  
**TOTAL ORGANIC HALIDES**

Client: **GIANT REFINING COMPANY**  
Project Location: **Unknown**  
Sample ID: **MW5-031396**  
Sample Number: **0396W00419/0696G00547**  
Sample Matrix: **Water**  
Condition: **Intact, Cool, pH=7**

Report Date: **04/09/96**  
Date Sampled: **03/13/96**  
Date Received: **03/26/96**  
Date Analyzed: **04/08/96**

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
<b>Total Organic Halides</b>	ND	30
Concentration is the average of the replicates reported below		
<b>Replicate #1</b>	ND	30
<b>Replicate #2</b>	ND	30

ND - Analyte not detected at stated detection limit.

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

DG/RRS  
Analyst

Not 7 mg/L  
Review



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: MW5-031396  
Laboratory ID: 0396W00419 / 0696G00477  
Matrix: Water

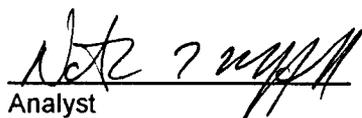
Report Date: 04/01/96  
Date Sampled: 03/13/96  
Date Analyzed: 03/22/96  
Time Analyzed: 11:15 PM

Tentative Identification	Retention Time (Minutes)	Concentration * (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

Reference: Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

Comments:

  
Analyst

  
Review

**Quality Control / Quality Assurance****Known Analysis/Spike Analysis****Dissolved Metals**

Client: **Giant Refinery**  
 Project: **NMED-LTA**  
 Lab ID: **0396W00418-420**  
 Matrix: **Water**

Date Reported: **04/10/96**  
 Date Sampled: **03/13/96**  
 Date Received: **03/20/96**

**Known Analysis**

Parameter	Found Result	Known Result	Units	Percent Recovery
<b>Arsenic</b>	0.009	0.010	mg/L	<b>90%</b>
<b>Barium</b>	0.97	1.00	mg/L	<b>97%</b>
<b>Cadmium</b>	0.004	0.004	mg/L	<b>109%</b>
<b>Manganese</b>	0.99	1.00	mg/L	<b>99%</b>
<b>Selenium</b>	0.011	0.010	mg/L	<b>110%</b>
<b>Silver</b>	1.00	1.00	mg/L	<b>100%</b>

**Spike Analysis**

Parameter	Spiked Sample Result	Sample Result	Spike Added	Percent Recovery
<b>Arsenic</b>	0.018	<0.005	0.020	<b>90%</b>
<b>Barium</b>	3.09	2.83	0.50	<b>109%</b>
<b>Cadmium</b>	0.002	<0.001	0.003	<b>97%</b>
<b>Manganese</b>	0.64	0.18	0.50	<b>97%</b>
<b>Selenium</b>	0.021	0.001	0.020	<b>100%</b>
<b>Silver</b>	0.47	<0.01	0.50	<b>95%</b>

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

Comments: Quality control run concurrently with the above sample lab numbers.

Reported by: 

Reviewed by: 

## Quality Control / Quality Assurance

### Spike Analysis / Known Analysis / Blank

#### Total Metals

Client: Giant Refinery  
 Project: NMED-LTA  
 Lab ID: 0396W00418-420  
 Matrix: Water  
 Condition: Cool / Intact

Date Reported: 04/10/96  
 Date Sampled: 03/13/96  
 Date Received: 03/20/96

#### Spike Analysis

Parameter	Spike Result (mg/L)	Unspiked		Percent Recovery
		Sample Result (mg/L)	Spike Amount (mg/L)	
Chromium	0.45	<0.01	0.50	90%
Lead	0.030	<0.005	0.025	119%
Mercury	0.009	<0.001	0.010	91%

#### Known Analysis

Parameter	Found Result (mg/L)	Known Result (mg/L)	Percent Recovery
Chromium	1.04	1.00	104%
Lead	0.041	0.040	101%
Mercury	0.010	0.010	102%

#### Blank Analysis

Parameter	Result	Detection Level (mg/L)
Chromium	ND	0.01
Lead	ND	0.005
Mercury	ND	0.001

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:** Quality control run concurrently with the above sample lab numbers.

  
 Reported By: \_\_\_\_\_

  
 Reviewed By: \_\_\_\_\_

**VOLATILE AROMATIC HYDROCARBONS  
QUALITY CONTROL REPORT**

Duplicate Analysis

Lab ID: 0396G00506  
Sample Matrix: Water  
Condition: Cool/Intact

Report Date: 04/11/96  
Date Analyzed: 04/04/96

Target Analyte	Duplicate Concentration (ppb)	Original Concentration (ppb)	% Difference
Benzene	102,100	129,200	23.4
Toluene	113,100	152,300	29.5
Ethylbenzene	4,720	6,350	29.4
m,p-Xylenes	16,700	21,500	25.1
o-Xylene	7,470	9,290	21.7

ND - Analyte not detected at the stated detection limit.  
NA - Not applicable or not calculated.

<b>Quality Control:</b>	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	99.6%	75 -115%

**Reference:** Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

**Comments:**

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Review

VOLATILE AROMATIC HYDROCARBONS  
QUALITY CONTROL REPORT

Matrix Spike Analysis

Lab ID: 0396W00503  
Sample Matrix: Water  
Condition: Cool/Intact

Report Date: 04/11/96  
Date Analyzed: 04/04/96

Target Analyte	Spiked Sample Result in ng	Sample result in ng	Spike Added (ng)	% Recovery	Acceptance Limits (%)
Benzene	40.28	0.61	45	88.2%	70-130
Toluene	37.75	0.32	45	83.2%	70-130
Ethylbenzene	39.08	0.00	45	86.8%	70-130
m,p-Xylenes	81.66	0.37	90	90.3%	70-130
o-Xylene	38.98	0.00	45	86.6%	70-130

ND - Analyte not detected at the stated detection limit.  
NA - Not applicable or not calculated.

<b>Quality Control:</b>	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	105.4%	75 -125%

**Reference:** Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

**Comments:**

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Review

## Quality Control / Quality Assurance

### Known Analysis BTEX

Client: **Giant Refining Co.**  
Project: **Not Given**

Date Reported: **04/09/96**  
Date Analyzed: **04/04/96**

#### Known Analysis

Parameter	Found Concentration (ppb)	Known Concentration (ppb)	Percent Recovery	Acceptance Limits
Benzene	8.89	9.0	99%	70-130%
Toluene	8.62	9.0	96%	70-130%
Ethylbenzene	8.11	9.0	90%	70-130%
m+p-Xylene	17.1	18.0	95%	70-130%
o-Xylene	8.23	9.0	91%	70-130%

<b>Quality Control:</b>	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	103.9	75-125%

**Reference:** Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

**Comments:**

Reported by           *Dr*          

Reviewed by           *JB*



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**EPA Method 8260**  
**VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Project: NA  
Sample ID: Trip Blank  
Laboratory ID: 0696G00543  
Sample Matrix: Water  
Preservative: HCl  
Condition: Intact, pH < 2

Report Date: 04/01/96  
Date Sampled: NA  
Date Received: 03/22/96  
Date Extracted: 03/26/96  
Date Analyzed: 03/26/96  
Time Analyzed: 11:59 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS**

Client: **GIANT REFINING COMPANY**  
Sample ID: Trip Blank  
Laboratory ID: 0696G00543  
Matrix: Water

Report Date: 04/01/96  
Date Sampled: NA  
Date Analyzed: 03/26/96  
Time Analyzed: 11:59 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	101%	86 - 118%
Toluene-d8	99%	88 - 110%
Bromofluorobenzene	97%	86 - 117%



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: Trip Blank  
Laboratory ID: 0696G00543  
Matrix: Water

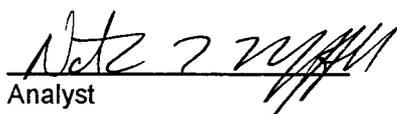
Report Date: 04/01/96  
Date Sampled: NA  
Date Analyzed: 03/26/96  
Time Analyzed: 11:59 PM

Tentative Identification	Retention Time (Minutes)	Concentration* (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

Reference: Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

Comments:

  
Analyst

  
Review



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Project: NMED-LTA  
Sample ID: Trip Blank  
Laboratory ID: 0696G00479  
Sample Matrix Water  
Preservative: HCl  
Condition: Intact, pH < 2

Report Date: 04/01/96  
Date Sampled: NA  
Date Received: 03/21/96  
Date Extracted: 03/22/96  
Date Analyzed: 03/22/96  
Time Analyzed: 11:59 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: Trip Blank  
Laboratory ID: 0696G00479  
Matrix: Water

Report Date: 04/01/96  
Date Sampled: NA  
Date Analyzed: 03/22/96  
Time Analyzed: 11:59 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

Quality Control:

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	99%	86 - 118%
Toluene-d8	99%	88 - 110%
Bromofluorobenzene	98%	86 - 117%



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EPA Method 8260  
VOLATILE ORGANIC COMPOUNDS  
ADDITIONAL DETECTED COMPOUNDS

Client: **GIANT REFINING COMPANY**  
Sample ID: Trip Blank  
Laboratory ID: 0696G00479  
Matrix: Water

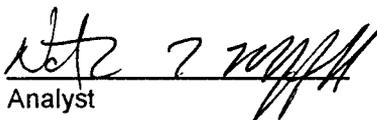
Report Date: 04/01/96  
Date Sampled: NA  
Date Analyzed: 03/22/96  
Time Analyzed: 11:59 PM

Tentative Identification	Retention Time (Minutes)	Concentration * (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

Reference: Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

Comments:

  
Analyst

  
Review

## Quality Control / Quality Assurance

### Spike Analysis / Known Analysis / Blank

#### Total Metals

**Client:** Giant Refining Company  
**Project:** Ciniza  
**Lab ID:** 0396W00439-441  
**Matrix:** Water  
**Condition:** Cool / Intact

**Date Reported:** 04/22/96  
**Date Sampled:** 3/14-15/96  
**Date Received:** 03/21/96

#### Spike Analysis

Parameter	Spike Result (mg/L)	Unspiked Sample Result (mg/L)	Spike Amount (mg/L)	Percent Recovery
Chromium	0.53	<0.01	0.50	105%
Lead	0.029	<0.005	0.025	117%

#### Known Analysis

Parameter	Found Result (mg/L)	Known Result (mg/L)	Percent Recovery
Chromium	1.07	1.00	107%
Lead	0.041	0.040	101%

#### Blank Analysis

Parameter	Result	Detection Level (mg/L)
Chromium	ND	0.01
Lead	ND	0.005

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:** Quality control run concurrently with the above sample lab numbers.

WM  
 Reported By:

  
 Reviewed By:

**Quality Control / Quality Assurance****Known Analysis/Spike Analysis*****Dissolved Metals***

Client: **Giant Refining Company**  
 Project: Ciniza  
 Lab ID: 0396W00442-443  
 Matrix: Water

Date Reported: 04/22/96  
 Date Sampled: 03/16/96  
 Date Received: 03/21/96

**Known Analysis**

Parameter	Found Result	Known Result	Units	Percent Recovery
Arsenic	0.009	0.010	mg/L	90%
Barium	0.97	1.00	mg/L	97%
Cadmium	0.004	0.004	mg/L	101%
Manganese	0.99	1.00	mg/L	99%
Selenium	0.011	0.010	mg/L	110%
Silver	0.98	1.00	mg/L	98%

**Spike Analysis**

Parameter	Spiked Sample Result	Sample Result	Spike Added	Percent Recovery
Arsenic	0.019	0.001	0.020	85%
Barium	3.09	2.83	0.50	109%
Cadmium	0.002	<0.001	0.003	91%
Manganese	0.64	0.18	0.50	97%
Selenium	0.019	<0.005	0.020	95%
Silver	0.47	<0.01	0.50	95%

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

Comments: Quality control run concurrently with the above sample lab numbers.

Reported by: WM

Reviewed by: CBH

## Quality Control / Quality Assurance

### Spike Analysis / Known Analysis / Blank

#### Total Metals

**Client:** Giant Refining Company  
**Project:** Ciniza  
**Lab ID:** 0396W00442-443  
**Matrix:** Water  
**Condition:** Cool / Intact

**Date Reported:** 04/22/96  
**Date Sampled:** 03/16/96  
**Date Received:** 03/21/96

#### Spike Analysis

Parameter	Spike Result (mg/L)	Unspiked Sample Result (mg/L)	Spike Amount (mg/L)	Percent Recovery
Chromium	0.45	<0.01	0.50	90%
Lead	0.030	<0.005	0.025	117%
Mercury	NS	NS	NS	NA

#### Known Analysis

Parameter	Found Result (mg/L)	Known Result (mg/L)	Percent Recovery
Chromium	1.04	1.00	104%
Lead	0.041	0.040	101%
Mercury	0.010	0.010	102%

#### Blank Analysis

Parameter	Result	Detection Level (mg/L)
Chromium	ND	0.01
Lead	ND	0.005
Mercury	ND	0.001

**Reference:** U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.  
 "Standard Methods For The Examination Of Water And Waste Water", 19th ed., 1995.

**Comments:** Quality control run concurrently with the above sample lab numbers.

WM  
 Reported By:

[Signature]  
 Reviewed By:



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QUALITY CONTROL REPORT - MATRIX SPIKE

TOX  
TOTAL ORGANIC HALIDES

Sample ID: Matrix Spike / Spike Duplicate  
Sample Number: 0696G00546 MS/MSD  
Sample Matrix: Water  
Condition: Intact, Cool, pH=7

Report Date: 04/09/96  
Date Sampled: 03/13/96  
Date Received: 03/26/96  
Date Analyzed: 04/08/96

Total Organic Halides	Spiked Sample Concentration	Sample Concentration	Spike Amount	Percent Recovery	Acceptance Limits
Matrix Spike	54	ND	50	109%	75-125
Matrix Spike Dup	55	ND	50	109%	75-125
%RPD				0%	

ND - Analyte not detected at stated detection limit  
%RPD - Relative percent deviation  
All unlabeled values are in units of micrograms per liter (ug/L)

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

DG / RPD  
Analyst

[Signature]  
Review



# Inter-Mountain Laboratories, Inc.

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## QUALITY CONTROL REPORT - METHOD BLANK

### TOX TOTAL ORGANIC HALIDES

Sample ID:	Method Blank	Report Date:	04/09/96
Sample Number:	MB040896	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Condition:	NA	Date Analyzed:	04/08/96

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	30
Concentration is the average of the replicates reported below		
Replicate #1	ND	30
Replicate #2	ND	30

ND - Analyte not detected at stated detection limit.

**Reference:** Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States Environmental Protection Agency, Third Edition, Final Update II, September 1994.

**Comments:**

JDG/RPS  
Analyst

Note 2 mpp  
Review



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QUALITY CONTROL REPORT - METHOD BLANK

TOX  
TOTAL ORGANIC HALIDES

Sample ID: Method Blank Report Date: 04/09/96  
Sample Number: MB040996 Date Sampled: NA  
Sample Matrix: Water Date Received: NA  
Condition: NA Date Analyzed: 04/09/96

Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	30
Concentration is the average of the replicates reported below		
Replicate #1	ND	30
Replicate #2	ND	30

ND - Analyte not detected at stated detection limit.

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States Environmental Protection Agency, Third Edition, Final Update II, September 1994.

Comments:

DG / RRD  
Analyst

Walt J. [Signature]  
Review



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QUALITY CONTROL REPORT - MATRIX SPIKE

TOX  
TOTAL ORGANIC HALIDES

Sample ID: Matrix Spike / Spike Duplicate  
Sample Number: 0696G00551 MS/MSD  
Sample Matrix: Water  
Condition: Intact, Cool, pH=7

Report Date: 04/09/96  
Date Sampled: 03/14/96  
Date Received: 03/26/96  
Date Analyzed: 04/09/96

Total Organic Halides	Spiked Sample Concentration	Sample Concentration	Spike Amount	Percent Recovery	Acceptance Limits
Matrix Spike	58	ND	50	116%	75-125
Matrix Spike Dup	55	ND	50	109%	75-125
%RPD				6%	

ND - Analyte not detected at stated detection limit  
%RPD - Relative percent deviation  
All unlabeled values are in units of micrograms per liter (ug/L)

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

DG/RED  
Analyst

Nitz 7 mppn  
Review

1:15PM P.03



# CHAIN OF CUSTODY RECORD

FILE 3091

APR 24, 1996

TO: TEXAS ORGANIC

FROM: IML - FARMINGTON, NM

Project Name		Project Location			ANALYSES / PARAMETERS			
Analyst: (Signature)		Chain of Custody Tape No.			No. of Containers	Remarks		
Sample No./ Identification	Date	Time	Lab Number	Matrix				
13-031596	3-15-96	1305		H <sub>2</sub> O	8	SEE ATTACHED LIST		
04-031596	3-15-96	10:38		"	8			
05-031496	3-14-96	1308		"	8			
02-031696	3-16-96	0900	0396W00442	"	8			
11-031696	3-16-96	1300	0396W00443	"	8			
						cool + intact		

Acquired by: (Signature)  Acquired by: (Signature)  Acquired by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	3-20-96	11:04	Chris Raymond	3/21/96	0900

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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**

Sample ID: Method Blank  
Laboratory ID: MB0322  
Sample Matrix Water

Report Date: 03/25/96  
Date Extracted: 03/22/96  
Date Analyzed: 03/22/96  
Time Analyzed: 7:04 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**

Sample ID: Method Blank  
Laboratory ID: MB0322

Report Date: 03/25/96  
Date Sampled: 03/22/96  
Date Analyzed: 03/22/96  
Time Analyzed: 7:04 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	99%	86 - 118%
Toluene-d8	101%	88 - 110%
Bromofluorobenzene	99%	86 - 117%



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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**  
**ADDITIONAL DETECTED COMPOUNDS**

Page 3

Sample ID: Method Blank  
Laboratory ID: MB0322

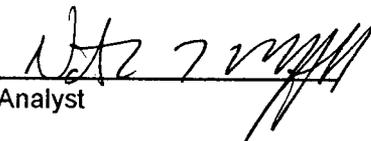
Report Date: 03/25/96  
Date Sampled: 03/22/96  
Date Analyzed: 03/22/96  
Time Analyzed: 7:04 PM

Tentative Identification	Retention Time (Minutes)	Concentration* (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

**Reference:** Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

**Comments:**

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Review



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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**

Sample ID: Method Blank  
Laboratory ID: MB0326  
Sample Matrix Water

Report Date: 03/29/96  
Date Extracted: 03/26/96  
Date Analyzed: 03/26/96  
Time Analyzed: 8:35 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**

Sample ID: Method Blank  
Laboratory ID: MB0326

Report Date: 03/29/96  
Date Sampled: 03/26/96  
Date Analyzed: 03/26/96  
Time Analyzed: 8:35 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	98%	86 - 118%
Toluene-d8	100%	88 - 110%
Bromofluorobenzene	98%	86 - 117%



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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**  
**ADDITIONAL DETECTED COMPOUNDS**

Sample ID: Method Blank  
Laboratory ID: MB0326

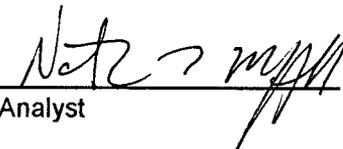
Report Date: 03/29/96  
Date Sampled: 03/26/96  
Date Analyzed: 03/26/96  
Time Analyzed: 8:35 PM

Tentative Identification	Retention Time (Minutes)	Concentration* (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

**Reference:** Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

**Comments:**

  
Analyst

  
Review



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QUALITY CONTROL REPORT - BLANK SPIKE / SPIKE DUPLICATE ANALYSIS
EPA METHOD 8260 - VOLATILE ORGANICS

Laboratory ID: Blank Spike and Blank Spike Duplicate
Sample Matrix: Water
Preservative: NA
Condition: NA

Report Date: 03/25/96
Date Sampled: NA
Date Received: NA
Date Analyzed: 03/22/96
Time Analyzed: 7:46 PM / 8:28 PM

BLANK SPIKE ANALYSIS

Table with 6 columns: Analyte, Spiked Sample Result (mg/L), Sample Result (mg/L), Spike Added (mg/L), Percent Recovery, QC Limits Recovery. Rows include 1,1 - Dichloroethene, Trichloroethene, Benzene, Toluene, Chlorobenzene.

BLANK SPIKE DUPLICATE ANALYSIS

Table with 7 columns: Analyte, Duplicate Result (mg/L), Percent Recovery, Original Spike Result (%), RPD, QC Limits RPD, QC Limits Rec. Rows include 1,1 - Dichloroethene, Trichloroethene, Benzene, Toluene, Chlorobenzene.

ND - Analyte not detected at stated limit of detection

Spike Recovery: 0 out of 10 outside QC Limits
RPD: 0 out of 5 outside QC Limits

Table with 5 columns: Quality Control, Surrogate, Spike Recovery, Duplicate Recovery, Recovery Limits. Rows include Dibromofluoromethane, Toluene-d8, Bromofluorobenzene.

Reference: Method 8260A: Gas Chromatography / Mass Spectrometry for Volatile Organics
Test Methods for Evaluating Solid Waste, SW - 846, Final Update II, United States
Environmental Protection Agency, September 1994.

Comments:

Handwritten signature of Analyst

Handwritten signature of Reviewer



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**QUALITY CONTROL REPORT - BLANK SPIKE / SPIKE DUPLICATE ANALYSIS**

**EPA METHOD 8260 - VOLATILE ORGANICS**

Laboratory ID: Blank Spike and Blank Spike Duplicate  
Sample Matrix: Water  
Preservative: NA  
Condition: NA

Report Date: 03/27/96  
Date Sampled: NA  
Date Received: NA  
Date Analyzed: 03/26/96  
Time Analyzed: 9:16 PM / 9:57 PM

**BLANK SPIKE ANALYSIS**

Analyte	Spiked Sample Result (mg/L)	Sample Result (mg/L)	Spike Added (mg/L)	Percent Recovery	QC Limits Recovery
1,1 - Dichloroethene	0.056	ND	0.050	112%	61 - 145
Trichloroethene	0.049	ND	0.050	98%	71 - 120
Benzene	0.048	ND	0.050	96%	76 - 127
Toluene	0.047	ND	0.050	94%	76 - 125
Chlorobenzene	0.046	ND	0.050	92%	75 - 130

**BLANK SPIKE DUPLICATE ANALYSIS**

Analyte	Duplicate Result (mg/L)	Percent Recovery	Original Spike Result (%)	RPD	QC Limits	
					RPD	Rec.
1,1 - Dichloroethene	0.055	110%	112%	2%	14%	61 - 145
Trichloroethene	0.047	94%	98%	4%	14%	71 - 120
Benzene	0.047	94%	96%	2%	11%	76 - 127
Toluene	0.042	84%	94%	11%	13%	76 - 125
Chlorobenzene	0.045	90%	92%	2%	13%	75 - 130

ND - Analyte not detected at stated limit of detection

Spike Recovery: 0 out of 10 outside QC Limits  
RPD: 0 out of 5 outside QC Limits

Quality Control:	Surrogate	Spike Recovery	Duplicate Recovery	Recovery Limits
	Dibromofluoromethane	99%	99%	86 - 118%
	Toluene-d8	100%	100%	88 - 110%
	Bromofluorobenzene	97%	97%	86 - 115%

Reference: Method 8260A: Gas Chromatography / Mass Spectrometry for Volatile Organics  
Test Methods for Evaluating Solid Waste, SW - 846, Final Update II, United States  
Environmental Protection Agency, September 1994.

Comments:

Analyst

Review



**VOLATILE AROMATIC HYDROCARBONS  
QUALITY CONTROL REPORT**

Matrix Spike Analysis

Lab ID: 0396W00422  
Sample Matrix: Water  
Condition: Cool/Intact

Report Date: 04/02/96  
Date Analyzed: 03/27/96

Target Analyte	Spiked Sample Result in ng	Sample result in ng	Spike Added (ng)	% Recovery	Acceptance Limits (%)
Benzene	57.66	0.86	60	94.7%	70-130
Toluene	53.22	0.00	60	88.7%	70-130
Ethylbenzene	55.14	0.00	60	91.9%	70-130
m,p-Xylenes	114.38	0.00	120	95.3%	70-130
o-Xylene	55.79	0.00	60	93.0%	70-130

ND - Analyte not detected at the stated detection limit.  
NA - Not applicable or not calculated.

<b>Quality Control:</b>	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	107.6%	75 -125%

**Reference:** Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

**Comments:**

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Review

## Quality Control / Quality Assurance

### Known Analysis

#### BTEX

Client: Giant Refining Co.  
Project: NMED-LTA

Date Reported: 03/28/96  
Date Analyzed: 03/27/96

#### Known Analysis

Parameter	Found Concentration (ppb)	Known Concentration (ppb)	Percent Recovery	Acceptance Limits
Benzene	8.95	9.0	99%	70-130%
Toluene	8.43	9.0	94%	70-130%
Ethylbenzene	8.20	9.0	91%	70-130%
m+p-Xylene	17.3	18.0	96%	70-130%
o-Xylene	8.31	9.0	92%	70-130%

<b>Quality Control:</b>	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	104.9	75-125%

**Reference:** Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

**Comments:**

Reported by AK

Reviewed by SB

**VOLATILE AROMATIC HYDROCARBONS  
QUALITY CONTROL REPORT**

**Method Blank Analysis**

Sample Matrix:  
Lab ID:

Water  
Method Blank

Report Date:  
Date Analyzed:

04/02/96  
03/27/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
m,p-Xylenes	ND	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate

Percent Recovery

Acceptance Limits

Bromofluorobenzene

100.4

75-125%

Reference:

Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Review



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## Inter-Mountain Laboratories, Inc.

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### QUALITY CONTROL REPORT - METHOD BLANK EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS

Sample ID: Method Blank  
Laboratory ID: MB0322  
Sample Matrix: Water

Report Date: 03/25/96  
Date Extracted: 03/22/96  
Date Analyzed: 03/22/96  
Time Analyzed: 7:04 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**

Sample ID: Method Blank  
Laboratory ID: MB0322

Report Date: 03/25/96  
Date Sampled: 03/22/96  
Date Analyzed: 03/22/96  
Time Analyzed: 7:04 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	99%	86 - 118%
Toluene-d8	101%	88 - 110%
Bromofluorobenzene	99%	86 - 117%



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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**  
**ADDITIONAL DETECTED COMPOUNDS**

Sample ID: Method Blank  
Laboratory ID: MB0322

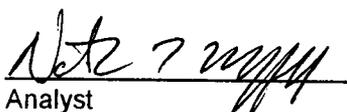
Report Date: 03/25/96  
Date Sampled: 03/22/96  
Date Analyzed: 03/22/96  
Time Analyzed: 7:04 PM

Tentative Identification	Retention Time (Minutes)	Concentration * (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

**Reference:** Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

**Comments:**

  
Analyst

  
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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**

Sample ID: Method Blank  
Laboratory ID: MB0326  
Sample Matrix Water

Report Date: 03/29/96  
Date Extracted: 03/26/96  
Date Analyzed: 03/26/96  
Time Analyzed: 8:35 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Acetone	ND	0.03
Acrolein	ND	0.02
Acrylonitrile	ND	0.01
Benzene	ND	0.005
Bromodichloromethane	ND	0.005
Bromoform	ND	0.005
Bromomethane	ND	0.005
Carbon Disulfide	ND	0.01
Carbon Tetrachloride	ND	0.005
Chlorobenzene	ND	0.005
Chlorodibromoethane	ND	0.005
Chloroethane	ND	0.005
2-Chloroethylvinyl ether	ND	0.005
Chloroform	ND	0.005
Chloromethane	ND	0.005
Dibromomethane	ND	0.005
t-1,4-Dichloro-2-butene	ND	0.05
Dichlorodifluoromethane	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethane	ND	0.005
1,1-Dichloroethene	ND	0.005
trans-1,2-Dichloroethene	ND	0.005
1,2-Dichloropropane	ND	0.005
cis-1,3-Dichloropropene	ND	0.005
trans-1,3-Dichloropropene	ND	0.005
Ethyl Benzene	ND	0.005
Ethyl Methacrylate	ND	0.005
2-Hexanone	ND	0.01
Iodomethane	ND	0.01
Methylene Chloride	ND	0.02
Methyl Ethyl Ketone	ND	0.01
4-Methyl-2-Pentanone	ND	0.01
Styrene	ND	0.005

ND - Analyte not detected at stated limit of detection



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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**

Sample ID: Method Blank  
Laboratory ID: MB0326

Report Date: 03/29/96  
Date Sampled: 03/26/96  
Date Analyzed: 03/26/96  
Time Analyzed: 8:35 PM

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
1,1,2,2-Tetrachloroethane	ND	0.005
Tetrachloroethene	ND	0.005
Toluene	ND	0.005
1,1,1-Trichloroethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Trichloroethene	ND	0.005
Trichlorofluoromethane	ND	0.005
1,2,3-Trichloropropane	ND	0.02
Vinyl Acetate	ND	0.01
Vinyl Chloride	ND	0.005
Xylenes	ND	0.005

ND - Analyte not detected at stated limit of detection

**Quality Control:**

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Dibromofluoromethane	98%	86 - 118%
Toluene-d8	100%	88 - 110%
Bromofluorobenzene	98%	86 - 117%



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**QUALITY CONTROL REPORT - METHOD BLANK**  
**EPA METHOD 8260 - VOLATILE ORGANIC COMPOUNDS**  
**ADDITIONAL DETECTED COMPOUNDS**

Page 3

Sample ID: Method Blank  
Laboratory ID: MB0326

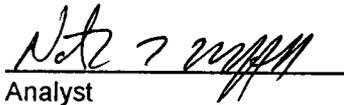
Report Date: 03/29/96  
Date Sampled: 03/26/96  
Date Analyzed: 03/26/96  
Time Analyzed: 8:35 PM

Tentative Identification	Retention Time (Minutes)	Concentration * (mg/L)
None detected at reportable levels		

\* - Concentration calculated using assumed Relative Response Factor = 1

**Reference:** Method 8260: Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry: Capillary Column Technique. Test Methods for Evaluating Solid Waste, SW - 846, United States Environmental Protection Agency, Final Update II, September 1994.

**Comments:**

  
Analyst

  
Review



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QUALITY CONTROL REPORT - BLANK SPIKE / SPIKE DUPLICATE ANALYSIS
EPA METHOD 8260 - VOLATILE ORGANICS

Laboratory ID: Blank Spike and Blank Spike Duplicate
Sample Matrix: Water
Preservative: NA
Condition: NA

Report Date: 03/25/96
Date Sampled: NA
Date Received: NA
Date Analyzed: 03/22/96
Time Analyzed: 7:46 PM / 8:28 PM

BLANK SPIKE ANALYSIS

Table with 6 columns: Analyte, Spiked Sample Result (mg/L), Sample Result (mg/L), Spike Added (mg/L), Percent Recovery, QC Limits Recovery. Rows include 1,1 - Dichloroethene, Trichloroethene, Benzene, Toluene, Chlorobenzene.

BLANK SPIKE DUPLICATE ANALYSIS

Table with 7 columns: Analyte, Duplicate Result (mg/L), Percent Recovery, Original Spike Result (%), RPD, QC Limits RPD, QC Limits Rec. Rows include 1,1 - Dichloroethene, Trichloroethene, Benzene, Toluene, Chlorobenzene.

ND - Analyte not detected at stated limit of detection

Spike Recovery: 0 out of 10 outside QC Limits
RPD: 0 out of 5 outside QC Limits

Quality Control table with 4 columns: Surrogate, Spike Recovery, Duplicate Recovery, Recovery Limits. Rows include Dibromofluoromethane, Toluene-d8, Bromofluorobenzene.

Reference: Method 8260A: Gas Chromatography / Mass Spectrometry for Volatile Organics
Test Methods for Evaluating Solid Waste, SW - 846, Final Update II, United States
Environmental Protection Agency, September 1994.

Comments:

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**QUALITY CONTROL REPORT - BLANK SPIKE / SPIKE DUPLICATE ANALYSIS**  
**EPA METHOD 8260 - VOLATILE ORGANICS**

Laboratory ID: Blank Spike and Blank Spike Duplicate  
Sample Matrix: Water  
Preservative: NA  
Condition: NA

Report Date: 03/27/96  
Date Sampled: NA  
Date Received: NA  
Date Analyzed: 03/26/96  
Time Analyzed: 9:16 PM / 9:57 PM

**BLANK SPIKE ANALYSIS**

Analyte	Spiked Sample Result (mg/L)	Sample Result (mg/L)	Spike Added (mg/L)	Percent Recovery	QC Limits Recovery
1,1 - Dichloroethene	0.056	ND	0.050	112%	61 - 145
Trichloroethene	0.049	ND	0.050	98%	71 - 120
Benzene	0.048	ND	0.050	96%	76 - 127
Toluene	0.047	ND	0.050	94%	76 - 125
Chlorobenzene	0.046	ND	0.050	92%	75 - 130

**BLANK SPIKE DUPLICATE ANALYSIS**

Analyte	Duplicate Result (mg/L)	Percent Recovery	Original Spike Result (%)	RPD	QC Limits	
					RPD	Rec.
1,1 - Dichloroethene	0.055	110%	112%	2%	14%	61 - 145
Trichloroethene	0.047	94%	98%	4%	14%	71 - 120
Benzene	0.047	94%	96%	2%	11%	76 - 127
Toluene	0.042	84%	94%	11%	13%	76 - 125
Chlorobenzene	0.045	90%	92%	2%	13%	75 - 130

ND - Analyte not detected at stated limit of detection

Spike Recovery: 0 out of 10 outside QC Limits  
RPD: 0 out of 5 outside QC Limits

Quality Control:	Surrogate	Spike Recovery	Duplicate Recovery	Recovery Limits
	Dibromofluoromethane	99%	99%	86 - 118%
	Toluene-d8	100%	100%	88 - 110%
	Bromofluorobenzene	97%	97%	86 - 115%

Reference: Method 8260A: Gas Chromatography / Mass Spectrometry for Volatile Organics  
Test Methods for Evaluating Solid Waste, SW - 846, Final Update II, United States  
Environmental Protection Agency, September 1994.

Comments:

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QUALITY CONTROL REPORT - METHOD BLANK  
TOX  
TOTAL ORGANIC HALIDES

Sample ID:	Method Blank	Report Date:	04/09/96
Sample Number:	MB040896	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Condition:	NA	Date Analyzed:	04/08/96

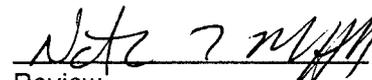
Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	10
Concentration is the average of the replicates reported below		
Replicate #1	ND	10
Replicate #2	ND	10

ND - Analyte not detected at stated detection limit.

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States Environmental Protection Agency, Third Edition, Final Update II, September 1994.

Comments:

  
Analyst

  
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## QUALITY CONTROL REPORT - METHOD BLANK

### TOX TOTAL ORGANIC HALIDES

Sample ID: Method Blank  
Sample Number: MB040996  
Sample Matrix: Water  
Condition: NA

Report Date: 04/09/96  
Date Sampled: NA  
Date Received: NA  
Date Analyzed: 04/09/96

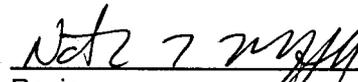
Parameter	Concentration (ug/L)	Detection Limit (ug/L)
Total Organic Halides	ND	10
Concentration is the average of the replicates reported below		
Replicate #1	ND	10
Replicate #2	ND	10

ND - Analyte not detected at stated detection limit.

**Reference:** Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States Environmental Protection Agency, Third Edition, Final Update II, September 1994.

**Comments:**

  
Analyst

  
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**QUALITY CONTROL REPORT - MATRIX SPIKE**  
**TOX**  
**TOTAL ORGANIC HALIDES**

Sample ID: Matrix Spike / Spike Duplicate  
Sample Number: 0696G00546 MS/MSD  
Sample Matrix: Water  
Condition: Intact, Cool, pH=7

Report Date: 04/09/96  
Date Sampled: 03/13/96  
Date Received: 03/26/96  
Date Analyzed: 04/08/96

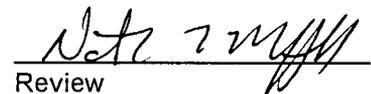
Total Organic Halides	Spiked Sample Concentration	Sample Concentration	Spike Amount	Percent Recovery	Acceptance Limits
Matrix Spike	54	ND	50	109%	75-125
Matrix Spike Dup	55	ND	50	109%	75-125
%RPD				0%	

ND - Analyte not detected at stated detection limit  
%RPD - Relative percent deviation  
All unlabeled values are in units of micrograms per liter (ug/L)

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

  
Analyst

  
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QUALITY CONTROL REPORT - MATRIX SPIKE

TOX  
TOTAL ORGANIC HALIDES

Sample ID: Matrix Spike / Spike Duplicate  
Sample Number: 0696G00551 MS/MSD  
Sample Matrix: Water  
Condition: Intact, Cool, pH=7

Report Date: 04/09/96  
Date Sampled: Unknown  
Date Received: 03/26/96  
Date Analyzed: 04/09/96

Total Organic Halides	Spiked Sample Concentration	Sample Concentration	Spike Amount	Percent Recovery	Acceptance Limits
Matrix Spike	58	ND	50	116%	75-125
Matrix Spike Dup	55	ND	50	109%	75-125
%RPD				6%	

ND - Analyte not detected at stated detection limit

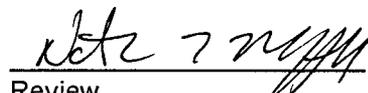
%RPD - Relative percent deviation

All unlabeled values are in units of micrograms per liter (ug/L)

Reference: Method 9020B: TOTAL ORGANIC HALIDES (TOX)  
Test Methods for Evaluating Solid Waste, SW-846, United States  
Environmental Protection Agency, Third Edition, Final Update II,  
September 1994.

Comments:

  
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