

GW - 40

MONITORING REPORTS

DATE:

1994



Crude Gathering Operations

5764 US Highway 64
Farmington, New Mexico
87401

505
632-8024
632-8006

February 7, 1995

Mr. William Olson
Hydrogeologist
New Mexico Oil Conservation Division
Environmental Bureau
P. O. Box 2088
Santa Fe, NM 87504-2088

RECEIVED

FEB 13 1995

Environmental Bureau
Oil Conservation Division

Dear Mr. Olson:

Enclosed you will find the quarterly report for Giant Refining Company's Bloomfield Refinery for the fourth quarter of 1994.

Please contact me if you have any questions.

Sincerely,

Tim Kinney
Remediation Project Manager

/dm

Enclosure

cc w/enc.: Carl Shook-Giant
Kim Bullerdick-Giant
Jacque Cumbie-Giant
Stephanie Odell-BLM
Maura Hanning-EID
Chris Shuey-SWRIC
Valda Terauds-H+GCL
Jim Durrett-SJC
Herbert Gorrod-EPA
Denny Foust-OCD

QUARTERLY DATA REPORT
GIANT BLOOMFIELD REFINERY
FOURTH QUARTER, 1994

RECEIVED

FEB 13 1995

Environmental Bureau
Oil Conservation Division

Prepared By:

GIANT REFINING COMPANY
5764 U. S. Highway 64
Farmington, NM 87401
(505)632-8006
FAX (505)632-4025

TABLE OF CONTENTS

Introduction and Summary	Section 1
Quarterly Analytical Results	Section 2
Potentiometric Surface Maps	Section 3
Total Volume History	Section 4
Analytical Results/Bioremediation Wells	Section 5

**INTRODUCTION AND SUMMARY
QUARTERLY REPORT
FOURTH QUARTER, 1994**

INTRODUCTION

No significant changes were made in the fourth quarter.

SUMMARY

Section 2

Section 2 contains a summary of the quarterly analytical results. Raw data, as received from the laboratory, is available on request as a supplement to the quarterly report.

Section 3

A quarterly potentiometric surface map, as well as the adjusted water surface elevation and product thickness for each well, is included in Section 3.

Section 4

Section 4 illustrates the volume history for the quarter. Total volume pumped from each well, as well as current tank volumes and the reinjection volume, is reported. Additional detail, on a weekly basis, is also available if desired.

Section 5

Section 5 contains a summary of the quarterly analytical results for the Bioremediation Project. Raw data, as received from the laboratory, is available on request as a supplement to the quarterly report.

SECTION 2

The following pages show the quarterly analytical data for the Giant Refining Remediation Project. The data is broken down into units as described below.

	<u>Unit of Measure</u>
Total dissolved solids (180)	mg/l
Total dissolved solids (calc)	mg/l
Total alkalinity as CaCO ₃	mg/l
Total hardness as CaCO ₃	mg/l
Bicarbonate as HCO ₃	mg/l
Carbonate as CO ₃	mg/l
Chloride	mg/l
Sulfate	mg/l
Calcium	mg/l
Magnesium	mg/l
Potassium	mg/l
Sodium	mg/l

The remainder of the data is measured in ug/l.

GIANT REFINING COMPANY
ONSITE REMEDIATION PROJECT
QUARTERLY ANALYTICAL DATA SUMMARY
FOURTH QUARTER, 1994

STRIPPER INFLUENT

October November December

GENERAL WATER CHEMISTRY

Lab pH (s.u.)	6.8
Lab Conductivity, umhos/cm	3420.00
Total Dissolved Solids (180)	2600.00
Total Dissolved Solids (calc.)	2552.00
Total Alkalinity as CaCO ₃	270.00
Total Hardness as CaCO ₃	NA
Bicarbonate as HCO ₃	329.00
Carbonate as CO ₃	0.00
Hydroxide as OH	0.00
Chloride	383.00
Sulfate	1170.00
Calcium	369.00
Magnesium	35.00
Potassium	3.10
Sodium	432.00

Cation/Anion Balance	0.50%
----------------------	-------

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dibromoethane (EDB)	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND

STRIPPER INFLUENT (contined)

OCTOBER NOVEMBER December

Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	3.9
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	7.9
Toluene	ND
Xylenes	11
Trichlorotrifluoroethane	--

STRIPPER EFFLUENT

October November December

GENERAL WATER CHEMISTRY

Lab pH (s.u.)	7.1
Lab Conductivity, umhos/cm	3380.00
Total Dissolved Solids (180)	2570.00
Total Dissolved Solids (calc.)	2524.00
Total Alkalinity as CaCO ₃	248.00
Total Hardness as CaCO ₃	NA
Bicarbonate as HCO ₃	303.00
Carbonate as CO ₃	0.00
Hydroxide as OH	0.00
Chloride	382.00
Sulfate	1180.00
Calcium	375.00
Magnesium	35.00
Potassium	3.10
Sodium	398.00
Cation/Anion Balance	1.82%

PAH

Naphthalene	ND
Acenaphthylene	ND
Acenaphthene	ND
Fluorene	ND
Phenanthrene	ND
Anthracene	ND
Fluoranthene	ND
Pyrene	ND
Benzo(A)Anthracene	ND
Chrysene	ND
Benzo(B)Fluoranthene	ND
Benzo(K)Fluoranthene	ND
Benzo(A)Pyrene	ND
Dibenzo(a,h)Anthracene	ND
Benzo(g,h,i)Perylene	ND
Indeno(1,2,3-CD)Pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND

STRIPPER EFFLUENT (continued)

HALOCARBONS	October	November	December
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	--		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dibromoethane (EDB)	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,1-Dichloroethene	ND		
1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	--		

GBR-17

OCTOBER NOVEMBER

GENERAL WATER CHEMISTRY

Lab pH (S.U.)	7.2
Lab Conductivity, umhos/cm	2620.00
Total Dissolved Solids (180)	2220.00
Total Dissolved Solids (calc.)	2006.00
Total Alkalinity as CaCO ₃	212.00
Total Hardness as CaCO ₃	988.00
Dissolved Oxygen	NA
Bicarbonate as HCO ₃	258.00
Carbonate as CO ₃	0.00
Hydroxide as OH	0.00
Chloride	62.00
Sulfate	1180.00
Calcium	353.00
Magnesium	26.00
Potassium	0.80
Sodium	257.00
Cation/Anion Balance	0.68%

HALOCARBONS

Bromodichloromethane
Bromoform
Bromomethane
Carbon tetrachloride
Chloroethane
Chloroethane
2-Chloroethylvinylether
Chloroform
Chloromethane
Dibromochloromethane
1,2-Dibromoethane (EDB)
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,1-Dichloroethane
1,2-Dichloroethane
1,2-Dichloroethene
cis-1,2-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Methylene chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane
Vinyl chloride

October November December

HALOCARBONS

Bromodichloromethane	ND	
Bromoform	ND	
Bromomethane	ND	
Carbon tetrachloride	ND	
Chloroethane	ND	
Chloroethane	ND	
2-Chloroethylvinylether	---	
Chloroform	ND	
Chloromethane	ND	
Dibromochloromethane	ND	
1,2-Dibromoethane (EDB)	ND	
1,2-Dichlorobenzene	ND	
1,3-Dichlorobenzene	ND	
1,4-Dichlorobenzene	ND	
1,1-Dichloroethane	ND	
1,2-Dichloroethane	ND	
1,2-Dichloroethene	ND	
cis-1,2-Dichloroethene	1.6	
trans-1,2-Dichloroethene	ND	
1,2-Dichloropropane	ND	
cis-1,3-Dichloropropene	ND	
trans-1,3-Dichloropropene	ND	
Methylene chloride	ND	
1,1,2,2-Tetrachloroethane	ND	
Tetrachloroethene	ND	
1,1,1-Trichloroethane	ND	
1,1,2-Trichloroethane	ND	
Trichloroethene	ND	
Trichlorofluoromethane	ND	
Vinyl chloride	ND	

AROMATICS

Benzene	ND	
Chlorobenzene	ND	
1,2-Dichlorobenzene	ND	
1,3-Dichlorobenzene	ND	
1,4-Dichlorobenzene	ND	
Ethylbenzene	ND	
Toluene	ND	
Xylenes	ND	
Trichlorotrifluoroethane	---	

OFFSITE WELLS

SHS-10

	October	November	December
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	--		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dibromoethane (EDB)	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	1.4		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	--		

October November December

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dibromoethane (EDB)	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	--

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dibromoethane (EDB)	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	0.4
1,2-Dichloroethane	7.4
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	--

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dibromoethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	--

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dibromoethane (EDB)	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	--

*ND - Not detected at specified detection limit

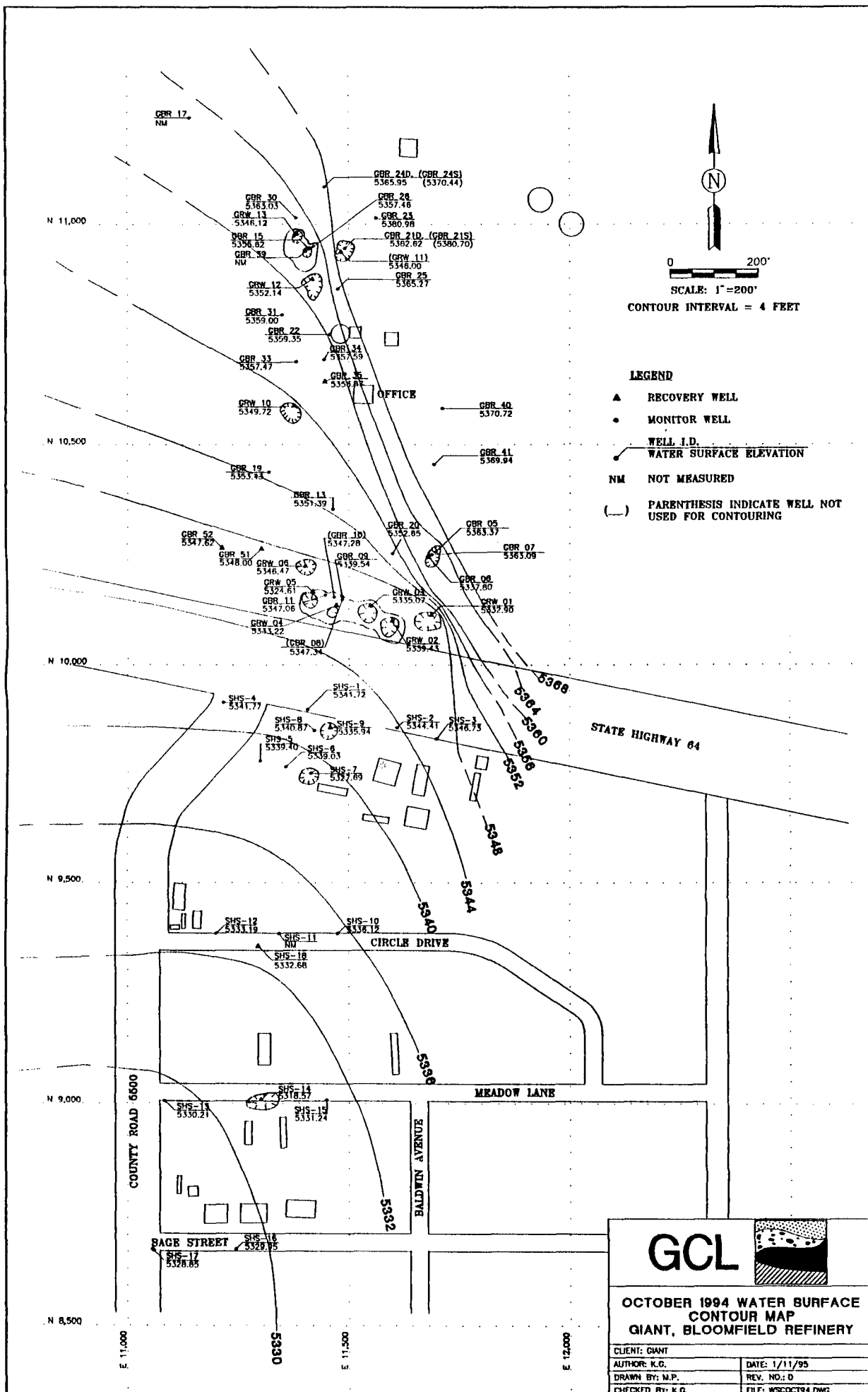
GIANT REFINING BLOOMFIELD REFINERY
MONTHLY POTENTIOMETRIC SURFACE

October, 1994

WELL #	WELLHEAD ELEVATION IN FEET	DEPTH TO WATER IN FEET	DEPTH TO PRODUCT IN FEET	PRODUCT THICKNESS IN FEET	ADJUSTED WSEL* IN FEET
GRW-1	5394.30	61.40	61.40	0.00	5332.90
GRW-2	5391.28	51.85	51.85	0.00	5339.43
GRW-3	5388.77	53.70	53.70	0.00	5335.07
GRW-4	5390.02	56.80	56.80	0.00	5333.22
GRW-5	5390.56	65.95	65.95	0.00	5324.61
GRW-6	5390.81	44.34	44.34	0.00	5346.47
GRW-10	5395.02	45.30	45.30	0.00	5349.72
GRW-11	5397.85	51.85	51.85	0.00	5346.00
GRW-12	5397.24	45.10	45.10	0.00	5352.14
GRW-13	5396.90	50.78	50.78	0.00	5346.12
GBR-5	5395.07	32.30	31.55	0.75	5363.37
GBR-6	5395.70	57.90	57.90	0.00	5337.80
GBR-7	5395.85	33.30	32.63	0.67	5363.09
GBR-8	5390.50	43.20	43.15	0.05	5347.34
GBR-9	5389.92	50.38	50.38	0.00	5339.54
GBR-10	5390.57	43.29	43.29	0.00	5347.28
GBR-11	5389.43	42.39	42.36	0.03	5347.06
GBR-13	5393.04	41.65	41.65	0.00	5351.39
GBR-15	5397.99	42.37	42.37	0.00	5355.62
GBR-17	5402.69	0.00	0.00	0.00	5402.69
GBR-18	5421.68	30.61	30.61	0.00	5391.07
GBR-19	5393.83	41.05	40.24	0.81	5353.43
GBR-20	5393.47	40.91	40.80	0.11	5352.65
GBR-21S	5400.65	19.97	19.94	0.03	5380.70
GBR-21D	5400.19	37.57	37.57	0.00	5362.62
GBR-22	5395.91	37.20	36.40	0.80	5359.35
GBR-23	5403.72	22.74	22.74	0.00	5380.98
GBR-24S	5396.08	25.64	25.64	0.00	5370.44
GBR-24D	5396.77	30.82	30.82	0.00	5365.95
GBR-25	5396.72	31.45	31.45	0.00	5365.27
GBR-26	5395.59	38.13	38.13	0.00	5357.46
GBR-30	5396.58	33.53	33.53	0.00	5363.05
GBR-31	5394.86	35.86	35.86	0.00	5359.00
GBR-33	5396.28	38.81	38.81	0.00	5357.47
GBR-34	5394.00	37.57	36.12	1.45	5357.59
GBR-35	5393.66	37.78	36.54	1.24	5356.87
GBR-39	5397.55	0.00	0.00	0.00	5397.55
GBR-40	5400.76	30.04	30.04	0.00	5370.72
GBR-41	5396.35	26.41	26.41	0.00	5369.94
GBR-51	5389.68	41.68	41.68	0.00	5348.00
GBR-52	5387.74	40.12	40.12	0.00	5347.62

* WSEL - WATER SURFACE ELEVATION ADJUSTED FOR PRODUCT DEPTH

WELL #	WELLHEAD ELEVATION IN FEET	DEPTH TO WATER IN FEET	DEPTH TO PRODUCT IN FEET	PRODUCT THICKNESS IN FEET	ADJUSTED WSEL* IN FEET
SHS-1	5383.54	41.92	41.80	0.12	5341.72
SHS-2	5381.66	37.25	37.25	0.00	5344.41
SHS-3	5383.33	36.60	36.60	0.00	5346.73
SHS-4	5383.62	41.85	41.85	0.00	5341.77
SHS-5	5378.36	38.96	38.96	0.00	5339.40
SHS-6	5378.17	39.14	39.14	0.00	5339.03
SHS-7	5375.89	48.20	48.20	0.00	5327.69
SHS-8	5380.25	39.38	39.38	0.00	5340.87
SHS-9	5380.79	44.85	44.85	0.00	5335.94
SHS-10	5373.80	37.68	37.68	0.00	5336.12
SHS-12	5373.94	40.75	40.75	0.00	5333.19
SHS-13	5367.81	37.60	37.60	0.00	5330.21
SHS-14	5367.07	48.50	48.50	0.00	5318.57
SHS-15	5366.21	34.97	34.97	0.00	5331.24
SHS-16	5362.58	32.63	32.63	0.00	5329.95
SHS-17	5364.35	35.50	35.50	0.00	5328.85
SHS-18	5373.64	41.20	40.90	0.30	5332.68



Giant Refining Co. Bloomfield Refinery
Quarterly Net Tank
Volume Change

Fourth Quarter, 1994

Tank Number	Beginning Volume	Ending Volume	Net Change
102	17,609	16,339	1,270
106	8,010	8,010	0
21	68,635	54,707	13,928
22	72,623	71,773	850
Total Net Volume Change			16,048

Giant Refining Co. Bloomfield Refinery
Quarterly Recovery Well
Volume Tabulation

Fourth Quarter, 1994

Well	Month #1	Month #2	Month #3	Total
GRW-1	8,010	9,260	6,600	23,870
GRW-2	15,700	21,100	6,960	43,760
GRW-3	12,160	16,000	12,250	40,410
GRW-4	22,820	26,430	19,830	69,080
GRW-5	30,050	72,200	49,200	151,450
GRW-6	49,590	43,630	54,650	147,870
GRW-9	7,800	5,340	3,410	16,550
GRW-10	256,200	367,030	253,540	876,770
GRW-11	32,260	77,160	36,090	145,510
GRW-12	9,040	22,730	10,010	41,780
GRW-13	16,780	20,740	17,470	54,990
SHS-7	182	149	24	355
SHS-9	7,662	1,399	389	9,450
SHS-14	158,845	173,809	227,635	560,289
SHS-18	2,606	9,270	6,388	18,264
Total Volume Pumped In Gallons				2,200,398

Giant Refining Co. Bloomfield Refinery
Total Volume Summary

Fourth Quarter, 1994

=====

Total Volume Of Water Recovered	2,200,398
Net Change In Storage Volume	<u>16,048</u>
Total Water Treated	2,216,446
Less Air Stripper	<u>11,074</u>
Evaporative Loss (1/2%)	
Total Water Pumped to the	<u>2,205,372</u>
Infiltration Gallery	

SECTION 5

ANALYTICAL RESULTS/BIOREMEDIATION WELLS

GRW-9

OCTOBER NOVEMBER DECEMBER

GENERAL WATER CHEMISTRY

Lab pH (s.u.)	6.9
Lab Conductivity, umhos/cm	3520.00
Total Dissolved Solids (180)	2580.00
Total Dissolved Solids (calc.)	2832.00
Total Alkalinity as CaCO ₃	610.00
Total Hardness as CaCO ₃	NA
Dissolved Oxygen	2.45
Bicarbonate as HCO ₃	744.00
Carbonate as CO ₃	0.00
Hydroxide as OH	0.00
Chloride	345.00
Sulfate	1270.00
Calcium	297.00
Magnesium	25.00
Potassium	46.00
Sodium	522.00
Cation/Anion Balance	0.51%

GBR-20

OCTOBER NOVEMBER DECEMBER

GENERAL WATER CHEMISTRY

Lab pH (s.u.)	7.1	
Lab Conductivity, umhos/cm	2900.00	
Total Dissolved Solids (180)	1710.00	
Total Dissolved Solids (calc.)	1622.00	
Total Alkalinity as CaCO ₃	748.00	
Total Hardness as CaCO ₃	NA	
Dissolved Oxygen	3.63	
Bicarbonate as HCO ₃	913.00	
Carbonate as CO ₃	0.00	
Hydroxide as OH	0.00	
Chloride	479.00	
Sulfate	43.00	
Calcium	71.00	
Magnesium	13.00	
Potassium	1.20	
Sodium	566.00	
Cation/Anion Balance	0.22%	

GBR-41

OCTOBER NOVEMBER DECEMBER

GENERAL WATER CHEMISTRY

Lab pH (s.u.)	7.0
Lab Conductivity, umhos/cm	3120.00
Total Dissolved Solids (180)	1880.00
Total Dissolved Solids (calc.)	1879.00
Total Alkalinity as CaCO ₃	1120.00
Total Hardness as CaCO ₃	NA
Dissolved Oxygen	1.81
Bicarbonate as HCO ₃	1370.00
Carbonate as CO ₃	0.00
Hydroxide as OH	0.00
Chloride	447.00
Sulfate	47.00
Calcium	170.00
Magnesium	54.00
Potassium	1.10
Sodium	485.00
Cation/Anion Balance	0.16%



Crude Gathering Operations

5764 US Highway 64
Farmington, New Mexico
87401

505
632-8024
632-8006

November 21, 1994

Mr. William Olson
Hydrogeologist
New Mexico Oil Conservation Division
Environmental Bureau
P. O. Box 2088
Santa Fe, NM 87504-2088

Dear Mr. Olson:

Enclosed you will find the quarterly report for Giant Refining Company's Bloomfield Refinery for the third quarter of 1994.

Please contact me if you have any questions.

Sincerely,

Tim Kinney
Remediation Project Manager

/dm

Enclosure

cc w/enc.: Carl Shook-Giant
Kim Bullerdick-Giant
Jacque Cumbie-Giant
Stephanie Odell-BLM
Maura Hanning-EID
Chris Shuey-SWRIC
Valda Terauds-H + GCL
Jim Durrett-SJC
Herbert Gorrod-EPA
Denny Foust-OCD

RECEIVED

NOV 28 1994

OIL CONSERVATION DIV.
SANTA FE

QUARTERLY DATA REPORT
GIANT BLOOMFIELD REFINERY
THIRD QUARTER, 1994

RECEIVED

NOV 28 1994

OIL CONSERVATION DIV.
SANTA FE

Prepared By:

GIANT REFINING COMPANY
5764 U. S. Highway 64
Farmington, NM 87401
(505)632-8006
FAX (505)632-4025

TABLE OF CONTENTS

Introduction and Summary	Section 1
Quarterly Analytical Results	Section 2
Potentiometric Surface Maps	Section 3
Total Volume History	Section 4
Analytical Results/Bioremediation Wells . . .	Section 5

**INTRODUCTION AND SUMMARY
QUARTERLY REPORT
THIRD QUARTER, 1994**

INTRODUCTION

No significant changes were made in the third quarter.

SUMMARY

Section 2

Section 2 contains a summary of the quarterly analytical results. Raw data, as received from the laboratory, is available on request as a supplement to the quarterly report.

Section 3

A quarterly potentiometric surface map, as well as the adjusted water surface elevation and product thickness for each well, is included in Section 3.

Section 4

Section 4 illustrates the volume history for the quarter. Total volume pumped from each well, as well as current tank volumes and the reinjection volume, is reported. Additional detail, on a weekly basis, is also available if desired.

Section 5

Section 5 contains a summary of the quarterly analytical results for the Bioremediation Project. Raw data, as received from the laboratory, is available on request as a supplement to the quarterly report.

SECTION 2

The following pages show the quarterly analytical data for the Giant Refining Remediation Project. The data is broken down into units as described below.

	<u>Unit of Measure</u>
Total dissolved solids (180)	mg/l
Total dissolved solids (calc)	mg/l
Total alkalinity as CaCO ₃	mg/l
Total hardness as CaCO ₃	mg/l
Bicarbonate as HCO ₃	mg/l
Carbonate as CO ₃	mg/l
Chloride	mg/l
Sulfate	mg/l
Calcium	mg/l
Magnesium	mg/l
Potassium	mg/l
Sodium	mg/l

The remainder of the data is measured in ug/l.

GIANT REFINING COMPANY
 ONSITE REMEDIATION PROJECT
 QUARTERLY ANALYTICAL DATA SUMMARY
 THIRD QUARTER, 1994

SYSTEM INFLUENT

HALOCARBONS	July	August	September
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
Chloroethane	ND		
2-Chloroethylvinylether	--		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	0.5		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		

AROMATICS

Benzene	6.0
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	0.8
Toluene	ND
Xylenes	0.6
Trichlorotrifluoroethane	--

SYSTEM EFFLUENT

HALOCARBONS	July	August	September
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
Chloroethane	ND		
2-Chloroethylvinylether	--		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dic anthracene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND	ND	ND
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND	ND	ND
Toluene	ND	ND	ND
Xylenes	ND	ND	ND
Trichlorotrifluoroethane	--		

SYSTEM EFFLUENT (continued)

PAH	July	August	September
Naphthalene	ND		
Acenaphthylene	ND		
Acenaphthene	ND		
Fluorene	ND		
Phenanthrene	ND		
Anthracene	ND		
Fluoranthene	ND		
Pyrene	ND		
Benzo(A)Anthracene	ND		
Chrysene	ND		
Benzo(B)Fluoranthene	ND		
Benzo(K)Fluoranthene	ND		
Benzo(A)Pyrene	ND		
Dibenzo(a,h)Anthracene	ND		
Benzo(g,h,i)Perylene	ND		
Indeno(1,2,3-CD)Pyrene	ND		
1-Methylnaphthalene	ND		
2-Methylnaphthalene	ND		

GBR-24D

July

August

September

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	12
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	1.6
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	3.6
Toluene	ND
Xylenes	1.3
Trichlorotrifluoroethane	--

GBR-24D	July	August	September
---------	------	--------	-----------

PAH

Naphthalene	ND		
Acenaphthylene	ND		
Acenaphthene	ND		
Fluorene	0.96		
Phenanthrene	0.34		
Anthracene	ND		
Fluoranthene	ND		
Pyrene	ND		
Benzo(A)Anthracene	0.044		
Chrysene	ND		
Benzo(B)Fluoranthene	ND		
Benzo(K)Fluoranthene	ND		
Benzo(A)Pyrene	ND		
Dibenzo(a,h)Anthracene	ND		
Benzo(g,h,i)Perylene	ND		
Indeno(1,2,3-CD)Pyrene	ND		
1-Methylnaphthalene	ND		
2-Methylnaphthalene	ND		

GBR-31

	July	August	September
--	------	--------	-----------

HALOCARBONS

Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
Chloroethane	ND		
2-Chloroethylvinylether	--		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		

GBR-31 (continued)

	July	August	September
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	--		

GBR-30

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	--

GBR-15

	July	August	September
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
Chloroethane	ND		
2-Chloroethylvinylether	--		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	11		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	0.9		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	1.2		
Trichlorotrifluoroethane	--		

OFFSITE WELLS

SHS-3

	July	August	September
HALOCARBONS	ND		
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	--		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	--		

SHS-4

July

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	--

SHS-10

July

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	0.4
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	3.0
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	--

SHS-12

HALOCARBONS	July	August	September
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	--		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	0.5		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	--		

SHS-13

July

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	--
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	0.5
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	--

SHS-15

July*

HALOCARBONS

	ND
Bromodichloromethane	0.92
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	-
Chloroform	14
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	-

*DILUTION FACTOR OF 2X

SHS-16

July

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	-
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	-

SHS-17

July

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	-
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	-

*ND - Not detected at specified detection limit

Giant Bloomfield: July 5 1994 Water Levels

Well	Wellhead Elevation ft. AMSL	Depth to Water feet	Depth to Product feet	Product thickness feet	Adjusted WSEL* ft. AMSL
GRW-1	5394.30	61.23			5333.07
GRW-2	5391.28	52.35			5338.93
GRW-3	5388.77	54.80			5333.97
GRW-4	5390.02	56.70			5333.32
GRW-5	5390.56	63.35			5327.21
GRW-6	5390.81	48.70			5342.11
GRW-9	5395.70	47.25			5348.45
GRW-10	5395.02	47.78	47.10	0.68	5347.79
GRW-11	5397.85	63.10			5334.75
GRW-12	5397.24	48.55			5348.69
GRW-13	5396.90	51.50			5345.40
GBR-5	5395.07	30.75	29.54	1.21	5365.29
GBR-7	5395.85	32.35	31.72	0.63	5364.01
GBR-8	5390.50	44.28	43.35	0.93	5346.97
GBR-9	5389.92	50.41			5339.51
GBR-10	5390.57	42.45			5348.12
GBR-11	5389.43	42.84	42.50	0.34	5346.86
GBR-13	5393.04	NM			NM
GBR-15	5397.99	42.81			5355.18
GBR-17	5402.69	NM			NM
GBR-18	5421.68	29.30			5392.38
GBR-19	5393.83	40.84	40.07	0.77	5353.61
GBR-20	5393.47	40.44			5353.03
GBR-21S	5400.65	20.15			5380.50
GBR-21D	5400.19	38.15			5362.04
GBR-22	5395.91	36.21			5359.70
GBR-23	5403.72	22.70			5381.02
GBR-24S	5396.08	28.90			5367.18
GBR-24D	5396.77	31.28			5365.49
GBR-25	5396.72	31.06			5365.66
GBR-26	5395.59	38.65			5356.94
GBR-30	5396.58	34.58			5362.00
GBR-31	5394.86	35.90			5358.96
GBR-33	5396.28	38.78	38.77	0.01	5357.51
GBR-34	5394.00	37.77	36.14	1.63	5357.54
GBR-35	5393.66	38.15	36.24	1.91	5357.04
GBR-39	5397.55	Dry			Dry
GBR-40	5400.76	30.71			5370.05
GBR-41	5396.35	21.27			5375.08
GBR-51	5389.68	41.55			5348.13
GBR-52	5387.74	39.99			5347.75

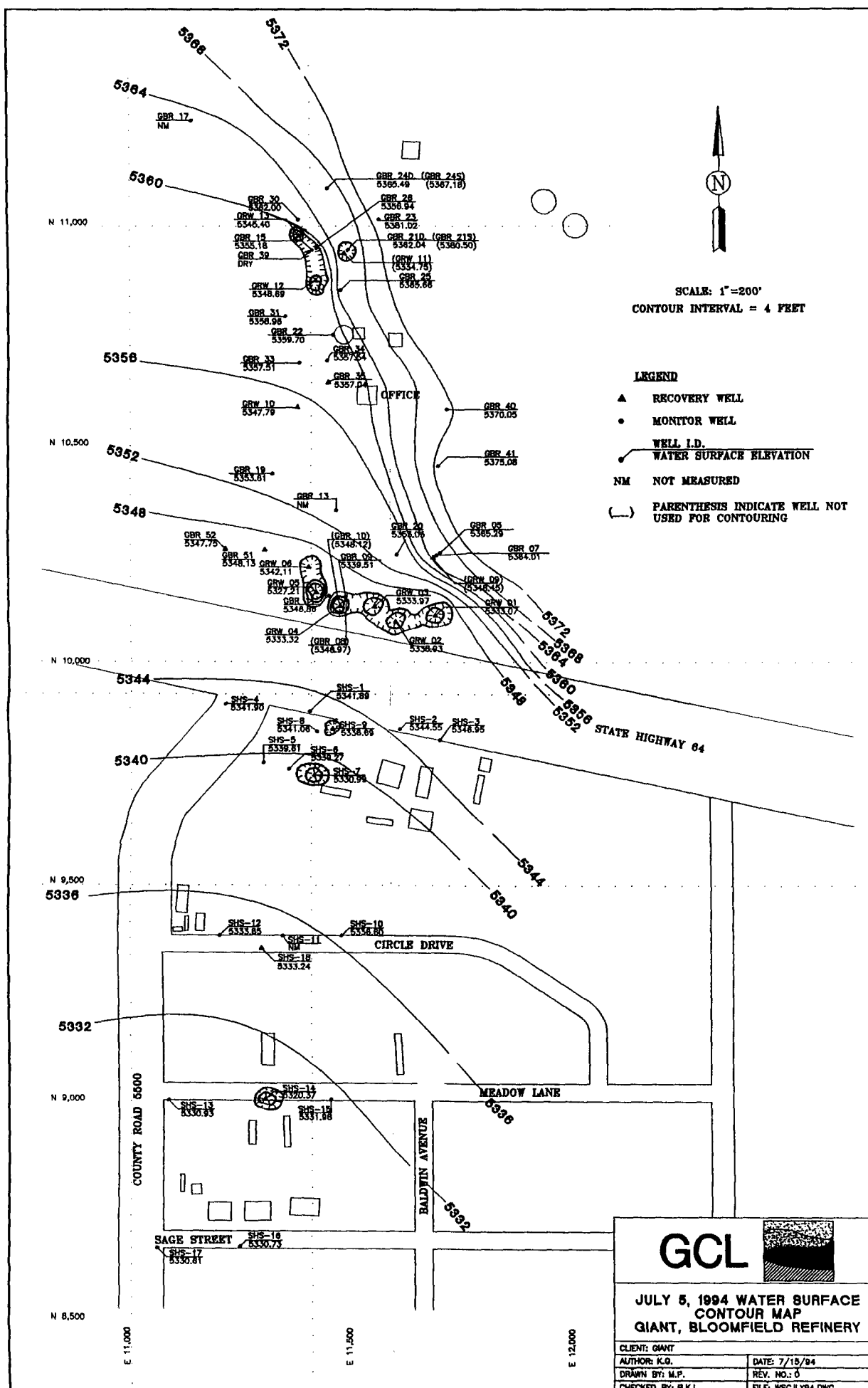
Giant Bloomfield: July 5 1994 Water Levels

Well	Wellhead Elevation ft. AMSL	Depth to Water feet	Depth to Product feet	Product thickness feet	Adjusted WSEL* ft. AMSL
SHS-1	5383.54	41.77	41.62	0.15	5341.89
SHS-2	5381.66	37.11			5344.55
SHS-3	5383.33	36.38			5346.95
SHS-4	5383.62	41.72			5341.90
SHS-5	5378.36	38.75			5339.61
SHS-6	5378.17	38.90			5339.27
SHS-7	5375.89	44.90			5330.99
SHS-8	5380.25	39.19			5341.06
SHS-9	5380.79	44.10			5336.69
SHS-10	5373.80	37.20			5336.60
SHS-12	5373.94	40.09			5333.85
SHS-13	5367.81	36.88			5330.93
SHS-14	5367.07	46.70			5320.37
SHS-15	5366.21	34.23			5331.98
SHS-16	5362.58	31.85			5330.73
SHS-17	5364.35	33.74			5330.61
SHS-18	5373.64	40.40			5333.24

*WSEL = Water Surface Elevation Adjusted for Product Depth.

NM = not measured

Note: 0.803 = the specific gravity used for adjusted product depth calculation



Giant Refining Co. Bloomfield Refinery
Quarterly Net Tank
Volume Change

Third Quarter, 1994

Tank Number	Beginning Volume	Ending Volume	Net Change
102	9,438	17,609	(8,171)
106	8,010	8,010	0
21	68,676	68,635	41
22	74,439	72,623	1,816
Total Net Volume Change			(6,314)

Giant Refining Co. Bloomfield Refinery
Quarterly Recovery Well
Volume Tabulation

Third Quarter, 1994

Well	Month #1	Month #2	Month #3	Total
GRW-1	8,110	12,830	10,010	30,950
GRW-2	12,130	14,170	14,100	40,400
GRW-3	11,290	13,740	12,220	37,250
GRW-4	25,930	49,940	77,970	153,840
GRW-5	45,680	40,110	36,850	122,640
GRW-6	91,400	34,860	74,670	200,930
GRW-9	10,610	12,330	9,630	32,570
GRW-10	589,120	802,140	224,350	1,615,610
GRW-11	27,290	55,400	85,800	168,490
GRW-12	54,850	5,780	14,160	74,790
GRW-13	14,960	13,850	17,200	46,010
SHS-7	51	80	30	161
SHS-9	7,850	27	65	7,942
SHS-14	176,478	167,687	162,830	506,995
SHS-18	15,011	0	0	15,011
Total Volume Pumped In Gallons				3,053,589

Giant Refining Co. Bloomfield Refinery
Total Volume Summary

Third Quarter, 1994

=====

Total Volume Of Water Recovered	3,053,589
Net Change In Storage Volume	(6,314)

Total Water Pumped To The Infiltration Gallery	3,053,589
---	-----------

=====

Difference	6,314
------------	-------

Comments: The approximately .2% difference
is due to meter inaccuracy.

SECTION 5
BIOREMEDIATION WELLS
ANALYTICAL RESULTS

RW-9

1994

	July 13	July 21	August 3	August 24	September 7
Laboratory Conductivity, umoh/cm	NA	NA	NA	3250	3060
Laboratory pH (s.u.)	7.3	6.8	7.1	7.1	7.2
Ammonia	0.12	0.15	ND	0.09	0.06
Nitrate Nitrogen	ND	0.12	ND	0.02	0.07
Ortho-Phosphate	ND	ND	ND	ND	ND
Dissolved Oxygen	3.5	3.5	1.8	2.56	1.22
Potassium	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)	8	12.8	7.2	7.8	6.8
Total Iron	0.30	1.06	0.77	0.76	0.7
Total Manganese	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons	ND	ND	ND	ND	ND
Total Phosphorus	ND	0.07	ND	0.06	0.03

BTEX

Benzene	0.4	18	16	22.6	19
Toluene	2.9	1.5	2.3	2.2	3.1
Ethylbenzene	1.7	25	17	10.8	5
m,p-Xylenes	0.7	11	7.7	3.8	3.5
o-Xylene	0.4	0.3	ND	ND	ND

Results of Bacteria Enumeration	1.2 x 10(4)	3.1 x 10(3)	8.0 x 10(3)	6.2 x 10(3)	6.4 x 10(3)
---------------------------------	-------------	-------------	-------------	-------------	-------------

	July 13	July 21	August 3	August 24	September 7
Laboratory Conductivity, umoh/cm	NA	NA	NA	2890	2670
Laboratory pH (s.u.)	7	6.9	7	7.1	7.2
Ammonia	0.2	0.07	0.76	0.15	0.07
Nitrate Nitrogen	ND	0.22	0.15	0.05	0.1
Ortho-Phosphate	ND	0.89	ND	0.26	ND
Dissolved Oxygen	1.5	0.89	0.13	0.54	0.68
Potassium	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)	55.6	52.4	23.4	45.7	37.4
Total Iron	9.00	0.81	10.5	13.2	12.44
Total Manganese	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons	4.5	3.7	4	1.8	4.7
Total Phosphorus	0.33	0.13	0.22	0.35	0.17

BTEX

Benzene	583	460	420	380	400
Toluene	ND	ND	ND	ND	26.5
Ethylbenzene	1140	1170	510	1200	1270
m,p-Xylenes	1450	1560	1220	1300	1210
o-Xylene	22.7	20	ND	ND	ND

Results of Bacteria Enumeration	3.2 x 10(5)	3.4 x 10(4)	3.7 x 10(4)	7.5 x 10(4)	4.4 x 10(4)
---------------------------------	-------------	-------------	-------------	-------------	-------------

	July 13	July 21	August 3	August 24	September 7
Laboratory Conductivity, umoh/cm	NA	NA	NA	2790	2560
Laboratory pH (s.u.)	7.3	6.9	7	7.1	7.3
Ammonia	0.13	ND	0.14	0.08	0.05
Nitrate Nitrogen	ND	0.11	0.16	0.03	0.09
Ortho-Phosphate	ND	ND	ND	ND	ND
Dissolved Oxygen	2	2.9	1.5	2.18	2.56
Potassium	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)	15.7	18.8	13.5	14.3	10.9
Total Iron	19.90	0.98	15.7	19.1	12.97
Total Manganese	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons	2.8	13	21	1.8	4.01
Total Phosphorus	0.07	ND	ND	0.27	0.03

BTEX

Benzene	313	300	420	340	420
Toluene	ND	7.6	ND	ND	20
Ethylbenzene	413	500	510	410	430
m,p-Xylenes	982	1070	1220	1100	1350
o-Xylene	ND	ND	ND	ND	12

Results of Bacteria Enumeration	$6.6 \times 10(3)$	$1.4 \times 10(3)$	$1.1 \times 10(4)$	$1.1 \times 10(3)$	$7.5 \times 10(2)$
---------------------------------	--------------------	--------------------	--------------------	--------------------	--------------------



Crude Gathering Operations

5764 US Highway 64
Farmington, New Mexico
87401

505
632-8024
632-8006

August 16, 1994

Mr. William Olson
Hydrogeologist
New Mexico Oil Conservation Division
Environmental Bureau
P. O. Box 2088
Santa Fe, NM 87504-2088

RECEIVED

AUG 18 1994

**OIL CONSERVATION DIV.
SANTA FE**

Dear Mr. Olson:

Enclosed you will find the quarterly report for Giant Refining Company's Bloomfield Refinery for the second quarter of 1994.

Please contact me if you have any questions.

Sincerely,

Tim Kinney
Remediation Project Manager

/dm

Enclosure

cc w/enc.: Carl Shook-Giant
Kim Bullerdick-Giant
Debbie Smith-Giant
Stephanie Odell-BLM
Maura Hanning-EID
Chris Shuey-SWRIC
Valda Terauds-H+GCL
Jim Durrett-SJC
Herbert Gorrod-EPA
Denny Foust-OCD

QUARTERLY DATA REPORT
GIANT BLOOMFIELD REFINERY
SECOND QUARTER, 1994

Prepared By:

GIANT REFINING COMPANY
5764 U. S. Highway 64
P. O. Box 256
Farmington, NM 87499
(505)632-3306
FAX (505)632-2487

TABLE OF CONTENTS

Introduction and Summary	Section 1
Quarterly Analytical Results	Section 2
Potentiometric Surface Maps	Section 3
Total Volume History	Section 4
Analytical Results/Bioremediation Wells . . .	Section 5

**INTRODUCTION AND SUMMARY
QUARTERLY REPORT
SECOND QUARTER, 1994**

INTRODUCTION

No significant changes were made in the second quarter.

SUMMARY

Section 2

Section 2 contains a summary of the quarterly analytical results. Raw data, as received from the laboratory, is available on request as a supplement to the quarterly report.

Section 3

A quarterly potentiometric surface map, as well as the adjusted water surface elevation and product thickness for each well, is included in Section 3.

Section 4

Section 4 illustrates the volume history for the quarter. Total volume pumped from each well, as well as current tank volumes and the reinjection volume, is reported. Additional detail, on a weekly basis, is also available if desired.

Section 5

Section 5 contains a summary of the quarterly analytical results for the Bioremediation Project. Raw data, as received from the laboratory, is available on request as a supplement to the quarterly report.

SECTION 2

The following pages show the quarterly analytical data for the Giant Refining Remediation Project. The data is broken down into units as described below.

	<u>Unit of Measure</u>
Total dissolved solids (180)	mg/l
Total dissolved solids (calc)	mg/l
Total alkalinity as CaCO ₃	mg/l
Total hardness as CaCO ₃	mg/l
Bicarbonate as HCO ₃	mg/l
Carbonate as CO ₃	mg/l
Chloride	mg/l
Sulfate	mg/l
Calcium	mg/l
Magnesium	mg/l
Potassium	mg/l
Sodium	mg/l

The remainder of the data is measured in ug/l.

GIANT REFINING COMPANY
 ONSITE REMEDIATION PROJECT
 QUARTERLY ANALYTICAL DATA SUMMARY
 SECOND QUARTER, 1994

STRIPPER INFLUENT

	April	May	June
GENERAL WATER CHEMISTRY			
Lab pH (s.u.)	7.40		
Lab conductivity, umhos/cm	3440.00		
Total alkalinity as CaCO ₃	2660.00		
Total hardness as CaCO ₃	990.00		
Carbonate as CO ₃	261.00		
Sulfate	1270.00		
Calcium	305.00		
Magnesium	55.00		
Potassium	2.60		
Sodium	478.00		

HALOCARBONS

Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	0.4		
1,1-Dichloroethene	ND		
1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	0.9		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		

STRIPPER INFLUENT (Continued)

	April	May	June
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	0.3		
Vinyl chloride	ND		

AROMATICS

Benzene	2.1		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	1.2		
Toluene	ND		
Xylenes	2.1		
Trichlorotrifluoroethane	\		

STRIPPER EFFLUENT

April

May

June

GENERAL WATER CHEMISTRY

Lab pH (s.u.)

Lab conductivity, umhos/cm

Total dissolved solids (180)

Total dissolved solids (calc)

Total alkalinity as CaCO₃Total hardness as CaCO₃Bicarbonate as HCO₃Carbonate as CO₃

Hydroxide as OH

Chloride

Sulfate

Calcium

Magnesium

Potassium

Sodium

HALOCARBONS

Bromodichloromethane

ND

Bromoform

ND

Bromomethane

ND

Carbon tetrachloride

ND

Chloroethane

ND

2-Chloroethylvinylether

\

Chloroform

ND

Chloromethane

ND

Dibromochloromethane

ND

1,2-Dichlorobenzene

ND

1,3-Dichlorobenzene

ND

1,4-Dichlorobenzene

ND

1,1-Dichloroethane

ND

1,2-Dichloroethane

ND

1,1-Dichloroethene

ND

1,2-Dichloroethene

ND

trans-1,2-Dichloroethene

ND

cis-1,2-Dichloroethene

ND

1,2-Dichloropropane

ND

cis-1,3-Dichloropropene

ND

trans-1,3-Dichloropropene

ND

Methylene chloride

ND

1,1,2,2-Tetrachloroethane

ND

Tetrachloroethene

ND

STRIPPER EFFLUENT (continued)

	April	May	June
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		

AROMATICS

Benzene	ND		ND
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		ND
Toluene	ND		ND
Xylenes	ND		ND
Trichlorotrifluoroethane	\		

PAH

Naphthalene	ND		
Acenaphthylene	ND		
Acenaphthene	ND		
Fluorene	ND		
Phenanthrene	ND		
Anthracene	ND		
Fluoranthene	ND		
Pyrene	ND		
Benzo(A)Anthracene	ND		
Chrysene	ND		
Benzo(B)Fluoranthene	ND		
Benzo(K)Fluoranthene	ND		
Benzo(A)Pyrene	ND		
Dibenzo(a,h)Anthracene	ND		
Benzo(g,h,i)Perylene	ND		
Indeno(1,2,3-CD)Pyrene	ND		
1-Methylnaphthalene	ND		
2-Methylnaphthalene	ND		

April

May

June

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
Chloroethane	ND
2-Chloroethylvinylether	\
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

GBR-31 (Continued)

	April	May	June
--	-------	-----	------

AROMATICS

Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-10

April

May

June

HALOCARBONS

Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		

SHS-10 (Continued)

April

May

June

AROMATICS

Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-12

	April	May	June
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		

SHS-12 (Continued)

	April	May	June
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-13

	April	May	June
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	0.8		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		

SHS-13 (Continued)

	April	May	June
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-16

April May June

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	\
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

SHS-16 (Continued)

	April	May	June
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-17

	April	May	June
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		

SHS-17 (Continued)

	April	May	June
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

Giant, Bloomfield: April 7, 1994 Water Levels

Well #	Wellhead Elevation (ft. AMSL)	Depth to Water (feet)	Depth to Product (feet)	Product Thickness (feet)	Adjusted WSEL* (ft. AMSL)
GRW-1	5394.30	61.65			5332.65
GRW-2	5391.28	50.95			5340.33
GRW-3	5388.77	52.45			5336.32
GRW-4	5390.02	42.96			5347.06
GRW-5	5390.56	62.30			5328.26
GRW-6	5390.81	43.95			5346.86
GRW-9	5395.70	59.51			5336.19
GRW-10	5395.02	55.20	52.76	2.44	5341.78
GRW-11	5397.85	61.31			5336.54
GRW-12	5397.24	43.64			5353.60
GRW-13	5396.90	56.90			5340.00
GBR-5	5395.07	33.60	32.20	1.40	5362.59
GBR-7	5395.85	34.34	33.68	0.66	5362.04
GBR-8	5390.50	43.64	42.75	0.89	5347.57
GBR-9	5389.92	42.96			5346.96
GBR-10	5390.57	42.23			5348.34
GBR-11	5389.43	42.39	42.09	0.30	5347.28
GBR-13	5393.04	41.58			5351.46
GBR-15	5397.99	42.50			5355.49
GBR-17	5402.69	NM			NM
GBR-18	5421.68	27.88			5393.80
GBR-19	5393.83	40.51	39.93	0.58	5353.79
GBR-20	5393.47	42.20	41.73	0.47	5351.65
GBR-21S	5400.65	19.54			5381.11
GBR-21D	5400.19	37.78			5362.41
GBR-22	5395.91	36.65	36.00	0.65	5359.78
GBR-23	5403.72	21.95			5381.77
GBR-24S	5396.08	24.49			5371.59
GBR-24D	5396.77	30.51			5366.26
GBR-25	5396.72	31.01			5365.71
GBR-26	5395.59	35.85			5359.74
GBR-30	5396.58	31.40			5365.18
GBR-31	5394.86	37.87			5356.99
GBR-33	5396.28	38.42			5357.86
GBR-34	5394.00	36.55	35.74	0.81	5358.10
GBR-35	5393.66	35.94	35.86	0.08	5357.78
GBR-39	5397.55	Dry			Dry
GBR-40	5400.76	31.50			5369.26
GBR-41	5396.35	27.87			5368.48
GBR-51	5389.68	41.25			5348.43
GBR-52	5387.74	39.62			5348.12

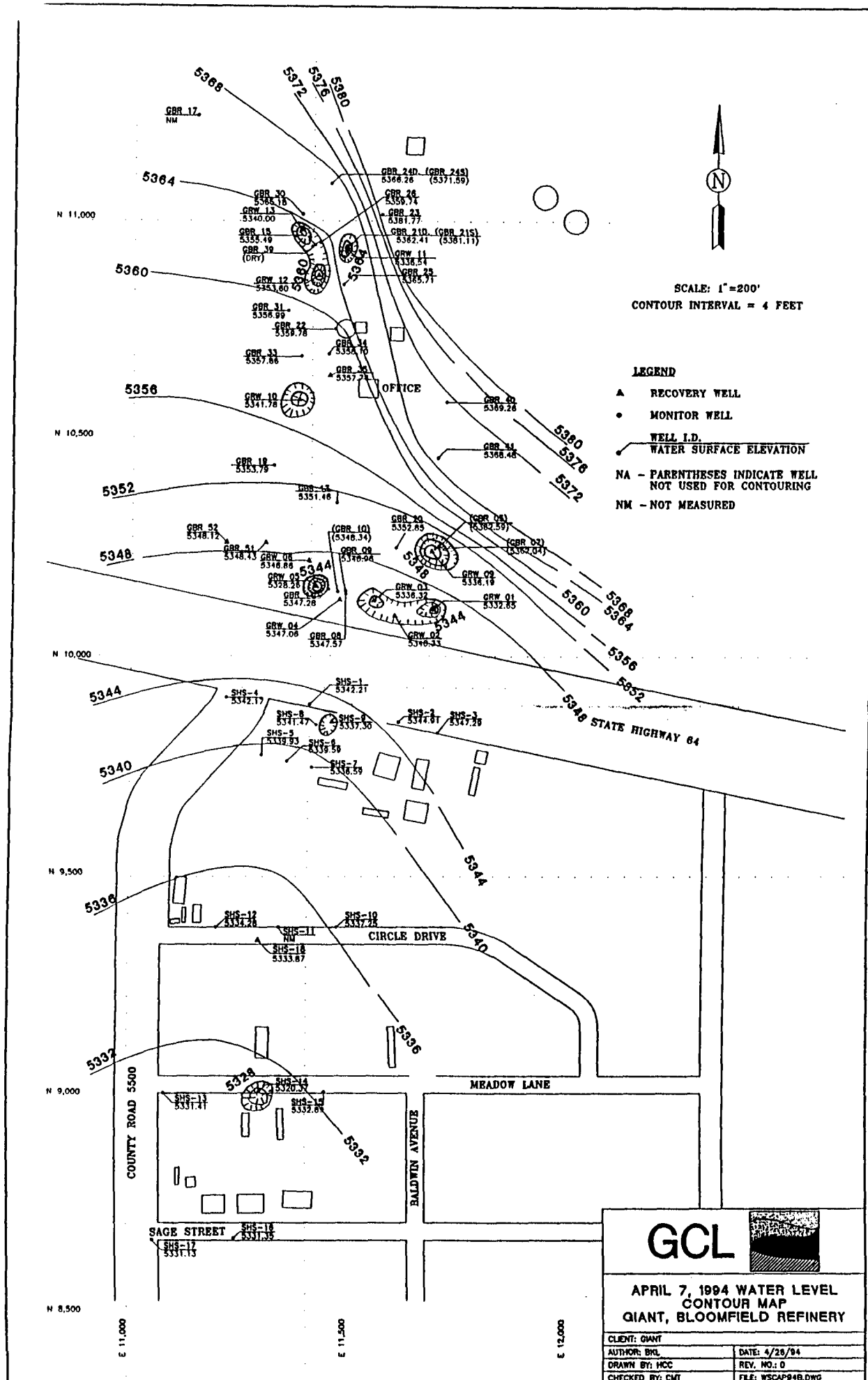
Giant, Bloomfield: April 7, 1994 Water Levels

Well #	Wellhead Elevation (ft. AMSL)	Depth to Water (feet)	Depth to Product (feet)	Product Thickness (feet)	Adjusted WSEL* (ft. AMSL)
SHS-1	5383.54	41.34	41.33	0.01	5342.21
SHS-2	5381.66	36.75			5344.91
SHS-3	5383.33	36.04			5347.29
SHS-4	5383.62	41.45			5342.17
SHS-5	5378.36	38.43			5339.93
SHS-6	5378.17	38.58			5339.59
SHS-7	5375.89	39.30			5336.59
SHS-8	5380.25	38.78			5341.47
SHS-9	5380.79	43.49			5337.30
SHS-10	5373.80	36.55			5337.25
SHS-12	5373.94	39.66			5334.28
SHS-13	5367.81	36.40			5331.41
SHS-14	5367.07	46.70			5320.37
SHS-15	5366.21	33.32			5332.89
SHS-16	5362.58	31.23			5331.35
SHS-17	5364.35	33.22			5331.13
SHS-18	5373.64	39.77			5333.87

NM = Not Measured

*WSEL = Water Surface Elevation adjusted for product depth.

Note: 0.803 = the specific gravity used for adjusted product depth.



Giant Refining Co. Bloomfield Refinery
Quarterly Net Tank
Volume Change

Second Quarter, 1994

Tank Number	Beginning Volume	Ending Volume	Net Change
102	12,678	9,438	3,240
106	8,010	8,010	0
21	54,064	68,676	(14,612)
22	74,439	74,439	0
Total Net Volume Change			(11,372)

Giant Refining Co. Bloomfield Refinery
Quarterly Recovery Well
Volume Tabulation

Second Quarter, 1994

Well	Month #1	Month #2	Month #3	Total
GRW-1	7,050	6,580	8,100	21,730
GRW-2	9,760	12,050	13,530	35,340
GRW-3	11,990	11,580	14,210	37,780
GRW-4	30	7,770	30,210	38,010
GRW-5	49,240	47,010	41,080	137,330
GRW-6	39,250	46,960	77,990	164,200
GRW-9	5,500	5,190	8,320	19,010
GRW-10	301,190	294,990	341,750	937,930
GRW-11	26,330	29,190	34,830	90,350
GRW-12	28,550	42,540	45,940	117,030
GRW-13	24,910	25,040	24,380	74,330
SHS-7	0	5	129	134
SHS-9	14,303	10,823	12,312	37,438
SHS-14	176,623	168,673	219,802	565,098
SHS-18	14,600	17,654	9,821	42,075
Total Volume Pumped In Gallons				2,317,785

Giant Refining Co. Bloomfield Refinery
Total Volume Summary

Second Quarter, 1994

=====

Total Volume Of Water Recovered	2,317,785
Net Change In Storage Volume	(11,372)

Total Water Pumped To The Infiltration Gallery	1,680,919
---	-----------

=====

Difference	(625,494)
------------	-----------

Comments: The approximately 37% difference
is due to meter failure.

SECTION 5

RW-9

1994

	3-Apr	15-Apr	31-May	10-Jun	21-Jun
Laboratory Conductivity, umoh/cm	3520	3620	3640		
Laboratory pH (s.u.)	6.8	7.2	6.9	7.1	7.3
Ammonia		0.8	<.1	0.08	<.05
Nitrate Nitrogen		<.01	0.09	0.06	<.05
Nitrite Nitrogen			<.1		
Dissolved Oxygen	4.4	6.7	7.1	4.3	3.5
Potassium			0.1		
Total Organic Carbon (TOC)		4.9	3.6	1	6.9
Total Iron		0.47	1	0.97	1
Total Manganese		0.85	0.94		
Total Petroleum Hydrocarbons		ND	ND	ND	ND
Ortho-Phosphate		<.01	<.01	<.01	<.01

BTEX

Benzene	ND	ND	1	2
Toluene	0.8	ND	1.4	ND
Ethylbenzene	ND	ND	ND	3
m,p-Xylenes	0.5	ND	1.1	2.6
o-Xylene	1.6	ND	ND	ND

	3-Apr	31-May	10-Jun	21-Jun
Laboratory Conductivity, umoh/cm		2950		
Laboratory pH (s.u.)		7.0	7.3	7.4
Ammonia		<.1	<.01	<.05
Nitrate Nitrogen		0.15	<.05	<.05
Nitrite Nitrogen		<.01		
Dissolved Oxygen		7.1	5.3	3.4
Potassium		0.03		
Total Organic Carbon (TOC)		9.7	2.5	16.9
Total Iron		13.2	13.2	14
Total Manganese		1.58		
Total Petroleum Hydrocarbons		52	42	37
Ortho-Phosphate		<.01	<.01	<.01

BTEX

Benzene		117	170	170
Toluene		5.8	ND	ND
Ethylbenzene		541	480	380
m,p-Xylenes		886	980	790
o-Xylene		ND	ND	ND

	3-Apr	15-Apr	31-May	10-Jun	21-Jun
Laboratory Conductivity, umoh/cm	3080	3300	3520		
Laboratory pH (s.u.)	7.3	7.1	7.1	7.2	7.3
Ammonia		0.9	<.1	0.35	<.05
Nitrate Nitrogen		0.09	0.12	<.05	<.05
Nitrite Nitrogen			<.1		
Dissolved Oxygen	2.7	1.5	7.1	0.7	2.9
Potassium			<.01		
Total Organic Carbon (TOC)		20	11.3	6.4	15.1
Total Iron		16.1	15.8	49.9	8.1
Total Manganese		0.55	0.56		
Total Petroleum Hydrocarbons		3	3	4	3
Ortho-Phosphate		0.03	<.01	0.02	<.01

BTEX

Benzene	590	322	337	410
Toluene	24	ND	27.4	18.3
Ethylbenzene	410	718	948	950
m,p-Xylenes	1070	273	227	1040
o-Xylene	47	14.6	16	21.2



P.O. Box 256
Farmington, New Mexico
87499

505
632-3306

May 9, 1994

Mr. William Olson
Hydrogeologist
New Mexico Oil Conservation Division
Environmental Bureau
P. O. Box 2088
Santa Fe, NM 87504-2088

Dear Mr. Olson:

Enclosed you will find the quarterly report for Giant Refining Company's Bloomfield Refinery for the first quarter of 1994.

Please contact me if you have any questions.

Sincerely,

Tim Kinney
Remediation Project Manager

/dm

Enclosure

cc w/enc.: Carl Shook-Giant
Kim Bullerdick-Giant
Debbie Smith-Giant
Stephanie Odell-BLM
Dale Doremus-EID
Chris Shuey-SWRIC
Valda Terauds-H+GCL
Jim Durrett-SJC
Herbert Gorrod-EPA
Denny Foust-OCD

RECEIVED

MAY 1³ 1994

OIL CONSERVATION DIV.
SANTA FE

QUARTERLY DATA REPORT
GIANT BLOOMFIELD REFINERY
FIRST QUARTER, 1994

RECEIVED

MAY 13 1994

**OIL CONSERVATION DIV.
SANTA FE**

Prepared By:

GIANT REFINING COMPANY
5764 U. S. Highway 64
P. O. Box 256
Farmington, NM 87499
(505)632-3306
FAX (505)632-2487

TABLE OF CONTENTS

Introduction and Summary	Section 1
Quarterly Analytical Results	Section 2
Potentiometric Surface Maps	Section 3
Total Volume History	Section 4
Specific Conductance Tracking	Section 5
Analytical Results/Bioremediation Wells . . .	Section 6

INTRODUCTION AND SUMMARY QUARTERLY REPORT FIRST QUARTER, 1994

INTRODUCTION

No significant changes were made in the first quarter.

SUMMARY

Section 2

Section 2 contains a summary of the quarterly analytical results. Raw data, as received from the laboratory, is available on request as a supplement to the quarterly report.

Section 3

A quarterly potentiometric surface map, as well as the adjusted water surface elevation and product thickness for each well, is included in Section 3.

Section 4

Section 4 illustrates the volume history for the quarter. Total volume pumped from each well, as well as current tank volumes and the reinjection volume, is reported. Additional detail, on a weekly basis, is also available if desired.

Section 5

Specific conductance tracking for GRW-13 is included in this section.

Section 6

Section 6 contains a summary of the quarterly analytical results for the Bioremediation Project. Raw data, as received from the laboratory, is available on request as a supplement to the quarterly report.

SECTION 2

The following pages show the quarterly analytical data for the Giant Refining Remediation Project. The data is broken down into units as described below.

	Unit of <u>Measure</u>
Total dissolved solids (180)	mg/l
Total dissolved solids (calc)	mg/l
Total alkalinity as CaCO ₃	mg/l
Total hardness as CaCO ₃	mg/l
Bicarbonate as HCO ₃	mg/l
Carbonate as CO ₃	mg/l
Chloride	mg/l
Sulfate	mg/l
Calcium	mg/l
Magnesium	mg/l
Potassium	mg/l
Sodium	mg/l

The remainder of the data is measured in ug/l.

GIANT REFINING COMPANY
ONSITE REMEDIATION PROJECT
QUARTERLY ANALYTICAL DATA SUMMARY
FIRST QUARTER, 1994

GENERAL WATER CHEMISTRY

STRIPPER INFLUENT

	January	February	March
Lab pH (s.u.)		6.7	
Lab Conductivity, umhos/cm		3580	
Total Dissolved Solids (180)		2590	
Total Dissolved Solids (calc.)		2550	
Total Alkalinity as CaCO ₃		227	
Total Hardness as CaCO ₃		1010	
Bicarbonate as HCO ₃		277	
Carbonate as CO ₃		0	
Hydroxide as OH		0	
Chloride		437	
Sulfate		1140	
Calcium		287	
Magnesium		72	
Potassium		4.8	
Sodium		472	
Cation/Anion Balance		0.24%	

STRIPPER EFFLUENT

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	6.9		
Lab Conductivity, umhos/cm	3600		
Total Dissolved Solids (180)	2610		
Total Dissolved Solids (calc.)	2550		
Total Alkalinity as CaCO ₃	193		
Total Hardness as CaCO ₃	1030		
Bicarbonate as HCO ₃	235		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	458		
Sulfate	1150		
Calcium	290		
Magnesium	74		
Potassium	5.4		
Sodium	464		
Cation/Anion Balance	0.29%		

GBR-15**GENERAL WATER CHEMISTRY**

	January	February	March
Lab pH (s.u.)	7.4		
Lab Conductivity, umhos/cm	4390		
Total Dissolved Solids (180)	3130		
Total Dissolved Solids (calc.)	3080		
Total Alkalinity as CaCO ₃	341		
Total Hardness as CaCO ₃	1150		
Bicarbonate as HCO ₃	415		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	639		
Sulfate	1200		
Calcium	334		
Magnesium	77		
Potassium	6.6		
Sodium	614		
Cation/Anion Balance	0.09%		

GBR-24D

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	8.0		
Lab Conductivity, umhos/cm	4650		
Total Dissolved Solids (180)	3580		
Total Dissolved Solids (calc.)	3370		
Total Alkalinity as CaCO ₃	216		
Total Hardness as CaCO ₃	1750		
Bicarbonate as HCO ₃	263		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	725		
Sulfate	1420		
Calcium	523		
Magnesium	108		
Potassium	5.9		
Sodium	460		
Cation/Anion Balance	0.72%		

GBR-30

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)		6.8	
Lab Conductivity, umhos/cm		3810	
Total Dissolved Solids (180)		2740	
Total Dissolved Solids (calc.)		2680	
Total Alkalinity as CaCO ₃		227	
Total Hardness as CaCO ₃		1100	
Bicarbonate as HCO ₃		277	
Carbonate as CO ₃		0	
Hydroxide as OH		0	
Chloride		514	
Sulfate		1160	
Calcium		316	
Magnesium		76	
Potassium		6	
Sodium		475	
Cation/Anion Balance		0.36%	

GBR-31

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.4		
Lab Conductivity, umhos/cm	3850		
Total Dissolved Solids (180)	3050		
Total Dissolved Solids (calc.)	2910		
Total Alkalinity as CaCO ₃	278		
Total Hardness as CaCO ₃	1230		
Bicarbonate as HCO ₃	339		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	270		
Sulfate	1560		
Calcium	347		
Magnesium	90		
Potassium	4.8		
Sodium	465		
Cation/Anion Balance	0.78%		

GBR-51

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.3		
Lab Conductivity, umhos/cm	2860		
Total Dissolved Solids (180)	2350		
Total Dissolved Solids (calc.)	2270		
Total Alkalinity as CaCO ₃	238		
Total Hardness as CaCO ₃	1060		
Bicarbonate as HCO ₃	291		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	71		
Sulfate	1360		
Calcium	309		
Magnesium	70		
Potassium	2.8		
Sodium	316		
Cation/Anion Balance	0.05%		

GBR-52

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.3		
Lab Conductivity, umhos/cm	3090		
Total Dissolved Solids (180)	2700		
Total Dissolved Solids (calc.)	2630		
Total Alkalinity as CaCO ₃	216		
Total Hardness as CaCO ₃	1340		
Bicarbonate as HCO ₃	263		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	41		
Sulfate	1660		
Calcium	403		
Magnesium	82		
Potassium	2.7		
Sodium	314		
Cation/Anion Balance	0.81%		

GIANT REFINING COMPANY
 ONSITE REMEDIATION PROJECT
 QUARTERLY ANALYTICAL DATA SUMMARY
 FIRST QUARTER, 1994

STRIPPER INFLUENT

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,1-Dichloroethene	ND		
1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	0.3		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	4.3		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	3.3		
Toluene	ND		
Xylenes	4.8		
Trichlorotrifluoroethane	\		

SYSTEM EFFLUENT

January February March

METALS

Silver	ND		
Arsenic	ND		
Beryllium	ND		
Cadmium	ND		
Chromium	ND		
Copper	ND		
Mercury	ND		
Nickel	0.058		
Lead	ND		
Antimony	ND		
Selenium	ND		
Thallium	ND		
Zinc	ND		

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
2-Chloroethylvinylether	\
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,1-Dichloroethene	ND
1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

STRIPPER EFFLUENT (continued)

	January	February	March
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		
PAH			
Naphthalene	ND		
Acenaphthylene	ND		
Acenaphthene	ND		
Fluorene	ND		
Phenanthrene	ND		
Anthracene	ND		
Fluoranthene	ND		
Pyrene	ND		
Benzo(A)Anthracene	ND		
Chrysene	ND		
Benzo(B)Fluoranthene	ND		
Benzo(K)Fluoranthene	ND		
Benzo(A)Pyrene	ND		
Dibenzo(a,h)Anthracene	ND		
Benzo(g,h,i)Perylene	ND		
Indeno(1,2,3-CD)Pyrene	ND		
1-Methylnaphthalene	ND		
2-Methylnaphthalene	ND		
Benzene	ND		ND
Toluene	ND		ND
Ethylbenzene	ND		ND
Xylenes	ND		ND

GBR-15

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane		12	
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene		1.9	
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes		2.2	
Trichlorotrifluoroethane	\		

GBR-24D

January February March

HALOCARBONS

Bromodichloromethane	ND	
Bromoform	ND	
Bromomethane	ND	
Carbon tetrachloride	ND	
Chloroethane	ND	
Chloroethane	ND	
2-Chloroethylvinylether	\	
Chloroform	ND	
Chloromethane	ND	
Dibromochloromethane	ND	
1,2-Dichlorobenzene	ND	
1,3-Dichlorobenzene	ND	
1,4-Dichlorobenzene	ND	
1,1-Dichloroethane	ND	
1,2-Dichloroethane		23
1,2-Dichloroethene	ND	
cis-1,2-Dic anthracene	ND	
trans-1,2-Dichloroethene	ND	
1,2-Dichloropropane	ND	
cis-1,3-Dichloropropene	ND	
trans-1,3-Dichloropropene	ND	
Methylene chloride	ND	
1,1,2,2-Tetrachloroethane	ND	
Tetrachloroethene	ND	
1,1,1-Trichloroethane	ND	
1,1,2-Trichloroethane	ND	
Trichloroethene	ND	
Trichlorofluoromethane	ND	
Vinyl chloride	ND	

AROMATICS

Benzene		3.9
Chlorobenzene	ND	
1,2-Dichlorobenzene	ND	
1,3-Dichlorobenzene	ND	
1,4-Dichlorobenzene	ND	
Ethylbenzene		3.3
Toluene	ND	
Xylenes		1.7
Trichlorotrifluoroethane	\	

GBR-24D (Continued)

	January	February	March
PAH			
Naphthalene	ND		
Acenaphthylene	ND		
Acenaphthene	ND		
Fluorene		1.4	
Phenanthrene		0.1	
Anthracene	ND		
Fluoranthene	ND		
Pyrene	ND		
Benzo(A)Anthracene	ND		
Chrysene	ND		
Benzo(B)Fluoranthene	ND		
Benzo(K)Fluoranthene	ND		
Benzo(A)Pyrene	ND		
Dibenzo(a,h)Anthracene	ND		
Benzo(g,h,i)Perylene	ND		
Indeno(1,2,3-CD)Pyrene	ND		
1-Methylnaphthalene	ND		
2-Methylnaphthalene	ND		

GBR-30

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dic anthracene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes		0.9	
Trichlorotrifluoroethane	\		

GBR-30 (Continued)

	January	February	March
PAH			
Naphthalene	ND		
Acenaphthylene	ND		
Acenaphthene	ND		
Fluorene	ND		
Phenanthrene	ND		
Anthracene	ND		
Fluoranthene	ND		
Pyrene	ND		
Benzo(A)Anthracene	ND		
Chrysene	ND		
Benzo(B)Fluoranthene	ND		
Benzo(K)Fluoranthene	ND		
Benzo(A)Pyrene	ND		
Dibenzo(a,h)Anthracene	ND		
Benzo(g,h,i)Perylene	ND		
Indeno(1,2,3-CD)Pyrene	ND		
1-Methylnaphthalene	ND		
2-Methylnaphthalene	ND		

GBR-31

January February March

HALOCARBONS

Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane		0.7	
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene		41	
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene		2.4	
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene		1.7	
Trichlorofluoromethane	ND		
Vinyl chloride	ND		

AROMATICS

Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

GBR-31 (Continued)

	January	February	March
PAH			
Naphthalene	ND		
Acenaphthylene	ND		
Acenaphthene	ND		
Fluorene	ND		
Phenanthrene	ND		
Anthracene	ND		
Fluoranthene	ND		
Pyrene	ND		
Benzo(A)Anthracene	ND		
Chrysene	ND		
Benzo(B)Fluoranthene	ND		
Benzo(K)Fluoranthene	ND		
Benzo(A)Pyrene	ND		
Dibenzo(a,h)Anthracene	ND		
Benzo(g,h,i)Perylene	ND		
Indeno(1,2,3-CD)Pyrene	ND		
1-Methylnaphthalene	ND		
2-Methylnaphthalene	ND		

GBR-51

January February March

HALOCARBONS

Bromodichloromethane	ND
Bromoform	ND
Bromomethane	ND
Carbon tetrachloride	ND
Chloroethane	ND
Chloroethane	ND
2-Chloroethylvinylether	\
Chloroform	ND
Chloromethane	ND
Dibromochloromethane	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
1,1-Dichloroethane	ND
1,2-Dichloroethane	ND
1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
1,2-Dichloropropane	ND
cis-1,3-Dichloropropene	ND
trans-1,3-Dichloropropene	ND
Methylene chloride	ND
1,1,2,2-Tetrachloroethane	ND
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
1,1,2-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Vinyl chloride	ND

AROMATICS

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Trichlorotrifluoroethane	\

GBR-52

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

OFFSITE WELLS
ANALYTICAL RESULTS

GENERAL WATER CHEMISTRY

SHS-3

	January	February	March
Lab pH (s.u.)		6.9	
Lab Conductivity, umhos/cm		4560	
Total Dissolved Solids (180)		3900	
Total Dissolved Solids (calc.)		3680	
Total Alkalinity as CaCO ₃		204	
Total Hardness as CaCO ₃		1910	
Bicarbonate as HCO ₃		249	
Carbonate as CO ₃		0	
Hydroxide as OH		0	
Chloride		365	
Sulfate		2070	
Calcium		546	
Magnesium		133	
Potassium		8.4	
Sodium		435	
Cation/Anion Balance		0.10%	

SHS-4

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.5		
Lab Conductivity, umhos/cm	3110		
Total Dissolved Solids (180)	2600		
Total Dissolved Solids (calc.)	2650		
Total Alkalinity as CaCO ₃	214		
Total Hardness as CaCO ₃	1340		
Bicarbonate as HCO ₃	261		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	41		
Sulfate	1680		
Calcium	392		
Magnesium	88		
Potassium	4.6		
Sodium	312		
Cation/Anion Balance	0.09%		

SHS-6**GENERAL WATER CHEMISTRY**

	January	February	March
Lab pH (s.u.)	7.1		
Lab Conductivity, umhos/cm	2910		
Total Dissolved Solids (180)	2360		
Total Dissolved Solids (calc.)	2240		
Total Alkalinity as CaCO ₃	272		
Total Hardness as CaCO ₃	1030		
Bicarbonate as HCO ₃	332		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	70		
Sulfate	1320		
Calcium	288		
Magnesium	75		
Potassium	4		
Sodium	325		
Cation/Anion Balance	0.08%		

SHS-7

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.3		
Lab Conductivity, umhos/cm	3530		
Total Dissolved Solids (180)	2300		
Total Dissolved Solids (calc.)	2270		
Total Alkalinity as CaCO ₃	874		
Total Hardness as CaCO ₃	741		
Bicarbonate as HCO ₃	1070		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	428		
Sulfate	467		
Calcium	215		
Magnesium	50		
Potassium	3.3		
Sodium	578		
Cation/Anion Balance	0.95%		

SHS-9

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.3		
Lab Conductivity, umhos/cm	3210		
Total Dissolved Solids (180)	1840		
Total Dissolved Solids (calc.)	1880		
Total Alkalinity as CaCO ₃	1000		
Total Hardness as CaCO ₃	622		
Bicarbonate as HCO ₃	1230		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	493		
Sulfate	40		
Calcium	179		
Magnesium	42		
Potassium	3.4		
Sodium	517		
Cation/Anion Balance	0.29%		

SHS-10

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.1		
Lab Conductivity, umhos/cm	2660		
Total Dissolved Solids (180)	2060		
Total Dissolved Solids (calc.)	1940		
Total Alkalinity as CaCO ₃	295		
Total Hardness as CaCO ₃	886		
Bicarbonate as HCO ₃	360		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	85		
Sulfate	1070		
Calcium	226		
Magnesium	79		
Potassium	9.8		
Sodium	289		
Cation/Anion Balance	0.07%		

SHS-12

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)		7.3	
Lab Conductivity, umhos/cm		3600	
Total Dissolved Solids (180)		2470	
Total Dissolved Solids (calc.)		2400	
Total Alkalinity as CaCO ₃		573	
Total Hardness as CaCO ₃		859	
Bicarbonate as HCO ₃		699	
Carbonate as CO ₃		0	
Hydroxide as OH		0	
Chloride		448	
Sulfate		787	
Calcium		245	
Magnesium		60	
Potassium		3.5	
Sodium		512	
Cation/Anion Balance		1.18%	

SHS-13

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.5		
Lab Conductivity, umhos/cm	3840		
Total Dissolved Solids (180)	2550		
Total Dissolved Solids (calc.)	2550		
Total Alkalinity as CaCO ₃	767		
Total Hardness as CaCO ₃	1020		
Bicarbonate as HCO ₃	935		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	483		
Sulfate	718		
Calcium	306		
Magnesium	62		
Potassium	3.8		
Sodium	523		
Cation/Anion Balance	0.83%		

SHS-14

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)		7.5	
Lab Conductivity, umhos/cm		2360	
Total Dissolved Solids (180)		1950	
Total Dissolved Solids (calc.)		1820	
Total Alkalinity as CaCO ₃		284	
Total Hardness as CaCO ₃		1040	
Bicarbonate as HCO ₃		346	
Carbonate as CO ₃		0	
Hydroxide as OH		0	
Chloride		37	
Sulfate		1060	
Calcium		299	
Magnesium		71	
Potassium		5.4	
Sodium		182	
Cation/Anion Balance		0.07%	

SHS-15

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)		7.5	
Lab Conductivity, umhos/cm		2200	
Total Dissolved Solids (180)		1800	
Total Dissolved Solids (calc.)		1710	
Total Alkalinity as CaCO ₃		233	
Total Hardness as CaCO ₃		999	
Bicarbonate as HCO ₃		284	
Carbonate as CO ₃		0	
Hydroxide as OH		0	
Chloride		43	
Sulfate		998	
Calcium		303	
Magnesium		59	
Potassium		3.8	
Sodium		162	
Cation/Anion Balance		0.85%	

SHS-16

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)		7.4	
Lab Conductivity, umhos/cm		2670	
Total Dissolved Solids (180)		2300	
Total Dissolved Solids (calc.)		2150	
Total Alkalinity as CaCO ₃		278	
Total Hardness as CaCO ₃		1220	
Bicarbonate as HCO ₃		339	
Carbonate as CO ₃		0	
Hydroxide as OH		0	
Chloride		42	
Sulfate		1300	
Calcium		365	
Magnesium		76	
Potassium		4.3	
Sodium		199	
Cation/Anion Balance		0.76%	

SHS-17

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.5		
Lab Conductivity, umhos/cm	3450		
Total Dissolved Solids (180)	2850		
Total Dissolved Solids (calc.)	2720		
Total Alkalinity as CaCO ₃	284		
Total Hardness as CaCO ₃	1260		
Bicarbonate as HCO ₃	347		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	145		
Sulfate	1550		
Calcium	367		
Magnesium	84		
Potassium	5.4		
Sodium	398		
Cation/Anion Balance	0.69%		

SHS-18

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)	7.1		
Lab Conductivity, umhos/cm	3410		
Total Dissolved Solids (180)	2190		
Total Dissolved Solids (calc.)	2150		
Total Alkalinity as CaCO ₃	765		
Total Hardness as CaCO ₃	720		
Bicarbonate as HCO ₃	933		
Carbonate as CO ₃	0		
Hydroxide as OH	0		
Chloride	470		
Sulfate	416		
Calcium	209		
Magnesium	48		
Potassium	3.6		
Sodium	541		
Cation/Anion Balance	1.06%		

OFFSITE WELLS

SHS-3

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-4

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-6

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-7

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene		3.8	
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes		1	
Trichlorotrifluoroethane	\		

SHS-9

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene		1.2	
Toluene	ND		
Xylenes		0.9	
Trichlorotrifluoroethane	\		

SHS-10

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene		5.6	
Toluene	ND		
Xylenes		1.1	
Trichlorotrifluoroethane	\		

SHS-12

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-14

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-13

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane		2.1	
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-15

January February March

HALOCARBONS

Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform		0.7	
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		

AROMATICS

Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

SHS-16

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	ND		

SHS-17

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	ND		

SHS-18

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,2-Dichloroethene	ND		
cis-1,2-Dichloroethene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane		0.6	
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene		2.7	
Toluene	ND		
Xylenes		10	
Trichlorotrifluoroethane	\		

*NOTE: ND=None Detected

\=Not Tested For

GIANT REFINING BLOOMFIELD REFINERY
QUARTERLY POTENTIOMETRIC SURFACE

JANUARY, 1994

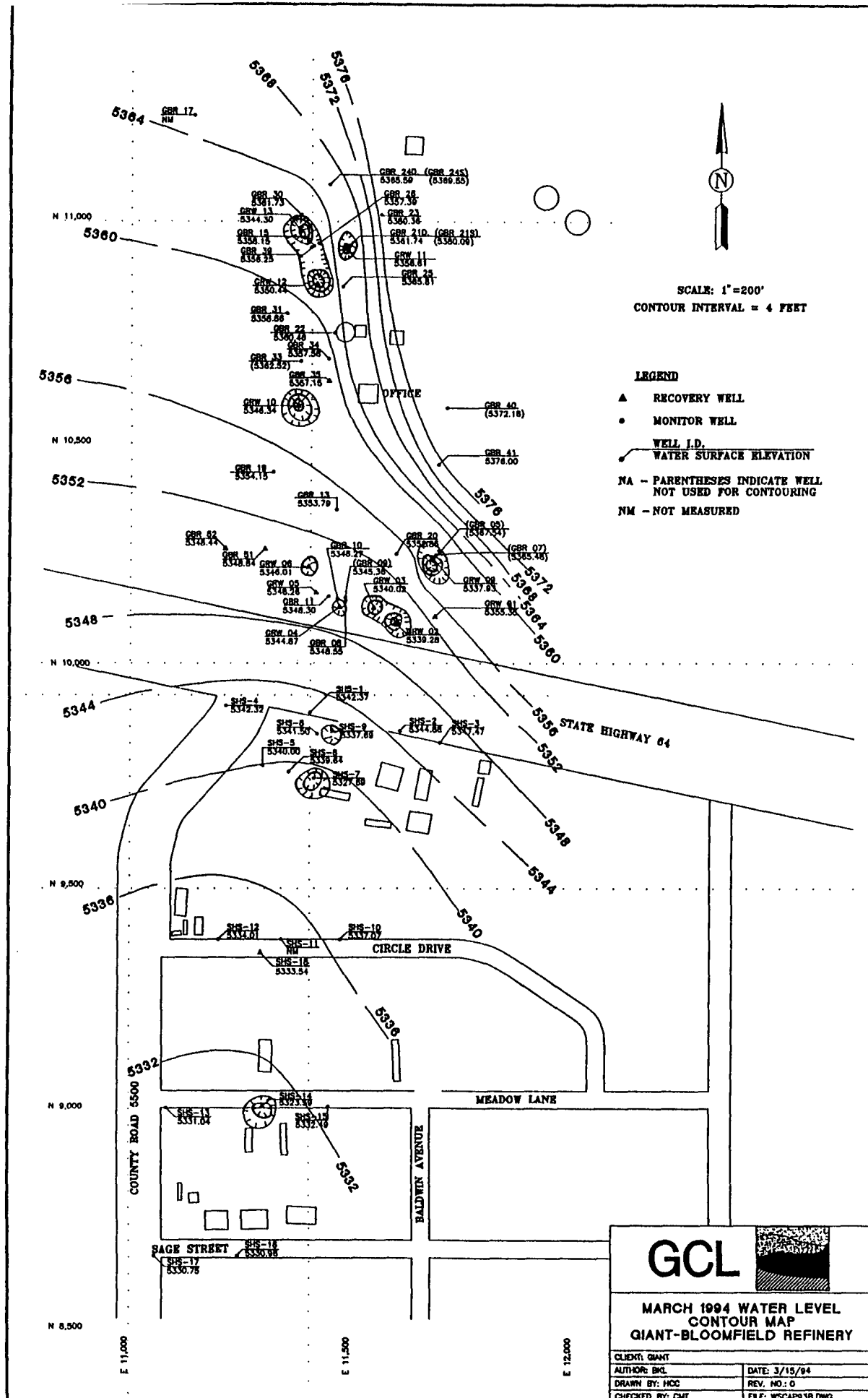
WELL #	WELLHEAD ELEVATION IN FEET	DEPTH TO WATER IN FEET	DEPTH TO PRODUCT IN FEET	PRODUCT THICKNESS IN FEET	ADJUSTED WSEL* IN FEET
GRW-1	5394.30	38.95	38.95	0.00	5355.35
GRW-2	5391.28	52.00	52.00	0.00	5339.28
GRW-3	5388.77	48.75	48.75	0.00	5340.02
GRW-4	5390.02	45.15	45.15	0.00	5344.87
GRW-5	5390.56	42.30	42.30	0.00	5348.26
GRW-6	5390.81	44.80	44.80	0.00	5346.01
GRW-10	5395.02	51.05	48.10	2.95	5346.33
GRW-11	5397.85	41.24	41.24	0.00	5356.61
GRW-12	5397.24	46.80	46.80	0.00	5350.44
GRW-13	5396.90	52.60	52.60	0.00	5344.30
GBR-5	5395.07	28.55	27.28	1.27	5367.54
GBR-6	5395.70	57.77	57.77	0.00	5337.93
GBR-7	5395.85	30.64	30.30	0.34	5365.48
GBR-8	5390.50	41.98	41.94	0.04	5348.55
GBR-9	5389.92	44.56	44.56	0.00	5345.36
GBR-10	5390.57	42.30	42.30	0.00	5348.27
GBR-11	5389.43	41.23	41.10	0.13	5348.30
GBR-13	5393.04	39.25	39.25	0.00	5353.79
GBR-15	5397.99	39.84	39.84	0.00	5358.15
GBR-18	5421.68	27.66	27.66	0.00	5394.02
GBR-19	5393.83	39.68	39.68	0.00	5354.15
GBR-20	5393.47	42.70	40.14	2.56	5352.82
GBR-21S	5400.65	20.56	20.56	0.00	5380.09
GBR-21D	5400.19	38.45	38.45	0.00	5361.74
GBR-22	5395.91	36.45	35.20	1.25	5360.46
GBR-23	5403.72	23.36	23.36	0.00	5377.19
GBR-24S	5396.08	26.53	26.53	0.00	5364.90
GBR-24D	5396.77	31.18	31.18	0.00	5365.59
GBR-25	5396.72	30.91	30.91	0.00	5365.81
GBR-26	5395.59	38.20	38.20	0.00	5357.39
GBR-30	5396.58	34.85	34.85	0.00	5361.73
GBR-31	5394.86	36.00	36.00	0.00	5358.86
GBR-33	5396.28	33.79	33.75	0.04	5362.52
GBR-34	5394.00	37.74	36.10	1.64	5357.57
GBR-35	5393.66	38.20	36.10	2.10	5357.14
GBR-39	5397.55	41.30	41.30	0.00	5356.25
GBR-40	5400.76	28.58	28.58	0.00	5372.18
GBR-41	5396.35	20.35	20.35	0.00	5376.00
GBR-51	5389.68	40.84	40.84	0.00	5348.84
GBR-52	5387.74	39.30	39.30	0.00	5348.44

* WSEL - WATER SURFACE ELEVATION ADJUSTED FOR PRODUCT DEPTH

GIANT REFINING BLOOMFIELD REFINERY
 QUARTERLY POTENTIOMETRIC SURFACE
 JANUARY, 1994
 Page 2

WELL #	WELLHEAD ELEVATION IN FEET	DEPTH TO WATER IN FEET	DEPTH TO PRODUCT IN FEET	PRODUCT THICKNESS IN FEET	ADJUSTED WSEL* IN FEET
SHS-1	5383.54	41.23	41.16	0.07	5342.37
SHS-2	5381.66	36.78	36.78	0.00	5344.88
SHS-3	5383.33	35.86	35.86	0.00	5347.47
SHS-4	5383.62	41.30	41.30	0.00	5342.32
SHS-5	5378.36	38.36	38.36	0.00	5340.00
SHS-6	5378.17	38.53	38.53	0.00	5339.64
SHS-7	5375.89	48.20	48.20	0.00	5327.69
SHS-8	5380.25	38.75	38.75	0.00	5341.50
SHS-9	5380.79	43.10	43.10	0.00	5337.69
SHS-10	5373.80	36.73	36.73	0.00	5337.07
SHS-12	5373.94	39.93	39.93	0.00	5334.01
SHS-13	5367.81	36.77	36.77	0.00	5331.04
SHS-14	5367.07	43.81	43.40	0.41	5323.59
SHS-15	5366.21	33.72	33.72	0.00	5332.49
SHS-16	5362.58	31.60	31.60	0.00	5330.98
SHS-17	5364.35	33.60	33.60	0.00	5330.75
SHS-18	5373.64	40.10	40.10	0.00	5333.54

* WSEL - WATER SURFACE ELEVATION ADJUSTED FOR PRODUCT DEPTH



Giant Refining Co. Bloomfield Refinery
Quarterly Net Tank
Volume Change

First Quarter, 1994

Tank Number	Beginning Volume	Ending Volume	Net Change
102	15,777	12,678	(3,099)
106	8,010	8,010	0
21	61,370	54,064	(7,306)
22	250,887	74,439	(176,448)
Total Net Volume Change			(186,853)

Giant Refining Co. Bloomfield Refinery
Quarterly Recovery Well
Volume Tabulation

First Quarter, 1994

Well	Month #1	Month #2	Month #3	Total
GRW-1	0	1,940	9,420	11,360
GRW-2	11,110	4,040	13,630	28,780
GRW-3	2,750	11,500	14,860	29,110
GRW-4	20,640	33,790	1,790	56,220
GRW-5	29,720	51,300	58,850	139,870
GRW-6	16,150	19,590	36,260	72,000
GRW-9	8,760	7,450	7,560	23,770
GRW-10	208,610	292,960	405,860	907,430
GRW-11	12,210	0	23,470	35,680
GRW-12	3,740	0	11,010	14,750
GRW-13	18,150	28,700	31,200	78,050
SHS-7	210	173	9	392
SHS-9	9,976	13,071	14,294	37,341
SHS-14	99,065	145,136	201,087	445,288
SHS-18	7,534	8,323	23,091	38,948
Total Volume Pumped In Gallons				1,918,989

Giant Refining Co. Bloomfield Refinery
Total Volume Summary

First Quarter, 1994

=====

Total Volume Of Water Recovered	2,110,327
Net Change In Storage Volume	(186,853)

Total Water Pumped To The Infiltration Gallery	1,918,989
---	-----------

=====

Difference	(4,485)
------------	---------

Comments: The approximately .2% difference
is due to meter inaccuracy.

GIANT REFINING COMPANY
SPECIFIC CONDUCTANCE TRACKING
FIRST QUARTER, 1994

RW-13

GENERAL WATER CHEMISTRY

	January	February	March
Lab pH (s.u.)		7.1	
Lab Conductivity, umhos/cm		4330	
Total Dissolved Solids (180)		3360	
Total Dissolved Solids (calc.)		3330	
Total Alkalinity as CaCO ₃		222	
Total Hardness as CaCO ₃		1230	
Bicarbonate as HCO ₃		271	
Carbonate as CO ₃		0	
Hydroxide as OH		0	
Chloride		435	
Sulfate		1680	
Calcium		351	
Magnesium		85	
Potassium		6.8	
Sodium		639	
Cation/Anion Balance		0.77%	

GRW-13

	January	February	March
HALOCARBONS			
Bromodichloromethane	ND		
Bromoform	ND		
Bromomethane	ND		
Carbon tetrachloride	ND		
Chloroethane	ND		
Chloroethane	ND		
2-Chloroethylvinylether	\		
Chloroform	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane		7.1	
1,2-Dichloroethene	ND		
cis-1,2-Dic anthracene	ND		
trans-1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis-1,3-Dichloropropene	ND		
trans-1,3-Dichloropropene	ND		
Methylene chloride	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl chloride	ND		
AROMATICS			
Benzene	ND		
Chlorobenzene	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Ethylbenzene	ND		
Toluene	ND		
Xylenes	ND		
Trichlorotrifluoroethane	\		

RW-13 (Continued)

	January	February	March
PAH			
Naphthalene	ND		
Acenaphthylene	ND		
Acenaphthene	ND		
Fluorene	ND		
Phenanthrene	ND		
Anthracene	ND		
Fluoranthene	ND		
Pyrene	ND		
Benzo(A)Anthracene	ND		
Chrysene	ND		
Benzo(B)Fluoranthene	ND		
Benzo(K)Fluoranthene	ND		
Benzo(A)Pyrene	ND		
Dibenzo(a,h)Anthracene	ND		
Benzo(g,h,i)Perylene	ND		
Indeno(1,2,3-CD)Pyrene	ND		
1-Methylnaphthalene	ND		
2-Methylnaphthalene	ND		

GIANT REFINING COMPANY
 BIOREMEDIATION PROJECT
 FIRST QUARTER, 1994

RW-9

	January 13	January 25	February 10	February 24
Laboratory Conductivity, umoh/cm		3590	3580	3600
Laboratory pH (s.u.)	7.1	6.9	7.1	7.0
Ammonia	0.11	0.16	0.2	0.32
Nitrate Nitrogen	0.03	ND	ND	0.01
Ortho-Phosphate	ND	ND	0.01	ND
Dissolved Oxygen	4.1	2.4	2.2	1.8
Potassium	5.08	5.08	3.9	3.9
Total Organic Carbon (TOC)	6.8	6.4	5.7	5.3
Total Iron	0.44	1.46	1.3	1.09
Total Manganese	0.95	1.19	1.14	1.04
Total Petroleum Hydrocarbons	0.52	0.52	ND	ND

BTEX

Benzene	6.34	7.33	0.68	1.5
Toluene	ND	ND	ND	0.6
Ethylbenzene	10.4	3.57	0.86	2.5
m,p-Xylenes	6.07	4.47	0.85	2.5
o-Xylene	0.57	ND	ND	0.2

GBR-20

	January 13	January 25	February 10	February 24
Laboratory Conductivity, umoh/cm		2910		
Laboratory pH (s.u.)	7.0	7.0		
Ammonia	0.14	0.14		
Nitrate Nitrogen	0.22	ND		
Ortho-Phosphate	ND	0.01		
Dissolved Oxygen	2.9	2.0	2.2	
Potassium	2.73	1.56		
Total Organic Carbon (TOC)	10.1	12.5		
Total Iron	11.24	16.95		
Total Manganese	0.42	0.29		
Total Petroleum Hydrocarbons	2.39	2.52		

BTEX

Benzene	165	210		
Toluene	ND	ND		
Ethylbenzene	208	415		
m,p-Xylenes	426	880		
o-Xylene	ND	ND		

GBR-41

	January 13	January 25	February 10	February 24
Laboratory Conductivity, umoh/cm		3130	3200	3270
Laboratory pH (s.u.)	7.1	7.1	7.3	7.1
Ammonia	0.28	0.19	0.62	0.61
Nitrate Nitrogen	ND	ND	0.06	ND
Ortho-Phosphate	0.02	0.01	0.02	ND
Dissolved Oxygen	1.5	1.7	1.8	1.5
Potassium	2.73	1.95	2.3	1.5
Total Organic Carbon (TOC)	9.4	13	13.2	16.9
Total Iron	8.18	10.11	20.3	18.1
Total Manganese	0.56	0.46	0.58	0.52
Total Petroleum Hydrocarbons	2.91	6.3	3.45	4.15

BTEX

Benzene	423	408	370	346
Toluene	ND	ND	ND	3.4
Ethylbenzene	1170	1660	1360	1080
m,p-Xylenes	1200	1280	1430	923
o-Xylene	ND	ND	ND	44.6