GRCC 04

**Price, Wayne**

**From:** Ed Riege [eriege@giant.com]
**Sent:** Thursday, July 01, 2004 4:12 PM
**To:** 'Price, Wayne'
**Subject:** RE: Giant Ciniza water wells

Wayne,
I gave you a bum steer! According to Kinglsey, well #1 is out of service not #2. Well #1 is sealed and capped. Well #3 is the potable well but can also be used as industrial.
Thanks Ed

-----Original Message-----
From: Price, Wayne [mailto:WPrice@state.nm.us]
Sent: Thursday, July 01, 2004 3:40 PM
To: 'Eriege@giant.com'
Cc: Dorinda Manncina (E-mail)
Subject: Giant Ciniza water wells

Dear ED,

I received the information on the plant water wells. Per our telephone conversation well #2 is out of service, while well #1 and 4 are your industrial wells and well #3 id the potable well. Do you know if well #2 has been plugged?

Sincerely:

Wayne Price
New Mexico Oil Conservation Division
1220 S. Saint Francis Drive
Santa Fe, NM 87505
505-476-3487
fax: 505-476-3462
E-mail: WPRICE@state.nm.us

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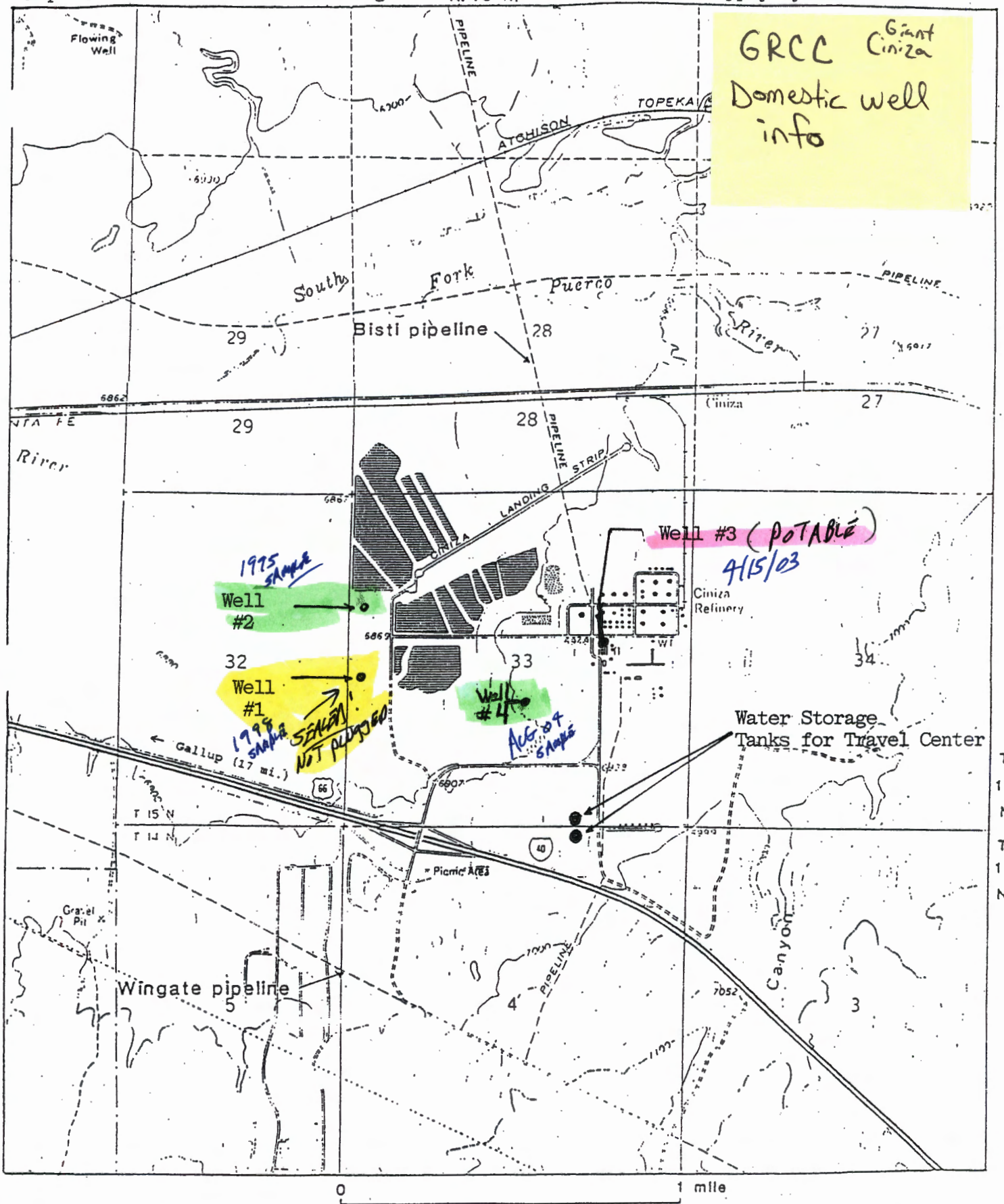
Map #1 Overview of Giant Refining R. 15 W. Domestic Water Supply System




Source: Giant Refining
Date: 1/16/97

Topographic map showing Giant Refining Ciniza Plant.

#1

APPENDIX E

RECEIVED

JUN 3 0 2004

OIL CONSERVATION DIVISION

History of Drilling Water Well No. 1

South Well

Well No. 1 was spudded in on August 27, 1956, by a Franks No. 5000, Rotary Rig owned by the Barron Drilling Company of Farmington, New Mexico. No trouble was encountered at start and a 20" Hughs rock bit was used to the depth of the surface hole. A stratum of sand was struck at 100 feet which was 50 feet in thickness. This stratum contained some surface water but no quantitative test was made. An analysis was run and the water was found to be brackish and contained a total solids equivalent of over 3,000 ppm. The large hole was continued to a depth of 220 feet until it was felt that the alluvium fill was well spent and the hole was well into the Chinle formations. The 16" surface casing was set at that depth and cemented by the Halliburton Company from bottom to top.

The hole was then reduced to a 15" hole, using a Hughs rock bit, and extremely hard drilling was immediately experienced through the mudstone in the stratum and all strata to a depth of 520 feet. At 520 feet, the sandstone encountered resembled the Glorietta and was the first producing aquifer. It became necessary at this point to increase the weight of the mud to 12.0 pounds and the viscosity to 80. This 80 foot aquifer was the most dense and hardest drilling in the various strata in the well. At a depth of 640 feet, another aquifer was struck which gave dilution trouble and the weight of the mud was increased to 13.0 pounds in order to hold the hole. Severe caving was experienced at this depth from the mudstone stratum directly above. From 700 feet to 800 feet, the stratas encountered were varied and contained a large amount of sliding shale which made progress difficult. From 800 feet to 1,030 feet the true Glorietta sandstone was encountered which is believed to be the largest and strongest aquifer in the well. At 820 feet, rig trouble was experienced and 13.0 pound mud did not hold the artesian flow. The well flowed 60 gpm until 15.0 pound mud was mixed in order to hold the pressure. At a depth of 1,020 feet, the Glorietta ran out and extremely hard siltstone was struck.

The U.S.G.S. had reported that in the approximate depth of 1,100 feet in the Yeso formation, a shelf of limestone would be struck. It was decided to continue through the limestone for exploratory purposes. The hole was reduced to a 9" hole at 1,020 feet and the rat-hole was then drilled to a depth of 1,235 feet. A 50 foot stratum of limestone was encountered between 1,095 feet and 1,150 feet which was very dense and hard. It had been anticipated that another aquifer would be struck under the limestone formation, but there was no indication to the depth of 1,235 feet. Drilling was stopped at this depth as it was felt that an adequate quantity of water had been struck.

After Schlumberger ran an electric log on the hole, it was decided to set 12" ID casing to 1,020 feet and plug the hole back to that depth. A Halliburton float shoe was used and the hole was cemented from 1,235 feet to 1,010 feet, or 10 feet from the bottom of the 12" casing. The casing was shot-perforated as shown on the log, 6 shots to the foot, using jet-shots every other foot and bullet-shot every alternate foot. Upon completion of the perforating, the well flowed 110 gpm, and developed 140 pounds shut-in pressure. Smith Machinery Company, Roswell, New Mexico, tested the well with a 6" turbine pump, set at a depth of 600 feet. The results of this test are shown on the test result sheet. The maximum pumping rate at this depth was found to be 240 gpm with a recovery rate of 29 minutes. The pump setting was restricted and due to the fact that the main producing aquifer is found at 800 feet and lower, that this well will produce at least 350 gpm at 900 feet pump setting. This will be accomplished with a submersible pump.

LITHOLOGIC LOG

CINIZA REFINERY

Water Well No. 1

| Material | Thickness (feet) | Depth (feet) |
|---|---|---|
| QUATERNARY: | | |
| ALLUVIUM: | | |
| Not available | 100 | 100 |
| Sand, pale-red (10R 4/2), very fine to medium grains; subangular to rounded; clear and frosted quartz, minor dark minerals and gypsum; weak calcareous cement | 50 | 150 |
| TRIASSIC: | | |
| CHINLE FORMATION: | | |
| Petrified Forest member: | | |
| Mudstone, grayish-red (5R 4/2) mottled with white; minor dark minerals | 10 | 160 |
| Siltstone, pale-red-purple (5RP 6/2); good sorting; dark minerals and mica rare; gypsum abundant | 10 | 170 |
| Sandstone, grayish-red-purple (5RP 4/2) and white, very-fine to medium-grained; poorly sorted; subangular to rounded grains; frosted to clear quartz, minor to abundant dark minerals; calcareous; some mudstone, possibly caved from higher zone | 20 | 190 |
| Siltstone, grayish-red-purple (5RP 4/2) and white; some clay and medium to coarse sand; minor dark minerals | 30 | 220 |
| Mudstone, grayish-purple (5P 4/2) and white; some shaly partings; minor gypsum; noncalcareous | 50 | 270 |
| Mudstone, white to light-gray (N7); some gypsum; non-calcareous | 10 | 280 |
| Mudstone, grayish-red-purple (5RP 4/2) and light-gray (N7); minor gypsum; sandy in lower part, quartz and dark minerals; noncalcareous | 20 | 300 |

| | Thickness (feet) | Depth (feet) |
|---|---|---|
| Sandstone, grayish-red (5R4/2), very-fine- to very-coarse-grained; gravel up to 6 mm across; angular to subangular; pebbles are sandy siltstone; some clay; noncalcareous | 20 | 320 |
| Mudstone, grayish-red (5R 4/2); some silt and sand; minor black minerals and mica; some small gravel, probably from above; calcareous | 10 | 330 |
| Siltstone, grayish-red (5R 4/2); fine to coarse sand and pebbles of sandstone and siltstone common; limonite and dark minerals rare; calcareous | 30 | 360 |
| Siltstone, grayish-red (5R 4/2) and white; very fine to fine frosted grains of quartz sand; dark minerals common, mica rare, secondary calcite abundant | 10 | 370 |
| Siltstone, grayish-red (5R 4/2); limonite and dark minerals rare; gypsum abundant; calcareous | 10 | 380 |
| Conglomerate, grayish-red (5R 4/2) and white, very-fine to fine pebbles of siltstone and sandstone, angular to subrounded; some calcareous material | 10 | 390 |
| Mudstone, grayish-red (5R 4/2); slightly shaly parting; minor limonite; noncalcareous; some gravel | 40 | 430 |
| Mudstone, grayish-red (10R 4/2) to grayish-red-purple mottled with white; minor limonite; calcareous | 10 | 440 |
| Mudstone, grayish-red (10R 4/2) to grayish-red-purple; minor limonite; calcareous; very-fine to fine gravel composed of grayish-red siltstone and sandstone common, more dark minerals in gravel than in 390-400 foot interval | 10 | 450 |
| Mudstone, grayish-red (10R 4/2); gypsum common; calcareous | 30 | 480 |
| Mudstone, grayish-red (10R 4/2) to dark-reddish-brown (10R $\frac{3}{4}$); partly sandy; quartz and dark minerals rare, gypsum abundant; calcareous | 40 | 520 |
| <u>Lower Red member:</u> | | |
| Sandstone, light-gray (N7) to grayish-red-purple (5RP 4/2), very-fine-grained to silty; poorly sorted; abundant quartz and dark minerals, minor limonite; calcareous | 50 | 570 |
| Sandstone, light-gray (N7) to grayish-purple (5P 4/2), very-fine- to coarse-grained; poorly sorted; some very-fine gravel; grains are stained and frosted quartz, minor dark minerals, and siltstone; calcareous; gravel increases in lower part | 30 | 600 |
| Mudstone, grayish-red-purple (5RP 4/2) and white; minor gypsum; some clear to frosted quartz sands and minor dark minerals; calcareous | 10 | 610 |
| Not available | 10 | 620 |
| Mudstone, pale-reddish-brown (10R 5/4) and white; gypsum common; some sand and gravel; calcareous | 20 | 640 |

| | Thickness (feet) | Depth (feet) |
|---|---|---|
| Sandstone, light-brownish-gray (5YR 6/1) to pale-reddish-brown (10R 5/4), very-fine- to medium-grained; poorly sorted; stained and frosted quartz abundant. dark minerals common, limonite rare; non calcareous | 60 | 700 |
| Siltstone, pale-red (10R 6/2), well sorted; minor sand; calcareous | 10 | 710 |
| **Shinarump member:** | | |
| Mudstone, grayish-red (10R 4/2) and mottled white; angular to subangular sand and gravel common; grains are chiefly light-gray sandstone, greenish-gray siltstone, and grayish-red-purple mudstone, minor limestone | 10 | 720 |
| Siltstone, pale-red (10R 6/2), poorly sorted; stained quartz sand common, minor dark minerals and limonite; calcareous | 10 | 730 |
| **Moenkopi formation:** | | |
| Sandstone, pale-red (10R 6/2) to yellowish-gray (5Y 8/1), medium-to very-fine-grained and silty; poorly sorted; chiefly clear quartz, minor stained quartz and dark minerals, mica rare; calcareous; some limestone and mudstone pebbles. | 10 | 740 |
| Sandstone, silty, grayish-orange-pink (5YR 7/2), fine-grained; well sorted; clear quartz, minor dark minerals and limonite; weak calcareous cement | 10 | 750 |
| Siltstone, grayish-red-purple (5RP 6/2); well sorted; minor dark minerals; strongly calcareous | 5 | 755 |
| Mudstone, grayish-red-purple (5RP 6/2), grayish-red (10R 4/2), and light-gray (N7); minor dark minerals and limonite; noncalcareous | 25 | 780 |
| Mudstone, light-gray (N7) to grayish-red-purple (5RP 4/2) light color caused by leaching; some sand and very-fine to fine gravel; curved partings prominent; dark minerals common; noncalcareous | 15 | 795 |
| Conglomerate, various colors, fine-to medium-grained; angular to subrounded; pebbles are chiefly medium-dark-gray (N4) cherty limestone | 5 | 800 |
| **PERMIAN:** | | |
| **Glorieta sandstone:** | | |
| Sandstone. grayish-orange-pink (5YR 7/2), very-fine- to fine-grained; medium sorting; subrounded to rounded; clear quartz, minor dark minerals and limonite; strong calcareous cement | 105 | 905 |
| Sandstone, grayish-orange-pink (10R 8/2) and yellowish-gray (5Y 8/1), very-fine- to fine-grained; some silt; minor dark minerals, limonite common, highly calcareous | 5 | 910 |

| | Thickness (feet) | Depth (feet) |
|---|---|---|
| YESO FORMATION: | | |
| Upper member: | | |
| Mudstone, grayish-red (10R 4/2), grayish-red-purple (5RP 4/2), and light-gray (N7); dark minerals rare, minor limonite; partly calcareous | 10 | 920 |
| Sandstone, grayish-orange-pink (5YR 7/2) to pale-red (10R 6/2), very-fine- to fine-grained; subrounded to rounded; minor dark minerals and limonite; calcareous | 45 | 965 |
| Sandstone, very-pale-orange (10YR 8/2), very-fine-grained and silty; sorting poor to medium; clear quartz; silica cement; dark minerals and limonite rare; noncalcareous | 10 | 975 |
| Sandstone, moderate-orange-pink (5 YR 8/4), very fine- to fine-grained and silty; poorly sorted; clear to frosted quartz, silica cement; dark minerals and limonite rare; calcareous | 10 | 985 |
| Sandstone, pale-red (10R 6/2) to pale-brown (5YR 5/2), very-fine- to fine-grained and silty; clear and stained quartz, dark minerals and limonite common; calcareous | 10 | 995 |
| Sandstone, white to pinkish-gray (5YR 8/1), very-fine-grained; subrounded; sorting good; clear quartz, silica cement, dark minerals and limonite rare; noncalcareous | 20 | 1015 |
| Siltstone, light-brown (5YR 6/4) to moderate-brown (5YR 4/4); has appearance of soil; some quartz sand and bands of white calcareous material; highly calcareous | 10 | 1025 |
| Siltstone, grayish-red (5R 4/2) and white; grains of frosted quartz and dark minerals rare; medium calcareous; some light-olive-gray (5Y 6/1), finely crystalline limestone and some dark minerals and mica in lower part; noncalcareous | 15 | 1040 |
| Sandstone, light-olive-gray (5Y 6/1) and yellowish-gray, very-fine-grained and silty; some medium quartz grains; poorly sorted; noncalcareous; some greenish-gray (5GY 6/1) calcareous mudstone | 5 | 1045 |
| Mudstone, grayish-red (5R 4/2); fine-grained quartz and dark minerals common; calcareous | 5 | 1050 |
| Siltstone, pale-brown (5YR 5/2); very-fine-grained; stained quartz, silica cement, minor dark minerals and limonite; calcareous | 5 | 1055 |
| Sandstone, very-pale-orange (10YR 8/2), very-fine- to medium-grained; poorly sorted; clear to frosted quartz; noncalcareous; some pale-brown (5YR 5/2) to dusky-yellowish-brown (10YR 2/2) limestone | 5 | 1060 |
| Sandstone, light-brown (5YR 6/4), very-fine- to fine-grained and silty; clear to stained quartz, minor bright- red hematite; calcareous | 5 | 1065 |
| Sandstone, very-pale-orange (10YR 8/2) and grayish-orange-pink (5YR 7/2), very-fine- to medium-grained; poorly sorted; subangular to subrounded; clear quartz, minor limonite; calcareous; coarser-grained and some hematite, calcite, and white limestone in lower part | 30 | 1095 |

| | Thickness (feet) | Depth (feet) |
|---|---|---|
| Cherty limestone, light- to dark-gray, dense | 5 | 1100 |
| Siltstone, pale-reddish brown (10R 6/2), muddy; muscovite common; pale-red in lower part | 10 | 1110 |
| Cherty limestone, medium- to dark-gray, dense, conchoidal fracture | 5 | 1115 |
| Siltstone, grayish-red (10R 4/2), well sorted; muscovite common; calcareous | 10 | 1125 |
| Sandstone, pale-red (10R 6/2) to pale-reddish-brown (10R 5/4), very-fine- to fine-grained; poorly sorted; angular to subangular; clear and stained quartz, minor dark minerals and limonite; noncalcareous; some light-olive-gray (5Y 6/1) to medium-dark-gray (N4), fine-grained, dense limestone in lower part | 25 | 1150 |
| Siltstone, pale-red (10R 6/2) to pale-brown (5YR 5/2); clear and stained quartz, dark minerals and limonite common; mica rare; calcareous | 40 | 1190 |
| Mudstone, greenish-gray (5GY 6/1) and pale-red (5R 6/2); quartz and dark minerals rare, muscovite common, some carbonaceous material; calcareous | 10 | 1200 |
| Siltstone, pale-red (10R 6/2) to grayish-red (10R 4/2); dark minerals, limonite, and muscovite common; calcareous | 25 | 1225 |
| Mudstone, light-greenish-gray (5G 8/1) and grayish-red (10R 4/2); dark minerals rare, muscovite common; light color caused by leaching, commonly around carbonaceous material; calcareous | 10 | 1235 |

# TEST DATA

## Water Well No. 1

Test Pump: 10" Peerless, 12 Stages, Set at 600 Feet

| Pumping Level | GPM | Remarks |
|---|---|---|
| 465 | 135 | Muddy - 30 Minutes |
| 490 | 175 | Pumped 1 Hour |
| 550 | 200 | Pumped 1 Hour |
| 582 | 220 | Pumped 2 Hours |
| 600 | 240 | Pumped 4 Days |

Note: At a pumping rate of 240 GPM at 600 feet, the pumping level raised to 590 feet. The well recovered its artesian flow of 110 GPM in 29 minutes after pump was shut off.

Form 23-11 (5-52)

EL PASO NATURAL GAS COMPANY
SAN JUAN DIVISION LABORATORY
10-9-56
WATER ANALYSIS

Ciniza Refinery Water Well #1

Sample secured on dates indicated by Jim Druley

| ANALYSIS NUMBER: 3-890 | 20 hr pumping | 28 hr pumping | Oct. 4 11 A.M. | Oct. 4 3 P.M. | Oct. 5 2 P.M. | After 7 Days |
|---|---|---|---|---|---|---|
| pH | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 |
| Total hardness as $CaCO_3$ | 604 | 600 | 630 | 649 | 636 | 612 |
| Calcium as $CaCO_3$ | 449 | 433 | 463 | 482 | 470 | 445 |
| Magnesium as $CaCO_3$ | 155 | 167 | 167 | 167 | 166 | 167 |
| P Alkalinity as $CaCO_3$ | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Alkalinity as $CaCO_3$ | 208 | 198 | 199 | 200 | 198 | 199 |
| Cloride as Cl | 18 | 16 | 20 | 19 | 15 | 17 |
| Sulfate as $SO_4$ 1 | 470 | 456 | 455 | 445 | 430 | 436 |
| Silica as $SiO_2$ 2 | 6.0 | 6.0 | 6.0 | | | |
| Iron as Fe | | | | | | |
| Total Solids | 992 | 923 | 1009 | 947 | 946 | 949 |
| Sodium as Na 2 | 51 | 25 | 38 | 28 | 28 | 28 |

--all results expressed as parts per million --- trace is less than 0.1 ppm --

REMARKS: Water flowing out of surface pipe = 6.0 ppm $SiO_2$

3. Special sample = 0.9 ppm Fe.

cc: A. D. Grant
T. F. Sullivan (2)
Jim Druley (10)
file (2)

1. Hellige Turbidimeter
2. Beckman Model "3" Flame Spectrophotometer
3. Taylor Comparator

Sullivan, Sattler, Wright
Chemist

#1

V MEXICO DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700 700 Camino de Salud, NE
lbuquerque, NM 87196-4700 [505] 841-2500
ORGANIC CHEMISTRY SECTION [505] 841-2570

REPORT TO CLIENT: ☑

| |
|---|
| Giant Refining Company |
| Route 3 Box 7 |
| Gallup, NM 87305 |

SLD No.: OR- 9802984
REQUEST ID No.: 2282489
RECEIVED AT SLD: 11/19/98
☐SLD COPY USER 55000

ED FIELD OFFICE: ☐

| |
|---|
| ED Dist #1 Office, Albuquerque |
| Drinking Water Bureau |
| 4131 Montgomery Blvd., NE |
| Albuquerque, NM 87109 |

☐ N.M.E.D. DRINKING WATER BUREAU

| |
|---|
| Gilbert Salas |
| Drinking Water Bureau |
| NMED |
| 525 Camino de los Marquez, Suite 4 |
| Santa Fe NM 87502 |

SAMPLE COLLECTION: DATE: 11/17/98 TIME: 1020 BY: Clo
SAMPLING LOCATION: Well #1 (North) Source ID:1
WSS #: 60217 REPORTING UNITS: ug/L

Remarks: Sample marked as: being preserved with Hydrochloric Acid;
No targeted compounds were detected in this sample.

## EPA METHOD 502.2 SDWA VOLATILES BY GAS CHROMATOGRAHY (PID/ELCD)

DATE EXTRACTED: N/A
DATE ANALYZED: 11/23/98 6 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 5
0

ANALYSIS No.: OR- 9802984
SLD BATCH No.: 446
DILUTION FACTOR: 1.00
REQUEST ID No.: 2282489

SAMPLE PRESERVATION: Sample Temperature when received: 14 Degrees C.; pH = 2

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | | U | 0.50 | 5 |
| 108-86-1 | Bromobenzene | | U | 0.50 | |
| 74-97-5 | Bromochloromethane | | U | 0.50 | |
| 75-27-4 | Bromodichloromethane* | | U | 0.50 | 80 |
| 75-25-2 | Bromoform* | | U | 0.50 | 80 |
| 24-83-9 | Bromomethane | | U | 0.50 | |
| 78-93-3 | 2-Butanone (MEK) | | U | 5.00 | |
| 104-51-8 | n-Butylbenzene | | U | 0.50 | |
| 135-98-8 | sec-Butylbenzene | | U | 0.50 | |
| 98-06-6 | tert-Butylbenzene | | U | 0.50 | |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | | U | 5.00 | |
| 56-23-5 | Carbon tetrachloride | | U | 0.50 | 5 |
| 108-90-7 | Chlorobenzene (monochlorobenzene) | | U | 0.50 | 100 |
| 75-00-3 | Chloroethane | | U | 0.50 | |
| 67-66-3 | Chloroform* | | U | 0.50 | 80 |
| 74-87-3 | Chloromethane | | U | 0.50 | |
| 95-49-8 | 2-Chlorotoluene | | U | 0.50 | |
| 106-43-4 | 4-Chlorotoluene | | U | 0.50 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane (DBCP) | | U | 0.50 | 0.2 |
| 124-48-1 | Dibromochloromethane* | | U | 0.50 | 80 |
| 106-93-4 | 1,2-Dibromoethane (Ethylene dibromide (EDB)) | | U | 0.50 | 0.05 |
| 74-95-3 | Dibromomethane | | U | 0.50 | |
| 95-50-1 | 1,2-Dichlorobenzene (o-Dichlorobenzene) | | U | 0.50 | 600 |
| 541-73-1 | 1,3-Dichlorobenzene (m-Dichlorobenzene) | | U | 0.50 | 600 |
| 106-46-7 | 1,4-Dichlorobenzene (p-Dichlorobenzene) | | U | 0.50 | 75 |
| 75-71-8 | Dichlorodifluoromethane | | U | 0.50 | |
| 75-34-3 | 1,1-Dichloroethane | | U | 0.50 | |
| 107-06-2 | 1,2-Dichloroethane | | U | 0.50 | 5 |

STATE OF NEW MEXICO | DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O Box 4700
Albuquerque, NM 87196-4700
AIR & HEAVY METALS SECTION

700 Camino de Salud, NE
(505)-841-2500
(505)-841-2553

SAMPLE COLLECTION: DATE: 11/17/98 TIME: 1022
MATRIX: wat BY: Clo
SAMPLING LOCATION: Well #1 (North) Source ID:1

**SLD No.:** HM-9802293

| | |
|---|---|
| REQUEST ID No.: | 2282418 |
| RECEIVED AT SLD: | 11/19/98 |
| USER: | 55000 |
| SUBMITTER: | 60 |
| WSS #: | 60217 |

Giant Refining Company

To: Client

Giant Refining Company
Attn: Bob Simpson
Route 3 Box 7
Gallup, NM 87305

DISTRIBUTION TO:
User
Submitter
Client
SLD Files

Practical Quantitation Limit (PQL) is defined as 10 times the Method Detection Limit (MDL)

## ANALYTICAL RESULTS

| Element | Result | Units | Analysis Date | Method | PQL | Dilution Factor | Sample Det. Limit. | Analyst | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | <0.001 | mg/L | 12/3/98 | 200.8 | 0.001 | 1 | 0.001 | SP | |
| Arsenic | 0.004 | mg/L | 12/3/98 | 200.8 | 0.001 | 1 | 0.001 | SP | |
| Barium | <0.1 | mg/L | 12/3/98 | 200.8 | 0.1 | 1 | 0.1 | SP | |
| Beryllium | <0.001 | mg/L | 12/3/98 | 200.8 | 0.001 | 1 | 0.001 | SP | |
| Cadmium | <0.001 | mg/L | 12/3/98 | 200.8 | 0.001 | 1 | 0.001 | SP | |
| Chromium | <0.001 | mg/L | 12/3/98 | 200.8 | 0.001 | 1 | 0.001 | SP | |
| Mercury | <0.0002 | mg/L | 11/24/98 | 245.1 | 0.0002 | 1 | 0.0002 | JM | |
| Nickel | <0.01 | mg/L | 12/3/98 | 200.8 | 0.01 | 1 | 0.01 | SP | |
| Selenium | <0.005 | mg/L | 12/7/98 | 200.9 | 0.005 | 1 | 0.005 | SJO | |
| Thallium | <0.001 | mg/L | 12/3/98 | 200.8 | 0.001 | 1 | 0.001 | SP | |

**Laboratory Comments:**
Sample digested using SLD Method 41414.

**Reviewed by:** **Ron Amato**
*Supervisor, Air & Heavy Metals Section*
Printed: 12/15/98

NCB

Data Qualifier Codes and Definitions

A = Insufficient sample for analysis
B = Laboratory Reagent Blank (RB)
C = Spike recovery between 80-120%
D = Spike recovery <80% or >120%
E = Over Calibration Range
F = Matrix interference suspected
G = Inconsistent results; suggest re-sampling
H = Analyzed in duplicate
I = Analyzed in Triplicate
J = Estimated Quantity, only.
K = Holding time exceeded
L = Equals or exceeds USEPA MCL
M = Equals or exceeds USEPA Action Level
N = Insufficient sample to verify results
O = Internal Standards(ICP/MS) <60% or >125% when sample analyzed straight
R = The data are unusable
T = Total Metals
TR = Total Recoverable Metals
U = Not detected above the PQL or SDL.
UJ = Not detected. Estimated value, only.

STATE OF NEW MEXICO

DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O Box 4700
Albuquerque, NM 87196-4700

700 Camino de Salud, NE
(505) 841-2500

WATER CHEMISTRY SECTION (505)-841-2555

SAMPLE COLLECTION DATE: 11/17/98 TIME: 1021 BY: Clo

SAMPLING LOCATION: Well #1 (North) Source ID:1

SAMPLE MATRIX: wat

SLD No.: WC-9805350

| | |
|---|---|
| REQUEST ID No.: | 2282420 |
| RECEIVED AT SLD: | 11/19/98 |
| USER: | 55000 |
| SUBMITTER: | 60 |
| WSS #: | 60217 |

This Copy of Report for::

**Giant Refining Company**
**Route 3 Box 7**
**Gallup, NM 87305**

DISTRIBUTION TO:

Drinking Water Bureau {U}
ED Dist #1 Office, Albuquerque {S}
Giant Refining Company {C}
Water Chemistry Section - File Copy

## ANALYTICAL RESULTS

| Analyte | Result | Units | Analysis Date | Method | Minimum Level | Dilution Factor | Sample Det. Limit | Analyst | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| Free Cyanide | <.01 | mG/L | 11/20/98 | SM4500-CN(F) | .1 | 1. | .1 | Jay Finney | |

**Laboratory Comments:**

**Reviewed by Paul Ortega**
*Supervisor, Water Chemistry Section*

Date Printed: 11-Dec-98

### Data Qualifier Codes and Definitions

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is the sample detection limit.
J - The associated value is an estimated quantity.
R - The data are unusable. (Note: Analyte may or may not be present.
UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

STATE OF NEW MEXICO

DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O Box 4700
Albuquerque, NM 87196-4700

700 Camino de Salud, NE
(505) 841-2500

WATER CHEMISTRY SECTION (505)-841-2555

SAMPLE COLLECTION DATE: 11/17/98 TIME: 1023 BY: Clo

SAMPLING LOCATION: Well #1 (North) Source ID:1

SAMPLE MATRIX: wat

SLD No.: WC-9805309

| | |
|---|---|
| REQUEST ID No.: | 2282419 |
| RECEIVED AT SLD: | 11/19/98 |
| USER: | 55000 |
| SUBMITTER: | 60 |
| WSS #: | 60217 |

This Copy of Report for::

Giant Refining Company
Route 3 Box 7
Gallup, NM 87305

DISTRIBUTION TO:

Drinking Water Bureau {U}
ED Dist #1 Office, Albuquerque {S}
Giant Refining Company {C}
Water Chemistry Section - File Copy

## ANALYTICAL RESULTS

| Analyte | Result | Units | Analysis Date | Method | Minimum Level | Dilution Factor | Sample Det. Limit | Analyst | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate + Nitrite | 0.104 | mG/L | 12/7/98 | 353.2 | .1 | 1. | .1 | Staci Morris | |

**Laboratory Comments:**

Reviewed by Paul Ortega
*Supervisor, Water Chemistry Section*

Date Printed: 16-Dec-98

### Data Qualifier Codes and Definitions

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is the sample detection limit.
J - The associated value is an estimated quantity.
R - The data are unusable. (Note: Analyte may or may not be present.
UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

RECEIVED
DEC 23 1998
GIANT REFINING CO.
CINIZA REFINERY

STATE OF NEW MEXICO

DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700
Albuquerque, NM 87196-4700

700 Camino de Salud, NE
[505] 841-2500

ORGANIC CHEMISTRY SECTION [505] 841-2570

WATER SUPPLY SYSTEM (wss): ☑
Giant Refining Company
Route 3 Box 7
Gallup, NM 87301

REQUEST ID No.: 130384
SLD No.: 9502024

RECEIVED AT SLD: 4/24/95
☐ SLD COPY

N.M.E.D. DRINKING WATER BUREAU: ☐
Richard Asbury
Drinking Water Bureau
NM-ED Dist. #3 Office
1001 N. Solano Drive
Las Cruces, NM 88001

ED FIELD OFFICE: ☐
ED Field Office, Gallup
306 S. 5th Street
Gallup, NM 87301

SAMPLE COLLECTION DATE: 4/24/95 TIME: 820 BY: Pre
SAMPLE LOCATION: #1 North
WSS #: 60217 REPORTING UNITS: ug/L

## EPA METHOD 504 SDWA EDB and DBCP BY ECD

DATE EXTRACTED: 4/29/95 5 Days: Within EPA Holding Time
DATE ANALYZED: 4/29/95 5 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 17.5

ANALYSIS No.: OR- 9502024
SLD BATCH No.: 207A95
DILUTION FACTOR: 2.00
REQUEST ID No.: 130384

SAMPLE PRESERVATION: Sample Temperature when received: 7 Degrees C.; pH = <2
COMPOSITED WITH SLD No.(s): 9502057

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 106-93-4 | 1,2-Dibromoethane (EDB) | | U | 0.04 | 0.05 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane (DBCP) | | U | 0.04 | 0.2 |

| | | | % RECOVERY |
|---|---|---|---|
| SURROGATE: | 1,1,2,2-Tetrachloroethane spiked at 0.57 ug/L | 0.58 | 101.8 % |

Surrogate Recovery: Within Normal Range of 80 - 120%

ANALYST: Nancy DeWitt QC APPROVED BY: Roberta Hine

## EPA METHOD 515.1 SDWA ACID HERBICIDES BY ECD

DATE EXTRACTED: 5/2/95 8 Days: Within EPA Holding Time
DATE ANALYZED: 5/3/95 9 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 125

ANALYSIS No.: OR- 9502024
SLD BATCH No.: 219A95
DILUTION FACTOR: 8.00
REQUEST ID No.: 130384

SAMPLE PRESERVATION: Sample Temperature when received: 7 Degrees C.; pH = <2
COMPOSITED WITH SLD No.(s): 9502057

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 75-99-0 | Dalapon | | U | 0.32 | 200 |
| 1918-00-9 | Dicamba | | U | 0.72 | Unreg. |
| 94-75-7 | 2,4-D | | U | 2.40 | 70 |
| 87-86-5 | Pentachlorophenol (PCP) | | U | 0.32 | 1 |
| 93-72-1 | 2,4,5-TP (Silvex) | | U | 3.20 | 50 |
| 88-85-7 | Dinoseb | | U | 6. | 7 |
| 1918-02-1 | Picloram | | U | 16. | 500 |

ANALYST: MaryLou LaCasse QC APPROVED BY: Roberta Hine

## EPA METHOD 531.1 SDWA CARBAMATE PESTICIDES BY HPLC

DATE EXTRACTED: 5/10/95
DATE ANALYZED: 5/10/95 16 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 0.2

ANALYSIS No.: OR- 9502024
SLD BATCH No.: 223A95
DILUTION FACTOR: 2.00
REQUEST ID No.: 130384

SAMPLE PRESERVATION: Sample Temperature when received: 7 Degrees C.; pH = 3
COMPOSITED WITH SLD No.(s): 9502057

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 116-06-3 | Aldicarb | | U | 1.2 | Unreg. |
| 1646-88-4 | Aldicarb Sulfone | | U | 0.8 | Unreg. |
| 1646-87-3 | Aldicarb Sulfoxide | | U | 0.6 | Unreg. |
| 114-26-1 | Baygon | | U | 1.4 | Unreg. |
| 63-25-2 | Carbaryl (Sevin) | | U | 1.4 | Unreg. |
| 1563-66-2 | Carbofuran | | U | 0.8 | 40 |
| 16655-82-6 | 3-Hydroxycarbofuran | | U | 1.4 | Unreg. |
| 2032-65-7 | Methiocarb | | U | 1.2 | Unreg. |
| 16752-77-5 | Methomyl | | U | 1.4 | Unreg. |
| 23135-22-0 | Oxamyl | | U | 1.4 | 200 |

ANALYST: Arnold Bentz QC APPROVED BY: Roberta Hine

## EPA METHOD 547 SDWA GLYPHOSATE BY HPLC

DATE EXTRACTED: 5/2/95
DATE ANALYZED: 5/2/95 8 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 0.025

ANALYSIS No.: OR- 9502024
SLD BATCH No.: 223A95
DILUTION FACTOR: 2.00
REQUEST ID No.: 130384

SAMPLE PRESERVATION: Sample Temperature when received: 7 Degrees C.
COMPOSITED WITH SLD No.(s): 9502057

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 1071-83-6 | Glyphosate | | U | 10. | 700 |

ANALYST: Arnold Bentz QC APPROVED BY: Roberta Hine

## EPA METHOD 548.1 SDWA ENDOTHALL BY GC/FID/MS

DATE EXTRACTED: 4/27/95 3 Days: Within EPA Holding Time
DATE ANALYZED: 4/29/95 5 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 40

ANALYSIS No.: OR- 9502024
SLD BATCH No.: 204A95
DILUTION FACTOR: 2.50
REQUEST ID No.: 130384

SAMPLE PRESERVATION: Sample Temperature when received: 7 Degrees C.
COMPOSITED WITH SLD No.(s): 9502057

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 145-73-3 | Endothall | | U | 25. | 100 |

ANALYST: MaryLou LaCasse QC APPROVED BY: Roberta Hine

## EPA METHOD 549.1 SDWA DIQUAT BY HPLC/UV

DATE EXTRACTED: 4/28/95 4 Days: Within EPA Holding Time
DATE ANALYZED: 5/4/95 10 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 125

ANALYSIS No.: OR- 9502024
SLD BATCH No.: 208A95
DILUTION FACTOR: 2.00
REQUEST ID No.: 130384

SAMPLE PRESERVATION: Sample Temperature when received: 7 Degrees C.; pH = <2
COMPOSITED WITH SLD No.(s): 9502057

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1071-83-6 | Diquat | | U | 0.80 | 20 |

ANALYST: Tim Chapman QC APPROVED BY: Roberta Hine

## EPA METHOD 525.1 SDWA SOC's BY GC/MS

DATE EXTRACTED: 4/27/95 3 Days: Within EPA Holding Time
DATE ANALYZED: 5/1/95 7 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 500

ANALYSIS No.: OR- 9502024
SLD BATCH No.: 209
DILUTION FACTOR: 2.00
REQUEST ID No.: 130384

SAMPLE PRESERVATION: Sample Temperature when received: 7 Degrees C.; pH = <2
COMPOSITED WITH SLD No.(s): 9502057

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 15972-60-8 | Alachlor | | U | 1.00 | 2 |
| 309-00-2 | Aldrin | | U | 1.00 | Unreg. |
| 11104-28-2 | Aroclor 1221 | | U | 1.00 | Unreg. |
| 11141-16-5 | Aroclor 1232 | | U | 1.00 | Unreg. |
| 53469-21-9 | Aroclor 1242/1016 | | U | 1.00 | Unreg. |
| 12672-29-6 | Aroclor 1248 | | U | 1.00 | Unreg. |
| 11097-69-1 | Aroclor 1254 | | U | 0.04 | Unreg. |
| 11096-82-5 | Aroclor 1260 | | U | 0.06 | Unreg. |
| 1912-24-9 | Atrazine | | U | 0.02 | 3 |
| 50-32-8 | Benzo[a]pyrene | | U | 0.02 | 0.2 |
| 28184-66-9 | Butachlor | | U | 0.40 | Unreg. |
| 57-74-9 | Chlordane (Total) | | U | 0.04 | 2 |
| 60-57-1 | Dieldren | | U | 0.20 | Unreg. |
| 4337-65-9 | Di(2-ethylhexyl)adipate | | U | 0.26 | 400 |
| 117-81-7 | Di(2-ethylhexyl)phthalate | | U | 0.04 | 6 |
| 72-20-8 | Endrin | | U | 0.02 | 2 |
| 76-44-8 | Heptachlor | | U | 0.08 | 0.4 |
| 1024-57-3 | Heptachlor epoxide | | U | 0.26 | 0.2 |
| 118-74-1 | Hexachlorobenzene | | U | 0.02 | 1 |
| 77-47-4 | Hexachlorocyclopentadiene | | U | 0.08 | 50 |
| 58-89-9 | Lindane | | U | 0.04 | 0.2 |
| 72-43-5 | Methoxychlor | | U | 0.02 | 40 |
| 21087-64-9 | Metribuzin | | U | 0.60 | Unreg. |
| 51218-45-2 | Metolachlor | | U | 0.20 | Unreg. |
| 1918-16-7 | Propachlor | | U | 0.60 | Unreg. |
| 122-34-9 | Simazine | | U | 0.20 | 4 |
| 8001-35-2 | Toxaphene | | U | 2.00 | 3 |

ANALYST: Tim Chapman QC APPROVED BY: Roberta Hine

## DEFINITIONS

| | |
|---|---|
| ** | **Concentration Exceeds EPA's allowable Maximum Contamination Level** |
| CAS# | Chemical Abstract Services Number - Unique number to help identify analytes listed by different names |
| CONC. | Concentration (ug/L) of analyte actually detected in the sample |
| QUAL | Qualifier of analytical results as follows:<br>B Analyte was detected in laboratory blank<br>J Analyte was detected at a level below which an accurate quanitation can be given ( ~5 * SDL)<br>U No analyte was detected above the Sample Detection Limit. |
| MCL | Maximum Contamination Level Allowed by EPA for regulated analytes |
| SDL | Sample Detection Limit - The lowest concentration which can be differentiated from Zero with 99% confidence taking sample size (compositing) into account. |
| ug/L | Concentration Units - micrograms per liter which is approximately equivalent to Parts Per Billion (ppb) |

789

# DWA SYNTHETIC ORGANIC CONTAMINANT (SOC) ANALYTICAL REQUEST FORM

SCIENTIFIC LABORATORY DIVISION
700 CAMINO DE SALUD N.E., ALBUQUERQUE, NM 87106
Organic Chemistry Section - Telephone: (505) 841-2570

1 SLD No. OR 9502024

Date Received: 4/25/95

Request SDWA-Org.
ID No. 130384-J

2 User Code #: 5500

3 Request ID No.:

4 Priority Code #: 3 (If "1" or "2", call ED-SLD Coordinator)

5 Facility Name: Giant Refinery

6 County: McKinley

7 City: Gallup

8 State: NM

9 Sample Location: #1 Wash

10 Collected By: [illegible] First [illegible] Last Phone# 320-9851 On: 95/04/24 Date: (YY/MM/DD) At: 0900 hrs. Time: 24 hr. clock 9:00 pm = 1500 hrs.

11 Codes: Submitter 09 WSS # 6002-17 Organization WS03

12 Latitude (DDMMSS) 35°29'25" Longitude (DDDMMSS) 108°26'15" 2 Digit ID (if needed)

13 Report To: Name Lynn Shelton
Address Giant Refinery
Rte 3 Box 7
City, State Zip Gallup, NM 87305

14 Phone #: 722-3833

15 Sampling Information:
Sample Purpose:
- [x] Compliance
- [ ] NMED Monitoring
- [ ] Confirmation
- [ ] Special

- [x] Grab
- [ ] Composite _____ (Composite Time Period)
- [ ] Chain of Custody

16 Field Data: pH: _____, Conductivity: _____ umhos/cm @ Temperature: _____ °C, Chlorine Residual: _____ mg/l, Flow: _____

17 Sample Source:
- [ ] Entry Point to Distribution
- [x] Well; Depth: _____
- [ ] Spring
- [ ] Distribution
- [ ] Other: _____

18 Field Remarks: Tap at well

19 Sample Type: [x] Water
- [x] Unchlorinated
- [ ] Chlorinated

Approximate Sulfate Concentration - _____ mg/l

20 Preservation:
- [x] Preserved as indicated on back of form.
- [ ] Other: _____

21 Analyses Requested: Please check the appropriate box(es) below to indicate the type of analytical screen(s) required and type of Compositing Requested.

- [ ] Composite Within this System Only
- [ ] Do Not Composite
- [x] Composite With Other Systems

## SAFE DRINKING WATER ACT SYNTHETIC ORGANIC CONTAMINANT (SOC) ANALYSES

[ ] All of the Safe Drinking Water Act Synthetic Organic Contaminant (SOC) Screens Listed Below

| | SLD No. | EPA No. | Analysis | SLD Lab Number | | SLD No. | EPA No. | Analysis | SLD Lab Number |
|---|---|---|---|---|---|---|---|---|---|
| [ ] | 775 | 504 | EDB & DBCP | 130384 A & B | [ ] | 781 | 547 | Glyphosate | 130384 E |
| [ ] | 760 | 505 | PCBs & Endrin | N/A | [ ] | 702 | 548.1 | Endothall | F |
| [ ] | 758 | 515.1 | Acid Herbicides | 130384 C | [ ] | 783 | 549.1 | Diquat | G |
| [ ] | 772 | 531.1 | Carbamate Pesticides | D | [ ] | 700 | 525.1 | Semivolatile Pesticides GC/MS | H & J |

Remarks:

74 0745

STATE OF NEW MEXICO DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700 700 Camino de Salud, NE
Albuquerque, NM 87196-4700 [505]-841-2500
ORGANIC CHEMISTRY SECTION [505]-841-2570

*June 17, 1994*

**Request ID No. 055380**

## ANALYTICAL REPORT
## SLD Accession No. OR-94-1538

*Distribution*
(x) User 55000
(x) Submitter 69
(X) Client
(x) SLD Files

*To:* Len Shelton
Giant Refining Company
Route 3 Box 7
Gallup, NM 87301

*From:* Organic Chemistry Section
Scientific Laboratory Division
700 Camino de Salud, NE
P.O. Box 4700
Albuquerque, NM 87196-4700

*Re:* **A water,Purgeable sample submitted to this laboratory on May 18, 1994**

*User:*
Richard Asbury
Drinking Water Bureau
NM-ED Dist. #3 Office
1001 N. Solano Drive
Las Cruces, NM 88001

*Submitter:*
Joe Winkler
ED Field Office, Gallup
306 S. 5th Street
Gallup, NM 87301-6424

### DEMOGRAPHIC DATA

*COLLECTION*
*On:* 17-May-94 *By:* Win . . .
*At:* 10:55 hrs. *In/Near:* Gallup

*LOCATION*
*WSS #:* 602-17; Well No1
Giant Refining Company

### ANALYTICAL RESULTS: SDWA VOC-I [EPA-502.2] Screen {774}

| Parameter | Value | Note | PQL | Units |
|---|---|---|---|---|
| SDWA VOC's-I (63) | 0.00 | N | 0.50 | ppb |

See Laboratory Remarks for Additional Information

*Notations & Comments:*
PQL = Practical Quantitation Level.
A = Approximate Value; N = None Detected above Detection Limit; P = Compound Present, but not quantified;
T = Trace (<Detection Limit); U = Compound Identity Not Confirmed.
Evidentiary Seals: Not Sealed [X]; Intact: No [ ], Yes [ ] & Broken By: _____ Date: _____

**Laboratory Remarks:**

SAFE DRINKING WATER ACT
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: NM SCIENTIFIC LABORATORY DIVISION Contract: N/A
Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A
Matrix: (soil/water) Water Lab Sample ID: OR-94-1638
Sample wt/vol: 5.0 (g/mL) mL SLD Batch No: 236
Level: (low/med) Low Date Received: 05/18/94

*(Continued on page 2.)*

% Moisture: not dec. N/A dec. N/A
Extraction: (SepF/Cont/Sonc) N/A
GPC Cleanup: (Y/N) No pH: N/D

Date Extracted: N/A
Date Analyzed: 05/28/94
Dilution Factor: 1
CONCENTRATION UNITS:
(ug/L or ug/Kg): ug/L

This sample was analyzed for the following compounds using EPA Method 502.2

| CAS NO. | COMPOUND | CONC. | Q | POL |
|---|---|---|---|---|
| 71-43-2 | Benzene | | U | 0.5 |
| 108-86-1 | Bromobenzene | | U | 0.5 |
| 74-97-5 | Bromochloromethane | | U | 0.5 |
| 75-27-4 | Bromodichloromethane | | U | 0.5 |
| 75-25-2 | Bromoform | | U | 0.5 |
| 24-83-9 | Bromomethane | | U | 0.5 |
| 78-93-3 | 2-Butanone (MEK) | | U | 5.0 |
| 104-51-8 | n-Butylbenzene | | U | 0.5 |
| 135-98-8 | sec-Butylbenzene | | U | 0.5 |
| 98-06-6 | tert-Butylbenzene | | U | 0.5 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | | U | 5.0 |
| 56-23-5 | Carbon tetrachloride | | U | 0.5 |
| 108-90-7 | Chlorobenzene | | U | 0.5 |
| 75-00-3 | Chloroethane | | U | 2.5 |
| 67-66-3 | Chloroform | | U | 0.5 |
| 74-87-3 | Chloromethane | | U | 0.5 |
| 95-49-8 | 2-Chlorotoluene | | U | 0.5 |
| 106-43-4 | 4-Chlorotoluene | | U | 0.5 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | U | 0.5 |
| 124-48-1 | Dibromochloromethane | | U | 0.5 |
| 106-93-4 | 1,2-Dibromoethane | | U | 0.5 |
| 74-95-3 | Dibromomethane | | U | 0.5 |
| 95-50-1 | 1,2-Dichlorobenzene | | U | 0.5 |
| 541-73-1 | 1,3-Dichlorobenzene | | U | 0.5 |
| 106-46-7 | 1,4-Dichlorobenzene | | U | 0.5 |
| 75-71-8 | Dichlorodifluoromethane | | U | 0.5 |
| 75-34-3 | 1,1-Dichloroethane | | U | 0.5 |
| 107-06-2 | 1,2-Dichloroethane | | U | 0.5 |
| 75-35-4 | 1,1-Dichloroethene | | U | 0.5 |
| 156-59-4 | cis-1,2-Dichloroethene | | U | 0.5 |
| 156-60-5 | trans-1,2-Dichloroethene | | U | 0.5 |
| 78-87-5 | 1,2-Dichloropropane | | U | 0.5 |
| 142-28-9 | 1,3-Dichloropropane | | U | 0.5 |

*(Continued on page 3.)*

| | | | | |
|---|---|---|---|---|
| 590-20-7 | 2,2-Dichloropropane | | U | 0.5 |
| 563-58-6 | 1,1-Dichloropropene | | U | 0.5 |
| 1006-01-5 | cis-1,3-Dichloropropene | | U | 0.5 |
| 1006-02-6 | trans-1,3-Dichloropropene | | U | 0.5 |
| 100-41-4 | Ethylbenzene | | U | 0.5 |
| 87-68-3 | Hexachlorobutadiene | | U | 0.5 |
| 98-82-8 | Isopropylbenzene | | U | 0.5 |
| 99-87-6 | 4-Isopropyltoluene | | U | 0.5 |
| 75-09-2 | Methylene chloride | | U | 2.5 |
| 91-20-3 | Naphthalene | | U | 0.5 |
| 103-65-1 | Propylbenzene | | U | 0.5 |
| 100-42-5 | Styrene | | U | 0.5 |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | U | 0.5 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | U | 0.5 |
| 127-18-4 | Tetrachloroethene | | U | 0.5 |
| 109-99-9 | Tetrahydrofuran (THF) | | U | 5.0 |
| 108-88-3 | Toluene | | U | 0.5 |
| 87-61-5 | 1,2,3-Trichlorobenzene | | U | 0.5 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | U | 0.5 |
| 71-55-6 | 1,1,1-Trichloroethane | | U | 0.5 |
| 79-00-5 | 1,1,2-Trichloroethane | | U | 0.5 |
| 79-01-6 | Trichloroethene | | U | 0.5 |
| 75-69-4 | Trichlorofluoromethane | | U | 0.5 |
| 96-18-4 | 1,2,3-Trichloropropane | | U | 0.5 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | U | 0.5 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | U | 0.5 |
| 75-01-4 | Vinyl chloride | | U | 2.0 |
| 95-47-6 | o-Xylene | | U | 0.5 |
| N/A | p- & m-Xylene | | U | 0.5 |
| N/A | Total Xylenes | | U | 1.0 |

* Q = Qualifier Definitions:
CONC = CONCENTRATION DETERMINED
PQL = Practical Quantitation Limit (Approximately 5 times MDL)
B - Indicates compound was detected in the Lab Blank as well as in the sample.
D - Indicates value taken from a secondary (diluted) sample analysis.
E - Indicates compound concentration exceeded the range of the standard curve.
J - Indicates an estimated value for tentatively identified compounds, or for compounds detected and identified but present at a concentration less than the PQL listed.

*(Continued on page 4.)*

N - Indicates that more than one peak was used for quantitation.
U - Indicates compound was analyzed for, but not detected at a concentration greater than the concentration listed.

## QUALITY CONTROL SUMMARY FOR VOLATILES SCREEN

METHOD BLANK: A laboratory method blank was analyzed along with this sample to assure the absence of interfering contaminants from lab reagents, instruments, or the general laboratory environment. Unless listed below, no contaminants were detected in this blank above the reported detection limit.

| COMPOUND DETECTED | CONCENTRATION (PPB) |
|---|---|
| No Compounds Detected | |

SURROGATE RECOVERIES:

| SURROGATE | CONCENTRATION | % RECOVERY |
|---|---|---|
| Bromofluorobenzene (PID Surr) | 10.0 ppb | 101.0 |
| Bromofluorobenzene (HALL Surr) | 10.0 ppb | 113.0 |

SPIKE RECOVERY: The % recoveries for compounds in the batch spike were from 80% to 120% with the exception of the compounds listed below:

| COMPOUND | CONCENTRATION | % RECOVERY |
|---|---|---|
| Acetone | 10.0 ppb | 123.0 |

**Analyst:** Nancy DeWitt
*Analyst, Organic Chemistry*

**Reviewed By:** Richard F. Meyerhein 06/02/94
*Supervisor, Organic Chemistry Section*

# ORGANIC CHEMISTRY ANALYTICAL REQUEST FORM

SCIENTIFIC LABORATORY DIVISION
700 CAMINO DE SALUD N.E., ALBUQUERQUE, NM 87106
Organic Chemistry Section - Telephone: (505) 841-2570

SLD No. OR94 1538 C

Date Received: 5-18-94

Request ID No. 055380-C

User Code #: 5500

3 Request ID No.:

4 Priority Code #: 3 [N "1" or "2", call ED-SLD Coordinator]

5 Facility Name: GIANT REFINING

6 County: McKINLEY

7 City: GALLUP

8 State: NM

9 Sample Location: WELL NO 1 WELL NO 1

10 Collected By: JOE WINKLER (First / Last) 722-4160 On: 94/05/17 (Date: YY/MM/DD) At: 1015 hrs. (Time: 24 hr. clock 3:00 pm = 1500 hrs.)

11 Codes: 06FL (Submitter) 602-17 (WSS #) WS010 (Organization)

12 Latitude (DDMMSS) ° ' "
Longitude (DDDMMSS) ° ' "
2 Digit ID (if needed)

13 Report To: Name: LEN SHELTON

14 Phone #: 722-3833

Address: GIANT REFINING
ROUTE 3, BOX 7

City, State Zip: GALLUP, NM 87305

15 Sampling Information:
Sample Purpose: [X] - Compliance; [ ] - NMED Monitoring; [ ] - Confirmation; [ ] - Special
[X] - Grab; [ ] - Composite ____ (Composite Time Period); [ ] - Flow Proportioned; [ ] - Equal Aliquot; [ ] - Sample Split w/Permittee; [ ] - Chain of Custody

16 Field Data: pH: ____, Conductivity: ____ umhos/cm @ Temperature: ____ °C, Chlorine Residual: ____ mg/l, Flow: ____

17 Sample Source:
[ ] -Stream
[ ] -Lake
[ ] -Drain
[ ] -Pool
[ ] -WWTP
[X] -Entry Point to Distribution
[ ] -Well; Depth: 1000 ft
[ ] -Spring
[ ] -Distribution
[ ] -Other: ____

18 Field Remarks: SAMPLE TAKEN AT WELL NO. 2 -

19 Sample Type: [X] - Water; [ ] - Wastewater; [ ] - Unchlorinated; [X] - Chlorinated; [ ] - Soil, [ ] - Food, [ ] - Other ____
This form accompanies a single sample consisting of:
2 - septum vial(s) (volume = 40 ml ea.)
____ - glass jug(s) (volume = ____ ml ea.)
____ - ____ (volume = ____)

20 Preservation:
[ ] - NP: No Preservation; Sample stored at room temperature
[ ] - P-Ice: Sample stored in an ice bath (Not Frozen)
[ ] - P-TS: Sample Preserved with Sodium Thiosulfate to remove chlorine residual
[X] - P-HCl: Sample Preserved with Hydrochloric Acid (2 drops/40 ml)
[ ] - P-$HgCl_2$: Sample Preserved with 20 mg/l Mercuric Chloride
[ ] - Other ____

21 Analyses Requested: Please check the appropriate box(es) below to indicate the type of analytical screen(s) required. Whenever possible, list specific compounds suspected or required, and note below whenever highly contaminated samples are suspected.

**Volatile Screens:**

[ ] - (753) Aliphatic Headspace (Qualitative Screen)
[ ] - (754) Aromatic & Halogenated Purgeables (EPA 601/2)
[ ] - (765) Mass Spectrometer Purgeables (EPA 624)
[ ] - (766) SDWA Total Trihalomethanes (EPA 501.1)
[X] - (774) SDWA VOC's I [21 REGULATED +] (EPA 502.2)
[ ] - (775) SDWA VOC's II [EDB & DBCP] (EPA 504)
[ ] - (790) Composite Sample for Analysis No. ____

**Other Specific Compounds or Classes:**

[ ] - ( ) ____
[ ] - ( ) ____

**Semivolatile Screens:**

[ ] - (755) Base/Neutral Extractables (EPA 625)
[ ] - (756) Base/Neutral/Acid Extractables (EPA 8270)
[ ] - (772) Carbamate Pesticides (EPA 531.1)
[ ] - (758) Herbicides, Chlorophenoxy Acid (EPA 515.1)
[ ] - (759) Herbicides, Triazine (EPA 507)
[ ] - (751) Hydrocarbon Fuel Screen (EPA M-8015)
[ ] - (760) Organochlorine Pesticides (EPA 505)
[ ] - (761) Organophosphate Pesticides (EPA 507)
[ ] - (767) Polychlorinated Biphenyls (PCB's) in Oil
[ ] - (762) SDWA Synthetic Org. Cmpds. (SLD 758/760)
[ ] - (782) Total Petroleum Hydrocarbons (EPA 418.1)

Remarks:



Please RETAIN A COPY of your completed form

#2

RECEIVED
JUN 30 2004
OIL CONSERVATION DIVISION

History of Drilling Water Well No. 2

North Well

Well No. 2 was spudded in on September 24, 1956, by a Franks 5,000 Rotary Rig owned by The Barron Drilling Company of Farmington, New Mexico. A 12-3/4" bit was used to a depth of 227 feet, the depth at which the alluvial fill was depleted and no further surface water was encountered. The hole was then reamed with a 20" reamer back to the 227 foot level and 16" O.D. casing was set and cemented by The Halliburton Company. It should be noted that the sand stratum in this well carried much deeper than in Well No. 1. A total of 200 sacks of cement was used to cement the 227 feet of surface casing.

The hole was reduced to a 15" hole, using a 12-3/4" bit after the cement had set for 24 hours. The drilling was moderately easy until a hard formation was hit at 312 feet and continued through the stratum at 390 feet. The conglomerate at 390 feet did not contain water although it had all the necessary characteristics. From 400 feet to 580 feet, the stratum was very hard and slow drilling - Mudstone, which contained considerable gypsum and gravel mineral particles. In this formation, there was some mud dilution as it was necessary to bring the mud weight up to 11.0 pounds. The second water pay was hit in the aquifer of sandstone from 580 feet to 620 feet. This was not, however, the Glorietta formation, but does produce some water pay. Drilling became very slow and one more aquifer was hit in the lower red member at 630 feet which produced a small quantity of water. The first indication of the Glorietta was struck at 725 feet but this aquifer was only 15 feet in thickness. However, it seemed to yield considerable water as mud dilution became a problem. It was now necessary to go to 12 pound mud to hold the drive from this level. The main Glorietta formation was struck at 792 feet and carried through to 885 feet.

At 950 feet, a crevice was struck and circulation was lost completely. It was necessary to add over 600 sacks of lost-circulation material before the crevice could be plugged. After circulation was restored, the crevice was cemented by The Halliburton Company from 945 feet to 965 feet and allowed to set for 24 hours. Drilling was then resumed and the hole drilled through the cement with no further trouble. The Yeso formation played out at 1,070 feet and the drilling stopped.

The 12" casing was run and, due to caving, was stuck at 965 feet, the point at which the crevice cementing was terminated. It was then necessary to clear the hole with ~~a 9-3/4" bit and run a second string of pipe. The 8-7/8" O.D. casing was set at~~ 950 feet to 1,075 feet and a cement plug at the bottom.

The well was shot perforated by Schlumberger, six (6) shots to the foot, alternating six shots of jets and six shots of bullets as indicated on the well graph. After perforating, the well flowed 270 gpm artesian and developed 140 pounds shut-in pressure.

Smith Machinery Company ran the pumping test with a 10" turbine set at 600 feet. The results of which indicated that the well will produce 370 gpm steady at 600 feet which is 100 to 150 feet above the main producing aquifer in this well. With submersible pump set at 900 feet, this well should produce at least 500 gpm with no detrimental effects on the well.

J. E. Druley
January 14, 1957

LITHOLOGIC LOG

CINIZA REFINERY

Water Well No. 2

| Material | Thickness (feet) | Depth (feet) |
|---|---|---|
| QUATERNARY: | | |
| ALLUVIUM: | | |
| Clay and Sand | 74 | 74 |
| Sand, pale-red (10R 4/2), very fine to medium grains; subangular to rounded; clear and frosted quartz, minor dark minerals and gypsum; weak calcareous cement | 116 | 190 |
| TRIASSIC: | | |
| CHINLE FORMATION: | | |
| Petrified Forest member: | | |
| Mudstone, grayish-red (5R 4/2) mottled with white; minor dark minerals | 10 | 200 |
| Sandstone, grayish-red-purple (5RP 4/2) and white, very-fine to medium-grained; poorly sorted; subangular to rounded grains; frosted to clear quartz, minor to abundant dark minerals; calcareous; some mudstone, possibly caved from higher zone. | 30 | 230 |
| Siltstone, grayish-red-purple (5RP 4/2) and white; some clay and medium to coarse sand; minor dark minerals | 30 | 260 |
| Mudstone, grayish-purple (5RP 4/2) and white; some shaly partings; minor gypsum; noncalcareous<br>Mudstone, white to light-gray (N7); some gypsum; non-calcareous<br>Mudstone, grayish-red-purple (5RP 4/2) and light-gray (N7); minor gypsum; sandy in lower part, quartz and dark minerals; noncalcareous | 50 | 310 |

| | Thickness (feet) | Depth (feet) |
|---|---|---|
| Sandstone, grayish-red (5R 4/2), very-fine to very-coarse grained; gravel up to 6mm across; angular to subangular; pebbles are sandy siltstone; some clay; noncalcareous - small gravel scattered. | 30 | 340 |
| Siltstone, grayish-red (5R 4/2); fine to coarse sand and pebbles of sandstone and siltstone common; limonite and dark minerals rare; calcareous. | | |
| Siltstone, grayish-red (5R 4/2) and white; very fine to fine frosted grains of quartz sand; dark minerals common, mica rare, secondary calcite abundant. | | |
| Siltstone, grayish-red (5R 4/2); limonite and dark minerals rare; gypsum abundant; calcareous | 50 | 390 |
| Conglomerate, grayish-red (5R 4/2) and white, very-fine to fine pebbles of siltstone and sandstone, angular to subrounded; some calcareous material | 10 | 400 |
| Mudstone, grayish-red (5R 4/2); slightly shaly parting; minor limonite; noncalcareous; some gravel | | |
| Mudstone, grayish-red (10R 4/2) to grayish-red-purple mottled with white; minor limonite; calcareous | | |
| Mudstone, grayish-red (10R 4/2) to grayish-red-purple; minor limonite; calcareous; very-fine to fine gravel composed of grayish-red siltstone and sandstone common, more dark minerals in gravel than in 390-400 foot interval | | |
| Mudstone, grayish-red (10R 4/2); gypsum common; calcareous | | |
| Mudstone, grayish-red (10R 4/2) to dark-reddish-brown (10R 3/4); partly sandy; quartz and dark minerals rare, gypsum abundant; calcareous | 178 | 578 |
| Lower Red member: | | |
| Sandstone, light-gray (N7) to grayish-red-purple (5RP 4/2), very-fine grained to silty; poorly sorted; abundant quartz and dark minerals, minor limonite; calcareous | | |
| Sandstone, light-gray (N7) to grayish-purple (5RP 4/2), very-fine grained to coarse grained; poorly sorted; some very-fine gravel; grains are stained and frosted quartz, minor dark minerals, and siltstone; calcareous; gravel increases in lower part | 43 | 621 |
| Mudstone, grayish-red-purple (5RP 4/2) and white; minor gypsum; some clear to frosted quartz sands and minor dark minerals; calcareous | | |
| Mudstone, pale-reddish-brown (10R 5/4) and white; gypsum common; some sand and gravel; calcareous | 24 | 645 |
| Sandstone, light-brownish-gray (5YR 6/1) to pale-reddish-brown (10R 5/4), very-fine to medium-grained; poorly sorted; stained and frosted quartz abundant, dark minerals common, limonite rare; noncalcareous | 26 | 671 |

| | Thickness (feet) | Depth (feet) |
|---|---|---|
| Siltstone, pale-red (10R 6/2), well sorted; minor sand; calcareous | 43 | 714 |
| Shinarump member: | | |
| Mudstone, grayish-red (10R 4/2) and mottled white; angular to subangular sand and gravel common; grains are chiefly light-gray sandstone, greenish-gray siltstone, and grayish-red-purple mudstone, minor limestone | 5 | 719 |
| Siltstone, pale-red (10R 6/2), poorly sorted; stained quartz sand common, minor dark minerals and limonite; calcareous | 5 | 724 |
| Moenkopi formation: | | |
| Sandstone, pale-red (10R 6/2) to yellowish-gray (5Y 8/1), medium to very-fine grained and silty; poorly sorted; chiefly clear quartz, minor stained quartz and dark minerals, mica rare; calcareous; some limestone and mudstone pebbles. Sandstone, silty, grayish-orange-pink (5YR 7/2), fine grained; well sorted; clear quartz, minor dark minerals and limonite; weak calcareous cement | 15 | 739 |
| Siltstone, grayish-red-purple (5RP 6/2); well sorted; minor dark minerals; strongly calcareous | 11 | 750 |
| Mudstone, grayish-red-purple (5RP 6/2), grayish-red (10R 4/2), and light-gray (N7); minor dark minerals and limonite; noncalcareous Mudstone, light-gray (N7) to grayish-red-purple (5RP 4/2), light color caused by leaching; some sand and very-fine to fine gravel; curved partings prominent; dark minerals common; noncalcareous | 32 | 782 |
| Conglomerate, various colors, fine to medium grained; angular to subrounded; pebbles are chiefly medium-dark-gray (N4) cherty limestone | 10 | 792 |
| PERMIAN: | | |
| GLORIETTA FORMATION: | | |
| Sandstone, grayish-orange-pink (5YR 7/2), very-fine to fine grained; medium sorting; subrounded to rounded; clear quartz, minor dark minerals and limonite; strong calcareous cement Sandstone, grayish-orange-pink (10R 8/2_ and yellowish-gray (5Y 8/1), very-fine to fine grained; some silt; minor dark minerals, limonite common, highly calcareous | 93 | 885 |

| | Thickness (feet) | Depth (feet) |
|---|---|---|
| YESO FORMATION: | | |
| Upper member: | | |
| Mudstone, grayish-red (10R 4/2); grayish-red-purple (5RP 4/2), and light-gray (N7); dark minerals rare, minor limonite; partly calcareous | 10 | 895 |
| Sandstone, grayish-orange-pink (5YR 7/2) to pale-red (10R 6/2), very-fine to fine grained; subrounded to rounded; minor dark minerals and limonite; calcareous<br>Sandstone, very-pale-orange (10YR 8/2), very-fine grained and silty; sorting poor to medium; clear quartz; silica cement; dark minerals and limonite rare; noncalcareous | 55 | 950 |
| Crevice | 10 | 960 |
| Sandstone, moderate-orange-pink (5YR 8/4), very-fine to fine grained and silty; poorly sorted; clear to frosted quartz, silica cement; dark minerals and limonite rare; calcareous<br>Sandstone, pale-red (10R 6/2) to pale-brown (5YR 5/2), very-fine to fine grained and silty; clear and stained quartz, dark minerals and limonite common; calcareous<br>Sandstone, white to pinkish-gray (5YR 8/1), very-fine grained; subrounded; sorting good; clear quartz, silica cement, dark minerals and limonite rare; noncalcareous | 80 | 1,040 |
| Siltstone, light-brown (5YR 6/4) to moderate-brown (5YR 4/4); has appearance of soil; some quartz sand and bands of white calcareous material; highly calcareous<br>Siltstone, grayish-red (5R 4/2) and white; grains of frosted quartz and dark minerals rare; medium calcareous; some light-olive-gray (5Y 6/1), finely crystalline limestone and some dark minerals and mica in lower part; noncalcareous | 10 | 1,050 |
| Sandstone, light-olive-gray (5Y 6/1) and yellowish-gray very-fine grained and silty; some medium quartz grains; poorly sorted; noncalcareous; some greenish-gray (5GY 6/1) calcareous mudstone | 20 | 1,070 |
| Mudstone, grayish-red (5R 4/2); fine grained quartz and dark minerals common; calcareous | 5 | 1,075 |

J.E.D.
1/14/57

EL PASO NATURAL GAS PRODUCTS COMPANY

Water Analysis

Water Well No. 2 — Ciniza Refinery

Sampled: November 15, 1956 by Jim Druley

| | |
|---|---|
| Total Hardness as $CaCO_3$ | 625 |
| Calcium as $CaCO_3$ | 460 |
| Magnesium as $CaCO_3$ | 155 |
| P - Alkalinity | 0 |
| Total Alkalinity as $CaCO_3$ | 168 |
| Chlorides as Cl | 16 |
| Sulfate as $SO_4$ | 440 |
| Silica as $SiO_2$ | 6 |
| Total Iron as Fe | 0.9 |
| Color No. | N.L. |
| pH | 7.2 |

All results expressed as parts per million.

J.E.D.
1/14/57

# TEST DATA

## Water Well No. 2

Test Pump: 10" Peerless, 12 Stages, Set at 600 Feet

| Pumping Level - Feet | GPM | Remarks |
|---|---|---|
| 285 | 220 | Muddy - 1 Hour |
| 365 | 260 | Pumped - 1 Hour |
| 465 | 290 | Pumped - 1 Hour |
| 510 | 330 | Pumped - 1 Hour |
| 600 | 370 | Pumped - 4 Days |

Note: At a pumping rate of 370 GPM at 600 feet, the pumping level raised to 550 feet after four days pumping. The well recovered it's artesian flow of 270 GPM in 14 minutes after pump was shut off. Shut-in pressure on this well is 140 psig, the same as Well No. 1.

J.E.D.
1/14/57

# SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700 — 700 Camino de Salud, NE
Albuquerque, NM 87196-4700 — [505]-841-2500
AIR & HEAVY METALS SECTION [505]-841-2553


*June 14, 1995*

Request
ID No. 121090

## ANALYTICAL REPORT
## SLD Accession No. HM-95-2364

*Distribution*
(x) User 55000
(x) Submitter 69
(X) Client
(x) SLD Files

*To:* Lynn Shelton
Giant Refining Company
Route 3 Box 7
Gallup, NM 87305

*From:* Air & Heavy Metals Section
Scientific Laboratory Division
700 Camino de Salud, NE
P.O. Box 4700
Albuquerque, NM 87196-4700

*Re:* **A water,Pres/Nonfiltered sample submitted to this laboratory on April 25, 1995**

*User:*
Richard Asbury
Drinking Water Bureau
NM-ED Dist. #3 Office
1001 N. Solano Drive
Las Cruces, NM 88001

*Submitter:*
Joe Winkler
ED Field Office, Gallup
306 S. 5th Street
Gallup, NM 87301-6424

### DEMOGRAPHIC DATA

*COLLECTION*
*On:* 24-Apr-95 *By:* Pre . . .
*At:* 8:00 hrs. *In/Near:* Gallup

*LOCATION*
*WSS #:* 602-17; #2 South
Giant Refining Company

### ANALYTICAL RESULTS

| Analysis | | Value | Units | Analyst |
|---|---|---|---|---|
| Arsenic | | 0.0030 | mG/L | |
| Barium | < | 0.1000 | mG/L | |
| Cadmium | < | 0.0010 | mG/L | |
| Chromium | < | 0.0010 | mG/L | |
| Mercury | < | 0.0005 | mG/L | |
| Selenium | < | 0.0050 | mG/L | |
| Nickel | | 0.0100 | mG/L | |
| Beryllium | < | 0.0010 | mG/L | |

**Laboratory Remarks:**

Antimony= <0.001 mg/l.
Thallium= <0.001 mg/l.
Mercury by method 245.1 on 5/12/95 by RAH.
Selenium by method 270.2 on 5/26/95 by MF.
ICP-MS by method 200.8 on 6/5/95 by SP for As, Ba, Cd, Cr, Ni, Be, Sb, Tl.

**Reviewed By:** _____
Ron Amato 06/14/95
*Supervisor, Air & Heavy Metals Section*

STATE OF NEW MEXICO

DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700
Albuquerque, NM 87196-4700

700 Camino de Salud, NE
[505] 841-2500

ORGANIC CHEMISTRY SECTION [505] 841-2570

WATER SUPPLY SYSTEM (wss): ☑
Giant Refining Company
Route 3 Box 7
Gallup, NM 87301

REQUEST ID No.: 130404
SLD No.: 9502025

RECEIVED AT SLD: 4/24/95
☐ SLD COPY

N.M.E.D. DRINKING WATER BUREAU: ☐
Richard Asbury
Drinking Water Bureau
NM-ED Dist. #3 Office
1001 N. Solano Drive
Las Cruces, NM 88001

ED FIELD OFFICE: ☐
ED Field Office, Gallup
306 S. 5th Street
Gallup, NM 87301

SAMPLE COLLECTION DATE: 4/24/95 TIME: 805 BY: Pre
SAMPLE LOCATION: #2 South
WSS #: 60217 REPORTING UNITS: ug/L

## EPA METHOD 504 SDWA EDB and DBCP BY ECD

DATE EXTRACTED: 4/29/95 5 Days: Within EPA Holding Time
DATE ANALYZED: 4/29/95 5 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 17.5

ANALYSIS No.: OR- 9502025
SLD BATCH No.: 207A95
DILUTION FACTOR: 2.00
REQUEST ID No.: 130404

SAMPLE PRESERVATION: Sample Temperature when received: 8 Degrees C.; pH = <2
COMPOSITED WITH SLD No.(s): 9502030

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 106-93-4 | 1,2-Dibromoethane (EDB) | | U | 0.04 | 0.05 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane (DBCP) | | U | 0.04 | 0.2 |

| | | | % RECOVERY |
|---|---|---|---|
| SURROGATE: | 1,1,2,2-Tetrachloroethane spiked at 0.57 ug/L | 0.58 | 101.8 % |

Surrogate Recovery: Within Normal Range of 80 - 120%

ANALYST: Nancy DeWitt QC APPROVED BY: Roberta Hine

## EPA METHOD 515.1 SDWA ACID HERBICIDES BY ECD

DATE EXTRACTED: 5/2/95 8 Days: Within EPA Holding Time
DATE ANALYZED: 5/3/95 9 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 125

ANALYSIS No.: OR- 9502025
SLD BATCH No.: 219A95
DILUTION FACTOR: 8.00
REQUEST ID No.: 130404

SAMPLE PRESERVATION: Sample Temperature when received: 8 Degrees C.; pH = <2
COMPOSITED WITH SLD No.(s): 9502030

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 75-99-0 | Dalapon | | U | 0.32 | 200 |
| 1918-00-9 | Dicamba | | U | 0.72 | Unreg. |
| 94-75-7 | 2,4-D | | U | 2.40 | 70 |
| 87-86-5 | Pentachlorophenol (PCP) | | U | 0.32 | 1 |
| 93-72-1 | 2,4,5-TP (Silvex) | | U | 3.20 | 50 |
| 88-85-7 | Dinoseb | | U | 6. | 7 |
| 1918-02-1 | Picloram | | U | 16. | 500 |

ANALYST: MaryLou LaCasse QC APPROVED BY: Roberta Hine

## EPA METHOD 531.1 SDWA CARBAMATE PESTICIDES BY HPLC

DATE EXTRACTED: 5/10/95
DATE ANALYZED: 5/10/95 16 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 0.2

ANALYSIS No.: OR- 9502025
SLD BATCH No.: 223A95
DILUTION FACTOR: 2.00
REQUEST ID No.: 130404

SAMPLE PRESERVATION: Sample Temperature when received: 8 Degrees C.; pH = 3
COMPOSITED WITH SLD No.(s): 9502030

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 116-06-3 | Aldicarb | | U | 1.2 | Unreg. |
| 1646-88-4 | Aldicarb Sulfone | | U | 0.8 | Unreg. |
| 1646-87-3 | Aldicarb Sulfoxide | | U | 0.6 | Unreg. |
| 114-26-1 | Baygon | | U | 1.4 | Unreg. |
| 63-25-2 | Carbaryl (Sevin) | | U | 1.4 | Unreg. |
| 1563-66-2 | Carbofuran | | U | 0.8 | 40 |
| 16655-82-6 | 3-Hydroxycarbofuran | | U | 1.4 | Unreg. |
| 2032-65-7 | Methiocarb | | U | 1.2 | Unreg. |
| 16752-77-5 | Methomyl | | U | 1.4 | Unreg. |
| 23135-22-0 | Oxamyl | | U | 1.4 | 200 |

ANALYST: Arnold Bentz QC APPROVED BY: Roberta Hine

## EPA METHOD 547 SDWA GLYPHOSATE BY HPLC

DATE EXTRACTED: 5/2/95
DATE ANALYZED: 5/2/95 8 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 0.025

ANALYSIS No.: OR- 9502025
SLD BATCH No.: 223A95
DILUTION FACTOR: 2.00
REQUEST ID No.: 130404

SAMPLE PRESERVATION: Sample Temperature when received: 8 Degrees C.
COMPOSITED WITH SLD No.(s): 9502030

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 1071-83-6 | Glyphosate | | U | 10. | 700 |

ANALYST: Arnold Bentz QC APPROVED BY: Roberta Hine

## EPA METHOD 548.1 SDWA ENDOTHALL BY GC/FID/MS

DATE EXTRACTED: 4/27/95 3 Days: Within EPA Holding Time
DATE ANALYZED: 4/29/95 5 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 40

ANALYSIS No.: OR- 9502025
SLD BATCH No.: 204A95
DILUTION FACTOR: 2.50
REQUEST ID No.: 130404

SAMPLE PRESERVATION: Sample Temperature when received: 8 Degrees C.
COMPOSITED WITH SLD No.(s): 9502030

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|
| 145-73-3 | Endothall | | U | 25. | 100 |

ANALYST: MaryLou LaCasse QC APPROVED BY: Roberta Hine

## EPA METHOD 549.1 SDWA DIQUAT BY HPLC/UV

DATE EXTRACTED: 4/28/95 4 Days: Within EPA Holding Time
DATE ANALYZED: 5/4/95 10 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 125

ANALYSIS No.: OR- 9502025
SLD BATCH No.: 208A95
DILUTION FACTOR: 2.00
REQUEST ID No.: 130404

SAMPLE PRESERVATION: Sample Temperature when received: 8 Degrees C.; pH = <2
COMPOSITED WITH SLD No.(s): 9502030

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL. | SDL | MCL |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1071-83-6 | Diquat | | U | 0.80 | 20 |

ANALYST: Tim Chapman QC APPROVED BY: Roberta Hine

## EPA METHOD 525.1 SDWA SOC's BY GC/MS

DATE EXTRACTED: 4/27/95 3 Days: Within EPA Holding Time
DATE ANALYZED: 5/1/95 7 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 500

ANALYSIS No.: OR- 9502025
SLD BATCH No.: 209
DILUTION FACTOR: 2.00
REQUEST ID No.: 130404

SAMPLE PRESERVATION: Sample Temperature when received: 8 Degrees C.; pH = <2
COMPOSITED WITH SLD No.(s): 9502030

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL | SDL | MCL |
|---|---|---|---|---|---|
| 15972-60-8 | Alachlor | | U | 1.00 | 2 |
| 309-00-2 | Aldrin | | U | 1.00 | Unreg. |
| 11104-28-2 | Aroclor 1221 | | U | 1.00 | Unreg. |
| 11141-16-5 | Aroclor 1232 | | U | 1.00 | Unreg. |
| 53469-21-9 | Aroclor 1242/1016 | | U | 1.00 | Unreg. |
| 12672-29-6 | Aroclor 1248 | | U | 1.00 | Unreg. |
| 11097-69-1 | Aroclor 1254 | | U | 0.04 | Unreg. |
| 11096-82-5 | Aroclor 1260 | | U | 0.06 | Unreg. |
| 1912-24-9 | Atrazine | | U | 0.02 | 3 |
| 50-32-8 | Benzo[a]pyrene | | U | 0.02 | 0.2 |
| 28184-66-9 | Butachlor | | U | 0.40 | Unreg. |
| 57-74-9 | Chlordane (Total) | | U | 0.04 | 2 |
| 60-57-1 | Dieldren | | U | 0.20 | Unreg. |
| 4337-65-9 | Di(2-ethylhexyl)adipate | 0.02 | | 0.26 | 400 |
| 117-81-7 | Di(2-ethylhexyl)phthalate | 0.34 | | 0.04 | 6 |
| 72-20-8 | Endrin | | U | 0.02 | 2 |
| 76-44-8 | Heptachlor | | U | 0.08 | 0.4 |
| 1024-57-3 | Heptachlor epoxide | | U | 0.26 | 0.2 |
| 118-74-1 | Hexachlorobenzene | | U | 0.02 | 1 |
| 77-47-4 | Hexachlorocyclopentadiene | | U | 0.08 | 50 |
| 58-89-9 | Lindane | | U | 0.04 | 0.2 |
| 72-43-5 | Methoxychlor | | U | 0.02 | 40 |
| 21087-64-9 | Metribuzin | | U | 0.60 | Unreg. |
| 51218-45-2 | Metolachlor | | U | 0.20 | Unreg. |
| 1918-16-7 | Propachlor | | U | 0.60 | Unreg. |
| 122-34-9 | Simazine | | U | 0.20 | 4 |
| 8001-35-2 | Toxaphene | | U | 2.00 | 3 |

ANALYST: Tim Chapman QC APPROVED BY: Roberta Hine

## DEFINITIONS

| | |
|---|---|
| ** | **Concentration Exceeds EPA's allowable Maximum Contamination Level** |
| CAS# | Chemical Abstract Services Number - Unique number to help identify analytes listed by different names |
| CONC. | Concentration (ug/L) of analyte actually detected in the sample |
| QUAL | Qualifier of analytical results as follows:<br>B Analyte was detected in laboratory blank<br>J Analyte was detected at a level below which an accurate quanitation can be given ( ~5 * SDL)<br>U No analyte was detected above the Sample Detection Limit. |
| MCL | Maximum Contamination Level Allowed by EPA for regulated analytes |
| SDL | Sample Detection Limit - The lowest concentration which can be differentiated from Zero with 99% confidence taking sample size (compositing) into account. |
| ug/L | Concentration Units - micrograms per liter which is approximately equivalent to Parts Per Billion (ppb) |

+07

# SDWA SYNTHETIC ORGANIC CONTAMINANT (SOC) ANALYTICAL REQUEST FORM

1 SLD No. OR9502025

SCIENTIFIC LABORATORY DIVISION
700 CAMINO DE SALUD N.E., ALBUQUERQUE, NM 87106
Organic Chemistry Section - Telephone: (505) 841-2570

Date Received: 4/25/95

Request SDWA-Org. ID No. 130404-J

2 User Code #: 5,5,0,0,0 | 3 Request ID No.: | 4 Priority Code #: 3 (If "1" or "2", call ED-SLD Coordinator)

5 Facility Name: Giant Refinery | 6 County: McKinley | 7 City: Gallup | 8 State: NM

9 Sample Location: #2 South

10 Collected By: Dean R. Fall (First / Last) Phone: 320-9851 On: 95/04/24 (Date: YY/MM/DD) At: 0815 hrs. (Time: 24 hr. clock 3:00 pm = 1500 hrs.)

11 Codes: 019 (Submitter) 602-17 (WSS #) WS0313 (Organization)

12 Latitude (DDMMSS) 35°29'12" Longitude (DDDMMSS) 108°20'15" 2 Digit ID (if needed)

13 Report To: Name: Lynn Shelton
Address: Giant Refinery, Rte 3 Box 7
City, State Zip: Gallup, NM 87305

14 Phone #: 722-3833

15 Sample Purpose: ☒ - Compliance; ☐ - NMED Monitoring; ☐ - Confirmation; ☐ - Special; ☐ - Chain of Custody
Sampling Information: ☒ - Grab; ☐ - Composite _____ (Composite Time Period)

16 Field Data: pH: _____, Conductivity: _____ umhos/cm @ Temperature: _____ °C, Chlorine Residual: _____ mg/l, Flow: _____

17 Sample Source:
☐ - Entry Point to Distribution
☐ - Well; Depth: _____
☐ - Spring
☐ - Distribution
☐ - Other: _____

18 Field Remarks: Tap at wall

19 Sample Type: ☒ - Water ☒ - Unchlorinated ☐ - Chlorinated
Approximate Sulfate Concentration - _____ mg/l

20 Preservation: ☒ - Preserved as indicated on back of form. ☐ - Other: _____

21 Analyses Requested: Please check the appropriate box(es) below to indicate the type of analytical screen(s) required and type of Compositing Requested.

☐ - Composite Within this System Only ☐ - Do Not Composite ☒ - Composite With Other Systems

## SAFE DRINKING WATER ACT SYNTHETIC ORGANIC CONTAMINANT (SOC) ANALYSES

☐ All of the Safe Drinking Water Act Synthetic Organic Contaminant (SOC) Screens Listed Below

| | SLD No. | EPA No. | Analysis | SLD Lab Number | | SLD No. | EPA No. | Analysis | SLD Lab Number |
|---|---|---|---|---|---|---|---|---|---|
| ☐ | 775 | 504 | EDB & DBCP | 130404 A & B | ☐ | 781 | 547 | Glyphosate | 130404 E |
| ☐ | 760 | 505 | PCBs & Endrin | N/A | ☐ | 702 | 548.1 | Endothall | F |
| ☐ | 758 | 515.1 | Acid Herbicides | 130404 C | ☐ | 783 | 549.1 | Diquat | G |
| ☐ | 772 | 531.1 | Carbamate Pesticides | ↓ D | ☐ | 700 | 525.1 | Semivolatile Pesticides GC/MS | ↓ H |

Remarks:
8°C 0845

STATE OF NEW MEXICO DEPARTMENT OF HEALTH

**SCIENTIFIC LABORATORY DIVISION**

P.O. Box 4700 700 Camino de Salud, NE
Albuquerque, NM 87196-4700 [505]-841-2500
ORGANIC CHEMISTRY SECTION [505]-841-2570

*June 30, 1994*

**Request ID No. 055381**

# ANALYTICAL REPORT
## SLD Accession No. OR-94-1537

*Distribution*
(x) User 55000
(x) Submitter 69
(X) Client
(x) SLD Files

*To:* Len Shelton
Giant Refining Company
Route 3 Box 7
Gallup, NM 87301

*From:* Organic Chemistry Section
Scientific Laboratory Division
700 Camino de Salud, NE
P.O. Box 4700
Albuquerque, NM 87196-4700

*Re:* **A water,Purgeable sample submitted to this laboratory on May 18, 1994**

*User:*
Richard Asbury
Drinking Water Bureau
NM-ED Dist. #3 Office
1001 N. Solano Drive
Las Cruces, NM 88001

*Submitter:*
Joe Winkler
ED Field Office, Gallup
306 S. 5th Street
Gallup, NM 87301-6424

**DEMOGRAPHIC DATA**

| *COLLECTION* | | *LOCATION* |
|---|---|---|
| *On:* 17-May-94 | *By:* Win . . . | *WSS #:* 602-17; Well No2 |
| *At:* 11:05 hrs. | *In/Near:* Gallup | Giant Refining Company |

**ANALYTICAL RESULTS: SDWA VOC-I [EPA-502.2] Screen {774}**

| Parameter | Value | Note | PQL | Units |
|---|---|---|---|---|
| Halogenated Volatiles (42) | 0.00 | N | 0.50 | ppb |

See Laboratory Remarks for Additional Information

*Notations & Comments:*

PQL = Practical Quantitation Level.

A = Approximate Value; N = None Detected above Detection Limit; P = Compound Present, but not quantified;
T = Trace (<Detection Limit); U = Compound Identity Not Confirmed.

Evidentiary Seals: Not Sealed [X]; Intact: No [ ], Yes [ ] & Broken By: _____ Date: _____

**Laboratory Remarks:**

A possible trace amount of toluene was detected at .2 ppb by the photoionization detector.

SAFE DRINKING WATER ACT
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: NM SCIENTIFIC LABORATORY DIVISION Contract: N/A
Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

*(Continued on page 2.)*

Matrix: (soil/water) Water
Sample wt/vol: 5.0 (g/mL) mL
Level: (low/med) Low
% Moisture: not dec. N/A dec. N/A
Extraction: (SepF/Cont/Sonc) N/A
GPC Cleanup: (Y/N) No pH: N/D

Lab Sample ID: OR-94-1637
SLD Batch No: 236
Date Received: 05/18/94
Date Extracted: N/A
Date Analyzed: 05/28/94
Dilution Factor: 1
CONCENTRATION UNITS:
(ug/L or ug/Kg): ug/L

This sample was analyzed for the following compounds using EPA Method 502.2

| CAS NO. | COMPOUND | CONC. | Q | PQL |
|---|---|---|---|---|
| 71-43-2 | Benzene | | U | 0.5 |
| 108-86-1 | Bromobenzene | | U | 0.5 |
| 74-97-5 | Bromochloromethane | | U | 0.5 |
| 75-27-4 | Bromodichloromethane | | U | 0.5 |
| 75-25-2 | Bromoform | | U | 0.5 |
| 24-83-9 | Bromomethane | | U | 0.5 |
| 78-93-3 | 2-Butanone (MEK) | | U | 5.0 |
| 104-51-8 | n-Butylbenzene | | U | 0.5 |
| 135-98-8 | sec-Butylbenzene | | U | 0.5 |
| 98-06-6 | tert-Butylbenzene | | U | 0.5 |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | | U | 5.0 |
| 56-23-5 | Carbon tetrachloride | | U | 0.5 |
| 108-90-7 | Chlorobenzene | | U | 0.5 |
| 75-00-3 | Chloroethane | | U | 2.5 |
| 67-66-3 | Chloroform | | U | 0.5 |
| 74-87-3 | Chloromethane | | U | 0.5 |
| 95-49-8 | 2-Chlorotoluene | | U | 0.5 |
| 106-43-4 | 4-Chlorotoluene | | U | 0.5 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | U | 0.5 |
| 124-48-1 | Dibromochloromethane | | U | 0.5 |
| 106-93-4 | 1,2-Dibromoethane | | U | 0.5 |
| 74-95-3 | Dibromomethane | | U | 0.5 |
| 95-50-1 | 1,2-Dichlorobenzene | | U | 0.5 |
| 541-73-1 | 1,3-Dichlorobenzene | | U | 0.5 |
| 106-46-7 | 1,4-Dichlorobenzene | | U | 0.5 |
| 75-71-8 | Dichlorodifluoromethane | | U | 0.5 |
| 75-34-3 | 1,1-Dichloroethane | | U | 0.5 |
| 107-06-2 | 1,2-Dichloroethane | | U | 0.5 |
| 75-35-4 | 1,1-Dichloroethene | | U | 0.5 |
| 156-59-4 | cis-1,2-Dichloroethene | | U | 0.5 |

*(Continued on page 3.)*

| | | | | |
|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethene | | U | 0.5 |
| 78-87-5 | 1,2-Dichloropropane | | U | 0.5 |
| 142-28-9 | 1,3-Dichloropropane | | U | 0.5 |
| 590-20-7 | 2,2-Dichloropropane | | U | 0.5 |
| 563-58-6 | 1,1-Dichloropropene | | U | 0.5 |
| 1006-01-5 | cis-1,3-Dichloropropene | | U | 0.5 |
| 1006-02-6 | trans-1,3-Dichloropropene | | U | 0.5 |
| 100-41-4 | Ethylbenzene | | U | 0.5 |
| 87-68-3 | Hexachlorobutadiene | | U | 0.5 |
| 98-82-8 | Isopropylbenzene | | U | 0.5 |
| 99-87-6 | 4-Isopropyltoluene | | U | 0.5 |
| 75-09-2 | Methylene chloride | | U | 2.5 |
| 91-20-3 | Naphthalene | | U | 0.5 |
| 103-65-1 | Propylbenzene | | U | 0.5 |
| 100-42-5 | Styrene | | U | 0.5 |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | U | 0.5 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | U | 0.5 |
| 127-18-4 | Tetrachloroethene | | U | 0.5 |
| 109-99-9 | Tetrahydrofuran (THF) | | U | 5.0 |
| 108-88-3 | Toluene | | U | 0.5 |
| 87-61-5 | 1,2,3-Trichlorobenzene | | U | 0.5 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | U | 0.5 |
| 71-55-6 | 1,1,1-Trichloroethane | | U | 0.5 |
| 79-00-5 | 1,1,2-Trichloroethane | | U | 0.5 |
| 79-01-6 | Trichloroethene | | U | 0.5 |
| 75-69-4 | Trichlorofluoromethane | | U | 0.5 |
| 96-18-4 | 1,2,3-Trichloropropane | | U | 0.5 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | U | 0.5 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | U | 0.5 |
| 75-01-4 | Vinyl chloride | | U | 2.0 |
| 95-47-6 | o-Xylene | | U | 0.5 |
| N/A | p- & m-Xylene | | U | 0.5 |
| N/A | Total Xylenes | | U | 1.0 |

* Q = Qualifier Definitions:
CONC = CONCENTRATION DETERMINED
PQL = Practical Quantitation Limit (Approximately 5 times MDL)
B - Indicates compound was detected in the Lab Blank as well as in the sample.
D - Indicates value taken from a secondary (diluted) sample analysis.
E - Indicates compound concentration exceeded the range of the standard curve.

*(Continued on page 4.)*

J - Indicates an estimated value for tentatively identified compounds, or for compounds detected and identified but present at a concentration less than the PQL listed.
N - Indicates that more than one peak was used for quantitation.
U - Indicates compound was analyzed for, but not detected at a concentration greater than the concentration listed.

## QUALITY CONTROL SUMMARY FOR VOLATILES SCREEN

METHOD BLANK: A laboratory method blank was analyzed along with this sample to assure the absence of interfering contaminants from lab reagents, instruments, or the general laboratory environment. Unless listed below, no contaminants were detected in this blank above the reported detection limit.

| COMPOUND DETECTED | CONCENTRATION (PPB) |
|---|---|
| No Compounds Detected | |

SURROGATE RECOVERIES:

| SURROGATE | CONCENTRATION | % RECOVERY |
|---|---|---|
| Bromofluorobenzene (PID Surr) | 10.0 ppb | 98.7 |
| Bromofluorobenzene (HALL Surr) | 10.0 ppb | 110.0 |

SPIKE RECOVERY: The % recoveries for compounds in the batch spike were from 80% to 120% with the exception of the compounds listed below:

| COMPOUND | CONCENTRATION | % RECOVERY |
|---|---|---|
| Acetone | 10.0 ppb | 123.0 |

**Analyst:** Nancy DeWitt
*Analyst, Organic Chemistry*

**Reviewed By:** Richard F. Meyerhein 06/02/94
*Supervisor, Organic Chemistry Section*

# ORGANIC CHEMISTRY ANALYTICAL REQUEST FORM

SCIENTIFIC LABORATORY DIVISION
700 CAMINO DE SALUD N.E., ALBUQUERQUE, NM 87106
Organic Chemistry Section - Telephone: (505) 841-2570

SLD No. 0R94 1537 C

Request ID No. 055381-C

Date Received: 5-18-94

2 User Code #: 5500

3 Request ID No.:

4 Priority Code #: 3 (1 or 2 call ED SLD Coordinator)

5 Facility Name: GIANT REFINING

6 County: McKINLEY

7 City: GALLUP

8 State: N.M.

9 Sample Location: WELL NO 2

10 Collected By: Joe (First) WINKLER (Last) 722-4160 On: 94/05/17 (Date: YY/MM/DD) At: 1105 hrs. (Time: 24 hr. clock 3:00 pm = 1500 hrs.)

11 Codes: 0651 Submitter; 602-17 WSS #; W5010 0 Organization

12 Latitude (DDMMSS) °' "

Longitude (DDDMMSS) °' "

2 Digit ID (if needed)

13 Report To: Name: LEN SHELTON

Address: GIANT REFINING, ROUTE 3, BOX 7

City, State Zip: GALLUP, NM 87305

14 Phone #: 722-3833

15 Sampling Information:

Sample Purpose:
- [x] Compliance
- [ ] NMED Monitoring
- [ ] Confirmation
- [ ] Special

- [x] Grab
- [ ] Composite (Composite Time Period)
  - [ ] Flow Proportioned
  - [ ] Equal Aliquot
  - [ ] Sample Split w/Permittee
  - [ ] Chain of Custody

16 Field Data: pH: _____, Conductivity: _____ umhos/cm @ Temperature: _____ °C, Chlorine Residual: _____ mg/l, Flow: _____

17 Sample Source:
- [ ] Stream
- [ ] Lake
- [ ] Drain
- [ ] Pool
- [ ] WWTP
- [x] Entry Point to Distribution
- [ ] Well; Depth: 1000 ft
- [ ] Spring
- [ ] Distribution
- [ ] Other: _____

18 Field Remarks: SAMPLE TAKEN AT WELL NO. -1:

19 Sample Type:
- [x] Water
- [ ] Wastewater
- [ ] Unchlorinated
- [x] Chlorinated
- [ ] Soil, [ ] Food, [ ] Other _____

This form accompanies a single sample consisting of:
2 - septum vial(s) (volume = 40 ml ea.)
____ - glass jug(s) (volume = ____ ml ea.)
____ - _____ (volume = _____)

20 Preservation:
- [ ] NP — No Preservation; Sample stored at room temperature
- [ ] P-Ice — Sample stored in an ice bath (Not Frozen)
- [ ] P-TS — Sample Preserved with Sodium Thiosulfate to remove chlorine residual
- [x] P-HCl — Sample Preserved with Hydrochloric Acid (2 drops/40 ml)
- [ ] P-$HgCl_2$ — Sample Preserved with 20 mg/l Mercuric Chloride
- [ ] Other _____

21 Analyses Requested: Please check the appropriate box(es) below to indicate the type of analytical screen(s) required. Whenever possible, list specific compounds suspected or required, and note below whenever highly contaminated samples are suspected.

## Volatile Screens:

- [ ] (753) Aliphatic Headspace (Qualitative Screen)
- [ ] (754) Aromatic & Halogenated Purgeables (EPA 601/2)
- [ ] (765) Mass Spectrometer Purgeables (EPA 624)
- [ ] (766) SDWA Total Trihalomethanes (EPA 501.1)
- [x] (774) SDWA VOC's I [21 REGULATED +] (EPA 502.2)
- [ ] (775) SDWA VOC's II [EDB & DBCP] (EPA 504)
- [ ] (790) Composite Sample for Analysis No. _____

## Semivolatile Screens:

- [ ] (755) Base/Neutral Extractables (EPA 625)
- [ ] (756) Base/Neutral/Acid Extractables (EPA 8270)
- [ ] (772) Carbamate Pesticides (EPA 531.1)
- [ ] (758) Herbicides, Chlorophenoxy Acid (EPA 515.1)
- [ ] (759) Herbicides, Triazine (EPA 507)
- [ ] (751) Hydrocarbon Fuel Screen (EPA M-8015)
- [ ] (760) Organochlorine Pesticides (EPA 505)
- [ ] (761) Organophosphate Pesticides (EPA 507)
- [ ] (767) Polychlorinated Biphenyls (PCB's) in Oil
- [ ] (762) SDWA Synthetic Org. Cmpds. (SLD 758/760)
- [ ] (782) Total Petroleum Hydrocarbons (EPA 418.1)

## Other Specific Compounds or Classes:

- [ ] - ( ) _____
- [ ] - ( ) _____

Remarks:

RECEIVED

STATE OF NEW MEXICO

# SCIENTIFIC LABORATORY DIVISION

P.O Box 4700
Albuquerque, NM 87196-4700
AIR & HEAVY METALS SECTION

700 Camino de Salud, NE
(505)-841-2500
(505)-841-2553

DEPARTMENT OF HEALTH
JUN 3 0 2004
OIL CONSERVATION DIVISION

SAMPLE COLLECTION: DATE: 4/14/2003 TIME: 10:23
MATRIX: wpn BY: HERRERA
FACILITY: Giant Refining Company
SAMPLING LOCATION: EP#1 ID#4

SLD No.: HM-200300439
REQUEST ID No.: 2344097
RECEIVED AT SLD: 4/15/2003
USER: 55000
SUBMITTER: 60
WSS #: NM3560217
Giant Refining Company

To: Client

Giant Refining Company
Route 3 Box 7
Gallup, NM 87305

DISTRIBUTION TO:
User
Submitter
Client
SLD

Practical Quantitation Limit (PQL) is defined as 10 times the Method Detection Limit (MDL)

## ANALYTICAL RESULTS

| Element | Result | Units | Analysis Date | Method | PQL | Dilution Factor | Sample Det. Limit. | Analyst | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Arsenic | 0.003 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Barium | <0.1 | mg/L | 5/27/2003 | 200.8 | 0.1 | 1 | 0.1 | SMP | H |
| Beryllium | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Cadmium | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Chromium | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Mercury | <0.0002 | mg/L | 4/23/2003 | 245.1 | 0.0002 | 1 | 0.0002 | HKM | |
| Nickel | <0.01 | mg/L | 5/27/2003 | 200.8 | 0.01 | 1 | 0.01 | SMP | C H |
| Selenium | <0.005 | mg/L | 5/19/2003 | 200.9 | 0.005 | 1 | 0.005 | NCB | |
| Thallium | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |

Laboratory Comments:

Reviewed by: Ron Amato
*Supervisor, Air & Heavy Metals Section*
Printed: 5/30/2003

Data Qualifier Codes and Definitions

A = See comments section below.
B = Laboratory Reagent Blank (RB)
C = Spike recovery between 80-120%
D = Spike recovery <80% or >120%
E = Over Calibration Range
F = Matrix interference suspected
G = Inconsistent results
H = Analyzed in duplicate
I = Analyzed in Triplicate
J = Estimated Quantity only.
K = Holding time exceeded
L = Equals or exceeds USEPA MCL
M = Equals or exceeds USEPA action level
N = Insufficient sample to verify results
O = Internal Standards(ICP-MS) <60% or >125% when analyzed straight
R = Results based on 4 or more duplicates.
S = Relative Percent Difference between duplicates > 10%(waters)
T = Relative Percent Difference between duplicates > 30%(soils).

3

RECEIVED
4 2004
GIANT REFINING CO.
CINIZA REFINERY

STATE OF NEW MEXICO — DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700 — 700 Camino de Salud, NE
Albuquerque, NM 87196-4700 — (505) 841-2500
ORGANIC CHEMISTRY SECTION (505) 841-2571

☑ REPORT TO CLIENT

Giant Refining Company
Route 3 Box 7
Gallup, NM 87305

**SLD No.: OR- 200301104**

REQUEST ID No.: 2328044
RECEIVED AT SLD: 4/15/03
☐ SLD COPY — USER: 55000

☐ ED FIELD OFFICE

NMED District #1 Office, Albuquerque
Drinking Water Bureau
4131 Montgomery Blvd, NE
Albuquerque, NM 87109

☐ N.M.E.D. DRINKING WATER BUREAU

Gilbert Salas
Drinking Water Bureau (Central Files)
NMED
525 Camino de Los Marquez, Suite 4
Santa Fe NM 87502

SAMPLE COLLECTION: DATE: 4/14/03 TIME: 1025 BY: HERRERA
FACILITY NAME: GIANT REFINING COMPANY
SAMPLING LOCATION: EP#1 ID#4
WSS #: NM3560217 REPORTING UNITS: ug/L

## EPA METHOD 504.1 SDWA EDB, TCP, and DBCP by GC/ECD

DATE EXTRACTED: 4/22/03 — 8 Days: Within EPA Holding Time
DATE ANALYZED: 4/25/03 — 11 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 34.0

ANALYSIS No.: OR- 200301104
SLD BATCH No.: 104
DILUTION FACTOR: 1.03
REQUEST ID No.: 2328044

SAMPLE PRESERVATION: Sample Temperature when received: 4 Degrees C.
COMPOSITED WITH SLD No.(s): NOT COMPOSITED

**No 504 Compounds Detected.**

| CAS | ANALYTE NAME | CONC. (ug/L) | QUAL | SDL | MCL |
|---|---|---|---|---|---|
| 106-93-4 | 1,2-Dibromoethane (EDB) | | U | 0.005 | 0.05 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane (DBCP) | | U | 0.007 | 0.2 |
| 96-18-4 | 1,2,3-Trichloropropane (123TCP) | | U | 0.010 | Unreg. |

| | | | % RECOVERY |
|---|---|---|---|
| SURROGATE: | 1,1,1,2-Tetrachloroethane (spiked at 0.05 ug/L) | 0.046 | 89 % |

Surrogate Recovery: Within Normal Range of 70 - 130%

ANALYST: ADAM S. PIMENTEL QC APPROVED BY: MICHAEL TRUJILLO

## EPA METHOD 508.1 SDWA POLYCHLOROBIPHENYLS and TOXAPHENE by GC/ECD

DATE EXTRACTED: 4/23/03 — 9 Days: Within EPA Holding Time
DATE ANALYZED: 5/21/03 — 28 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 960

ANALYSIS No.: OR- 200301104
SLD BATCH No.: 104
DILUTION FACTOR: 1.04
REQUEST ID No.: 2328044

SAMPLE PRESERVATION: Sample Temperature when received: 4 Degrees C.; pH = 2
COMPOSITED WITH SLD No.(s): NOT COMPOSITED

**No PCBs or Toxaphene Detected.**

| CAS | ANALYTE NAME | CONC. (ug/L) | QUAL | SDL | MCL |
|---|---|---|---|---|---|
| 11104-28-2 | Aroclor 1221 | | U | 0.09 | 0.5 |
| 11141-16-5 | Aroclor 1232 | | U | 0.06 | 0.5 |
| 53469-21-9 | Aroclor 1242/1016 | | U | 0.07 | 0.5 |
| 12672-29-6 | Aroclor 1248 | | U | 0.05 | 0.5 |
| 11097-69-1 | Aroclor 1254 | | U | 0.05 | 0.5 |
| 11096-82-5 | Aroclor 1260 | | U | 0.03 | 0.5 |
| 57-74-9 | Chlordane (Total) | | U | 0.05 | 2 |
| 8001-35-2 | Toxaphene | | U | 0.51 | 3 |

| | | | % RECOVERY |
|---|---|---|---|
| SURROGATE: | Decachlorobiphenyl | 0.484 | 96.8 % |

Surrogate Recovery: Within Normal Range of 70 - 130%

ANALYST: Cliff Kear QC APPROVED BY: Sandra Oliver

## EPA METHOD 515.2 SDWA ACID HERBICIDES by GC/ECD

ANALYST: Sandra Oliver QC APPROVED BY: Greg Bybee

## EPA METHOD 548.1 SDWA ENDOTHALL by GC/MS

DATE EXTRACTED: 4/21/03 7 Days: Within EPA Holding Time
DATE ANALYZED: 4/22/03 1 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 12.5

ANALYSIS No.: OR- 200301104
SLD BATCH No.: 104
DILUTION FACTOR: 2.00
REQUEST ID No.: 2328044

SAMPLE PRESERVATION: Sample Temperature when received: 4 Degrees C.
COMPOSITED WITH SLD No.(s): NOT COMPOSITED No Endothall Detected.

| CAS | ANALYTE NAME | CONC (ug/L) | QUAL | SDL | MCL |
|---|---|---|---|---|---|
| 145-73-3 | Endothall | | U | 4 | 100 |

| | | | % RECOVERY |
|---|---|---|---|
| SURROGATE: | 5-Norborene-2,3-dicarboxylic acid | 80.5 | 80.5 |

Surrogate Recovery: Within Normal Range of 65 - 130%

ANALYST: G.Bybee QC APPROVED BY: Sandra Oliver

## EPA METHOD 549.1 SDWA DIQUAT by HPLC/UV-PDA

DATE EXTRACTED: 4/18/03 4 Days: Within EPA Holding Time
DATE ANALYZED: 4/24/03 10 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 250

ANALYSIS No.: OR- 200301104
SLD BATCH No.: 104
DILUTION FACTOR: 1.00
REQUEST ID No.: 2328044

SAMPLE PRESERVATION: Sample Temperature when received: 4 Degrees C.; pH = 7
COMPOSITED WITH SLD No.(s): NOT COMPOSITED No Diquat Detected.

| CAS | ANALYTE NAME | CONC (ug/L) | QUAL | SDL | MCL |
|---|---|---|---|---|---|
| 85-00-7 | Diquat | | U | 1.01 | 20 |

| | | | % RECOVERY |
|---|---|---|---|
| SURROGATE: | Paraquat | 57.1 | 114.2 |

Surrogate Recovery: Within Normal Range of 70 - 130%

ANALYST: Ron Druva QC APPROVED BY: Sandra Oliver

## EPA METHOD 525.2 SDWA SOCs by GC/MS

DATE EXTRACTED: 4/23/03 9 Days: Within EPA Holding Time
DATE ANALYZED: 5/13/03 20 Days: Within EPA Analysis Time
SAMPLE VOL (ml): 960

ANALYSIS No.: OR- 200301104
SLD BATCH No.: 104
DILUTION FACTOR: 1.04
REQUEST ID No.: 2328044

SAMPLE PRESERVATION: Sample Temperature when received: 4 Degrees C.; pH = 2
COMPOSITED WITH SLD No.(s): NOT COMPOSITED

| CAS | ANALYTE NAME | CONC (ug/L) | QUAL | SDL | MCL |
|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | | U | 0.04 | Unreg. |
| 208-96-8 | Acenaphthylene | | U | 0.40 | Unreg. |
| 34256-82-1 | Acetochlor | | U | 0.09 | Unreg. |
| 15972-60-8 | Alachlor | | U | 0.06 | 2 |
| 309-00-2 | Aldrin | | U | 0.16 | Unreg. |
| 120-12-7 | Anthracene | | U | 0.12 | Unreg. |
| 1912-24-9 | Atrazine | | U | 0.21 | 3 |
| 56-55-3 | Benzo(a)anthracene | | U | 0.06 | Unreg. |
| 50-32-8 | Benzo(a)pyrene | | U | 0.12 | 0.2 |
| 205-99-2 | Benzo(b)fluoranthene | | U | 0.05 | Unreg. |
| 191-24-2 | Benzo(ghi)perylene | | U | 0.04 | Unreg. |
| 207-08-9 | Benzo(k)fluoranthene | | U | 0.08 | Unreg. |
| 319-84-6 | α-BHC | | U | 0.08 | Unreg. |
| 319-85-7 | β-BHC | | U | 0.09 | Unreg. |
| 319-86-8 | δ-BHC | | U | 0.07 | Unreg. |
| 103-23-1 | Bis(2-Ethylhexyl)adipate | 0.1 | B | 0.13 | 400 |
| 117-81-7 | Bis(2-Ethylhexyl)phthalate | | U | 1.01 | 6 |
| 23184-66-9 | Butachlor | | U | 0.07 | Unreg. |
| 85-68-7 | Butylbenzylphthalate | | U | 0.17 | Unreg. |
| 5103-71-9 | cis-Chlordane | | U | 0.14 | {2} |
| 5103-74-2 | trans-Chlordane | | U | 0.14 | {2} |
| 1897-45-6 | Chlorothalonil | | U | 0.13 | Unreg. |
| 2921-88-2 | Chlorpyrifos | | U | 0.05 | Unreg. |
| 218-01-9 | Chrysene | | U | 0.06 | Unreg. |
| 72-54-8 | 4,4'-DDD | | U | 0.18 | Unreg. |

[1] Request ID No. Pla 2328044

# ORGANIC CHEMISTRY ANALYTICAL REQUEST FORM

[2] SLD's Accession N OR0301104

OR

Scientific Laboratory Division
700 Camino de Salud, NE (P.O. Box 4700)
Albuquerque, NM 87106 (87196-4700)
Phone: 505-841-2500/ -2570/ -2566

OR

[3] User Code: 5 5 0 0 0

Date & Time of Receipt at SLD: 03 APR 15 AM 9:27

[4] Sample Priority: 3 *If 1 or 2 call SLD*

[5] Submitter Code: 0 6 0 WSS Code: NM35 - 6 0 2 1 7 User's Site ID:

[6] *Sample Temp. Receipt @ SLD:* 2/

[7] Facility or WSS Name: Giant Refining Company

Facility/WSS Location: *If No WSS Code Complete 8, 9 & 10*

[8] County:

[9] City:

[10] State: *or CHANGE* NM *TO*

[11] Sampling Location: EP#1 ID#4

[12] Sample Collection: On: 04 / 14 / 03 (Date: MM / DD / YY) By: Herrera (Last Name) Joe (First Name)

At: 10 : 25 (Time: 24:00 Hour Clock)

[13] Sample Info. Contact: Ph: [ 505 ] - 841 - 9467

If not collector, per box 12, Please print name here:

[14] *Reports are mailed to the address specified by the Submitter Code and WSS Code (when present). However, if one of the following applies, please check ☒ appropriate boxes below and complete address form.*

☐ Send additional Report to:

☐ New Address for:
☐ Submitter
☐ WSS / Client

*Name:*

*Address:*

*City:* *State:* *Zip:*

[15] Sampling Documentation: *(Check)*
☐ Confirmation ☐ NMED Monitoring
☐ Resample ☐ Raw Water
☐ Split w/ Facility ☐ Finished Water
■ Grab Sample
☐ Other:

[16a] Field Data: *(When appropriate)*
☐ Sample is Chlorinated
Chlorine Residual: _____ mG/L
Conductivity: _____ uMhos/cm
Sulfate: _____ mG/L
Temperature on Collection: _____ °C

[16b] Field Remarks: *(Optional)*

SDWA Comments:
■ Compliance

SDWA Compositing:
☐ No Compositing
☐ Within This System Only
☐ Within All Systems

[17] Sample Type: *(Check ☒ only one)*
■ Water ☐ Vapor ☐ Tissue ☐ Other: ☐ Liquid:
☐ Soil ☐ Plant ☐ Blood ☐ Solid:

[18] Preservation: *(Check ☒ all that apply)*
☐ Preserved with HCl to pH < 2 ☐ No Preservation
■ Stored at 4°C ☐ Other:

Number of Containers Submitted: 1 Set
Bottles: Vials: Jars:

[19] Analyses Requested: *Please Check ☒ the appropriate box(es) below to indicate your analytical request(s);*

Volatile Analyses:
☐-(754) Aromatic & Halogenated Volatiles (EPA 8021)
☐-(765) Mass Spectrometer Volatiles (EPA 8260 or 524.2)
☐-(764) Appendix IX Mass Spectrometer VOCs (EPA 8260)
☐-(774) Volatile Organic Compounds [VOC's] (EPA 502.2)
☐-(766) SDWA Trihalomethanes (EPA 502.2)

Remarks or Other Specific Compounds or Classes:
☐-(__) _____
☐-(__) _____

Special Extractions:
☐-(784) TCLP Extraction, Volatiles (Method 1311)
☐-(785) TCLP Extraction, Semivolatiles (Method 1311)

Semivolatile Analyses:
■-(789) Drinking Water Semivolatile Analyses (Indented list
☐-(775) EDB, DBCP & TCP (EPA 504.1)
☐-(758) Acid Herbicides (EPA 515.2)
☐-(772) Carbamates (EPA 531.1)
☐-(781) Glyphosate (EPA 547)
☐-(782) Endothall (EPA 548.1)
☐-(783) Diquat (EPA 549.1)
☐-(788) Synthetic Organic Compounds (SOCs) (EPA 525/508)
☐-(771) Haloacetic Acids in Drinking Water (EPA 552.2)
☐-(750) Hydrocarbon Fuel Screen, GRO (Modified EPA 8015)
☐-(751) Hydrocarbon Fuel Screen, GRO/DRO (Mod. EPA 8015
☐-(752) Hydrocarbon Fuel Screen, DRO (Mod. EPA 8015)
☐-(755) Base/Neutral Semivolatiles (No Phenols) (EPA 8270)
☐-(756) Base/Neutral/Acids Semivolatiles (EPA 625/8270)
☐-(759) Polychlorinated Biphenyls (PCBs) (EPA 8082)
☐-(760) Organochlorine Pesticides (EPA 608/8081)
☐-(786) Explosives Screen (Aberdeen Method)

STATE OF NEW MEXICO

DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O Box 4700
Albuquerque, NM 87196-4700
AIR & HEAVY METALS SECTION

700 Camino de Salud, NE
(505)-841-2500
(505)-841-2553

SAMPLE COLLECTION: DATE: 4/14/2003 TIME: 10:23
MATRIX: wpn BY: HERRERA
FACILITY: Giant Refining Company
SAMPLING LOCATION: EP#1 ID#4

SLD No.: HM-200300439
REQUEST ID No.: 2344097
RECEIVED AT SLD: 4/15/2003
USER: 55000
SUBMITTER: 60
WSS #: NM3560217
Giant Refining Company

To: Client

Giant Refining Company
Route 3 Box 7
Gallup, NM 87305

DISTRIBUTION TO:
User
Submitter
Client
SLD

Practical Quantitation Limit (PQL) is defined as 10 times the Method Detection Limit (MDL)

## ANALYTICAL RESULTS

| Element | Result | Units | Analysis Date | Method | PQL | Dilution Factor | Sample Det. Limit. | Analyst | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Arsenic | 0.003 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Barium | <0.1 | mg/L | 5/27/2003 | 200.8 | 0.1 | 1 | 0.1 | SMP | H |
| Beryllium | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Cadmium | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Chromium | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |
| Mercury | <0.0002 | mg/L | 4/23/2003 | 245.1 | 0.0002 | 1 | 0.0002 | HKM | |
| Nickel | <0.01 | mg/L | 5/27/2003 | 200.8 | 0.01 | 1 | 0.01 | SMP | C H |
| Selenium | <0.005 | mg/L | 5/19/2003 | 200.9 | 0.005 | 1 | 0.005 | NCB | |
| Thallium | <0.001 | mg/L | 5/27/2003 | 200.8 | 0.001 | 1 | 0.001 | SMP | C H |

**Laboratory Comments:**

**Reviewed by:** **Ron Amato**
*Supervisor, Air & Heavy Metals Section*
Printed: 5/30/2003 LRC

Data Qualifier Codes and Definitions

A = See comments section below.
B = Laboratory Reagent Blank (RB)
C = Spike recovery between 80-120%
D = Spike recovery <80% or >120%
E = Over Calibration Range
F = Matrix interference suspected
G = Inconsistent results
H = Analyzed in duplicate
I = Analyzed in Triplicate
J = Estimated Quantity only.
K = Holding time exceeded
L = Equals or exceeds USEPA MCL
M = Equals or exceeds USEPA action level
N = Insufficient sample to verify results
O = Internal Standards(ICP-MS) <60% or >125% when analyzed straight
R = Results based on 4 or more duplicates.
S = Relative Percent Difference between duplicates > 10%(waters)
T = Relative Percent Difference between duplicates > 30%(soils).

RECEIVED
4 2003
GIANT REFINING CO.
CINIZA REFINERY

STATE OF NEW MEXICO — DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700 — 700 Camino de Salud, NE

Albuquerque, NM 87196-4700 — (505) 841-2500

ORGANIC CHEMISTRY SECTION (505) 841-2571

REPORT TO CLIENT: ☑

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

**SLD No.: OR- 200301102**

REQUEST ID No.: 2343431

RECEIVED AT SLD: 4/15/03

☐ SLD COPY — USER 55000

ED FIELD OFFICE: ☐

| |
|---|
| NMED Dist #1 Office, Albuquerque |
| Drinking Water Bureau |
| 4131 Montgomery Blvd, NE |
| Albuquerque, NM 87109 |

☐ N.M.E.D. DRINKING WATER BUREAU

| |
|---|
| Gilbert Salas |
| NMED Drinking Water Bureau |
| 525 Camino de Los Marquez |
| Suite 4 |
| Santa Fe NM 87502 |

SAMPLE COLLECTION: DATE: 4/14/03 TIME: 1021 BY: HERRERA

FACILITY NAME: GIANT REFINING COMPANY

SAMPLING LOCATION: EP#1 ID#4

WSS #: NM3560217 REPORTING UNITS: ug/L

Remarks:

## EPA METHOD 524.2 SDWA VOLATILES BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY

DATE EXTRACTED: N/A

DATE ANALYZED: 4/25/03 — 11 Days: Within EPA Analysis Time

SAMPLE VOL (ml): 5.0

ANALYSIS No.: OR- 200301102

SLD BATCH No.: 110

DILUTION FACTOR: 1.00

REQUEST ID No.: 2343431

SAMPLE PRESERVATION: **Sample temperature when received: 5 Degrees C.; sample preserved with Hydrochloric Acid: pH = 2**

| CAS # | ANALYTE NAME | CONC. (ug/L) | QUAL | SDL | PQL MCL |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | | U | 0.13 | 5 |
| 108-86-1 | Bromobenzene | | U | 0.06 | |
| 74-97-5 | Bromochloromethane | | U | 0.11 | |
| 75-27-4 | Bromodichloromethane* | | U | 0.13 | 80 |
| 75-25-2 | Bromoform* | | U | 0.07 | 80 |
| 74-83-9 | Bromomethane | | U | 0.46 | |
| 78-93-3 | 2-Butanone (MEK) | | U | 0.27 | |
| 104-51-8 | n-Butylbenzene | | U | 0.17 | |
| 135-98-8 | sec-Butylbenzene | | U | 0.10 | |
| 98-06-6 | tert-Butylbenzene | | U | 0.09 | |
| 1634-04-4 | tert-Butyl methyl ether (MTBE) | | U | 0.04 | |
| 56-23-5 | Carbon tetrachloride | | U | 0.14 | 5 |
| 108-90-7 | Chlorobenzene (monochlorobenzene) | | U | 0.05 | 100 |
| 75-00-3 | Chloroethane | | U | 0.26 | |
| 67-66-3 | Chloroform* | | U | 0.60 | 80 |
| 74-87-3 | Chloromethane | | U | 0.56 | |
| 95-49-8 | 2-Chlorotoluene | | U | 0.09 | |
| 106-43-4 | 4-Chlorotoluene | | U | 0.12 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane (DBCP) | | U | 0.13 | 0.2 |
| 124-48-1 | Dibromochloromethane* | | U | 0.08 | 80 |
| 106-93-4 | 1,2-Dibromoethane (Ethylene dibromide (EDB)) | | U | 0.06 | 0.05 |
| 74-95-3 | Dibromomethane | | U | 0.09 | |
| 95-50-1 | 1,2-Dichlorobenzene (o-Dichlorobenzene) | | U | 0.08 | 600 |
| 541-73-1 | 1,3-Dichlorobenzene (m-Dichlorobenzene) | | U | 0.07 | 600 |
| 106-46-7 | 1,4-Dichlorobenzene (p-Dichlorobenzene) | | U | 0.07 | 75 |
| 75-71-8 | Dichlorodifluoromethane | | U | 0.38 | |
| 75-34-3 | 1,1-Dichloroethane | | U | 0.07 | |
| 107-06-2 | 1,2-Dichloroethane | | U | 0.08 | 5 |
| 75-35-4 | 1,1-Dichloroethene | | U | 0.12 | 7 |

RECEIVED 23 GIANT REFINING CO. CINIZA REFINERY

1 Request ID No. 2343431

# ORGANIC CHEMISTRY ANALYTICAL REQUEST FORM

2 SLD's Accession No. OR0301102

OR

Scientific Laboratory Division
700 Camino de Salud, NE (P.O. Box 4700)
Albuquerque, NM 87106 (87196-4700)
Phone: 505-841-2500/ -2570/ -2566

OR

3 User Code: 5 5 0 0 0

Date & Time of Receipt at SLD: 03 APR 15 AM 9:27

4 Sample Priority: 3 *If 1 or 2 call SLD*

5 Submitter Code: 0 6 0 WSS Code: NM35 - 6 0 2 1 7 User's Site ID:

6 *Sample Temp. Receipt @ SLD:* 5 °

7 Facility or WSS Name: Giant Refining Company

Facility/WSS Location: *If No WSS Code Complete 8, 9 & 10*

8 County:

9 City:

10 State: *or CHANGE* NM *TO*

11 Sampling Location: EP #1 ID #4

12 Sample Collection: On: 04 / 14 / 03 (Date: MM / DD / YY) By: Herrera (Last Name) Joe (First Name)

At: 10 : 21 (Time: 24:00 Hour Clock)

13 Sample Info. Contact: Ph: 505 - 841 - 9467

If not collector, per box 12, Please print name here:

14 *Reports are mailed to the address specified by the Submitter Code and WSS Code (when present). However, if one of the following applies, please check ☒ appropriate boxes below and complete address form.*

☐ Send additional Report to:

☐ New Address for:
☐ Submitter
☐ WSS / Client

*Name:*

*Address:*

*City:* *State:* *Zip:*

15 Sampling Documentation: *(Check)*
☐ Confirmation ☐ NMED Monitoring
☐ Resample ☐ Raw Water
☐ Split w/ Facility ☐ Finished Water
■ Grab Sample
☐ Other:

16a Field Data: *(When appropriate)*
☐ Sample is Chlorinated
Chlorine Residual: mG/L
Conductivity: uMhos/cm
Sulfate: mG/L
Temperature on Collection: °C

16b Field Remarks: *(Optional)*

SDWA Comments:
■ Compliance
SDWA Compositing:
☐ No Compositing
☐ Within This System Only
☐ Within All Systems

17 Sample Type: *(Check ☒ only one)*
■ Water ☐ Vapor ☐ Tissue ☐ Other: ☐ Liquid:
☐ Soil ☐ Plant ☐ Blood ☐ Solid:

18 Preservation: *(Check ☒ all that apply)*
☐ Preserved with HCl to pH < 2 ☐ No Preservation
■ Stored at 4°C ☐ Other:

Number of Containers Submitted:
Bottles: Vials: 2 Jars:

19 Analyses Requested: *Please Check ☒ the appropriate box(es) below to indicate your analytical request(s);*

**Volatile Analyses:**
☐-(754) Aromatic & Halogenated Volatiles (EPA 8021)
☐-(765) Mass Spectrometer Volatiles (EPA 8260 or 524.2)
☐-(764) Appendix IX Mass Spectrometer VOCs (EPA 8260)
■-(774) Volatile Organic Compounds [VOC's] (EPA 502.2)
☐-(766) SDWA Trihalomethanes (EPA 502.2)

**Remarks or Other Specific Compounds or Classes:**
☐-(__)
☐-(__)

**Special Extractions:**
☐-(784) TCLP Extraction, Volatiles (Method 1311)
☐-(785) TCLP Extraction, Semivolatiles (Method 1311)

**Semivolatile Analyses:**
☐-(789) Drinking Water Semivolatile Analyses (Indented lis
☐-(775) EDB, DBCP & TCP (EPA 504.1)
☐-(758) Acid Herbicides (EPA 515.2)
☐-(772) Carbamates (EPA 531.1)
☐-(781) Glyphosate (EPA 547)
☐-(782) Endothall (EPA 548.1)
☐-(783) Diquat (EPA 549.1)
☐-(788) Synthetic Organic Compounds (SOCs) (EPA 525/508
☐-(771) Haloacetic Acids in Drinking Water (EPA 552.2)
☐-(750) Hydrocarbon Fuel Screen, GRO (Modified EPA 8015
☐-(751) Hydrocarbon Fuel Screen, GRO/DRO (Mod. EPA 80
☐-(752) Hydrocarbon Fuel Screen, DRO (Mod. EPA 8015)
☐-(755) Base/Neutral Semivolatiles (No Phenols) (EPA 8270)
☐-(756) Base/Neutral/Acids Semivolatiles (EPA 625/8270)
☐-(759) Polychlorinated Biphenyls (PCBs) (EPA 8082)
☐-(760) Organochlorine Pesticides (EPA 608/8081)
☐-(786) Explosives Screen (Aberdeen Method)

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

System Copy
Rec'd 6/9/03 OM Barnes

PL I.D. **304085**
WSS#: **NM3560217**

RECEIVED
JUN 16 2003
GIANT REFINING CO.
CINIZA REFINERY

April 30, 2003

NMED – Drinking Water Bureau
525 Camino De Los Marquez
Suite 4
Santa Fe, NM 87501

Project Name/Contract Number: GIANT REFINING COMPANY EP #1 ID #4 20-667-55-02459

Attention: Joe Chavez

On **04/15/03**, Pinnacle Laboratories Inc., (ADHS License No. AZ0643 pending), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

All samples were analyzed by Environmental Health Laboratories (EHL), South Bend, IN.

EHL is certified in NM for all analytes reported.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

H. Mitchell Rubenstein, Ph.D.
General Manager

MR:jt

Enclosure

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

RECEIVED

| | | | |
|---|---|---|---|
| CLIENT | :NMED DRINKING WATER BUREAU | DATE RECEIVED | :04/15/03 |
| CONTRACT # | :20-667-55-02459 | | |
| PROJECT NAME | :GIANT REFINING COMPANY EP #1 ID #4 | REPORT DATE | :04/30/03 |

PL ID: 304085

| | PINNACLE ID # | CLIENT DESCRIPTION | MATRIX | DATE COLLECTED |
|---|---|---|---|---|
| 01 | 304085-01 | GIANT REFINING COMPANY EP #1 ID #4 | AQUEOUS | 04/14/03 |
| 02 | 304085-02 | GIANT REFINING COMPANY EP #1 ID #4 TB | AQUEOUS | 03/18/03 |

---TOTALS---

| MATRIX | #SAMPLES |
|---|---|
| AQUEOUS | 2 |

Environmental Health Laboratories
The Nation's Drinking Water Laboratory

110 S. Hill Street
South Bend, IN 46617
574.233.4777
800.332.4345
Fax: 574.233.8207
www.ehl.com

RECEIVED

# LABORATORY REPORT

Client: Pinnacle Laboratories
Attn: Mitch Rubenstein, Ph.D.
2709 D Pan American Freeway NE
Albuquerque, NM 87107

Report: 874967-5014(4992-4996)

Priority: Standard Written

Status: Final

Sampling Point: 304085 / Giant Retinning Company EP#1 ID #4

PWS ID#: NM3560217

Sample Point ID#: †

Facility ID#: †

Samples Submitted: Four drinking water samples and one laboratory trip blank

Sample Type: †

Copies to: None

Collected Date: 04/14/03

Received Date: 04/16/03

| PARAMETER | SDWA Method | MRL * (ug/L) | Results (ug/L) | Analysis Date | Lab Number |
|---|---|---|---|---|---|
| Acetochlor | 525.2 | 2.0 | < 2.0 | 04/23/03 | 874992 |
| 2,4-Dinitrotoluene | 525.2 | 2.0 | < 2.0 | 04/23/03 | 874992 |
| 2,6-Dinitrotoluene | 525.2 | 2.0 | < 2.0 | 04/23/03 | 874992 |
| 4-4'-DDE | 525.2 | 0.8 | < 0.8 | 04/23/03 | 874992 |
| DCPA acid metabolites | 515.4 | 1.0 | < 1.0 | 04/17/03 | 874993 |
| EPTC | 525.2 | 1.0 | < 1.0 | 04/23/03 | 874992 |
| Molinate | 525.2 | 0.9 | < 0.9 | 04/23/03 | 874992 |
| MTBE | 524.2 | 5.0 | < 5.0 | 04/18/03 | 874994 |
| Nitrobenzene | 524.2 | 10 | < 10 | 04/18/03 | 874994 |
| Terbacil | 525.2 | 2.0 | < 2.0 | 04/23/03 | 874992 |
| Perchlorate | 314.0 | 4.0 | < 4.0 | 04/17/03 | 874995 |

* EHL has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.
Any PWS information not provided is marked with a † symbol. Compliance data cannot be generated without this information.

Note: Once all PWS information is provided, these results will be uploaded into the EPA SDWARS database within thirty days of report finalization. You must then approve the data to meet the requirements of the UCMR.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call us at (574) 233-4777.

Note: This report may not be reproduced, except in full, without written approval from Environmental Health Laboratories (EHL). EHL is accredited by the National Environmental Laboratory Accreditation Program (NELAP). This report satisfies the requirements of your project but has not been prepared to comply with NELAP reporting requirements.

Reviewed By: _____ Date: 4/24/03

Finalized By: _____ Date: 4-25-03

A Division of Underwriters Laboratories Inc.

STATE OF NEW MEXICO DEPARTMENT OF HEALTH

**SCIENTIFIC LABORATORY DIVISION**

P.O. Box 4700 700 Camino de Salud, NE
Albuquerque, NM 87196-4700 [505]-841-2500
RADIOCHEMISTRY SECTION [505]-841-2574

*April 4, 1996*

**Request ID No. 105779**

# ANALYTICAL REPORT
## SLD Accession No. RC-96-0097

*Distribution*
(x) User 55000
(x) Submitter 69
(X) Client
(x) SLD Files

*To:* Ed Horst
Giant Refining Company
Route 3 Box 7
Gallup, NM 87305

*From:* Radiochemistry Section
Scientific Laboratory Division
700 Camino de Salud, NE
P.O. Box 4700
Albuquerque, NM 87196-4700

*Re:* **A water sample submitted to this laboratory on March 6, 1996**

*User:*
Richard Asbury
Drinking Water Bureau
NM-ED Dist. #3 Office
1001 N. Solano Drive
Las Cruces, NM 88001

*Submitter:*
Joe Winkler
ED Field Office, Gallup
306 S. 5th Street
Gallup, NM 87301-6424

## DEMOGRAPHIC DATA

*COLLECTION*
*On:* 5-Mar-96 *By:* Win . . .
*At:* 11:32 hrs. *In/Near:* Gallup

*LOCATION*
*WSS #:* 602-17; Well 3, ID 3
Giant Refining Company

## ANALYTICAL RESULTS

| Analysis | Value | Sigma | D. Lmt. | Units | Analyst |
|---|---|---|---|---|---|
| G-Alpha w/ Am-241 ref. | 2.40 | 0.90 | 1.40 | pCi/L | Troxel |
| G-Alpha w/ U -nat ref. | 4.00 | 1.50 | 2.40 | pCi/L | Troxel |
| G-Beta w/ Cs-137 ref. | 2.20 | 1.30 | 2.50 | pCi/L | Troxel |
| G-Beta w/ Sr/Y90 ref. | 2.00 | 1.10 | 2.20 | pCi/L | Troxel |
| Ra-226, SDWA Method. . | 0.18 | 0.02 | 0.02 | pCi/L | Monroe |

*Notations & Comments:*

Uncertainties, sigmas, are expressed as +- one standard deviation, i.e. one standard error.

Small negative or positive values which are less than two(2) standard deviations should be interpreted as: including 'zero'; as 'not detected'; as 'less than the detection limit (<D. Lmt.)' when reported; or 'less than twice the standard deviation'.

**Reviewed By:** Loren A. Berge
Loren A. Berge, Ph.D. 04/04/96
*Supervisor, Radiochemistry Section*

STATE OF NEW MEXICO

DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O Box 4700
Albuquerque, NM 87196-4700

700 Camino de Salud, NE
(505) 841-2500

WATER CHEMISTRY SECTION (505)-841-2555

SAMPLE COLLECTION DATE: 4/14/2003 TIME: 10:20 BY: HERRERA

SAMPLING LOCATION: EP#1 ID#4

SAMPLE MATRIX: wn

SLD No.: WC- 200301230

| | |
|---|---|
| REQUEST ID No.: | 2344096 |
| RECEIVED AT SLD: | 4/15/2003 |
| USER: | 55000 |
| SUBMITTER: | 60 |
| WSS #: | NM3560217 |

This Copy of Report for::

Giant Refining Company
Route 3 Box 7
Gallup, NM 87305

DISTRIBUTION TO:

NMED Drinking Water Bureau {U}
ED Dist #1 Office, Albuquerque {S}
Giant Refining Company {C}
Water Chemistry Section - File Copy

## ANALYTICAL RESULTS

| Analyte | Result | Units | Analysis Date | Method | Minimum Level | Dilution Factor | Sample Det. Limit | Analyst | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate + Nitrite | <0.1 | mG/L | 4/22/2003 | 353.2 | .1 | 1. | .1 | Vince Speshock | |

**Laboratory Comments:**

Reviewed by Chris Dean
Supervisor, Water Chemistry Section

Date Printed: 24-Apr-03

**Data Qualifier Codes and Definitions**

A - Insufficient sample to analyze or verify results
B - Sample holding time exceeded at laboratory
C - Sample submitted past holding time
D - Inconsistent results, data unusable, suggest re-sampling
E - Matrix interference suspected
F - Ion balance criteria exceeded
G - Result equals 50% or more of EPA MCL
H - Result equals or exceeds EPA MCL for this analyte
I - Spike recovery <80% or >120%
J - Estimated quantity only
K - Sample rejected
L - Sample voided at laboratory
M - Daily control value <80% or >120% of theoretical value
N - External control value <80% or >120% of theoretical value

STATE OF NEW MEXICO

DEPARTMENT OF HEALTH

# SCIENTIFIC LABORATORY DIVISION

P.O Box 4700
Albuquerque, NM 87196-4700

700 Camino de Salud, NE
(505) 841-2500

WATER CHEMISTRY SECTION (505)-841-2555

SAMPLE COLLECTION DATE: 4/14/2003 TIME: 10:23 BY: HERRERA

SAMPLING LOCATION: EP#1 ID#4

SAMPLE MATRIX: wn

SLD No.: WC- 200301237

| | |
|---|---|
| REQUEST ID No.: | 2344098 |
| RECEIVED AT SLD: | 4/15/2003 |
| USER: | 55000 |
| SUBMITTER: | 60 |
| WSS #: | NM3560217 |

This Copy of Report for::

Giant Refining Company
Route 3 Box 7
Gallup, NM 87305

DISTRIBUTION TO:

NMED Drinking Water Bureau {U}
ED Dist #1 Office, Albuquerque {S}
Giant Refining Company {C}
Water Chemistry Section - File Copy

## ANALYTICAL RESULTS

| Analyte | Result | Units | Analysis Date | Method | Minimum Level | Dilution Factor | Sample Det. Limit | Analyst | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| Free Cyanide | <0.1 | mG/L | 4/24/2003 | SM4500-CN(F) | .1 | . | . | Chet Markham | |

**Laboratory Comments:**

Reviewed by Chris Dean
Supervisor, Water Chemistry Section

Date Printed: 29-Apr-03

### Data Qualifier Codes and Definitions

A - Insufficient sample to analyze or verify results
B - Sample holding time exceeded at laboratory
C - Sample submitted past holding time
D - Inconsistent results, data unusable, suggest re-sampling
E - Matrix interference suspected
F - Ion balance criteria exceeded
G - Result equals 50% or more of EPA MCL
H - Result equals or exceeds EPA MCL for this analyte
I - Spike recovery <80% or >120%
J - Estimated quantity only
K - Sample rejected
L - Sample voided at laboratory
M - Daily control value <80% or >120% of theoretical value
N - External control value <80% or >120% of theoretical value

STATE OF NEW MEXICO DEPARTMENT OF HEALTH

**SCIENTIFIC LABORATORY DIVISION**

**P.O. Box 4700** **700 Camino de Salud, NE**
**Albuquerque, NM 87196-4700** **[505]-841-2500**
WATER CHEMISTRY SECTION [505]-841-2555

*March 22, 1996*

**Request ID No. 108938**

# ANALYTICAL REPORT
## SLD Accession No. WC-96-1380

*Distribution*
(x) User 55000
(x) Submitter 69
(X) Client
(x) SLD Files

*To:* Ed Horst
Giant Refining Company
Route 3 Box 7
Gallup, NM 87305

*From:* Water Chemistry Section
Scientific Laboratory Division
700 Camino de Salud, NE
P.O. Box 4700
Albuquerque, NM 87196-4700

*Re:* **A water,Pres/Nonfiltered sample submitted to this laboratory on March 6, 1996**

*User:*
Richard Asbury
Drinking Water Bureau
NM-ED Dist. #3 Office
1001 N. Solano Drive
Las Cruces, NM 88001

*Submitter:*
Joe Winkler
ED Field Office, Gallup
306 S. 5th Street
Gallup, NM 87301-6424

## DEMOGRAPHIC DATA

*COLLECTION*
*On:* 5-Mar-96 *By:* Win . . .
*At:* 11:35 hrs. *In/Near:* Gallup

*LOCATION*
*WSS #:* 602-17; Well 3 ID3
Giant Refining Company

## ANALYTICAL RESULTS

| Analysis | Value | D. Lmt. | Units |
|---|---|---|---|
| nitrate+ite as N | 0.10 | | mG/L |

**Reviewed By:**
Diana Suvannunt, Ph.D. 03/21/96
*Supervisor, Water Chemistry Section*

RECEIVED

JUN 3 0 2004

OIL CONSERVATION DIVISION

| Post-it® Fax Note 7671 | Date 10/8/03 # of pages ▶ 21 |
|---|---|
| To Diane Barnes | From D Mancini |
| Co./Dept. | Co. |
| Phone # | Phone # |
| Fax # 505-326-3747 | Fax # |

January 27, 2000

PRECISION ENGINEERING INC.

#4

# Ciniza Refinery Water Well #4

--

## Gallup, New Mexico

File No.: 99-058

Submitted To:

Mr. Eddie Stalcup
Giant Refining Company
Route 3, Box 7
Gallup, New Mexico
87301

# History of Drilling Water Well #4
## Ciniza Refining Company

The well was spudded in on November 12, 1999 with a Gardner-Denver 2000, Rig #10, owned and operated by United Drilling Inc. of Roswell, NM. The pilot hole was drilled using a 7 7/8" J33 (carbide button) bit to depth of 175' to a sandstone bed competent to anchor the surface casing below the alluvium and shallow water producing zones. The Sonsela member of the Chinle Formation was encountered at a depth of 15' to 85' which produced some water (not measured) that thinned the drilling mud.

The hole was reamed to 32" with three passes. The first was a 17 1/2" mill tooth bit and the hole extended an additional five feet to allow for the length of the reamer and pilot bit. The mill tooth seemed to drilled faster than the button bit, especially in the mudstone. The 17 1/2" bit was used as the pilot for the 24" reamer and also on the 32" reamer. Both reamers had open ports, not jets, at the cones, which did not keep the mudstone from balling up on the cones and slowed drilling.

Twenty four inch surface casing was run to a depth of 175'. The casing was a welded, flush joint. Concern was expressed by the drilling contractor that the casing might collapse if cemented in one stage so it was decided to cement in two stages. Cement was tremmied from bottom to top by the drilling contractor. Two yards of concrete were required to bring the cement to surface after shrink back.

A 9 7/8" mill tooth bit was used to extend the pilot hole from below the surface casing. The mill tooth penetrated the mudstones better than the previously used button bit.

Sloughing of the mudstones in the Chinle Formation mixed with cuttings throughout the hole masking the strata being drilled. After electric/nuclear logs were run, the strata could better be determined.

Formation water began thinning the drilling mud at 570', interbedded sandstone and mudstone were encountered at this depth. An increase in pit volume was apparent at 620'. Drilling had stopped at 650' for the night and was flowing 13.5 gallons per minute the next morning. The drilling contractor had been working daylight tour only but began 24 hour operations when the well started flowing. The viscosity was increased from 45 to 55 and the weight increased from 9.9 to 11.5 lbs./gal. This viscosity and weight stabilized the water flow but not the sloughing of the Chinle formation. Drilling rates averaged 5 minutes per foot.

Hard sandstone was encountered at 655'. The bit seemed to be locked up at 735' but when pulled for inspection it was undergauge and replaced. A 9 7/8" button bit was installed and reamed 150' back to bottom. After 240' of dense sandstone drilling was stopped and the hole was logged. Using the E-logs and neutron-density logs the formations were identified and it was decided to continue drilling.

A 7 7/8" inch button bit (original pilot bit) was used and more collars were added to increase weight. Until this point the hole had remained almost vertical but started deviating dramatically with the extra weight.

Limestone was encountered at 1060' which is in the Yeso Formation and drilling was stopped at 1076'.

Reaming for the production casing began from the bottom of the surface casing to 775' with a 17 1/2" bit. A cone from the 17 1/2" bit was lost and was washed to the bottom with the 7 7/8" bit. The reaming was accomplished using 9 lbs./gal. mud to make up volume and allowed to thin as the well began to flow.

A 13 3/8" threaded casing was to be run from surface to 750' but because of deviation the casing could only be run to 733'. The casing was cemented from the bottom to top by BJ Well Services from Farmington, NM.

The hole was reamed with a 12 1/2" bit from 775 to 1075' and the well was completed open hole below 733'.

Initial flow rate after drilling was 120 gallons per minute with dissolved solids at 1300 ppm.

To increase production the lower Chinle Formation was perforated. The casing was perforated by Schlumberger from 560'-715' at eight shots per foot using tubing guns with jet shot.

The initial flow rate after perforation was approximately 150 gallons per minute and dissolved solids at 600 ppm.

**CINIZA WATER WELL #4**
(Replacement of water well #1)

UNITED DRILLING CO. Roswell, NM
Rig #10, Gardner-Denver 2000
Measurements from kelly bushing 6' above ground
Bit 7 7/8" J33 button bit.

**11-12-99**
**Alluvium**

0-5 Sand, fine to medium, red-brown, sub angular, chert, quartz-frosted; some petrified wood pieces, some clay.

5-10 Gravel, sandy, coarse, sub-angular, sandstone, quartz, chert.

10-15 Clay, red-brown, slightly sandy.

**Chinle Formation**
**Petrified Forest Member**

**Sonsela Sandstone Bed (12')**

15-20 Sandstone, fine to medium, quartz, chert.

20-25 Sandstone, fine, mainly quartz, some frosting, sub-rounded to rounded, chert.

25-30 Sandstone, fine, well sorted, calcite cemented, sub-rounded, typically frosted ~1% dark lithics, cuttings are coarse sand size. Hard drilling.

30-35 Same as above.
33-34' mudstone stringer.

**11-13-99**

35-40 Sandstone, very fine, well sorted, round to sub-rounded, some frosting, dominately quartz, <10% other, <1% dark lithics. Easier drilling

40-45 Same as above, ~1% dark lithics, some shaly stringers.

45-50 Same as above, dense again at 50'.

50-55 Same as above with shaly stringers throughout, sandstone is dense, chert/quartz fine grains, quartz rounded, frosted 50%; shale is dark red to purple; chert appears to be associated with the shale, shaly @ 54'.

55-60 Shale/mudstone purple with light blue to white chert.

60-65 Shale/mudstone purple to dark red, some grey pieces, dense, shale/mudstone interbedded ~1'.
Drilling Rate: 2 min/ft.

65-70 Mudstone/shale interbedded, some chert/silicious chips, some blue-green shale, white appears to be gypsum, very soft/friable when wet, suspect high montmorillonite content.

70-75 Sandstone, fine, well sorted, 1% dark lithics, few limestone pieces, silica cemented, hard drilling.

75-80 Sandstone, quartz, well sorted, very fine, silica cemented hard (mature); some thin shale interbeds (dark purple), hard, fissile, softens in water (montmorillonite?); some black shards of silica rock with copper colored veins (phlogopite).

80-85 Sandstone, white well sorted, very fine, rounded to well rounded, weaker than above.

85 **Bottom of Sonsela Sandstone Bed**

85-90 Mudstone-shaly (fissile) soft, purple to white or light grey, fissile, feels sticky (montmorillonite), some quartz grains, relatively easy drilling.

90-95 Same as above with 10% white pieces, purple primary, very sticky and soft when wet.

95-100 Same as above.

100-105 Same as above some blue-green interbedded with purple layers.

105-110 Same as above.

110-115 Same as above.

115-120 Same as above, slightly more light green to white mudstone.

**Deviation survey @ 100' = 1/2 degree.**

120-125 Same as above.

125-130 Same as above.

130-135 Same as above.

135-140 Same as above.

140-145 Same as above, slightly denser drilling, slightly brighter red-purple.

145-150 Same as above, softer drilling.

150-155 Same as above, firmer drilling ~1ft/min.

155-160 Same as above.

160-165 Same as above.

165-170 Same as above.

170-175 Same as above. @172 hard drilling. Very fine sandstone, some chert interbedded with sandstone. Drilling rates as follows: 172-173: 6 min; 173-174: 3 min; 174-175: 12 min. Circulate to run casing.

Terminated pilot hole to ream for surface casing.

Went from 7 7/8" bit to 17 1/2" bit.

**11-14-99**
Began reaming 17 1/2" hole, slow drilling in sandstone, 80' drilled.

**11-15-99**
**Deviation survey @ 90' = 1/4 degree. (5.25"/100')**

Sonsela making some water and diluting mud, mixed mud.

175-180 Same as above, easier drilling with the mill tooth bit. Sandstone, very fine, super mature, white, well sorted silica cement, interbedded with mudstone.

Increased depth of hole to allow for the larger reamers to reach the 175' depth.

**Deviation survey @ 160' = 1/8 degree. (2"/100')**

**11-16-99**
Start drilling 24" hole.

**11-17-99**
Drill 24" hole to 135' progress slow. Pull bit to inspect, cones are clogged with clay.

**11-18-99**
Mix mud, clean off pilot bit and reaming bit, finish reaming 24" hole.

**11-19-99**

Begin Reaming 32". Using 32" reamer with 17 1/2" pilot. Cannot get 17 1/2" plus 24" and 32" reamer in the hole since substructure is only 6 feet high.
Thirty two inch bit may "waller" unless lightly loaded.

11-20-99
Ream 32" hole.

11-21-99
Ream 32" hole.

11-22-99
Finish reaming 32" hole, condition and circulate hole. Lay down pipe and collars and reamer, run tremmie pipe, remove rotary table. 1:30-4:00pm wait on orders. Giant agreed to allow structural welders to place surface casing-will not allow on production casing. 4:00-7:30 pm run 175' of 24" casing and cutoff.

11-23-99
Replace rotary table, adjust tremmie, place first 8 yards of cement on outside of casing.

11-24-99
Place second 8 yards of cement.

11-25-99 thru 11-28-99
Shutdown for Thanksgiving.

11-29-99
Place 2 yards concrete at top of casing (15'). Mixed mud began drilling 9 7/8" SDC mill tooth bit (Smith) 1:30 pm.

180-185 Siltstone, hard, white/light tan, slightly cemented, some carbonate pieces (appears to be cement); some mudstone.

185-190 Mudstone, (claystone) dense, grey-blue to light brown, some very thin siltstone lenses.

190-195 Same as above.

195-200 Same as above.

200-205 Mudstone, dense, blue-grey, more siltstone than above, some chert/quartz grains, amber to yellow-brown in the (claystone, siltstone) matrix.

205-210 Same as above.
Drilling Rate: 2.5 min/ft.

210-215 Same as above, better cutting returns.

215-220 Sandstone, 50%, red-purple, very fine, well sorted, stained yellow, effervesces with HCl; mudstone, 50%, red-purple and white (soft), chert.

220-225 Mudstone, red-purple, white (soft), no sandstone, clear quartz with impurities (black specs).

225-230 Same as above.
Drilling Rate: 225-235 1ft/min.

230-235 Same as above, amber quartz grains.

235-240 Same as above, 2% sandstone, clear and stained (yellow to red) effervesces.

240-245 Same as above, 1% stained sandstone, chert.

245-250 Same as above, no sandstone, plus chert.

250-255 Same as above, 1% clear sandstone, chert.

255-260 Same as above.

260-265 Mudstone, red-purple, 2% blue-grey, no sandstone or chert.

265-270 Same as above, 10% blue-grey.

270-275 Same as above, 30% blue-grey.

275-280 Same as above.

**Deviation survey @ 248' = 1/4 degree.**

Stuck in hole at 275' cuttings fell back in and stuck bit while running deviation survey. Circulated and freed pipe.

11-30-99
Mud flowing from casing approximately 1 gpm.
Viscosity 36 seconds.

280-285 Mudstone, Same as above.

285-290 Sandstone/siltstone interbedded. Sandstone is partially silica cemented, some carbonate cemented (50%/50%), multicolored silica particles in sandstone; siltstone is red-purple, weak (easily broken). Sandstone 60% of section.

290-295 Sandstone/siltstone, with interbedded dark lithic particles (50%), 40% sandstone, siltstone is more competent (dense). Drilling Rate: 2 ft/min.

295-300 Same as above, slightly more siltstone, 70%, red-purple.

300-305 Sandstone, (70%) white, little staining, carbonate cement; some mudstone, 80% red-purple, 20% blue-green. Drilling Rate: 2 min/ft

305-310 Mudstone, red-purple, some minor sandstone pieces (likely washed up), some limonite staining. Drilling Rate: 2 min/ft.

310-315 Same as above.

315-320 Same as above.

320-325 Same as above, 10% sandstone

Viscosity 46 seconds.

325-330 Mudstone, red-purple 90%, grey 5%, sandstone 5%.

330-335 Same as above.

335-340 Same as above, no sandstone.

340-345 Same as above.

345-350 Same as above. Drilling Rate: 1 min/ft.

350-355 Same as above.

Viscosity 45 seconds

355-360 Same as above. Drilling Rate: 3 min/ft.

360-365 Same as above.

365-370 Same as above.

370-375 Same as above, purple mudstone, firmer. Drilling Rate: 4 ft/min.

**Deviation survey @ 248' = 1/4 degree.**

375-380 Same as above. Viscosity 46 seconds;

380-385 Same as above.

385-390 Same as above. Drilling Rate: 2 min/ft.

390-395 Same as above.

395-400 Same as above but brighter red, some very thin gypsum plates.

400-405 Same as above, firmer, especially the blue-grey material
Drilling Rate: 4 min/ft.

405-410 Mudstone, brown-red, firmer.

Viscosity: 46 seconds; Weight: 8.9 lbs/gal.

410-415 Same as above.

415-420 Same as above.

420-425 Same as above.

425-430 Same as above. Drilling Rate: 3-4 min/ft.

430-435 Same as above.

435-440 Same as above.

440-445 Same as above. Drilling Rate: 1-2 min/ft.

Viscosity: 44 seconds; Weight: 9.9 lbs/gal.

445-450 Same as above.

450-455 Same as above.

455-460 Same as above. Dense.

12-1-99

Well flowing 1 gpm.
Viscosity: 46 seconds; Weight: 9.1 lbs/gal.

460-465 Same as above.

465-470 Same as above.

**Deviation survey @ 435' = 3/8 degree.**

470-475 Same as above.

475-480 Same as above (mainly claystone).

Viscosity: 43 seconds; Weight: 9.3 lbs/gal.

480-485 Same as above, slightly more red, some blue-grey mottling ~15%. Pits gaining volume.

485-490 Mudstone, red-brown, red-purple, 5-10% grey mottling; siltstone, yellow-red, brown, slightly calcareous.

490-495 Same as above.

495-500 Same as above.

500-505 Same as above.

505-510 Same as above with ~2% sandstone white and dark lithics (50%-50%).

510-515 Same as above.

515-520 Same as above.

520-525 Same as above.

Viscosity: 58 seconds; Weight: 9.9 lbs/gal. Mixed 10 sacks gel.

525-530 Same as above with some siltstone; ~10% sandstone, white, hard, calcareous cement, quartz (50%) dark lithics (50%), very fine grained.

530-535 Same as above with ~1% sandstone.

535-540 Same as above.

Viscosity: 48 seconds; Weight: 9.9 lbs/gal.
Drilling Rate: 2 min/ft.

540-545 Same as above.

**Blue Water Creek and Shinarump Undifferentiated**

545-550 Same as above, 50% grey, 50% red, soft to firm .

Drilling Rate: 4 min/ft.

550-555 Same as above with some gypsum.

555-560 Same as above.

Drilling Rate: 5 min/ft from 558-573. (At 573' increased rotation speed to try to increase drill rate)

560-565 Same as above some firmer grey.

565-570 Same as above, 60% red, 40% grey

570-575 Same as above, 70% red, 30% grey.

575-580 Same as above, 50% grey, 50% red, a few sandstones grains.

580-585 Same as above.

585-590 Same as above, ~2% sandstone, quartz with silica cement.

590-595 Same as above some limonite.

Drilling Rate: 5 min/ft.

595-600 Same as above, a little siltier, 5% sandstone, very fine to fine, some limonite staining.

Viscosity: 43 seconds; Weight: 9.9 lbs/gal.

600-605 Same as above, silty mudstone, white and yellow stained, sandstone 10%.

605-610 Same as above with red sandstone, 15%.

610-615 Same as above, 5% sandstone.

615-620 Same as above, 5% sandstone. Less limonite.

Viscosity: 39 seconds; Weight: 9.9 lbs/gal.

620-625 Same as above, 3% sandstone.

Pit volume appears to have increased since morning.

625-630 Same as above.

630-635 Same as above.

Mixed mud. Viscosity: 57 seconds; Weight: 10.0 lbs/gal.
Larger and more cuttings. 30% sandstone (origin?)
Lowered pit approximately 1 foot at 2:30 pm. Full again at 4:30 pm.

635-640 Silty mudstone, red, firm to soft; sandstone, red, soft, very fine, slightly calcareous cement.

640-645 Sandstone, red-purple, some white, some mudstone, primarily siltstone, sandstone is typically dark colored minerals, very fine but some larger particles, rounded, some limonite.
Drilling Rate: 5 min/ft.

Viscosity: 56 seconds; Weight: 10.4 lbs/gal.

645-650 Sandstone, clean, well rounded, quartz and dark lithics, silica cement, some limonite stained.

Viscosity: 55 seconds; Weight: 10.6 lbs/gal.

12/3/99

Ciniza Well #4 Log

Well flowing-estimate 10 gpm (end of pipe not reachable)

12/4/99
Flowing clear - measured 13 1/2 gpm

Deviation survey @623' = 7/16 degrees.

Drilling Rate: 2 min/ft.

650-655 Sandstone, red; mudstone, grey, most likely cave in.

Viscosity: 55 seconds; Weight: 11.5 lbs/gal.

655-660 Same as above, 5% light grey sandstone, well rounded, quartz, silica cement.

660-665 Sandstone, red, very fine, 5% light grey sandstone, red and white chert, grey mudstone, some gypsum.

665-670 Sandstone, red, 50%, some light grey sandstone, some limonite; grey, mudstone.

670-675 Same as above. Red sandstone consists of quartz, sub-rounded, red stained, very fine; grey mudstone. Drilling Rate: 4 min/ft.

675-680 Mudstone, grey; sandstone, light red, soft; siltstone, firm. Small piece of well rounded gravel (silica), 20% purple silty mudstone.

680-685 Sandstone, light red, soft, 50%; light grey sandstone, firm, 20%; 10% of sandstone is strongly calcareous; purple silty mudstone.
Drilling Rate: 4-5 min/ft.

Viscosity: 50 seconds; Weight: 11.5 lbs/gal.

685-690 Sandstone 60% light red; 20% purple siltstone; 20% grey mudstone, some dark grains and is firmer.

690-695 Sandstone, 80%; light red, soft, very fine, well sorted, stained quartz, and light grey, finer, lithics in well sorted quartz, calcareous; 20% silty, grey mudstone; some limestone.

695-700 Light red, well sorted, soft, calcareous sandstone; medium grey mudstone, silty, some limonite.
Drilling Rate: 10 min/ft.

700-705 Sandstone, red-brown, firm, calcareous when crushed, very fine, quartz with red stain, pale red, silty to very fine sandstone, hard, quartz and dark minerals, 80%; mudstone, grey and purple mudstone (20%).

705-710 Sandstone, 60% light red; 20% red mudstone; 10% light grey sandstone with limonite; 10% sandstone with angular red mudstone clasts to very fine sand, calcareous when crushed, hard.
Drilling Rate: 10 min/ft

710-715 Same as above.

Pump not pumping well. Viscosity 78. Half of volume as before.

715-720 Same as above with more grey and red mottled mudstone, and gypsum.

**Moenkopi Formation (820')**

720-725 Sandstone, pale red, 60%, effervesces when broken; mudstone, grey, 20%, 5% mottled; 5% limestone.
Drilling Rate: 10 min/ft, Viscosity 90, Weight 11.5

725-730 Same as above.

Trip bit; locked up

**12/5/99**
Bit O.K. - 2 jets plugged - clean bit and return trip (did not change bit). Bit in excellent condition otherwise.

Viscosity: 74 seconds; Weight: 11.5 lbs/gal.

Circulate, pebbly chert and other silica rocks, sandstone - pale red, fine not calcareous, quartz grains in pale red matrix, some (approximately 10%) dark lithic rock grains also - also medium grey mudstone (15%) rounded, easily broken by hand. Very slow drilling. Still poor pumping. 730-731 Calcite infilling (1/4") 6:50am - Shut down - no progress (3/4') since 4:40am. Trip bit still locking up. Bit worn, replaced with carbide button, (Security).

**12/6/99**
Work on pumps. Trip back in hole. Ream 150 feet with new button fit - old button bit was undergauge.
6:15pm - Drilling Rate: 12 min/ft

730-735 Sandstone, pale red to light red, 70%, well sorted quartz, slight staining, red sandstone; 30% grey mudstone, dark purple mudstone.

735-740 Same as above. 10% white sandstone, same characteristics as the pale red - some dark chert, some white mudstone. Drilling Rate: 20 min/ft.

Viscosity: 50 seconds; Weight: 11.5 lbs/gal.

740-745 Same as above. 10% white mudstone mottled with purple; grainy (gypsum?).
Drilling Rate: 15 min/ft,

Viscosity: 40 seconds; Weight: 11.4 lbs/gal.

745-750 Same as above. Some cherty limestone (?) fizzles some.

**Deviation survey @ = 7/16 degrees.**

Viscosity: 46 seconds; Weight: 11.5 lbs/gal.

**12/6/99**
11:50pm - Swivel leaking
Viscosity: 46 seconds; Weight: 11.4 lbs/gal.

750-755 Sandstone, 50% light red, 40% pale red, to 10% white, very fine, well sorted, clear quartz, very fine dark lithics, non-calcareous, angular to sub-angular; 1-2% overall limestone, grey-green to grey. 1% dark red mudstone.
Drilling Rate: 8 - 10 min/ft

755-760 Same as above, effervesces when particles are crushed, mudstone approximately 15%, hard drilling.
Drilling Rate: 8-10 min/ft.

760-765 Same as above, pale red sandstone, frosted, 60%, sandstone is non-calcareous; approximately 10% mudstone, some grey claystone approximately 2%.
Drilling Rate: 12-13 min/ft

Viscosity: 66 seconds; Weight: 11.6 lbs/gal.

765-770 Same as above.

770-775 Same as above, approximately 40% mudstone - dark red/purple with minor grey to light blue white, sandstone still very light red to tan, angular to sub-angular, quartz frosted, well sorted, some red staining gives overall light red color, non-calcareous, red staining very slightly calcareous.

775-780 Same as above. Minor limestone pieces are angular - sub-angular, well sorted quartz, non-calcareous/mudstone is calcareous.

Viscosity: 57 se

905-910 Same as

12/8/99 Drilling
7 7/8 bit. 15,00
Drilling Rate:5
Viscosity: 46 se

910-915 Same san
mudstone

915-920 Sandston
50/50%,
sandston
mudstone
Drilling

920-925 Sandston
red-purp

925-930 Same as
grey mud
Drilling

Viscosity: 48 se

935-940 Sandston
sorted,
mudstone
together
Drilling

Viscosity: 49 se

940-945 Sandston
mudstone

945-950 Same as

Yeso Formation (
950-955 Red brow
sandston
mudstone

955-960 Mudstone
red purp
calcareo
lithics
lithics,
balls.
Viscosity: 48 se





Viscosity: 51 seconds; Weight: 11.9

850-855 Same as above, slightly yell
to break.

855-860 Same as above, only 2% lithi
Drilling Rate:8 min/ft.

Viscosity: 52 seconds; Weight: 11.9

860-865 Same as above, less yellow.
Drilling Rate: 10 min/ft.

865-870 Same as above, tan.

Viscosity: 51 seconds; Weight: 11.9

870-875 Same as above, some yellow m
with red staining.

Table has been popping some, approxi

875-880 Same as above.
Drilling Rate:10 min/ft.

Viscosity: 55 seconds; Weight: 11.9

12/7/99

880-885 Same as above.

885-890 Same sandstone, shows more m
above approximately 30%, man
fracture-dendritic psilomela
faces, non-calcareous.
Drilling Rate: 20 min/ft.

890-895 Same as above, non-calcareou
frosted, very fine approxima

Viscosity: 54 seconds; Weight: 11.9

895-900 Mudstone plus sandstone inte
mudstone (887-993), mudstone
non-calcareous, mudstone/san
suspect rate in mudstone app
sandstone 6-10 min/ft.

Viscosity: 56 seconds; Weight: 12 lb

900-905 Sandstone, same sandstone as
mudstone, slow drilling appe
Drilling Rate: 9-12 min/ft.

Deviation survey @ 928' = 1 1/4 degrees

960-965 Sandstone, light grey (same as above); 40%-mudstone red brown 30%; red purple 5%; light grey mudstone, medium soft 20%; grey mud balls 5%.
Drilling Rate: 10-12 min/ft.

965-970 Sandstone, light grey to tan 60%; red brown mudstone 35%; red purple 5%.

<u>12/9/99 1:20 am</u>

970-975 Sandstone, strongly calcareous when broken, light grey, very fine, angular to sub-angular, quartz, flakes crumble easily, some red brown mudstone washes up with sandstone-suspect washout from above.
Drilling Rate:12 min/ft.

Viscosity: 46 seconds; Weight: 12 lbs/gal.

975-980 Same as above.

980-985 Sandstone as above; red brown mudstone, some medium grey mudstone 60/40%, sandstone/mudstone approximately 50/50%, mudstone/sandstone is likely interbedded although some washing may be occuring-caliper log will tell
Drilling Rate: 9-10 min/ft.

Viscosity: 51 seconds; Weight: 12 lbs/gal.

985-990 Mudstone, red brown 90%, grey/purple 10%, minor light blue grey, some mottled red brown/blue grey, crumbly, few pieces of sandstone but rare.
Drilling Rate:7-10 min/ft.

990-995 Sandstone/mudstone 50/50%, sandstone is very fine, weakly calcareous, light blue grey-very light red, quartz, rounded to sub-rounded, slightly frosted to clear; mudstone 50/50%, red brown-light blue grey-medium grey, some mudstone washing from above.
Drilling Rate:5-6 min/ft.

Viscosity: 52 seconds; Weight: 12.1 lbs/gal.

995-1000 Same as above, some chert.
Drilling Rate: 5-6 min/ft.

Viscosity: 55 seconds; Weight: 12.2 lbs/gal.

1000-1005 Same as above, slightly more mudstone-approximately 60%, grey mudstone is slightly calcareous.

1005-1010 Same as above, some chert, sandstone is calcareous when broken.
Drilling Rate:7-10 min/ft.

Viscosity: 7-10 seconds; Weight: 12.2 lbs/gal.

1010-1015 Same as above, mudstone/sandstone approximately 70/30%; mudstone red brown/blue grey approximately 80/20%.

1015-1020 Sandstone, very slightly calcareous, sub-rounded, generally clear, very fine light grey-white, crumbles easily; approximately 25% shale that appears to have sloughed from walls above (large pieces), red brown and mottled, medium to light brown grey.

1020-1025 Same as above.

1025-1030 Same as above, some blue green mudstone pieces, some (minor) dark red sandstone, very fine non-calcareous, some clay balls with sample, added water and cleaned pit.
Drilling Rate:7-9 min/ft.

Viscosity: 43 seconds; Weight: 11.8 lbs/gal.

1030-1035 Same as above.

1035-1040 Same as above.

1040-1045 Same as above, 40% sandstone.

1045-1050 Same as above, 70% sandstone, sandstone appears a little coarser.

1050-1055 Same as above, 70% sandstone, some sandstones have slightly larger quartz grains, sub-rounded, clear.
Drilling Rate: 10 min/ft.
Viscosity: 56 seconds; Weight: 11.6 lbs/gal.

1055-1060 Same as above, 60% sandstone, dark grey, hard limestone 20%.

Rotary table very noisy at 1057'.

1060-1065 Limestone, hard, dark grey to grey 60/30%, red purple mudstone 10%, sandstone grey, limestones may be partially dolomitized.
Drilling Rate:10 min/ft.

Viscosity: 48 seconds; Weight: 11.6 lbs/gal.

1065-1070 Limestone 70%, red brown 15%, red purple, 18%, white soft to clay balls 8%, grey mudballs 8%.

**Total depth 1076 feet**

**Deviation survey @ 1040' = 1 1/2 degrees**

**12/10/99 - 12/15/99**

Ream 17 1/2"to 775'.
Set 13 3/8" casing to 731' and cement.
Cone lost off reaming bit. Washed hole to 1075'.
Cone at 1076'.

**12/16/99**

Begin reaming 12" hole. Well completed as open hole from 731' to 1020. The 7 7/8" rathole is from 1020' to 1076'.

Well shut in pressure, before perforating, on 1/10/00 was 112 psi with unrestricted flow at approximately 110 gpm.

Perforated 13 3/8" casing with 8 shots per foot from 560'-715' to increase production.

**1/27/00**

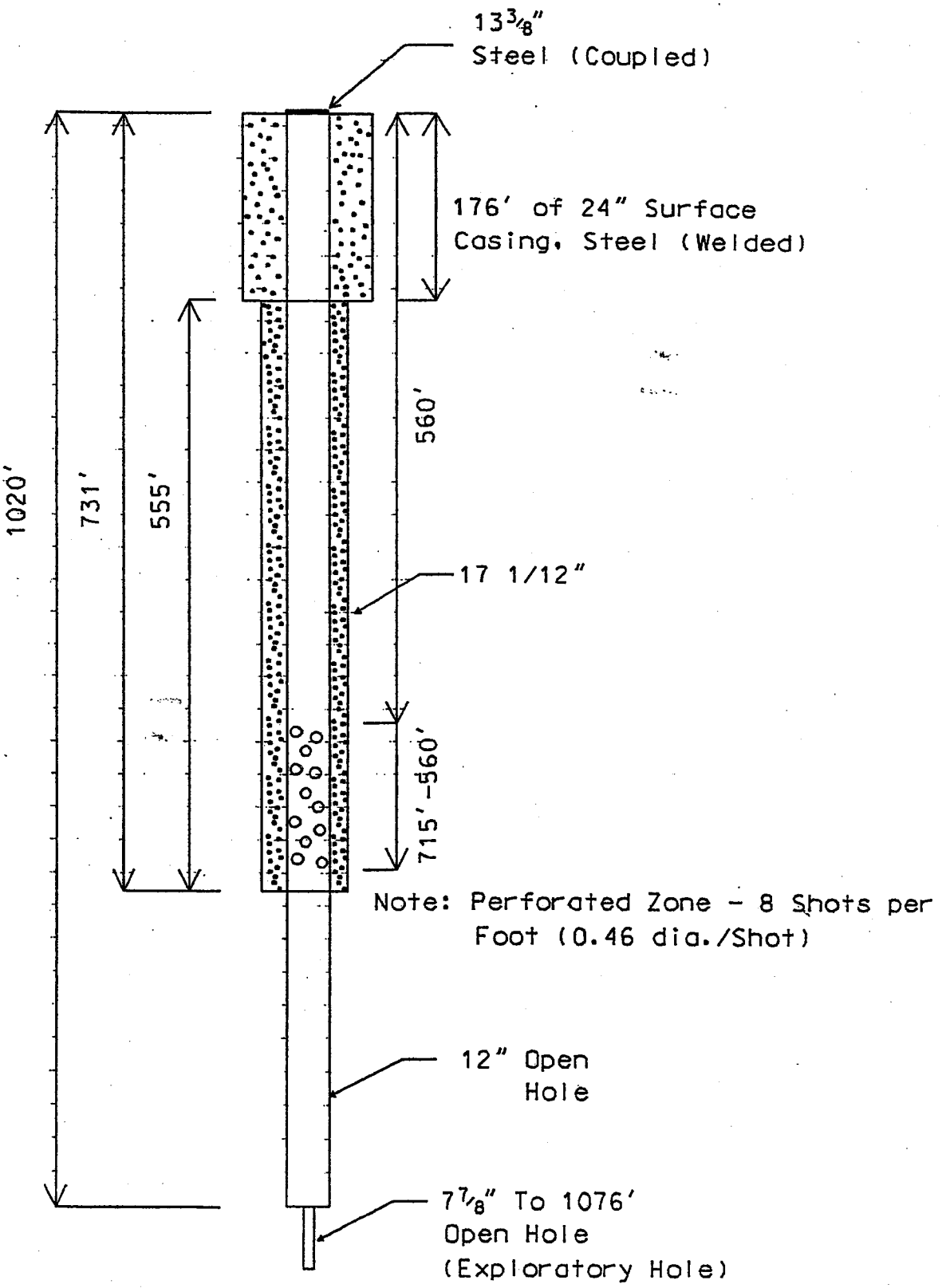
Unrestricted flow not measured at the time of this report.

# CINIZA REFINERY

## COMPLETION DIAGRAM

CINIZA WELL #4

Note: All Elevations From Kelly Bushing



# Hall Environmental Analysis Laboratory

**Date:** *25-Aug-04*

**CLIENT:** Giant Refining Co
**Lab Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito
**Lab ID:** 0408038-01

**Client Sample ID:** Well #4
**Collection Date:** 8/4/2004 3:00:00 PM
**Matrix:** AQUEOUS

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **MAP** |
| Fluoride | 0.21 | 0.10 | | mg/L | 1 | 8/5/2004 1:56:45 PM |
| Nitrogen, Nitrate (As N) | 0.12 | 0.10 | | mg/L | 1 | 8/5/2004 1:56:45 PM |
| **EPA METHOD 504.1: EDB** | | | | | | Analyst: **SCC** |
| 1,2-Dibromoethane | ND | 0.010 | | µg/L | 1 | 8/6/2004 12:29:58 PM |
| **EPA METHOD 8082: PCB'S** | | | | | | Analyst: **JMP** |
| Aroclor 1016 | ND | 1.0 | | µg/L | 1 | 8/24/2004 5:22:53 AM |
| Aroclor 1221 | ND | 5.0 | | µg/L | 1 | 8/24/2004 5:22:53 AM |
| Aroclor 1232 | ND | 1.0 | | µg/L | 1 | 8/24/2004 5:22:53 AM |
| Aroclor 1242 | ND | 1.0 | | µg/L | 1 | 8/24/2004 5:22:53 AM |
| Aroclor 1248 | ND | 1.0 | | µg/L | 1 | 8/24/2004 5:22:53 AM |
| Aroclor 1254 | ND | 1.0 | | µg/L | 1 | 8/24/2004 5:22:53 AM |
| Aroclor 1260 | ND | 1.0 | | µg/L | 1 | 8/24/2004 5:22:53 AM |
| Surr: Decachlorobiphenyl | 106 | 45.3-140 | | %REC | 1 | 8/24/2004 5:22:53 AM |
| Surr: Tetrachloro-m-xylene | 66.0 | 28.1-139 | | %REC | 1 | 8/24/2004 5:22:53 AM |
| **EPA METHOD 8260B: VOLATILES** | | | | | | Analyst: **KTM** |
| Benzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Toluene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Methyl tert-butyl ether (MTBE) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2,4-Trimethylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,3,5-Trimethylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dichloroethane (EDC) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dibromoethane (EDB) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Naphthalene | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| 1-Methylnaphthalene | ND | 4.0 | | µg/L | 1 | 8/10/2004 |
| 2-Methylnaphthalene | ND | 4.0 | | µg/L | 1 | 8/10/2004 |
| Acetone | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Bromobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Bromochloromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Bromodichloromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Bromoform | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Bromomethane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| 2-Butanone | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Carbon disulfide | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Carbon Tetrachloride | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Chlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Chloroethane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| Chloroform | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Chloromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |

**Qualifiers:**
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

# Hall Environmental Analysis Laboratory

**Date:** *25-Aug-04*

**CLIENT:** Giant Refining Co
**Lab Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito
**Lab ID:** 0408038-01

**Client Sample ID:** Well #4
**Collection Date:** 8/4/2004 3:00:00 PM
**Matrix:** AQUEOUS

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| 2-Chlorotoluene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 4-Chlorotoluene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| cis-1,2-DCE | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| cis-1,3-Dichloropropene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dibromo-3-chloropropane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| Dibromochloromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Dibromomethane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,3-Dichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,4-Dichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Dichlorodifluoromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1-Dichloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1-Dichloroethene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dichloropropane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,3-Dichloropropane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 2,2-Dichloropropane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1-Dichloropropene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Hexachlorobutadiene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 2-Hexanone | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Isopropylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 4-Isopropyltoluene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 4-Methyl-2-pentanone | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Methylene Chloride | ND | 3.0 | | µg/L | 1 | 8/10/2004 |
| n-Butylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| n-Propylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| sec-Butylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Styrene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| tert-Butylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1,1,2-Tetrachloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1,2,2-Tetrachloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Tetrachloroethene (PCE) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| trans-1,2-DCE | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| trans-1,3-Dichloropropene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2,3-Trichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2,4-Trichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1,1-Trichloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1,2-Trichloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Trichloroethene (TCE) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Trichlorofluoromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2,3-Trichloropropane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| Vinyl chloride | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Xylenes, Total | ND | 1.0 | | µg/L | 1 | 8/10/2004 |

**Qualifiers:**
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R - RPD outside accepted recovery limits
E - Value above quantitation range

# Hall Environmental Analysis Laboratory

**Date:** *25-Aug-04*

**CLIENT:** Giant Refining Co
**Lab Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito
**Lab ID:** 0408038-01

**Client Sample ID:** Well #4
**Collection Date:** 8/4/2004 3:00:00 PM
**Matrix:** AQUEOUS

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Surr: 1,2-Dichloroethane-d4 | 102 | 70.6-124 | | %REC | 1 | 8/10/2004 |
| Surr: 4-Bromofluorobenzene | 101 | 76.4-130 | | %REC | 1 | 8/10/2004 |
| Surr: Dibromofluoromethane | 111 | 67.2-131 | | %REC | 1 | 8/10/2004 |
| Surr: Toluene-d8 | 99.6 | 82.1-123 | | %REC | 1 | 8/10/2004 |
| **EPA METHOD 8310: PAHS** | | | | | | Analyst: **IC** |
| Naphthalene | ND | 2.5 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| 1-Methylnaphthalene | ND | 2.5 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| 2-Methylnaphthalene | ND | 2.5 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Acenaphthylene | ND | 2.5 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Acenaphthene | ND | 2.5 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Fluorene | ND | 0.80 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Phenanthrene | ND | 0.60 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Anthracene | ND | 0.60 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Fluoranthene | ND | 0.30 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Pyrene | ND | 0.30 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Benz(a)anthracene | ND | 0.020 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Chrysene | ND | 0.20 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Benzo(b)fluoranthene | ND | 0.050 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Benzo(k)fluoranthene | ND | 0.020 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Benzo(a)pyrene | ND | 0.020 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Dibenz(a,h)anthracene | ND | 0.040 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Benzo(g,h,i)perylene | ND | 0.030 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Indeno(1,2,3-cd)pyrene | ND | 0.080 | | µg/L | 1 | 8/21/2004 11:48:01 AM |
| Surr: Benzo(e)pyrene | 88.7 | 54-102 | | %REC | 1 | 8/21/2004 11:48:01 AM |
| **EPA METHOD 7470: MERCURY** | | | | | | Analyst: **CMC** |
| Mercury | ND | 0.00020 | | mg/L | 1 | 8/9/2004 |
| **EPA METHOD 6010C: DISSOLVED METALS** | | | | | | Analyst: **NMO** |
| Arsenic | ND | 0.020 | | mg/L | 1 | 8/6/2004 10:18:19 AM |
| Barium | 0.014 | 0.0020 | | mg/L | 1 | 8/6/2004 10:18:19 AM |
| Cadmium | ND | 0.0020 | | mg/L | 1 | 8/6/2004 10:18:19 AM |
| Chromium | ND | 0.0060 | | mg/L | 1 | 8/6/2004 10:18:19 AM |
| Lead | ND | 0.0050 | | mg/L | 1 | 8/6/2004 10:18:19 AM |
| Selenium | ND | 0.050 | | mg/L | 1 | 8/6/2004 10:18:19 AM |
| Silver | ND | 0.0050 | | mg/L | 1 | 8/6/2004 10:18:19 AM |
| Uranium | ND | 0.10 | | mg/L | 1 | 8/6/2004 10:18:19 AM |

**Qualifiers:**
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# Hall Environmental Analysis Laboratory

**Date:** *25-Aug-04*

**CLIENT:** Giant Refining Co
**Lab Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito
**Lab ID:** 0408038-02

**Client Sample ID:** TRIP BLANK
**Collection Date:**
**Matrix:** TRIP BLANK

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 504.1: EDB** | | | | | | Analyst: **SCC** |
| 1,2-Dibromoethane | ND | 0.010 | | µg/L | 1 | 8/6/2004 12:42:50 PM |
| **EPA METHOD 8260B: VOLATILES** | | | | | | Analyst: **KTM** |
| Benzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Toluene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Methyl tert-butyl ether (MTBE) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2,4-Trimethylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,3,5-Trimethylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dichloroethane (EDC) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dibromoethane (EDB) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Naphthalene | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| 1-Methylnaphthalene | ND | 4.0 | | µg/L | 1 | 8/10/2004 |
| 2-Methylnaphthalene | ND | 4.0 | | µg/L | 1 | 8/10/2004 |
| Acetone | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Bromobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Bromochloromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Bromodichloromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Bromoform | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Bromomethane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| 2-Butanone | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Carbon disulfide | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Carbon Tetrachloride | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Chlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Chloroethane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| Chloroform | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Chloromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 2-Chlorotoluene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 4-Chlorotoluene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| cis-1,2-DCE | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| cis-1,3-Dichloropropene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dibromo-3-chloropropane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| Dibromochloromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Dibromomethane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,3-Dichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,4-Dichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Dichlorodifluoromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1-Dichloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1-Dichloroethene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2-Dichloropropane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |

**Qualifiers:**
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

# Hall Environmental Analysis Laboratory

**Date:** *25-Aug-04*

**CLIENT:** Giant Refining Co
**Lab Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito
**Lab ID:** 0408038-02

**Client Sample ID:** TRIP BLANK
**Collection Date:**
**Matrix:** TRIP BLANK

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| 1,3-Dichloropropane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 2,2-Dichloropropane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1-Dichloropropene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Hexachlorobutadiene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 2-Hexanone | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Isopropylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 4-Isopropyltoluene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 4-Methyl-2-pentanone | ND | 10 | | µg/L | 1 | 8/10/2004 |
| Methylene Chloride | ND | 3.0 | | µg/L | 1 | 8/10/2004 |
| n-Butylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| n-Propylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| sec-Butylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Styrene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| tert-Butylbenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1,1,2-Tetrachloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1,2,2-Tetrachloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Tetrachloroethene (PCE) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| trans-1,2-DCE | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| trans-1,3-Dichloropropene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2,3-Trichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2,4-Trichlorobenzene | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1,1-Trichloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,1,2-Trichloroethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Trichloroethene (TCE) | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Trichlorofluoromethane | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| 1,2,3-Trichloropropane | ND | 2.0 | | µg/L | 1 | 8/10/2004 |
| Vinyl chloride | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Xylenes, Total | ND | 1.0 | | µg/L | 1 | 8/10/2004 |
| Surr: 1,2-Dichloroethane-d4 | 104 | 70.6-124 | | %REC | 1 | 8/10/2004 |
| Surr: 4-Bromofluorobenzene | 106 | 76.4-130 | | %REC | 1 | 8/10/2004 |
| Surr: Dibromofluoromethane | 114 | 67.2-131 | | %REC | 1 | 8/10/2004 |
| Surr: Toluene-d8 | 99.5 | 82.1-123 | | %REC | 1 | 8/10/2004 |

**Qualifiers:**
ND - Not Detected at the Reporting Limit
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* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

ENERGY LABORATORIES, INC. *2393 Salt Creek Highway (82601)* P.O. Box 3258 * Casper, WY 82602
Toll Free 888.235.0515 * 307.235.0515 * Fax 307.234.1639 * casper@energylab.com

# LABORATORY ANALYTICAL REPORT

**Client:** Hall Environmental
**Project:** Well 4 Iyanbito
**Lab ID:** C04080305-001
**Client Sample ID:** Well #4 (0408038-01)

**Report Date:** 08/23/04
**Collection Date:** 08/04/04 15:00
**Date Received:** 08/06/04
**Matrix:** Aqueous

| Analyses | Result | Units | Qual | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **NON-METALS** | | | | | | | |
| Cyanide, Total Automated | ND | mg/L | | 0.1 | | E335.3 | 08/12/04 11:56 eli-b |
| **RADIONUCLIDES - TOTAL** | | | | | | | |
| Radium 226 | ND | pCi/L | | 2.5 | | E903.0 | 08/09/04 14:50 df |
| Radium 228 | ND | pCi/L | | 2.5 | | E904.0 | 08/09/04 14:50 pj |

**Report Definitions:**
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected a he reporting limit.

# ASSAIGAI ANALYTICAL LABORATORIES, INC.

4301 Masthead NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259

3332 Wedgewood, Ste. N • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820

127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558


**Explanation of codes**

| | |
|---|---|
| B | *analyte detected in Method Blank* |
| E | *result is estimated* |
| H | *analyzed out of hold time* |
| N | *tentatively identified compound* |
| S | *subcontracted* |
| 1-9 | *see footnote* |

**HALL ENVIRONMENTAL**
attn: **ANDY FREEMAN**
**4901 HAWKINS NE, SUITE D**
**ALBUQUERQUE NM 87109-4372**

STANDARD

*Assaigai Analytical Laboratories, Inc.*

## *Certificate of Analysis*

Client: **HALL ENVIRONMENTAL**
Project: **WELL 4 LYANBITO**
Order: **0408106 HAL03** Receipt: **08-05-04**

*William T. Biava: President of Assaigai Analytical Laboratories, Inc.*

Sample: ***WELL #4*** Collected: *08-04-04 15:00:00* By:
Matrix: ***AQUEOUS***

| QC Group | Run Sequence | CAS # | Analyte | Result | Units | Dilution Factor | Detection Limit | Code | Prep Date | Run Date |
|---|---|---|---|---|---|---|---|---|---|---|
| **0408106-01A** | | **SM-9223B** | | | | | By: | DAW | | |
| BT04216 | BT.2004.588.13 | | E. coli, MMO/MUG | Absent | N/A | 1 | 0 | | 08-05-04 | 08-06-04 |
| BT04216 | BT.2004.588.13 | | Total Coliform, MMO/MUG | Absent | N/A | 1 | 0 | | 08-05-04 | 08-06-04 |

*Unless otherwise noted, all samples were received in acceptable condition and all sampling was performed by client or client representative. Sample result of ND indicates Not Detected, ie result is less than the sample specific Detection Limit. Sample specific Detection Limit is determined by multiplying the sample Dilution Factor by the listed Reporting Detection Limit. All results relate only to the items tested. Any miscellaneous workorder information or foonotes will appear below.*




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PRODUCT ENDORSEMENT BY THE NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM.

Hall Environmental Analysis Laboratory

**Date:** *25-Aug-04*

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

## Method Blank

Sample ID **MBLK** | Batch ID: **R12686** | Test Code: **E300** | Units: **mg/L** | Analysis Date **8/5/2004 10:18:34 AM** | Prep Date
Client ID: | Run ID: **LC_040805A** | SeqNo: **294143**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | ND | 0.1 | | | | | | | | | |
| Nitrogen, Nitrate (As N) | ND | 0.1 | | | | | | | | | |

Sample ID **MBLK** | Batch ID: **R12686** | Test Code: **E300** | Units: **mg/L** | Analysis Date **8/5/2004 10:20:37 PM** | Prep Date
Client ID: | Run ID: **LC_040805A** | SeqNo: **294187**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | ND | 0.1 | | | | | | | | | |
| Nitrogen, Nitrate (As N) | ND | 0.1 | | | | | | | | | |

Sample ID **MB-6258** | Batch ID: **6258** | Test Code: **E504.1** | Units: **µg/L** | Analysis Date **8/6/2004 9:56:00 AM** | Prep Date **8/6/2004**
Client ID: | Run ID: **ECD(14A)_040806A** | SeqNo: **294277**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dibromoethane | ND | 0.01 | | | | | | | | | |

**Qualifiers:** ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

## Method Blank

Sample ID **MB-6260** Batch ID: **6260** Test Code: **SW8080A** Units: **µg/L** Analysis Date **8/24/2004 2:18:30 AM** Prep Date **8/6/2004**

Client ID: Run ID: **ECD(17A)_040822A** SeqNo: **298794**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND | 1 | | | | | | | | | |
| Aroclor 1221 | ND | 5 | | | | | | | | | |
| Aroclor 1232 | ND | 1 | | | | | | | | | |
| Aroclor 1242 | ND | 1 | | | | | | | | | |
| Aroclor 1248 | ND | 1 | | | | | | | | | |
| Aroclor 1254 | ND | 1 | | | | | | | | | |
| Aroclor 1260 | ND | 1 | | | | | | | | | |
| Surr: Decachlorobiphenyl | 2.52 | 0 | 2.5 | 0 | 101 | 45.3 | 140 | 0 | | | |
| Surr: Tetrachloro-m-xylene | 1.72 | 0 | 2.5 | 0 | 68.8 | 28.1 | 139 | 0 | | | |

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**Qualifiers:** ND - Not Detected at the Reporting Limit
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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT
## Method Blank

Sample ID **MB-6265** Batch ID: **6265** Test Code: **SW8310** Units: **µg/L** Analysis Date **8/21/2004 10:12:01 AM** Prep Date **8/9/2004**
Client ID: Run ID: **HUGO_040820A** SeqNo: **298503**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | 2.5 | | | | | | | | | |
| 1-Methylnaphthalene | ND | 2.5 | | | | | | | | | |
| 2-Methylnaphthalene | ND | 2.5 | | | | | | | | | |
| Acenaphthylene | ND | 2.5 | | | | | | | | | |
| Acenaphthene | ND | 2.5 | | | | | | | | | |
| Fluorene | ND | 0.8 | | | | | | | | | |
| Phenanthrene | ND | 0.6 | | | | | | | | | |
| Anthracene | ND | 0.6 | | | | | | | | | |
| Fluoranthene | ND | 0.3 | | | | | | | | | |
| Pyrene | ND | 0.3 | | | | | | | | | |
| Benz(a)anthracene | ND | 0.02 | | | | | | | | | |
| Chrysene | ND | 0.2 | | | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.05 | | | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.02 | | | | | | | | | |
| Benzo(a)pyrene | ND | 0.02 | | | | | | | | | |
| Dibenz(a,h)anthracene | ND | 0.04 | | | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.03 | | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | ND | 0.08 | | | | | | | | | |
| Surr: Benzo(e)pyrene | 9.01 | 0 | 10 | 0 | 90.1 | 54 | 102 | 0 | | | |

Sample ID **MB-6267** Batch ID: **6267** Test Code: **SW7470** Units: **mg/L** Analysis Date **8/9/2004** Prep Date **8/9/2004**
Client ID: Run ID: **MI-LA254_040809A** SeqNo: **295021**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | 0.0002 | | | | | | | | | |

**Qualifiers:** ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

## Method Blank

Sample ID **MB** Batch ID: **R12692** Test Code: **SW6010A** Units: **mg/L** Analysis Date **8/6/2004 8:35:37 AM** Prep Date

Client ID: Run ID: **ICP_040806A** SeqNo: **294294**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | 0.02 | | | | | | | | | |
| Barium | ND | 0.002 | | | | | | | | | |
| Cadmium | ND | 0.002 | | | | | | | | | |
| Chromium | ND | 0.006 | | | | | | | | | |
| Lead | ND | 0.005 | | | | | | | | | |
| Selenium | ND | 0.05 | | | | | | | | | |
| Silver | ND | 0.005 | | | | | | | | | |
| Uranium | ND | 0.1 | | | | | | | | | |

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**Qualifiers:** ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

**Date:** *25-Aug-04*

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT
## Method Blank

Sample ID **5ml rb** Batch ID: **R12713** Test Code: **SW8260B** Units: **µg/L** Analysis Date **8/9/2004** Prep Date
Client ID: Run ID: **VAL_040809A** SeqNo: **295199**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | ND | 1 | | | | | | | | | |
| Toluene | ND | 1 | | | | | | | | | |
| Ethylbenzene | ND | 1 | | | | | | | | | |
| Methyl tert-butyl ether (MTBE) | ND | 1 | | | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 1 | | | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 1 | | | | | | | | | |
| 1,2-Dichloroethane (EDC) | ND | 1 | | | | | | | | | |
| 1,2-Dibromoethane (EDB) | ND | 1 | | | | | | | | | |
| Naphthalene | ND | 2 | | | | | | | | | |
| 1-Methylnaphthalene | ND | 4 | | | | | | | | | |
| 2-Methylnaphthalene | ND | 4 | | | | | | | | | |
| Acetone | ND | 10 | | | | | | | | | |
| Bromobenzene | ND | 1 | | | | | | | | | |
| Bromochloromethane | ND | 1 | | | | | | | | | |
| Bromodichloromethane | ND | 1 | | | | | | | | | |
| Bromoform | ND | 1 | | | | | | | | | |
| Bromomethane | ND | 2 | | | | | | | | | |
| 2-Butanone | ND | 10 | | | | | | | | | |
| Carbon disulfide | ND | 10 | | | | | | | | | |
| Carbon Tetrachloride | ND | 1 | | | | | | | | | |
| Chlorobenzene | ND | 1 | | | | | | | | | |
| Chloroethane | ND | 2 | | | | | | | | | |
| Chloroform | ND | 1 | | | | | | | | | |
| Chloromethane | ND | 1 | | | | | | | | | |
| 2-Chlorotoluene | ND | 1 | | | | | | | | | |
| 4-Chlorotoluene | ND | 1 | | | | | | | | | |
| cis-1,2-DCE | ND | 1 | | | | | | | | | |

**Qualifiers:** ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

Method Blank

| | | |
|---|---|---|
| cis-1,3-Dichloropropene | ND | 1 |
| 1,2-Dibromo-3-chloropropane | ND | 2 |
| Dibromochloromethane | ND | 1 |
| Dibromomethane | ND | 2 |
| 1,2-Dichlorobenzene | ND | 1 |
| 1,3-Dichlorobenzene | ND | 1 |
| 1,4-Dichlorobenzene | ND | 1 |
| Dichlorodifluoromethane | ND | 1 |
| 1,1-Dichloroethane | ND | 1 |
| 1,1-Dichloroethene | ND | 1 |
| 1,2-Dichloropropane | ND | 1 |
| 1,3-Dichloropropane | ND | 1 |
| 2,2-Dichloropropane | ND | 1 |
| 1,1-Dichloropropene | ND | 1 |
| Hexachlorobutadiene | ND | 1 |
| 2-Hexanone | ND | 10 |
| Isopropylbenzene | ND | 1 |
| 4-Isopropyltoluene | ND | 1 |
| 4-Methyl-2-pentanone | ND | 10 |
| Methylene Chloride | ND | 3 |
| n-Butylbenzene | ND | 1 |
| n-Propylbenzene | ND | 1 |
| sec-Butylbenzene | ND | 1 |
| Styrene | ND | 1 |
| tert-Butylbenzene | ND | 1 |
| 1,1,1,2-Tetrachloroethane | ND | 1 |
| 1,1,2,2-Tetrachloroethane | ND | 1 |
| Tetrachloroethene (PCE) | ND | 1 |
| trans-1,2-DCE | ND | 1 |
| trans-1,3-Dichloropropene | ND | 1 |
| 1,2,3-Trichlorobenzene | ND | 1 |
| 1,2,4-Trichlorobenzene | ND | 1 |
| 1,1,1-Trichloroethane | ND | 1 |

**Qualifiers:** ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

Method Blank

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | ND | 1 | | | | | | |
| Trichloroethene (TCE) | ND | 1 | | | | | | |
| Trichlorofluoromethane | ND | 1 | | | | | | |
| 1,2,3-Trichloropropane | ND | 2 | | | | | | |
| Vinyl chloride | ND | 1 | | | | | | |
| Xylenes, Total | ND | 1 | | | | | | |
| Surr: 1,2-Dichloroethane-d4 | 10.27 | 0 | 10 | 0 | 103 | 68.4 | 127 | 0 |
| Surr: 4-Bromofluorobenzene | 10.23 | 0 | 10 | 0 | 102 | 70.4 | 126 | 0 |
| Surr: Dibromofluoromethane | 10.91 | 0 | 10 | 0 | 109 | 70.2 | 126 | 0 |
| Surr: Toluene-d8 | 10.3 | 0 | 10 | 0 | 103 | 73.5 | 129 | 0 |

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**Qualifiers:** ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

**Date:** *25-Aug-04*

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

Sample Duplicate

Sample ID **0408038-01D DUP** Batch ID: **6267** Test Code: **SW7470** Units: **mg/L** Analysis Date **8/9/2004** Prep Date **8/9/2004**
Client ID: **Well #4** Run ID: **MI-LA254_040809A** SeqNo: **295024**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | 0.0002 | 0 | 0 | 0 | 0 | 0 | 0 | | | |

Sample ID **0408038-01E DUP** Batch ID: **R12692** Test Code: **SW6010A** Units: **mg/L** Analysis Date **8/6/2004 10:21:16 AM** Prep Date
Client ID: **Well #4** Run ID: **ICP_040806A** SeqNo: **294320**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | |
| Barium | 0.01348 | 0.002 | 0 | 0 | 0 | 0 | 0 | 0.01352 | 0.264 | 20 | |
| Cadmium | ND | 0.002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | |
| Chromium | ND | 0.006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | |
| Lead | ND | 0.005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | |
| Selenium | ND | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | |
| Silver | ND | 0.005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | |
| Uranium | ND | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | |

**Qualifiers:** ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

**Date:** *25-Aug-04*

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **LCS** | Batch ID: **R12686** | Test Code: **E300** | Units: **mg/L** | Analysis Date **8/5/2004 10:35:20 AM** | Prep Date
Client ID: | Run ID: **LC_040805A** | SeqNo: **294144**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | 0.4755 | 0.1 | 0.5 | 0 | 95.1 | 90 | 110 | 0 | | | |
| Nitrogen, Nitrate (As N) | 2.436 | 0.1 | 2.5 | 0 | 97.4 | 90 | 110 | 0 | | | |

Sample ID **LCS** | Batch ID: **R12686** | Test Code: **E300** | Units: **mg/L** | Analysis Date **8/5/2004 10:54:14 PM** | Prep Date
Client ID: | Run ID: **LC_040805A** | SeqNo: **294189**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | 0.4508 | 0.1 | 0.5 | 0 | 90.2 | 90 | 110 | 0 | | | |
| Nitrogen, Nitrate (As N) | 2.372 | 0.1 | 2.5 | 0 | 94.9 | 90 | 110 | 0 | | | |

Sample ID **LCS-6258** | Batch ID: **6258** | Test Code: **E504.1** | Units: **µg/L** | Analysis Date **8/6/2004 10:08:52 AM** | Prep Date **8/6/2004**
Client ID: | Run ID: **ECD(14A)_040806A** | SeqNo: **294278**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dibromoethane | 0.077 | 0.01 | 0.1 | 0 | 77.0 | 70 | 130 | 0 | | | |

Sample ID **LCSD-6258** | Batch ID: **6258** | Test Code: **E504.1** | Units: **µg/L** | Analysis Date **8/6/2004 10:21:49 AM** | Prep Date **8/6/2004**
Client ID: | Run ID: **ECD(14A)_040806A** | SeqNo: **294279**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dibromoethane | 0.072 | 0.01 | 0.1 | 0 | 72.0 | 70 | 130 | 0.077 | 6.71 | 13.5 | |

**Qualifiers:** ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

## Laboratory Control Spike - generic

Sample ID **LCS-6260** Batch ID: **6260** Test Code: **SW8080A** Units: **µg/L** Analysis Date **8/24/2004 3:05:02 AM** Prep Date **8/6/2004**
Client ID: Run ID: **ECD(17A)_040822A** SeqNo: **298796**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | 7.096 | 1 | 10 | 0 | 71.0 | 27.4 | 132 | 0 | | | |
| Aroclor 1260 | 10.68 | 1 | 10 | 0 | 107 | 52.1 | 148 | 0 | | | |

Sample ID **LCSD-6260** Batch ID: **6260** Test Code: **SW8080A** Units: **µg/L** Analysis Date **8/24/2004 4:37:48 AM** Prep Date **8/6/2004**
Client ID: Run ID: **ECD(17A)_040822A** SeqNo: **298801**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | 7.658 | 1 | 10 | 0 | 76.6 | 27.4 | 132 | 7.096 | 7.62 | 45.7 | |
| Aroclor 1260 | 11.08 | 1 | 10 | 0 | 111 | 52.1 | 148 | 10.68 | 3.64 | 30 | |

Sample ID **100ng lcs** Batch ID: **R12713** Test Code: **SW8260B** Units: **µg/L** Analysis Date **8/9/2004** Prep Date
Client ID: Run ID: **VAL_040809A** SeqNo: **295201**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 23.45 | 1 | 20 | 0 | 117 | 75.3 | 128 | 0 | | | |
| Toluene | 21.53 | 1 | 20 | 0 | 108 | 87.7 | 122 | 0 | | | |
| Chlorobenzene | 19.71 | 1 | 20 | 0 | 98.6 | 76.2 | 130 | 0 | | | |
| 1,1-Dichloroethene | 19.25 | 1 | 20 | 0 | 96.3 | 70.7 | 122 | 0 | | | |
| Trichloroethene (TCE) | 20.92 | 1 | 20 | 0 | 105 | 76.9 | 130 | 0 | | | |

**Qualifiers:** ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **LCS-6265** Batch ID: **6265** Test Code: **SW8310** Units: **µg/L** Analysis Date **8/21/2004 11:00:01 AM** Prep Date **8/9/2004**
Client ID: Run ID: **HUGO_040820A** SeqNo: **298504**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 27.64 | 2.5 | 40 | 0 | 69.1 | 20.939 | 111.211 | 0 | | | |
| 1-Methylnaphthalene | 28.12 | 2.5 | 40.1 | 0 | 70.1 | 22.016 | 110.385 | 0 | | | |
| 2-Methylnaphthalene | 27.2 | 2.5 | 40 | 0 | 68.0 | 21.098 | 111.261 | 0 | | | |
| Acenaphthylene | 28.18 | 2.5 | 40.1 | 0 | 70.3 | 23.852 | 116.857 | 0 | | | |
| Acenaphthene | 28.22 | 2.5 | 40 | 0 | 70.6 | 27.524 | 111.73 | 0 | | | |
| Fluorene | 2.71 | 0.8 | 4.01 | 0 | 67.6 | 31.046 | 113.32 | 0 | | | |
| Phenanthrene | 1.51 | 0.6 | 2.01 | 0 | 75.1 | 42.279 | 115.749 | 0 | | | |
| Anthracene | 1.51 | 0.6 | 2.01 | 0 | 75.1 | 43.767 | 118.693 | 0 | | | |
| Fluoranthene | 3.25 | 0.3 | 4.01 | 0 | 81.0 | 55.334 | 117.461 | 0 | | | |
| Pyrene | 3.18 | 0.3 | 4.01 | 0 | 79.3 | 57.722 | 120.832 | 0 | | | |
| Benz(a)anthracene | 0.32 | 0.02 | 0.401 | 0 | 79.8 | 70.18 | 113.452 | 0 | | | |
| Chrysene | 1.57 | 0.2 | 2.01 | 0 | 78.1 | 43.942 | 141.404 | 0 | | | |
| Benzo(b)fluoranthene | 0.3 | 0.05 | 0.38 | 0 | 78.9 | 71.192 | 103.368 | 0 | | | |
| Benzo(k)fluoranthene | 0.21 | 0.02 | 0.25 | 0 | 84.0 | 75.336 | 107.209 | 0 | | | |
| Benzo(a)pyrene | 0.2 | 0.02 | 0.251 | 0 | 79.7 | 74.556 | 100.742 | 0 | | | |
| Dibenz(a,h)anthracene | 0.41 | 0.04 | 0.501 | 0 | 81.8 | 80.693 | 106.931 | 0 | | | |
| Benzo(g,h,i)perylene | 0.44 | 0.03 | 0.5 | 0 | 88.0 | 55.168 | 135.014 | 0 | | | |
| Indeno(1,2,3-cd)pyrene | 0.848 | 0.08 | 1.002 | 0 | 84.6 | 79.328 | 104.794 | 0 | | | |

Sample ID **LCS-6267** Batch ID: **6267** Test Code: **SW7470** Units: **mg/L** Analysis Date **8/9/2004** Prep Date **8/9/2004**
Client ID: Run ID: **MI-LA254_040809A** SeqNo: **295022**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.004961 | 0.0002 | 0.005 | 0 | 99.2 | 75.2 | 134 | 0 | | | |

**Qualifiers:** ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

## Laboratory Control Spike Duplicate

Sample ID **LCSD-6267** Batch ID: **6267** Test Code: **SW7470** Units: **mg/L** Analysis Date **8/9/2004** Prep Date **8/9/2004**
Client ID: Run ID: **MI-LA254_040809A** SeqNo: **295037**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00507 | 0.0002 | 0.005 | 0 | 101 | 75.2 | 134 | 0.004961 | 2.19 | 0 | |

Sample ID **LCS** Batch ID: **R12692** Test Code: **SW6010A** Units: **mg/L** Analysis Date **8/6/2004 8:38:30 AM** Prep Date
Client ID: Run ID: **ICP_040806A** SeqNo: **294295**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.5066 | 0.02 | 0.5 | 0 | 101 | 80 | 120 | 0 | | | |
| Barium | 0.4724 | 0.002 | 0.5 | 0 | 94.5 | 80 | 120 | 0 | | | |
| Cadmium | 0.4991 | 0.002 | 0.5 | 0 | 99.8 | 80 | 120 | 0 | | | |
| Chromium | 0.4786 | 0.006 | 0.5 | 0 | 95.7 | 80 | 120 | 0 | | | |
| Lead | 0.4877 | 0.005 | 0.5 | 0 | 97.5 | 80 | 120 | 0 | | | |
| Selenium | 0.5447 | 0.05 | 0.5 | 0 | 109 | 80 | 120 | 0 | | | |
| Silver | 0.4788 | 0.005 | 0.5 | 0 | 95.8 | 80 | 120 | 0 | | | |

Sample ID **LCSD** Batch ID: **R12692** Test Code: **SW6010A** Units: **mg/L** Analysis Date **8/6/2004 8:41:30 AM** Prep Date
Client ID: Run ID: **ICP_040806A** SeqNo: **294296**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.5037 | 0.02 | 0.5 | 0 | 101 | 80 | 120 | 0.5066 | 0.564 | 20 | |
| Barium | 0.4822 | 0.002 | 0.5 | 0 | 96.4 | 80 | 120 | 0.4724 | 2.06 | 20 | |
| Cadmium | 0.5077 | 0.002 | 0.5 | 0 | 102 | 80 | 120 | 0.4991 | 1.70 | 20 | |
| Chromium | 0.4859 | 0.006 | 0.5 | 0 | 97.2 | 80 | 120 | 0.4786 | 1.51 | 20 | |
| Lead | 0.4945 | 0.005 | 0.5 | 0 | 98.9 | 80 | 120 | 0.4877 | 1.39 | 20 | |
| Selenium | 0.5452 | 0.05 | 0.5 | 0 | 109 | 80 | 120 | 0.5447 | 0.0927 | 20 | |
| Silver | 0.4917 | 0.005 | 0.5 | 0 | 98.3 | 80 | 120 | 0.4788 | 2.67 | 20 | |

**Qualifiers:** ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

**CLIENT:** Giant Refining Co
**Work Order:** 0408038
**Project:** Well #4 SDWA/Iyanbito

# QC SUMMARY REPORT

## Laboratory Control Spike - generic

Sample ID **LCS U** Batch ID: **R12692** Test Code: **SW6010A** Units: **mg/L** Analysis Date **8/6/2004 10:58:34 AM** Prep Date
Client ID: Run ID: **ICP_040806A** SeqNo: **294330**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Uranium | 5.11 | 0.1 | 5 | 0 | 102 | 80 | 120 | 0 | | | |

Sample ID **LCSD U** Batch ID: **R12692** Test Code: **SW6010A** Units: **mg/L** Analysis Date **8/6/2004 11:01:27 AM** Prep Date
Client ID: Run ID: **ICP_040806A** SeqNo: **294331**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Uranium | 5.131 | 0.1 | 5 | 0 | 103 | 80 | 120 | 5.11 | 0.414 | 20 | |

20/21

**Qualifiers:** ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

# Hall Environmental Analysis Laboratory

## Sample Receipt Checklist

Client Name GIANTREFIN

Date and Time Received:

Work Order Number 0408038

Received by AMG

Checklist completed by O Gonzales 08/05/04
Signature Date

Matrix

Carrier name Client drop-off

| | | | | |
|---|---|---|---|---|
| Shipping container/cooler in good condition? | Yes ☑ | No ☐ | Not Present ☐ | |
| Custody seals intact on shipping container/cooler? | Yes ☐ | No ☐ | Not Present ☐ | Not Shipped ☑ |
| Custody seals intact on sample bottles? | Yes ☐ | No ☐ | N/A ☑ | |
| Chain of custody present? | Yes ☑ | No ☐ | | |
| Chain of custody signed when relinquished and received? | Yes ☑ | No ☐ | | |
| Chain of custody agrees with sample labels? | Yes ☑ | No ☐ | | |
| Samples in proper container/bottle? | Yes ☑ | No ☐ | | |
| Sample containers intact? | Yes ☑ | No ☐ | | |
| Sufficient sample volume for indicated test? | Yes ☑ | No ☐ | | |
| All samples received within holding time? | Yes ☑ | No ☐ | | |
| Water - VOA vials have zero headspace? | No VOA vials submitted ☐ | Yes ☐ | No ☑ | |
| Water - pH acceptable upon receipt? | Yes ☐ | No ☐ | N/A ☑ | |

Container/Temp Blank temperature? **8°** *4° C ± 2 Acceptable*
If given sufficient time to cool.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____

# CHAIN-OF-CUSTODY RECORD

**HALL ENVIRONMENTAL ANALYSIS LABORATORY**
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345-3975 Fax 505.345.4107
www.hallenvironmental.com

Client: Giant Refining Company - Ciniza
Address: Rt 3 Box 7 Gallup, NM 87301
Phone #: 505 722 3833
Fax #:

Project Name: Well #4 SDWA/Navajito
Project #:
Project Manager: [signature]
Sampler: [signature]
Samples Cold?: ☐ Yes ☐ No 8.0

| Date | Time | Matrix | Sample I.D. No. | Number/Volume | Preservative $HgCl_2$ | Preservative HCl | Preservative | HEAL No. 040838 | BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gasoline Only) | TPH Method 8015B MOD (Gas/Diesel) | TPH (Method 418.1) | Volatiles Full List (8021) | EDB (Method 504.1) | EDC (Method 8021) | 8310 (PNA or PAH) | RCRA 8 Metals | Cations (Na, K, Ca, Mg) | Anions (F, Cl, $NO_3$, $NO_2$, $PO_4$, $SO_4$) | 8081 Pesticides / PCB's (8082) | 8260 (VOA) | 8270 (Semi-VOA) | SDWA | Total coliform | Air Bubbles or Headspace (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/4/04 | 1500 | $H_2O$ | Well #4 | | | | | 1 | | | | | | | | | | | | | | | X | X | N Y |
| | | | TB | | | | | 2 | | | | | | | | | | | | | | | | | |

| Date: | Time: | Relinquished By: (Signature) | Received By: (Signature) |
|---|---|---|---|
| 3/5/04 | 1015 | [signature] | [signature] 03/05/04 1015 |
| Date: | Time: | Relinquished By: (Signature) | Received By: (Signature) |

Remarks: No pesticides or herbicides NEEDED