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GIANT
Giant Refining Company
Route 3, Box 7
Gallup, NM 87301

March 14, 2007

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RE: Revised 2005 Annual Groundwater Report (and OCD Addendum), Discharge Permit GW-032

Dear Carl, Hope, and Brandon:

Giant Refining has revised the 2005 OCD Groundwater Report according to the Notice of Deficiency that NMED sent to Giant dated October 31, 2006. I have provided a cross reference chart at the beginning of the report which details where all changes have been made.

At the time of submittal, Giant had not received the revised Figures 4 and 5 from Precision Engineering. Giant will provide the figures to OCD and NMED once Giant has received them from Precision Engineering. I apologize in advance for any inconvenience this may cause.

If you have any questions please contact me at (505) 722-0227.

Sincerely,

Jim Lieb, Environmental Engineer
Giant Refining, Ciniza Refinery
Gallup, NM

cc: Ed Rios w/o report
Ed Riege w/o report

OIL CONSERVATION DIVISION 2005 ANNUAL GROUNDWATER REPORT (AND OCD ADDENDUM) *REVISION*

Binder 1: Annual Groundwater Report

Giant Refining Company - Ciniza Refinery

McKinley County, New Mexico

March 14, 2007

EPA ID No. NMD000333211

Discharge Permit No. GW-032

Prepared By : Jim Lieb, Environmental Engineer, Giant Refining – Ciniza Refinery

Signature: _____, Date: 3/14/07

Certified By: Ed Rios, General Manager, Giant Refining – Ciniza Refinery

Signature: _____, Date: 3-14-07

Cross Reference Chart
Revised Oil Conservation Division 2005 Groundwater Report
Giant Refining Company, Ciniza Refinery, HWB-GRCC-06-003
EPA ID#: NMD000333211

NMED Comment Number	Revised Report Revision Location
1	Addressed in the Executive Summary and in Section 4 (Page 18).
2	No change is necessary for this report, will abide by in future reports.
3	This text was entirely removed as a result of Comment 17.
4	See revised table in Section 4 (Page 15).
5	See the revised Well Data Summary Table in Section 7.
6	All field sampling and handling procedures were moved into, and consolidated in, the Appendix B.
7	Conversions were made to nearest 0.01 foot in *RW-1 Hydrocarbon Recovery* table in Section 7. Coversion factors to calculate the well volumes are also included (see the Well Volume Sheet).
8	Results for EP-1-IN were added to tables in Section 5 (*Influent to Evaoporation Pond 1*).
9	The *Unless Otherwise Specified* comments were unecessary and therefore removed.
10	Addressed in Section 6 (Page 18). The MTBE result was corrected in the Table *Volatiles 8021B (Page 21)*
11	Addressed on Page 18.
12	Addressed in Section 6 (bottom of Page 41 and top of 42).
13	Conversions were made to nearest 0.01 foot in *RW-1 Hydrocarbon Recovery* table in Section 7.
14	A footnote was added to the bottom of the Well Data Summary table to define "na".
15	New Figure 4 and Figure 5 based on September and October sampling data are included.
16. a.	Groundwater sampling Instruments are identified in Appendix B on Page 56.
16. b.	The instrument calibration procedures are provided in Appendix B on Page 60.
16.c.	The filter type is described in Appendix B on Page 56.
16.d.	Sample collection methods are providd in Appendix B.
16.e.	Decontamination is described in Appendix B on Page 60.
17	All references to the RR Rack Lagoon cleanup were deleted from the report.
18	The reference to HWB-GRCC-04-001 was removed from the Executive Summary and Section 1.
19	In future reports, in Binder 2, Section 3a, the year will be provided with the month.
20	In future reports, in Binder 2, section breaks will be provided between the different groups of analysis.

Executive Summary

The purpose of groundwater sampling performed in 2005 at Ciniza Refinery is to determine whether contamination resulting from refinery related activities has entered groundwater at the facility. Twenty monitoring wells are distributed within the boundaries of the refinery and 9 monitoring wells are located along the perimeter of the lagoons and ponds. The ground water monitoring is conducted at the Ciniza Refinery located approximately 17 miles east of Gallup and approximately 1 mile north of Interstate I-40 at Exit 39. The facility is owned and operated by Giant Industries, Arizona, Inc. U.S. EPA permit ID No. NMD000333211 pertains to the facility.

The monitoring in 2005 has shown that although contamination has entered the shallow perched groundwater at one location (OW-14), the contamination is limited in extent and has not migrated to the wells that were placed nearby OW-14 (OW-12, OW-13, OW-29, and OW-30). The monitoring performed in 2005 has shown that, at the OW-14 location where contamination exists, the contamination has remained relatively constant in concentration in comparison to sampling conducted in past years and the concentrations have not appreciably increased.

Monitoring of well GWM-1 in 2005 has shown benzene in concentrations (June 2005 = 0.010 mg/l and September 2005 = 0.081 mg/l) exceeding the NM Water Quality Control Commission standard (0.01 mg/l) and the U.S. EPA MCL (0.005 mg/l). Giant conducted annual sampling of GWM-1 on August 4, 2006. The benzene concentration in this sample was 0.012 mg/l.

Elevated levels of fluoride and total dissolved solids (TDS) have shown up in some of the boundary wells in 2005 and 2004 but these are likely due to naturally occurring concentrations of fluoride and TDS in these particular wells. Giant performed a statistical analysis of the data from these wells in comparison to results of chloride, fluoride and TDS sampling at well OW-11. Well OW-11 was selected because it is an up-gradient well to the processing areas of the refinery. The statistical analysis included comparison of the maximum detected contaminant levels to the 95% upper tolerance limit for each contaminant calculated using the historical OW-11 monitoring data that Giant has accumulated over a sixteen year period. Chloride was detected in elevated concentration in GWM-1 in 2005 (2,000 mg/l) which is above the 95% upper tolerance level of background level, so the chloride in GWM-1 may not be due entirely to natural background concentration.

In October 2005, closure work was completed to close the railroad rack lagoon solid waste management unit (SWMU No. 8). Representative samples taken from the excavated area of the lagoon showed that all the existing contamination was removed. A remedy completion report on the cleanup was completed and submitted to the New Mexico Environment Department's (NMED's) Hazardous Waste Bureau in February 2006 for review.

Table of Contents

Section	Title

I. Annual Groundwater Report (Binder 1)

1. Introduction
   1.1 Facility Description
   1.2 Background Information
   1.3 Site Characteristics

2. Scope of Activities

3. Regulatory Criteria

4. Groundwater Monitoring Results

5. Groundwater Chemical Analytical Data

6. Summary of Groundwater Testing

7. List of Tables
Permit Condition 16A vi (Volume of product recovered)
Well Data Summary Table
Well Inspection Logs

8. List of Figures
Figure 1 – Regional Map
Figure 2 – Topographic Map
Figure 3 - Well and Boring Locations Map
Figure 4 - Potentiometric Elevation Map (Alluvium – Chinle Group Interface Water Levels)
Figure 5 - Annual Product Thickness Map (Separate Phase Hydrocarbon Thickness)
Figure 6 – Plots of Water Table Elevations (Permit Condition 16A iv)

Appendix A: Well Drilling Logs for GMM-2 and GWM-3
Appendix B: Ciniza Field Sampling Collection and Handling Procedures
Appendix C: Statistical Analysis of OW-11 to Show Background Levels

I. Annual Groundwater Report (Binder 1)

Section 1 Introduction

1.1 Facility Description

This annual groundwater report pertains to the Giant Refining Company refinery located at Exit 39 on Interstate I-40. This refinery is known as the Ciniza Refinery and is located at Jamestown New Mexico, approximately 17 miles east of Gallup. Figure 1 shows the location of the Ciniza Refinery.

The owner is:

	Giant Industries Arizona, Inc. 23733 North Scottsdale Road Scottsdale, Arizona 85255	(parent corporation)
Operator:	Giant Refining Company Route 3, Box 7 Gallup, New Mexico 87301	(postal address)
	Giant Refining Company I-40, Exit 39 Jamestown, New Mexico 87347	(physical address)

SIC code 2911 (petroleum refining) pertains to the Ciniza Refinery.

The following permits pertain to the Ciniza Refinery:

- U.S. EPA ID Number NMD000333211
- OCD Discharge Permit No. GW-032

The facility status is corrective action/compliance. Annual and quarterly groundwater sampling is conducted at the facility to evaluate present contamination.

The refinery is situated on an 810 acre irregular shaped tract of land that is substantially located within the lower one quarter of Section 28 and throughout Section 33 of Township 15 North, Range 15 West of the New Mexico Prime Meridian. A small component of the property lies within the northeastern one quarter of Section 4 of Township 14 North, Range 15 West. Figure 2 is a topographic map showing the general layout of the refinery in comparison to the local topography.

1.2 Background Information

The Ciniza Refinery is located within a rural and sparsely populated section of McKinley County in western New Mexico. The setting is a high desert plain on the western slope of the continental divide. The nearest population centers are the Pilot (formerly Giant) Travel Center refueling plaza, the Interstate 40 highway corridor, and a small cluster of residential homes located on the south side of Interstate 40 approximately 2 miles southwest of the refinery (Jamestown). The surrounding land is comprised primarily of public lands and is used for cattle and sheep grazing at a density of less than six cattle or 30 sheep per section. Except for Gallup, McKinley County is predominantly rural, as are the adjoining portions of neighboring counties.

The refinery primarily receives crude oil via two 6 inch diameter pipelines; Bisti Pipeline comes down from the Four Corners Area and enters the refinery property from the north and Hospah Pipeline comes in from the northeast and is an interconnection with a main interstate pipeline. In addition, the refinery also receives natural gasoline feedstocks via a 4-inch diameter pipeline that comes in from the west along the Interstate 40 corridor from the Conoco gas plant. These feedstocks are then stored in tanks until refined into products. The refinery has an overall capacity to process up to 32,000 barrels per day of crude oil and natural gasoline feedstocks.

The refinery incorporates various processing units that convert crude oil and natural gasoline into finished products. These units are briefly described as follows.

- The crude distillation unit separates crude oil into various fractions; including gas, naphtha, light oil, heavy oil, and residual.
- The fluidized catalytic cracking unit (FCCU) breaks up (cracks) long-chain hydrocarbon molecules into smaller molecules, and essentially converts heavier oils into naphtha and lighter oils.
- The alkylation unit combines specific types of hydrocarbon molecules into a high octane gasoline blending component.
- The reforming unit combines low octane naphtha molecules to form high octane naphtha.
- The hydrotreating unit removes undesirable sulfur and nitrogen compounds from intermediate feedstocks, and also saturates the feedstocks with hydrogen.
- The isomerization unit converts low octane hydrocarbon molecules into high octane molecules.
- The treater units remove impurities from various intermediate and blending feedstocks in order to produce finished products that comply with sales specifications.

- The sulfur recovery unit converts and recovers various sulfur compounds from other processing units and then produces a solid elemental sulfur byproduct.

As a result of these processing steps, the refinery produces a wide range of petroleum products including propane, butane, unleaded gasoline, diesel, kerosene, and residual fuel.
In addition to the aforementioned processing units, various other equipment and systems support the operation of the refinery and are briefly described as follows.

Storage tanks are used throughout the refinery to hold and store crude oil, natural gasoline, intermediate feedstocks, finished products, chemicals, and water. These tanks are all located aboveground and range in size from 80,000 barrels to less than a 1,000 barrels. A grouping of tanks is commonly referred to as a "tank farm" such as the hot oil "tank farm".

Pumps, valves, and piping systems are used throughout the refinery to transfer various liquids among storage tanks and processing units.

A railroad spur track and a railcar loading rack are used to transfer feed-stocks and products from refinery storage tanks into and out of railcars.

Several tank truck loading racks are used at the refinery to load out finished products and also may receive crude oil, other feedstocks, additives, and chemicals.

A pipeline from the refinery carries diesel fuel to the Pilot (formerly Giant) Travel Center. Gasoline is delivered to the Pilot Center via tanker truck.

A firefighting training facility is used to conduct employee firefighting training. Waste water from the facility, when training is conducted, is pumped into a tank which is then pumped out by a vac truck. The vac truck pumps the oily water into a process sewer leading to the New API Separator (NAPIS).

The process wastewater system is a network of curbing, paving, catch basins, and underground piping that collects waste water effluent from various processing areas within the refinery and then conveys this wastewater to the new API separator. A separate storm water collection system routes storm water to the old API separator (OAPIS). Water from the OAPIS is pumped to the NAPIS for processing and benzene stripping.

The NAPIS is a two compartment oil water separator. Oil is separated from water based on the principle that, given a quiet surface, oil will float to the water surface where it can be skimmed off. The skimmed slop oil is passed to a collection chamber where it is pumped back into the refinery process. The clarified water is piped to the top of dual stripping columns where benzene is removed. The stripped water flows into the first aeration lagoon. Sludge sinks to the bottom of the separator which is periodically vacuumed out by a vac truck and disposed as hazardous waste at an approved landfill.

At the stripping columns, ambient air is blown upwards through the falling cascade of clarified wastewater as it passes through distillation column packing. Countercurrent desorption of

benzene from the water occurs due to the high volume of air passing over the relatively large surface area provided by the packing. The desorbed benzene is absorbed into the air stream and vented to the atmosphere. Effluent from the stripper columns gravity flows through piping into the first aeration lagoon.

At the aeration basins, the treated wastewater is mixed with air in order to oxidize any remaining organic constituents and increase the dissolved oxygen concentration available in the water for growth of bacteria and other microbial organisms. The microbes degrade hydrocarbons into carbon dioxide and water. Three 15-hp mechanical aerators provide aeration in the first aeration lagoon with two 15-hp aerators providing aeration in the second lagoon. Effluent from the second aeration lagoon flows onward into the first of several evaporation ponds of various sizes.

At the evaporation ponds, wastewater is converted into vapor via solar and mechanical wind-effect evaporation. No wastewater is discharged from the refinery to surface waters of the state because all of the waste water evaporates. Therefore, the refinery is not required to have a NPDES discharge permit for discharge of treated process water. However, the Ciniza refinery does have a NPDES permit for storm water discharge.

The storm water system is a network of valves, gates, berms, embankments, culverts, trenches, ditches, natural arroyos, and retention ponds that collect, convey, control, treat, and release storm water that falls within or passes through refinery property. Storm water discharge from the refinery is very infrequent due to the arid desert-like nature of the surrounding geographical area. The Ciniza Refinery maintains a storm water pollution prevention plan (SWPPP) that includes Best Management Practices (BMPs) for effective storm water pollution prevention. The refinery has recently constructed several new berms in the "grassy area" and improved outfalls (installed barrier dams equipped with gate valves) to minimize the possibility of contaminated runoff leaving the refinery property.

1.3 Site Characteristics

The Ciniza Refinery is located within a rural and sparsely populated section of McKinley County. It is situated in the high desert plain on the western flank of the continental divide approximately 17 miles east of Gallup. The surrounding land is comprised primarily of public lands and is used for cattle and sheep grazing at a density of less than six cattle or 30 sheep per section. Surface vegetation consists of native xerophytic vegetation including grasses, shrubs, small junipers, and some prickly pear cacti. Average rainfall is less than 7 inches per year.

Local topography consists of a gradually inclined down-slope from high ground in the southeast to a lowland fluvial plain in the northwest. The highest point on refinery property is located at the southeast corner boundary (elevation approximately 7,040 feet) and the lowest point is located at the northwest corner boundary (elevation approximately 6,860 feet). The refinery processing facility is located on a flat man-made terrace at an elevation of approximately 6,950 feet.

Surface water in this region consists of the man-made evaporation ponds and aeration basins located within the refinery, a cattle watering pond (Jon Myer's Pond) located east of the refinery, two small unnamed spring fed ponds located south of the refinery, and the South Fork of the Puerco River and its tributary arroyos. The various ponds and basins typically contain water consistently throughout the year. The South Fork of the Puerco River and its tributaries are intermittent and generally contain water only during, and immediately after, the occurrence of precipitation.

The 810 acre refinery property site is located on a layered geologic formation. Surface soils generally consist of fluvial and alluvial deposits; primarily clay and silt with minor inter-bedded sand layers. Below this surface layer is the Chinle Formation, which consists of very low permeability claystones and siltstones that comprise the shales of this formation. As such, the Chinle Formation effectively serves as an aquiclude. Inter-bedded within the Chinle Formation is the Sonsela Sandstone bed, which represents the uppermost potential aquifer in the region.

The Sonsela Sandstone bed lies within and parallels the dip of the Chinle Formation. As such, its high point is located southeast of the refinery and it slopes downward to the northwest as it passes under the refinery. Due to the confinement of the Chinle Formation aquiclude, the Sonsela Sandstone bed acts as a water-bearing reservoir and is artesian at its lower extremis. Artesian conditions exist throughout the central and western portions of the refinery property.

Groundwater flow within the Chinle Formation is extremely slow and typically averages less than 10^{-10} centimeters per second (less than 0.01 feet per year). Groundwater flow within the surface soil layer above the Chinle Formation is highly variable due to the presence of complex and irregular stratigraphy; including sand stringers, cobble beds, and dense clay layers. As such, hydraulic conductivity may range from less than 10^{-2} centimeters per second in the gravelly sands immediately overlying the Chinle Formation up to 10^{-8} centimeters per second in the clay soil layers located near the surface.

Shallow groundwater located under refinery property generally flows along the upper contact of the Chinle Formation. The prevailing flow direction is from the southeast and toward the northwest; however, a subsurface ridge has been identified and is thought to deflect some flow in a northeasterly direction in the vicinity of the refinery tank farm.

2. Scope of Activities

The annual monitoring of the ground water monitoring wells began on September 27, 2005 and lasted until October 20, 2005. Wells OW-11, OW-12, OW-13, OW-14, OW-29, and OW-30 were sampled from September 27, 2005 thru September 29, 2005. Well OW-11 was sampled on September 29, 2005 and analyzed for VOCs, SVOCs, BTEX, MTBE, RCRA metals, and general chemistry. Wells OW-12, OW-13, OW-14, OW-29, and OW-30 were sampled and analyzed for BTEX and MTBE. Wells MW-1, MW-4, MW-5, SMW-2, and SMW-4 were sampled from October 12, 2005 thru October 13, 2005. Samples from these wells were analyzed for VOCs, SVOCs, BTEX, MTBE, RCRA metals, and general chemistry. Boundary wells BW-1-C, BW-2-A, BW-2-B, BW-2-C, BW-3-B, and BW-3-C were sampled from October 17, 2005 thru October 20, 2005. The boundary well samples were analyzed for VOCs, SVOCs, BTEX, MTBE, metals, and general chemistry. Field data (Section 8: "GW Well Depths to Water 2005" and "Purge Only" notes) show that well BW-1-A was dry and BW-1-B had only a couple inches of water and therefore could not be sampled. The results of the annual sampling event are summarized in tables provided in Section 4 (Groundwater Monitoring Events).

Quarterly visual checks for artesian flow conditions at OW-1 and level measurements at OW-10 were conducted on February 15, June 24, September 16, and December 6 of 2005. The visual checks are documented on the forms provided in Section 8 - Well Inspection Logs.

GWM-1 was sampled on February 15, June 28, and August 1 of 2005. The sample was tested for VOCs, SVOCs, BTEX, MTBE, Metals, and general chemistry. The test results are summarized in tables in Section 4. Wells GWM-2 and GWM-3 were installed in September 2005. Visual observations for presence of water were conducted at GMM-2 and GWM-3 on October 12, November 15, and December 6 of 2005. Both of these wells were dry in 2005, so no sampling could be performed on them in 2005.

The following table summarizes all the currently active monitoring wells and sampling frequencies:

The observation, measurement, sampling frequency, and type of analysis are as follows.

Well ID	Frequency	Measurement[1] / Analysis
OW-1	Quarterly	Visual check for artesian flow conditions
OW-10	Quarterly	Level measurement of the Sonsela Aquifer water table
GWM-1	Quarterly Annual	Q: Check for indication of aeration basin leakage. A: General chemistry/VOC/SVOC/BTEX/MTBE/metals
GWM-2	Quarterly	Check for indication of aeration basin leakage.
GWM-3	Quarterly	Check for indication of aeration basin leakage.
OW-11	Annual	General chemistry/VOC/SVOC /BTEX/MTBE/ metals
OW-12	Annual	BTEX / MTBE

Well ID	Frequency	Measurement[4] / Analysis
OW-13[2]	Annual	BTEX / MTBE
OW-14	SemiAnnual	BTEX / MTBE
OW-29	Annual	BTEX / MTBE
OW-30	Annual	BTEX / MTBE
BW-1-A[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-1-B[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE /
BW-1-C[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-2-A[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-2-B[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-2-C[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-3-A[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-3-B[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-3-C[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
MW-1	Annual	General chemistry / RCRA list constituents[5]
MW-4	Annual in 05,07,09	General chemistry / RCRA list constituents[5] Modified Skinner List and organics
MW-5	Annual in 05,07,09	General chemistry / RCRA list constituents[5] Modified Skinner List and organics
SMW-2	Annual in 05,07,09	General chemistry / RCRA list constituents[5] Modified Skinner List and organics
SMW-4	Annual	General chemistry / RCRA list constituents[5] Modified Skinner List and organics
RW-1	Annual	Measurement of product layer thickness, if present
RW-2	Annual	Measurement of product layer thickness, if present
RW-5	Annual	Measurement of product layer thickness, if present
RW-6	Annual	Measurement of product layer thickness, if present
PW-2 (Process)	2008, then every 3 yrs thereafter	SVOCs, VOCs, Heavy Metals, Cyanide, Nitrates

Well ID	Frequency	Measurement[4] / Analysis
PW-3 (Drinking/ Process)	Every 3 yrs starting with 2006	SVOCs, VOCs, Heavy Metals, Cyanide, Nitrates
PW-4 (Process)	Every 3 yrs starting with 2004	SVOCs, VOCs, Heavy Metals, Cyanide, Nitrates
Pond 1 Inlet (EP1-IN)	Semi-Annual	BTEX, SVOCs, RCRA metals
Pilot Wastewater	Quarterly	TCLP (EPA Method 1311 and BOD)

[1] This is the new well installed down gradient of the aeration basins.

[2] When OW-14 is cleaned up, then monitoring of OW-13 shall be discontinued.

[3] These are the new wells installed at the northwest corner boundary of the refinery. BW-1-A, BW-1-B, and BW-3-A were dry at the time of drilling.

[4] To the extent practicable, water table depth shall be measured at each well annually.

[5] Frequency of sampling shall be per RCRA post closure schedule.

In addition to groundwater monitoring, surface water monitoring shall also be conducted as follows.

- On an annual basis, a grab sample of the inlet water to Pond #2 shall be collected and analyzed for BOD, COD, TDS, BTEX, and MTBE.

On an annual basis, a grab sample of evaporation pond water shall be collected and analyzed for general chemistry parameters. The evaporation pond selected for sampling shall be the pond, considered by refinery personnel, to most likely contain the highest salinity or TDS. In addition, the selected pond shall be alternated from year-to-year in order to provide a broader indication of analysis.

Groundwater Monitoring Well Installations in 2005

Two new shallow ground water monitoring wells were installed in the early fall of 2005 near GWM-1 which is located at the south west corner of evaporation pond 1. GWM-2 was placed at the northwest corner of evaporation pond 2 and GWM-3 was placed at the northwest corner of evaporation pond 1. GWM-1, GWM-2, and GWM-3 were placed to determine whether any leakage from the lagoons and or evaporation ponds is occurring. GWM-2 is screened at 18.95 feet and GWM-3 is screened at 17.95 feet.

Ground water remediation activities are conducted at the Ciniza refinery included the pumping of 447.5 gallons of product from recovery well No.1 (RW-1).

Old API Oil Water Separator

The old API Separator (OAPIS) was removed from service on October 6, 2004 and the start up of the new API Separator (NAPIS) occurred on the same date. Work to remove the OAPIS from service as an oil water separator was described in the 2004 report. Once the OAPIS was removed from oil/water separator service, its use as a storm water catch basin commenced. Beginning in early 2005, Giant began pumping accumulated storm water from the OAPIS into the NAPIS so that the water would undergo treatment in the benzene stripping columns.

Perimeter Search

Giant conducts a perimeter search of the refinery property on a bimonthly basis starting in December 2004. The inspection focuses on hydrocarbon staining or any release that could result in contamination leaving the property boundary. Giant has prepared an inspection checklist to be completed and signed by the environmental employee conducting the inspection. Completed inspection sheets are maintained onsite.

3. Regulatory Criteria

No site-specific groundwater risk based screening levels have been established for the Ciniza refinery so the criteria that Ciniza groundwater samples are compared with are the New Mexico Water Quality Control Commission Standards 20.6.2.3103 and the U. S. EPA's National Primary Drinking Water Quality Standards (MCLs) and the NMED total petroleum hydrocarbon (TPH) screening guidelines. Tables comparing the results of sampling with the standards are provided in Section 4.

MCL's

EPA National Primary Drinking Water Standards

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Acrylamide	TT8	Nervous system or blood problems;	Added to water during sewage/wastewater increased risk of cancer treatment	zero
OC	Alachlor	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops	zero
R	Alpha particles	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	zero
IOC	Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	0.006
IOC	Arsenic	0.010 as of 1/23/06	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards, runoff from glass & electronics production wastes	0
IOC	Asbestos (fibers >10 micrometers)	7 million fibers per Liter (MFL)	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	7 MFL
OC	Atrazine	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops	0.003
IOC	Barium	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	2
OC	Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills	zero
OC	Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines	zero
IOC	Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	0.004
R	Beta particles and photon emitters	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation	zero
DBP	Bromate	0.010	Increased risk of cancer	Byproduct of drinking water disinfection	zero
IOC	Cadmium	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	0.005
OC	Carbofuran	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa	0.04
OC	Carbon tetrachloride	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities	zero
D	Chloramines (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort, anemia	Water additive used to control microbes	MRDLG=4[1]

LEGEND

D Dinsinfectant

DBP Disinfection Byproduct

IOC Inorganic Chemical

M Microorganism

OC Organic Chemical

R Radionuclides

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Chlordane	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide	zero
D	Chlorine (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort	Water additive used to control microbes	MRDLG=4[1]
D	Chlorine dioxide (as ClO_2)	MRDL=0.8[1]	Anemia; infants & young children: nervous system effects	Water additive used to control microbes	MRDLG=0.8[1]
DBP	Chlorite	1.0	Anemia; infants & young children: nervous system effects	Byproduct of drinking water disinfection	0.8
OC	Chlorobenzene	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories	0.1
IOC	Chromium (total)	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits	0.1
IOC	Copper	TT[7]; Action Level = 1.3	Short term exposure: Gastrointestinal distress. Long term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level	Corrosion of household plumbing systems; erosion of natural deposits	1.3
M	*Cryptosporidium*	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
IOC	Cyanide (as free cyanide)	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories	0.2
OC	2,4-D	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops	0.07
OC	Dalapon	0.2	Minor kidney changes	Runoff from herbicide used on rights of way	0.2
OC	1,2-Dibromo-3-chloropropane (DBCP)	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	zero
OC	o-Dichlorobenzene	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories	0.6
OC	p-Dichlorobenzene	0.075	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories	0.075
OC	1,2-Dichloroethane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
OC	1,1-Dichloroethylene	0.007	Liver problems	Discharge from industrial chemical factories	0.007
OC	cis-1,2-Dichloroethylene	0.07	Liver problems	Discharge from industrial chemical factories	0.07
OC	trans-1,2-Dichloroethylene	0.1	Liver problems	Discharge from industrial chemical factories	0.1
OC	Dichloromethane	0.005	Liver problems; increased risk of cancer	Discharge from drug and chemical factories	zero
OC	1,2-Dichloropropane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
OC	Di(2-ethylhexyl) adipate	0.4	Weight loss, live problems, or possible reproductive difficulties	Discharge from chemical factories	0.4
OC	Di(2-ethylhexyl) phthalate	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories	zero
OC	Dinoseb	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables	0.007
OC	Dioxin (2,3,7,8-TCDD)	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories	zero
OC	Diquat	0.02	Cataracts	Runoff from herbicide use	0.02
OC	Endothall	0.1	Stomach and intestinal problems	Runoff from herbicide use	0.1

LEGEND

D Dinsinfectant

DBP Disinfection Byproduct

IOC Inorganic Chemical

M Microorganism

OC Organic Chemical

R Radionuclides

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Endrin	0.002	Liver problems	Residue of banned insecticide	0.002
OC	Epichlorohydrin	TT[8]	Increased cancer risk, and over a long period of time, stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals	zero
OC	Ethylbenzene	0.7	Liver or kidneys problems	Discharge from petroleum refineries	0.7
OC	Ethylene dibromide	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries	zero
IOC	Fluoride	4.0	Bone disease (pain and tenderness of the bones); Children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	4.0
M	*Giardia lamblia*	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
OC	Glyphosate	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use	0.7
DBP	Haloacetic acids (HAA5)	0.060	Increased risk of cancer	Byproduct of drinking water disinfection	n/a[6]
OC	Heptachlor	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide	zero
OC	Heptachlor epoxide	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor	zero
M	Heterotrophic plate count (HPC)	TT[3]	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment	n/a
OC	Hexachlorobenzene	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories	zero
OC	Hexachlorocyclopentadiene	0.05	Kidney or stomach problems	Discharge from chemical factories	0.05
IOC	Lead	TT[7]; Action Level = 0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities; Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits	zero
M	*Legionella*	TT[3]	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems	zero
OC	Lindane	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens	0.0002
IOC	Mercury (inorganic)	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands	0.002
OC	Methoxychlor	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	0.04
IOC	Nitrate (measured as Nitrogen)	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	10
IOC	Nitrite (measured as Nitrogen)	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	1

LEGEND

D	Dinsinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
DBP	Disinfection Byproduct	M	Microorganism	R	Radionuclides

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Oxamyl (Vydate)	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes	0.2
OC	Pentachlorophenol	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood preserving factories	zero
OC	Picloram	0.5	Liver problems	Herbicide runoff	0.5
OC	Polychlorinated biphenyls (PCBs)	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals	zero
R	Radium 226 and Radium 228 (combined)	5 pCi/L	Increased risk of cancer	Erosion of natural deposits	zero
IOC	Selenium	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines	0.05
OC	Simazine	0.004	Problems with blood	Herbicide runoff	0.004
OC	Styrene	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills	0.1
OC	Tetrachloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners	zero
IOC	Thallium	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories	0.0005
OC	Toluene	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories	1
M	Total Coliforms (including fecal coliform and *E. coli*)	5.0%[4]	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present[5]	Coliforms are naturally present in the environment as well as feces; fecal coliforms and *E. coli* only come from human and animal fecal waste.	zero
DBP	Total Trihalomethanes (TTHMs)	0.10 0.080 after 12/31/03	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection	n/a[6]
OC	Toxaphene	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle	zero
OC	2,4,5-TP (Silvex)	0.05	Liver problems	Residue of banned herbicide	0.05
OC	1,2,4-Trichlorobenzene	0.07	Changes in adrenal glands	Discharge from textile finishing factories	0.07
OC	1,1,1-Trichloroethane	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories	0.20
OC	1,1,2-Trichloroethane	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories	0.003
OC	Trichloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories	zero
M	Turbidity	TT[3]	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing micro-organisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff	n/a
R	Uranium	30 ug/L as of 12/08/03	Increased risk of cancer, kidney toxicity	Erosion of natural deposits	zero

LEGEND

D Dinsinfectant
DBP Disinfection Byproduct
IOC Inorganic Chemical
M Microorganism
OC Organic Chemical
R Radionuclides

	Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Vinyl chloride	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories	zero
M	Viruses (enteric)	TT[3]	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
OC	Xylenes (total)	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories	10

NOTES

1 Definitions

- Maximum Contaminant Level Goal (MCLG)—The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
- Maximum Contaminant Level (MCL)—The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
- Maximum Residual Disinfectant Level Goal (MRDLG)—The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- Maximum Residual Disinfectant Level (MRDL)—The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- Treatment Technique (TT)—A required process intended to reduce the level of a contaminant in drinking water.

2 Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million (ppm).

3 EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:

- *Cryptosporidium* (as of 1/1/02 for systems serving >10,000 and 1/14/05 for systems serving <10,000) 99% removal.
- *Giardia lamblia*: 99.9% removal/inactivation
- Viruses: 99.99% removal/inactivation
- *Legionella:* No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated, *Legionella* will also be controlled.
- Turbidity: At no time can turbidity (cloudiness of water) go above 5 nephelolometric turbidity units (NTU); systems that filter must ensure that the turbidity go no higher than 1 NTU (0.5 NTU for conventional or direct filtration) in at least 95% of the daily samples in any month. As of January 1, 2002, for systems servicing >10,000, and January 14, 2005, for systems servicing <10,000, turbidity may never exceed 1 NTU, and must not exceed 0.3 NTU in 95% of daily samples in any month.
- HPC: No more than 500 bacterial colonies per milliliter
- Long Term 1 Enhanced Surface Water Treatment (Effective Date: January 14, 2005); Surface water systems or (GWUDI) systems serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, *Cryptosporidium* removal requirements, updated watershed control requirements for unfiltered systems).
- Filter Backwash Recycling: The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.

4 No more than 5.0% samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or *E. coli* if two consecutive TC-positive samples, and one is also positive for *E. coli* fecal coliforms, system has an acute MCL violation.

5 Fecal coliform and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Disease-causing microbes (pathogens) in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. These pathogens may pose a special health risk for infants, young children, and people with severely compromised immune systems.

6 Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:

- Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L)
- Trihalomethanes: bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L)

7 Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

8 Each water system must certify, in writing, to the state (using third-party or manufacturers certification) that when it uses acrylamide and/or epichlorohydrin to treat water, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows: Acrylamide = 0.05% dosed at 1 mg/L (or equivalent); Epichlorohydrin = 0.01% dosed at 20 mg/L (or equivalent).

LEGEND

D	Dinsinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
DBP	Disinfection Byproduct	M	Microorganism	R	Radionuclides

National Secondary Drinking Water Standards

National Secondary Drinking Water Standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

Contaminant	Secondary Standard
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

Office of Water (4606M)
EPA 816-F-03-016
www.epa.gov/safewater
June 2003

C. The standards are not intended as maximum ranges and concentrations for use, and nothing herein contained shall be construed as limiting the use of waters containing higher ranges and concentrations.
[2-18-77; 20.6.2.3101 NMAC - Rn, 20 NMAC 6.2.III.3101, 1-15-01]

20.6.2.3102: [RESERVED]
[12-1-95; 20.6.2.3102 NMAC - Rn, 20 NMAC 6.2.III.3102, 1-15-01]

20.6.2.3103 STANDARDS FOR GROUND WATER OF 10,000 mg/l TDS CONCENTRATION OR LESS: The following standards are the allowable pH range and the maximum allowable concentration in ground water for the contaminants specified unless the existing condition exceeds the standard or unless otherwise provided in Subsection D of Section 20.6.2.3109 NMAC. Regardless of whether there is one contaminant or more than one contaminant present in ground water, when an existing pH or concentration of any water contaminant exceeds the standard specified in Subsection A, B, or C of this section, the existing pH or concentration shall be the allowable limit, provided that the discharge at such concentrations will not result in concentrations at any place of withdrawal for present or reasonably foreseeable future use in excess of the standards of this section. These standards shall apply to the dissolved portion of the contaminants specified with a definition of dissolved being that given in the publication "*methods for chemical analysis of water and waste of the U.S. environmental protection agency*," with the exception that standards for mercury, organic compounds and non-aqueous phase liquids shall apply to the total unfiltered concentrations of the contaminants.

A. **Human Health Standards**-Ground water shall meet the standards of Subsection A and B of this section unless otherwise provided. If more than one water contaminant affecting human health is present, the toxic pollutant criteria as set forth in the definition of toxic pollutant in Section 20.6.2.1101 NMAC for the combination of contaminants, or the Human Health Standard of Subsection A of Section 20.6.2.3103 NMAC for each contaminant shall apply, whichever is more stringent. Non-aqueous phase liquid shall not be present floating atop of or immersed within ground water, as can be reasonably measured.

(1) Arsenic (As).....0.1 mg/l
(2) Barium (Ba).....1.0 mg/l
(3) Cadmium (Cd).....0.01 mg/l
(4) Chromium (Cr).....0.05 mg/l
(5) Cyanide (CN).....0.2 mg/l
(6) Fluoride (F).....1.6 mg/l
(7) Lead (Pb).....0.05 mg/l
(8) Total Mercury (Hg).....0.002 mg/l
(9) Nitrate (NO_3 as N).....10.0 mg/l
(10) Selenium (Se).....0.05 mg/l
(11) Silver (Ag).....0.05 mg/l
(12) Uranium (U).....0.03 mg/l
(13) Radioactivity: Combined Radium-226 & Radium-228.....30 pCi/l
(14) Benzene.....0.01 mg/l
(15) Polychlorinated biphenyls (PCB's).....0.001 mg/l
(16) Toluene.....0.75 mg/l
(17) Carbon Tetrachloride.....0.01 mg/l
(18) 1,2-dichloroethane (EDC).....0.01 mg/l
(19) 1,1-dichloroethylene (1,1-DCE).....0.005 mg/l
(20) 1,1,2,2-tetrachloroethylene (PCE).....0.02 mg/l
(21) 1,1,2-trichloroethylene (TCE).....0.1 mg/l
(22) ethylbenzene.....0.75 mg/l
(23) total xylenes.....0.62 mg/l
(24) methylene chloride.....0.1 mg/l
(25) chloroform.....0.1 mg/l
(26) 1,1-dichloroethane.....0.025 mg/l
(27) ethylene dibromide (EDB).....0.0001 mg/l
(28) 1,1,1-trichloroethane.....0.06 mg/l
(29) 1,1,2-trichloroethane.....0.01 mg/l
(30) 1,1,2,2-tetrachloroethane.....0.01 mg/l
(31) vinyl chloride.....0.001 mg/l

(32) PAHs: total naphthalene plus monomethylnaphthalenes.....0.03 mg/l
(33) benzo-a-pyrene.....0.0007 mg/l

B. Other Standards for Domestic Water Supply

(1) Chloride (Cl) .....250.0 mg/l
(2) Copper (Cu) .....1.0 mg/l
(3) Iron (Fe) .....1.0 mg/l
(4) Manganese (Mn) .....0.2 mg/l
(6) Phenols.....0.005 mg/l
(7) Sulfate (SO_4) .....600.0 mg/l
(8) Total Dissolved Solids (TDS) .....1000.0 mg/l
(9) Zinc (Zn) .....10.0 mg/l
(10) pH.....between 6 and 9

C. Standards for Irrigation Use - Ground water shall meet the standards of Subsection A, B, and C of this section unless otherwise provided.

(1) Aluminum (Al).....5.0 mg/l
(2) Boron (B) .....0.75 mg/l
(3) Cobalt (Co) .....0.05 mg/l
(4) Molybdenum (Mo) .....1.0 mg/l
(5) Nickel (Ni) .....0.2 mg/l

[2-18-77, 1-29-82, 11-17-83, 3-3-86, 12-1-95; 20.6.2.3103 NMAC - Rn, 20 NMAC 6.2.III.3103, 1-15-01; A, 9-26-04]

[Note: For purposes of application of the amended numeric uranium standard to past and current water discharges (as of 9-26-04), the new standard will not become effective until June 1, 2007. For any new water discharges, the uranium standard is effective 9-26-04.]

20.6.2.3104 DISCHARGE PERMIT REQUIRED: Unless otherwise provided by this Part, no person shall cause or allow effluent or leachate to discharge so that it may move directly of indirectly into ground water unless he is discharging pursuant to a discharge permit issued by the secretary. When a permit has been issued, discharges must be consistent with the terms and conditions of the permit. In the event of a transfer of the ownership, control, or possession of a facility for which a discharge permit is in effect, the transferee shall have authority to discharge under such permit, provided that the transferee has complied with Section 20.6.2.3111 NMAC, regarding transfers. [2-18-77, 12-24-87, 12-1-95; Rn & A, 20.6.2.3104 NMAC - 20 NMAC 6.2.III.3104, 1-15-01; A, 12-1-01]

20.6.2.3105 EXEMPTIONS FROM DISCHARGE PERMIT REQUIREMENT: Sections 20.6.2.3104 and 20.6.2.3106 NMAC do not apply to the following:

A. Effluent or leachate which conforms to all the listed numerical standards of Section 20.6.2.3103 NMAC and has a total nitrogen concentration of 10 mg/l or less, and does not contain any toxic pollutant. To determine conformance, samples may be taken by the agency before the effluent or leachate is discharged so that it may move directly or indirectly into ground water; provided that if the discharge is by seepage through non-natural or altered natural materials, the agency may take samples of the solution before or after seepage. If for any reason the agency does not have access to obtain the appropriate samples, this exemption shall not apply;

B. Effluent which is discharged from a sewerage system used only for disposal of household and other domestic waste which is designed to receive and which receives 2,000 gallons or less of liquid waste per day;

C. Water used for irrigated agriculture, for watering of lawns, trees, gardens or shrubs, or for irrigation for a period not to exceed five years for the revegetation of any disturbed land area, unless that water is received directly from any sewerage system;

D. Discharges resulting from the transport or storage of water diverted, provided that the water diverted has not had added to it after the point of diversion any effluent received from a sewerage system, that the source of the water diverted was not mine workings, and that the secretary has not determined that a hazard to public health may result;

E. Effluent which is discharged to a watercourse which is naturally perennial; discharges to dry arroyos and ephemeral streams are not exempt from the discharge permit requirement, except as otherwise provided in this section;

F. Those constituents which are subject to effective and enforceable effluent limitations in a National Pollutant Discharge Elimination System (NPDES) permit, where discharge onto or below the surface of the ground so that water contaminants may move directly or indirectly into ground water occurs downstream from the outfall

NEW MEXICO ENVIRONMENT DEPARTMENT TPH SCREENING GUIDELINES
November 2005

In some instances, it may be practical to assess areas of soil contamination that are the result of releases of petroleum products such as jet fuel and diesel, using total petroleum hydrocarbon (TPH) analyses. TPH results may be used to delineate the extent of petroleum-related contamination at these sites and ascertain if the residual level of petroleum products in soil represents an unacceptable risk to future users of the site. Petroleum hydrocarbons represent complex mixtures of compounds, some of which are regulated constituents and some compounds that are not regulated. In addition, the amount and types of the constituent compounds in a petroleum hydrocarbon release differ widely depending on what type of product was spilled and how the spill has weathered. This variability makes it difficult to determine the toxicity of weathered petroleum products in soil solely from TPH results; however, these results can be used to approximate risk in some cases, depending upon the nature of the petroleum product, the release scenario, how well the site has been characterized, and anticipated potential future land uses. In some cases, site clean up cannot be based solely on results of TPH sampling. The New Mexico Environment Department (NMED) will make these determinations on a case by case basis. If NMED determines that additional data are necessary, these TPH guidelines must be used in conjunction with the screening guidelines for individual petroleum-related contaminants in Table 3 and other contaminants, as applicable.

The screening levels for each petroleum carbon range from the Massachusetts Department of Environmental Protection (MADEP) Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons (VPH/EPH) approach and the percent composition table below were used to generate screening levels corresponding to total TPH. Except for waste oil, the information in the compositional assumptions table was obtained from the Massachusetts Department of Environmental Protection guidance document *Implementation of the MADEP VPH/EPH Approach* (October 31, 2002). TPH toxicity was based only on the weighted sum of the toxicity of the hydrocarbon fractions listed in Table 1.

Table 1. TPH Compositional Assumptions in Soil

Petroleum Product	C11-C22 Aromatics	C9-C18 Aliphatics	C19-C36 Aliphatics
Diesel #2/ new crankcase oil	60%	40%	0%
#3 and #6 Fuel Oil	70%	30%	0%
Kerosene and jet fuel	30%	70%	0%
Mineral oil dielectric fluid	20%	40%	40%
Unknown oil[a]	100%	0%	0%
Waste Oil[b]	0%	0%	100%

[a] Sites with oil from unknown sources must be tested for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

[b] Compositional assumption for waste oil developed by NMED is based on review of chromatographs of several types of waste oil. Sites with waste oil must be tested for VOCs, SVOCs, metals, and PCBs to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

A TPH screening guideline was calculated for each of the types of petroleum product based on the assumed composition from Table 1 for petroleum products and the direct soil standards incorporating ceiling concentrations given in the MADEP VPH/EPH Excel spreadsheet for each of the carbon fractions. Groundwater concentrations are based on the weighted sum of the noncarcinogenic toxicity of the petroleum fractions.

Method 1 from the MADEP VPH/EPH document was applied, which represents generic cleanup standards for soil and groundwater. Method 1 applies if contamination exists in only soil and groundwater. The MADEP VPH/EPH further divides groundwater into standards. Standard GW-1 applies when groundwater may be used for drinking water purposes. GW-1 standards are based upon ingestion and use of groundwater as a potable water supply. The TPH screening guidelines for sites with potable groundwater are presented in Table 2a.

Table 2a. TPH Screening Guidelines for Potable Groundwater (GW-1)

TPH			Concentration in Groundwater (mg/L)
Petroleum Product	**Residential Direct Exposure (mg/kg)**	**Industrial Direct Exposure (mg/kg)**	
Diesel #2/crankcase oil	520	1120	1.72
#3 and #6 Fuel Oil	440	890	1.34
Kerosene and jet fuel	760	1810	2.86
Mineral oil dielectric fluid	1440	3040	3.64
Unknown oil[a]	200	200	0.2
Waste Oil[b]	2500	5000	Petroleum-Related Contaminants
Gasoline	Not applicable	Not applicable	Petroleum-Related Contaminants

[a] Sites with oil from unknown sources must be tested for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

[b] Compositional assumption for waste oil developed by NMED is based on review of chromatographs of several types of waste oil. Sites with waste oil must be tested for VOCs, SVOCs, metals, and PCBs to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

The second standard is GW-2, which is applicable for sites where the depth to groundwater is less than 15 feet from the ground surface and within 30 feet of an occupied structure. The structure may be either residential or industrial. GW-2 standards are based upon "inhalation exposures that could occur to occupants of the building impacted by volatile compounds, which partition from the groundwater" (MADEP 2001). The GW-2 screening guidelines ONLY apply for the evaluation of inhalation exposures. If potential ingestion or contact with contaminated soil and/or

groundwater could occur, then the screening guidelines provided in Table 2.a should be applied. Table 2.b lists the TPH screening guidelines for the inhalation scenario.

Table 2b. TPH Screening Guidelines – Vapor Migration and Inhalation of Groundwater (GW-2)

TPH			Concentration in Groundwater (mg/L)
Petroleum Product	**Residential Direct Exposure (mg/kg)**	**Industrial Direct Exposure (mg/kg)**	
Diesel #2/crankcase oil	880	2200	30.4
#3 and #6 Fuel Oil	860	2150	35.3
Kerosene and jet fuel	940	2350	15.7
Mineral oil dielectric fluid	1560	3400	10.4
Unknown oil [a]	800	2000	50.0
Waste Oil [b]	2500	5000	Petroleum-Related Contaminants
Gasoline	Not applicable	Not applicable	Petroleum-Related Contaminants

[a] Sites with oil from unknown sources must be tested for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

[b] Compositional assumption for waste oil developed by NMED is based on review of chromatographs of several types of waste oil. Sites with waste oil must be tested for VOCs, SVOCs, metals, and PCBs to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

Mineral oil based hydraulic fluids can be evaluated for petroleum fraction toxicity using the screening guidelines from Tables 2a and 2b specified for waste oil, because this type of hydraulic fluid is composed of approximately the same range of carbon fractions as waste oil. However, these hydraulic fluids often contain proprietary additives that may be significantly more toxic than the oil itself; these additives must be considered on a site- and product-specific basis (see ATSDR hydraulic fluids profile reference). **Use of alternate screening guideline values requires prior written approval from the New Mexico Environment Department.** TPH screening guidelines in Tables 2a and 2b must be used in conjunction with the screening levels for petroleum-related contaminants given in Table 3 because the TPH screening levels are NOT designed to be protective of exposure to these individual petroleum-related contaminants. Table 3 petroleum-related contaminants screening levels are based on the New Mexico Environment Department soil screening levels (SSLs) released in February 2004.

The list of petroleum-related contaminants does not include polyaromatic hydrocarbons (PAHs) with individual screening levels that would exceed the total TPH screening levels (acenaphthene, anthracene, flouranthene, flourene, and pyrene). In addition, these TPH screening guidelines are based solely on human health, not ecological risk considerations, protection of surface water, or

potential indoor air impacts from soil vapors. Potential soil vapor impacts to structures or utilities are not addressed by these guidelines. Site-specific investigations for potential soil vapor impacts to structures or utilities must be done to assure that screenings are consistently protective of human health, welfare or use of the property. NMED believes that use of these screening guidelines will allow more efficient screenings of petroleum release sites at sites while protecting human health and the environment. Copies of the references cited below are available on the MADEP website at http://www.state.ma.us/dep/bwsc/vph_eph.htm and the NMED website at http://www.nmenv.state.nm.us/HWB/guidance.html.

Table 3. Petroleum-Related Contaminants Screening Guidelines

Petroleum-Related Contaminants	Values for Direct Exposure to Soil		NMED DAF[a] 20 GW protection (mg/kg in soil)	NMED DAF[b] 1 GW protection (mg/kg in soil)
	NMED residential SSL (mg/kg)	NMED Industrial SSL (mg/kg)		
Benzene	2.70E+01	7.36E+01	2.83E-02	1.41E-03
Toluene	2.48E+02	2.48E+02	6.80E+00	3.40E-01
Ethyl benzene	1.06E+04	2.54E+04	1.05E+01	5.25E-01
Xylene[c]	1.32E+02	1.32E+02	1.01E+01	5.07E-01
Naphthalene	7.19E+01	9.83E+01	3.93E-01	1.97E-02
2-methyl naphthalene	1.00E+03[d]	2.50E+03[d]	---[d]	---[d]
Benzo(a)anthracene	6.21E+00	2.34E+01	1.10E+00	5.49E-02
Benzo(b)fluoranthene	6.21E+00	2.34E+01	3.40E+00	1.7E-01
Benzo(k)fluoranthene	6.21E+01	2.34E+02	3.40E+01	1.70E+00
Benzo(a)pyrene	6.21E-01	2.34E+00	6.12E+00	3.06E-01
Chrysene	6.21E+02	2.34E+03	1.10E+02	5.49E+00
Dibenz(a,h) anthracene	6.21E-01	2.34E+00	1.05E+00	5.24E-02
Indeno(1,2,3-c,d) pyrene	6.21E+00	2.34E+01	9.58E+00	4.79E-01

[a] DAF – Dilution Attenuation Factor
[b] For contaminated soil in contact with groundwater
[c] Based upon total xylenes
[d] No NMED value available, value taken from MADEP 2002

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological Profile for Hydraulic fluids.

Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup and Office of Research and Standards. 1994. "Background Documentation for the Development of the MCP Numerical Standards."

Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup and Office of Research and Standards. 2002. "Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach," Policy, October 31, 2002.

Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup and Office of Research and Standards. 2003. "Updated Petroleum Hydrocarbon Fraction Toxicity Values for the VPH/EPH/APH Methodology." November 2003.

New Mexico Environment Department, Hazardous Waste Bureau and Groundwater Quality Bureau Voluntary Remediation Program. 2004. "Technical Background Document for Development of Soil Screening Levels." February 2004. Revision 2.0.

4. Groundwater Monitoring Results

Results of the annual groundwater sampling are summarized in tables presented in this section.

No semi-volatile compounds were detected in any of the samples except there was a single hit of 2, 4-Dimethylphenol (110 ug/l) in GWM-1 in the sample taken on 8-1-05.

Elevated levels of fluoride and total dissolved solids (TDS) have shown up in some of the boundary wells in 2005 and 2004 but these are likely due to naturally occurring concentrations of fluoride and TDS in these particular wells. Giant performed a statistical analysis of the data from these wells in comparison to results of chloride, fluoride and TDS sampling at well OW-11. Well Ow-11 was selected because it is an up-gradient well to the processing areas of the refinery. The statistical analysis included comparison of the maximum detected contaminant levels to the 95% upper tolerance limit for each contaminant calculated using the historical OW-11.

Chloride was detected in elevated concentration in GWM-1 in 2005 (2,000 mg/l) which is above the 95% upper tolerance level of background level, so the chloride in GWM-1 may not be due entirely to natural background concentration.

A table summarizing the results of the determination of 95% upper tolerance limits is included in the *List of Tables*.

POTABLE WELLS #2 AND #4							
	mg/L	DATE SAMPLED	PW Well #2	PW Well #4	WQCC 20 NMAC 6.2.3103	MCL'S	EPA sug. for MTBE
	Benzene	Not sampled in 2005*			0.01	0.005	
		04-Aug-04		<0.001			
		09-Dec-04	<0.001				
	Toluene	Not sampled in 2005*			0.75	1	
		04-Aug-04		<0.001			
		09-Dec-04	<0.001				
	EthylBen	Not sampled in 2005*			0.75	0.7	
		04-Aug-04		<0.001			
		09-Dec-04	<0.001				
	Xylene	Not sampled in 2005*			0.62	10	
		04-Aug-04		<0.001			
		19-Nov-04	0.005				
		Not sampled in 2005*					

*The potable water supply wells were not required to be sampled in 2005.

INFLUENT TO EVAPORATION POND 1						
	mg/L	DATE SAMPLED	EP1 INFLUENT	WQCC20 NMAC 6.2.3103	MCLS	EPA sug. for MTBE
EPA METHOD 8260 VOLATILES	Benzene	September 15, 2005	0.077	0.01	0.005	
		December 7, 2005	0.0044			
	EthylBenzene	September 15, 2005	0.016	0.75	0.7	
		December 7, 2005	0.0037			
	MTBE	September 15, 2005	0.072			
		December 7, 2005	0.035			0.2
	Toluene	September 15, 2005	0.130	0.75	1	
		December 7, 2005	0.0081			
	Xylenes	September 15, 2005	0.096	0.62	10	
		December 7, 2005	0.027			
EPA METHOD 8260 VOLATILES	2-Methylnaphthalene	September 15, 2005	0.280	0.03		
		December 7, 2005				
	2-Methylphenol	September 15, 2005	1.8			
		December 7, 2005				
	3, 4-Methylphenol	September 15, 2005	2.9			
		December 7, 2005				
	Phenanthrene	September 15, 2005	0.270			
		December 7, 2005				
	Phenol	September 15, 2005	6.4	0.005*		
		December 7, 2005				
EPA METHOD 6010B METALS	Hg	September 15, 2005	0.00062	0.002	0.002	
		December 7, 2005				
	Ni	September 15, 2005	0.011	0.2**		
		December 7, 2005				
	Zn	September 15, 2005	1.2	10.0*		
		December 7, 2005				
	Cu	September 15, 2005	0.022	1.0*	1.3	
		December 7, 2005				

Groundwater standards from NMAC are human health based standards except as indicated below:
*Standard for domestic water supply.
**Standard for irrigation use.

VOLATILES 8021B

EPA METHOD 8021B VOLATILES

mg/L	DATE SAMPLED	OW #12	OW 13	OW 14	OW 29	OW 30	POND #2	GWM 1	WQCC 20 NMAC 6.2.3103	EPA MCLs	EPA Sug. # MTBE
Benzene	27-Sep-05	<0.0005	<0.0005	0.017	<0.0005	<0.0005		0.081*	0.01	0.005	0.2
	28-Jun-05							0.010			
	15-Feb-05							0.005			
	08-Dec-04	<0.0005	<0.0005		<0.0005	<0.0005					
	09-Dec-04			0.23				0.0044			
	19-Nov-04						0.024				
Toluene	27-Sep-05	<0.0005	<0.0005	0.0022	<0.0005	<0.0005		0.0046*	0.75	1	
	28-Jun-05							<.0025			
	15-Feb-05							0.0024			
	08-Dec-04	<0.0005	<0.0005	0.0025	<0.0005	<0.0005		0.0032			
	19-Nov-04						0.072				
EthylBen	27-Sep-05	<0.0005	<0.0005	0.0023	<0.0005	<0.0005		0.0028*	0.75	0.7	
	28-Jun-05							0.0035			
	15-Feb-05							0.0026			
	08-Dec-04	<0.0005	<0.0005	0.0029	<0.0005	<0.0005		0.0021			
	19-Nov-04						0.02				
Xylene	27-Sep-05	<0.0005	<0.0005	0.0014	<0.0005	<0.0005		0.010*	0.62	10	
	28-Jun-05							0.041			
	15-Feb-05							0.031			
	08-Dec-04	<0.0005	<0.0005	0.003	<0.0005	<0.0005		0.0024			
	19-Nov-04						0.11				
MTBE	27-Sep-05	<0.0025	<0.0025	0.077	<0.0025	<0.0025		0.170*			
	08-Dec-04	<0.0025	<0.0025	0.065	<0.0025	<0.0025		0.048			
	19-Nov-04						0.11				

GWM-1 was sampled on August 1, 2005.
MTBE is required to be tested annually and was not tested for on the 2-15-05 and 6-28-05 samples from GWM-1.

VOLATILES 8260B

EPA METHOD 8260B VOLATILES

mg/L	DATE SAMPLED	OW 11**	BW 1A	BW 1B	BW 2A	BW 2B	BW 3B	BW 1C	BW 2C	BW 3C	WQCC 20 NMAC 6.2.3103	MCL'S	EPA sug. for MT
Benzene	17/20-Oct-05	<0.001	DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.01	0.005	
	08-Dec-04	<0.001	DRY	DRY									
	04-Aug-04		DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.01	0.0052			
Toluene	17/20-Oct-05	<0.001	DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.75	1	
	08-Dec-04	<0.001	DRY	DRY									
	04-Aug-04		DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.01	0.001			
EthylBen	17/20-Oct-05	<0.001	DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.75	0.7	
	08-Dec-04	<0.001	DRY	DRY									
	04-Aug-04		DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001			
Xylene	17/20-Oct-05	<0.001	DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.62	10	
	08-Dec-04	<0.001	DRY	DRY									
	04-Aug-04		DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.01	0.0015			
MTBE	17/20-Oct-05	<0.001	DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			0.2
	08-Dec-04	<0.001	DRY	DRY									
	04-Aug-04		DRY	DRY	<0.001	<0.001	<0.001	<0.001	<0.01	0.001			

**OW-11 was sampled in 2005 on September 29, 2005.

VOLATILES 8260B										
	mg/L	DATE SAMPLED	MW-1	MW-4	MW-5	SMW-2	SMW-4	WQCC 20 NMAC 6.2.3103	MCLs	EPA sug. for MT
EPA METHOD 8260B VOLATILES	Benzene	12-Oct-05	<0.001	<0.001	<0.001	<0.001	<0.001	0.01	0.005	
	Toluene	12-Oct-05	<0.001	<0.001	<0.001	<0.001	<0.001	0.75	1	
	EthylBen	12-Oct-05	<0.001	<0.001	<0.001	<0.001	<0.001	0.75	0.7	
	Xylene	29-Sep-05	<0.001	<0.001	<0.001	<0.001	<0.001	0.62	10	
	MTBE	29-Sep-05	<0.001	<0.001	<0.001	0.0083	<0.001			0.2

DRO, MRO, GRO, Metals, and General Chemistry

	mg/L	DATE SAMPLED	MW-1	MW-4	MW-5	SMW-2	SMW-4	WQCC 20 NMAC 6.2.3103	MCLs	EPA sug. For MI
EPA Method 8015B	DRO	October 12, 2005	<1.0	<1.0	<1.0	<1.0	<1.0			
	MRO	October 12, 2005	<5.0	<5.0	<5.0	<5.0	<5.0			
	GRO	October 12, 2005	<0.05	<0.05	<0.05	0.51	<0.05			
EPA Method 300.0	Fluoride	October 12, 2005	0.76	0.34	0.78	0.74	1.0	1.6	4.0	
	Chloride	October 12, 2005	45	16	56	**1700**	51	250*		
	Phosphorus	October 12, 2005	<0.5	<0.50	<0.50	<0.50	<0.50			
	Sulfate	October 12, 2005	150	150	160	**1500**	150	600*		
	Nitrogen-Nitrate+Nitrite	October 12, 2005	<0.5	<0.50	<0.50	<0.50	<0.50	10 nitrate	10nitrate 1nitrite	
EPA 245.1	Hg	October 12, 2005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.002	0.002	
EPA Method 6010	Total Recoverable Metals									
	Ar	October 12, 2005	<0.020	<0.020	<0.020	<0.020	<0.020	0.1	0.010	
	Ba	October 12, 2005	<0.020	0.022	<0.020	<0.020	<0.020	1.0	2	
	Be	October 12, 2005	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030		0.004	
	Ca	October 12, 2005	1.7	1.8	1.5	180	3.2			
	Cd	October 12, 2005	<0.002	<0.002	<0.002	<0.002	<0.002	0.01	0.005	
	Co	October 12, 2005	<0.006	<0.006	<0.006	0.0072	0.0072	0.05**		
	Cr	October 12, 2005	<0.006	<0.006	<0.006	0.024	0.024	0.05	0.1	
	K	October 12, 2005	<1.0	<1.0	<1.0	1.4	1.4			
	Pb	October 12, 2005	<0.005	<0.005	<0.005	<0.005	<0.005	0.05	0.015	
	Mg	October 12, 2005	<1.0	<1.0	<1.0	58	<1.0			
	Na	October 12, 2005	270	280	250	1900	300			
	Ni	October 12, 2005	<0.01	<0.01	<0.01	0.035	<0.01	0.2**		
	Se	October 12, 2005	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.05	
	Ag	October 12, 2005	<0.005	<0.005	<0.005	<0.005	<0.005	0.05		
	Va	October 12, 2005	<0.05	<0.05	<0.05	<0.05	0.052			
	Zn	October 12, 2005	<0.05	<0.05	<0.05	<0.05	<0.05	10*		
EPA Method 15.1	pH	October 12, 2005	9.08	8.80	9.07	7.58	8.66			

Groundwater standards from NMAC are human health based standards except as indicated below:
*Standard for domestic water supply.
**Standard for irrigation use.

GENERAL CHEMISTRY

EPA Method 300.0

mg/L	DATE SAMPLED	OW 11**	BW 1A	BW 1B	BW 2A	BW 2B	BW 3B	BW 1C	BW 2C	BW 3C	POND #2	WELL #2	WELL #4	WQCC 20 NMAC 6.2.3103	MCL'S
Fluoride	17/20-Oct-05	2.3	DRY	DRY	1.1	1.7	1.4	2.2	1.5	1.6				1.6	4
	08-Dec-04	2.3	DRY	DRY											
	04-Aug-04		DRY	DRY	1.2	1.7	1.4	2	2.2	0.95		0.21			
	06-Nov-03	2.3													
	09-Dec-04												0.18		
Chloride	17/20-Oct-05	87	DRY	DRY	39	29	34	34	42	37				250	250
	08-Dec-04	80	DRY	DRY											
	04-Aug-04		DRY	DRY	40	32	35	38	46	25					
	06-Nov-03	88													
	09-Dec-04												16		
Nitrogen - Nitrite	17/20-Oct-05	<0.1	DRY	DRY	<0.50	<0.50	<0.10	<0.50	<0.50	<0.10					1
	08-Dec-04	<.50	DRY	DRY											
	04-Aug-04		DRY	DRY	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10					
	06-Nov-03	<0.10													
	09-Dec-04												<0.10		
Bromide	17/20-Oct-05		DRY	DRY											
	08-Dec-04	<0.10	DRY	DRY											
	04-Aug-04		DRY	DRY	0.4	1.3	0.49	0.32	0.78	1.2					
	06-Nov-03	<0.10													
Nitrogen - Nitrate	17/20-Oct-05	0.72	DRY	DRY	<0.50	<0.50	<0.10	<0.50	<0.50	<0.10				10	
	08-Dec-04	<0.50	DRY	DRY											
	04-Aug-04		DRY	DRY	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		0.12			
	06-Nov-03	0.65													
	09-Dec-04												<0.10		
P	17/20-Oct-05	<0.50	DRY	DRY	0.59	<0.50	1.0	<0.50	<0.50	<0.50					
	08-Dec-04	<0.50	DRY	DRY											
	04-Aug-04		DRY	DRY	0.57	<0.50	1.2	<0.50	<0.50	<0.50					
	06-Nov-03	<0.50													
	09-Dec-04												<0.50		

	Sulfate	17/20-Oct-05	990	DRY	DRY	6.9	130	56	240	270	350				600	
		08-Dec-04	1100	DRY	DRY											
		04-Aug-04		DRY	DRY	9.6	140	63	210	230	440					
		06-Nov-03	1000													
		09-Dec-04												170		
EPA METHOD 160.1	TDS	17/20-Oct-05		DRY	DRY										1000	500
		08-Dec-04	1900	DRY	DRY											
		04-Aug-04		DRY	DRY	1100	1500	1000	970	970	940	3800				
		06-Nov-03	1800													
	pH	29-Sep-05	8.44	DRY	DRY										6.5 - 8.5	BETWEEN AND 9
		08-Dec-04	8.48	DRY	DRY											
		04-Aug-04		DRY	DRY	8.4	8.35	8.5	**9.36**	8.84	8.87					
		06-Nov-03	8.45													
	SP COND	17-Oct-05		DRY	DRY	1400	2500	1600	1400	1500	1400					
		04-Aug-04		DRY	DRY	1447	2280	1534	1280	1401	1380					
	Temp F			DRY	DRY	63	62	61	62	62	62					
	Depth to water			DRY	DRY	32.1'	29.7'	32.9	18.8"	27.5'	63.2'					

**OW-11 was sampled on September 29, 2005.

DISSOLVED METALS

mg/L	DATE SAMPLED	OW 11	BW 1A	BW 1B	BW 2A	BW 2B	BW 3B	BW 1C	BW 2C	BW 3C	POND #2	WELL #2	WELL #4	MCL
Arsenic	29-Sep-05	<0.020												0.05
	08-Dec-04	<0.020												
	04-Aug-04		DRY	DRY	<0.020	<0..020	<0.020	<0.020	<0.020	<0.020			<0.020	
	19-Nov-04										<0.020			
Barium	29-Sep-05	<0.020												
	08-Dec-04	<0.020												2
	04-Aug-04		DRY	DRY	0.12	0.066	0.13	<0.0020	0.047	0.051			0.014	
	19-Nov-04										0.14			
Cadmium	29-Sep-05	0.002												
	08-Dec-04	0.002												0.005
	04-Aug-04		DRY	DRY	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020			<0.0020	
	19-Nov-04										<0.0020			
Calcium	17-Oct-05	10			10	23	9.9	3.1	140	6.1				
	08-Dec-04	9.6												
	04-Aug-04		DRY	DRY	6.7	14	11	3.8	5.6	45				
Cr	29-Sep-05	<0.0060												
	08-Dec-04	<0.0060												0.1
	04-Aug-04		DRY	DRY	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060			<0.0060	
	19-Nov-04										0.012			
Lead	29-Sep-05	<0.0050												
	08-Dec-04	<0.0050												0.015
	04-Aug-04		DRY	DRY	0.0059	0.0064	0.006	<0.0050	<0.0050	<0.0050			<0.0050	
	19-Nov-04										0.0075			
Mg	17-Oct-05	1.2			3.6	3.9	2.9	<1.0	7.7	1.1				
	08-Dec-04	1.1												
	04-Aug-04		DRY	DRY	2.5	3.2	3.1	<1.0	1.5	9.8				
	19-Nov-04													
K	17-Oct-05	1.7			1.1	2.1	1.4	1.5	2.5	1.8				
	08-Dec-04	1.9												
	04-Aug-04		DRY	DRY	<1.0	4.7	1.3	2	2	5.3				

EPA METHOD 601

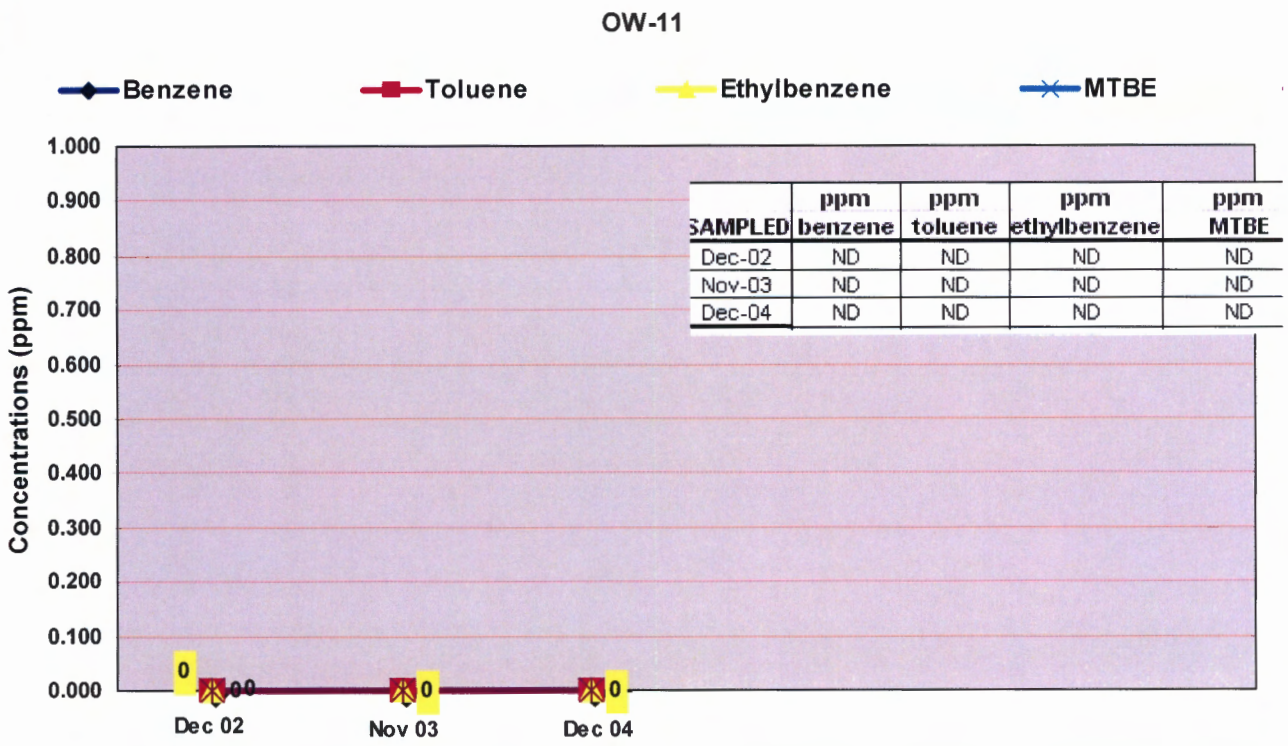
DISSOLVED METALS

mg/L	Date Sampled	OW 11	BW1A	BW1B	BW2A	BW2B	BW3B	BW1C	BW2C	BW3C	POND 2	WELL #2	WELL #4	MCL's
Se	29-Sep-05	<0.050												
	08-Dec-04	0.005												0.05
	04-Aug-04		DRY	DRY	<0.050	0.069	<0.050	<0.050	<0.050	<0.050			<0.050	
	19-Nov-04										<0.050			
	09-Dec-04											<0.050		
Silver	29-Sep-05	<0.0050												
	08-Dec-04	<0.0050												0.05
	04-Aug-04		DRY	DRY	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050			<0.0050	
	19-Nov-04										<0.0050			
	09-Dec-04											<0.0050		
Sodium	29-Sep-05	620												
	08-Dec-04	620												
	04-Aug-04		DRY	DRY	220	540	340	200	300	230				
	19-Nov-04													
	09-Dec-04													
Uranium	29-Sep-05													
	08-Dec-04													0.2
	04-Aug-04		DRY	DRY	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10			<0.10	
	09-Dec-04											<0.10		

BOD - PILOT TRAVEL CENTER AND TRUCK STOP

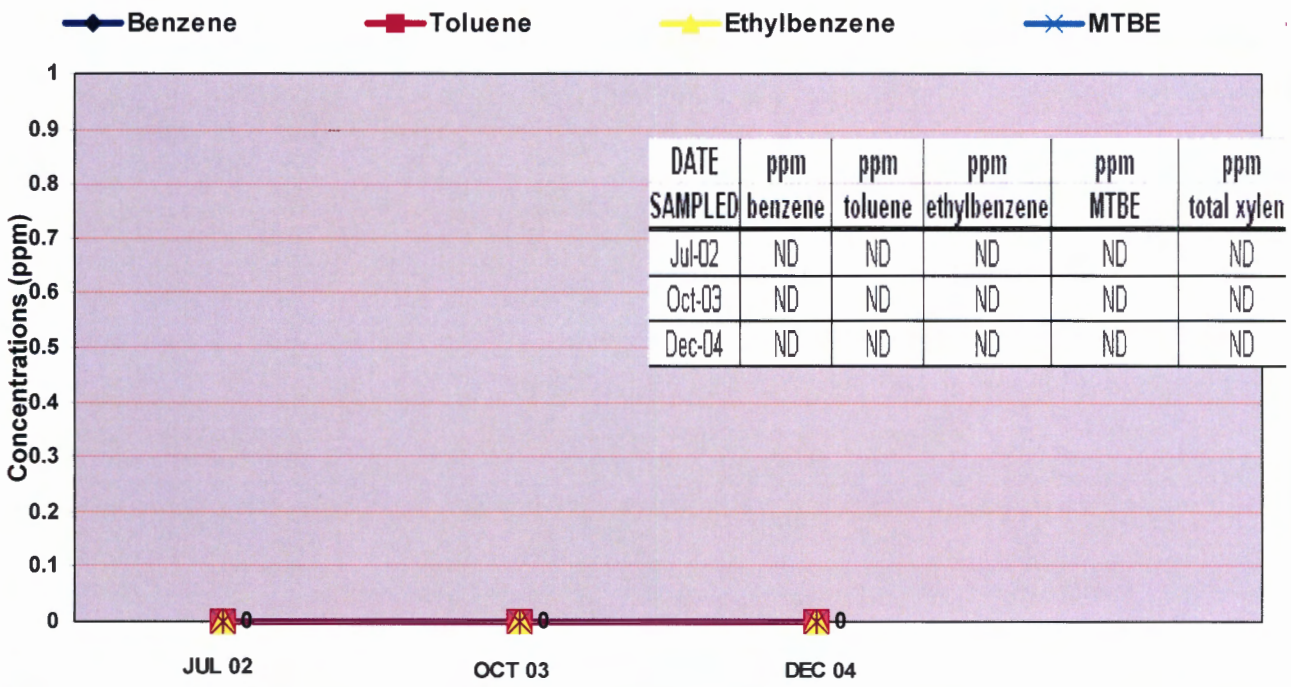
EPA 405.1

Date of Analysis	BOD Results (mg/l)	Detection Limit (mg/l)
30-Dec-05	4100	5
2-Dec-05	504	5
11-Jun-05	2850	5



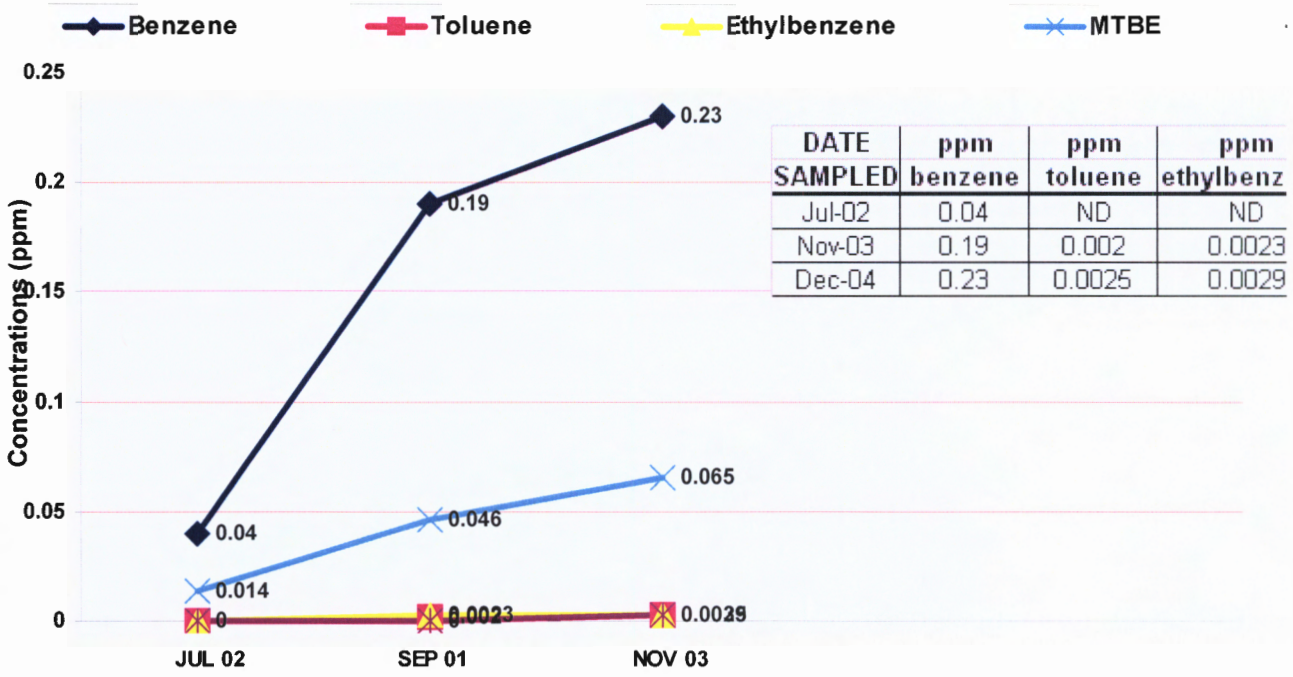
SAMPLED	ppm benzene	ppm toluene	ppm ethylbenzene	ppm MTBE
Dec-02	ND	ND	ND	ND
Nov-03	ND	ND	ND	ND
Dec-04	ND	ND	ND	ND

OW-12

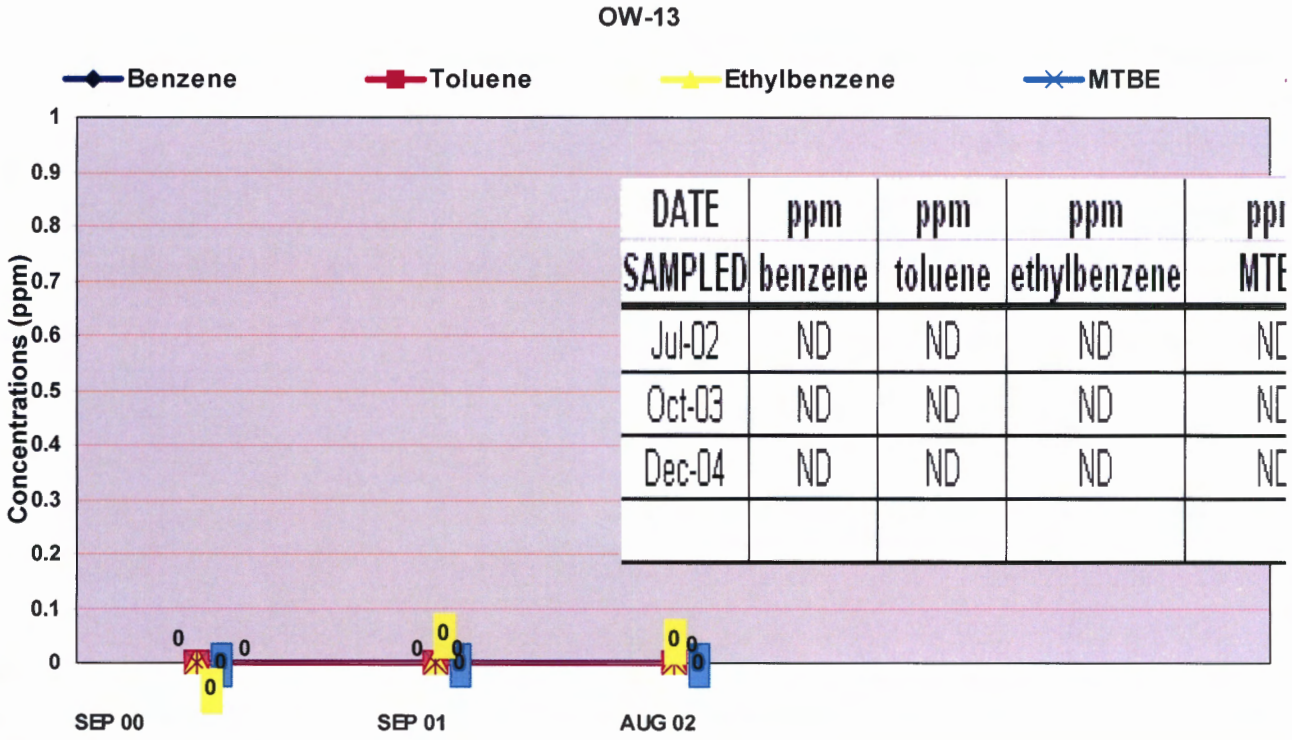


DATE SAMPLED	ppm benzene	ppm toluene	ppm ethylbenzene	ppm MTBE	ppm total xylen
Jul-02	ND	ND	ND	ND	ND
Oct-03	ND	ND	ND	ND	ND
Dec-04	ND	ND	ND	ND	ND

OW-14

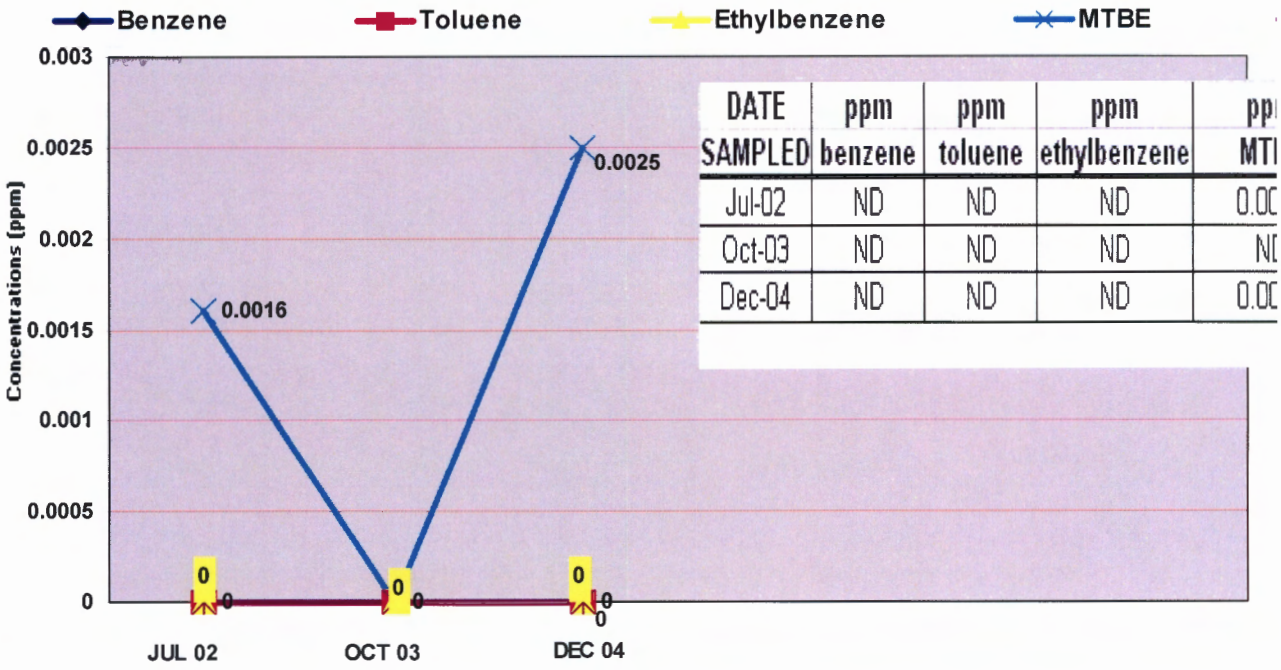


DATE SAMPLED	ppm benzene	ppm toluene	ppm ethylbenz
Jul-02	0.04	ND	ND
Nov-03	0.19	0.002	0.0023
Dec-04	0.23	0.0025	0.0029



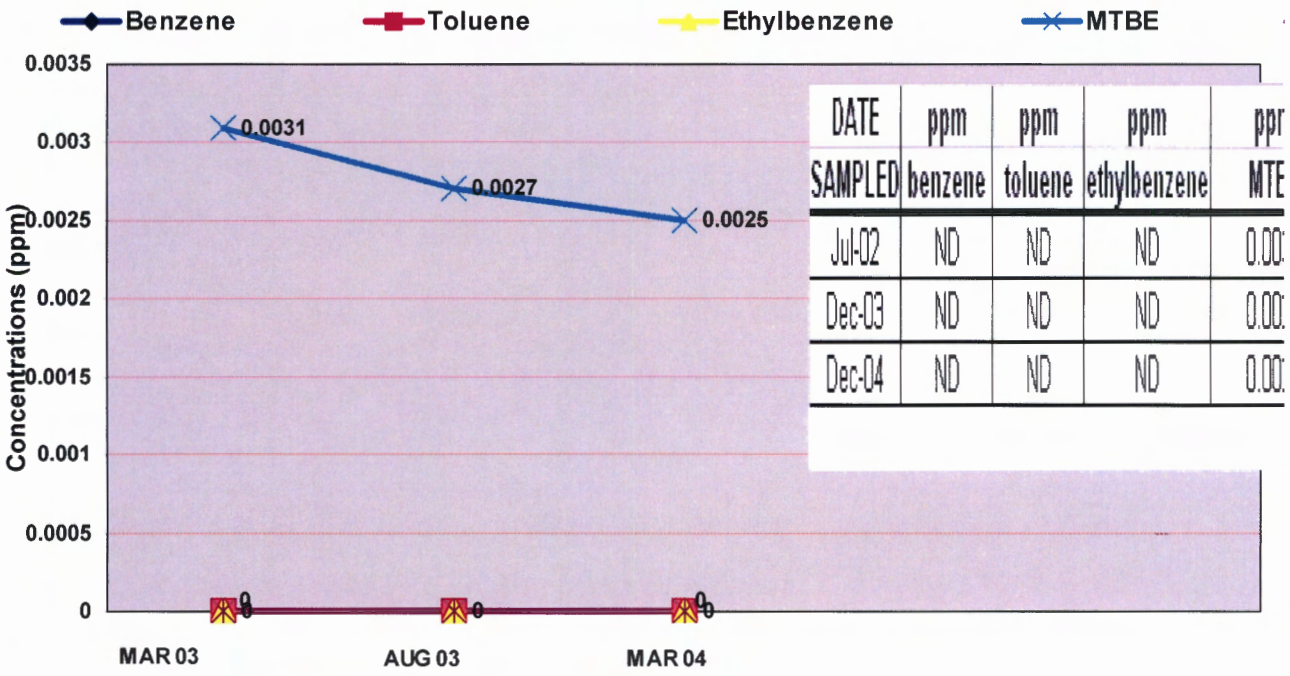
DATE SAMPLED	ppm benzene	ppm toluene	ppm ethylbenzene	ppı MTE
Jul-02	ND	ND	ND	NE
Oct-03	ND	ND	ND	NE
Dec-04	ND	ND	ND	NE

OW-29



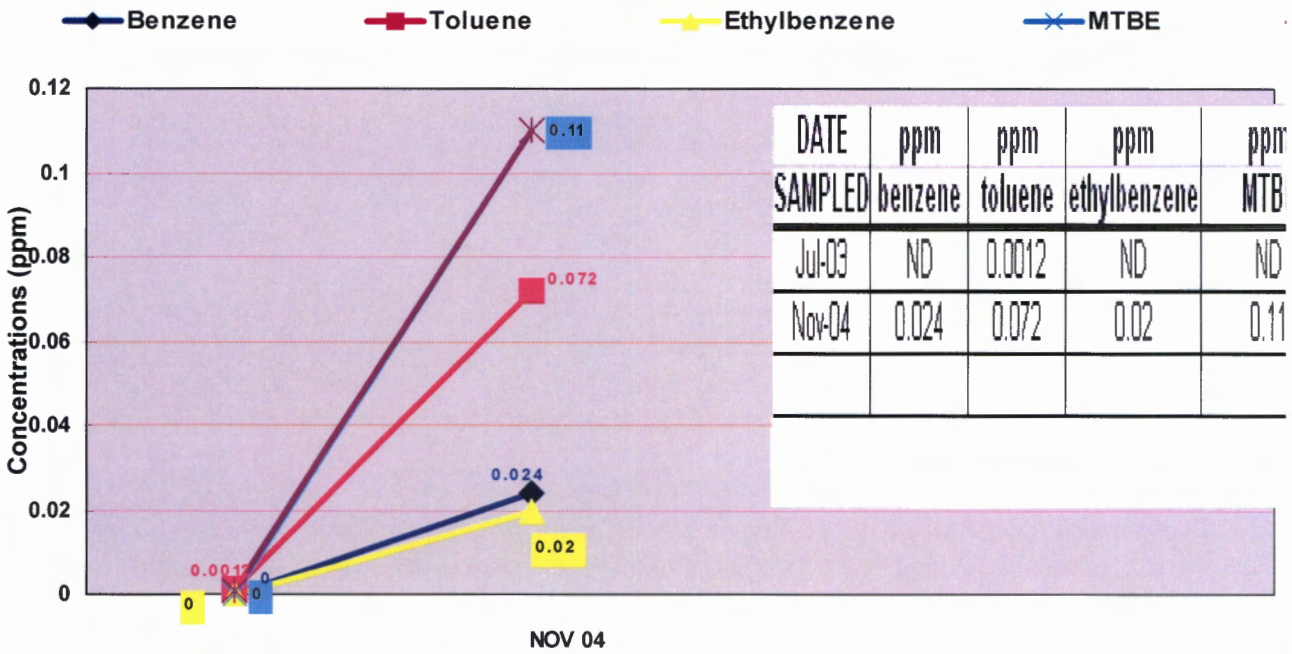
DATE SAMPLED	ppm benzene	ppm toluene	ppm ethylbenzene	pp MT
Jul-02	ND	ND	ND	0.0
Oct-03	ND	ND	ND	N
Dec-04	ND	ND	ND	0.0

OW-30



DATE SAMPLED	ppm benzene	ppm toluene	ppm ethylbenzene	ppr MTE
Jul-02	ND	ND	ND	0.00
Dec-03	ND	ND	ND	0.00
Dec-04	ND	ND	ND	0.00

POND #2



DATE SAMPLED	ppm benzene	ppm toluene	ppm ethylbenzene	ppm MTB
Jul-03	ND	0.0012	ND	ND
Nov-04	0.024	0.072	0.02	0.11

5. Groundwater Chemical Analytical Data

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

November 03, 2005

Steve Morris
Giant Refining Co
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0258
FAX (505) 722-0210

RE: Ciniza Annual Groundwater Samples 2005 Order No.: 0510204

Dear Steve Morris:

Hall Environmental Analysis Laboratory received 7 samples on 10/20/2005 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

ACCREDITED IN ACCORDANCE WITH nelac

4901 Hawkins NE ■ Suite D ■ Albuquerque, NM 87109
505.345.3975 ■ Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory

Date: *03-Nov-05*

LIENT: Giant Refining Co
roject: Ciniza Annual Groundwater Samples 2005
Lab Order: 0510204

CASE NARRATIVE

8270 sample BW-2-C was extracted at a x5 dilution due the heavy amount of sediment and turbidity of the sample.

Hall Environmental Analysis Laboratory

Date: *03-Nov-05*

IENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-01

Client Sample ID: BW-1-C
Collection Date: 10/17/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	2.2	0.10		mg/L	1	10/22/2005
Chloride	34	0.10		mg/L	1	10/22/2005
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	10/22/2005
Sulfate	240	2.5		mg/L	5	11/1/2005
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	11/1/2005
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/28/2005
Toluene	ND	1.0		µg/L	1	10/28/2005
Ethylbenzene	ND	1.0		µg/L	1	10/28/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/28/2005
Naphthalene	ND	2.0		µg/L	1	10/28/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
Acetone	ND	10		µg/L	1	10/28/2005
Bromobenzene	ND	1.0		µg/L	1	10/28/2005
Bromochloromethane	ND	1.0		µg/L	1	10/28/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/28/2005
Bromoform	ND	1.0		µg/L	1	10/28/2005
Bromomethane	ND	2.0		µg/L	1	10/28/2005
2-Butanone	ND	10		µg/L	1	10/28/2005
Carbon disulfide	ND	10		µg/L	1	10/28/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/28/2005
Chlorobenzene	ND	1.0		µg/L	1	10/28/2005
Chloroethane	ND	2.0		µg/L	1	10/28/2005
Chloroform	ND	1.0		µg/L	1	10/28/2005
Chloromethane	ND	1.0		µg/L	1	10/28/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/28/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/28/2005
Dibromomethane	ND	2.0		µg/L	1	10/28/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005

ualifiers:
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: *03-Nov-05*

LIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-01

Client Sample ID: BW-1-C
Collection Date: 10/17/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/28/2005
2-Hexanone	ND	10		µg/L	1	10/28/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/28/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/28/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/28/2005
Methylene Chloride	ND	3.0		µg/L	1	10/28/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/28/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
Styrene	ND	1.0		µg/L	1	10/28/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/28/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/28/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/28/2005
Vinyl chloride	ND	1.0		µg/L	1	10/28/2005
Xylenes, Total	ND	1.0		µg/L	1	10/28/2005
Surr: 1,2-Dichloroethane-d4	97.5	69.9-130		%REC	1	10/28/2005
Surr: 4-Bromofluorobenzene	100	71.2-123		%REC	1	10/28/2005
Surr: Dibromofluoromethane	97.7	73.9-134		%REC	1	10/28/2005
Surr: Toluene-d8	95.5	81.9-122		%REC	1	10/28/2005

EPA METHOD 8270C: SEMIVOLATILES Analyst: **BL**

Acenaphthene	ND	10		µg/L	1	10/26/2005
Acenaphthylene	ND	10		µg/L	1	10/26/2005
Aniline	ND	20		µg/L	1	10/26/2005
Anthracene	ND	10		µg/L	1	10/26/2005
Azobenzene	ND	10		µg/L	1	10/26/2005

Qualifiers:
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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: *03-Nov-05*

IENT: Giant Refining Co
Client Sample ID: BW-1-C
Lab Order: 0510204
Collection Date: 10/17/2005 2:00:00 PM
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-01
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Benz(a)anthracene	ND	15		µg/L	1	10/26/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/26/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/26/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/26/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/26/2005
Benzoic acid	ND	50		µg/L	1	10/26/2005
Benzyl alcohol	ND	20		µg/L	1	10/26/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/26/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/26/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/26/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/26/2005
Carbazole	ND	10		µg/L	1	10/26/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/26/2005
4-Chloroaniline	ND	20		µg/L	1	10/26/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/26/2005
2-Chlorophenol	ND	10		µg/L	1	10/26/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/26/2005
Chrysene	ND	15		µg/L	1	10/26/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/26/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/26/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/26/2005
Dibenzofuran	ND	10		µg/L	1	10/26/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/26/2005
Diethyl phthalate	ND	10		µg/L	1	10/26/2005
Dimethyl phthalate	ND	10		µg/L	1	10/26/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/26/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/26/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
Fluoranthene	ND	10		µg/L	1	10/26/2005
Fluorene	ND	10		µg/L	1	10/26/2005
Hexachlorobenzene	ND	10		µg/L	1	10/26/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/26/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/26/2005
Hexachloroethane	ND	10		µg/L	1	10/26/2005

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: *03-Nov-05*

IENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-01

Client Sample ID: BW-1-C
Collection Date: 10/17/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/26/2005
Isophorone	ND	10		µg/L	1	10/26/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/26/2005
2-Methylphenol	ND	15		µg/L	1	10/26/2005
3+4-Methylphenol	ND	20		µg/L	1	10/26/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/26/2005
Naphthalene	ND	10		µg/L	1	10/26/2005
2-Nitroaniline	ND	50		µg/L	1	10/26/2005
3-Nitroaniline	ND	50		µg/L	1	10/26/2005
4-Nitroaniline	ND	20		µg/L	1	10/26/2005
Nitrobenzene	ND	10		µg/L	1	10/26/2005
2-Nitrophenol	ND	15		µg/L	1	10/26/2005
4-Nitrophenol	ND	50		µg/L	1	10/26/2005
Pentachlorophenol	ND	50		µg/L	1	10/26/2005
Phenanthrene	ND	10		µg/L	1	10/26/2005
Phenol	ND	10		µg/L	1	10/26/2005
Pyrene	ND	15		µg/L	1	10/26/2005
Pyridine	ND	30		µg/L	1	10/26/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/26/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/26/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/26/2005
Surr: 2,4,6-Tribromophenol	63.9	16.6-150		%REC	1	10/26/2005
Surr: 2-Fluorobiphenyl	51.1	19.6-134		%REC	1	10/26/2005
Surr: 2-Fluorophenol	55.9	9.54-113		%REC	1	10/26/2005
Surr: 4-Terphenyl-d14	80.3	22.7-145		%REC	1	10/26/2005
Surr: Nitrobenzene-d5	63.6	14.6-134		%REC	1	10/26/2005
Surr: Phenol-d6	27.8	10.7-80.3		%REC	1	10/26/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **TES**
Specific Conductance	1400	0.010		µmhos/cm	1	11/1/2005
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Calcium	3.1	1.0		mg/L	1	10/27/2005 5:16:35 PM
Magnesium	ND	1.0		mg/L	1	10/27/2005 5:16:35 PM
Potassium	1.5	1.0		mg/L	1	10/27/2005 5:16:35 PM
Sodium	310	10		mg/L	10	10/28/2005 10:45:13 AM

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: *03-Nov-05*

IENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-02

Client Sample ID: BW-2-A
Collection Date: 10/17/2005 3:30:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	1.1	0.10		mg/L	1	10/22/2005
Chloride	39	0.10		mg/L	1	10/22/2005
Phosphorus, Orthophosphate (As P)	0.59	0.50	H	mg/L	1	10/22/2005
Sulfate	6.9	0.50		mg/L	1	10/22/2005
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	11/1/2005
EPA METHOD 8260B: VOLATILES						Analyst: **BDH**
Benzene	ND	1.0		µg/L	1	10/28/2005
Toluene	ND	1.0		µg/L	1	10/28/2005
Ethylbenzene	ND	1.0		µg/L	1	10/28/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/28/2005
Naphthalene	ND	2.0		µg/L	1	10/28/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
Acetone	ND	10		µg/L	1	10/28/2005
Bromobenzene	ND	1.0		µg/L	1	10/28/2005
Bromochloromethane	ND	1.0		µg/L	1	10/28/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/28/2005
Bromoform	ND	1.0		µg/L	1	10/28/2005
Bromomethane	ND	2.0		µg/L	1	10/28/2005
2-Butanone	ND	10		µg/L	1	10/28/2005
Carbon disulfide	ND	10		µg/L	1	10/28/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/28/2005
Chlorobenzene	ND	1.0		µg/L	1	10/28/2005
Chloroethane	ND	2.0		µg/L	1	10/28/2005
Chloroform	ND	1.0		µg/L	1	10/28/2005
Chloromethane	ND	1.0		µg/L	1	10/28/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/28/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/28/2005
Dibromomethane	ND	2.0		µg/L	1	10/28/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005

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: *03-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-02

Client Sample ID: BW-2-A
Collection Date: 10/17/2005 3:30:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/28/2005
2-Hexanone	ND	10		µg/L	1	10/28/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/28/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/28/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/28/2005
Methylene Chloride	ND	3.0		µg/L	1	10/28/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/28/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
Styrene	ND	1.0		µg/L	1	10/28/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/28/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/28/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/28/2005
Vinyl chloride	ND	1.0		µg/L	1	10/28/2005
Xylenes, Total	ND	1.0		µg/L	1	10/28/2005
Surr: 1,2-Dichloroethane-d4	97.7	69.9-130		%REC	1	10/28/2005
Surr: 4-Bromofluorobenzene	98.4	71.2-123		%REC	1	10/28/2005
Surr: Dibromofluoromethane	119	73.9-134		%REC	1	10/28/2005
Surr: Toluene-d8	102	81.9-122		%REC	1	10/28/2005

EPA METHOD 8270C: SEMIVOLATILES Analyst: **BL**

Acenaphthene	ND	10		µg/L	1	10/26/2005
Acenaphthylene	ND	10		µg/L	1	10/26/2005
Aniline	ND	20		µg/L	1	10/26/2005
Anthracene	ND	10		µg/L	1	10/26/2005
Azobenzene	ND	10		µg/L	1	10/26/2005

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: *03-Nov-05*

IENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-02

Client Sample ID: BW-2-A
Collection Date: 10/17/2005 3:30:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Benz(a)anthracene	ND	15		µg/L	1	10/26/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/26/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/26/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/26/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/26/2005
Benzoic acid	ND	50		µg/L	1	10/26/2005
Benzyl alcohol	ND	20		µg/L	1	10/26/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/26/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/26/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/26/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/26/2005
Carbazole	ND	10		µg/L	1	10/26/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/26/2005
4-Chloroaniline	ND	20		µg/L	1	10/26/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/26/2005
2-Chlorophenol	ND	10		µg/L	1	10/26/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/26/2005
Chrysene	ND	15		µg/L	1	10/26/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/26/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/26/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/26/2005
Dibenzofuran	ND	10		µg/L	1	10/26/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/26/2005
Diethyl phthalate	ND	10		µg/L	1	10/26/2005
Dimethyl phthalate	ND	10		µg/L	1	10/26/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/26/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/26/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
Fluoranthene	ND	10		µg/L	1	10/26/2005
Fluorene	ND	10		µg/L	1	10/26/2005
Hexachlorobenzene	ND	10		µg/L	1	10/26/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/26/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/26/2005
Hexachloroethane	ND	10		µg/L	1	10/26/2005

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: *03-Nov-05*

LIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-02

Client Sample ID: BW-2-A
Collection Date: 10/17/2005 3:30:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/26/2005
Isophorone	ND	10		µg/L	1	10/26/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/26/2005
2-Methylphenol	ND	15		µg/L	1	10/26/2005
3+4-Methylphenol	ND	20		µg/L	1	10/26/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/26/2005
Naphthalene	ND	10		µg/L	1	10/26/2005
2-Nitroaniline	ND	50		µg/L	1	10/26/2005
3-Nitroaniline	ND	50		µg/L	1	10/26/2005
4-Nitroaniline	ND	20		µg/L	1	10/26/2005
Nitrobenzene	ND	10		µg/L	1	10/26/2005
2-Nitrophenol	ND	15		µg/L	1	10/26/2005
4-Nitrophenol	ND	50		µg/L	1	10/26/2005
Pentachlorophenol	ND	50		µg/L	1	10/26/2005
Phenanthrene	ND	10		µg/L	1	10/26/2005
Phenol	ND	10		µg/L	1	10/26/2005
Pyrene	ND	15		µg/L	1	10/26/2005
Pyridine	ND	30		µg/L	1	10/26/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/26/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/26/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/26/2005
Surr: 2,4,6-Tribromophenol	59.4	16.6-150		%REC	1	10/26/2005
Surr: 2-Fluorobiphenyl	49.4	19.6-134		%REC	1	10/26/2005
Surr: 2-Fluorophenol	47.2	9.54-113		%REC	1	10/26/2005
Surr: 4-Terphenyl-d14	80.3	22.7-145		%REC	1	10/26/2005
Surr: Nitrobenzene-d5	64.0	14.6-134		%REC	1	10/26/2005
Surr: Phenol-d6	23.0	10.7-80.3		%REC	1	10/26/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **TES**
Specific Conductance	1400	0.010		µmhos/cm	1	11/1/2005
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Calcium	10	1.0		mg/L	1	10/27/2005 5:20:47 PM
Magnesium	3.6	1.0		mg/L	1	10/27/2005 5:20:47 PM
Potassium	1.1	1.0		mg/L	1	10/27/2005 5:20:47 PM
Sodium	330	10		mg/L	10	10/28/2005 10:55:15 AM

Qualifiers:
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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: *03-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-03

Client Sample ID: BW-2-B
Collection Date: 10/18/2005 11:10:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	1.7	0.10		mg/L	1	10/22/2005
Chloride	29	0.10		mg/L	1	10/22/2005
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	10/22/2005
Sulfate	130	2.5		mg/L	5	11/1/2005
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	11/1/2005
EPA METHOD 8260B: VOLATILES						Analyst: **BDH**
Benzene	ND	1.0		µg/L	1	10/28/2005
Toluene	ND	1.0		µg/L	1	10/28/2005
Ethylbenzene	ND	1.0		µg/L	1	10/28/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/28/2005
Naphthalene	ND	2.0		µg/L	1	10/28/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
Acetone	ND	10		µg/L	1	10/28/2005
Bromobenzene	ND	1.0		µg/L	1	10/28/2005
Bromochloromethane	ND	1.0		µg/L	1	10/28/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/28/2005
Bromoform	ND	1.0		µg/L	1	10/28/2005
Bromomethane	ND	2.0		µg/L	1	10/28/2005
2-Butanone	ND	10		µg/L	1	10/28/2005
Carbon disulfide	ND	10		µg/L	1	10/28/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/28/2005
Chlorobenzene	ND	1.0		µg/L	1	10/28/2005
Chloroethane	ND	2.0		µg/L	1	10/28/2005
Chloroform	ND	1.0		µg/L	1	10/28/2005
Chloromethane	ND	1.0		µg/L	1	10/28/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/28/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/28/2005
Dibromomethane	ND	2.0		µg/L	1	10/28/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005

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: *03-Nov-05*

IENT: Giant Refining Co
Client Sample ID: BW-2-B
Lab Order: 0510204
Collection Date: 10/18/2005 11:10:00 AM
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-03
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/28/2005
2-Hexanone	ND	10		µg/L	1	10/28/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/28/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/28/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/28/2005
Methylene Chloride	ND	3.0		µg/L	1	10/28/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/28/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
Styrene	ND	1.0		µg/L	1	10/28/2005
ert-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/28/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/28/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/28/2005
Vinyl chloride	ND	1.0		µg/L	1	10/28/2005
Xylenes, Total	ND	1.0		µg/L	1	10/28/2005
Surr: 1,2-Dichloroethane-d4	96.4	69.9-130		%REC	1	10/28/2005
Surr: 4-Bromofluorobenzene	106	71.2-123		%REC	1	10/28/2005
Surr: Dibromofluoromethane	116	73.9-134		%REC	1	10/28/2005
Surr: Toluene-d8	97.6	81.9-122		%REC	1	10/28/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
Acenaphthene	ND	10		µg/L	1	10/26/2005
Acenaphthylene	ND	10		µg/L	1	10/26/2005
Aniline	ND	20		µg/L	1	10/26/2005
Anthracene	ND	10		µg/L	1	10/26/2005
Azobenzene	ND	10		µg/L	1	10/26/2005

ualifiers:
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: *03-Nov-05*

.IENT: Giant Refining Co
Client Sample ID: BW-2-B
Lab Order: 0510204
Collection Date: 10/18/2005 11:10:00 AM
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-03
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Benz(a)anthracene	ND	15		µg/L	1	10/26/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/26/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/26/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/26/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/26/2005
Benzoic acid	ND	50		µg/L	1	10/26/2005
Benzyl alcohol	ND	20		µg/L	1	10/26/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/26/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/26/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/26/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/26/2005
Carbazole	ND	10		µg/L	1	10/26/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/26/2005
4-Chloroaniline	ND	20		µg/L	1	10/26/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/26/2005
?-Chlorophenol	ND	10		µg/L	1	10/26/2005
⁴-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/26/2005
Chrysene	ND	15		µg/L	1	10/26/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/26/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/26/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/26/2005
Dibenzofuran	ND	10		µg/L	1	10/26/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/26/2005
Diethyl phthalate	ND	10		µg/L	1	10/26/2005
Dimethyl phthalate	ND	10		µg/L	1	10/26/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/26/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/26/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
Fluoranthene	ND	10		µg/L	1	10/26/2005
Fluorene	ND	10		µg/L	1	10/26/2005
Hexachlorobenzene	ND	10		µg/L	1	10/26/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/26/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/26/2005
Hexachloroethane	ND	10		µg/L	1	10/26/2005

ualifiers:
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: *03-Nov-05*

LIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-03

Client Sample ID: BW-2-B
Collection Date: 10/18/2005 11:10:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/26/2005
Isophorone	ND	10		µg/L	1	10/26/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/26/2005
2-Methylphenol	ND	15		µg/L	1	10/26/2005
3+4-Methylphenol	ND	20		µg/L	1	10/26/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/26/2005
Naphthalene	ND	10		µg/L	1	10/26/2005
2-Nitroaniline	ND	50		µg/L	1	10/26/2005
3-Nitroaniline	ND	50		µg/L	1	10/26/2005
4-Nitroaniline	ND	20		µg/L	1	10/26/2005
Nitrobenzene	ND	10		µg/L	1	10/26/2005
2-Nitrophenol	ND	15		µg/L	1	10/26/2005
4-Nitrophenol	ND	50		µg/L	1	10/26/2005
Pentachlorophenol	ND	50		µg/L	1	10/26/2005
Phenanthrene	ND	10		µg/L	1	10/26/2005
Phenol	ND	10		µg/L	1	10/26/2005
Pyrene	ND	15		µg/L	1	10/26/2005
Pyridine	ND	30		µg/L	1	10/26/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/26/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/26/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/26/2005
Surr: 2,4,6-Tribromophenol	55.4	16.6-150		%REC	1	10/26/2005
Surr: 2-Fluorobiphenyl	45.0	19.6-134		%REC	1	10/26/2005
Surr: 2-Fluorophenol	47.8	9.54-113		%REC	1	10/26/2005
Surr: 4-Terphenyl-d14	78.1	22.7-145		%REC	1	10/26/2005
Surr: Nitrobenzene-d5	60.1	14.6-134		%REC	1	10/26/2005
Surr: Phenol-d6	24.7	10.7-80.3		%REC	1	10/26/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **TES**
Specific Conductance	2500	0.010		µmhos/cm	1	11/1/2005
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Calcium	23	1.0		mg/L	1	10/27/2005 5:25:03 PM
Magnesium	3.9	1.0		mg/L	1	10/27/2005 5:25:03 PM
Potassium	2.1	1.0		mg/L	1	10/27/2005 5:25:03 PM
Sodium	540	10		mg/L	10	10/28/2005 10:57:58 AM

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: *03-Nov-05*

.IENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-04

Client Sample ID: BW-2-C
Collection Date: 10/19/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	1.5	0.50		mg/L	5	10/22/2005
Chloride	42	0.50		mg/L	5	10/22/2005
Phosphorus, Orthophosphate (As P)	ND	2.5	H	mg/L	5	10/22/2005
Sulfate	270	2.5		mg/L	5	10/22/2005
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	11/1/2005
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/28/2005
Toluene	ND	1.0		µg/L	1	10/28/2005
Ethylbenzene	ND	1.0		µg/L	1	10/28/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/28/2005
Naphthalene	ND	2.0		µg/L	1	10/28/2005
-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
Acetone	ND	10		µg/L	1	10/28/2005
Bromobenzene	ND	1.0		µg/L	1	10/28/2005
Bromochloromethane	ND	1.0		µg/L	1	10/28/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/28/2005
Bromoform	ND	1.0		µg/L	1	10/28/2005
Bromomethane	ND	2.0		µg/L	1	10/28/2005
2-Butanone	ND	10		µg/L	1	10/28/2005
Carbon disulfide	ND	10		µg/L	1	10/28/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/28/2005
Chlorobenzene	ND	1.0		µg/L	1	10/28/2005
Chloroethane	ND	2.0		µg/L	1	10/28/2005
Chloroform	ND	1.0		µg/L	1	10/28/2005
Chloromethane	ND	1.0		µg/L	1	10/28/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/28/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/28/2005
Dibromomethane	ND	2.0		µg/L	1	10/28/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005

ualifiers:
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: *03-Nov-05*

LIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-04

Client Sample ID: BW-2-C
Collection Date: 10/19/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/28/2005
2-Hexanone	ND	10		µg/L	1	10/28/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/28/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/28/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/28/2005
Methylene Chloride	ND	3.0		µg/L	1	10/28/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/28/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
Styrene	ND	1.0		µg/L	1	10/28/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/28/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/28/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/28/2005
Vinyl chloride	ND	1.0		µg/L	1	10/28/2005
Xylenes, Total	ND	1.0		µg/L	1	10/28/2005
Surr: 1,2-Dichloroethane-d4	99.6	69.9-130		%REC	1	10/28/2005
Surr: 4-Bromofluorobenzene	104	71.2-123		%REC	1	10/28/2005
Surr: Dibromofluoromethane	98.2	73.9-134		%REC	1	10/28/2005
Surr: Toluene-d8	99.4	81.9-122		%REC	1	10/28/2005

EPA METHOD 8270C: SEMIVOLATILES Analyst: BL

Acenaphthene	ND	50		µg/L	1	10/26/2005
Acenaphthylene	ND	50		µg/L	1	10/26/2005
Aniline	ND	100		µg/L	1	10/26/2005
Anthracene	ND	50		µg/L	1	10/26/2005
Azobenzene	ND	50		µg/L	1	10/26/2005

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: *03-Nov-05*

IENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-04

Client Sample ID: BW-2-C
Collection Date: 10/19/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Benz(a)anthracene	ND	75		µg/L	1	10/26/2005
Benzo(a)pyrene	ND	75		µg/L	1	10/26/2005
Benzo(b)fluoranthene	ND	75		µg/L	1	10/26/2005
Benzo(g,h,i)perylene	ND	50		µg/L	1	10/26/2005
Benzo(k)fluoranthene	ND	50		µg/L	1	10/26/2005
Benzoic acid	ND	250		µg/L	1	10/26/2005
Benzyl alcohol	ND	100		µg/L	1	10/26/2005
Bis(2-chloroethoxy)methane	ND	50		µg/L	1	10/26/2005
Bis(2-chloroethyl)ether	ND	75		µg/L	1	10/26/2005
Bis(2-chloroisopropyl)ether	ND	75		µg/L	1	10/26/2005
Bis(2-ethylhexyl)phthalate	ND	75		µg/L	1	10/26/2005
4-Bromophenyl phenyl ether	ND	50		µg/L	1	10/26/2005
Butyl benzyl phthalate	ND	75		µg/L	1	10/26/2005
Carbazole	ND	50		µg/L	1	10/26/2005
4-Chloro-3-methylphenol	ND	100		µg/L	1	10/26/2005
4-Chloroaniline	ND	100		µg/L	1	10/26/2005
2-Chloronaphthalene	ND	50		µg/L	1	10/26/2005
-Chlorophenol	ND	50		µg/L	1	10/26/2005
-Chlorophenyl phenyl ether	ND	75		µg/L	1	10/26/2005
Chrysene	ND	75		µg/L	1	10/26/2005
Di-n-butyl phthalate	ND	50		µg/L	1	10/26/2005
Di-n-octyl phthalate	ND	75		µg/L	1	10/26/2005
Dibenz(a,h)anthracene	ND	50		µg/L	1	10/26/2005
Dibenzofuran	ND	50		µg/L	1	10/26/2005
1,2-Dichlorobenzene	ND	50		µg/L	1	10/26/2005
1,3-Dichlorobenzene	ND	50		µg/L	1	10/26/2005
1,4-Dichlorobenzene	ND	50		µg/L	1	10/26/2005
3,3'-Dichlorobenzidine	ND	75		µg/L	1	10/26/2005
Diethyl phthalate	ND	50		µg/L	1	10/26/2005
Dimethyl phthalate	ND	50		µg/L	1	10/26/2005
2,4-Dichlorophenol	ND	50		µg/L	1	10/26/2005
2,4-Dimethylphenol	ND	50		µg/L	1	10/26/2005
4,6-Dinitro-2-methylphenol	ND	250		µg/L	1	10/26/2005
2,4-Dinitrophenol	ND	250		µg/L	1	10/26/2005
2,4-Dinitrotoluene	ND	50		µg/L	1	10/26/2005
2,6-Dinitrotoluene	ND	50		µg/L	1	10/26/2005
Fluoranthene	ND	50		µg/L	1	10/26/2005
Fluorene	ND	50		µg/L	1	10/26/2005
Hexachlorobenzene	ND	50		µg/L	1	10/26/2005
Hexachlorobutadiene	ND	50		µg/L	1	10/26/2005
Hexachlorocyclopentadiene	ND	50		µg/L	1	10/26/2005
Hexachloroethane	ND	50		µg/L	1	10/26/2005

ualifiers:
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: *03-Nov-05*

LIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-04

Client Sample ID: BW-2-C
Collection Date: 10/19/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Indeno(1,2,3-cd)pyrene	ND	50		µg/L	1	10/26/2005
Isophorone	ND	50		µg/L	1	10/26/2005
2-Methylnaphthalene	ND	50		µg/L	1	10/26/2005
2-Methylphenol	ND	75		µg/L	1	10/26/2005
3+4-Methylphenol	ND	100		µg/L	1	10/26/2005
N-Nitrosodi-n-propylamine	ND	50		µg/L	1	10/26/2005
N-Nitrosodimethylamine	ND	50		µg/L	1	10/26/2005
N-Nitrosodiphenylamine	ND	50		µg/L	1	10/26/2005
Naphthalene	ND	50		µg/L	1	10/26/2005
2-Nitroaniline	ND	250		µg/L	1	10/26/2005
3-Nitroaniline	ND	250		µg/L	1	10/26/2005
4-Nitroaniline	ND	100		µg/L	1	10/26/2005
Nitrobenzene	ND	50		µg/L	1	10/26/2005
2-Nitrophenol	ND	75		µg/L	1	10/26/2005
4-Nitrophenol	ND	250		µg/L	1	10/26/2005
Pentachlorophenol	ND	250		µg/L	1	10/26/2005
Phenanthrene	ND	50		µg/L	1	10/26/2005
Phenol	ND	50		µg/L	1	10/26/2005
Pyrene	ND	75		µg/L	1	10/26/2005
Pyridine	ND	150		µg/L	1	10/26/2005
1,2,4-Trichlorobenzene	ND	50		µg/L	1	10/26/2005
2,4,5-Trichlorophenol	ND	50		µg/L	1	10/26/2005
2,4,6-Trichlorophenol	ND	75		µg/L	1	10/26/2005
Surr: 2,4,6-Tribromophenol	52.2	16.6-150		%REC	1	10/26/2005
Surr: 2-Fluorobiphenyl	46.6	19.6-134		%REC	1	10/26/2005
Surr: 2-Fluorophenol	55.8	9.54-113		%REC	1	10/26/2005
Surr: 4-Terphenyl-d14	75.0	22.7-145		%REC	1	10/26/2005
Surr: Nitrobenzene-d5	62.4	14.6-134		%REC	1	10/26/2005
Surr: Phenol-d6	30.0	10.7-80.3		%REC	1	10/26/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **TES**
Specific Conductance	1400	0.010		µmhos/cm	1	11/1/2005
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Calcium	140	10		mg/L	10	11/3/2005 12:55:59 PM
Magnesium	7.7	1.0		mg/L	1	10/27/2005 5:29:14 PM
Potassium	2.5	1.0		mg/L	1	10/27/2005 5:29:14 PM
Sodium	320	10		mg/L	10	10/28/2005 10:59:56 AM

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: *03-Nov-05*

IENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-05

Client Sample ID: BW-3-B
Collection Date: 10/20/2005 8:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	1.4	0.10		mg/L	1	10/22/2005
Chloride	34	0.10		mg/L	1	10/22/2005
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/22/2005
Nitrogen, Nitrate (As N)	ND	0.10		mg/L	1	10/22/2005
Phosphorus, Orthophosphate (As P)	1.0	0.50		mg/L	1	10/22/2005
Sulfate	56	0.50		mg/L	1	10/22/2005
EPA METHOD 8260B: VOLATILES						Analyst: **BDH**
Benzene	ND	1.0		µg/L	1	10/28/2005
Toluene	ND	1.0		µg/L	1	10/28/2005
Ethylbenzene	ND	1.0		µg/L	1	10/28/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/28/2005
Naphthalene	ND	2.0		µg/L	1	10/28/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
Acetone	ND	10		µg/L	1	10/28/2005
Bromobenzene	ND	1.0		µg/L	1	10/28/2005
Bromochloromethane	ND	1.0		µg/L	1	10/28/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/28/2005
Bromoform	ND	1.0		µg/L	1	10/28/2005
Bromomethane	ND	2.0		µg/L	1	10/28/2005
2-Butanone	ND	10		µg/L	1	10/28/2005
Carbon disulfide	ND	10		µg/L	1	10/28/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/28/2005
Chlorobenzene	ND	1.0		µg/L	1	10/28/2005
Chloroethane	ND	2.0		µg/L	1	10/28/2005
Chloroform	ND	1.0		µg/L	1	10/28/2005
Chloromethane	ND	1.0		µg/L	1	10/28/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/28/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/28/2005
Dibromomethane	ND	2.0		µg/L	1	10/28/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005

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: *03-Nov-05*

CLIENT: Giant Refining Co
Client Sample ID: BW-3-B
Lab Order: 0510204
Collection Date: 10/20/2005 8:00:00 AM
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-05
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/28/2005
2-Hexanone	ND	10		µg/L	1	10/28/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/28/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/28/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/28/2005
Methylene Chloride	ND	3.0		µg/L	1	10/28/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/28/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
Styrene	ND	1.0		µg/L	1	10/28/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/28/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/28/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/28/2005
Vinyl chloride	ND	1.0		µg/L	1	10/28/2005
Xylenes, Total	ND	1.0		µg/L	1	10/28/2005
Surr: 1,2-Dichloroethane-d4	96.7	69.9-130		%REC	1	10/28/2005
Surr: 4-Bromofluorobenzene	99.7	71.2-123		%REC	1	10/28/2005
Surr: Dibromofluoromethane	116	73.9-134		%REC	1	10/28/2005
Surr: Toluene-d8	97.8	81.9-122		%REC	1	10/28/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
Acenaphthene	ND	10		µg/L	1	10/26/2005
Acenaphthylene	ND	10		µg/L	1	10/26/2005
Aniline	ND	20		µg/L	1	10/26/2005
Anthracene	ND	10		µg/L	1	10/26/2005

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: *03-Nov-05*

CLIENT: Giant Refining Co
Client Sample ID: BW-3-B
Lab Order: 0510204
Collection Date: 10/20/2005 8:00:00 AM
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-05
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Azobenzene	ND	10		µg/L	1	10/26/2005
Benz(a)anthracene	ND	15		µg/L	1	10/26/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/26/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/26/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/26/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/26/2005
Benzoic acid	ND	50		µg/L	1	10/26/2005
Benzyl alcohol	ND	20		µg/L	1	10/26/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/26/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/26/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/26/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/26/2005
Carbazole	ND	10		µg/L	1	10/26/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/26/2005
4-Chloroaniline	ND	20		µg/L	1	10/26/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/26/2005
2-Chlorophenol	ND	10		µg/L	1	10/26/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/26/2005
Chrysene	ND	15		µg/L	1	10/26/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/26/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/26/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/26/2005
Dibenzofuran	ND	10		µg/L	1	10/26/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/26/2005
Diethyl phthalate	ND	10		µg/L	1	10/26/2005
Dimethyl phthalate	ND	10		µg/L	1	10/26/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/26/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/26/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
Fluoranthene	ND	10		µg/L	1	10/26/2005
Fluorene	ND	10		µg/L	1	10/26/2005
Hexachlorobenzene	ND	10		µg/L	1	10/26/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/26/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/26/2005

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: *03-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-05

Client Sample ID: BW-3-B
Collection Date: 10/20/2005 8:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Hexachloroethane	ND	10		µg/L	1	10/26/2005
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/26/2005
Isophorone	ND	10		µg/L	1	10/26/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/26/2005
2-Methylphenol	ND	15		µg/L	1	10/26/2005
3+4-Methylphenol	ND	20		µg/L	1	10/26/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/26/2005
Naphthalene	ND	10		µg/L	1	10/26/2005
2-Nitroaniline	ND	50		µg/L	1	10/26/2005
3-Nitroaniline	ND	50		µg/L	1	10/26/2005
4-Nitroaniline	ND	20		µg/L	1	10/26/2005
Nitrobenzene	ND	10		µg/L	1	10/26/2005
2-Nitrophenol	ND	15		µg/L	1	10/26/2005
4-Nitrophenol	ND	50		µg/L	1	10/26/2005
Pentachlorophenol	ND	50		µg/L	1	10/26/2005
Phenanthrene	ND	10		µg/L	1	10/26/2005
Phenol	ND	10		µg/L	1	10/26/2005
Pyrene	ND	15		µg/L	1	10/26/2005
Pyridine	ND	30		µg/L	1	10/26/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/26/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/26/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/26/2005
Surr: 2,4,6-Tribromophenol	59.8	16.6-150		%REC	1	10/26/2005
Surr: 2-Fluorobiphenyl	50.3	19.6-134		%REC	1	10/26/2005
Surr: 2-Fluorophenol	50.9	9.54-113		%REC	1	10/26/2005
Surr: 4-Terphenyl-d14	77.3	22.7-145		%REC	1	10/26/2005
Surr: Nitrobenzene-d5	63.6	14.6-134		%REC	1	10/26/2005
Surr: Phenol-d6	29.1	10.7-80.3		%REC	1	10/26/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **TES**
Specific Conductance	1600	0.010		µmhos/cm	1	11/1/2005
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Calcium	9.9	1.0		mg/L	1	10/27/2005 5:33:13 PM
Magnesium	2.9	1.0		mg/L	1	10/27/2005 5:33:13 PM
Potassium	1.4	1.0		mg/L	1	10/27/2005 5:33:13 PM
Sodium	370	10		mg/L	10	10/28/2005 11:02:39 AM

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: *03-Nov-05*

CLIENT: Giant Refining Co
Client Sample ID: BW-3-C
Lab Order: 0510204
Collection Date: 10/20/2005 9:45:00 AM
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-06
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	1.6	0.10		mg/L	1	10/22/2005
Chloride	37	0.10		mg/L	1	10/22/2005
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/22/2005
Nitrogen, Nitrate (As N)	ND	0.10		mg/L	1	10/22/2005
Phosphorus, Orthophosphate (As P)	ND	0.50		mg/L	1	10/22/2005
Sulfate	350	5.0		mg/L	10	11/1/2005
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/28/2005
Toluene	ND	1.0		µg/L	1	10/28/2005
Ethylbenzene	ND	1.0		µg/L	1	10/28/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/28/2005
Naphthalene	ND	2.0		µg/L	1	10/28/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
Acetone	ND	10		µg/L	1	10/28/2005
Bromobenzene	ND	1.0		µg/L	1	10/28/2005
Bromochloromethane	ND	1.0		µg/L	1	10/28/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/28/2005
Bromoform	ND	1.0		µg/L	1	10/28/2005
Bromomethane	ND	2.0		µg/L	1	10/28/2005
2-Butanone	ND	10		µg/L	1	10/28/2005
Carbon disulfide	ND	10		µg/L	1	10/28/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/28/2005
Chlorobenzene	ND	1.0		µg/L	1	10/28/2005
Chloroethane	ND	2.0		µg/L	1	10/28/2005
Chloroform	ND	1.0		µg/L	1	10/28/2005
Chloromethane	ND	1.0		µg/L	1	10/28/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/28/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/28/2005
Dibromomethane	ND	2.0		µg/L	1	10/28/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005

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: *03-Nov-05*

CLIENT: Giant Refining Co
Client Sample ID: BW-3-C
Lab Order: 0510204
Collection Date: 10/20/2005 9:45:00 AM
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-06
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/28/2005
2-Hexanone	ND	10		µg/L	1	10/28/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/28/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/28/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/28/2005
Methylene Chloride	ND	3.0		µg/L	1	10/28/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/28/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
Styrene	ND	1.0		µg/L	1	10/28/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/28/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/28/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/28/2005
Vinyl chloride	ND	1.0		µg/L	1	10/28/2005
Xylenes, Total	ND	1.0		µg/L	1	10/28/2005
Surr: 1,2-Dichloroethane-d4	103	69.9-130		%REC	1	10/28/2005
Surr: 4-Bromofluorobenzene	105	71.2-123		%REC	1	10/28/2005
Surr: Dibromofluoromethane	102	73.9-134		%REC	1	10/28/2005
Surr: Toluene-d8	98.0	81.9-122		%REC	1	10/28/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
Acenaphthene	ND	10		µg/L	1	10/26/2005
Acenaphthylene	ND	10		µg/L	1	10/26/2005
Aniline	ND	20		µg/L	1	10/26/2005
Anthracene	ND	10		µg/L	1	10/26/2005

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: *03-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-06

Client Sample ID: BW-3-C
Collection Date: 10/20/2005 9:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Azobenzene	ND	10		µg/L	1	10/26/2005
Benz(a)anthracene	ND	15		µg/L	1	10/26/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/26/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/26/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/26/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/26/2005
Benzoic acid	ND	50		µg/L	1	10/26/2005
Benzyl alcohol	ND	20		µg/L	1	10/26/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/26/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	10/26/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/26/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/26/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/26/2005
Carbazole	ND	10		µg/L	1	10/26/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/26/2005
4-Chloroaniline	ND	20		µg/L	1	10/26/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/26/2005
2-Chlorophenol	ND	10		µg/L	1	10/26/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/26/2005
Chrysene	ND	15		µg/L	1	10/26/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/26/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/26/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/26/2005
Dibenzofuran	ND	10		µg/L	1	10/26/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/26/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/26/2005
Diethyl phthalate	ND	10		µg/L	1	10/26/2005
Dimethyl phthalate	ND	10		µg/L	1	10/26/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/26/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/26/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/26/2005
2,4-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/26/2005
Fluoranthene	ND	10		µg/L	1	10/26/2005
Fluorene	ND	10		µg/L	1	10/26/2005
Hexachlorobenzene	ND	10		µg/L	1	10/26/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/26/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/26/2005

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: *03-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-06

Client Sample ID: BW-3-C
Collection Date: 10/20/2005 9:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Hexachloroethane	ND	10		µg/L	1	10/26/2005
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/26/2005
Isophorone	ND	10		µg/L	1	10/26/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/26/2005
2-Methylphenol	ND	15		µg/L	1	10/26/2005
3+4-Methylphenol	ND	20		µg/L	1	10/26/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/26/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/26/2005
Naphthalene	ND	10		µg/L	1	10/26/2005
2-Nitroaniline	ND	50		µg/L	1	10/26/2005
3-Nitroaniline	ND	50		µg/L	1	10/26/2005
4-Nitroaniline	ND	20		µg/L	1	10/26/2005
Nitrobenzene	ND	10		µg/L	1	10/26/2005
2-Nitrophenol	ND	15		µg/L	1	10/26/2005
4-Nitrophenol	ND	50		µg/L	1	10/26/2005
Pentachlorophenol	ND	50		µg/L	1	10/26/2005
Phenanthrene	ND	10		µg/L	1	10/26/2005
Phenol	ND	10		µg/L	1	10/26/2005
Pyrene	ND	15		µg/L	1	10/26/2005
Pyridine	ND	30		µg/L	1	10/26/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/26/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/26/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/26/2005
Surr: 2,4,6-Tribromophenol	56.6	16.6-150		%REC	1	10/26/2005
Surr: 2-Fluorobiphenyl	44.8	19.6-134		%REC	1	10/26/2005
Surr: 2-Fluorophenol	43.6	9.54-113		%REC	1	10/26/2005
Surr: 4-Terphenyl-d14	71.5	22.7-145		%REC	1	10/26/2005
Surr: Nitrobenzene-d5	54.6	14.6-134		%REC	1	10/26/2005
Surr: Phenol-d6	22.3	10.7-80.3		%REC	1	10/26/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **TES**
Specific Conductance	1500	0.010		µmhos/cm	1	11/1/2005
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Calcium	6.1	1.0		mg/L	1	10/27/2005 5:37:28 PM
Magnesium	1.1	1.0		mg/L	1	10/27/2005 5:37:28 PM
Potassium	1.8	1.0		mg/L	1	10/27/2005 5:37:28 PM
Sodium	290	10		mg/L	10	10/28/2005 11:05:24 AM

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: *03-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-07

Client Sample ID: Trip Blank
Collection Date:
Matrix: TRIP BLANK

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/28/2005
Toluene	ND	1.0		µg/L	1	10/28/2005
Ethylbenzene	ND	1.0		µg/L	1	10/28/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/28/2005
Naphthalene	ND	2.0		µg/L	1	10/28/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/28/2005
Acetone	ND	10		µg/L	1	10/28/2005
Bromobenzene	ND	1.0		µg/L	1	10/28/2005
Bromochloromethane	ND	1.0		µg/L	1	10/28/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/28/2005
Bromoform	ND	1.0		µg/L	1	10/28/2005
Bromomethane	ND	2.0		µg/L	1	10/28/2005
2-Butanone	ND	10		µg/L	1	10/28/2005
Carbon disulfide	ND	10		µg/L	1	10/28/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/28/2005
Chlorobenzene	ND	1.0		µg/L	1	10/28/2005
Chloroethane	ND	2.0		µg/L	1	10/28/2005
Chloroform	ND	1.0		µg/L	1	10/28/2005
Chloromethane	ND	1.0		µg/L	1	10/28/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/28/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/28/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/28/2005
Dibromomethane	ND	2.0		µg/L	1	10/28/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/28/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/28/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/28/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/28/2005

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: *03-Nov-05*

JIENT: Giant Refining Co
Client Sample ID: Trip Blank
Lab Order: 0510204
Collection Date:
Project: Ciniza Annual Groundwater Samples 2005
Lab ID: 0510204-07
Matrix: TRIP BLANK

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Hexachlorobutadiene	ND	1.0		µg/L	1	10/28/2005
2-Hexanone	ND	10		µg/L	1	10/28/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/28/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/28/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/28/2005
Methylene Chloride	ND	3.0		µg/L	1	10/28/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/28/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
Styrene	ND	1.0		µg/L	1	10/28/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/28/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/28/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/28/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/28/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/28/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/28/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/28/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/28/2005
Vinyl chloride	ND	1.0		µg/L	1	10/28/2005
Xylenes, Total	ND	1.0		µg/L	1	10/28/2005
Surr: 1,2-Dichloroethane-d4	102	69.9-130		%REC	1	10/28/2005
Surr: 4-Bromofluorobenzene	102	71.2-123		%REC	1	10/28/2005
Surr: Dibromofluoromethane	102	73.9-134		%REC	1	10/28/2005
Surr: Toluene-d8	99.3	81.9-122		%REC	1	10/28/2005

ualifiers:
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: 03-Nov-05

CLIENT: Giant Refining Co
Work Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID **MBLK** Batch ID: **R17038** Test Code: **E300** Units: **mg/L** Analysis Date **10/21/2005** Prep Date
Client ID: Run ID: **WC_051021D** SeqNo: **413479**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1									
Chloride	ND	0.1									
Nitrogen, Nitrite (As N)	ND	0.1									
Nitrogen, Nitrate (As N)	ND	0.1									
Phosphorus, Orthophosphate (As P)	ND	0.5									
Sulfate	ND	0.5									
Nitrate (As N)+Nitrite (As N)	ND	0.1									

Sample ID **MBLK** Batch ID: **R17140** Test Code: **E300** Units: **mg/L** Analysis Date **10/31/2005** Prep Date
Client ID: Run ID: **LC_051031A** SeqNo: **417317**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1									
Chloride	ND	0.1									
Nitrogen, Nitrite (As N)	ND	0.1									
Nitrogen, Nitrate (As N)	ND	0.1									
Phosphorus, Orthophosphate (As P)	ND	0.5									
Sulfate	ND	0.5									
Nitrate (As N)+Nitrite (As N)	ND	0.1									

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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT
Method Blank

Sample ID **MB-9023** Batch ID: **9023** Test Code: **SW8270C** Units: **µg/L** Analysis Date **10/26/2005** Prep Date **10/24/2005**
Client ID: Run ID: **ELMO_051026A** SeqNo: **415322**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	10									
Acenaphthylene	ND	10									
Aniline	ND	20									
Anthracene	ND	10									
Azobenzene	ND	10									
Benz(a)anthracene	ND	15									
Benzo(a)pyrene	ND	15									
Benzo(b)fluoranthene	ND	15									
Benzo(g,h,i)perylene	ND	10									
Benzo(k)fluoranthene	ND	10									
Benzoic acid	ND	50									
Benzyl alcohol	ND	20									
Bis(2-chloroethoxy)methane	ND	10									
Bis(2-chloroethyl)ether	ND	15									
Bis(2-chloroisopropyl)ether	ND	15									
Bis(2-ethylhexyl)phthalate	ND	15									
4-Bromophenyl phenyl ether	ND	10									
Butyl benzyl phthalate	ND	15									
Carbazole	ND	10									
4-Chloro-3-methylphenol	ND	20									
4-Chloroaniline	ND	20									
2-Chloronaphthalene	ND	10									
2-Chlorophenol	ND	10									
4-Chlorophenyl phenyl ether	ND	15									
Chrysene	ND	15									
Di-n-butyl phthalate	ND	10									
Di-n-octyl phthalate	ND	15									
Dibenz(a,h)anthracene	ND	10									

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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Method Blank

Dibenzofuran	ND	10
1,2-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
3,3'-Dichlorobenzidine	ND	15
Diethyl phthalate	ND	10
Dimethyl phthalate	ND	10
2,4-Dichlorophenol	ND	10
2,4-Dimethylphenol	ND	10
4,6-Dinitro-2-methylphenol	ND	50
2,4-Dinitrophenol	ND	50
2,4-Dinitrotoluene	ND	10
2,6-Dinitrotoluene	ND	10
Fluoranthene	ND	10
Fluorene	ND	10
Hexachlorobenzene	ND	10
Hexachlorobutadiene	ND	10
Hexachlorocyclopentadiene	ND	10
Hexachloroethane	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Isophorone	ND	10
2-Methylnaphthalene	ND	10
2-Methylphenol	ND	15
3+4-Methylphenol	ND	20
N-Nitrosodi-n-propylamine	ND	10
N-Nitrosodimethylamine	ND	10
N-Nitrosodiphenylamine	ND	10
Naphthalene	ND	10
2-Nitroaniline	ND	50
3-Nitroaniline	ND	50
4-Nitroaniline	ND	20
Nitrobenzene	ND	10
2-Nitrophenol	ND	15

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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Method Blank

4-Nitrophenol	ND	50						
Pentachlorophenol	ND	50						
Phenanthrene	ND	10						
Phenol	ND	10						
Pyrene	ND	15						
Pyridine	ND	30						
1,2,4-Trichlorobenzene	ND	10						
2,4,5-Trichlorophenol	ND	10						
2,4,6-Trichlorophenol	ND	15						
Surr: 2,4,6-Tribromophenol	102.9	0	200	0	51.4	16.6	150	0
Surr: 2-Fluorobiphenyl	44.64	0	100	0	44.6	19.6	134	0
Surr: 2-Fluorophenol	104.7	0	200	0	52.3	9.54	113	0
Surr: 4-Terphenyl-d14	83.74	0	100	0	83.7	22.7	145	0
Surr: Nitrobenzene-d5	58.22	0	100	0	58.2	14.6	134	0
Surr: Phenol-d6	62.2	0	200	0	31.1	10.7	80.3	0

Sample ID **MB-9044** Batch ID: **9044** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/27/2005 4:15:57 PM** Prep Date **10/25/2005**

Client ID: Run ID: **ICP_051027A** SeqNo: **415916**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	1									
Magnesium	ND	1									
Potassium	0.1242	1									J
Sodium	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

Hall Environmental Analysis Laboratory

Date: *03-Nov-05*

CLIENT: Giant Refining Co
Work Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID **rb 5ml** Batch ID: **R17105** Test Code: **SW8260B** Units: **µg/L** Analysis Date **10/27/2005** Prep Date

Client ID: Run ID: **THOR_051027A** SeqNo: **415606**

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	0.782	4									J
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	2									
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
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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

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	9.724	0	10	0	97.2	69.9	130	0	
Surr: 4-Bromofluorobenzene	9.816	0	10	0	98.2	71.2	123	0	
Surr: Dibromofluoromethane	16.21	0	10	0	162	73.9	134	0	S
Surr: Toluene-d8	10.01	0	10	0	100	81.9	122	0	

34/42

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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT
Method Blank

Sample ID **5ml rb** Batch ID: **R17125** Test Code: **SW8260B** Units: **µg/L** Analysis Date **10/28/2005** Prep Date
Client ID: Run ID: **VAL_051028A** SeqNo: **416323**

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	2									
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									
cis-1,3-Dichloropropene	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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Method Blank

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
1,1,2-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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Method Blank

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	10.74	0	10	0	107	69.9	130	0
Surr: 4-Bromofluorobenzene	10.14	0	10	0	101	71.2	123	0
Surr: Dibromofluoromethane	10.47	0	10	0	105	73.9	134	0
Surr: Toluene-d8	9.73	0	10	0	97.3	81.9	122	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

Hall Environmental Analysis Laboratory

Date: 03-Nov-05

CLIENT: Giant Refining Co
Work Order: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **LCS-ST300-05022** Batch ID: **R17038** Test Code: **E300** Units: **mg/L** Analysis Date **10/21/2005** Prep Date

Client ID: Run ID: **WC_051021D** SeqNo: **413480**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.4799	0.1	0.5	0	96.0	90	110	0			
Chloride	4.71	0.1	5	0	94.2	90	110	0			
Nitrogen, Nitrite (As N)	0.9544	0.1	1	0	95.4	90	110	0			
Nitrogen, Nitrate (As N)	2.379	0.1	2.5	0	95.2	90	110	0			
Phosphorus, Orthophosphate (As P)	4.757	0.5	5	0	95.1	90	110	0			
Sulfate	9.504	0.5	10	0	95.0	90	110	0			
Nitrate (As N)+Nitrite (As N)	3.333	0.1	3.5	0	95.2	90	110	0			

Sample ID **LCS-ST300-05022** Batch ID: **R17140** Test Code: **E300** Units: **mg/L** Analysis Date **10/31/2005** Prep Date

Client ID: Run ID: **LC_051031A** SeqNo: **417318**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.5114	0.1	0.5	0	102	90	110	0			
Chloride	4.69	0.1	5	0	93.8	90	110	0			
Nitrogen, Nitrite (As N)	0.9663	0.1	1	0	96.6	90	110	0			
Nitrogen, Nitrate (As N)	2.4	0.1	2.5	0	96.0	90	110	0			
Phosphorus, Orthophosphate (As P)	4.786	0.5	5	0	95.7	90	110	0			
Sulfate	9.59	0.5	10	0	95.9	90	110	0			
Nitrate (As N)+Nitrite (As N)	3.366	0.1	3.5	0	96.2	90	110	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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **icv** | Batch ID: **R17105** | Test Code: **SW8260B** | Units: **µg/L** | Analysis Date **10/27/2005** | Prep Date
Client ID: | Run ID: **THOR_051027A** | SeqNo: **415607**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19.82	1	20	0	99.1	79.3	136	0			
Toluene	18.53	1	20	0	92.6	65.5	123	0			
Chlorobenzene	18.4	1	20	0	92.0	85.6	126	0			
1,1-Dichloroethene	17.12	1	20	0	85.6	72.7	135	0			
Trichloroethene (TCE)	17.38	1	20	0	86.9	85.6	119	0			

Sample ID **100ng lcs** | Batch ID: **R17125** | Test Code: **SW8260B** | Units: **µg/L** | Analysis Date **10/28/2005** | Prep Date
Client ID: | Run ID: **VAL_051028A** | SeqNo: **416326**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	21.19	1	20	0	106	79.3	136	0			
Toluene	17.45	1	20	0	87.2	65.5	123	0			
Chlorobenzene	19.78	1	20	0	98.9	85.6	126	0			
1,1-Dichloroethene	22.34	1	20	0	112	72.7	135	0			
Trichloroethene (TCE)	19.61	1	20	0	98.1	85.6	119	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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **LCS-9023** Batch ID: **9023** Test Code: **SW8270C** Units: **µg/L** Analysis Date **10/26/2005** Prep Date **10/24/2005**
Client ID: Run ID: **ELMO_051026A** SeqNo: **415323**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	65.38	10	100	0	65.4	11	123	0			
4-Chloro-3-methylphenol	110.3	20	200	0	55.2	15.4	119	0			
2-Chlorophenol	136.2	10	200	0	68.1	12.2	122	0			
1,4-Dichlorobenzene	61.5	10	100	0	61.5	16.9	100	0			
2,4-Dinitrotoluene	52.16	10	100	0	52.2	13	138	0			
N-Nitrosodi-n-propylamine	57.72	10	100	0	57.7	9.93	122	0			
4-Nitrophenol	75.6	50	200	0	37.8	-20.5	87.4	0			
Pentachlorophenol	101.2	50	200	0	50.6	-0.355	114	0			
Phenol	73.7	10	200	0	36.9	7.53	73.1	0			
Pyrene	71.3	15	100	0	71.3	12.6	140	0			
1,2,4-Trichlorobenzene	52.4	10	100	0	52.4	17.4	98.7	0			

Sample ID **LCSD-9023** Batch ID: **9023** Test Code: **SW8270C** Units: **µg/L** Analysis Date **10/26/2005** Prep Date **10/24/2005**
Client ID: Run ID: **ELMO_051026A** SeqNo: **415324**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	64.36	10	100	0	64.4	11	123	65.38	1.57	30.5	
4-Chloro-3-methylphenol	104.6	20	200	0	52.3	15.4	119	110.3	5.29	28.6	
2-Chlorophenol	130.8	10	200	0	65.4	12.2	122	136.2	4.03	107	
1,4-Dichlorobenzene	60.42	10	100	0	60.4	16.9	100	61.5	1.77	62.1	
2,4-Dinitrotoluene	48.3	10	100	0	48.3	13	138	52.16	7.68	14.7	
N-Nitrosodi-n-propylamine	55.78	10	100	0	55.8	9.93	122	57.72	3.42	30.3	
4-Nitrophenol	77.7	50	200	0	38.9	12.5	87.4	75.6	2.74	36.3	
Pentachlorophenol	99.8	50	200	0	49.9	3.55	114	101.2	1.43	49	
Phenol	70.58	10	200	0	35.3	7.53	73.1	73.7	4.32	52.4	
Pyrene	71.12	15	100	0	71.1	12.6	140	71.3	0.253	16.3	
1,2,4-Trichlorobenzene	53.3	10	100	0	53.3	17.4	98.7	52.4	1.70	36.4	

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: 0510204
Project: Ciniza Annual Groundwater Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **LCS-9044** Batch ID: **9044** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/27/2005 4:19:14 PM** Prep Date **10/25/2005**
Client ID: Run ID: **ICP_051027A** SeqNo: **415917**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	49.18	1	50	0	98.4	80	120	0			
Magnesium	48.8	1	50	0	97.6	80	120	0			
Potassium	50.1	1	50	0.1242	100	80	120	0			
Sodium	52.32	1	50	0	105	80	120	0			

Sample ID **LCSD-9044** Batch ID: **9044** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/27/2005 4:21:36 PM** Prep Date **10/25/2005**
Client ID: Run ID: **ICP_051027A** SeqNo: **415918**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	49.58	1	50	0	99.2	80	120	49.18	0.823	20	
Magnesium	49	1	50	0	98.0	80	120	48.8	0.406	20	
Potassium	50.1	1	50	0.1242	100	80	120	50.1	0.00219	20	
Sodium	52.9	1	50	0	106	80	120	52.32	1.10	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

Sample Receipt Checklist

Client name GIANTREFIN

Date and Time Received: 10/20/2005

Work Order Number 0510204

Received by AT

Checklist completed by Signature Date 10/20/05

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 ☐		
Was VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐	
Was pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐	

Container/Temp Blank temperature? 3° *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

QA / QC Pac
Std ☐ Leve
Other:

HALL ENVIRONME
ANALYSIS LABOR Y
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: Rte 3 Box 7 Gallup, NM 87301
Phone #: 505 722 3833
Fax #: 505 722 0210

Project Name: Ciniza Annual Groundwater Sample 2005
Project #:
Project Manager: Steve Morris
Sampler: Steve Morris
Sample Temperature: 3

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative HgCl2	Preservative HNO3		HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	Gen Chem			Air Bubbles or Headspace (Y or N)
10/13/05	1400	H_2O	BW-1-C					0510204-1											X	X	X			
10/13/05	1530	"	BW-2-A					-2											X	X	X			
10/13/05	1110	"	BW-2-B					-3											X	X	X			
10/13/05	1045	"	BW-2-C					-4											X	X	X			
10/20/05	0800	"	BW-3-B					-5											X	X	X			
10/20/05	0945	"	BW-3-C					-6											X	X	X			
			Trip blank	2 VOA				-7																

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
10/20/05	1615	Steve Morris	10/20/05 1615
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks: Gen Chem = Cations, Anions, & Conductivity

Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Project: Ciniza Annual GW Samples 2005
Lab Order: 0510131

CASE NARRATIVE

Analytical Comments for METHOD 8270_W, SAMPLE 0510131-04B: Sample was originally shot with non-detect results and low acid surrogates recovered. Sample was re-extracted out of hold time and reanalyzed. The recovery for the acid surrogates were acceptable and all analytes were still non-detect.

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

October 18, 2005

Steve Morris
Giant Refining Co
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0258
FAX (505) 722-0210

RE: Ciniza Annual GW Samples 2005 Order No.: 0509323

Dear Steve Morris:

Hall Environmental Analysis Laboratory received 7 samples on 9/30/2005 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

4901 Hawkins NE ▪ Suite D ▪ Albuquerque, NM 87109
505.345.3975 ▪ Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory

Date: *18-Oct-05*

CLIENT: Giant Refining Co
Lab Order: 0509323
Project: Ciniza Annual GW Samples 2005
Lab ID: 0509323-01

Client Sample ID: OW-12
Collection Date: 9/27/2005 8:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	2.5		µg/L	1	9/30/2005 10:10:10 PM
Benzene	ND	0.50		µg/L	1	9/30/2005 10:10:10 PM
Toluene	ND	0.50		µg/L	1	9/30/2005 10:10:10 PM
Ethylbenzene	ND	0.50		µg/L	1	9/30/2005 10:10:10 PM
Xylenes, Total	ND	0.50		µg/L	1	9/30/2005 10:10:10 PM
Surr: 4-Bromofluorobenzene	97.0	82.2-119		%REC	1	9/30/2005 10:10:10 PM

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: *18-Oct-05*

CLIENT: Giant Refining Co
Lab Order: 0509323
Project: Ciniza Annual GW Samples 2005
Lab ID: 0509323-02

Client Sample ID: OW-13
Collection Date: 9/27/2005 10:30:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	2.5		µg/L	1	9/30/2005 10:40:58 PM
Benzene	ND	0.50		µg/L	1	9/30/2005 10:40:58 PM
Toluene	ND	0.50		µg/L	1	9/30/2005 10:40:58 PM
Ethylbenzene	ND	0.50		µg/L	1	9/30/2005 10:40:58 PM
Xylenes, Total	ND	0.50		µg/L	1	9/30/2005 10:40:58 PM
Surr: 4-Bromofluorobenzene	95.4	82.2-119		%REC	1	9/30/2005 10:40:58 PM

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: *18-Oct-05*

CLIENT:	Giant Refining Co	**Client Sample ID:**	OW-14
Lab Order:	0509323	**Collection Date:**	9/29/2005 2:00:00 PM
Project:	Ciniza Annual GW Samples 2005		
Lab ID:	0509323-03	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Methyl tert-butyl ether (MTBE)	77	2.5		µg/L	1	10/3/2005 12:55:48 PM
Benzene	17	0.50		µg/L	1	10/3/2005 12:55:48 PM
Toluene	2.2	0.50		µg/L	1	10/3/2005 12:55:48 PM
Ethylbenzene	2.3	0.50		µg/L	1	10/3/2005 12:55:48 PM
Xylenes, Total	1.4	0.50		µg/L	1	10/3/2005 12:55:48 PM
Surr: 4-Bromofluorobenzene	110	82.2-119		%REC	1	10/3/2005 12:55:48 PM

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: *18-Oct-05*

LIENT:	Giant Refining Co	**Client Sample ID:**	OW-29
ab Order:	0509323	**Collection Date:**	9/28/2005 12:30:00 PM
Project:	Ciniza Annual GW Samples 2005		
Lab ID:	0509323-04	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	2.5		µg/L	1	10/1/2005 12:43:01 AM
Benzene	ND	0.50		µg/L	1	10/1/2005 12:43:01 AM
Toluene	ND	0.50		µg/L	1	10/1/2005 12:43:01 AM
Ethylbenzene	ND	0.50		µg/L	1	10/1/2005 12:43:01 AM
Xylenes, Total	ND	0.50		µg/L	1	10/1/2005 12:43:01 AM
Surr: 4-Bromofluorobenzene	96.1	82.2-119		%REC	1	10/1/2005 12:43:01 AM

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: *18-Oct-05*

CLIENT:	Giant Refining Co	Client Sample ID:	OW-30
Lab Order:	0509323	Collection Date:	9/29/2005 8:45:00 AM
Project:	Ciniza Annual GW Samples 2005		
Lab ID:	0509323-05	Matrix:	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	2.5		µg/L	1	10/1/2005 1:13:44 AM
Benzene	ND	0.50		µg/L	1	10/1/2005 1:13:44 AM
Toluene	ND	0.50		µg/L	1	10/1/2005 1:13:44 AM
Ethylbenzene	ND	0.50		µg/L	1	10/1/2005 1:13:44 AM
Xylenes, Total	ND	0.50		µg/L	1	10/1/2005 1:13:44 AM
Surr: 4-Bromofluorobenzene	94.9	82.2-119		%REC	1	10/1/2005 1:13:44 AM

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: *18-Oct-05*

LIENT: Giant Refining Co
Lab Order: 0509323
Project: Ciniza Annual GW Samples 2005
Lab ID: 0509323-06

Client Sample ID: OW-11
Collection Date: 9/29/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	2.3	0.10		mg/L	1	9/30/2005
Chloride	87	1.0		mg/L	10	10/11/2005
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	9/30/2005
Nitrogen, Nitrate (As N)	0.72	0.10		mg/L	1	9/30/2005
Phosphorus, Orthophosphate (As P)	ND	0.50		mg/L	1	9/30/2005
Sulfate	990	10		mg/L	20	10/12/2005
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/4/2005
Toluene	ND	1.0		µg/L	1	10/4/2005
Ethylbenzene	ND	1.0		µg/L	1	10/4/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/4/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/4/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/4/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/4/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/4/2005
Naphthalene	ND	2.0		µg/L	1	10/4/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/4/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/4/2005
Acetone	ND	10		µg/L	1	10/4/2005
Bromobenzene	ND	1.0		µg/L	1	10/4/2005
Bromochloromethane	ND	1.0		µg/L	1	10/4/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/4/2005
Bromoform	ND	1.0		µg/L	1	10/4/2005
Bromomethane	ND	2.0		µg/L	1	10/4/2005
2-Butanone	ND	10		µg/L	1	10/4/2005
Carbon disulfide	ND	10		µg/L	1	10/4/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/4/2005
Chlorobenzene	ND	1.0		µg/L	1	10/4/2005
Chloroethane	ND	2.0		µg/L	1	10/4/2005
Chloroform	ND	1.0		µg/L	1	10/4/2005
Chloromethane	ND	1.0		µg/L	1	10/4/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/4/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/4/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/4/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/4/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/4/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/4/2005
Dibromomethane	ND	2.0		µg/L	1	10/4/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/4/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/4/2005

Qualifiers:
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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: *18-Oct-05*

LIENT: Giant Refining Co
ab Order: 0509323
Project: Ciniza Annual GW Samples 2005
Lab ID: 0509323-06

Client Sample ID: OW-11
Collection Date: 9/29/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/4/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/4/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/4/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/4/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/4/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/4/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/4/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/4/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/4/2005
2-Hexanone	ND	10		µg/L	1	10/4/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/4/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/4/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/4/2005
Methylene Chloride	ND	3.0		µg/L	1	10/4/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/4/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/4/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/4/2005
Styrene	ND	1.0		µg/L	1	10/4/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/4/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/4/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/4/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/4/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/4/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/4/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/4/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/4/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/4/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/4/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/4/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/4/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/4/2005
Vinyl chloride	ND	1.0		µg/L	1	10/4/2005
Xylenes, Total	ND	1.0		µg/L	1	10/4/2005
Surr: 1,2-Dichloroethane-d4	103	69.9-130		%REC	1	10/4/2005
Surr: 4-Bromofluorobenzene	107	71.2-123		%REC	1	10/4/2005
Surr: Dibromofluoromethane	102	73.9-134		%REC	1	10/4/2005
Surr: Toluene-d8	96.9	81.9-122		%REC	1	10/4/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: BL
Acenaphthene	ND	10		µg/L	1	10/12/2005
Acenaphthylene	ND	10		µg/L	1	10/12/2005
Aniline	ND	20		µg/L	1	10/12/2005
Anthracene	ND	10		µg/L	1	10/12/2005

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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *18-Oct-05*

CLIENT: Giant Refining Co
Lab Order: 0509323
Project: Ciniza Annual GW Samples 2005
Lab ID: 0509323-06

Client Sample ID: OW-11
Collection Date: 9/29/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Azobenzene	ND	10		µg/L	1	10/12/2005
Benz(a)anthracene	ND	15		µg/L	1	10/12/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/12/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/12/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/12/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/12/2005
Benzoic acid	ND	50		µg/L	1	10/12/2005
Benzyl alcohol	ND	20		µg/L	1	10/12/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/12/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/12/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	10/12/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/12/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/12/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/12/2005
Carbazole	ND	10		µg/L	1	10/12/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/12/2005
4-Chloroaniline	ND	20		µg/L	1	10/12/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/12/2005
2-Chlorophenol	ND	10		µg/L	1	10/12/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/12/2005
Chrysene	ND	15		µg/L	1	10/12/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/12/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/12/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/12/2005
Dibenzofuran	ND	10		µg/L	1	10/12/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/12/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/12/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/12/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/12/2005
Diethyl phthalate	ND	10		µg/L	1	10/12/2005
Dimethyl phthalate	ND	10		µg/L	1	10/12/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/12/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/12/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/12/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/12/2005
2,4-Dinitrotoluene	ND	10		µg/L	1	10/12/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/12/2005
Fluoranthene	ND	10		µg/L	1	10/12/2005
Fluorene	ND	10		µg/L	1	10/12/2005
Hexachlorobenzene	ND	10		µg/L	1	10/12/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/12/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/12/2005

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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *18-Oct-05*

.IENT: Giant Refining Co
.b Order: 0509323
Project: Ciniza Annual GW Samples 2005
Lab ID: 0509323-06

Client Sample ID: OW-11
Collection Date: 9/29/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Hexachloroethane	ND	10		µg/L	1	10/12/2005
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/12/2005
Isophorone	ND	10		µg/L	1	10/12/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/12/2005
2-Methylphenol	ND	15		µg/L	1	10/12/2005
3+4-Methylphenol	ND	20		µg/L	1	10/12/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/12/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/12/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/12/2005
Naphthalene	ND	10		µg/L	1	10/12/2005
2-Nitroaniline	ND	50		µg/L	1	10/12/2005
3-Nitroaniline	ND	50		µg/L	1	10/12/2005
4-Nitroaniline	ND	20		µg/L	1	10/12/2005
Nitrobenzene	ND	10		µg/L	1	10/12/2005
2-Nitrophenol	ND	15		µg/L	1	10/12/2005
4-Nitrophenol	ND	50		µg/L	1	10/12/2005
Pentachlorophenol	ND	50		µg/L	1	10/12/2005
Phenanthrene	ND	10		µg/L	1	10/12/2005
Phenol	ND	10		µg/L	1	10/12/2005
Pyrene	ND	15		µg/L	1	10/12/2005
Pyridine	ND	30		µg/L	1	10/12/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/12/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/12/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/12/2005
Surr: 2,4,6-Tribromophenol	74.5	16.6-150		%REC	1	10/12/2005
Surr: 2-Fluorobiphenyl	58.0	19.6-134		%REC	1	10/12/2005
Surr: 2-Fluorophenol	45.3	9.54-113		%REC	1	10/12/2005
Surr: 4-Terphenyl-d14	52.8	22.7-145		%REC	1	10/12/2005
Surr: Nitrobenzene-d5	62.8	14.6-134		%REC	1	10/12/2005
Surr: Phenol-d6	32.3	10.7-80.3		%REC	1	10/12/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: CMC
Specific Conductance	2800	0.010		µmhos/cm	1	10/17/2005
EPA METHOD 7470: MERCURY						Analyst: IC
Mercury	0.00039	0.00020		mg/L	1	10/6/2005
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: NMO
Arsenic	ND	0.020		mg/L	1	10/6/2005 11:39:05 AM
Barium	ND	0.020		mg/L	1	10/6/2005 11:39:05 AM
Cadmium	ND	0.0020		mg/L	1	10/6/2005 11:39:05 AM
Calcium	10	1.0		mg/L	1	10/6/2005 3:00:59 PM
Chromium	ND	0.0060		mg/L	1	10/6/2005 11:39:05 AM
Lead	ND	0.0050		mg/L	1	10/6/2005 11:39:05 AM

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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *18-Oct-05*

.IENT:	Giant Refining Co	Client Sample ID:	OW-11
b Order:	0509323	Collection Date:	9/29/2005 10:45:00 AM
Project:	Ciniza Annual GW Samples 2005		
Lab ID:	0509323-06	Matrix:	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Magnesium	1.2	1.0		mg/L	1	10/6/2005 3:00:59 PM
Potassium	1.7	1.0		mg/L	1	10/6/2005 3:00:59 PM
Selenium	ND	0.050		mg/L	1	10/6/2005 11:39:05 AM
Silver	ND	0.0050		mg/L	1	10/6/2005 11:39:05 AM
Sodium	620	10		mg/L	10	10/6/2005 4:03:15 PM
EPA METHOD 150.1: PH						Analyst: CKL
pH	8.44	0.010		pH units	1	9/30/2005

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

Hall Environmental Analysis Laboratory

Date: *18-Oct-05*

LIENT:	Giant Refining Co	Client Sample ID:	Trip Blank
b Order:	0509323	Collection Date:	
Project:	Ciniza Annual GW Samples 2005		
Lab ID:	0509323-07	Matrix:	TRIP BLANK

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.50		µg/L	1	10/1/2005 1:44:12 AM
Toluene	ND	0.50		µg/L	1	10/1/2005 1:44:12 AM
Ethylbenzene	ND	0.50		µg/L	1	10/1/2005 1:44:12 AM
Xylenes, Total	ND	0.50		µg/L	1	10/1/2005 1:44:12 AM
Surr: 4-Bromofluorobenzene	94.5	82.2-119		%REC	1	10/1/2005 1:44:12 AM
EPA METHOD 8260B: VOLATILES						Analyst: HLM
Benzene	ND	1.0		µg/L	1	10/4/2005
Toluene	ND	1.0		µg/L	1	10/4/2005
Ethylbenzene	ND	1.0		µg/L	1	10/4/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/4/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/4/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/4/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/4/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/4/2005
Naphthalene	ND	2.0		µg/L	1	10/4/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/4/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/4/2005
Acetone	ND	10		µg/L	1	10/4/2005
Bromobenzene	ND	1.0		µg/L	1	10/4/2005
Bromochloromethane	ND	1.0		µg/L	1	10/4/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/4/2005
Bromoform	ND	1.0		µg/L	1	10/4/2005
Bromomethane	ND	2.0		µg/L	1	10/4/2005
2-Butanone	ND	10		µg/L	1	10/4/2005
Carbon disulfide	ND	10		µg/L	1	10/4/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/4/2005
Chlorobenzene	ND	1.0		µg/L	1	10/4/2005
Chloroethane	ND	2.0		µg/L	1	10/4/2005
Chloroform	ND	1.0		µg/L	1	10/4/2005
Chloromethane	ND	1.0		µg/L	1	10/4/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/4/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/4/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/4/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/4/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/4/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/4/2005
Dibromomethane	ND	2.0		µg/L	1	10/4/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/4/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/4/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/4/2005

Qualifiers:
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- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *18-Oct-05*

'LIENT:	Giant Refining Co	Client Sample ID:	Trip Blank
b Order:	0509323	Collection Date:	
Project:	Ciniza Annual GW Samples 2005		
Lab ID:	0509323-07	Matrix:	TRIP BLANK

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/4/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/4/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/4/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/4/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/4/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/4/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/4/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/4/2005
2-Hexanone	ND	10		µg/L	1	10/4/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/4/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/4/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/4/2005
Methylene Chloride	ND	3.0		µg/L	1	10/4/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/4/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/4/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/4/2005
Styrene	ND	1.0		µg/L	1	10/4/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/4/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/4/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/4/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/4/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/4/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/4/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/4/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/4/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/4/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/4/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/4/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/4/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/4/2005
Vinyl chloride	ND	1.0		µg/L	1	10/4/2005
Xylenes, Total	ND	1.0		µg/L	1	10/4/2005
Surr: 1,2-Dichloroethane-d4	96.9	69.9-130		%REC	1	10/4/2005
Surr: 4-Bromofluorobenzene	104	71.2-123		%REC	1	10/4/2005
Surr: Dibromofluoromethane	99.2	73.9-134		%REC	1	10/4/2005
Surr: Toluene-d8	98.6	81.9-122		%REC	1	10/4/2005

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: *18-Oct-05*

CLIENT: Giant Refining Co
Work Order: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Method Blank

Sample ID MBLK | Batch ID: R16830 | Test Code: E300 | Units: mg/L | Analysis Date 9/30/2005 | Prep Date
Client ID: | Run ID: LC_050930A | SeqNo: 406281

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1									
Chloride	ND	0.1									
Nitrogen, Nitrite (As N)	ND	0.1									
Nitrogen, Nitrate (As N)	ND	0.1									
Phosphorus, Orthophosphate (As P)	ND	0.5									
Sulfate	ND	0.5									

Sample ID MBLK | Batch ID: R16873 | Test Code: E300 | Units: mg/L | Analysis Date 10/5/2005 | Prep Date
Client ID: | Run ID: LC_051005A | SeqNo: 408106

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1									
Chloride	ND	0.1									
Nitrogen, Nitrite (As N)	ND	0.1									
Nitrogen, Nitrate (As N)	ND	0.1									
Phosphorus, Orthophosphate (As P)	ND	0.5									
Sulfate	ND	0.5									

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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID MBLK | Batch ID: R16932 | Test Code: E300 | Units: mg/L | Analysis Date 10/11/2005 | Prep Date
Client ID: | Run ID: LC_051011A | SeqNo: 410517

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1	0	0	0	0	0	0			
Chloride	ND	0.1	0	0	0	0	0	0			
Nitrogen, Nitrite (As N)	ND	0.1	0	0	0	0	0	0			
Nitrogen, Nitrate (As N)	ND	0.1	0	0	0	0	0	0			
Phosphorus, Orthophosphate (As P)	ND	0.5	0	0	0	0	0	0			
Sulfate	ND	0.5	0	0	0	0	0	0			

Sample ID MBLK | Batch ID: R16944 | Test Code: E300 | Units: mg/L | Analysis Date 10/12/2005 | Prep Date
Client ID: | Run ID: LC_051012A | SeqNo: 410818

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1									
Chloride	ND	0.1									
Nitrogen, Nitrite (As N)	ND	0.1									
Nitrogen, Nitrate (As N)	ND	0.1									
Phosphorus, Orthophosphate (As P)	ND	0.5									
Sulfate	ND	0.5									

Sample ID Reagent Blank 5m | Batch ID: R16833 | Test Code: SW8021 | Units: µg/L | Analysis Date 9/30/2005 8:42:07 AM | Prep Date
Client ID: | Run ID: PIDFID_050930A | SeqNo: 406340

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	2.5									
Benzene	ND	0.5									
Toluene	ND	0.5									
Ethylbenzene	ND	0.5									
Xylenes, Total	ND	0.5									
Surr: 4-Bromofluorobenzene	18.35	0	20	0	91.7	82.2	119	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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID Reagent Blank 5m Batch ID: R16840 Test Code: SW8021 Units: µg/L Analysis Date 10/3/2005 8:46:25 AM Prep Date
Client ID: Run ID: PIDFID_051003A SeqNo: 406636

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	2.5									
Benzene	ND	0.5									
Toluene	ND	0.5									
Ethylbenzene	ND	0.5									
Xylenes, Total	ND	0.5									
Surr: 4-Bromofluorobenzene	21.02	0	20	0	105	82.2	119	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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID MB-8864 Batch ID: 8864 Test Code: SW8270C Units: µg/L Analysis Date 10/12/2005 Prep Date 10/3/2005
Client ID: Run ID: ELMO_051012A SeqNo: 410869

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	10									
Acenaphthylene	ND	10									
Aniline	ND	20									
Anthracene	ND	10									
Azobenzene	ND	10									
Benz(a)anthracene	ND	15									
Benzo(a)pyrene	ND	15									
Benzo(b)fluoranthene	ND	15									
Benzo(g,h,i)perylene	ND	10									
Benzo(k)fluoranthene	ND	10									
Benzoic acid	ND	50									
Benzyl alcohol	ND	20									
Bis(2-chloroethoxy)methane	ND	10									
Bis(2-chloroethyl)ether	ND	15									
Bis(2-chloroisopropyl)ether	ND	15									
Bis(2-ethylhexyl)phthalate	ND	15									
4-Bromophenyl phenyl ether	ND	10									
Butyl benzyl phthalate	ND	15									
Carbazole	ND	10									
4-Chloro-3-methylphenol	ND	20									
4-Chloroaniline	ND	20									
2-Chloronaphthalene	ND	10									
2-Chlorophenol	ND	10									
4-Chlorophenyl phenyl ether	ND	15									
Chrysene	ND	15									
Di-n-butyl phthalate	ND	10									
Di-n-octyl phthalate	ND	15									
Dibenz(a,h)anthracene	ND	10									

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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

Dibenzofuran	ND	10	
1,2-Dichlorobenzene	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
3,3'-Dichlorobenzidine	ND	15	
Diethyl phthalate	ND	10	
Dimethyl phthalate	ND	10	
2,4-Dichlorophenol	ND	10	
2,4-Dimethylphenol	ND	10	
4,6-Dinitro-2-methylphenol	ND	50	
2,4-Dinitrophenol	ND	50	
2,4-Dinitrotoluene	ND	10	
2,6-Dinitrotoluene	ND	10	
Fluoranthene	ND	10	
Fluorene	ND	10	
Hexachlorobenzene	ND	10	
Hexachlorobutadiene	ND	10	
Hexachlorocyclopentadiene	ND	10	
Hexachloroethane	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Isophorone	ND	10	
2-Methylnaphthalene	ND	10	
2-Methylphenol	ND	15	
3+4-Methylphenol	ND	20	
N-Nitrosodi-n-propylamine	ND	10	
N-Nitrosodimethylamine	5.7	10	J
N-Nitrosodiphenylamine	ND	10	
Naphthalene	ND	10	
2-Nitroaniline	ND	50	
3-Nitroaniline	ND	50	
4-Nitroaniline	ND	20	
Nitrobenzene	ND	10	
2-Nitrophenol	ND	15	

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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

4-Nitrophenol	ND	50						
Pentachlorophenol	ND	50						
Phenanthrene	ND	10						
Phenol	ND	10						
Pyrene	ND	15						
Pyridine	ND	30						
1,2,4-Trichlorobenzene	ND	10						
2,4,5-Trichlorophenol	ND	10						
2,4,6-Trichlorophenol	ND	15						
Surr: 2,4,6-Tribromophenol	162.5	0	200	0	81.2	16.6	150	0
Surr: 2-Fluorobiphenyl	62.88	0	100	0	62.9	19.6	134	0
Surr: 2-Fluorophenol	103.1	0	200	0	51.6	9.54	113	0
Surr: 4-Terphenyl-d14	62.84	0	100	0	62.8	22.7	145	0
Surr: Nitrobenzene-d5	68.04	0	100	0	68.0	14.6	134	0
Surr: Phenol-d6	81.2	0	200	0	40.6	10.7	80.3	0

Sample ID MB-8897 Batch ID: 8897 Test Code: SW7470 Units: mg/L Analysis Date 10/6/2005 Prep Date 10/6/2005
Client ID: Run ID: MI-LA254_051006A SeqNo: 408247

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

Sample ID MB-8884 Batch ID: 8884 Test Code: SW6010A Units: mg/L Analysis Date 10/6/2005 10:00:44 AM Prep Date 10/5/2005
Client ID: Run ID: ICP_051006B SeqNo: 408450

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

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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID MB-8884 | Batch ID: 8884 | Test Code: SW6010A | Units: mg/L | Analysis Date 10/6/2005 2:17:32 PM | Prep Date 10/5/2005

Client ID: | Run ID: ICP_051006B | SeqNo: 408648

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	1									
Magnesium	ND	1									
Potassium	ND	1									
Sodium	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

Hall Environmental Analysis Laboratory

Date: *18-Oct-05*

CLIENT: Giant Refining Co
Work Order: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Method Blank

Sample ID 5ml rb | Batch ID: R16841 | Test Code: SW8260B | Units: µg/L | Analysis Date 10/3/2005 | Prep Date
Client ID: | Run ID: VAL_051003A | SeqNo: 406639

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	2.624	10									J
Carbon disulfide	ND	10									
Carbon Tetrachloride	ND	2									
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: 0509323
Project: Ciniza Annual GW Samples 2005

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	2.438	3	J
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: 0509323
Project: Ciniza Annual GW Samples 2005

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	10.22	0	10	0	102	69.9	130	0
Surr: 4-Bromofluorobenzene	9.85	0	10	0	98.5	71.2	123	0
Surr: Dibromofluoromethane	10.03	0	10	0	100	73.9	134	0
Surr: Toluene-d8	9.734	0	10	0	97.3	81.9	122	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

Hall Environmental Analysis Laboratory

Date: *18-Oct-05*

CLIENT: Giant Refining Co
Work Order: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID 0509323-02a ms | Batch ID: R16833 | Test Code: SW8021 | Units: µg/L | Analysis Date 9/30/2005 11:11:24 PM | Prep Date
Client ID: OW-13 | Run ID: PIDFID_050930A | SeqNo: 406406

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	37.4	2.5	40	1.539	89.7	64.5	133	0			
Benzene	19.87	0.5	20	0	99.3	88.5	114	0			
Toluene	19.28	0.5	20	0	96.4	87.2	114	0			
Ethylbenzene	18.91	0.5	20	0	94.6	88.6	113	0			
Xylenes, Total	58.78	0.5	60	0	98.0	83.3	114	0			
Surr: 4-Bromofluorobenzene	23.85	0	24	0	99.4	82.2	119	0			

Sample ID 0509323-02a msd | Batch ID: R16833 | Test Code: SW8021 | Units: µg/L | Analysis Date 9/30/2005 11:42:00 PM | Prep Date
Client ID: OW-13 | Run ID: PIDFID_050930A | SeqNo: 406407

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	36.16	2.5	40	1.539	86.5	64.5	133	37.4	3.38	28	
Benzene	19.88	0.5	20	0	99.4	88.5	114	19.87	0.0322	27	
Toluene	19.73	0.5	20	0	98.6	87.2	114	19.28	2.28	19	
Ethylbenzene	19.28	0.5	20	0	96.4	88.6	113	18.91	1.93	10	
Xylenes, Total	58.5	0.5	60	0	97.5	83.3	114	58.78	0.473	13	
Surr: 4-Bromofluorobenzene	23.4	0	24	0	97.5	82.2	119	23.85	1.90	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

Hall Environmental Analysis Laboratory

Date: *18-Oct-05*

CLIENT: Giant Refining Co
Work Order: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID LCS-ST300-05022 Batch ID: R16830 Test Code: E300 Units: mg/L Analysis Date 9/30/2005 Prep Date
Client ID: Run ID: LC_050930A SeqNo: 406282

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.5271	0.1	0.5	0	105	90	110	0			
Chloride	4.739	0.1	5	0	94.8	90	110	0			
Nitrogen, Nitrite (As N)	0.9317	0.1	1	0	93.2	90	110	0			
Nitrogen, Nitrate (As N)	2.434	0.1	2.5	0	97.3	90	110	0			
Phosphorus, Orthophosphate (As P)	5.094	0.5	5	0	102	90	110	0			
Sulfate	9.814	0.5	10	0	98.1	90	110	0			

Sample ID LCS-ST300-05022 Batch ID: R16873 Test Code: E300 Units: mg/L Analysis Date 10/5/2005 Prep Date
Client ID: Run ID: LC_051005A SeqNo: 408107

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.5385	0.1	0.5	0	108	90	110	0			
Chloride	4.919	0.1	5	0	98.4	90	110	0			
Nitrogen, Nitrite (As N)	0.9952	0.1	1	0	99.5	90	110	0			
Nitrogen, Nitrate (As N)	2.512	0.1	2.5	0	100	90	110	0			
Phosphorus, Orthophosphate (As P)	5.155	0.5	5	0	103	90	110	0			
Sulfate	10	0.5	10	0	100	90	110	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

1

CLIENT: Giant Refining Co
Work Order: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID LCS-ST300-05022 Batch ID: R16932 Test Code: E300 Units: mg/L Analysis Date 10/11/2005 Prep Date
Client ID: Run ID: LC_051011A SeqNo: 410518

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.5405	0.1	0.5	0	108	90	110	0			
Chloride	4.892	0.1	5	0	97.8	90	110	0			
Nitrogen, Nitrite (As N)	0.9457	0.1	1	0	94.6	90	110	0			
Nitrogen, Nitrate (As N)	2.495	0.1	2.5	0	99.8	90	110	0			
Phosphorus, Orthophosphate (As P)	5.156	0.5	5	0	103	90	110	0			
Sulfate	10.07	0.5	10	0	101	90	110	0			

Sample ID LCS-ST300-05022 Batch ID: R16944 Test Code: E300 Units: mg/L Analysis Date 10/12/2005 Prep Date
Client ID: Run ID: LC_051012A SeqNo: 410819

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.5557	0.1	0.5	0	111	90	110	0			S
Chloride	4.827	0.1	5	0	96.5	90	110	0			
Nitrogen, Nitrite (As N)	0.9707	0.1	1	0	97.1	90	110	0			
Nitrogen, Nitrate (As N)	2.445	0.1	2.5	0	97.8	90	110	0			
Phosphorus, Orthophosphate (As P)	5.01	0.5	5	0	100	90	110	0			
Sulfate	9.867	0.5	10	0	98.7	90	110	0			

Sample ID BTEX lcs 100ng Batch ID: R16833 Test Code: SW8021 Units: µg/L Analysis Date 9/30/2005 8:38:12 PM Prep Date
Client ID: Run ID: PIDFID_050930A SeqNo: 406343

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	17.78	2.5	20	0	88.9	64.5	133	0			
Benzene	19.52	0.5	20	0	97.6	88.5	114	0			
Toluene	19.08	0.5	20	0	95.4	87.2	114	0			
Ethylbenzene	18.98	0.5	20	0	94.9	88.6	113	0			
Xylenes, Total	39.45	0.5	40	0	98.6	83.3	114	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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID BTEX lcs 100ng | Batch ID: R16840 | Test Code: SW8021 | Units: µg/L | Analysis Date 10/3/2005 1:58:23 PM | Prep Date
Client ID: | Run ID: PIDFID_051003A | SeqNo: 406644

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	17.2	2.5	20	0	86.0	64.5	133	0			
Benzene	19.89	0.5	20	0	99.5	88.5	114	0			
Toluene	19.34	0.5	20	0	96.7	87.2	114	0			
Ethylbenzene	19.19	0.5	20	0	96.0	88.6	113	0			
Xylenes, Total	39.4	0.5	40	0	98.5	83.3	114	0			

Sample ID BTEX lcsd 100ng | Batch ID: R16840 | Test Code: SW8021 | Units: µg/L | Analysis Date 10/3/2005 2:30:36 PM | Prep Date
Client ID: | Run ID: PIDFID_051003A | SeqNo: 406647

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	17.37	2.5	20	0	86.8	64.5	133	17.2	0.951	28	
Benzene	19.92	0.5	20	0	99.6	88.5	114	19.89	0.170	27	
Toluene	19.3	0.5	20	0	96.5	87.2	114	19.34	0.176	19	
Ethylbenzene	19.33	0.5	20	0	96.6	88.6	113	19.19	0.691	10	
Xylenes, Total	39.41	0.5	40	0	98.5	83.3	114	39.4	0.0142	13	

Sample ID 100ng lcs | Batch ID: R16841 | Test Code: SW8260B | Units: µg/L | Analysis Date 10/3/2005 | Prep Date
Client ID: | Run ID: VAL_051003A | SeqNo: 406643

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	20.88	1	20	0	104	81.4	130	0			
Toluene	21.98	1	20	0	110	90.8	128	0			
Chlorobenzene	21.4	1	20	0	107	89.6	134	0			
1,1-Dichloroethene	18.04	1	20	0	90.2	75.1	120	0			
Trichloroethene (TCE)	20.18	1	20	0	101	75.8	110	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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID 100ng lcs | Batch ID: R16855 | Test Code: SW8260B | Units: µg/L | Analysis Date 10/4/2005 | Prep Date
Client ID: | Run ID: NEPTUNE_051004A | SeqNo: 407483

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	23.41	1	20	0	117	81.4	130	0			
Toluene	22.8	1	20	0	114	90.8	128	0			
Chlorobenzene	22.21	1	20	0	111	89.6	134	0			
1,1-Dichloroethene	21.23	1	20	0	106	75.1	120	0			
Trichloroethene (TCE)	21.5	1	20	0	108	75.8	110	0			

Sample ID LCS-8864 | Batch ID: 8864 | Test Code: SW8270C | Units: µg/L | Analysis Date 10/12/2005 | Prep Date 10/3/2005
Client ID: | Run ID: ELMO_051012A | SeqNo: 410870

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	75.04	10	100	0	75.0	11	123	0			
4-Chloro-3-methylphenol	151.7	20	200	0	75.8	15.4	119	0			
2-Chlorophenol	150	10	200	0	75.0	12.2	122	0			
1,4-Dichlorobenzene	68.78	10	100	0	68.8	16.9	100	0			
2,4-Dinitrotoluene	77.38	10	100	0	77.4	13	138	0			
N-Nitrosodi-n-propylamine	71.46	10	100	0	71.5	9.93	122	0			
4-Nitrophenol	96.16	50	200	0	48.1	-20.5	87.4	0			
Pentachlorophenol	144.2	50	200	0	72.1	-0.355	114	0			
Phenol	81.16	10	200	0	40.6	7.53	73.1	0			
Pyrene	73.62	15	100	0	73.6	12.6	140	0			
1,2,4-Trichlorobenzene	68.44	10	100	0	68.4	17.4	98.7	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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID LCSD-8864 | Batch ID: 8864 | Test Code: SW8270C | Units: µg/L | Analysis Date 10/12/2005 | Prep Date 10/3/2005
Client ID: | Run ID: ELMO_051012A | SeqNo: 410871

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	65.84	10	100	0	65.8	11	123	75.04	13.1	30.5	
4-Chloro-3-methylphenol	137.4	20	200	0	68.7	15.4	119	151.7	9.87	28.6	
2-Chlorophenol	112.8	10	200	0	56.4	12.2	122	150	28.3	107	
1,4-Dichlorobenzene	51.84	10	100	0	51.8	16.9	100	68.78	28.1	62.1	
2,4-Dinitrotoluene	73.66	10	100	0	73.7	13	138	77.38	4.93	14.7	
N-Nitrosodi-n-propylamine	60.32	10	100	0	60.3	9.93	122	71.46	16.9	30.3	
4-Nitrophenol	26.08	50	200	0	13.0	12.5	87.4	96.16	0	36.3	J
Pentachlorophenol	46.76	50	200	0	23.4	3.55	114	144.2	0	49	J
Phenol	64.62	10	200	0	32.3	7.53	73.1	81.16	22.7	52.4	
Pyrene	73.1	15	100	0	73.1	12.6	140	73.62	0.709	16.3	
1,2,4-Trichlorobenzene	54.58	10	100	0	54.6	17.4	98.7	68.44	22.5	36.4	

Sample ID LCS-8897 | Batch ID: 8897 | Test Code: SW7470 | Units: mg/L | Analysis Date 10/6/2005 | Prep Date 10/6/2005
Client ID: | Run ID: MI-LA254_051006A | SeqNo: 408248

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.005624	0.0002	0.005	0	112	75.2	134	0			

Sample ID LCSD-8897 | Batch ID: 8897 | Test Code: SW7470 | Units: mg/L | Analysis Date 10/6/2005 | Prep Date 10/6/2005
Client ID: | Run ID: MI-LA254_051006A | SeqNo: 408249

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.005469	0.0002	0.005	0	109	75.2	134	0.005624	2.81	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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID LCS-8884 | Batch ID: 8884 | Test Code: SW6010A | Units: mg/L | Analysis Date 10/6/2005 10:03:05 AM | Prep Date 10/5/2005
Client ID: | Run ID: ICP_051006B | SeqNo: 408451

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.4875	0.02	0.5	0	97.5	80	120	0			
Barium	0.4572	0.02	0.5	0	91.4	80	120	0			
Cadmium	0.4561	0.002	0.5	0	91.2	80	120	0			
Chromium	0.4746	0.006	0.5	0	94.9	80	120	0			
Lead	0.4596	0.005	0.5	0	91.9	80	120	0			
Selenium	0.4143	0.05	0.5	0	82.9	80	120	0			
Silver	0.4596	0.005	0.5	0	91.9	80	120	0			

Sample ID LCSD-8884 | Batch ID: 8884 | Test Code: SW6010A | Units: mg/L | Analysis Date 10/6/2005 10:06:23 AM | Prep Date 10/5/2005
Client ID: | Run ID: ICP_051006B | SeqNo: 408452

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.4937	0.02	0.5	0	98.7	80	120	0.4875	1.26	20	
Barium	0.4615	0.02	0.5	0	92.3	80	120	0.4572	0.939	20	
Cadmium	0.4612	0.002	0.5	0	92.2	80	120	0.4561	1.11	20	
Chromium	0.4796	0.006	0.5	0	95.9	80	120	0.4746	1.06	20	
Lead	0.4616	0.005	0.5	0	92.3	80	120	0.4596	0.431	20	
Selenium	0.425	0.05	0.5	0	85.0	80	120	0.4143	2.55	20	
Silver	0.4639	0.005	0.5	0	92.8	80	120	0.4596	0.936	20	

Sample ID LCS-8884 | Batch ID: 8884 | Test Code: SW6010A | Units: mg/L | Analysis Date 10/6/2005 2:19:10 PM | Prep Date 10/5/2005
Client ID: | Run ID: ICP_051006B | SeqNo: 408649

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	47.33	1	50	0	94.7	80	120	0			
Magnesium	47.17	1	50	0	94.3	80	120	0			
Potassium	50.35	1	50	0	101	80	120	0			
Sodium	50.21	1	50	0	100	80	120	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: 0509323
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID LCSD-8884 Batch ID: 8884 Test Code: SW6010A Units: mg/L Analysis Date 10/6/2005 2:20:38 PM Prep Date 10/5/2005
Client ID: Run ID: ICP_051006B SeqNo: 408650

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	48.32	1	50	0	96.6	80	120	47.33	0	20	
Magnesium	48.45	1	50	0	96.9	80	120	47.17	0	20	
Potassium	51.16	1	50	0	102	80	120	50.35	0	20	
Sodium	51.4	1	50	0	103	80	120	50.21	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

Sample Receipt Checklist

C ame GIANTREFIN

Date and Time Received: 9/30/2005

Work Order Number 0509323

Received by AT

Checklist completed by _____ Signature _____ Date 9/30/05

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 ☐		
- VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐	
- pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐	

Container/Temp Blank temperature? 6° *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

QA / QC Pac
Std ☐ Level 4 ☐
Other:

Client: Giant Refining Company - Ciniza
Address: Route 3 Box 7 Gallup, NM 87301
Phone #: 505 722 3833
Fax #: 505 7220210

Project Name: Ciniza Annual Groundwater Sampling 2005
Project #:
Project Manager: Steve Morris
Sampler: Steve Morris
Sample Temperature: 6°

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3	HEAL No.	BTEX + MTBE + TMBs (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	Gen Chem	ec / pH			Air Bubbles or Headspace (Y or N)
9/27/05	0845	H_2O	OW-12	2 VOAs	X		0509323-1	X																
9/27/05	1030	"	OW-13	"			-2	X																
9/29/05	1400	"	OW-14	"			-3	X																
9/28/05	1230	"	OW-29	"			-4	X																
9/29/05	0845	"	OW-30	"			-5	X																
9/29/05	1045	"	OW-11				-6								X			X	X	X	X			
			Trip Blank				-7	X																

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	Date:	Time:
9/30/05	0850	Steve Morris	[signature]	9/30/05	0850
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)		

Remarks: Gen Chem = Cations, Anions, pH, and conductivity.
~~See attached Hydrofield Measurement Data~~ [signature] 9/30/05

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

November 04, 2005

Steve Morris
Giant Refining Co
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0258
FAX (505) 722-0210

RE: Ciniza Annual GW Samples 2005 Order No.: 0510131

Dear Steve Morris:

Hall Environmental Analysis Laboratory received 6 samples on 10/14/2005 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

Andy Freeman
Business Manager

4901 Hawkins NE ■ Suite D ■ Albuquerque, NM 87109
505.345.3975 ■ Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-01

Client Sample ID: MW-1
Collection Date: 10/12/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	0.76	0.10		mg/L	1	10/14/2005
Chloride	45	0.50		mg/L	5	10/24/2005
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	10/14/2005
Sulfate	150	2.5		mg/L	5	10/24/2005
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	10/14/2005
EPA METHOD 8015B: DIESEL RANGE						Analyst: **SCC**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	10/18/2005 5:17:58 PM
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	10/18/2005 5:17:58 PM
Surr: DNOP	123	58-140		%REC	1	10/18/2005 5:17:58 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	10/18/2005 11:21:11 PM
Surr: BFB	102	79.7-118		%REC	1	10/18/2005 11:21:11 PM
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/23/2005
Toluene	ND	1.0		µg/L	1	10/23/2005
Ethylbenzene	ND	1.0		µg/L	1	10/23/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2005
Naphthalene	ND	2.0		µg/L	1	10/23/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
Acetone	ND	10		µg/L	1	10/23/2005
Bromobenzene	ND	1.0		µg/L	1	10/23/2005
Bromochloromethane	ND	1.0		µg/L	1	10/23/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2005
Bromoform	ND	1.0		µg/L	1	10/23/2005
Bromomethane	ND	2.0		µg/L	1	10/23/2005
2-Butanone	ND	10		µg/L	1	10/23/2005
Carbon disulfide	ND	10		µg/L	1	10/23/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/23/2005
Chlorobenzene	ND	1.0		µg/L	1	10/23/2005
Chloroethane	ND	2.0		µg/L	1	10/23/2005
Chloroform	ND	1.0		µg/L	1	10/23/2005
Chloromethane	ND	1.0		µg/L	1	10/23/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005

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: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-01

Client Sample ID: MW-1
Collection Date: 10/12/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2005
Dibromomethane	ND	2.0		µg/L	1	10/23/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2005
2-Hexanone	ND	10		µg/L	1	10/23/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2005
Methylene Chloride	ND	3.0		µg/L	1	10/23/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
Styrene	ND	1.0		µg/L	1	10/23/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2005
Vinyl chloride	ND	1.0		µg/L	1	10/23/2005
Xylenes, Total	ND	1.0		µg/L	1	10/23/2005
Surr: 1,2-Dichloroethane-d4	94.4	69.9-130		%REC	1	10/23/2005
Surr: 4-Bromofluorobenzene	104	71.2-123		%REC	1	10/23/2005

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: *04-Nov-05*

IENT: Giant Refining Co
b Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-01

Client Sample ID: MW-1
Collection Date: 10/12/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Surr: Dibromofluoromethane	93.0	73.9-134		%REC	1	10/23/2005
Surr: Toluene-d8	102	81.9-122		%REC	1	10/23/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
Acenaphthene	ND	10		µg/L	1	10/21/2005
Acenaphthylene	ND	10		µg/L	1	10/21/2005
Aniline	ND	20		µg/L	1	10/21/2005
Anthracene	ND	10		µg/L	1	10/21/2005
Azobenzene	ND	10		µg/L	1	10/21/2005
Benz(a)anthracene	ND	15		µg/L	1	10/21/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/21/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/21/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/21/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/21/2005
Benzoic acid	ND	50		µg/L	1	10/21/2005
Benzyl alcohol	ND	20		µg/L	1	10/21/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/21/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/21/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	10/21/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/21/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/21/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/21/2005
Carbazole	ND	10		µg/L	1	10/21/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/21/2005
4-Chloroaniline	ND	20		µg/L	1	10/21/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/21/2005
2-Chlorophenol	ND	10		µg/L	1	10/21/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/21/2005
Chrysene	ND	15		µg/L	1	10/21/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/21/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/21/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/21/2005
Dibenzofuran	ND	10		µg/L	1	10/21/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/21/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/21/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/21/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/21/2005
Diethyl phthalate	ND	10		µg/L	1	10/21/2005
Dimethyl phthalate	ND	10		µg/L	1	10/21/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/21/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/21/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/21/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/21/2005

Qualifiers:
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R - RPD outside accepted recovery limits
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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

LIENT: Giant Refining Co
ab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-01

Client Sample ID: MW-1
Collection Date: 10/12/2005 10:45:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
2,4-Dinitrotoluene	ND	10		µg/L	1	10/21/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/21/2005
Fluoranthene	ND	10		µg/L	1	10/21/2005
Fluorene	ND	10		µg/L	1	10/21/2005
Hexachlorobenzene	ND	10		µg/L	1	10/21/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/21/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/21/2005
Hexachloroethane	ND	10		µg/L	1	10/21/2005
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/21/2005
Isophorone	ND	10		µg/L	1	10/21/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/21/2005
2-Methylphenol	ND	15		µg/L	1	10/21/2005
3+4-Methylphenol	ND	20		µg/L	1	10/21/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/21/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/21/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/21/2005
Naphthalene	ND	10		µg/L	1	10/21/2005
2-Nitroaniline	ND	50		µg/L	1	10/21/2005
3-Nitroaniline	ND	50		µg/L	1	10/21/2005
4-Nitroaniline	ND	20		µg/L	1	10/21/2005
Nitrobenzene	ND	10		µg/L	1	10/21/2005
2-Nitrophenol	ND	15		µg/L	1	10/21/2005
4-Nitrophenol	ND	50		µg/L	1	10/21/2005
Pentachlorophenol	ND	50		µg/L	1	10/21/2005
Phenanthrene	ND	10		µg/L	1	10/21/2005
Phenol	ND	10		µg/L	1	10/21/2005
Pyrene	ND	15		µg/L	1	10/21/2005
Pyridine	ND	30		µg/L	1	10/21/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/21/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/21/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/21/2005
Surr: 2,4,6-Tribromophenol	59.8	16.6-150		%REC	1	10/21/2005
Surr: 2-Fluorobiphenyl	47.7	19.6-134		%REC	1	10/21/2005
Surr: 2-Fluorophenol	43.4	9.54-113		%REC	1	10/21/2005
Surr: 4-Terphenyl-d14	83.9	22.7-145		%REC	1	10/21/2005
Surr: Nitrobenzene-d5	53.2	14.6-134		%REC	1	10/21/2005
Surr: Phenol-d6	27.1	10.7-80.3		%REC	1	10/21/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **CMC**
Specific Conductance	1100	0.010		µmhos/cm	1	10/17/2005
EPA METHOD 245.1: MERCURY						Analyst: **CMC**
Mercury	ND	0.00020		mg/L	1	10/14/2005

Qualifiers:
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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

IENT: Giant Refining Co
Client Sample ID: MW-1
.b Order: 0510131
Collection Date: 10/12/2005 10:45:00 AM
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-01
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 10:09:24 AM
Barium	ND	0.020		mg/L	1	10/27/2005 10:09:24 AM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 10:09:24 AM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 10:09:24 AM
Chromium	ND	0.0060		mg/L	1	10/27/2005 10:09:24 AM
Cobalt	ND	0.0060		mg/L	1	10/27/2005 10:09:24 AM
Lead	ND	0.0050		mg/L	1	10/27/2005 10:09:24 AM
Nickel	ND	0.010		mg/L	1	10/27/2005 10:09:24 AM
Selenium	ND	0.020		mg/L	1	10/27/2005 10:09:24 AM
Silver	ND	0.0050		mg/L	1	10/27/2005 10:09:24 AM
Vanadium	ND	0.050		mg/L	1	10/27/2005 10:09:24 AM
Zinc	ND	0.050		mg/L	1	10/27/2005 10:09:24 AM
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 4:34:22 PM
Barium	ND	0.020		mg/L	1	10/27/2005 4:34:22 PM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 4:34:22 PM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 4:34:22 PM
Calcium	1.7	1.0		mg/L	1	10/27/2005 4:34:22 PM
Chromium	ND	0.0060		mg/L	1	10/27/2005 4:34:22 PM
Cobalt	ND	0.0060		mg/L	1	10/27/2005 4:34:22 PM
Lead	ND	0.0050		mg/L	1	10/28/2005 9:28:23 AM
Magnesium	ND	1.0		mg/L	1	10/27/2005 4:34:22 PM
Nickel	ND	0.010		mg/L	1	10/27/2005 4:34:22 PM
Potassium	ND	1.0		mg/L	1	10/27/2005 4:34:22 PM
Selenium	ND	0.050		mg/L	1	10/27/2005 4:34:22 PM
Silver	ND	0.0050		mg/L	1	10/27/2005 4:34:22 PM
Sodium	270	10		mg/L	10	10/28/2005 10:21:12 AM
Vanadium	ND	0.050		mg/L	1	10/27/2005 4:34:22 PM
Zinc	ND	0.050		mg/L	1	10/27/2005 4:34:22 PM
EPA METHOD 150.1: PH						Analyst: **TES**
pH	9.08	0.010		pH units	1	10/18/2005

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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

.IENT: Giant Refining Co
.b Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-02

Client Sample ID: MW-4
Collection Date: 10/12/2005 7:30:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	0.34	0.10		mg/L	1	10/14/2005
Chloride	16	0.10		mg/L	1	10/14/2005
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	10/14/2005
Sulfate	150	2.5		mg/L	5	10/27/2005
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	10/14/2005
EPA METHOD 8015B: DIESEL RANGE						Analyst: **SCC**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	10/18/2005 5:50:22 PM
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	10/18/2005 5:50:22 PM
Surr: DNOP	125	58-140		%REC	1	10/18/2005 5:50:22 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	10/18/2005 11:52:30 PM
Surr: BFB	98.4	79.7-118		%REC	1	10/18/2005 11:52:30 PM
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/23/2005
Toluene	ND	1.0		µg/L	1	10/23/2005
Ethylbenzene	ND	1.0		µg/L	1	10/23/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2005
Naphthalene	ND	2.0		µg/L	1	10/23/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
Acetone	ND	10		µg/L	1	10/23/2005
Bromobenzene	ND	1.0		µg/L	1	10/23/2005
Bromochloromethane	ND	1.0		µg/L	1	10/23/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2005
Bromoform	ND	1.0		µg/L	1	10/23/2005
Bromomethane	ND	2.0		µg/L	1	10/23/2005
2-Butanone	ND	10		µg/L	1	10/23/2005
Carbon disulfide	ND	10		µg/L	1	10/23/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/23/2005
Chlorobenzene	ND	1.0		µg/L	1	10/23/2005
Chloroethane	ND	2.0		µg/L	1	10/23/2005
Chloroform	ND	1.0		µg/L	1	10/23/2005
Chloromethane	ND	1.0		µg/L	1	10/23/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005

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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-02

Client Sample ID: MW-4
Collection Date: 10/12/2005 7:30:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2005
Dibromomethane	ND	2.0		µg/L	1	10/23/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2005
2-Hexanone	ND	10		µg/L	1	10/23/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2005
Methylene Chloride	ND	3.0		µg/L	1	10/23/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
Styrene	ND	1.0		µg/L	1	10/23/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2005
Vinyl chloride	ND	1.0		µg/L	1	10/23/2005
Xylenes, Total	ND	1.0		µg/L	1	10/23/2005
Surr: 1,2-Dichloroethane-d4	98.0	69.9-130		%REC	1	10/23/2005
Surr: 4-Bromofluorobenzene	101	71.2-123		%REC	1	10/23/2005

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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

IENT: Giant Refining Co
b Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-02

Client Sample ID: MW-4
Collection Date: 10/12/2005 7:30:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Surr: Dibromofluoromethane	94.8	73.9-134		%REC	1	10/23/2005
Surr: Toluene-d8	98.6	81.9-122		%REC	1	10/23/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
Acenaphthene	ND	10		µg/L	1	10/23/2005
Acenaphthylene	ND	10		µg/L	1	10/23/2005
Aniline	ND	20		µg/L	1	10/23/2005
Anthracene	ND	10		µg/L	1	10/23/2005
Azobenzene	ND	10		µg/L	1	10/23/2005
Benz(a)anthracene	ND	15		µg/L	1	10/23/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/23/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/23/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/23/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/23/2005
Benzoic acid	ND	50		µg/L	1	10/23/2005
Benzyl alcohol	ND	20		µg/L	1	10/23/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/23/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/23/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	10/23/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/23/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/23/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/23/2005
Carbazole	ND	10		µg/L	1	10/23/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/23/2005
4-Chloroaniline	ND	20		µg/L	1	10/23/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/23/2005
2-Chlorophenol	ND	10		µg/L	1	10/23/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/23/2005
Chrysene	ND	15		µg/L	1	10/23/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/23/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/23/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/23/2005
Dibenzofuran	ND	10		µg/L	1	10/23/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/23/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/23/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/23/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/23/2005
Diethyl phthalate	ND	10		µg/L	1	10/23/2005
Dimethyl phthalate	ND	10		µg/L	1	10/23/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/23/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/23/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/23/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/23/2005

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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

IENT: Giant Refining Co
Client Sample ID: MW-4
Job Order: 0510131
Collection Date: 10/12/2005 7:30:00 AM
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-02
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
2,4-Dinitrotoluene	ND	10		µg/L	1	10/23/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/23/2005
Fluoranthene	ND	10		µg/L	1	10/23/2005
Fluorene	ND	10		µg/L	1	10/23/2005
Hexachlorobenzene	ND	10		µg/L	1	10/23/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/23/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/23/2005
Hexachloroethane	ND	10		µg/L	1	10/23/2005
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/23/2005
Isophorone	ND	10		µg/L	1	10/23/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/23/2005
2-Methylphenol	ND	15		µg/L	1	10/23/2005
3+4-Methylphenol	ND	20		µg/L	1	10/23/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/23/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/23/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/23/2005
Naphthalene	ND	10		µg/L	1	10/23/2005
2-Nitroaniline	ND	50		µg/L	1	10/23/2005
3-Nitroaniline	ND	50		µg/L	1	10/23/2005
4-Nitroaniline	ND	20		µg/L	1	10/23/2005
Nitrobenzene	ND	10		µg/L	1	10/23/2005
2-Nitrophenol	ND	15		µg/L	1	10/23/2005
4-Nitrophenol	ND	50		µg/L	1	10/23/2005
Pentachlorophenol	ND	50		µg/L	1	10/23/2005
Phenanthrene	ND	10		µg/L	1	10/23/2005
Phenol	ND	10		µg/L	1	10/23/2005
Pyrene	ND	15		µg/L	1	10/23/2005
Pyridine	ND	30		µg/L	1	10/23/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/23/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/23/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/23/2005
Surr: 2,4,6-Tribromophenol	59.2	16.6-150		%REC	1	10/23/2005
Surr: 2-Fluorobiphenyl	44.1	19.6-134		%REC	1	10/23/2005
Surr: 2-Fluorophenol	41.3	9.54-113		%REC	1	10/23/2005
Surr: 4-Terphenyl-d14	94.8	22.7-145		%REC	1	10/23/2005
Surr: Nitrobenzene-d5	50.0	14.6-134		%REC	1	10/23/2005
Surr: Phenol-d6	22.2	10.7-80.3		%REC	1	10/23/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **CMC**
Specific Conductance	1200	0.010		µmhos/cm	1	10/17/2005
EPA METHOD 245.1: MERCURY						Analyst: **CMC**
Mercury	ND	0.00020		mg/L	1	10/17/2005

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-02

Client Sample ID: MW-4
Collection Date: 10/12/2005 7:30:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 10:13:58 AM
Barium	ND	0.020		mg/L	1	10/27/2005 10:13:58 AM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 10:13:58 AM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 10:13:58 AM
Chromium	ND	0.0060		mg/L	1	10/27/2005 10:13:58 AM
Cobalt	ND	0.0060		mg/L	1	10/27/2005 10:13:58 AM
Lead	ND	0.0050		mg/L	1	10/27/2005 10:13:58 AM
Nickel	ND	0.010		mg/L	1	10/27/2005 10:13:58 AM
Selenium	ND	0.020		mg/L	1	10/27/2005 10:13:58 AM
Silver	ND	0.0050		mg/L	1	10/27/2005 10:13:58 AM
Vanadium	ND	0.050		mg/L	1	10/27/2005 10:13:58 AM
Zinc	ND	0.050		mg/L	1	10/27/2005 10:13:58 AM
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 4:38:36 PM
Barium	0.022	0.020		mg/L	1	10/27/2005 4:38:36 PM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 4:38:36 PM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 4:38:36 PM
Calcium	1.8	1.0		mg/L	1	10/27/2005 4:38:36 PM
Chromium	ND	0.0060		mg/L	1	10/27/2005 4:38:36 PM
Cobalt	ND	0.0060		mg/L	1	10/27/2005 4:38:36 PM
Lead	ND	0.0050		mg/L	1	10/28/2005 9:30:18 AM
Magnesium	ND	1.0		mg/L	1	10/27/2005 4:38:36 PM
Nickel	ND	0.010		mg/L	1	10/27/2005 4:38:36 PM
Potassium	ND	1.0		mg/L	1	10/27/2005 4:38:36 PM
Selenium	ND	0.050		mg/L	1	10/27/2005 4:38:36 PM
Silver	ND	0.0050		mg/L	1	10/27/2005 4:38:36 PM
Sodium	280	10		mg/L	10	10/28/2005 10:23:59 AM
Vanadium	ND	0.050		mg/L	1	10/27/2005 4:38:36 PM
Zinc	ND	0.050		mg/L	1	10/27/2005 4:38:36 PM
EPA METHOD 150.1: PH						Analyst: **TES**
pH	8.80	0.010		pH units	1	10/18/2005

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: *04-Nov-05*

IENT: Giant Refining Co
Client Sample ID: MW-5
Lab Order: 0510131
Collection Date: 10/11/2005 2:00:00 PM
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-03
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	0.78	0.10		mg/L	1	10/14/2005
Chloride	56	0.50		mg/L	5	10/24/2005
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	10/14/2005
Sulfate	160	2.5		mg/L	5	10/24/2005
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	10/14/2005
EPA METHOD 8015B: DIESEL RANGE						Analyst: **SCC**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	10/18/2005 6:22:50 PM
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	10/18/2005 6:22:50 PM
Surr: DNOP	127	58-140		%REC	1	10/18/2005 6:22:50 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	10/19/2005 12:23:41 AM
Surr: BFB	100	79.7-118		%REC	1	10/19/2005 12:23:41 AM
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/23/2005
Toluene	ND	1.0		µg/L	1	10/23/2005
Ethylbenzene	ND	1.0		µg/L	1	10/23/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2005
Naphthalene	ND	2.0		µg/L	1	10/23/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
Acetone	ND	10		µg/L	1	10/23/2005
Bromobenzene	ND	1.0		µg/L	1	10/23/2005
Bromochloromethane	ND	1.0		µg/L	1	10/23/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2005
Bromoform	ND	1.0		µg/L	1	10/23/2005
Bromomethane	ND	2.0		µg/L	1	10/23/2005
2-Butanone	ND	10		µg/L	1	10/23/2005
Carbon disulfide	ND	10		µg/L	1	10/23/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/23/2005
Chlorobenzene	ND	1.0		µg/L	1	10/23/2005
Chloroethane	ND	2.0		µg/L	1	10/23/2005
Chloroform	ND	1.0		µg/L	1	10/23/2005
Chloromethane	ND	1.0		µg/L	1	10/23/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005

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: *04-Nov-05*

.IENT: Giant Refining Co
.b Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-03

Client Sample ID: MW-5
Collection Date: 10/11/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2005
Dibromomethane	ND	2.0		µg/L	1	10/23/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2005
2-Hexanone	ND	10		µg/L	1	10/23/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2005
Methylene Chloride	ND	3.0		µg/L	1	10/23/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
Styrene	ND	1.0		µg/L	1	10/23/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2005
Vinyl chloride	ND	1.0		µg/L	1	10/23/2005
Xylenes, Total	ND	1.0		µg/L	1	10/23/2005
Surr: 1,2-Dichloroethane-d4	95.5	69.9-130		%REC	1	10/23/2005
Surr: 4-Bromofluorobenzene	104	71.2-123		%REC	1	10/23/2005

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

Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-03

Client Sample ID: MW-5
Collection Date: 10/11/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Surr: Dibromofluoromethane	95.5	73.9-134		%REC	1	10/23/2005
Surr: Toluene-d8	98.9	81.9-122		%REC	1	10/23/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
Acenaphthene	ND	10		µg/L	1	10/23/2005
Acenaphthylene	ND	10		µg/L	1	10/23/2005
Aniline	ND	20		µg/L	1	10/23/2005
Anthracene	ND	10		µg/L	1	10/23/2005
Azobenzene	ND	10		µg/L	1	10/23/2005
Benz(a)anthracene	ND	15		µg/L	1	10/23/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/23/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/23/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/23/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/23/2005
Benzoic acid	ND	50		µg/L	1	10/23/2005
Benzyl alcohol	ND	20		µg/L	1	10/23/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/23/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/23/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	10/23/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/23/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/23/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/23/2005
Carbazole	ND	10		µg/L	1	10/23/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/23/2005
4-Chloroaniline	ND	20		µg/L	1	10/23/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/23/2005
2-Chlorophenol	ND	10		µg/L	1	10/23/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/23/2005
Chrysene	ND	15		µg/L	1	10/23/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/23/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/23/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/23/2005
Dibenzofuran	ND	10		µg/L	1	10/23/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/23/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/23/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/23/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/23/2005
Diethyl phthalate	ND	10		µg/L	1	10/23/2005
Dimethyl phthalate	ND	10		µg/L	1	10/23/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/23/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/23/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/23/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/23/2005

Qualifiers:
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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: *04-Nov-05*

IENT: Giant Refining Co
Client Sample ID: MW-5
Lab Order: 0510131
Collection Date: 10/11/2005 2:00:00 PM
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-03
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
2,4-Dinitrotoluene	ND	10		µg/L	1	10/23/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/23/2005
Fluoranthene	ND	10		µg/L	1	10/23/2005
Fluorene	ND	10		µg/L	1	10/23/2005
Hexachlorobenzene	ND	10		µg/L	1	10/23/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/23/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/23/2005
Hexachloroethane	ND	10		µg/L	1	10/23/2005
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/23/2005
Isophorone	ND	10		µg/L	1	10/23/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/23/2005
2-Methylphenol	ND	15		µg/L	1	10/23/2005
3+4-Methylphenol	ND	20		µg/L	1	10/23/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/23/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/23/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/23/2005
Naphthalene	ND	10		µg/L	1	10/23/2005
2-Nitroaniline	ND	50		µg/L	1	10/23/2005
3-Nitroaniline	ND	50		µg/L	1	10/23/2005
4-Nitroaniline	ND	20		µg/L	1	10/23/2005
Nitrobenzene	ND	10		µg/L	1	10/23/2005
2-Nitrophenol	ND	15		µg/L	1	10/23/2005
4-Nitrophenol	ND	50		µg/L	1	10/23/2005
Pentachlorophenol	ND	50		µg/L	1	10/23/2005
Phenanthrene	ND	10		µg/L	1	10/23/2005
Phenol	ND	10		µg/L	1	10/23/2005
Pyrene	ND	15		µg/L	1	10/23/2005
Pyridine	ND	30		µg/L	1	10/23/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/23/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/23/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/23/2005
Surr: 2,4,6-Tribromophenol	59.4	16.6-150		%REC	1	10/23/2005
Surr: 2-Fluorobiphenyl	43.5	19.6-134		%REC	1	10/23/2005
Surr: 2-Fluorophenol	31.4	9.54-113		%REC	1	10/23/2005
Surr: 4-Terphenyl-d14	97.4	22.7-145		%REC	1	10/23/2005
Surr: Nitrobenzene-d5	51.7	14.6-134		%REC	1	10/23/2005
Surr: Phenol-d6	16.3	10.7-80.3		%REC	1	10/23/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **CMC**
Specific Conductance	1200	0.010		µmhos/cm	1	10/17/2005
EPA METHOD 245.1: MERCURY						Analyst: **CMC**
Mercury	ND	0.00020		mg/L	1	10/17/2005

Qualifiers:
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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: *04-Nov-05*

LIENT: Giant Refining Co
ab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-03

Client Sample ID: MW-5
Collection Date: 10/11/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 10:18:09 AM
Barium	ND	0.020		mg/L	1	10/27/2005 10:18:09 AM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 10:18:09 AM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 10:18:09 AM
Chromium	ND	0.0060		mg/L	1	10/27/2005 10:18:09 AM
Cobalt	ND	0.0060		mg/L	1	10/27/2005 10:18:09 AM
Lead	ND	0.0050		mg/L	1	10/27/2005 10:18:09 AM
Nickel	ND	0.010		mg/L	1	10/27/2005 10:18:09 AM
Selenium	ND	0.020		mg/L	1	10/27/2005 10:18:09 AM
Silver	ND	0.0050		mg/L	1	10/27/2005 10:18:09 AM
Vanadium	ND	0.050		mg/L	1	10/27/2005 10:18:09 AM
Zinc	ND	0.050		mg/L	1	10/27/2005 10:18:09 AM
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 4:42:45 PM
Barium	ND	0.020		mg/L	1	10/27/2005 4:42:45 PM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 4:42:45 PM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 4:42:45 PM
Calcium	1.5	1.0		mg/L	1	10/27/2005 4:42:45 PM
Chromium	ND	0.0060		mg/L	1	10/27/2005 4:42:45 PM
Cobalt	ND	0.0060		mg/L	1	10/27/2005 4:42:45 PM
Lead	ND	0.0050		mg/L	1	10/28/2005 9:32:09 AM
Magnesium	ND	1.0		mg/L	1	10/27/2005 4:42:45 PM
Nickel	ND	0.010		mg/L	1	10/27/2005 4:42:45 PM
Potassium	ND	1.0		mg/L	1	10/27/2005 4:42:45 PM
Selenium	ND	0.050		mg/L	1	10/27/2005 4:42:45 PM
Silver	ND	0.0050		mg/L	1	10/27/2005 4:42:45 PM
Sodium	250	10		mg/L	10	10/28/2005 10:26:43 AM
Vanadium	ND	0.050		mg/L	1	10/27/2005 4:42:45 PM
Zinc	ND	0.050		mg/L	1	10/27/2005 4:42:45 PM
EPA METHOD 150.1: PH						Analyst: **TES**
pH	9.07	0.010		pH units	1	10/18/2005

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: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-04

Client Sample ID: SMW-2
Collection Date: 10/12/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	0.74	0.10		mg/L	1	10/14/2005
Chloride	1700	5.0		mg/L	50	10/24/2005
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	10/14/2005
Sulfate	1500	25		mg/L	50	10/24/2005
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	10/14/2005
EPA METHOD 8015B: DIESEL RANGE						Analyst: **SCC**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	10/18/2005 6:55:20 PM
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	10/18/2005 6:55:20 PM
Surr: DNOP	110	58-140		%REC	1	10/18/2005 6:55:20 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	0.51	0.10		mg/L	2	10/19/2005 2:08:42 PM
Surr: BFB	103	79.7-118		%REC	2	10/19/2005 2:08:42 PM
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/23/2005
Toluene	ND	1.0		µg/L	1	10/23/2005
Ethylbenzene	ND	1.0		µg/L	1	10/23/2005
Methyl tert-butyl ether (MTBE)	8.3	1.0		µg/L	1	10/23/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2005
Naphthalene	ND	2.0		µg/L	1	10/23/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
Acetone	ND	10		µg/L	1	10/23/2005
Bromobenzene	ND	1.0		µg/L	1	10/23/2005
Bromochloromethane	ND	1.0		µg/L	1	10/23/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2005
Bromoform	ND	1.0		µg/L	1	10/23/2005
Bromomethane	ND	2.0		µg/L	1	10/23/2005
2-Butanone	ND	10		µg/L	1	10/23/2005
Carbon disulfide	ND	10		µg/L	1	10/23/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/23/2005
Chlorobenzene	ND	1.0		µg/L	1	10/23/2005
Chloroethane	ND	2.0		µg/L	1	10/23/2005
Chloroform	ND	1.0		µg/L	1	10/23/2005
Chloromethane	ND	1.0		µg/L	1	10/23/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005

Qualifiers:
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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

Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-04

Client Sample ID: SMW-2
Collection Date: 10/12/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2005
Dibromomethane	ND	2.0		µg/L	1	10/23/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2005
2-Hexanone	ND	10		µg/L	1	10/23/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2005
Methylene Chloride	ND	3.0		µg/L	1	10/23/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
Styrene	ND	1.0		µg/L	1	10/23/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2005
Vinyl chloride	ND	1.0		µg/L	1	10/23/2005
Xylenes, Total	ND	1.0		µg/L	1	10/23/2005
Surr: 1,2-Dichloroethane-d4	102	69.9-130		%REC	1	10/23/2005
Surr: 4-Bromofluorobenzene	97.6	71.2-123		%REC	1	10/23/2005

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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

LIENT: Giant Refining Co
ab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-04

Client Sample ID: SMW-2
Collection Date: 10/12/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Surr: Dibromofluoromethane	99.7	73.9-134		%REC	1	10/23/2005
Surr: Toluene-d8	91.0	81.9-122		%REC	1	10/23/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
Acenaphthene	ND	10		µg/L	1	11/2/2005
Acenaphthylene	ND	10		µg/L	1	11/2/2005
Aniline	ND	20		µg/L	1	11/2/2005
Anthracene	ND	10		µg/L	1	11/2/2005
Azobenzene	ND	10		µg/L	1	11/2/2005
Benz(a)anthracene	ND	15		µg/L	1	11/2/2005
Benzo(a)pyrene	ND	15		µg/L	1	11/2/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	11/2/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	11/2/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	11/2/2005
Benzoic acid	ND	50		µg/L	1	11/2/2005
Benzyl alcohol	ND	20		µg/L	1	11/2/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	11/2/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	11/2/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	11/2/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	11/2/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	11/2/2005
Butyl benzyl phthalate	ND	15		µg/L	1	11/2/2005
Carbazole	ND	10		µg/L	1	11/2/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	11/2/2005
4-Chloroaniline	ND	20		µg/L	1	11/2/2005
2-Chloronaphthalene	ND	10		µg/L	1	11/2/2005
2-Chlorophenol	ND	10		µg/L	1	11/2/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	11/2/2005
Chrysene	ND	15		µg/L	1	11/2/2005
Di-n-butyl phthalate	ND	10		µg/L	1	11/2/2005
Di-n-octyl phthalate	ND	15		µg/L	1	11/2/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	11/2/2005
Dibenzofuran	ND	10		µg/L	1	11/2/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	11/2/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	11/2/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	11/2/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	11/2/2005
Diethyl phthalate	ND	10		µg/L	1	11/2/2005
Dimethyl phthalate	ND	10		µg/L	1	11/2/2005
2,4-Dichlorophenol	ND	10		µg/L	1	11/2/2005
2,4-Dimethylphenol	ND	10		µg/L	1	11/2/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	11/2/2005
2,4-Dinitrophenol	ND	50		µg/L	1	11/2/2005

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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-04

Client Sample ID: SMW-2
Collection Date: 10/12/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
2,4-Dinitrotoluene	ND	10		µg/L	1	11/2/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	11/2/2005
Fluoranthene	ND	10		µg/L	1	11/2/2005
Fluorene	ND	10		µg/L	1	11/2/2005
Hexachlorobenzene	ND	10		µg/L	1	11/2/2005
Hexachlorobutadiene	ND	10		µg/L	1	11/2/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	11/2/2005
Hexachloroethane	ND	10		µg/L	1	11/2/2005
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	11/2/2005
Isophorone	ND	10		µg/L	1	11/2/2005
2-Methylnaphthalene	ND	10		µg/L	1	11/2/2005
2-Methylphenol	ND	15		µg/L	1	11/2/2005
3+4-Methylphenol	ND	20		µg/L	1	11/2/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	11/2/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	11/2/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	11/2/2005
Naphthalene	ND	10		µg/L	1	11/2/2005
2-Nitroaniline	ND	50		µg/L	1	11/2/2005
3-Nitroaniline	ND	50		µg/L	1	11/2/2005
4-Nitroaniline	ND	20		µg/L	1	11/2/2005
Nitrobenzene	ND	10		µg/L	1	11/2/2005
2-Nitrophenol	ND	15		µg/L	1	11/2/2005
4-Nitrophenol	ND	50		µg/L	1	11/2/2005
Pentachlorophenol	ND	50		µg/L	1	11/2/2005
Phenanthrene	ND	10		µg/L	1	11/2/2005
Phenol	ND	10		µg/L	1	11/2/2005
Pyrene	ND	15		µg/L	1	11/2/2005
Pyridine	ND	30		µg/L	1	11/2/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	11/2/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	11/2/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	11/2/2005
Surr: 2,4,6-Tribromophenol	73.8	16.6-150		%REC	1	11/2/2005
Surr: 2-Fluorobiphenyl	66.9	19.6-134		%REC	1	11/2/2005
Surr: 2-Fluorophenol	52.3	9.54-113		%REC	1	11/2/2005
Surr: 4-Terphenyl-d14	69.8	22.7-145		%REC	1	11/2/2005
Surr: Nitrobenzene-d5	68.1	14.6-134		%REC	1	11/2/2005
Surr: Phenol-d6	40.1	10.7-80.3		%REC	1	11/2/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **CMC**
Specific Conductance	8800	0.010		µmhos/cm	1	10/17/2005
EPA METHOD 245.1: MERCURY						Analyst: **CMC**
Mercury	ND	0.00020		mg/L	1	10/17/2005

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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

LIENT: Giant Refining Co
ab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-04

Client Sample ID: SMW-2
Collection Date: 10/12/2005 2:00:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 10:22:18 AM
Barium	ND	0.020		mg/L	1	10/27/2005 10:22:18 AM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 10:22:18 AM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 10:22:18 AM
Chromium	ND	0.0060		mg/L	1	10/27/2005 10:22:18 AM
Cobalt	0.0072	0.0060		mg/L	1	10/27/2005 10:22:18 AM
Lead	ND	0.0050		mg/L	1	10/27/2005 10:22:18 AM
Nickel	0.035	0.010		mg/L	1	10/27/2005 10:22:18 AM
Selenium	ND	0.020		mg/L	1	10/27/2005 10:22:18 AM
Silver	ND	0.0050		mg/L	1	10/27/2005 10:22:18 AM
Vanadium	ND	0.050		mg/L	1	10/27/2005 10:22:18 AM
Zinc	ND	0.050		mg/L	1	10/27/2005 10:22:18 AM
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 4:46:54 PM
Barium	ND	0.020		mg/L	1	10/27/2005 4:46:54 PM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 4:46:54 PM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 4:46:54 PM
Calcium	180	1.0		mg/L	1	10/27/2005 4:46:54 PM
Chromium	0.024	0.0060		mg/L	1	10/27/2005 4:46:54 PM
Cobalt	ND	0.0060		mg/L	1	10/27/2005 4:46:54 PM
Lead	ND	0.0050		mg/L	1	10/28/2005 9:34:43 AM
Magnesium	58	1.0		mg/L	1	10/27/2005 4:46:54 PM
Nickel	0.029	0.010		mg/L	1	10/27/2005 4:46:54 PM
Potassium	1.4	1.0		mg/L	1	10/27/2005 4:46:54 PM
Selenium	ND	0.050		mg/L	1	10/27/2005 4:46:54 PM
Silver	ND	0.0050		mg/L	1	10/27/2005 4:46:54 PM
Sodium	1900	100		mg/L	100	10/28/2005 2:20:22 PM
Vanadium	ND	0.050		mg/L	1	10/27/2005 4:46:54 PM
Zinc	ND	0.050		mg/L	1	10/27/2005 4:46:54 PM
EPA METHOD 150.1: PH						Analyst: **TES**
pH	7.58	0.010		pH units	1	10/18/2005

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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-05

Client Sample ID: SMW-4
Collection Date: 10/13/2005 11:30:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	1.0	0.10		mg/L	1	10/14/2005
Chloride	51	0.50		mg/L	5	10/24/2005
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	10/14/2005
Sulfate	150	2.5		mg/L	5	10/24/2005
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	10/14/2005
EPA METHOD 8015B: DIESEL RANGE						Analyst: **SCC**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	10/18/2005 7:27:52 PM
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	10/18/2005 7:27:52 PM
Surr: DNOP	113	58-140		%REC	1	10/18/2005 7:27:52 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	10/19/2005 1:26:14 AM
Surr: BFB	98.6	79.7-118		%REC	1	10/19/2005 1:26:14 AM
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/23/2005
Toluene	ND	1.0		µg/L	1	10/23/2005
Ethylbenzene	ND	1.0		µg/L	1	10/23/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2005
Naphthalene	ND	2.0		µg/L	1	10/23/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
Acetone	ND	10		µg/L	1	10/23/2005
Bromobenzene	ND	1.0		µg/L	1	10/23/2005
Bromochloromethane	ND	1.0		µg/L	1	10/23/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2005
Bromoform	ND	1.0		µg/L	1	10/23/2005
Bromomethane	ND	2.0		µg/L	1	10/23/2005
2-Butanone	ND	10		µg/L	1	10/23/2005
Carbon disulfide	ND	10		µg/L	1	10/23/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/23/2005
Chlorobenzene	ND	1.0		µg/L	1	10/23/2005
Chloroethane	ND	2.0		µg/L	1	10/23/2005
Chloroform	ND	1.0		µg/L	1	10/23/2005
Chloromethane	ND	1.0		µg/L	1	10/23/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005

Qualifiers:
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Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

LIENT: Giant Refining Co
ab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-05

Client Sample ID: SMW-4
Collection Date: 10/13/2005 11:30:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2005
Dibromomethane	ND	2.0		µg/L	1	10/23/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2005
2-Hexanone	ND	10		µg/L	1	10/23/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2005
Methylene Chloride	ND	3.0		µg/L	1	10/23/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
Styrene	ND	1.0		µg/L	1	10/23/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2005
Vinyl chloride	ND	1.0		µg/L	1	10/23/2005
Xylenes, Total	ND	1.0		µg/L	1	10/23/2005
Surr: 1,2-Dichloroethane-d4	99.8	69.9-130		%REC	1	10/23/2005
Surr: 4-Bromofluorobenzene	102	71.2-123		%REC	1	10/23/2005

Qualifiers:
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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: *04-Nov-05*

IENT: Giant Refining Co
Client Sample ID: SMW-4
o Order: 0510131
Collection Date: 10/13/2005 11:30:00 AM
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-05
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Surr: Dibromofluoromethane	100	73.9-134		%REC	1	10/23/2005
Surr: Toluene-d8	101	81.9-122		%REC	1	10/23/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
Acenaphthene	ND	10		µg/L	1	10/23/2005
Acenaphthylene	ND	10		µg/L	1	10/23/2005
Aniline	ND	20		µg/L	1	10/23/2005
Anthracene	ND	10		µg/L	1	10/23/2005
Azobenzene	ND	10		µg/L	1	10/23/2005
Benz(a)anthracene	ND	15		µg/L	1	10/23/2005
Benzo(a)pyrene	ND	15		µg/L	1	10/23/2005
Benzo(b)fluoranthene	ND	15		µg/L	1	10/23/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/23/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	10/23/2005
Benzoic acid	ND	50		µg/L	1	10/23/2005
Benzyl alcohol	ND	20		µg/L	1	10/23/2005
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/23/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	10/23/2005
is(2-chloroisopropyl)ether	ND	15		µg/L	1	10/23/2005
is(2-ethylhexyl)phthalate	ND	15		µg/L	1	10/23/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/23/2005
Butyl benzyl phthalate	ND	15		µg/L	1	10/23/2005
Carbazole	ND	10		µg/L	1	10/23/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	10/23/2005
4-Chloroaniline	ND	20		µg/L	1	10/23/2005
2-Chloronaphthalene	ND	10		µg/L	1	10/23/2005
2-Chlorophenol	ND	10		µg/L	1	10/23/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	10/23/2005
Chrysene	ND	15		µg/L	1	10/23/2005
Di-n-butyl phthalate	ND	10		µg/L	1	10/23/2005
Di-n-octyl phthalate	ND	15		µg/L	1	10/23/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/23/2005
Dibenzofuran	ND	10		µg/L	1	10/23/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	10/23/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	10/23/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	10/23/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	10/23/2005
Diethyl phthalate	ND	10		µg/L	1	10/23/2005
Dimethyl phthalate	ND	10		µg/L	1	10/23/2005
2,4-Dichlorophenol	ND	10		µg/L	1	10/23/2005
2,4-Dimethylphenol	ND	10		µg/L	1	10/23/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	10/23/2005
2,4-Dinitrophenol	ND	50		µg/L	1	10/23/2005

ualifiers:
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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-05

Client Sample ID: SMW-4
Collection Date: 10/13/2005 11:30:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
2,4-Dinitrotoluene	ND	10		µg/L	1	10/23/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	10/23/2005
Fluoranthene	ND	10		µg/L	1	10/23/2005
Fluorene	ND	10		µg/L	1	10/23/2005
Hexachlorobenzene	ND	10		µg/L	1	10/23/2005
Hexachlorobutadiene	ND	10		µg/L	1	10/23/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/23/2005
Hexachloroethane	ND	10		µg/L	1	10/23/2005
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/23/2005
Isophorone	ND	10		µg/L	1	10/23/2005
2-Methylnaphthalene	ND	10		µg/L	1	10/23/2005
2-Methylphenol	ND	15		µg/L	1	10/23/2005
3+4-Methylphenol	ND	20		µg/L	1	10/23/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/23/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	10/23/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/23/2005
Naphthalene	ND	10		µg/L	1	10/23/2005
2-Nitroaniline	ND	50		µg/L	1	10/23/2005
3-Nitroaniline	ND	50		µg/L	1	10/23/2005
4-Nitroaniline	ND	20		µg/L	1	10/23/2005
Nitrobenzene	ND	10		µg/L	1	10/23/2005
2-Nitrophenol	ND	15		µg/L	1	10/23/2005
4-Nitrophenol	ND	50		µg/L	1	10/23/2005
Pentachlorophenol	ND	50		µg/L	1	10/23/2005
Phenanthrene	ND	10		µg/L	1	10/23/2005
Phenol	ND	10		µg/L	1	10/23/2005
Pyrene	ND	15		µg/L	1	10/23/2005
Pyridine	ND	30		µg/L	1	10/23/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/23/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/23/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	10/23/2005
Surr: 2,4,6-Tribromophenol	55.5	16.6-150		%REC	1	10/23/2005
Surr: 2-Fluorobiphenyl	45.8	19.6-134		%REC	1	10/23/2005
Surr: 2-Fluorophenol	28.8	9.54-113		%REC	1	10/23/2005
Surr: 4-Terphenyl-d14	80.2	22.7-145		%REC	1	10/23/2005
Surr: Nitrobenzene-d5	47.2	14.6-134		%REC	1	10/23/2005
Surr: Phenol-d6	16.3	10.7-80.3		%REC	1	10/23/2005
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **CMC**
Specific Conductance	1200	0.010		µmhos/cm	1	10/17/2005
EPA METHOD 245.1: MERCURY						Analyst: **CMC**
Mercury	ND	0.00020		mg/L	1	10/17/2005

Qualifiers:
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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

IENT: Giant Refining Co
Client Sample ID: SMW-4
ab Order: 0510131
Collection Date: 10/13/2005 11:30:00 AM
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-05
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 10:26:56 AM
Barium	ND	0.020		mg/L	1	10/27/2005 10:26:56 AM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 10:26:56 AM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 10:26:56 AM
Chromium	ND	0.0060		mg/L	1	10/27/2005 10:26:56 AM
Cobalt	ND	0.0060		mg/L	1	10/27/2005 10:26:56 AM
Lead	ND	0.0050		mg/L	1	10/27/2005 10:26:56 AM
Nickel	ND	0.010		mg/L	1	10/27/2005 10:26:56 AM
Selenium	ND	0.020		mg/L	1	10/27/2005 10:26:56 AM
Silver	ND	0.0050		mg/L	1	10/27/2005 10:26:56 AM
Vanadium	0.052	0.050		mg/L	1	10/27/2005 10:26:56 AM
Zinc	ND	0.050		mg/L	1	10/27/2005 10:26:56 AM
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	10/27/2005 5:00:25 PM
Barium	ND	0.020		mg/L	1	10/27/2005 5:00:25 PM
Beryllium	ND	0.0030		mg/L	1	10/27/2005 5:00:25 PM
Cadmium	ND	0.0020		mg/L	1	10/27/2005 5:00:25 PM
Calcium	3.2	1.0		mg/L	1	10/27/2005 5:00:25 PM
Chromium	ND	0.0060		mg/L	1	10/27/2005 5:00:25 PM
Cobalt	ND	0.0060		mg/L	1	10/27/2005 5:00:25 PM
Lead	ND	0.0050		mg/L	1	10/28/2005 9:46:19 AM
Magnesium	ND	1.0		mg/L	1	10/27/2005 5:00:25 PM
Nickel	ND	0.010		mg/L	1	10/27/2005 5:00:25 PM
Potassium	ND	1.0		mg/L	1	10/27/2005 5:00:25 PM
Selenium	ND	0.050		mg/L	1	10/27/2005 5:00:25 PM
Silver	ND	0.0050		mg/L	1	10/27/2005 5:00:25 PM
Sodium	300	10		mg/L	10	10/28/2005 10:31:28 AM
Vanadium	ND	0.050		mg/L	1	10/27/2005 5:00:25 PM
Zinc	ND	0.050		mg/L	1	10/27/2005 5:00:25 PM
EPA METHOD 150.1: PH						Analyst: **TES**
pH	8.66	0.010		pH units	1	10/18/2005

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

Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-06

Client Sample ID: Trip Blank
Collection Date:
Matrix: TRIP BLANK

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	10/19/2005 1:57:24 AM
Surr: BFB	105	79.7-118		%REC	1	10/19/2005 1:57:24 AM
EPA METHOD 8260B: VOLATILES						Analyst: **HLM**
Benzene	ND	1.0		µg/L	1	10/23/2005
Toluene	ND	1.0		µg/L	1	10/23/2005
Ethylbenzene	ND	1.0		µg/L	1	10/23/2005
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2005
Naphthalene	ND	2.0		µg/L	1	10/23/2005
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2005
Acetone	ND	10		µg/L	1	10/23/2005
Bromobenzene	ND	1.0		µg/L	1	10/23/2005
Bromochloromethane	ND	1.0		µg/L	1	10/23/2005
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2005
Bromoform	ND	1.0		µg/L	1	10/23/2005
Bromomethane	ND	2.0		µg/L	1	10/23/2005
2-Butanone	ND	10		µg/L	1	10/23/2005
Carbon disulfide	ND	10		µg/L	1	10/23/2005
Carbon Tetrachloride	ND	2.0		µg/L	1	10/23/2005
Chlorobenzene	ND	1.0		µg/L	1	10/23/2005
Chloroethane	ND	2.0		µg/L	1	10/23/2005
Chloroform	ND	1.0		µg/L	1	10/23/2005
Chloromethane	ND	1.0		µg/L	1	10/23/2005
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2005
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2005
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2005
Dibromomethane	ND	2.0		µg/L	1	10/23/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2005

Qualifiers:
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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: *04-Nov-05*

CLIENT: Giant Refining Co
Lab Order: 0510131
Project: Ciniza Annual GW Samples 2005
Lab ID: 0510131-06

Client Sample ID: Trip Blank
Collection Date:
Matrix: TRIP BLANK

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2005
2-Hexanone	ND	10		µg/L	1	10/23/2005
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2005
Methylene Chloride	ND	3.0		µg/L	1	10/23/2005
n-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2005
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
Styrene	ND	1.0		µg/L	1	10/23/2005
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2005
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2005
Vinyl chloride	ND	1.0		µg/L	1	10/23/2005
Xylenes, Total	ND	1.0		µg/L	1	10/23/2005
Surr: 1,2-Dichloroethane-d4	103	69.9-130		%REC	1	10/23/2005
Surr: 4-Bromofluorobenzene	103	71.2-123		%REC	1	10/23/2005
Surr: Dibromofluoromethane	102	73.9-134		%REC	1	10/23/2005
Surr: Toluene-d8	98.5	81.9-122		%REC	1	10/23/2005

Qualifiers:
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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

LABORATORY ANALYTICAL REPORT

t: Hall Environmental
ct: 0510131
Lab ID: C05100731-001
Client Sample ID: MW-1

Report Date: 10/27/05
Collection Date: 10/12/05 10:45
Date Received: 10/18/05
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
NON-METALS							
Cyanide, Total Automated	ND	mg/L		0.005		E335.3	10/21/05 10:19 / eli-b
METALS - DISSOLVED							
Antimony	ND	mg/L		0.001		SW6020	10/20/05 06:36 / bws
METALS - TOTAL							
Antimony	ND	mg/L		0.001		SW6020	10/21/05 17:46 / sml

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

nt: Hall Environmental
ect: 0510131
Lab ID: C05100731-002
Client Sample ID: MW-4

Report Date: 10/27/05
Collection Date: 10/12/05 07:30
Date Received: 10/18/05
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
NON-METALS							
Cyanide, Total Automated	ND	mg/L		0.005		E335.3	10/21/05 10:21 / eli-b
METALS - DISSOLVED							
Antimony	ND	mg/L		0.001		SW6020	10/20/05 07:35 / bws
METALS - TOTAL							
Antimony	ND	mg/L		0.001		SW6020	10/21/05 17:52 / sml

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

ıt: Hall Environmental
ect: 0510131
Lab ID: C05100731-003
Client Sample ID: MW-5

Report Date: 10/27/05
Collection Date: 10/11/05 14:00
Date Received: 10/18/05
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
NON-METALS							
Cyanide, Total Automated	ND	mg/L		0.005		E335.3	10/21/05 10:29 / eli-b
METALS - DISSOLVED							
Antimony	ND	mg/L		0.001		SW6020	10/20/05 07:42 / bws
METALS - TOTAL							
Antimony	ND	mg/L		0.001		SW6020	10/21/05 17:59 / sml

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

t: Hall Environmental
ct: 0510131
Lab ID: C05100731-004
Client Sample ID: SMW-2

Report Date: 10/27/05
Collection Date: 10/12/05 14:00
Date Received: 10/18/05
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
NON-METALS							
Cyanide, Total Manual Distillation	ND	mg/L		0.0050		E335.4	10/24/05 14:38 / eli-b
METALS - DISSOLVED							
Antimony	ND	mg/L		0.001		SW6020	10/20/05 07:50 / bws
METALS - TOTAL							
Antimony	ND	mg/L		0.001		SW6020	10/21/05 18:05 / sml

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

nt: Hall Environmental
ject: 0510131
Lab ID: C05100731-005
Client Sample ID: SMW-4

Report Date: 10/27/05
Collection Date: 10/13/05 11:30
Date Received: 10/18/05
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
NON-METALS							
Cyanide, Total Automated	ND	mg/L		0.005		E335.3	10/21/05 10:32 / eli-b
METALS - DISSOLVED							
Antimony	ND	mg/L		0.001		SW6020	10/20/05 07:57 / bws
METALS - TOTAL							
Antimony	ND	mg/L		0.001		SW6020	10/21/05 18:12 / sml

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Hall Environmental
Project: 0510131

Report Date: 10/27/05
Work Order: C05100731

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E335.3								Batch: B_A2005-10-21_4_CN__01	
Sample ID: LFB-4	Laboratory Fortified Blank							10/21/05 08:40	
Cyanide, Total Automated	0.0980	mg/L	0.0050	98	90	110			
Sample ID: MBLK-5	Method Blank							10/21/05 08:42	
Cyanide, Total Automated	ND	mg/L	0.001						
Sample ID: C05100731-002C	Matrix Spike							10/21/05 10:23	
Cyanide, Total Automated	0.104	mg/L	0.0050	104	80	120			
Sample ID: C05100731-002C	Matrix Spike Duplicate							10/21/05 10:25	
Cyanide, Total Automated	0.103	mg/L	0.0050	103	80	120	0.3	10	
Sample ID: B05101131-002EMS	Matrix Spike							10/21/05 10:50	
Cyanide, Total Automated	0.102	mg/L	0.0050	102	80	120			
Sample ID: B05101131-002EMSD	Matrix Spike Duplicate							10/21/05 10:52	
Cyanide, Total Automated	0.105	mg/L	0.0050	105	80	120	3.4	10	
ıple ID: B05101328-001EMS	Matrix Spike							10/21/05 12:07	
nide, Total Automated	0.102	mg/L	0.0050	100	80	120			
Sample ID: B05101328-001EMSD	Matrix Spike Duplicate							10/21/05 12:09	
Cyanide, Total Automated	0.0950	mg/L	0.0050	93.4	80	120	7.1	10	
Method: E335.4								Batch: B_18270	
Sample ID: LFB-4	Laboratory Fortified Blank							10/24/05 14:25	
Cyanide, Total Manual Distillation	0.0921	mg/L	0.0050	92.1	90	110			
Sample ID: LCS-6	Laboratory Control Spike							10/24/05 14:29	
Cyanide, Total Manual Distillation	0.152	mg/L	0.0050	102	90	110			
Sample ID: MBLK-8	Method Blank							10/24/05 14:32	
Cyanide, Total Manual Distillation	ND	mg/L	0.003						
Sample ID: B05101342-002DMS	Matrix Spike							10/24/05 15:14	
Cyanide, Total Manual Distillation	0.111	mg/L	0.0050	106	90	110			
Sample ID: B05101342-002DMSD	Matrix Spike Duplicate							10/24/05 15:16	
Cyanide, Total Manual Distillation	0.111	mg/L	0.0050	106	90	110	0	10	

Qualifiers:

Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Hall Environmental
Project: 0510131

Report Date: 10/27/05
Work Order: C05100731

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Batch: 9320
Sample ID: MB-9320	Method Blank								10/21/05 17:06
Antimony	ND	mg/L	0.00004						
Sample ID: LCS1-9320	Laboratory Control Spike - Low								10/21/05 17:39
Antimony	0.0202	mg/L	0.050	101	75	125			
Sample ID: C05100757-002BMS4	Post Digestion Spike								10/21/05 19:05
Antimony	0.258	mg/L	0.050	103	75	125			
Sample ID: C05100757-002BMSD4	Post Digestion Spike Dup								10/21/05 19:12
Antimony	0.257	mg/L	0.050	102	75	125	0.5	20	
Sample ID: C05100767-001BMS4	Post Digestion Spike								10/21/05 19:45
Antimony	0.262	mg/L	0.050	105	75	125			
- Matrix spike recoveries outside the acceptance criteria of 70 to 130 percent are considered matrix related, not system related. Reported values are within method specifications. (EPA Method 200.8, par. 9.4.4)									
Sample ID: C05100767-001BMSD4	Post Digestion Spike Dup								10/21/05 19:51
Antimony	0.263	mg/L	0.050	105	75	125	0.5	20	
ıtrix spike duplicate recoveries outside the acceptance criteria of 70 to 130 percent are considered matrix related, not system related. Reported values are within hod specifications. (EPA Method 200.8, par. 9.4.4)									
Method: SW6020									Batch: R57057
Sample ID: LRB	Method Blank								10/19/05 16:36
Antimony	0.00009	mg/L	0.00004						
Sample ID: LFB	Laboratory Fortified Blank								10/19/05 16:44
Antimony	0.0513	mg/L	0.0010	102	75	125			
Sample ID: C05100731-001BMS4	Post Digestion Spike								10/20/05 06:43
Antimony	0.0514	mg/L	0.050	103	75	125			
Sample ID: C05100731-001BMSD4	Post Digestion Spike Dup								10/20/05 07:20
Antimony	0.0520	mg/L	0.050	104	75	125	1.2	20	

Qualifiers:

Analyte reporting limit.

ND - Not detected at the reporting limit.

Hall Environmental Analysis Laboratory

Date: 04-Nov-05

CLIENT: Giant Refining Co
Work Order: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID **MBLK** Batch ID: **R16980** Test Code: **E300** Units: **mg/L** Analysis Date **10/14/2005** Prep Date
Client ID: Run ID: **LC_051014A** SeqNo: **411864**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1									
Chloride	ND	0.1									
Phosphorus, Orthophosphate (As P)	ND	0.5									
Sulfate	ND	0.5									
Nitrate (As N)+Nitrite (As N)	ND	0.1									

Sample ID **MBLK** Batch ID: **R16980** Test Code: **E300** Units: **mg/L** Analysis Date **10/14/2005** Prep Date
Client ID: Run ID: **LC_051014A** SeqNo: **411907**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1									
Chloride	ND	0.1									
Phosphorus, Orthophosphate (As P)	ND	0.5									
Sulfate	ND	0.5									
Nitrate (As N)+Nitrite (As N)	ND	0.1									

Sample ID **MBLK** Batch ID: **R17066** Test Code: **E300** Units: **mg/L** Analysis Date **10/24/2005** Prep Date
Client ID: Run ID: **LC_051024A** SeqNo: **414296**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1									
Chloride	ND	0.1									
Phosphorus, Orthophosphate (As P)	ND	0.5									
Sulfate	ND	0.5									
Nitrate (As N)+Nitrite (As N)	ND	0.1									

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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID **MBLK** Batch ID: **R17108** Test Code: **E300** Units: **mg/L** Analysis Date **10/27/2005** Prep Date
Client ID: Run ID: **LC_051027A** SeqNo: **415631**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.1									
Chloride	ND	0.1									
Phosphorus, Orthophosphate (As P)	ND	0.5									
Sulfate	ND	0.5									
Nitrate (As N)+Nitrite (As N)	ND	0.1									

Sample ID **MB-8981** Batch ID: **8981** Test Code: **SW8015** Units: **mg/L** Analysis Date **10/18/2005 3:40:11 PM** Prep Date **10/18/2005**
Client ID: Run ID: **FID(17A) 2_051018A** SeqNo: **412584**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1									
Motor Oil Range Organics (MRO)	ND	5									
Surr: DNOP	1.191	0	1	0	119	58	140	0			

Sample ID **Reagent Blank 5m** Batch ID: **R16999** Test Code: **SW8015** Units: **mg/L** Analysis Date **10/18/2005 8:14:20 AM** Prep Date
Client ID: Run ID: **PIDFID_051018A** SeqNo: **412615**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.05									
Surr: BFB	21.26	0	20	0	106	79.7	118	0			

Sample ID **Reagent Blank 5m** Batch ID: **R17012** Test Code: **SW8015** Units: **mg/L** Analysis Date **10/19/2005 11:33:25 A** Prep Date
Client ID: Run ID: **PIDFID_051019A** SeqNo: **412884**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.05									
Surr: BFB	19.81	0	20	0	99.1	79.7	118	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Method Blank

Sample ID **MB-8970** Batch ID: **8970** Test Code: **SW8270C** Units: **µg/L** Analysis Date **10/21/2005** Prep Date **10/17/2005**
Client ID: Run ID: **ELMO_051019B** SeqNo: **413452**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	10									
Acenaphthylene	ND	10									
Aniline	ND	20									
Anthracene	ND	10									
Azobenzene	ND	10									
Benz(a)anthracene	ND	15									
Benzo(a)pyrene	ND	15									
Benzo(b)fluoranthene	ND	15									
Benzo(g,h,i)perylene	ND	10									
Benzo(k)fluoranthene	ND	10									
Benzoic acid	ND	50									
Benzyl alcohol	ND	20									
Bis(2-chloroethoxy)methane	ND	10									
Bis(2-chloroethyl)ether	ND	15									
Bis(2-chloroisopropyl)ether	ND	15									
Bis(2-ethylhexyl)phthalate	ND	15									
4-Bromophenyl phenyl ether	ND	10									
Butyl benzyl phthalate	ND	15									
Carbazole	ND	10									
4-Chloro-3-methylphenol	ND	20									
4-Chloroaniline	ND	20									
2-Chloronaphthalene	ND	10									
2-Chlorophenol	ND	10									
4-Chlorophenyl phenyl ether	ND	15									
Chrysene	ND	15									
Di-n-butyl phthalate	ND	10									
Di-n-octyl phthalate	ND	15									
Dibenz(a,h)anthracene	ND	10									

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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Method Blank

Dibenzofuran	ND	10
1,2-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
3,3'-Dichlorobenzidine	ND	15
Diethyl phthalate	ND	10
Dimethyl phthalate	ND	10
2,4-Dichlorophenol	ND	10
2,4-Dimethylphenol	ND	10
4,6-Dinitro-2-methylphenol	ND	50
2,4-Dinitrophenol	ND	50
2,4-Dinitrotoluene	ND	10
2,6-Dinitrotoluene	ND	10
Fluoranthene	ND	10
Fluorene	ND	10
Hexachlorobenzene	ND	10
Hexachlorobutadiene	ND	10
Hexachlorocyclopentadiene	ND	10
Hexachloroethane	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Isophorone	ND	10
2-Methylnaphthalene	ND	10
2-Methylphenol	ND	15
3+4-Methylphenol	ND	20
N-Nitrosodi-n-propylamine	ND	10
N-Nitrosodimethylamine	ND	10
N-Nitrosodiphenylamine	ND	10
Naphthalene	ND	10
2-Nitroaniline	ND	50
3-Nitroaniline	ND	50
4-Nitroaniline	ND	20
Nitrobenzene	ND	10
2-Nitrophenol	ND	15

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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

4-Nitrophenol	ND	50						
Pentachlorophenol	ND	50						
Phenanthrene	ND	10						
Phenol	ND	10						
Pyrene	ND	15						
Pyridine	ND	30						
1,2,4-Trichlorobenzene	ND	10						
2,4,5-Trichlorophenol	ND	10						
2,4,6-Trichlorophenol	ND	15						
Surr: 2,4,6-Tribromophenol	111.5	0	200	0	55.7	16.6	150	0
Surr: 2-Fluorobiphenyl	44.82	0	100	0	44.8	19.6	134	0
Surr: 2-Fluorophenol	84.78	0	200	0	42.4	9.54	113	0
Surr: 4-Terphenyl-d14	72.68	0	100	0	72.7	22.7	145	0
Surr: Nitrobenzene-d5	51.52	0	100	0	51.5	14.6	134	0
Surr: Phenol-d6	55.46	0	200	0	27.7	10.7	80.3	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Method Blank

Sample ID **MB-9051** Batch ID: **9051** Test Code: **SW8270C** Units: **µg/L** Analysis Date **11/2/2005** Prep Date **10/26/2005**
Client ID: Run ID: **ELMO_051102A** SeqNo: **418017**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	10									
Acenaphthylene	ND	10									
Aniline	ND	20									
Anthracene	ND	10									
Azobenzene	ND	10									
Benz(a)anthracene	ND	15									
Benzo(a)pyrene	ND	15									
Benzo(b)fluoranthene	ND	15									
Benzo(g,h,i)perylene	ND	10									
Benzo(k)fluoranthene	ND	10									
Benzoic acid	ND	50									
Benzyl alcohol	ND	20									
Bis(2-chloroethoxy)methane	ND	10									
Bis(2-chloroethyl)ether	ND	15									
Bis(2-chloroisopropyl)ether	ND	15									
Bis(2-ethylhexyl)phthalate	ND	15									
4-Bromophenyl phenyl ether	ND	10									
Butyl benzyl phthalate	ND	15									
Carbazole	ND	10									
4-Chloro-3-methylphenol	ND	20									
4-Chloroaniline	ND	20									
2-Chloronaphthalene	ND	10									
2-Chlorophenol	ND	10									
4-Chlorophenyl phenyl ether	ND	15									
Chrysene	ND	15									
Di-n-butyl phthalate	ND	10									
Di-n-octyl phthalate	7.52	15									J
Dibenz(a,h)anthracene	8.22	10									J

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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Method Blank

Dibenzofuran	ND	10
1,2-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
3,3'-Dichlorobenzidine	ND	15
Diethyl phthalate	ND	10
Dimethyl phthalate	ND	10
2,4-Dichlorophenol	ND	10
2,4-Dimethylphenol	ND	10
4,6-Dinitro-2-methylphenol	ND	50
2,4-Dinitrophenol	ND	50
2,4-Dinitrotoluene	ND	10
2,6-Dinitrotoluene	ND	10
Fluoranthene	ND	10
Fluorene	ND	10
Hexachlorobenzene	ND	10
Hexachlorobutadiene	ND	10
Hexachlorocyclopentadiene	ND	10
Hexachloroethane	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Isophorone	ND	10
2-Methylnaphthalene	ND	10
2-Methylphenol	ND	15
3+4-Methylphenol	ND	20
N-Nitrosodi-n-propylamine	ND	10
N-Nitrosodimethylamine	ND	10
N-Nitrosodiphenylamine	ND	10
Naphthalene	ND	10
2-Nitroaniline	ND	50
3-Nitroaniline	ND	50
4-Nitroaniline	ND	20
Nitrobenzene	ND	10
2-Nitrophenol	ND	15

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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Method Blank

4-Nitrophenol	ND	50						
Pentachlorophenol	ND	50						
Phenanthrene	ND	10						
Phenol	ND	10						
Pyrene	ND	15						
Pyridine	ND	30						
1,2,4-Trichlorobenzene	ND	10						
2,4,5-Trichlorophenol	ND	10						
2,4,6-Trichlorophenol	ND	15						
Surr: 2,4,6-Tribromophenol	126.4	0	200	0	63.2	16.6	150	0
Surr: 2-Fluorobiphenyl	64.88	0	100	0	64.9	19.6	134	0
Surr: 2-Fluorophenol	120.1	0	200	0	60.1	9.54	113	0
Surr: 4-Terphenyl-d14	72.42	0	100	0	72.4	22.7	145	0
Surr: Nitrobenzene-d5	69.08	0	100	0	69.1	14.6	134	0
Surr: Phenol-d6	85.88	0	200	0	42.9	10.7	80.3	0

Sample ID **MB-8964** Batch ID: **8964** Test Code: **SW7470** Units: **mg/L** Analysis Date **10/14/2005** Prep Date **10/14/2005**
Client ID: Run ID: **MI-LA254_051014A** SeqNo: **411533**

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

Sample ID **MB-8972** Batch ID: **8972** Test Code: **SW7470** Units: **mg/L** Analysis Date **10/17/2005** Prep Date **10/17/2005**
Client ID: Run ID: **MI-LA254_051117A** SeqNo: **412256**

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
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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Method Blank

Sample ID **MB** Batch ID: **R17096** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/27/2005 9:03:42 AM** Prep Date
Client ID: Run ID: **ICP_051026B** SeqNo: **415364**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.02									
Barium	ND	0.02									
Beryllium	ND	0.003									
Cadmium	ND	0.002									
Chromium	ND	0.006									
Cobalt	ND	0.006									
Lead	ND	0.005									
Nickel	ND	0.01									
Selenium	ND	0.02									
Silver	ND	0.005									
Vanadium	ND	0.05									
Zinc	ND	0.05									
Yttrium	103.1	0									
Yttrium Radial	102.4	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID **MB-9044** Batch ID: **9044** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/27/2005 4:15:57 PM** Prep Date **10/25/2005**
Client ID: Run ID: **ICP_051027A** SeqNo: **415916**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.02									
Barium	ND	0.02									
Beryllium	0.000151	0.003									J
Cadmium	ND	0.002									
Calcium	ND	1									
Chromium	ND	0.006									
Cobalt	ND	0.006									
Magnesium	ND	1									
Nickel	ND	0.01									
Potassium	0.1242	1									J
Selenium	ND	0.05									
Silver	ND	0.005									
Sodium	ND	1									
Vanadium	ND	0.05									
Zinc	ND	0.05									

Sample ID **MB-9044** Batch ID: **9044** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/28/2005 9:04:57 AM** Prep Date **10/25/2005**
Client ID: Run ID: **ICP_051027A** SeqNo: **415951**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.005									

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: 04-Nov-05

CLIENT: Giant Refining Co
Work Order: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Method Blank

Sample ID **5ml rb** Batch ID: **R17048** Test Code: **SW8260B** Units: **µg/L** Analysis Date **10/23/2005** Prep Date

Client ID: Run ID: **VAL_051021D** SeqNo: **413813**

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	2									
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; 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: 0510131
Project: Ciniza Annual GW Samples 2005

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: 0510131
Project: Ciniza Annual GW Samples 2005

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	9.966	0	10	0	99.7	69.9	130	0
Surr: 4-Bromofluorobenzene	11.31	0	10	0	113	71.2	123	0
Surr: Dibromofluoromethane	9.9	0	10	0	99.0	73.9	134	0
Surr: Toluene-d8	9.656	0	10	0	96.6	81.9	122	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

Hall Environmental Analysis Laboratory

Date: *04-Nov-05*

CLIENT: Giant Refining Co
Work Order: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **LCS-ST300-05022** Batch ID: **R16980** Test Code: **E300** Units: **mg/L** Analysis Date **10/14/2005** Prep Date
Client ID: Run ID: **LC_051014A** SeqNo: **411865**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.4716	0.1	0.5	0	94.3	90	110	0			
Chloride	4.577	0.1	5	0	91.5	90	110	0			
Phosphorus, Orthophosphate (As P)	4.599	0.5	5	0	92.0	90	110	0			
Sulfate	9.233	0.5	10	0	92.3	90	110	0			
Nitrate (As N)+Nitrite (As N)	3.247	0.1	3.5	0	92.8	90	110	0			

Sample ID **LCS** Batch ID: **R16980** Test Code: **E300** Units: **mg/L** Analysis Date **10/14/2005** Prep Date
Client ID: Run ID: **LC_051014A** SeqNo: **411908**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.465	0.1	0.5	0	93.0	90	110	0			
Chloride	4.5	0.1	5	0	90.0	90	110	0			
Phosphorus, Orthophosphate (As P)	3.719	0.5	5	0	74.4	90	110	0			S
Sulfate	9.51	0.5	10	0	95.1	90	110	0			
Nitrate (As N)+Nitrite (As N)	3.155	0.1	3.5	0	90.1	90	110	0			

Sample ID **LCS-ST300-05022** Batch ID: **R17066** Test Code: **E300** Units: **mg/L** Analysis Date **10/24/2005** Prep Date
Client ID: Run ID: **LC_051024A** SeqNo: **414301**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.5209	0.1	0.5	0	104	90	110	0			
Chloride	4.625	0.1	5	0	92.5	90	110	0			
Phosphorus, Orthophosphate (As P)	4.628	0.5	5	0	92.6	90	110	0			
Sulfate	9.36	0.5	10	0	93.6	90	110	0			
Nitrate (As N)+Nitrite (As N)	3.256	0.1	3.5	0	93.0	90	110	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **LCS-ST300-05022** Batch ID: **R17108** Test Code: **E300** Units: **mg/L** Analysis Date **10/27/2005** Prep Date
Client ID: Run ID: **LC_051027A** SeqNo: **415632**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.4951	0.1	0.5	0	99.0	90	110	0			
Chloride	4.834	0.1	5	0	96.7	90	110	0			
Phosphorus, Orthophosphate (As P)	4.977	0.5	5	0	99.5	90	110	0			
Sulfate	9.814	0.5	10	0	98.1	90	110	0			
Nitrate (As N)+Nitrite (As N)	3.406	0.1	3.5	0	97.3	90	110	0			

Sample ID **LCS-8981** Batch ID: **8981** Test Code: **SW8015** Units: **mg/L** Analysis Date **10/18/2005 4:12:55 PM** Prep Date **10/18/2005**
Client ID: Run ID: **FID(17A) 2_051018A** SeqNo: **412585**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.282	1	5	0	106	81.2	149	0			

Sample ID **LCSD-8981** Batch ID: **8981** Test Code: **SW8015** Units: **mg/L** Analysis Date **10/18/2005 4:45:30 PM** Prep Date **10/18/2005**
Client ID: Run ID: **FID(17A) 2_051018A** SeqNo: **412586**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.907	1	5	0	118	81.2	149	5.282	11.2	23	

Sample ID **GRO lcs 2.5ug** Batch ID: **R16999** Test Code: **SW8015** Units: **mg/L** Analysis Date **10/18/2005 5:05:16 PM** Prep Date
Client ID: Run ID: **PIDFID_051018A** SeqNo: **412616**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.5124	0.05	0.5	0	102	82.6	114	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **GRO lcs 2.5ug** Batch ID: **R17012** Test Code: **SW8015** Units: **mg/L** Analysis Date **10/19/2005 11:59:33 P** Prep Date
Client ID: Run ID: **PIDFID_051019A** SeqNo: **412885**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.447	0.05	0.5	0	89.4	82.6	114	0			

Sample ID **100ng lcs** Batch ID: **R17048** Test Code: **SW8260B** Units: **µg/L** Analysis Date **10/23/2005** Prep Date
Client ID: Run ID: **VAL_051021D** SeqNo: **413814**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	22.17	1	20	0	111	79.3	136	0			
Toluene	17.62	1	20	0	88.1	65.5	123	0			
Chlorobenzene	20.56	1	20	0	103	85.6	126	0			
1,1-Dichloroethene	22.25	1	20	0	111	72.7	135	0			
Trichloroethene (TCE)	19.68	1	20	0	98.4	85.6	119	0			

Sample ID **LCS-8970** Batch ID: **8970** Test Code: **SW8270C** Units: **µg/L** Analysis Date **10/21/2005** Prep Date **10/17/2005**
Client ID: Run ID: **ELMO_051019B** SeqNo: **413453**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	83.66	10	100	0	83.7	11	123	0			
4-Chloro-3-methylphenol	155.3	20	200	0	77.6	15.4	119	0			
2-Chlorophenol	147.1	10	200	0	73.6	12.2	122	0			
1,4-Dichlorobenzene	65.28	10	100	0	65.3	16.9	100	0			
2,4-Dinitrotoluene	81.84	10	100	0	81.8	13	138	0			
N-Nitrosodi-n-propylamine	76.12	10	100	0	76.1	9.93	122	0			
4-Nitrophenol	69.32	50	200	0	34.7	-20.5	87.4	0			
Pentachlorophenol	140.7	50	200	0	70.3	-0.355	114	0			
Phenol	80.56	10	200	0	40.3	7.53	73.1	0			
Pyrene	81.62	15	100	0	81.6	12.6	140	0			
1,2,4-Trichlorobenzene	64.44	10	100	0	64.4	17.4	98.7	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID **LCSD-8970** Batch ID: **8970** Test Code: **SW8270C** Units: **µg/L** Analysis Date **10/21/2005** Prep Date **10/17/2005**
Client ID: Run ID: **ELMO_051019B** SeqNo: **413454**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	66.84	10	100	0	66.8	11	123	83.66	22.4	30.5	
4-Chloro-3-methylphenol	119.7	20	200	0	59.8	15.4	119	155.3	25.9	28.6	
2-Chlorophenol	112.7	10	200	0	56.3	12.2	122	147.1	26.5	107	
1,4-Dichlorobenzene	52.08	10	100	0	52.1	16.9	100	65.28	22.5	62.1	
2,4-Dinitrotoluene	67.34	10	100	0	67.3	13	138	81.84	19.4	14.7	R
N-Nitrosodi-n-propylamine	58.6	10	100	0	58.6	9.93	122	76.12	26.0	30.3	
4-Nitrophenol	55.8	50	200	0	27.9	12.5	87.4	69.32	21.6	36.3	
Pentachlorophenol	117.4	50	200	0	58.7	3.55	114	140.7	18.0	49	
Phenol	65.2	10	200	0	32.6	7.53	73.1	80.56	21.1	52.4	
Pyrene	68.92	15	100	0	68.9	12.6	140	81.62	16.9	16.3	R
1,2,4-Trichlorobenzene	49.52	10	100	0	49.5	17.4	98.7	64.44	26.2	36.4	

Sample ID **LCS-9051** Batch ID: **9051** Test Code: **SW8270C** Units: **µg/L** Analysis Date **11/2/2005** Prep Date **10/26/2005**
Client ID: Run ID: **ELMO_051102A** SeqNo: **418018**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	79.16	10	100	0	79.2	11	123	0			
4-Chloro-3-methylphenol	158	20	200	0	79.0	15.4	119	0			
2-Chlorophenol	153.3	10	200	0	76.7	12.2	122	0			
1,4-Dichlorobenzene	67	10	100	0	67.0	16.9	100	0			
2,4-Dinitrotoluene	74.26	10	100	0	74.3	13	138	0			
N-Nitrosodi-n-propylamine	73.86	10	100	0	73.9	9.93	122	0			
4-Nitrophenol	61.86	50	200	0	30.9	-20.5	87.4	0			
Pentachlorophenol	106.2	50	200	0	53.1	-0.355	114	0			
Phenol	84.98	10	200	0	42.5	7.53	73.1	0			
Pyrene	80.64	15	100	0	80.6	12.6	140	0			
1,2,4-Trichlorobenzene	67.22	10	100	0	67.2	17.4	98.7	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID **LCSD-9051** Batch ID: **9051** Test Code: **SW8270C** Units: **µg/L** Analysis Date **11/2/2005** Prep Date **10/26/2005**
Client ID: Run ID: **ELMO_051102A** SeqNo: **418019**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	76.02	10	100	0	76.0	11	123	79.16	4.05	30.5	
4-Chloro-3-methylphenol	133.5	20	200	0	66.8	15.4	119	158	16.8	28.6	
2-Chlorophenol	140.5	10	200	0	70.3	12.2	122	153.3	8.71	107	
1,4-Dichlorobenzene	64.54	10	100	0	64.5	16.9	100	67	3.74	62.1	
2,4-Dinitrotoluene	71.52	10	100	0	71.5	13	138	74.26	3.76	14.7	
N-Nitrosodi-n-propylamine	69.1	10	100	0	69.1	9.93	122	73.86	6.66	30.3	
4-Nitrophenol	62.3	50	200	0	31.2	12.5	87.4	61.86	0.709	36.3	
Pentachlorophenol	97.4	50	200	0	48.7	3.55	114	106.2	8.64	49	
Phenol	82.02	10	200	0	41.0	7.53	73.1	84.98	3.54	52.4	
Pyrene	73.7	15	100	0	73.7	12.6	140	80.64	8.99	16.3	
1,2,4-Trichlorobenzene	62.36	10	100	0	62.4	17.4	98.7	67.22	7.50	36.4	

Sample ID **LCS-8964** Batch ID: **8964** Test Code: **SW7470** Units: **mg/L** Analysis Date **10/14/2005** Prep Date **10/14/2005**
Client ID: Run ID: **MI-LA254_051014A** SeqNo: **411534**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.004877	0.0002	0.005	0	97.5	75.2	134	0			

Sample ID **LCSD-8964** Batch ID: **8964** Test Code: **SW7470** Units: **mg/L** Analysis Date **10/14/2005** Prep Date **10/14/2005**
Client ID: Run ID: **MI-LA254_051014A** SeqNo: **411551**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.004788	0.0002	0.005	0	95.8	75.2	134	0.004877	1.84	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **LCS-8972** Batch ID: **8972** Test Code: **SW7470** Units: **mg/L** Analysis Date **10/17/2005** Prep Date **10/17/2005**
Client ID: Run ID: **MI-LA254_051117A** SeqNo: **412257**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.004663	0.0002	0.005	0	93.3	75.2	134	0			

Sample ID **LCSD-8972** Batch ID: **8972** Test Code: **SW7470** Units: **mg/L** Analysis Date **10/17/2005** Prep Date **10/17/2005**
Client ID: Run ID: **MI-LA254_051117A** SeqNo: **412275**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.004783	0.0002	0.005	0	95.7	75.2	134	0.004663	2.54	0	

Sample ID **LCS** Batch ID: **R17096** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/27/2005 9:06:56 AM** Prep Date
Client ID: Run ID: **ICP_051026B** SeqNo: **415365**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.5095	0.02	0.5	0	102	80	120	0			
Barium	0.4867	0.02	0.5	0	97.3	80	120	0			
Beryllium	0.5026	0.003	0.5	0	101	80	120	0			
Cadmium	0.4964	0.002	0.5	0	99.3	80	120	0			
Chromium	0.4886	0.006	0.5	0	97.7	80	120	0			
Cobalt	0.4724	0.006	0.5	0	94.5	80	120	0			
Lead	0.4977	0.005	0.5	0	99.5	80	120	0			
Nickel	0.485	0.01	0.5	0	97.0	80	120	0			
Selenium	0.477	0.02	0.5	0	95.4	80	120	0			
Silver	0.4934	0 005	0.5	0	98.7	80	120	0			
Vanadium	0.5044	0.05	0.5	0	101	80	120	0			
Zinc	0.5089	0.05	0.5	0	102	80	120	0			
Yttrium	97.73	0	100	0	97.7	70	130	0			
Yttrium Radial	101.4	0	100	0	101	70	130	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID **LCSD** Batch ID: **R17096** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/27/2005 9:10:13 AM** Prep Date

Client ID: Run ID: **ICP_051026B** SeqNo: **415366**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.5045	0.02	0.5	0	101	80	120	0.5095	0.979	20	
Barium	0.4633	0.02	0.5	0	92.7	80	120	0.4867	4.94	20	
Beryllium	0.4903	0.003	0.5	0	98.1	80	120	0.5026	2.48	20	
Cadmium	0.4791	0.002	0.5	0	95.8	80	120	0.4964	3.55	20	
Chromium	0.4708	0.006	0.5	0	94.2	80	120	0.4886	3.71	20	
Cobalt	0.4592	0.006	0.5	0	91.8	80	120	0.4724	2.83	20	
Lead	0.484	0.005	0.5	0	96.8	80	120	0.4977	2.78	20	
Nickel	0.4623	0.01	0.5	0	92.5	80	120	0.485	4.79	20	
Selenium	0.4754	0.02	0.5	0	95.1	80	120	0.477	0.339	20	
Silver	0.472	0.005	0.5	0	94.4	80	120	0.4934	4.43	20	
Vanadium	0.4821	0.05	0.5	0	96.4	80	120	0.5044	4.52	20	
Zinc	0.485	0.05	0.5	0	97.0	80	120	0.5089	4.81	20	
Yttrium	99.12	0	100	0	99.1	70	130	97.73	1.41	20	
Yttrium Radial	101.3	0	100	0	101	70	130	101.4	0.0910	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **LCS-9044** Batch ID: **9044** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/27/2005 4:19:14 PM** Prep Date **10/25/2005**

Client ID: Run ID: **ICP_051027A** SeqNo: **415917**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.4732	0.02	0.5	0	94.6	80	120	0			
Barium	0.4692	0.02	0.5	0	93.8	80	120	0			
Beryllium	0.484	0.003	0.5	0.000151	96.8	80	120	0			
Cadmium	0.4645	0.002	0.5	0	92.9	80	120	0			
Calcium	49.18	1	50	0	98.4	80	120	0			
Chromium	0.4691	0.006	0.5	0	93.8	80	120	0			
Cobalt	0.5081	0.006	0.5	0	102	80	120	0			
Magnesium	48.8	1	50	0	97.6	80	120	0			
Nickel	0.453	0.01	0.5	0	90.6	80	120	0			
Potassium	50.1	1	50	0.1242	100	80	120	0			
Selenium	0.4463	0.05	0.5	0	89.3	80	120	0			
Silver	0.465	0.005	0.5	0	93.0	80	120	0			
Sodium	52.32	1	50	0	105	80	120	0			
Vanadium	0.4761	0.05	0.5	0	95.2	80	120	0			
Zinc	0.4587	0.05	0.5	0	91.7	80	120	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: 0510131
Project: Ciniza Annual GW Samples 2005

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID **LCSD-9044** Batch ID: **9044** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/27/2005 4:21:36 PM** Prep Date **10/25/2005**
Client ID: Run ID: **ICP_051027A** SeqNo: **415918**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.4697	0.02	0.5	0	93.9	80	120	0.4732	0.739	20	
Barium	0.4551	0.02	0.5	0	91.0	80	120	0.4692	3.06	20	
Beryllium	0.4808	0.003	0.5	0.000151	96.1	80	120	0.484	0.666	20	
Cadmium	0.4561	0.002	0.5	0	91.2	80	120	0.4645	1.82	20	
Calcium	49.58	1	50	0	99.2	80	120	49.18	0.823	20	
Chromium	0.4598	0.006	0.5	0	92.0	80	120	0.4691	2.01	20	
Cobalt	0.4994	0.006	0.5	0	99.9	80	120	0.5081	1.73	20	
Magnesium	49	1	50	0	98.0	80	120	48.8	0.406	20	
Nickel	0.4391	0.01	0.5	0	87.8	80	120	0.453	3.13	20	
Potassium	50.1	1	50	0.1242	100	80	120	50.1	0.00219	20	
Selenium	0.4285	0.05	0.5	0	85.7	80	120	0.4463	4.06	20	
Silver	0.4501	0.005	0.5	0	90.0	80	120	0.465	3.25	20	
Sodium	52.9	1	50	0	106	80	120	52.32	1.10	20	
Vanadium	0.4611	0.05	0.5	0	92.2	80	120	0.4761	3.20	20	
Zinc	0.4504	0.05	0.5	0	90.1	80	120	0.4587	1.83	20	

Sample ID **LCSD-9044** Batch ID: **9044** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/28/2005 9:12:58 AM** Prep Date **10/25/2005**
Client ID: Run ID: **ICP_051027A** SeqNo: **415954**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.4704	0.005	0.5	0	94.1	80	120	0.4728	0.504	20	

Sample ID **LCS-9044** Batch ID: **9044** Test Code: **SW6010A** Units: **mg/L** Analysis Date **10/28/2005 9:20:56 AM** Prep Date **10/25/2005**
Client ID: Run ID: **ICP_051027A** SeqNo: **415957**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.4728	0.005	0.5	0	94.6	80	120	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

Hall Environmental Analysis Laboratory

Sample Receipt Checklist

Name GIANTREFIN | Date and Time Received: 10/14/2005

Order Number 0510131 | Received by AT

Checklist completed by Signature | Date 10/14/05

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? **5°** *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

QA / QC F
Std ☐ Level 4 ☐
Other:

HALL ENVIRONM[illegible]
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: Route 3 Box 7 Gallup, NM 87301
Phone #: 505 722 3833
Fax #: 505 722 0210

Project Name: Ciniza Annual Groundwater Sampler 2005
Project #:
Project Manager: Steve Morris
Sampler: Steve Morris
Sample Temperature: 5°

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative HgCl$_2$	Preservative HNO$_3$		HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals Total + Dissol	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	Gen Chem Cyanide			Air Bubbles or Headspace (Y or N)
10-12-05	1045	H_2O	MW-1	14				0510131-1			X					X			X	X	X	X		
10-12-05	0730	"	MW-4	14				-2			X					X			X	X	X	X		
10-11-05	1400	"	MW-5	14				-3			X					X			X	X	X	X		
10-12-05	1400	"	SMW-2	14				-4			X					X			X	X	X	X		
10-13-05	1130	"	SMW-4	14				-5			X					X			X	X	X	X		
			TRIPBLANK		3			-6			X								X					

Date	Time	Relinquished By: (Signature)	Received By: (Signature)
10/14/05	0830	Steve Morris	[illegible] 10/14/05 0830
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks: Gen Chem = Cations, Anions, pH + Conductivity - Ref. 0307136 See Modified Shipper List

Hall Environmental Analysis Laboratory

Date: *04-Aug-05*

CLIENT: Giant Refining Co
Lab Order: 0508005
Project: GWM-1-3rd Qtr. 2005
Lab ID: 0508005-01

Client Sample ID: GWM-1-3Q
Collection Date: 8/1/2005 7:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MAP**
Fluoride	2.6	0.10		mg/L	1	8/1/2005
Chloride	2000	10		mg/L	100	8/2/2005
Nitrogen, Nitrite (As N)	ND	10		mg/L	100	8/2/2005
Nitrogen, Nitrate (As N)	ND	0.10		mg/L	1	8/1/2005
Phosphorus, Orthophosphate (As P)	ND	0.50		mg/L	1	8/1/2005
Sulfate	96	2.5		mg/L	5	8/2/2005
EPA METHOD 8260: VOLATILES						Analyst: **HLM**
Benzene	8.1	1.0		µg/L	1	8/3/2005
Toluene	4.6	1.0		µg/L	1	8/3/2005
Ethylbenzene	2.8	1.0		µg/L	1	8/3/2005
Methyl tert-butyl ether (MTBE)	170	10		µg/L	10	8/2/2005
1,2,4-Trimethylbenzene	7.3	1.0		µg/L	1	8/3/2005
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	8/3/2005
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	8/3/2005
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	8/3/2005
Naphthalene	ND	2.0		µg/L	1	8/3/2005
1-Methylnaphthalene	4.5	4.0		µg/L	1	8/3/2005
2-Methylnaphthalene	ND	4.0		µg/L	1	8/3/2005
Acetone	ND	10		µg/L	1	8/3/2005
Bromobenzene	ND	1.0		µg/L	1	8/3/2005
Bromochloromethane	ND	1.0		µg/L	1	8/3/2005
Bromodichloromethane	ND	1.0		µg/L	1	8/3/2005
Bromoform	ND	1.0		µg/L	1	8/3/2005
Bromomethane	ND	2.0		µg/L	1	8/3/2005
2-Butanone	ND	10		µg/L	1	8/3/2005
Carbon disulfide	ND	10		µg/L	1	8/3/2005
Carbon Tetrachloride	ND	1.0		µg/L	1	8/3/2005
Chlorobenzene	ND	1.0		µg/L	1	8/3/2005
Chloroethane	ND	2.0		µg/L	1	8/3/2005
Chloroform	ND	1.0		µg/L	1	8/3/2005
Chloromethane	ND	1.0		µg/L	1	8/3/2005
2-Chlorotoluene	ND	1.0		µg/L	1	8/3/2005
4-Chlorotoluene	ND	1.0		µg/L	1	8/3/2005
cis-1,2-DCE	ND	1.0		µg/L	1	8/3/2005
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	8/3/2005
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	8/3/2005
Dibromochloromethane	ND	1.0		µg/L	1	8/3/2005
Dibromomethane	ND	2.0		µg/L	1	8/3/2005
1,2-Dichlorobenzene	ND	1.0		µg/L	1	8/3/2005
1,3-Dichlorobenzene	ND	1.0		µg/L	1	8/3/2005

Qualifiers: ND - Not Det[illegible] Reporting Limit
J - Analyte de[illegible]cted be[illegible]w [illegible]ntit[illegible]ion limi
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level

S - Sp[illegible] Re[illegible]very outsid[illegible] accep[illegible] re[illegible]ver[illegible] limits
R - RF [illegible] outside [illegible]ept[illegible] [illegible]over [illegible]
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *04-Aug-05*

CLIENT: Giant Refining Co
Lab Order: 0508005
Project: GWM-1-3rd Qtr. 2005
Lab ID: 0508005-01

Client Sample ID: GWM-1-3Q
Collection Date: 8/1/2005 7:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
1,4-Dichlorobenzene	ND	1.0		µg/L	1	8/3/2005
Dichlorodifluoromethane	ND	1.0		µg/L	1	8/3/2005
1,1-Dichloroethane	ND	1.0		µg/L	1	8/3/2005
1,1-Dichloroethene	ND	1.0		µg/L	1	8/3/2005
1,2-Dichloropropane	ND	1.0		µg/L	1	8/3/2005
1,3-Dichloropropane	ND	1.0		µg/L	1	8/3/2005
2,2-Dichloropropane	ND	1.0		µg/L	1	8/3/2005
1,1-Dichloropropene	ND	1.0		µg/L	1	8/3/2005
Hexachlorobutadiene	ND	1.0		µg/L	1	8/3/2005
2-Hexanone	ND	10		µg/L	1	8/3/2005
Isopropylbenzene	ND	1.0		µg/L	1	8/3/2005
4-Isopropyltoluene	ND	1.0		µg/L	1	8/3/2005
4-Methyl-2-pentanone	ND	10		µg/L	1	8/3/2005
Methylene Chloride	ND	3.0		µg/L	1	8/3/2005
n-Butylbenzene	ND	1.0		µg/L	1	8/3/2005
n-Propylbenzene	ND	1.0		µg/L	1	8/3/2005
sec-Butylbenzene	ND	1.0		µg/L	1	8/3/2005
Styrene	ND	1.0		µg/L	1	8/3/2005
tert-Butylbenzene	ND	1.0		µg/L	1	8/3/2005
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	8/3/2005
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	8/3/2005
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	8/3/2005
trans-1,2-DCE	ND	1.0		µg/L	1	8/3/2005
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	8/3/2005
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	8/3/2005
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	8/3/2005
1,1,1-Trichloroethane	ND	1.0		µg/L	1	8/3/2005
1,1,2-Trichloroethane	ND	1.0		µg/L	1	8/3/2005
Trichloroethene (TCE)	ND	1.0		µg/L	1	8/3/2005
Trichlorofluoromethane	ND	1.0		µg/L	1	8/3/2005
1,2,3-Trichloropropane	ND	2.0		µg/L	1	8/3/2005
Vinyl chloride	ND	1.0		µg/L	1	8/3/2005
Xylenes, Total	10	1.0		µg/L	1	8/3/2005
Surr: 1,2-Dichloroethane-d4	97.2	87.7-108		%REC	1	8/3/2005
Surr: 4-Bromofluorobenzene	103	88.8-113		%REC	10	8/2/2005
Surr: Dibromofluoromethane	101	84.1-111		%REC	1	8/3/2005
Surr: Toluene-d8	101	85.9-109		%REC	1	8/3/2005

Analyst: BL

EPA METHOD 8270C: SEMIVOLATILES

Acenaphthene	ND	10		µg/L	1	8/3/2005
Acenaphthylene	ND	10		µg/L	1	8/3/2005
Aniline	ND	10		µg/L	1	8/3/2005
Anthracene	ND	10		µg/L	1	8/3/2005

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

Hall Environmental Analysis Laboratory

Date: *04-Aug-05*

CLIENT: Giant Refining Co
Lab Order: 0508005
Project: GWM-1-3rd Qtr. 2005
Lab ID: 0508005-01

Client Sample ID: GWM-1-3Q
Collection Date: 8/1/2005 7:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Azobenzene	ND	10		µg/L	1	8/3/2005
Benz(a)anthracene	ND	15		µg/L	1	8/3/2005
Benzo(a)pyrene	ND	10		µg/L	1	8/3/2005
Benzo(b)fluoranthene	ND	10		µg/L	1	8/3/2005
Benzo(g,h,i)perylene	ND	10		µg/L	1	8/3/2005
Benzo(k)fluoranthene	ND	10		µg/L	1	8/3/2005
Benzoic acid	ND	50		µg/L	1	8/3/2005
Benzyl alcohol	ND	20		µg/L	1	8/3/2005
Bis(2-chloroethoxy)methane	ND	0		µg/L	1	8/3/2005
Bis(2-chloroethyl)ether	ND	15		µg/L	1	8/3/2005
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	8/3/2005
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	8/3/2005
4-Bromophenyl phenyl ether	ND	10		µg/L	1	8/3/2005
Butyl benzyl phthalate	ND	15		µg/L	1	8/3/2005
Carbazole	ND	10		µg/L	1	8/3/2005
4-Chloro-3-methylphenol	ND	20		µg/L	1	8/3/2005
4-Chloroaniline	ND	20		µg/L	1	8/3/2005
2-Chloronaphthalene	ND	10		µg/L	1	8/3/2005
2-Chlorophenol	ND	10		µg/L	1	8/3/2005
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	8/3/2005
Chrysene	ND	15		µg/L	1	8/3/2005
Di-n-butyl phthalate	ND	10		µg/L	1	8/3/2005
Di-n-octyl phthalate	ND	15		µg/L	1	8/3/2005
Dibenz(a,h)anthracene	ND	10		µg/L	1	8/3/2005
Dibenzofuran	ND	10		µg/L	1	8/3/2005
1,2-Dichlorobenzene	ND	10		µg/L	1	8/3/2005
1,3-Dichlorobenzene	ND	10		µg/L	1	8/3/2005
1,4-Dichlorobenzene	ND	10		µg/L	1	8/3/2005
3,3'-Dichlorobenzidine	ND	15		µg/L	1	8/3/2005
Diethyl phthalate	ND	10		µg/L	1	8/3/2005
Dimethyl phthalate	ND	10		µg/L	1	8/3/2005
2,4-Dichlorophenol	ND	10		µg/L	1	8/3/2005
2,4-Dimethylphenol	110	10		µg/L	1	8/3/2005
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	8/3/2005
2,4-Dinitrophenol	ND	50		µg/L	1	8/3/2005
2,4-Dinitrotoluene	ND	10		µg/L	1	8/3/2005
2,6-Dinitrotoluene	ND	10		µg/L	1	8/3/2005
Fluoranthene	ND	10		µg/L	1	8/3/2005
Fluorene	ND	10		µg/L	1	8/3/2005
Hexachlorobenzene	ND	10		µg/L	1	8/3/2005
Hexachlorobutadiene	ND	10		µg/L	1	8/3/2005
Hexachlorocyclopentadiene	ND	10		µg/L	1	8/3/2005

Qualifiers:
ND - Not Det[illegible] Reporting Limit
J - Analyte de[illegible] be[illegible] quantitation limit
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: *04-Aug-05*

CLIENT: Giant Refining Co
Lab Order: 0508005
Project: GWM-1-3rd Qtr. 2005
Lab ID: 0508005-01

Client Sample ID: GWM-1-3Q
Collection Date: 8/1/2005 7:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Hexachloroethane	ND	10		µg/L	1	8/3/2005
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	8/3/2005
Isophorone	ND	10		µg/L	1	8/3/2005
2-Methylnaphthalene	ND	10		µg/L	1	8/3/2005
2-Methylphenol	ND	15		µg/L	1	8/3/2005
3+4-Methylphenol	ND	10		µg/L	1	8/3/2005
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	8/3/2005
N-Nitrosodimethylamine	ND	10		µg/L	1	8/3/2005
N-Nitrosodiphenylamine	ND	10		µg/L	1	8/3/2005
Naphthalene	ND	10		µg/L	1	8/3/2005
2-Nitroaniline	ND	50		µg/L	1	8/3/2005
3-Nitroaniline	ND	50		µg/L	1	8/3/2005
4-Nitroaniline	ND	20		µg/L	1	8/3/2005
Nitrobenzene	ND	10		µg/L	1	8/3/2005
2-Nitrophenol	ND	15		µg/L	1	8/3/2005
4-Nitrophenol	ND	50		µg/L	1	8/3/2005
Pentachlorophenol	ND	50		µg/L	1	8/3/2005
Phenanthrene	ND	10		µg/L	1	8/3/2005
Phenol	ND	10		µg/L	1	8/3/2005
Pyrene	ND	15		µg/L	1	8/3/2005
Pyridine	ND	30		µg/L	1	8/3/2005
1,2,4-Trichlorobenzene	ND	10		µg/L	1	8/3/2005
2,4,5-Trichlorophenol	ND	10		µg/L	1	8/3/2005
2,4,6-Trichlorophenol	ND	15		µg/L	1	8/3/2005
Surr: 2,4,6-Tribromophenol	25.7	16.6-150		%REC	1	8/3/2005
Surr: 2-Fluorobiphenyl	78.8	19.6-134		%REC	1	8/3/2005
Surr: 2-Fluorophenol	11.5	9.54-113		%REC	1	8/3/2005
Surr: 4-Terphenyl-d14	64.7	22.7-145		%REC	1	8/3/2005
Surr: Nitrobenzene-d5	74.6	14.6-134		%REC	1	8/3/2005
Surr: Phenol-d6	20.8	10.7-80.3		%REC	1	8/3/2005
EPA METHOD 7470: MERCURY						Analyst: **CMC**
Mercury	ND	0.00020		mg/L	1	8/3/2005
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Arsenic	0.098	0.020		mg/L	1	8/4/2005 9:55:10 AM
Barium	0.57	0.020		mg/L	1	8/4/2005 9:55:10 AM
Cadmium	ND	0.0020		mg/L	1	8/4/2005 9:55:10 AM
Calcium	410	10		mg/L	10	8/4/2005 10:26:02 AM
Chromium	ND	0.0060		mg/L	1	8/4/2005 9:55:10 AM
Lead	ND	0.0050		mg/L	1	8/4/2005 9:55:10 AM
Magnesium	110	1.0		mg/L	1	8/4/2005 9:55:10 AM
Potassium	6.5	1.0		mg/L	1	8/4/2005 9:55:10 AM

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: *04-Aug-05*

CLIENT: Giant Refining Co
Lab Order: 0508005
Project: GWM-1-3rd Qtr. 2005
Lab ID: 0508005-01

Client Sample ID: GWM-1-3Q
Collection Date: 8/1/2005 7:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Selenium	ND	0.050		mg/L	1	8/4/2005 9:55:10 AM
Silver	ND	0.0050		mg/L	1	8/4/2005 9:55:10 AM
Sodium	1500	20		mg/L	20	8/4/2005 10:38:12 AM

Qualifiers:
ND - Not Det[illegible] Re[illegible]rti[illegible] Lim.it
J - Analyte de[illegible]cted be[illegible] w[illegible]anti[illegible]ion limi
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
[illegible]: Sp[illegible] Re[illegible]ery outsi[illegible] accep[illegible] [illegible]ve[illegible] limits
[illegible] RF outside [illegible]ept[illegible]: [illegible]ve[illegible] li[illegible]s
E - Value above quantitation range

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

July 05, 2005

Ed Riege
Giant Refining Co
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-3833
FAX (505) 722-0210

RE: GWM-1-2nd Qtr. 2005 Order No.: 0506293

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 1 sample on 6/30/2005 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

4901 Hawkins NE ■ Suite D ■ Albuquerque, NM 87109
505.345.3975 ■ Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory

Date: *05-Jul-05*

CLIENT:	Giant Refining Co	Client Sample ID:	GWM-1-2Q-05
Lab Order:	0506293	Collection Date:	6/28/2005 12:30:00 PM
Project:	GWM-1-2nd Qtr. 2005		
Lab ID:	0506293-01	Matrix:	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	10	2.5		µg/L	5	6/30/2005 7:39:06 PM
Toluene	ND	2.5		µg/L	5	6/30/2005 7:39:06 PM
Ethylbenzene	3.5	2.5		µg/L	5	6/30/2005 7:39:06 PM
Xylenes, Total	41	2.5		µg/L	5	6/30/2005 7:39:06 PM
Surr: 4-Bromofluorobenzene	101	83.3-121		%REC	5	6/30/2005 7:39:06 PM

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: 05-Jul-05

CLIENT: Giant Refining Co
Work Order: 0506293
Project: GWM-1-2nd Qtr. 2005

QC SUMMARY REPORT

Method Blank

Sample ID Reagent Blank 5m Batch ID: R15863 Test Code: SW8021 Units: µg/L Analysis Date 6/30/2005 10:30:22 AM Prep Date

Client ID: Run ID: PIDFID_050630A SeqNo: 376231

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.5									
Toluene	ND	0.5									
Ethylbenzene	ND	0.5									
Xylenes, Total	ND	0.5									
Surr: 4-Bromofluorobenzene	17.44	0	20	0	87.2	83.3	121	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

Hall Environmental Analysis Laboratory

Date: *05-Jul-05*

CLIENT: Giant Refining Co
Work Order: 0506293
Project: GWM-1-2nd Qtr. 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID BTEX LCS 100ng Batch ID: R15863 Test Code: SW8021 Units: µg/L Analysis Date 6/30/2005 12:03:37 PM Prep Date

Client ID: Run ID: PIDFID_050630A SeqNo: 376239

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	18.58	0.5	20	0	92.9	88.7	114	0			
Toluene	18.93	0.5	20	0	94.6	89.3	112	0			
Ethylbenzene	18.79	0.5	20	0	93.9	88.6	113	0			
Xylenes, Total	57.41	0.5	60	0	95.7	89.4	112	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

1

Hall Environmental Analysis Laboratory

Sample Receipt Checklist

Client Name GIANTREFIN

Date and Time Received: 6/30/2005

Work Order Number 0506293

Received by AT

Checklist completed by _____ 6/30/05
Signature | Date

Matrix

Carrier name FedEx

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? 5° *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

Accreditation Applied: NELAC ☐ USACE ☐
Other:

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: ROUTE 3 BOX 7 GALLUP, NM 87301
Phone #: 505-722-3833
Fax #: 505-722-0210

Project Name: GWM-1-2ND QTR 2005
Project #:
Project Manager: ED RIEGLE
Sampler: JOHNNY SANCHEZ
Sample Temperature: 5

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative H_gCl_2	Preservative HNO_3	Preservative HCL	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B MOD (Gas/Diesel)	TPH (Method 418.1)	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)	8021 BTEX			Air Bubbles or Headspace (Y or N)
6/28/05	1230HR	H_2O	GWM-1-2Q-05	3 VOA's		•	✓	0506293-1														X			

Date	Time	Relinquished By: (Signature)	Remarks:
6/29/05	0800	[signature]	[signature] 6/30/05
Date:	Time:	Relinquished By: (Signature)	Remarks: 1016

Remarks:

ANALYSIS REQUEST

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

February 23, 2005

Steve Morris
Giant Refining Co
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0258
FAX (505) 722-0210

RE: GWM-1-1st Qtr. 2005

Order No.: 0502178

Dear Steve Morris:

Hall Environmental Analysis Laboratory received 1 sample on 2/18/2005 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

4901 Hawkins NE ■ Suite D ■ Albuquerque, NM 87109
505.345.3975 ■ Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory

Date: *23-Feb-05*

CLIENT:	Giant Refining Co	Client Sample ID:	GWM-1-1Q-05
Lab Order:	0502178	Collection Date:	2/15/2005 2:30:00 PM
Project:	GWM-1-1st Qtr. 2005		
Lab ID:	0502178-01	Matrix:	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	5.0	0.50		µg/L	1	2/22/2005 9:49:27 AM
Toluene	2.4	0.50		µg/L	1	2/22/2005 9:49:27 AM
Ethylbenzene	2.6	0.50		µg/L	1	2/22/2005 9:49:27 AM
Xylenes, Total	31	0.50		µg/L	1	2/22/2005 9:49:27 AM
Surr: 4-Bromofluorobenzene	112	83.3-121		%REC	1	2/22/2005 9:49:27 AM

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

Date: *23-Feb-05*

Hall Environmental Analysis Laboratory

CLIENT: Giant Refining Co
Work Order: 0502178
Project: GWM-1-1st Qtr. 2005

QC SUMMARY REPORT
Method Blank

Sample ID **Reagent Blank 5m** Batch ID: R14637 Test Code: SW8021 Units: µg/L Analysis Date 2/21/2005 9:04:53 AM Prep Date
Client ID: Run ID: PIDFID_050221A SeqNo: 340815

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.5									
Toluene	ND	0.5									
Ethylbenzene	ND	0.5									
Xylenes, Total	ND	0.5									
Surr: 4-Bromofluorobenzene	19.5	0	20	0	97.5	83.3	121	0			

Sample ID **Reagent Blank 5m** Batch ID: R14648 Test Code: SW8021 Units: µg/L Analysis Date 2/22/2005 7:49:45 AM Prep Date
Client ID: Run ID: PIDFID_050222A SeqNo: 341024

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.5									
Toluene	ND	0.5									
Ethylbenzene	ND	0.5									
Xylenes, Total	ND	0.5									
Surr: 4-Bromofluorobenzene	20.33	0	20	0	102	83.3	121	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

Date: *23-Feb-05*

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Laboratory Control Spike - generic

CLIENT: Giant Refining Co
Work Order: 0502178
Project: GWM-1-1st Qtr. 2005

Sample ID BTEX std 100ng | Batch ID: R14637 | Test Code: SW8021 | Units: µg/L | Analysis Date 2/21/2005 11:21:58 AM | Prep Date
Client ID: | Run ID: PIDFID_050221A | SeqNo: 340816

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19.91	0.5	20	0	99.6	88.7	114	0			
Toluene	20.02	0.5	20	0	100	89.3	112	0			
Ethylbenzene	19.91	0.5	20	0	99.5	88.6	113	0			
Xylenes, Total	60.56	0.5	60	0	101	89.4	112	0			

Sample ID BTEX std 100ng | Batch ID: R14648 | Test Code: SW8021 | Units: µg/L | Analysis Date 2/22/2005 7:22:24 PM | Prep Date
Client ID: | Run ID: PIDFID_050222A | SeqNo: 341035

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	20.17	0.5	20	0	101	88.7	114	0			
Toluene	20.5	0.5	20	0	103	89.3	112	0			
Ethylbenzene	20.05	0.5	20	0	100	88.6	113	0			
Xylenes, Total	60.68	0.5	60	0	101	89.4	112	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

I

!all Environmental Analysis Laboratory

Sample Receipt Checklist

Client Name GIANTREFIN

Date and Time Received: 2/18/2005

Work Order Number 0502178

Received by AT

Checklist completed by _____ Signature | 2/18/05 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?	6°	*4° C ± 2 Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

September 30, 2005

Steve Morris
Giant Refining Co
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0258
FAX (505) 722-0210

RE: AL-2 to EP-1 Week of Sept. 12, 2005 Order No.: 0509182

Dear Steve Morris:

Hall Environmental Analysis Laboratory received 1 sample on 9/19/2005 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

4901 Hawkins NE ■ Suite D ■ Albuquerque, NM 87109
505.345.3975 ■ Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory

Date: *30-Sep-05*

CLIENT: Giant Refining Co
Lab Order: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005
Lab ID: 0509182-01

Client Sample ID: AL-2 TO EP-1
Collection Date: 9/15/2005 7:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: HLM
Benzene	77	10		µg/L	10	9/20/2005
Toluene	130	10		µg/L	10	9/20/2005
Ethylbenzene	16	10		µg/L	10	9/20/2005
Methyl tert-butyl ether (MTBE)	72	10		µg/L	10	9/20/2005
Xylenes, Total	96	10		µg/L	10	9/20/2005
Surr: 4-Bromofluorobenzene	103	86.1-121		%REC	10	9/20/2005
EPA METHOD 8270C: SEMIVOLATILES						Analyst: BL
Acenaphthene	ND	200		µg/L	1	9/22/2005
Acenaphthylene	ND	200		µg/L	1	9/22/2005
Aniline	ND	200		µg/L	1	9/22/2005
Anthracene	ND	200		µg/L	1	9/22/2005
Azobenzene	ND	200		µg/L	1	9/22/2005
Benz(a)anthracene	ND	300		µg/L	1	9/22/2005
Benzo(a)pyrene	ND	200		µg/L	1	9/22/2005
Benzo(b)fluoranthene	ND	200		µg/L	1	9/22/2005
Benzo(g,h,i)perylene	ND	200		µg/L	1	9/22/2005
Benzo(k)fluoranthene	ND	200		µg/L	1	9/22/2005
Benzoic acid	ND	1000		µg/L	1	9/22/2005
Benzyl alcohol	ND	400		µg/L	1	9/22/2005
Bis(2-chloroethoxy)methane	ND	200		µg/L	1	9/22/2005
Bis(2-chloroethyl)ether	ND	300		µg/L	1	9/22/2005
Bis(2-chloroisopropyl)ether	ND	300		µg/L	1	9/22/2005
Bis(2-ethylhexyl)phthalate	ND	300		µg/L	1	9/22/2005
4-Bromophenyl phenyl ether	ND	200		µg/L	1	9/22/2005
Butyl benzyl phthalate	ND	300		µg/L	1	9/22/2005
Carbazole	ND	200		µg/L	1	9/22/2005
4-Chloro-3-methylphenol	ND	400		µg/L	1	9/22/2005
4-Chloroaniline	ND	400		µg/L	1	9/22/2005
2-Chloronaphthalene	ND	200		µg/L	1	9/22/2005
2-Chlorophenol	ND	200		µg/L	1	9/22/2005
4-Chlorophenyl phenyl ether	ND	300		µg/L	1	9/22/2005
Chrysene	ND	300		µg/L	1	9/22/2005
Di-n-butyl phthalate	ND	200		µg/L	1	9/22/2005
Di-n-octyl phthalate	ND	300		µg/L	1	9/22/2005
Dibenz(a,h)anthracene	ND	200		µg/L	1	9/22/2005
Dibenzofuran	ND	200		µg/L	1	9/22/2005
1,2-Dichlorobenzene	ND	200		µg/L	1	9/22/2005
1,3-Dichlorobenzene	ND	200		µg/L	1	9/22/2005
1,4-Dichlorobenzene	ND	200		µg/L	1	9/22/2005
3,3'-Dichlorobenzidine	ND	300		µg/L	1	9/22/2005

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: *30-Sep-05*

CLIENT: Giant Refining Co
Lab Order: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005
Lab ID: 0509182-01

Client Sample ID: AL-2 TO EP-1
Collection Date: 9/15/2005 7:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Diethyl phthalate	ND	200		µg/L	1	9/22/2005
Dimethyl phthalate	ND	200		µg/L	1	9/22/2005
2,4-Dichlorophenol	ND	200		µg/L	1	9/22/2005
2,4-Dimethylphenol	ND	200		µg/L	1	9/22/2005
4,6-Dinitro-2-methylphenol	ND	1000		µg/L	1	9/22/2005
2,4-Dinitrophenol	ND	1000		µg/L	1	9/22/2005
2,4-Dinitrotoluene	ND	200		µg/L	1	9/22/2005
2,6-Dinitrotoluene	ND	200		µg/L	1	9/22/2005
Fluoranthene	ND	200		µg/L	1	9/22/2005
Fluorene	ND	200		µg/L	1	9/22/2005
Hexachlorobenzene	ND	200		µg/L	1	9/22/2005
Hexachlorobutadiene	ND	200		µg/L	1	9/22/2005
Hexachlorocyclopentadiene	ND	200		µg/L	1	9/22/2005
Hexachloroethane	ND	200		µg/L	1	9/22/2005
Indeno(1,2,3-cd)pyrene	ND	200		µg/L	1	9/22/2005
Isophorone	ND	200		µg/L	1	9/22/2005
2-Methylnaphthalene	280	200		µg/L	1	9/22/2005
2-Methylphenol	1800	300		µg/L	1	9/22/2005
3+4-Methylphenol	2900	200		µg/L	1	9/22/2005
N-Nitrosodi-n-propylamine	ND	200		µg/L	1	9/22/2005
N-Nitrosodimethylamine	ND	200		µg/L	1	9/22/2005
N-Nitrosodiphenylamine	ND	200		µg/L	1	9/22/2005
Naphthalene	ND	200		µg/L	1	9/22/2005
2-Nitroaniline	ND	1000		µg/L	1	9/22/2005
3-Nitroaniline	ND	1000		µg/L	1	9/22/2005
4-Nitroaniline	ND	400		µg/L	1	9/22/2005
Nitrobenzene	ND	200		µg/L	1	9/22/2005
2-Nitrophenol	ND	300		µg/L	1	9/22/2005
4-Nitrophenol	ND	1000		µg/L	1	9/22/2005
Pentachlorophenol	ND	1000		µg/L	1	9/22/2005
Phenanthrene	270	200		µg/L	1	9/22/2005
Phenol	6400	1000		µg/L	5	9/23/2005
Pyrene	ND	300		µg/L	1	9/22/2005
Pyridine	ND	600		µg/L	1	9/22/2005
1,2,4-Trichlorobenzene	ND	200		µg/L	1	9/22/2005
2,4,5-Trichlorophenol	ND	200		µg/L	1	9/22/2005
2,4,6-Trichlorophenol	ND	300		µg/L	1	9/22/2005
Surr: 2,4,6-Tribromophenol	82.6	16.6-150		%REC	1	9/22/2005
Surr: 2-Fluorobiphenyl	66.9	19.6-134		%REC	1	9/22/2005
Surr: 2-Fluorophenol	48.9	9.54-113		%REC	1	9/22/2005
Surr: 4-Terphenyl-d14	75.5	22.7-145		%REC	1	9/22/2005
Surr: Nitrobenzene-d5	64.8	14.6-134		%REC	1	9/22/2005

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: *30-Sep-05*

CLIENT: Giant Refining Co
Lab Order: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005
Lab ID: 0509182-01

Client Sample ID: AL-2 TO EP-1
Collection Date: 9/15/2005 7:00:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Surr: Phenol-d6	41.0	10.7-80.3		%REC	1	9/22/2005
EPA METHOD 7470: MERCURY						Analyst: IC
Mercury	0.00062	0.00020		mg/L	1	9/28/2005
EPA METHOD 6010B: DISSOLVED METALS						Analyst: NMO
Antimony	ND	0.010		mg/L	1	9/27/2005 3:34:34 PM
Arsenic	ND	0.020		mg/L	1	9/27/2005 3:34:34 PM
Beryllium	ND	0.0030		mg/L	1	9/27/2005 3:34:34 PM
Cadmium	ND	0.0020		mg/L	1	9/27/2005 3:34:34 PM
Chromium	ND	0.0060		mg/L	1	9/27/2005 3:34:34 PM
Copper	ND	0.0060		mg/L	1	9/27/2005 3:34:34 PM
Lead	ND	0.0050		mg/L	1	9/27/2005 3:34:34 PM
Nickel	ND	0.010		mg/L	1	9/27/2005 3:34:34 PM
Selenium	ND	0.020		mg/L	1	9/27/2005 3:34:34 PM
Silver	ND	0.0050		mg/L	1	9/27/2005 3:34:34 PM
Thallium	ND	0.010		mg/L	1	9/27/2005 3:34:34 PM
Zinc	0.050	0.050		mg/L	1	9/27/2005 3:34:34 PM
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: NMO
Antimony	ND	0.010		mg/L	1	9/22/2005 11:25:59 AM
Arsenic	ND	0.020		mg/L	1	9/22/2005 11:25:59 AM
Beryllium	ND	0.0030		mg/L	1	9/21/2005 2:49:30 PM
Cadmium	ND	0.0020		mg/L	1	9/21/2005 2:49:30 PM
Chromium	ND	0.0060		mg/L	1	9/21/2005 2:49:30 PM
Copper	0.022	0.0060		mg/L	1	9/21/2005 2:49:30 PM
Lead	ND	0.0050		mg/L	1	9/21/2005 2:49:30 PM
Nickel	0.011	0.010		mg/L	1	9/21/2005 2:49:30 PM
Selenium	ND	0.050		mg/L	1	9/21/2005 2:49:30 PM
Silver	ND	0.0050		mg/L	1	9/21/2005 2:49:30 PM
Thallium	ND	0.010		mg/L	1	9/22/2005 11:25:59 AM
Zinc	1.2	0.10		mg/L	2	9/21/2005 3:19:36 PM

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: *30-Sep-05*

CLIENT: Giant Refining Co
Work Order: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Method Blank

Sample ID MB-8785 | Batch ID: 8785 | Test Code: SW8270C | Units: µg/L | Analysis Date 9/22/2005 | Prep Date 9/19/2005

Client ID: | Run ID: ELMO_050921A | SeqNo: 403263

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	10									
Acenaphthylene	ND	10									
Aniline	ND	10									
Anthracene	ND	10									
Azobenzene	ND	10									
Benz(a)anthracene	ND	15									
Benzo(a)pyrene	ND	10									
Benzo(b)fluoranthene	ND	10									
Benzo(g,h,i)perylene	ND	10									
Benzo(k)fluoranthene	ND	10									
Benzoic acid	ND	50									
Benzyl alcohol	ND	20									
Bis(2-chloroethoxy)methane	ND	10									
Bis(2-chloroethyl)ether	ND	15									
Bis(2-chloroisopropyl)ether	ND	15									
Bis(2-ethylhexyl)phthalate	ND	15									
4-Bromophenyl phenyl ether	ND	10									
Butyl benzyl phthalate	ND	15									
Carbazole	ND	10									
4-Chloro-3-methylphenol	ND	20									
4-Chloroaniline	ND	20									
2-Chloronaphthalene	ND	10									
2-Chlorophenol	ND	10									
4-Chlorophenyl phenyl ether	ND	15									
Chrysene	ND	15									
Di-n-butyl phthalate	ND	10									
Di-n-octyl phthalate	ND	15									

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: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Method Blank

Dibenz(a,h)anthracene	ND	10
Dibenzofuran	ND	10
1,2-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
3,3'-Dichlorobenzidine	ND	15
Diethyl phthalate	ND	10
Dimethyl phthalate	ND	10
2,4-Dichlorophenol	ND	10
2,4-Dimethylphenol	ND	10
4,6-Dinitro-2-methylphenol	ND	50
2,4-Dinitrophenol	ND	50
2,4-Dinitrotoluene	ND	10
2,6-Dinitrotoluene	ND	10
Fluoranthene	ND	10
Fluorene	ND	10
Hexachlorobenzene	ND	10
Hexachlorobutadiene	ND	10
Hexachlorocyclopentadiene	ND	10
Hexachloroethane	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Isophorone	ND	10
2-Methylnaphthalene	ND	10
2-Methylphenol	ND	15
3+4-Methylphenol	ND	10
N-Nitrosodi-n-propylamine	ND	10
N-Nitrosodimethylamine	ND	10
N-Nitrosodiphenylamine	ND	10
Naphthalene	ND	10
2-Nitroaniline	ND	50
3-Nitroaniline	ND	50
4-Nitroaniline	ND	20
Nitrobenzene	ND	10

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: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Method Blank

2-Nitrophenol	ND	15						
4-Nitrophenol	ND	50						
Pentachlorophenol	ND	50						
Phenanthrene	ND	10						
Phenol	ND	10						
Pyrene	ND	15						
Pyridine	ND	30						
1,2,4-Trichlorobenzene	ND	10						
2,4,5-Trichlorophenol	ND	10						
2,4,6-Trichlorophenol	ND	15						
Surr: 2,4,6-Tribromophenol	128	0	200	0	64.0	16.6	150	0
Surr: 2-Fluorobiphenyl	48.56	0	100	0	48.6	19.6	134	0
Surr: 2-Fluorophenol	107.5	0	200	0	53.8	9.54	113	0
Surr: 4-Terphenyl-d14	66.86	0	100	0	66.9	22.7	145	0
Surr: Nitrobenzene-d5	60.64	0	100	0	60.6	14.6	134	0
Surr: Phenol-d6	60.52	0	200	0	30.3	10.7	80.3	0

Sample ID MB-8834 Batch ID: 8834 Test Code: SW7470 Units: mg/L Analysis Date 9/28/2005 Prep Date 9/28/2005

Client ID: Run ID: MI-LA254_050928C SeqNo: 404921

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
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: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Method Blank

Sample ID MB | Batch ID: R16791 | Test Code: SW6010A | Units: mg/L | Analysis Date 9/27/2005 3:18:56 PM | Prep Date
Client ID: | Run ID: ICP_050927C | SeqNo: 404507

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	0.01									
Arsenic	ND	0.02									
Beryllium	ND	0.003									
Cadmium	ND	0.002									
Chromium	ND	0.006									
Copper	ND	0.006									
Lead	ND	0.005									
Nickel	ND	0.01									
Selenium	ND	0.02									
Silver	ND	0.005									
Thallium	ND	0.01									
Zinc	ND	0.05									

Sample ID MB-8790 | Batch ID: 8790 | Test Code: SW6010A | Units: mg/L | Analysis Date 9/21/2005 2:21:15 PM | Prep Date 9/20/2005
Client ID: | Run ID: ICP_050921B | SeqNo: 402645

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	ND	0.003									
Cadmium	ND	0.002									
Chromium	ND	0.006									
Copper	ND	0.006									
Lead	ND	0.005									
Nickel	ND	0.01									
Selenium	ND	0.05									
Silver	ND	0.005									
Zinc	ND	0.05									

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: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Method Blank

Sample ID MB-8790 | Batch ID: 8790 | Test Code: SW6010A | Units: mg/L | Analysis Date 9/22/2005 10:53:46 AM | Prep Date 9/20/2005

Client ID: | Run ID: ICP_050922B | SeqNo: 402880

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.01878	0.01									
Arsenic	ND	0.02									
Thallium	ND	0.01									

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

Hall Environmental Analysis Laboratory

Date: *30-Sep-05*

CLIENT: Giant Refining Co
Work Order: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Method Blank

Sample ID 5ml rb | Batch ID: R16716 | Test Code: SW8260B | Units: µg/L | Analysis Date 9/20/2005 | Prep Date
Client ID: | Run ID: VAL_050920A | SeqNo: 401902

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									J
Xylenes, Total	0.282	1									
Surr: 4-Bromofluorobenzene	11.21	0	10	0	112	86.1	121	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

Date: *30-Sep-05*

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Laboratory Control Spike - generic

CLIENT: Giant Refining Co
Work Order: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

Sample ID 100ng lcs | Batch ID: R16716 | Test Code: SW8260B | Units: µg/L | Analysis Date 9/20/2005 | Prep Date
Client ID: | Run ID: VAL_050920A | SeqNo: 401905

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19.27	1	20	0	96.4	80	130	0			
Toluene	23.3	1	20	0	117	77	121	0			

Sample ID LCS-8785 | Batch ID: 8785 | Test Code: SW8270C | Units: µg/L | Analysis Date 9/22/2005 | Prep Date 9/19/2005
Client ID: | Run ID: ELMO_050921A | SeqNo: 403264

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	71.18	10	100	0	71.2	11	123	0			
4-Chloro-3-methylphenol	129.1	20	200	0	64.5	15.4	119	0			
2-Chlorophenol	140.3	10	200	0	70.2	12.2	122	0			
1,4-Dichlorobenzene	66.48	10	100	0	66.5	16.9	100	0			
2,4-Dinitrotoluene	66.08	10	100	0	66.1	13	138	0			
N-Nitrosodi-n-propylamine	66.52	10	100	0	66.5	9.93	122	0			
4-Nitrophenol	63.48	50	200	0	31.7	-20.5	87.4	0			
Pentachlorophenol	128.3	50	200	0	64.2	-0.355	114	0			
Phenol	75.38	10	200	0	37.7	7.53	73.1	0			
Pyrene	69.74	15	100	0	69.7	12.6	140	0			
1,2,4-Trichlorobenzene	64.46	10	100	0	64.5	17.4	98.7	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: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID LCSD-8785 | Batch ID: 8785 | Test Code: SW8270C | Units: µg/L | Analysis Date 9/22/2005 | Prep Date 9/19/2005
Client ID: | Run ID: ELMO_050921A | SeqNo: 403265

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	67.9	10	100	0	67.9	11	123	71.18	4.72	30.5	
4-Chloro-3-methylphenol	129.2	20	200	0	64.6	15.4	119	129.1	0.0929	28.6	
2-Chlorophenol	123.6	10	200	0	61.8	12.2	122	140.3	12.7	107	
1,4-Dichlorobenzene	57.4	10	100	0	57.4	16.9	100	66.48	14.7	62.1	
2,4-Dinitrotoluene	64.72	10	100	0	64.7	13	138	66.08	2.08	14.7	
N-Nitrosodi-n-propylamine	67.04	10	100	0	67.0	9.93	122	66.52	0.779	30.3	
4-Nitrophenol	73.86	50	200	0	36.9	12.5	87.4	63.48	15.1	36.3	
Pentachlorophenol	147.6	50	200	0	73.8	3.55	114	128.3	13.9	49	
Phenol	70.36	10	200	0	35.2	7.53	73.1	75.38	6.89	52.4	
Pyrene	68.02	15	100	0	68.0	12.6	140	69.74	2.50	16.3	
1,2,4-Trichlorobenzene	52.52	10	100	0	52.5	17.4	98.7	64.46	20.4	36.4	

Sample ID LCS-8834 | Batch ID: 8834 | Test Code: SW7470 | Units: mg/L | Analysis Date 9/28/2005 | Prep Date 9/28/2005
Client ID: | Run ID: MI-LA254_050928C | SeqNo: 404922

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.004734	0.0002	0.005	0	94.7	75.2	134	0			

Sample ID LCSD-8834 | Batch ID: 8834 | Test Code: SW7470 | Units: mg/L | Analysis Date 9/28/2005 | Prep Date 9/28/2005
Client ID: | Run ID: MI-LA254_050928C | SeqNo: 404935

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.004779	0.0002	0.005	0	95.6	75.2	134	0.004734	0.937	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: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID LCS | Batch ID: R16791 | Test Code: SW6010A | Units: mg/L | Analysis Date 9/27/2005 3:21:59 PM | Prep Date

Client ID: | Run ID: ICP_050927C | SeqNo: 404508

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.5461	0.01	0.5	0	109	80	120	0			
Arsenic	0.5781	0.02	0.5	0	116	80	120	0			
Beryllium	0.5656	0.003	0.5	0	113	80	120	0			
Cadmium	0.5667	0.002	0.5	0	113	80	120	0			
Chromium	0.5781	0.006	0.5	0	116	80	120	0			
Copper	0.5645	0.006	0.5	0	113	80	120	0			
Lead	0.5552	0.005	0.5	0	111	80	120	0			
Nickel	0.5496	0.01	0.5	0	110	80	120	0			
Selenium	0.5345	0.02	0.5	0	107	80	120	0			
Silver	0.5539	0.005	0.5	0	111	80	120	0			
Thallium	0.5653	0.01	0.5	0	113	80	120	0			
Zinc	0.5622	0.05	0.5	0	112	80	120	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: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID LCSD | Batch ID: R16791 | Test Code: SW6010A | Units: mg/L | Analysis Date 9/27/2005 3:25:13 PM | Prep Date
Client ID: | Run ID: ICP_050927C | SeqNo: 404509

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.5436	0.01	0.5	0	109	80	120	0.5461	0.447	20	
Arsenic	0.5719	0.02	0.5	0	114	80	120	0.5781	1.08	20	
Beryllium	0.5637	0.003	0.5	0	113	80	120	0.5656	0.349	20	
Cadmium	0.5632	0.002	0.5	0	113	80	120	0.5667	0.616	20	
Chromium	0.5694	0.006	0.5	0	114	80	120	0.5781	1.52	20	
Copper	0.5533	0.006	0.5	0	111	80	120	0.5645	2.01	20	
Lead	0.5559	0.005	0.5	0	111	80	120	0.5552	0.132	20	
Nickel	0.5406	0.01	0.5	0	108	80	120	0.5496	1.65	20	
Selenium	0.5396	0.02	0.5	0	108	80	120	0.5345	0.961	20	
Silver	0.5381	0.005	0.5	0	108	80	120	0.5539	2.88	20	
Thallium	0.5581	0.01	0.5	0	112	80	120	0.5653	1.27	20	
Zinc	0.5552	0.05	0.5	0	111	80	120	0.5622	1.26	20	

Sample ID LCS-8790 | Batch ID: 8790 | Test Code: SW6010A | Units: mg/L | Analysis Date 9/21/2005 2:24:19 PM | Prep Date 9/20/2005
Client ID: | Run ID: ICP_050921B | SeqNo: 402646

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	0.5112	0.003	0.5	0	102	80	120	0			
Cadmium	0.4939	0.002	0.5	0	98.8	80	120	0			
Chromium	0.4974	0.006	0.5	0	99.5	80	120	0			
Copper	0.5088	0.006	0.5	0	102	80	120	0			
Lead	0.4932	0.005	0.5	0	98.6	80	120	0			
Nickel	0.4797	0.01	0.5	0	95.9	80	120	0			
Selenium	0.487	0.05	0.5	0	97.4	80	120	0			
Silver	0.4989	0.005	0.5	0	99.8	80	120	0			
Zinc	0.4874	0.05	0.5	0	97.5	80	120	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: 0509182
Project: AL-2 to EP-1 Week of Sept. 12, 2005

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID LCSD-8790 | Batch ID: 8790 | Test Code: SW6010A | Units: mg/L | Analysis Date 9/21/2005 2:27:26 PM | Prep Date 9/20/2005
Client ID: | Run ID: ICP_050921B | SeqNo: 402647

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	0.5118	0.003	0.5	0	102	80	120	0.5112	0.128	20	
Cadmium	0.4993	0.002	0.5	0	99.9	80	120	0.4939	1.08	20	
Chromium	0.4994	0.006	0.5	0	99.9	80	120	0.4974	0.402	20	
Copper	0.5129	0.006	0.5	0	103	80	120	0.5088	0.790	20	
Lead	0.4927	0.005	0.5	0	98.5	80	120	0.4932	0.0901	20	
Nickel	0.4849	0.01	0.5	0	97.0	80	120	0.4797	1.08	20	
Selenium	0.4837	0.05	0.5	0	96.7	80	120	0.487	0.688	20	
Silver	0.5033	0.005	0.5	0	101	80	120	0.4989	0.894	20	
Zinc	0.4936	0.05	0.5	0	98.7	80	120	0.4874	1.27	20	

Sample ID LCS-8790 | Batch ID: 8790 | Test Code: SW6010A | Units: mg/L | Analysis Date 9/22/2005 10:56:26 AM | Prep Date 9/20/2005
Client ID: | Run ID: ICP_050922B | SeqNo: 402881

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.5026	0.01	0.5	0.01878	96.8	80	120	0			B
Arsenic	0.4931	0.02	0.5	0	98.6	80	120	0			
Thallium	0.4937	0.01	0.5	0	98.7	80	120	0			

Sample ID LCSD-8790 | Batch ID: 8790 | Test Code: SW6010A | Units: mg/L | Analysis Date 9/22/2005 10:58:56 AM | Prep Date 9/20/2005
Client ID: | Run ID: ICP_050922B | SeqNo: 402882

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.497	0.01	0.5	0.01878	95.6	80	120	0.5026	1.13	20	B
Arsenic	0.4943	0.02	0.5	0	98.9	80	120	0.4931	0.254	20	
Thallium	0.4977	0.01	0.5	0	99.5	80	120	0.4937	0.809	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

Sample Receipt Checklist

Client Name GIANTREFIN | Date and Time Received: 9/19/2005

Work Order Number 0509182 | Received by GLS

Checklist completed by B Schlegel 9-19-05
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? 4° *4° C ± 2 Acceptable*
If given sufficient time to cool.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: Bottles for total and Dissolved Metals were both preserved in Lab on 9/19/05 GS. Dissolved Metals was filtered in Lab 9/19/05 GS

Corrective Action _____

CHAIN-OF-CUSTODY RECORD

QA / QC Package:
Std ☐ Level 4 ☐
Other:

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: Route 3 Box 7 Gallup, NM 87301
Phone #: 505 722 3833
Fax #: 505 722 0210

Project Name: AL-2 to EP-1 Week of 9-12-2005
Project #:
Project Manager: Steve Morris
Sampler: Steve Morris
Sample Temperature: 4°

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3	Preservative	HEAL No. 0509182	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	8021 - BTEX + MTBE	PPL Metals Total + Diss.			Air Bubbles or Headspace (Y or N)
9/15/05	0700	H_2O	AL-2 to EP-1					-1												X	X	X			

Date	Time	Relinquished By: (Signature)	Received By: (Signature)
9/19/05	0845	Steve Morris	Schlippe 9/19/05 @845
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks: RUSH 5DAY

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

December 20, 2005

Ed Riege
Giant Refining Co
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-3833
FAX (505) 722-0210

RE: AL-2 to EP-1 Week of 12/5/2005 Order No.: 0512124

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 1 sample on 12/9/2005 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

4901 Hawkins NE ■ Suite D ■ Albuquerque, NM 87109
505.345.3975 ■ Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory

Date: *20-Dec-05*

CLIENT:	Giant Refining Co
Project:	AL-2 to EP-1 Week of 12/5/2005
Lab Order:	0512124

CASE NARRATIVE

Analytical Comments for METHOD 8015GRO_W, SAMPLE 0512124-01a: Elevated surrogate due to matrix interference.

Hall Environmental Analysis Laboratory

Date: 20-Dec-05

CLIENT:	Giant Refining Co	Client Sample ID:	AL-2 to EP-1
Lab Order:	0512124	Collection Date:	12/7/2005 9:30:00 AM
Project:	AL-2 to EP-1 Week of 12/5/2005		
Lab ID:	0512124-01	Matrix:	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: SCC
Diesel Range Organics (DRO)	110	10		mg/L	10	12/14/2005 5:19:24 PM
Motor Oil Range Organics (MRO)	ND	50		mg/L	10	12/14/2005 5:19:24 PM
Surr: DNOP	139	58-140		%REC	10	12/14/2005 5:19:24 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	1.7	0.10		mg/L	2	12/16/2005 4:45:20 PM
Surr: BFB	182	79.7-118	S	%REC	2	12/16/2005 4:45:20 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Methyl tert-butyl ether (MTBE)	35	5.0		µg/L	2	12/16/2005 4:45:20 PM
Benzene	4.4	1.0		µg/L	2	12/16/2005 4:45:20 PM
Toluene	8.1	1.0		µg/L	2	12/16/2005 4:45:20 PM
Ethylbenzene	3.7	1.0		µg/L	2	12/16/2005 4:45:20 PM
Xylenes, Total	27	1.0		µg/L	2	12/16/2005 4:45:20 PM
Surr: 4-Bromofluorobenzene	107	82.2-119		%REC	2	12/16/2005 4:45:20 PM
EPA METHOD 7470: MERCURY						Analyst: CMC
Mercury	0.0019	0.00020		mg/L	1	12/14/2005
EPA 6010: TOTAL RECOVERABLE METALS						Analyst: NMO
Antimony	ND	0.010		mg/L	1	12/13/2005 11:14:07 AM
Arsenic	ND	0.020		mg/L	1	12/13/2005 11:14:07 AM
Beryllium	ND	0.0030		mg/L	1	12/13/2005 11:14:07 AM
Cadmium	ND	0.0020		mg/L	1	12/13/2005 11:14:07 AM
Chromium	0.0077	0.0060		mg/L	1	12/13/2005 11:14:07 AM
Copper	0.0060	0.0060		mg/L	1	12/13/2005 11:14:07 AM
Lead	ND	0.0050		mg/L	1	12/14/2005 9:04:57 AM
Nickel	0.064	0.010		mg/L	1	12/13/2005 11:14:07 AM
Selenium	ND	0.050		mg/L	1	12/13/2005 11:14:07 AM
Silver	ND	0.0050		mg/L	1	12/13/2005 11:14:07 AM
Thallium	ND	0.010		mg/L	1	12/13/2005 11:14:07 AM
Zinc	0.70	0.050		mg/L	1	12/14/2005 9:04:57 AM

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: *20-Dec-05*

CLIENT: Giant Refining Co
Work Order: 0512124
Project: AL-2 to EP-1 Week of 12/5/2005

QC SUMMARY REPORT
Method Blank

Sample ID: MB-9397 Batch ID: 9397 Test Code: SW8015 Units: mg/L Analysis Date: 12/14/2005 3:07:07 PM Prep Date: 12/14/2005
Client ID: Run ID: FID(17A) 2_051213A SeqNo: 432319

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1									
Motor Oil Range Organics (MRO)	ND	5									
Surr: DNOP	1.2	0	1	0	120	58	140	0			

Sample ID: Reagent Blank 5m Batch ID: R17648 Test Code: SW8015 Units: mg/L Analysis Date: 12/16/2005 11:08:28 A Prep Date:
Client ID: Run ID: PIDFID_051216A SeqNo: 433316

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.05									
Surr: BFB	20.68	0	20	0	103	79.7	118	0			

Sample ID: Reagent Blank 5m Batch ID: R17648 Test Code: SW8021 Units: µg/L Analysis Date: 12/16/2005 11:08:28 A Prep Date:
Client ID: Run ID: PIDFID_051216A SeqNo: 433347

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	2.5									
Benzene	ND	0.5									
Toluene	ND	0.5									
Ethylbenzene	ND	0.5									
Xylenes, Total	ND	0.5									
Surr: 4-Bromofluorobenzene	20.64	0	20	0	103	82.2	119	0			

Sample ID: MB-9401 Batch ID: 9401 Test Code: SW7470 Units: mg/L Analysis Date: 12/14/2005 Prep Date: 12/14/2005
Client ID: Run ID: MI-LA254_051214A SeqNo: 432216

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
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: 0512124
Project: AL-2 to EP-1 Week of 12/5/2005

QC SUMMARY REPORT
Method Blank

Sample ID: MB-9372 | Batch ID: 9372 | Test Code: SW6010A | Units: mg/L | Analysis Date: 12/13/2005 10:49:51 A | Prep Date: 12/12/2005
Client ID: | Run ID: ICP_051213B | SeqNo: 431617

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.01418	0.01									J
Arsenic	0.006163	0.02									
Beryllium	ND	0.003									J
Cadmium	0.0007709	0.002									J
Chromium	0.000567	0.006									J
Copper	0.005159	0.006									
Nickel	ND	0.01									
Selenium	ND	0.05									J
Silver	0.001074	0.005									
Thallium	ND	0.05									

Sample ID: MB-9372 | Batch ID: 9372 | Test Code: SW6010A | Units: mg/L | Analysis Date: 12/14/2005 8:44:40 AM | Prep Date: 12/12/2005
Client ID: | Run ID: ICP_051213B | SeqNo: 431964

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.005									
Zinc	0.01186	0.05									J

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: 20-Dec-05

CLIENT: Giant Refining Co
Work Order: 0512124
Project: AL-2 to EP-1 Week of 12/5/2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS-9397 | Batch ID: 9397 | Test Code: SW8015 | Units: mg/L | Analysis Date: 12/14/2005 3:39:54 PM | Prep Date: 12/14/2005
Client ID: | Run ID: FID(17A) 2_051213A | SeqNo: 432320

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.049	1	5	0	121	81.2	149	0			

Sample ID: LCSD-9397 | Batch ID: 9397 | Test Code: SW8015 | Units: mg/L | Analysis Date: 12/14/2005 4:12:56 PM | Prep Date: 12/14/2005
Client ID: | Run ID: FID(17A) 2_051213A | SeqNo: 432321

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.925	1	5	0	138	81.2	149	6.049	13.5	23	

Sample ID: GRO lcs 2.5ug | Batch ID: R17648 | Test Code: SW8015 | Units: mg/L | Analysis Date: 12/16/2005 11:22:12 P | Prep Date:
Client ID: | Run ID: PIDFID_051216A | SeqNo: 433317

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.5446	0.05	0.5	0	109	82.6	114	0			

Sample ID: GRO lcsd 2.5ug | Batch ID: R17648 | Test Code: SW8015 | Units: mg/L | Analysis Date: 12/17/2005 5:25:12 AM | Prep Date:
Client ID: | Run ID: PIDFID_051216A | SeqNo: 433321

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.5538	0.05	0.5	0	111	82.6	114	0.5446	1.68	8.39	

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: 0512124
Project: AL-2 to EP-1 Week of 12/5/2005

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: BTEX lcs 100ng | Batch ID: R17648 | Test Code: SW8021 | Units: µg/L | Analysis Date: 12/17/2005 12:23:13 A | Prep Date:
Client ID: | Run ID: PIDFID_051216A | SeqNo: 433355

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	20.96	2.5	20	0	105	64.5	133	0			
Benzene	18.49	0.5	20	0	92.5	88.5	114	0			
Toluene	19.34	0.5	20	0	96.7	87.2	114	0			
Ethylbenzene	19.81	0.5	20	0	99.1	88.6	113	0			
Xylenes, Total	40.01	0.5	40	0	100	83.3	114	0			

Sample ID: BTEX lcsd 100ng | Batch ID: R17648 | Test Code: SW8021 | Units: µg/L | Analysis Date: 12/17/2005 6:25:05 AM | Prep Date:
Client ID: | Run ID: PIDFID_051216A | SeqNo: 433387

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	18.43	2.5	20	0	92.2	64.5	133	20.96	12.8	28	
Benzene	18.81	0.5	20	0	94.0	88.5	114	18.49	1.70	27	
Toluene	19.63	0.5	20	0	98.2	87.2	114	19.34	1.52	19	
Ethylbenzene	19.82	0.5	20	0	99.1	88.6	113	19.81	0.0313	10	
Xylenes, Total	39.34	0.5	40	0	98.3	83.3	114	40.01	1.69	13	

Sample ID: LCS-9401 | Batch ID: 9401 | Test Code: SW7470 | Units: mg/L | Analysis Date: 12/14/2005 | Prep Date: 12/14/2005
Client ID: | Run ID: MI-LA254_051214A | SeqNo: 432217

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.00509	0.0002	0.005	0	102	80	120	0			

Sample ID: LCSD-9401 | Batch ID: 9401 | Test Code: SW7470 | Units: mg/L | Analysis Date: 12/14/2005 | Prep Date: 12/14/2005
Client ID: | Run ID: MI-LA254_051214A | SeqNo: 432225

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.004801	0.0002	0.005	0	96.0	80	120	0.00509	5.85	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

QC SUMMARY REPORT

Laboratory Control Spike - generic

CLIENT: Giant Refining Co
Work Order: 0512124
Project: AL-2 to EP-1 Week of 12/5/2005

Sample ID: LCS-9372 | Batch ID: 9372 | Test Code: SW6010A | Units: mg/L | Analysis Date: 12/13/2005 10:52:52 A | Prep Date: 12/12/2005
Client ID: | Run ID: ICP_051213B | SeqNo: 431618

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.4876	0.01	0.5	0.01418	94.7	80	120	0			B
Arsenic	0.4833	0.02	0.5	0.006163	95.4	80	120	0			
Beryllium	0.486	0.003	0.5	0	97.2	80	120	0			
Cadmium	0.4607	0.002	0.5	0.0007709	92.0	80	120	0			
Chromium	0.4699	0.006	0.5	0.000567	93.9	80	120	0			
Copper	0.4757	0.006	0.5	0.005159	94.1	80	120	0			
Nickel	0.4436	0.01	0.5	0	88.7	80	120	0			
Selenium	0.4488	0.05	0.5	0	89.8	80	120	0			
Silver	0.4753	0.005	0.5	0.001074	94.8	80	120	0			
Thallium	0.4768	0.05	0.5	0	95.4	80	120	0			

Sample ID: LCSD-9372 | Batch ID: 9372 | Test Code: SW6010A | Units: mg/L | Analysis Date: 12/13/2005 10:56:11 A | Prep Date: 12/12/2005
Client ID: | Run ID: ICP_051213B | SeqNo: 431619

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.4843	0.01	0.5	0.01418	94.0	80	120	0.4876	0.685	20	B
Arsenic	0.4827	0.02	0.5	0.006163	95.3	80	120	0.4833	0.133	20	
Beryllium	0.4873	0.003	0.5	0	97.5	80	120	0.486	0.265	20	
Cadmium	0.463	0.002	0.5	0.0007709	92.4	80	120	0.4607	0.496	20	
Chromium	0.4707	0.006	0.5	0.000567	94.0	80	120	0.4699	0.169	20	
Copper	0.4761	0.006	0.5	0.005159	94.2	80	120	0.4757	0.0793	20	
Nickel	0.4441	0.01	0.5	0	88.8	80	120	0.4436	0.104	20	
Selenium	0.4429	0.05	0.5	0	88.6	80	120	0.4488	1.34	20	
Silver	0.476	0.005	0.5	0.001074	95.0	80	120	0.4753	0.142	20	
Thallium	0.4832	0.05	0.5	0	96.6	80	120	0.4768	1.32	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

QC SUMMARY REPORT

Laboratory Control Spike - generic

CLIENT: Giant Refining Co
Work Order: 0512124
Project: AL-2 to EP-1 Week of 12/5/2005

Sample ID: LCS-9372 | Batch ID: 9372 | Test Code: SW6010A | Units: mg/L | Analysis Date: 12/14/2005 8:47:09 AM | Prep Date: 12/12/2005
Client ID: | Run ID: ICP_051213B | SeqNo: 431965

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.4862	0.005	0.5	0	97.2	80	120	0			
Zinc	0.4679	0.05	0.5	0.01186	91.2	80	120	0			

Sample ID: LCSD-9372 | Batch ID: 9372 | Test Code: SW6010A | Units: mg/L | Analysis Date: 12/14/2005 8:50:10 AM | Prep Date: 12/12/2005
Client ID: | Run ID: ICP_051213B | SeqNo: 431966

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.4836	0.005	0.5	0	96.7	80	120	0.4862	0.546	20	
Zinc	0.4688	0.05	0.5	0.01186	91.4	80	120	0.4679	0.194	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

Sample Receipt Checklist

Client Name GIANTREFIN

Date and Time Received: 12/9/2005

Work Order Number 0512124

Received by AT

Checklist completed by _____ Signature _____ Date 12/9/05

Matrix

Carrier name UPS

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?	4°	*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

QA / QC Package:
Std ☐ Level 4 ☐
Other:

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: Route 3 Box 7 Gallup, NM 87301
Phone #: 505 722 3833
Fax #: 505 722 0210

Project Name: AL-2 to EP-1 Week of 12-5-2005
Project #:
Project Manager: Steve Morris
Sampler: Steve Morris
Sample Temperature: 4°

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3		HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	PP Metals Total				Air Bubbles or Headspace (Y or N)
12/7/05	0930	H_2O	AL-2 to EP-1					0512124-1	X		X										X				

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	
12-8-05	0735	Steve Morris	[illegible]	12/9/05@ 1135
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	

Remarks: RUSH

6. Summary of Groundwater Testing

OW-11

A grab sample fom OW-11 was taken on September 29, 2005. The sample was analyzed for RCRA Metals, VOC, SVOC, BTEX, MTBE and general chemistry. Lab results showed results less than the New Mexico Water Quality Standards (NMWQS) for anions, VOCs, SVOCs, and metals. All the tested parameters were less than the applicable MCLs, NM ground water, and NM TPH screening levels. However, the general chemistry results showed that fluoride (2.3 mg/l) and sulfate (990 mg/l) were present at levels greater than the NMWQS for fluoride (1.6 mg/l) and sulfate (600 mg/l).

RECOMMENDATION: *Giant Ciniza will continue to test annually for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry*

OW-12

OW-12 was sampled on September 27, 2005 and analyzed for BTEX and MTBE. Lab analysis showed all parameters at concentrations less than (all non-detect) the NMWQS for BTEX and MTBE.

RECOMMENDATION: *Giant Ciniza will continue to monitor OW-12 on an annual basis for BTEX and MTBE*

OW-13

OW-13 was sampled on September 27, 2005 and analyzed for BTEX and MTBE. Lab analysis showed all parameters at concentrations less than (all non-detect) the NMWQS for BTEX compounds and MTBE.

RECOMMENDATION: *Giant Ciniza will continue to monitor OW-13 on an annual basis for BTEX and MTBE*

OW-14

OW-14 was sampled on September 29, 2005 and analyzed for BTEX and MTBE. Lab analysis showed concentrations less than the NMWQS for Toluene, Ethylbenzene, Xylene, and MTBE. However, benzene was detected at 0.017 mg/l which is greater than the New Mexico WQCC standard and USEPA's MCL.

RECOMMENDATION: *Giant Ciniza will monitor OW-14 on a semi-annual basis for BTEX and MTBE. This well has been known to contain contaminants. Wells OW-12, OW-13, OW- 29, and OW-30 were installed to monitor if contaminants from OW-14 were migrating.* ***Data from the additional wells have not shown any signs of contaminants.***

OW-14 was only sampled once in 2005 because the agreement to sample OW-14 became effective when the year was half over in June 2005. Giant Ciniza will try to sample this well in the first half and again in the second half of 2006.

OW-29

OW-29 was sampled on September 28, 2005 and analyzed for BTEX and MTBE. Lab analysis showed concentrations less than (all non-detect) the NMWQS for Benzene, Toluene, Ethylbenzene, Xylene, and MTBE.

RECOMMENDATION: *Giant Ciniza will continue to monitor OW-29 on an annual basis for BTEX and MTBE*

OW-30

OW-30 was sampled on September 29, 2005 and analyzed for BTEX and MTBE. Lab analysis showed concentrations less than (all non-detect) the NMWQS for Benzene, Toluene, Ethylbenzene, Xylene, and MTBE.

RECOMMENDATION: *Giant Ciniza will continue to monitor OW-30 on an annual basis for BTEX and MTBE*

BW-1-A

BW-1-A is a dry well and therefore was not sampled in 2005.

RECOMMENDATION: *Giant Ciniza will continue to visually inspect BW-1-A annually for any liquids. If liquids are observed, then sampling will occur. All samples will be analyzed for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry.*

BW-1-B

BW-1-B is a dry well and therefore was not sampled in 2005.

RECOMMENDATION: *Giant Ciniza will continue to visually inspect BW-1-B annually for any liquids. If liquids appear, samples will be analyzed for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry.*

BW-1-C

BW-1-C was sampled on October 17, 2005 and analyzed for VOC, SVOC, BTEX, MTBE, metals, and General Chemistry. Lab analysis showed concentrations less than (all non-detect) the NMWQS for benzene, toluene, ethylbenzene, xylene, and MTBE. However, lab results showed fluoride (2.2 mg/l) was slightly greater than the NMWQS (1.6 mg/l).

RECOMMENDATION: *Giant Ciniza will continue to monitor BW-1-C on an annual basis for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry*

BW-2-A

BW-2-A was sampled on October 17, 2005 and analyzed for VOC, SVOC, BTEX, MTBE, recoverable metals, and General Chemistry. Lab results showed all parameters less than NMWQS.

RECOMMENDATION: *Giant Ciniza will continue to monitor BW-2-A on an annual basis for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry*

BW-2-B

BW-2-B was sampled on October 18, 2005 and analyzed for VOC, SVOC, BTEX, MTBE, metals and General Chemistry. Lab results showed concentrations less than the NMWQS for all parameters except fluoride which was slightly greater (1.7 mg/l) than the NMWQS (1.6 mg/l).

RECOMMENDATION: *Giant Ciniza will continue to monitor BW-2-B on an annual basis for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry. All future lab reports will be compared to past data to determine if levels of Selenium are increasing or remaining static.*

BW-2-C

BW-2-C was sampled on October 19, 2005 and analyzed for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry. Lab results showed concentrations less than the NMWQS for all parameters.

RECOMMENDATION: Giant Ciniza will continue to monitor BW-2-C on an annual basis for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry.

BW-3-A

BW-3-A was dry and therefore could not be sampled.

RECOMMENDATION: *Giant Ciniza will continue to visually inspect BW-3-A for any liquids. If liquids appear, samples will be analyzed for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry.*

BW-3-B

BW-3-B was sampled on October 20, 2005 and analyzed for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry. Lab results showed concentrations less than the NMWQS for all parameters.

RECOMMENDATION: *Giant Ciniza will continue to monitor BW-3-B on an annual basis for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry*

BW-3-C

BW-3-C was sampled on October 20, 2005 and analyzed for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry. Lab results showed concentrations less than the NMWQS for all parameters except fluoride which was present at the standard concentration (1.6 mg/l).

RECOMMENDATION: *Giant Ciniza will continue to monitor BW-3-C on an annual basis for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry*

GWM-1

GWM-1 was sampled on February 15, 2005, June 28, 2005, and August 1, 2005. The samples from February 15 and June 28 were analyzed for BTEX. The sample from August 1 was analyzed for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry. The sample from June 28 showed benzene present at the 0.01 mg/l NMWQS standard. The sample from August 1 showed benzene present at 8.1 ug/l (0.0081 mg/l). These benzene values are greater than the 0.005 mg/l MCL standard for benzene. The sample from February 15 was present at the 0.005 mg/l MCL. All other results from the February 15 and June 28 sampling were less than the NMWQS. Lab results from the August 1 sampling showed concentrations less than the NMWQS for all parameters except fluoride (2.6 mg/l) and chloride (2,000 mg/l) which were greater than the NMWQS for fluoride (1.6 mg/l) and chloride (250 mg/l).

RECOMMENDATION: *Giant Ciniza will monitor GWM-1 on an annual basis for VOC, SVOC, BTEX, MTBE, Metals, and General Chemistry. Ciniza also checks GWM-1 on a quarterly basis for the presence of water. Based on 2006 lab data, discussions with NMED and NMOCD are ongoing and sampling maybe changed*

GWM-2

GWM-2 was installed in the Fall of 2005 and was dry.

RECOMMENDATION: *Giant Ciniza will monitor GWM-2 on a quarterly basis for the presence of water. If water is found, Giant will contact OCD/HWB immediately.*

GWM-3

GWM-3 was installed in the Fall of 2005 and was dry.

RECOMMENDATION: *Giant Ciniza will continue to monitor GWM-3 on a quarterly basis for the presence of water. If water is found, Giant will contact OCD/HWB immediately.*

POND #2

Pond #2 should have been sampled in 2005 but was not due to an oversight. The permit requires that the inlet water to Pond #2 is to be sampled annually for BTEX, MTBE, RCRA Metals, BOD, COD, and TDS. This evaluation is not to be confused with the general chemistry evaluation, as for Pond 8, described in the next section.

RECOMMENDATION: *Giant Ciniza will continue to monitor Pond 2on an annual basis for BTEX, MTBE, RCRA Metals, BOD, COD, and TDS. Moreover, in 2006 Giant will monitor above this point (pond 1) for any contaminants.*

Pond 8

Giant is required to sample on an annual basis one of the evaporation ponds for general chemistry parameters. Pond 8 was sampled on 12/13/05 for general chemistry. As to be expected in water from evaporation ponds, the water sample was high in chloride, sodium and sulfate.

RECOMMENDATION: *Giant Ciniza will continue to perform a general chemistry evaluation of one of the evaporation ponds on an annual basis for general chemistry. The pond selection will be at Giant's discretion.*

PW-2

PW-2 was not required to be sampled in 2005.

RECOMMENDATION: *Giant Ciniza will continue to monitor PW-2 according to the discharge plan for VOC, SVOC, Metals, Cyanide, and Nitrates. The next scheduled sampling will take place in 2008*

PW-3

PW-3 was not required to be sampled in 2005

RECOMMENDATION: *Giant Ciniza will monitor PW-3 according to the discharge plan. Sampling will be conducted every 3 years beginning in 2006*

PW-4

PW-4 was not required to be sampled in 2005.

RECOMMENDATION: *Giant Ciniza will continue to monitor PW-4 according to the discharge plan for VOC, SVOC, Metals, Cyanide, and Nitrates and is scheduled for sampling in 2007*

OW-1 and OW-10

These wells will be visually checked on a quarterly basis starting the 4th quarter of 2004. In 2005, at OW-1 the depth to water is zero and OW-10 is at 2.95 feet.

RECOMMENDATION: *Giant Ciniza will continue to visually inspect OW-1 and OW-10 for artesian flow quarterly*

MW-1, MW-4, MW-5, SMW-2 AND SMW-4

MW-1, MW-4 and MW-5 were sampled on October 11 and 12, 2005. SMW-2 and SMW-4 were sampled on October 12 and 13 in 2005. Lab results showed concentrations less than the NMWQS on all parameters except for chloride (1,700 mg/l) and sulfate (1,500 mg/l) in SMW-2 for which the NMWQS for chloride and fluoride are 250 mg/l and 600 mg/l respectively. The pH detected in MW-1 (9.08) and MW-5 (9.07) were slightly greater than the NMWQS of pH=9.

RECOMMENDATION: *Giant Ciniza will sample MW-1 annually. MW-4, MW-5, SMW-2 and SMW-4 will be sampled in 2007 and 2009 and biennially thereafter.*

7. List of Tables

Plots of Water Table Elevations

GW Well Depths to Water 2005

Well #	Date:	DTW: in Ft.	Water Elev.
BW-1A	5/24/2005	Dry	
BW-1B	5/24/2005	67.5	
BW-1C	5/24/2005	6.6	
BW-2A	5/24/2005	31.3	
BW-2B	5/24/2005	28	
BW-2C	5/24/2005	20.5	
BW-3A	5/24/2005	Dry	
BW-3B	5/24/2005	32.2	
BW-3C	5/24/2005	7.9	
OW-11	5/24/2005	21	6902.89
OW-12	5/24/2005	48.5	6891.93
OW-13	5/24/2005	23.7	6894.9
OW-14	5/24/2005	27.15	6899.49
OW-29	5/24/2005	21.4	6892.1
OW-30	5/24/2005	21.7	6899.9
MW-1	5/24/2005	7	6871.52
MW-4	5/24/2005	7.7	6874.84
MW-5	5/24/2005	11.3	6827.02
SMW-2	5/24/2005	26.45	6857.66
SMW-4	5/24/2005	29.6	6850.48

DTW = Depth to Water

Groundwater levels before purging or sampling

GW Well Depths to Water 2005

Well #	Date:	DTW:
BW-1A	5-24-05	Dry
BW-1B	5-24-05	67.5'
BW-1C w	5-24-05	6.6'
BW-2A w	5-24-05	31.3'
BW-2B w	5-24-05	28.0'
BW-2C w	5-24-05	20.5'
BW-3A	5-24-05	Dry
BW-3B w	5-24-05	32.2'
BW-3C w	5-24-05	7.9'
OW-11	5-24-05	21.0'
OW-12	5-24-05	48.5'
OW-13	"	23.7'
OW-14	"	27.15
OW-29	5-24-05	21.4'
OW-30	5-24-05	21.7
MW-1	5-24-05	7.0'
MW-4	5-24-05	7.7'
MW-5	5-24-05	11.3'
SMW-2	5-24-05	26.45
SMW-4	5-24-05	29.6'

Purge Only pg-1

6-13-2005

OW-12 DTW 44.5 ft. 223 gal = 3 WVs

1030 hrs 1st purge 50 gallons = 173 left to get 3 WVs
lost suction

6-16-05

OW-12

0630 2nd purge lost suction 45 gal = 128 gal left to get 3 WVs

6-21-95

OW-12

0630-3rd purge 50 gal + lost suction = 78 gal to ge
3 WVs

OW-12

0640 4th purge 42 gal + lost suction = 36 gal to get 3 WVs

7-21-95 SC Morris on site survey monitor
0630 hrs MW-1 DTW 7.45 ft 382 gal = 3 WVs
1st purge 140 gal + lost suction leaving
242 gal to get 3 WVs

7-22-05

1000 hrs MW-5 - DTW 11.9 ft 258 gal = 3 WVs
1st purge 165 gal leaving 103 gal to get 3 WVs

7-25

0615 hrs MW-5 DTW 11.85 ft
2nd purge 53 gal leaving 59 gal to get 3 WVs

Purge Only pg 2

7-25-05

0650 MW-4 DTW 8.25 349 gal = 3WV's
1st purge 165 gal leaving 184 gal to get 3WV's

7-26-05

0630 MW-4 184 gal to get 3WV's
2nd purge 140 gal leaving 44 gal to get 3WV's

10-12-05

0645 MW-4 2nd purge 130 gallons to get 3 WVs

0730 Purged 130 gallons + sampled
DTW 7.9 ft

1000 MW-1 157 gallons left to get 3 WVs
2nd purge DTW 7.4 ft.

1045 Purged 157 gallons + sampled

1100 SMW-4 DTW 29.6 ft. 3 WVs = 20.8 gal
Purged 9.7 gallons + lost suction
Rechecked DTW at 1300 hrs. at 53 ft. not enough recharge to sample well today.

1330 SMW-2 DTW-26.35
Purged 2 gallons to flush pump discharge hose and sampled

10-13-05

1100 SMW-4 DTW-33.1 ft 3.25 gal recharge overnight.

1130 Purged 1 gallon + sampled

2-C 20-35, 64 gal
2-B 27.85

10-17-05

1100 BW-1-A DTW - Dry - no water

BW-1-B DTW - 67.5
There appear to be about 2" of water in well
Can not sample.

BW-1-C DTW 7.3 ft 3WVs = 73.2 gallons
1150 1st purge = 3 gal + lost suction
1300 2nd purge = 5 gallons + lost suction. Ran pump more slowly to try + watch recharge.
1400 Sampled well

1500 BW-2-A DTW - 32.1 3WVs = 16.1 gallons
1st purge
Water muddy - reddish brown
1530 Purged 17 gal + sampled well

10-18-05
1000 BW-2-B DTW 27.85 3WVs = 31 gallons
1st purge 20 gallons + lost suction
Water milky with reddish tinge
1110 Waited 30 min. + sampled

1200 BW-2-C DTW 20.35 ft Pump at 140 ft depth
Purged 18.6 gallons + lost suction
400 Attempted sampling but could not pump water.
Rechecked DTW but got no signal at 100 ft. (Max)

3C 8.3 ft - 3 WV = 72 gal

10-19-2005

1000 BW-2-C DTW 54.2 ft.

1045 Sampled well. Water very muddy, reddish brown.

1345 BW-3-A - Dry - No water

1400 BW-3-B DTW - 32.75 ft. 3 WVs = 19.2 gal

Purged 16 gallons + lost suction

1500 BW-3-C DTW - 8.3 ft 3 WVs = 72 gallons

Started purge - 16 gallons + lost suction

10-20-2005

0730 BW-3-B DTW - 32.75

0800 Sampled well

0930 BW-3-C DTW - 78.4 ft.

0945 Sampled Well

WELL PUMPING & SAMPLING LOG

WELL #	MW-1	MW-~~5~~ 5	MW-~~5~~ 7	SMW-2	SMW-4							
PURGE DATE												
PURGE TIME												
OVA READING												
LIQUID DEPTH												
PUMP DEPTH												
IMMISC. LAYER												
FLOW RATE												
PUMP TIME												

SAMPLE DAY	10/12/05	10/11/05	10/12/05	10/12/05	10/13/05							
SAMPLE TIME	1045	1400	0730	1400	1130							
OVA READING												
LIQUID DEPTH	7.4	12.55	7.9	26.35	33.1							
1) TEMP. F	56	57	55	57	56							
pH	8.92	8.7	8.80	6.86	8.44							
SP. COND.	1136	1172	1198	8480	1212							
2) TEMP. F	56	57	55	57	56							
pH	8.88	8.75	8.79	6.91	8.36							
SP. COND.	1133	1160	1197	8430	1207							
3) TEMP. F	56	57	55	57	56							
pH	8.88	8.76	8.76	6.92	8.41							
SP. COND.	1131	1172	1198	8460	1208							
4) TEMP. F	56	57	55	57	56							
pH	8.88	8.75	8.76	6.92	8.41							
SP. COND.	1139	1172	1198	8370	1210							

WELL PUMPING & SAMPLING LOG

WELL #	OW-12	OW-13	OW-14	OW29	OW-30	OW-11						
PURGE DATE												
PURGE TIME												
OVA READING												
LIQUID DEPTH												
PUMP DEPTH												
IMMISC. LAYER												
FLOW RATE												
PUMP TIME												

SAMPLE DAY	9/27/05	9/27/05	9/29/05	9/28/05	9/29/05	9/29/05						
SAMPLE TIME	0845	1030	1400	1230		1045						
OVA READING												
LIQUID DEPTH	60.9	24.25	27.15	22.0	26.3	21.1						
1) TEMP. F	58	57	57	57	55	57						
pH	9.13	7.96	6.78	6.98	7.15	8.25						
SP. COND.	1111	1234	2730	1669	1633	2840						
2) TEMP. F	57	57	57	57	55	57						
pH	9.17	7.89	6.93	6.94	7.18	8.26						
SP. COND.	1107	1226	2750	1665	1631	2840						
3) TEMP. F	57	57	57	57	55	57						
pH	9.14	7.87	6.90	6.95	7.16	8.26						
SP. COND.	1121	1227	2750	1666	1629	2840						
4) TEMP. F	57	57	57	57	55	57						
pH	9.12	7.86	6.92	6.89	7.18	8.25						
SP. COND.	1121	1233	2680	1657	1633	2820						

WELL PUMPING & SAMPLING LOG

WELL #	BW-1-C	BW-2-A	BW-2B	BW-2-C	BW-3-B	~~BW-4-C~~ BW-3-C						
PURGE DATE												
PURGE TIME												
OVA READING												
LIQUID DEPTH												
PUMP DEPTH												
IMMISC. LAYER												
FLOW RATE												
PUMP TIME												
PUMP METHOD												
DISP. AREA												

SAMPLE DAY	10/17/05	10/17/05	10/18/05	10/19/05	10/20/05	10/20/05						
SAMPLE TIME	1400	1530	1110	1045	0800	0945						
OVA READING												
LIQUID DEPTH	7.3	32.1	27.85	54.2	32.75	78.4						
1) TEMP. F	55	57	55	57	55	53						
pH	8.58	7.75	7.82	8.91	8.07	8.62						
SP. COND.	1297	1353	2260	1357	1556	1453						
2) TEMP. F	55	57	55	57	55	55						
pH	8.54	7.65	7.77	8.87	8.08	8.63						
SP. COND.	1293	1353	2250	1353	1555	1457						
3) TEMP. F	55	57	55	57	55	55						
pH	8.42	7.67	7.80	8.90	8.07	8.64						
SP. COND.	1288	1350	2270	1367	15[illegible]3	1448						
4) TEMP. F	55	57	55	57	55	55						
pH	8.60	7.67	7.77	8.88	8.04	8.59						
SP. COND.	1287	1347	2260	1363	1547	1434						

WELL VOLUME SHEET

WELL	TOTAL DEPTH	DEPTH TO WATER	CAPACITY GALLON PER FOOT	ONE WELL VOLUME	THREE WELL VOLUME
MW-1	132.02		1.02		
MW-2	140.24		1.02		
MW-4	122.14		1.02		
MW-5	133.02		0.74		
SMW-1			0.163		
SMW-2			0.163		
SMW-3	45.86		0.163		
SMW-4	72.22		0.163		
SMW-5	76.22		0.163		
SMW-6	73.11		0.163		
OW-1	94.04		0.74		
OW-2	61.0		0.74		
OW-3	66.73		0.74		
OW-11	66.62		0.74		
OW-29	52.00		0.74		
OW-30	48.00		0.74		
OW-24	65.0		0.74		

TABLE 1

.91**

WELL ELEVATION AND CAPACITY DATA

WELL	CASING DIAMETER (inches)	T.O.C. * (feet)	B.O.C. * (feet)	CAPACITY (gallon per foot)	TOTAL DEPTH (feet)
MW-1	5	6878.52	6746.5	1.02	132.02
MW-2	5	6880.84	6740.6	1.02	140.24
MW-4	5	6882.54	6760.4	1.02	122.14
MW-5	4	6883.32	6750.3	0.74	133.02
SMW-1	2	6883.29	6834.20	0.163	?
SMW-2	2	6884.44	6827.10	0.163	50.24
SMW-3	2	6884.56	6838.70	0.163	45.86
SMW-4	2	6880.08	6807.80	0.163	72.22
SMW-5	2	6878.02	6801.80	0.163	76.22
SMW-6	2	6880.71	6807.60	0.163	73.11
OW-1	4	6868.00	6773.96	0.74	94.04
OW-2	4	6871.00	6810.00	0.74	61.0
OW-3	4	6876.00	6809.30	0.74	66.73
OW-11	4	6923.89	6857.27	0.74	66.62
OW-24	.4	6880.00	6815.00	0.74	65.0

* T.O.C. - Top of Casing
B.O.C. - Bottom of Casing

** Update of 1989 Sample and Analysis Plan.

Volume of Product Recovered

RW-1 HYDROCARBON RECOVERY 2/22 TO 4/15/05

Date of Mmeasurement	Time	Quarter	Well #	Depth to Product (feet)	Depth to Water (feet)	Product Level Thickness (feet)	Volume of Product Bailed (gallons)	Water (gallons)
2/22/2005	0830 Hrs	1st.	**RW-1**	32.46	36.50	4.04	14	
3/2/2005	0745 Hrs	1st.	**RW-1**	32.42	36.44	4.02	9	
3/8/2005	0830 Hrs	1st.	**RW-1**	31.92	36.35	4.44	15	
3/9/2005	0830 Hrs	1st.	**RW-1**	31.92	37.50	5.58	4	
3/11 to 3/18/05		1st.	**RW-1**	Started Pumping Well on 3/11/05			74	
3/18 to 3/23/05		1st.	**RW-1**	Continue Pumping			48	
3/23 to 4/1/05		1st.	**RW-1**	Continue Pumping			62	
4/1 To 4/4/05		2nd	**RW-1**	Pump shut down to measure well			27	
4/5/2005	11:30Hrs	2nd	**RW-1**	34.75	38.92	4.17		
4/4 TO 4/15/05	11:00Hrs	2nd	**RW-1**	Continue Pumping			50	
4-15 to 5-5-05	1230 Hrs	2nd	**RW-1**	Continue Pumping			45	154
5-5 to 6-17-05	1130 Hrs	2nd	**RW-1**	Continue Pumping			24	196
6/27/2005	1400 Hrs	2nd	**RW-1**	Pump shut down to measure well				
6/28/2005	1100 Hrs	2nd	**RW-1**	32.46	33.25	0.79		
6/28/2005		2nd	**RW-1**	Continue Pumping				
6/17 to 7/8/2005	1030 Hrs	2nd	**RW-1**	Continue Pumping			18	146
7/8 to 8/9/2005	1330 Hrs	3rd	**RW-1**	Continue Pumping			28	350
8/9 to 9/16/2005	1135 Hrs	3rd	**RW-1**	36.46	36.54	0.08	8	240
12/5/2005	1315 Hrs	4th	**RW-1**	31.92	34.71	2.79		
12/8/2005	1400 Hrs	4th	**RW-1**	Stard Pumping				
12/22/2005	1530 Hrs	4th	**RW-1**	Pulled Pump			5	120
12/29/2005	1400 Hrs	4th	**RW-1**	Hand Bailed			0.5	4.5
3/16/2006	1300 Hrs	1st.	**RW-1**	32.23	34.48	2.25		
3/16/2006	1430 Hrs	1st.	**RW-1**	Start Pumping				
3/23/2006	1430 Hrs	1st.	**RW-1**	Shut off Pump				
3/27/2006	1530 Hrs	1st.	**RW-1**	Start Pumping				
3/31/2006	1130 Hrs	1st.	**RW-1**	Continue Pumping			7	174
4/3/2006	1130 Hrs	2nd	**RW-1**	Stopped Pumping			1	38
4/4/2006	1100 Hrs	2nd	**RW-1**	32.75	33.08	0.33		
6/6/2006	1300 Hrs	2nd	**RW-1**	32.40	34.54	2.15		
6/8/2006	1500 Hrs	2nd	**RW-1**	Start Pumping (Intermittently)				
6/29/2006	1000 Hrs	2nd	**RW-1**	Stopped Pumping			8	365
					Total Volume (gallons)		447.5	1787.5

Well Data Summary Table

Well Data Summary Table - REVISED
2005 Annual Groundwater Discharge Report
Giant Refining - Ciniza Refinery
February 5, 2007 by Jim Lieb

Well ID Number	Measurement Date	A Well Casing Rim Elevations (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)*	B SPH Thickness (ft)	C Depth to Water (ft)	D = A - C Groundwater Elevation (ft)	= 0.8B + D Corrected Water Table Elevation (ft)**
BW-1A	May 24,2005	6,876.73	6,836.73	40	na	na	dry	dry	na
BW-1A	October 17,2005	6,876.73	6,836.73	40	na	na	dry	dry	na
BW-1B	May 24,2005	6,876.91	6,811.71	67.5	na	na	67.50	6,809.41	na
BW-1B	October 17,2005	6,876.91	6,811.71	67.5	na	na	67.50	6,809.41	na
BW-1C	May 24,2005	6,876.75	6,719.75	157	na	na	6.60	6,870.15	na
BW-1C	October 17,2005	6,876.75	6,719.75	157	na	na	7.30	6,869.45	na
BW-2A	May 24,2005	6,874.72	6,809.22	65.5	na	na	31.30	6,843.42	na
BW-2A	October 17,2005	6,874.72	6,809.22	65.5	na	na	32.10	6,842.62	na
BW-2B	May 24,2005	6,874.58	6,784.08	90.5	na	na	28.00	6,846.58	na
BW-2B	October 18,2005	6,874.58	6,784.08	90.5	na	na	27.85	6,846.73	na
BW-2C	May 24,2005	6,875.40	6,724.40	151	na	na	20.50	6,854.90	na
BW-2C	October 18,2005	6,875.40	6,724.40	151	na	na	20.35	6,855.05	na
BW-3A	May 24,2005	6,878.22	6,828.22	50	na	na	dry	dry	na
BW-3A	October 19,2005	6,878.22	6,828.22	50	na	na	dry	dry	na
BW-3B	May 24,2005	6,878.79	6,803.79	75	na	na	32.20	6,846.59	na
BW-3B	October 20,2005	6,878.79	6,803.79	75	na	na	32.75	6,846.04	na
BW-3C	May 24,2005	6,878.08	6,723.08	155	na	na	7.90	6,870.18	na
BW-3C	October 19,2005	6,878.08	6,723.08	155	na	na	8.30	6,869.78	na
OW-1	not sampled	6,868.00	6,773.96	94.04	na	na	not sampled	not sampled	na
OW-11	May 24,2005	6,923.89	6,857.27	66.62	na	na	21.00	6,902.89	na
OW-11	September 29,2005	6,923.89	6,857.27	66.62	na	na	21.10	6,902.79	na
OW-12	May 24,2005	6,940.43	6,795.43	145	na	na	48.50	6,891.93	na
OW-12	June 13,2005	6,940.43	6,795.43	145	na	na	44.50	6,895.93	na
OW-12	September 27,2005	6,940.43	6,795.43	145	na	na	60.90	6,879.53	na
OW-13	May 24,2005	6,920.12	6,820.12	100	na	na	23.70	6,896.42	na
OW-13	September 27,2005	6,920.12	6,820.12	100	na	na	24.25	6,895.87	na
OW-14	May 24,2005	6,926.64	6,881.64	45	na	na	27.15	6,899.49	na
OW-14	September 29,2005	6,926.64	6,881.64	45	na	na	27.15	6,899.49	na
OW-29	May 24,2005			0	na	na	21.40	-21.4	na
OW-29	September 28,2005			0	na	na	22.00	-22	na
OW-30	May 24,2005	6,921.60	6,873.20	48.4	na	na	21.70	6,899.90	na
OW-30	May 24,2005	6,921.60	6,873.20	48.4	na	na	26.30	6,895.30	na
MW-1	May 24,2005	6,878.52	6,746.50	132.02	na	na	7.00	6,871.52	na
MW-1	July 21, 2005	6,878.52	6,746.50	132.02	na	na	7.45	6,871.07	na
MW-1	October 12,2005	6,878.52	6,746.50	132.02	na	na	7.40	6,871.12	na
MW-4	May 24,2005	6,882.54	6,760.40	122.14	na	na	7.70	6,874.84	na
MW-4	July 25,2005	6,882.54	6,760.40	122.14	na	na	8.25	6,874.29	na
MW-4	October 12, 2005	6,882.54	6,760.40	122.14	na	na	7.90	6,874.64	na
MW-5	May 24,2005	6,883.32	6,750.30	133.02	na	na	11.30	6,872.02	na
MW-5	July 22,2005	6,883.32	6,750.30	133.02	na	na	11.90	6,871.42	na
MW-5	October 11, 2005	6,883.32	6,750.30	133.02	na	na	12.55	6,870.77	na
RW-1 (OW-27)	February 22,2005	6,943.50			32.46	4.04	36.50	6,907.00	6910.232
	March 2,2005				32.42	4.02	36.44	6,907.06	6910.276
	March 8,2005				31.92	4.44	36.35	6,907.15	6910.702
	March 9,2005				31.92	5.58	37.50	6,906.00	6910.464
	April 5,2005				34.75	4.17	38.92	6,904.58	6907.916
	June 28,2005				32.46	0.79	33.25	6,910.25	6910.882
	September 16,2005				36.46	0.08	36.54	6,906.96	6907.024
	December 5,2005				31.92	2.79	34.71	6,908.79	6911.022
RW-2 (OW-28)	February 22,2005	6,927.20			na	0	27.79	6,899.41	6899.41
	June 28,2005				na	0	27.77	6,899.43	6899.43
	September 16,2005				na	0	28.25	6,898.95	6898.95
	December 5,2005				na	0	27.92	6,899.28	6899.28

Well ID Number	Measurement Date	A Well Casing Rim Elevations (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)*	B SPH Thickness (ft)	C Depth to Water (ft)	D = A - C Groundwater Elevation (ft)	= 0.8B + D Corrected Water Table Elevation (ft)**
RW-5	February 22,2005	6,942.50	40.00		32.92	1.17	34.08	6,908.42	6909.356
	March 3,2005				33.00	0.75	33.75	6,908.75	6909.35
	March 8,2005				33.08	0.33	33.42	6,909.08	6909.344
	June 24,2005				32.96	1.08	34.08	6,908.42	6909.284
	September 16,2005				32.83	1.02	33.85	6,908.65	6909.466
	December 5,2005				32.52	0.69	33.19	6,909.31	6909.862
RW-6	February 22,2005	6,972.60	38.80		33.13	1.38	34.50	6,938.10	6939.204
	March 3,2005				33.19	1.19	34.38	6,938.22	6939.172
	March 8,2005				33.15	0.85	34.00	6,938.60	6939.28
	June 24,2005				33.31	1.19	34.46	6,938.14	6939.092
	September 16,2005				32.98	1.35	34.33	6,938.27	6939.35
	December 5,2005				32.69	1.02	33.75	6,938.85	6939.666
SMW-2	May 24,2005	6,884.44	6,827.10	57.34	na	na	26.45	6857.99	na
SMW-2	October 12, 2005	6,884.44	6,827.10	57.34	na	na	26.35	6858.09	na
SMW-4	May 24,2005	6,882.54	6,760.40	122.14	na	na	29.60	6852.94	na
SMW-4	October 13, 2005	6,882.54	6,760.40	122.14	na	na	33.10	6849.44	na
SMW-6	not sampled	6,880.71	6,807.60	73.11	na	na	not sampled	not sampled	na
GWM-1		6,912.65	6,888.95	23.7	na	na	na	na	na
GWM-2				0	na	na	na	na	na
GWM-3				0	na	na	na	na	na

*SPH = Separate Phase Hydrocarbons
**Corrected water table elevations are only provided if SPH was detected.
na = If no SPH was detected then this is shown on the table as *na* (not applicable).
Water was not observed in GWM-1, GWM-2, and GWM-3 in 2005.

GIANT CINIZA REFINERY

Permit Requirement: GW-032

Condition Permit ID # : OCD Sect. 9, Item 4

Monitoring Required: Quarterly
Measurement of product layer thickness and bailing of product.

Equipment Identification: RW-1, RW-2, RW-5, RW-6

Date of measurment	Time	Quarter	Well #	Depth to Prouduct (feet)	Depth to Water (feet)	Product Level Thickness (feet)	Volume of Product Bailed (gallons)
2/22/2005	8:30am	1st.	**RW-1**	32'-5 1/2"	36'-6"	4'-0 1/2"	14
2/22/2005	12:30pm	1st.	**RW-2**	No Product	27'-9 1/2"	0	0
2/22/2005	1:15pm	1st.	**RW-5**	32'-11"	34'-1"	1'-2"	4 1/2
2/22/2005	2:30pm	1st.	**RW-6**	33'-1 1/2"	34'-6"	1'-4 1/2"	4 1/2
Name and Title of person who performed measurement: **Johnny Sanchez (Enviromental Specialist) & Darren Joe (Special Projects)**							

Signature: Johnny Sanchez / Darren Joe

CC: Ed Riege

GIANT CINIZA REFINERY

Permit Requirement: GW-032

Condition Permit ID # : OCD Sect. 9, Item 4

Monitoring Required: Quarterly measurement of product layer thickness and bailing of product.

Equipment Identification: RW-1, RW-2, RW-5, RW-6

Date of measurement	Time	Quarter	Well #	Depth to Product (feet)	Depth to Water (feet)	Product Level Thickness (feet)	Volume of Product Bailed (gallons)
3/3/2005	0745	1st.	**RW-1**	32'-5"	36'-5 1/4"	4'-0 1/4"	9
		1st.	**RW-2**				
3/3/2005	1130	1st.	**RW-5**	33'-0"	33'-9"	0'-9"	6
3/3/2005	1400	1st.	**RW-6**	33'-2 1/4"	34'-4 1/2"	1'-2 1/4"	6

Name and Title of person who performed measurement:
Johnny Sanchez (Environmental Specialist) & Darren Joe (Special Projects)

Signature: Johnny Sanchez / Darren R. Joe

CC: Ed Riege

GIANT CINIZA REFINERY

Permit Requirement: GW-032

Condition Permit ID # : OCD Sect. 9, Item 4

Monitoring Required: Quarterly measurement of product layer thickness and bailing of product.

Equipment Identification: RW-1, RW-2, RW-5, RW-6

Date of measurement	Time	Quarter	Well #	Depth to Product (feet)	Depth to Water (feet)	Product Level Thickness (feet)	Volume of Product Bailed (gallons)
3/8/2005	0830	1st.	**RW-1**	31'-11"	36'-4 1/4"	4'-5 1/4"	15
		1st.	**RW-2**				
3/8/2005	1330	1st.	**RW-5**	33"-1"	33'-5"	0'-4"	1/2
3/8/2005	1430	1st.	**RW-6**	33'-1 3/4"	34'-0"	0'-10 1/4"	2

Name and Title of person who performed measurement:
Johnny Sanchez (Environmental Specialist)

Signature: Johnny Sanchez

CC: Ed Riege

GIANT CINIZA REFINERY

Permit Requirement: **GW-032**

Condition Permit ID # : **OCD Sect. 9, Item 4**

Monitoring Required: **Quarterly**
Measurement of product layer thickness and bailing of product.

Equipment Identification: RW-1 DRUMS

Top of Drum Inside is 34" ~1.612 Gallons per Inch

Date of measurment	Time	Drum Number	Well #	Depth to Prouduct (Inches)	Depth to Water (Inches)	Product Level Thickness (Inches)	Volume of Product (gallons)
3/18/2005	1030	1	**RW-1**	25	16.25	8.75	14.105
3/18/2005	1030	2	**RW-1**	19.5	0	19.5	31.434
3/18/2005	1030	3	**RW-1**	17.5	0	17.5	28.21
3/18/2005	1030	4	**RW-1**	0	0	0	0
Start Pumping Product 3/11/05							73.749

Signature: _____

CC: Ed Riege

GIANT CINIZA REFINERY

Permit Requirement: **GW-032**

Condition Permit ID # : **OCD Sect. 9, Item 4**

Monitoring Required: **Quarterly**
Measurement of product layer thickness and bailing of product.

Equipment Identification: RW-1

Date of measurment	Time	Drum Number	Well #	Volume of Water (Gallons)			Volume of Product (gallons)
3-23 To 4-1-05	10:00 Hrs.	1	**RW-1**	29			16
3-23 To 4-1-05	10:00 Hrs.	2	**RW-1**	25			15
3-23 To 4-1-05	10:00 Hrs.	3	**RW-1**	29			16
3-23 To 4-1-05	10:00 Hrs.	4	**RW-1**	30			15
			Total	113			62

RW-1 Gallons of Hydrocarbons

Date		
2/22/2005	14	
3/3/2005	9	
3/8/2005	15	
3/9/2005	4	
3/11/05 Thru 3/18/05	74	
3/18/05 Thru 3/23/05	48	
3/23/05 Thru 4/01/05	62	
	226	Total to Date

RW1 Gallons Product & Water 4-1-05

GIANT CINIZA REFINERY

Permit Requirement: GW-032

Condition Permit ID # : OCD Sect. 9, Item 4

Monitoring Required: Quarterly measurement of product layer thickness and bailing of product.

Equipment Identification: RW-1, RW-2, RW-5, & RW-6

Date of measurement	Time	Quarter	Well #	Depth to Product (feet)	Depth to Water (feet)	Product Level Thickness (feet)	Volume of Product Bailed (gallons)
6/28/2005	1100 Hrs.	2nd	**RW-1**	32' 5 1/2"	33' 3"	0' 9 1/2"	Continue Pumping
6/24/2005	1315 Hrs.	2nd	**RW-2**	No Product	27'-9 1/4"	0	0
6/24/2005	900 Hrs.	2nd	**RW-5**	32'-11 1/2"	34'-0 1/2"	1'-1"	2 1/2
6/24/2005	1100Hrs	2nd	**RW-6**	33'-3 3/4"	34'-5 1/2"	1'-2 1/4"	3 1/2

Name and Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)

Signature: Johnny Sanchez

CC: Ed Riege

GIANT CINIZA REFINERY

Permit Requirement: GW-032

Condition Permit ID # : OCD Sect. 9, Item 4

Monitoring Required: Quarterly measurement of product layer thickness and bailing of product.

Equipment Identification: RW-1, RW-2, RW-5, & RW-6

Date of measurement	Time	Quarter	Well #	Depth to Product (feet)	Depth to Water (feet)	Product Level Thickness (feet)	Volume of Product Bailed (gallons)
9/16/2005	1135 Hrs.	3rd	**RW-1**	36'- 5 1/2"	36'-6 1/2"	0'- 1"	8/9 to 9/16 Pumped 8 Gals
9/16/2005	0830 Hrs.	3rd	**RW-2**	No Product	28'-0 1/4"	0	0
9/16/2005	0920 Hrs.	3rd	**RW-5**	32'-10"	33'-10 1/4"	1'-0 1/4"	2 1/2
9/16/2005	1020 Hrs	3rd	**RW-6**	32'-11 3/4"	34'-4"	1'-4 1/4"	3

Name and Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)

Signature: Johnny Sanchez

GIANT CINIZA REFINERY

Permit Requirement: GW-032

Condition Permit ID # : OCD Sect. 9, Item 4

Monitoring Required: Quarterly measurement of product layer thickness and bailing of product.

Equipment Identification: RW-1, RW-2, RW-5, & RW-6

Date of measurement	Time	Quarter	Well #	Depth to Product (feet)	Depth to Water (feet)	Product Level Thickness (feet)	Volume of Product Bailed (gallons)
12/5/2005	1315 Hrs.	4th	**RW-1**	31'-11"	34'-8 1/2"	2'- 9 1/2"	***
12/5/2005	1340 Hrs.	4th	**RW-2**	No Product	27'-11"	0	0
12/5/2005	1400 Hrs.	4th	**RW-5**	32'-6 1/4"	33'-2 1/2"	0'-8 1/4"	1 1/2
12/5/2005	1500 Hrs.	4th	**RW-6**	32'-8 1/2"	33'-9"	1'-0 1/2"	2
Name and Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)							

*** Could not start pump. Started pump 12/8/05, Pulled pump 12/22/05, Hand Bailed 12/29/05. Period of 12/8/05 to 12/29/05 5.5 gallons of product and 124.5 gallons of water.

Signature: Johnny Sanchez

CC: Ed Riege

Well Inspection Logs

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
OW-1 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Check well OW-1 for artesian flow condition

Date	Time	Quarter	Depth to Water (feet)	Comments
2/15/2005	1300 Hrs.	1st	0.00	
Name & Title of person who performed measurement: Darren Joe (Special Projects) & Johnny Sanchez (Environmental Specialist)				

Signature:_____

CC: Ed Riege

File: (S:)\env-share\Wells OW-1,OW-10 GWM-1 Form

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
OW-1 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Check well OW-1 for artesian flow condition

Date	Time	Quarter	Depth to Water (feet)	Comments
6/24/2005	1400 Hrs.	2nd	0	
Name & Title of person who performed measurement: Steve Morris (Environmental Engineer)				

Signature:_____

CC: Ed Riege

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
OW-1 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Check well OW-1 for artesian flow condition

Date	Time	Quarter	Depth to Water (feet)	Comments
9/16/2005	0850 Hrs.	3rd	0	
Name & Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)				

Signature:_____

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
OW-1 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Check well OW-1 for artesian flow condition

Date	Time	Quarter	Depth to Water (feet)	Comments
12/6/2005	2:45PM	4th	0	
Name & Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)				

Signature:_____

CC: Ed Riege

File: (S:)\env-share\Wells OW-1,OW-10 GWM-1 Form

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
OW-10 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Quarterly water level on OW-10

Date	Time	Quarter	Depth to Water (feet)	Comments
2/15/2005	1315	1st	2.75	

Name & Title of person who performed measurement: Darren Joe (Special Projects) & Johnny Sanchez (Environmental Specialist)

Signature:_____

CC: Ed Riege

File: (S:)\env-share\Wells OW-1,OW-10 GWM-1 Form

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
OW-10 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Quarterly water level on OW-10

Date	Time	Quarter	Depth to Water (feet)	Comments
6/24/2005	1350 Hrs.	2nd	2.6	
Name & Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)				

Signature:_____

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
OW-10 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Quarterly water level on OW-10

Date	Time	Quarter	Depth to Water (feet)	Comments
9/16/2005	0900 Hrs.	3rd	2.4	
Name & Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)				

Signature:_____

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
OW-10 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Quarterly water level on OW-10

Date	Time	Quarter	Depth to Water (feet)	Comments
12/6/2005	2:30PM	4th	2.7	To Top of Plastic Casing
Name & Title of person who performed measurement: Johnny Sanchez (Environmental Specilist)				

Signature:_____

CC: Ed Riege

File: (S:)\env-share\Wells OW-1,OW-10 GWM-1 Form

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-1 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Quarterly water level of GWM-1

Date	Time	Quarter	Depth to Water (feet)	Comments
2/15/2005	1430	1st	20.50	
Name & Title of person who performed measurement: Darren Joe (Special Projects) & Johnny Sanchez (Environmental Specialist)				

Signature:_____

CC: Ed Riege

File: (S:)\env-share\Wells OW-1,OW-10 GWM-1 Form

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-1 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Quarterly water level & sample on GWM-1

Date	Time	Quarter	Depth to Water (feet)	Comments
6/24/2005	1405 Hrs.	2nd	20.5	Plan to Sample
Name & Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)				

Signature:_____

CC: Ed Riege

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-1 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Quarterly water level & sample on GWM-1

Date	Time	Quarter	Depth to Water (feet)	Comments
9/16/2005	0910 Hrs.	3rd	20.65	Steve sampled 08/01/05 for 3rd Qtr.
Name & Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)				

Signature:_____

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-1 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 4

Monitoring Requirement: Quarterly water level on GWM-1

Date	Time	Quarter	Depth to Water (feet)	Comments
12/6/2005	3:00PM	4th	20.65	To top of plastic casing
Name & Title of person who performed measurement: Johnny Sanchez (Environmental Specialist)				

Signature:_____

CC: Ed Riege

File: (S:)\env-share\Wells OW-1,OW-10 GWM-1 Form

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-2 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 3

Monitoring Requirement: Monthly Through 2005

Date	Time	Month	Depth to Bottom (feet)	Comments (Dry?)
10-12-05	2:30 PM	OCT.	18.97	TO TOP OF PLASTIC
				CASING, DRY
				1ST TIME MEASURING
Name & Title of person who performed measurement: JOHNNY SANCHEZ CONV. SPECIALIST				

Signature: Johnny Sanchez

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-2 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 3

Monitoring Requirement: Monthly Through 2005

Date	Time	Month	Depth to Bottom (feet)	Comments (Dry?)
11-15-05	11:30AM	Nov.	18.97	DRY

Name & Title of person who performed measurement: JOHNNY SANCHEZ (ENV. SPECIALIST)

Signature: Johnny Sanchez

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-2 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 3

Monitoring Requirement: Monthly Through 2005

Date	Time	Month	Depth to Bottom (feet)	Comments (Dry?)
12-6-05	3:05 PM	DEC.	18.97	DRY

Name & Title of person who performed measurement: JOHNNY SANCHEZ (ENV. SPECIALIST)

Signature: Johnny Sanchez

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-3 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 3

Monitoring Requirement: Monthly Through 2005

Date	Time	Month	Depth to Bottom (feet)	Comments (Dry?)
10-12-05	2:40PM	OCT	17.93	TO TOP OF PLASTIC
				CASING, DRY.
				1ST TIME MEASURING

Name & Title of person who performed measurement: JOHNNY SANCHEZ (ENV. SPECIALIST)

Signature: Johnny Sanchez

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-3 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 3

Monitoring Requirement: Monthly Through 2005

Date	Time	Month	Depth to Bottom (feet)	Comments (Dry?)
11-15-05	11:35AM	Nov.	17.93	Dry

Name & Title of person who performed measurement: JOHNNY SANCHEZ (ENV. SPECIALIST)

Signature: Johnny Sanchez

GIANT CINIZA REFINERY

GROUNDWATER DISCHARGE PERMIT
GWM-3 WELL INSPECTION

Permit Requirement: OCD, Section 9, Item 3

Monitoring Requirement: Monthly Through 2005

Date	Time	Month	Depth to Bottom (feet)	Comments (Dry?)
12-6-05	3:15PM	DEC	17.93	DRY

Name & Title of person who performed measurement: JOHNNY SANCHEZ (ENV. SPECIAL)

Signature: Johnny Sanchez

8. List of Figures

Figure 1
Regional Map

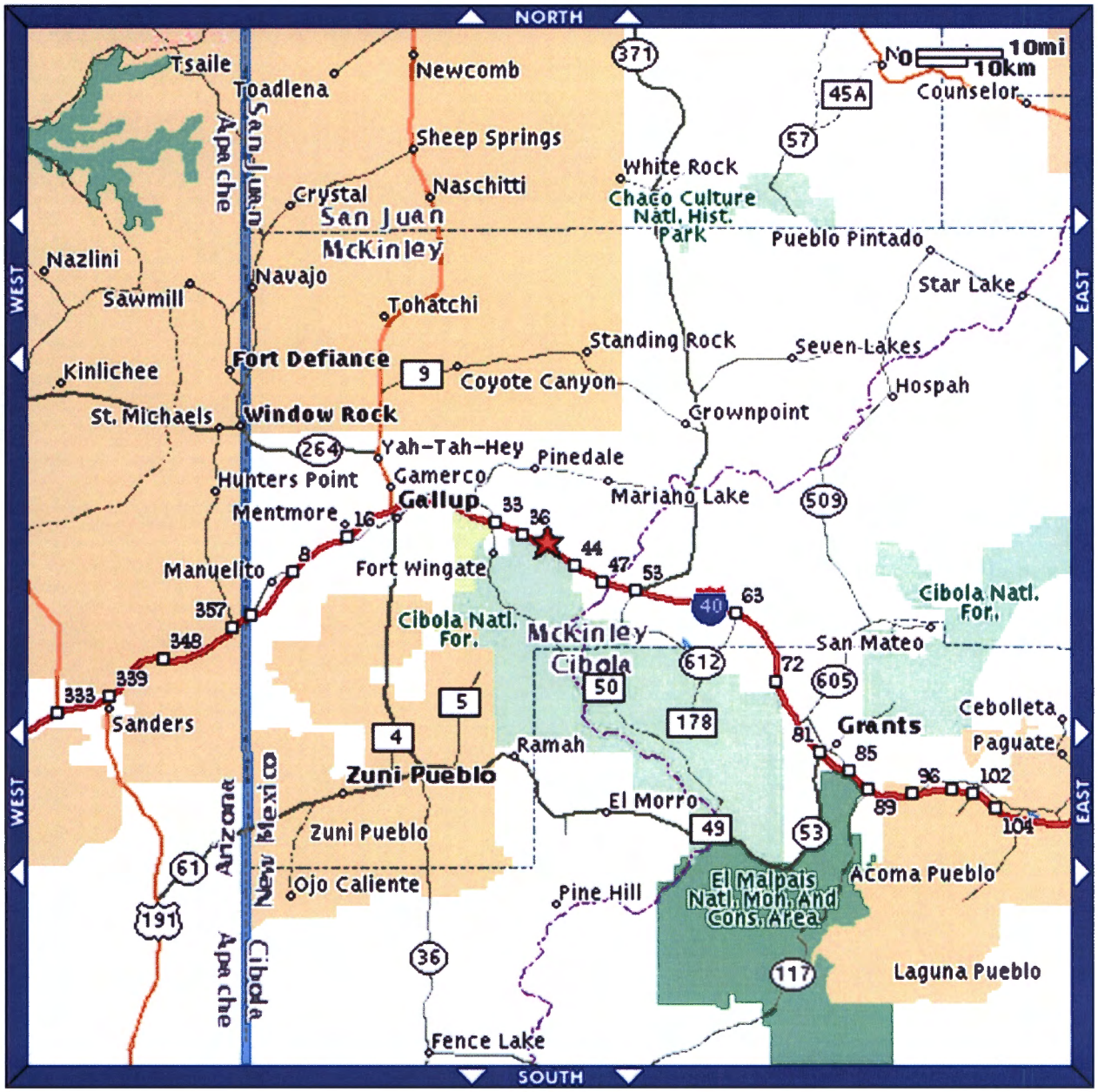
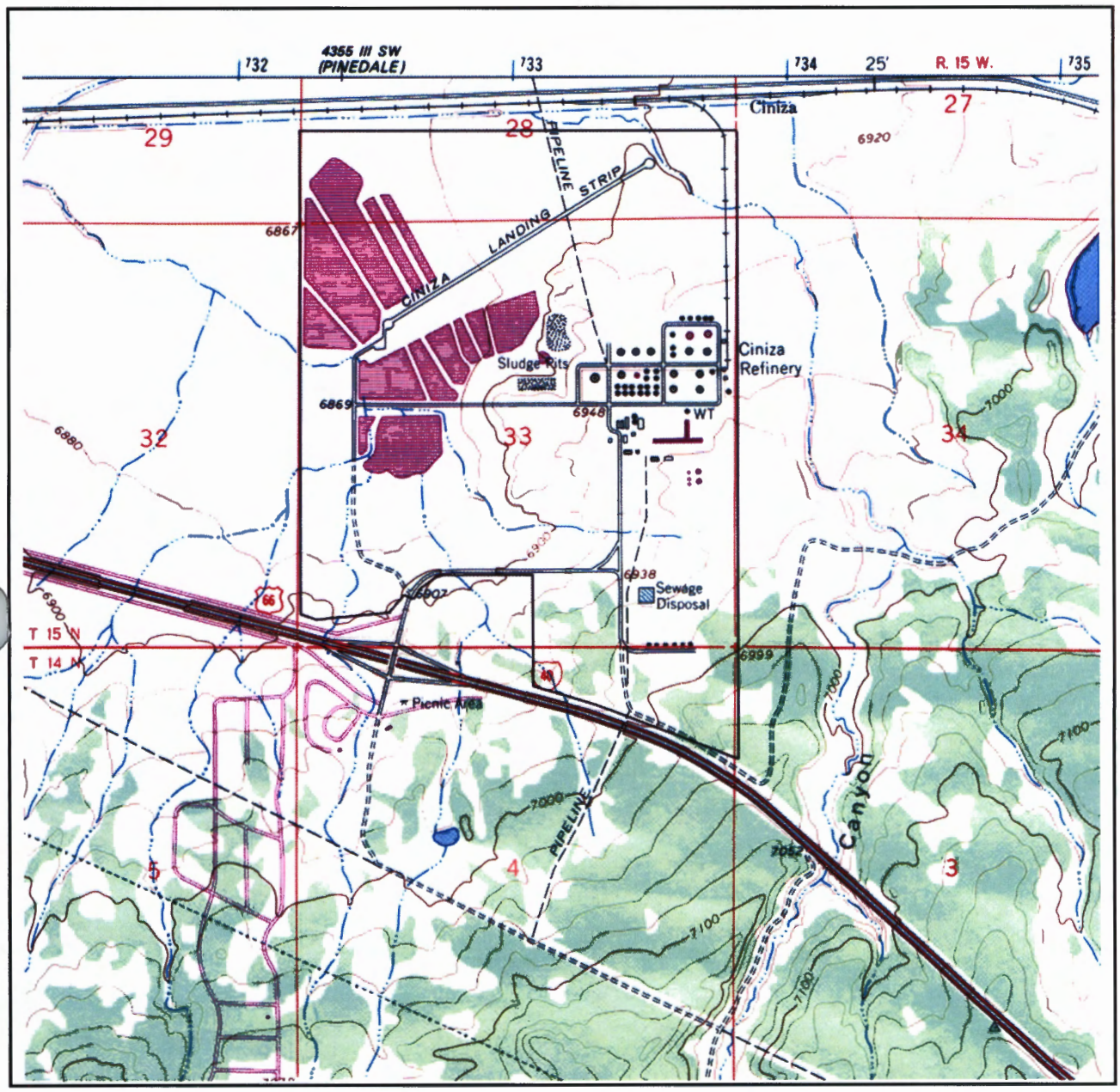


Figure 2 - Topographic Map of the Refinery Site

Locality Map
USGS Topographical Map - Ciniza Quadrangle (Revised 1980)



Well and Boring Locations Map

TO VIEW THE MAP AND/OR MAPS WITH THIS DOCUMENT, PLEASE CALL THE HAZARDOUS WASTE BUREAU AT 505-476-6000 TO MAKE AN APPOINTMENT

Potentiometric Elevation Map
(Alluvium - Chinle Group Interface Water Levels)

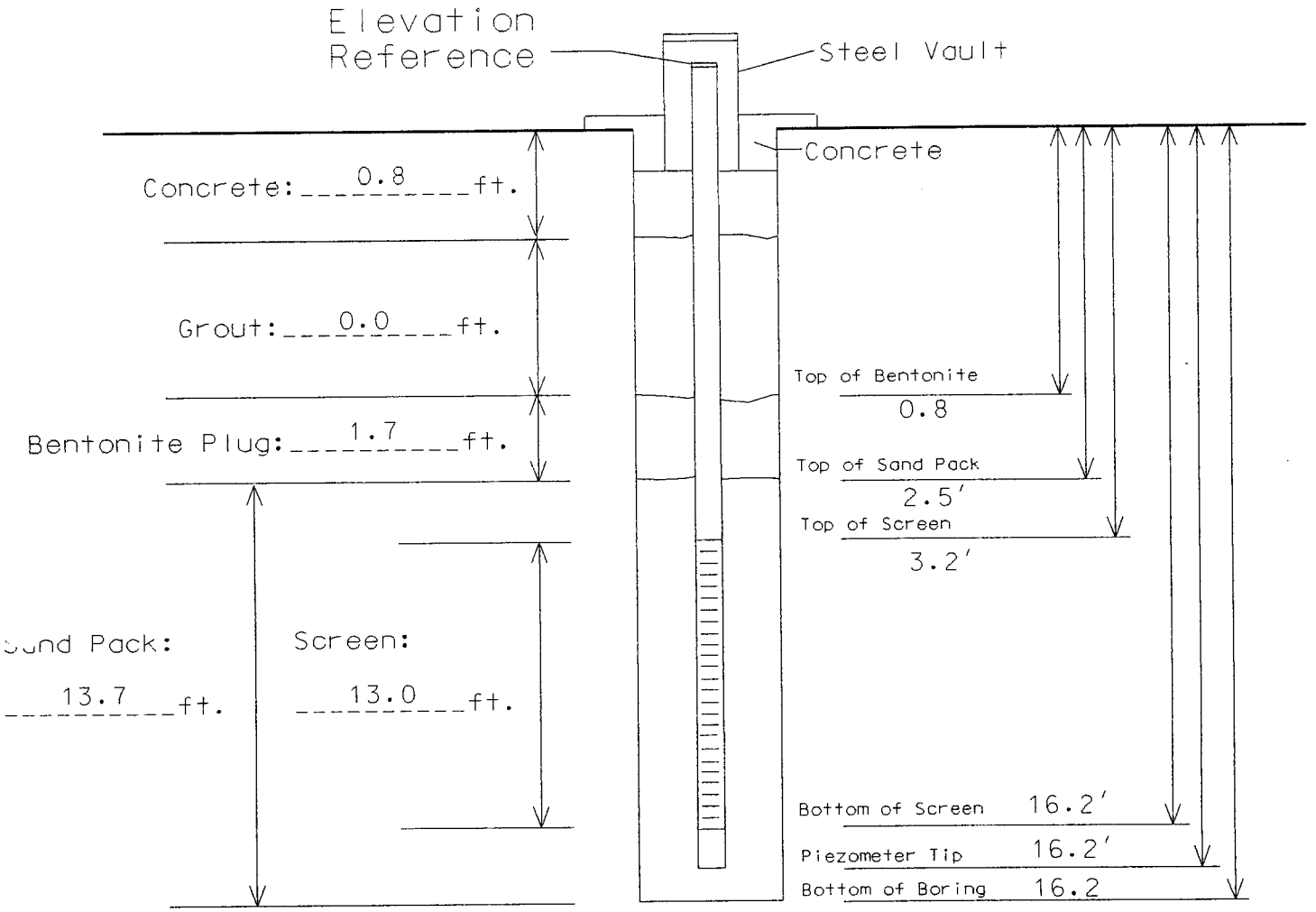
Elevation vs Time Map

PRECISION ENGINEERING, INC.

505-523-7674

Installation Diagram

Monitoring Well No. GWM 2



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.10" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 2244.46

Bottom Cap Used? Yes

Site Easting: 3864.28

Other:

Project #: 05-099

Project Name: Ciniza Refinery

Elevation: 6913.17

Sheet: 1 OF 1
Bore Point: 10' S, 4'E of GMW-1
Water Elevation: Not Encountered
Boring No.: GWM-2

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 05-099
Site: Giant-Ciniza

Elevation: 6913.17
Date: 9/25/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
	0.0-0.5				**Clay**, Gravelly (From Roadfill), Wet, Sandy, Red/Brown				
	0.5-5.0			2.5	**Clay**, Red/Brown, Some Silt, Very Fine Sand In Thin Seams, Wet, Firm				
	5.0-10.0			5.0 7.5	**Same As Above**				
	10.0-14.7			10.0	**Same As Above**, No Sand				
	14.7-15.0			15.0	**Clay**, Fine Sand, Red/Brown, Soft, Root Matter, Wet				
	16.2			20.0	TD Set Well @ 16.2' 13.0' - 2" PVC Sch. 40 #10 Slot Screen 3.2' - 2" PVC Sch. 40 Riser to Ground Surface 10-20 Sand From Bottom of Hole to 2.5' Below Ground Surface, 3/8 Bentonite Chip to 8" Below Ground Surface, Hydrated Chips Set Above Ground Surface Finish with 4'x4' Concrete Pad. Top of Casing ~ 3.0' Above Ground Surface				

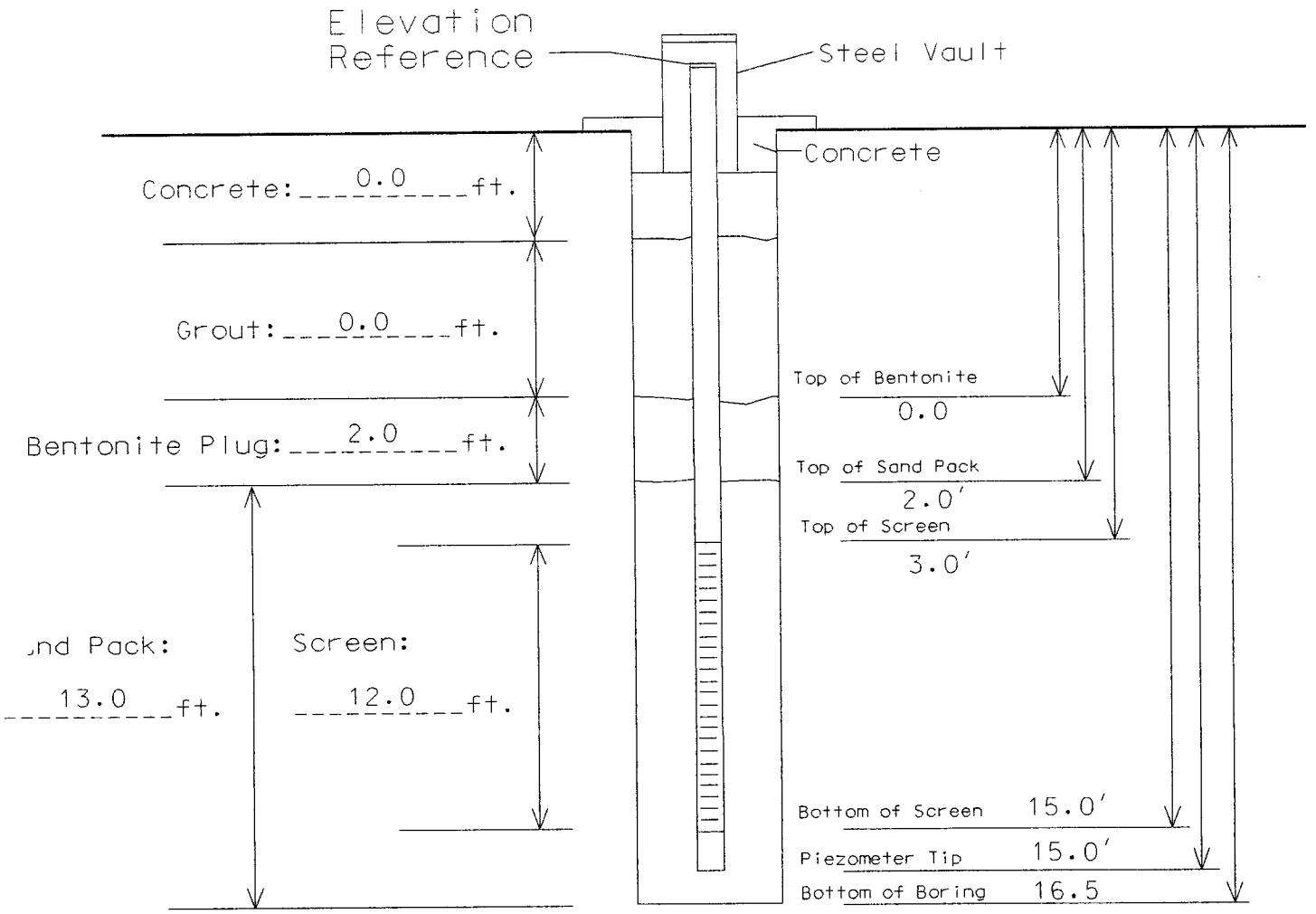
SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY: WHK

.\bill\Projects\2005\05099GWM2-3\[GWM 2.xls]Sheet1

Installation Diagram

Monitoring Well No. GWM 3

PRECISION ENGINEERING, INC.
505-523-7674



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.10" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 2233.38

Bottom Cap Used? Yes

Site Easting: 4110.05

Other:

Project #: 05-099

Project Name: Ciniza Refinery

Elevation: 6912.65

Sheet: 1 OF 1
Bore Point: NW Corner of Pond 1
Water Elevation: Not Encountered
Boring No.: GWM-3

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 05-099
Site: Giant-Ciniza

Elevation: 6912.65
Date: 9/25/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
	0.0-0.25				**Clay**, Gravelly, Hard, Red Brown, Wet				
	0.25-5.0				**Clay**, Very Silty, Sandy, Very Sandy, Wet, Red/Brown, Stiff				
				2.5					
				5.0					
	5.0-10.0				**Clay**, Very Sandy, Slightly Silty, Wet, Red/ Brown, Stiff				
				7.5					
				10.0					
	10.0-15.0				**Clay**, Wet, Red/Brown, Firm, Root Matter @ 14.5'				
				15.0					
	16.0								
	16.0-16.1				**Clay**, Sandy, Some Gravel, Very Wet, Moisture on Surface, Red/Brown				
	16.1-16.5				**Clay**, Some Pebbles, Wet, No Free Water, Red/Brown				
	16.5			20.0	TD Plug Boring with 3/8 Bentonite Chips to 15.0' 12.0' of 2" Sch. 40 PVC #10 Slot Screen, 3.0' of 2" Sch. 40 PVC Riser, Above Ground Finish with 4'x4' Concrete Pad. 10-20 Sand from 15.0' to 2.0', 3/8 Bentonite Chips from 2.0' to Surface Top of Casing ~ 3.0' Above Ground Surface				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY: WHK

Appendix B: Ciniza Field Sampling Collection and Handling Procedures

Field Data Collection

All facility monitoring wells and recovery wells were gauged in February, May, September, and December of 2005. Ciniza does not have any recovery well pumps that need to be shut off and removed prior to water elevation measurements.

All water/product levels are measured to an accuracy of the nearest 0.01 foot using an electrical conductance based meter. After determining water levels, well volumes are calculated using the conversion factors listed (under the heading *Capacity gallons per foot*) in Table 1 in Section 7.

Generally, at least three well volumes are purged from each well prior to sampling. Wells that don't have sufficient recovery to obtain 3 well volumes are pumped until loss of suction then sampled.

Electrical conductance (E.C.), pH, and temperature are monitored during purging using a meter. The wells are considered satisfactorily purged when the pH, E.C., and temperatures values did not vary by more than 10 percent for at least three measurements.

Filed data and well elevations can be found in Section 8 - Well Data Summary Table.

Purged well water from wells that have shown prior contamination is collected in fifty five gallon drums. The water is treated in the refinery's waste water treatment system. Purged water from historically non-contaminated wells is drained onto the ground.

Sampling Equipment at Ciniza

The following sampling equipment is maintained at Ciniza and used by the sampling personnel:

- Heron Instruments 100 ft. DipperT electric water depth tape complying with US GGG-T-106E, EEC Class II.
- Pall Corporation Acro 50A 0.45 micron disposable filter used with 60 ml. disposable syringe for filtering water in the field.
- Myron L Company Model DCH4 pH 4 & 10 for gain, and Hach NaCl 1990 Micro-siemens for conductivity calibration.
- Grundfos 2-inch pumps with Grundfos 115-volt AC-to-Dc converter.

Groundwater Elevation

All water/product levels are measured using DipperT electric water depth tape. The technician records separate phase hydrocarbon (SPH), depth to water (DTW), and total well depth using the tape. Wash probe on DipperT electric water depth tape first with non-phosphate soap water

then with deionized or distilled water before lowering into the well casing. Recovery wells with free product are checked using a reel gauge with water and hydrocarbon finding paste.

Water Quality/Groundwater Sampling

Water quality parameters are measured using a meter. Electrical conductance, pH, and temperature are monitored during purging.

Field Procedure for Purging Monitor Wells

In order to assure that the sample collected is representative of actual aquifer conditions, it is necessary to purge the well of stagnant water in the casing. This is accomplished by pumping three casing volumes of water from the well or until it is bailed dry, whichever occurs first. If a well can be pumped dry, it requires only that sufficient time elapse for an adequate volume of water to accumulate for the sampling event.

The casing volume is calculated according to the following formula:

One casing volume = L x F where

L = Length of water column = total depth - depth to water

F = gallons water per foot of well, based on the well casing diameter

F is provided on the *Well Volume Sheet* for the monitoring wells at Ciniza provided at the end of this appendix.

The volume to be purged from each well is determined as follows:

Purge volume = casing volume x 3

Document the following information:

a. The amount of water purged from each well.
b. Weather conditions (dry or wet).
c. Depth to Water (DTW).
d. Purge date.
e. Purge time.

Well Evacuation

Before sample collection can begin, the water collected from each monitoring well must be fresh aquifer water. Well evacuation replaces stagnant well water with fresh aquifer water. The water level in the well, total depth of well and thickness of floating product (if any) will be measured using the DipperT electric water depth tape. A transparent bailer will be used to check for the presence and measure the thickness of floating product. If product is present, a ground water sample is typically not obtained.

Recovery wells are evacuated by use of an air driven pump. Wells MW-1, MW-2, MW-4, MW-5, BW-1C, BW-2A, BW-2B, BW-3B, and SMW-4 are each equipped with a dedicated electrical pump. The remaining wells were purged using a portable Grundfos pump in 2005.

In low yielding wells, the standing water will be removed until the well is essentially dry. The water level in the well will be allowed to recover until a sufficient volume is present to obtain a sample.

The first sample should be tested for pH, temperature, and specific conductance. Samples should then be collected and containerized in the order of the parameter's volatilization sensitivity (see *Order of Collection* below). The well should be retested for pH, temperature and specific conductance after sampling as a measure of purging efficiency and as a check on the stability of the water samples over time. All well evacuation information should be recorded in a log book.

Hand Bailing

Hand bailing is only used to remove free product from recovery wells. Hand bailing is performed by lowering a Teflon™ bailer slowly into the well, allowing water to enter the bailer, and lifting the bailer out of the well. The bailer is positioned just below the top of the standing water in the well, so that the bailed product is removed from the top of the water column.

Pumping

An electric pump is used to remove water from all wells other than recovery wells with free product in them. Wells MW-1, MW-2, MW-4, MW-5, BW-1C, BW-2A, BW-2B, BW-3B, and SMW-4 are each equipped with a dedicated electrical pump. The other wells, except for recovery wells, are pumped using a portable 2-inch Grundfos pump. During sample collection, a maximum flow rate of 100 milliliters/minute should be used. The actual flow rate should be measured using a graduated container and timed using a stop watch or a watch with a second hand. This rate can change as the water level in the well drops. The flow rate can be determined by:

$$\text{Flow rate (gpm)} = \frac{\text{volume collected (gallons)} \times 60 \text{ seconds per minute}}{\text{Time to fill container (seconds)}}$$

Bottle Filling Procedure

If the well was not bailed dry and the water level is recovering to provide sufficient water to fill all the sample bottles, then samples should be collected immediately. If the well was completely evacuated and/or recovery is slow, wait for a sufficient volume of water to recover in the well to fill all of the sample bottles before beginning to collect samples. Do not overfill the bottles as this will dilute the preservative. When filling VOA and TOX containers, slowly fill the container until the meniscus is just above the lip of the container. Place the cap on the container and tighten. Check for air bubbles by inverting the container and tapping gently. There should be no headspace (air) in the container. If headspace is present, the sample should be discarded and the container refilled (add sufficient preservative if required by sample test).

Do not touch the inside of bottle caps or the inside of the containers. If a cap is accidentally dropped, it should be rinsed with de-ionized or distilled water followed by a rinse with the sample prior to being placed on the container. Record in the field notes whether this happens. Filled containers should be placed on ice in the coolers immediately upon collection. Replace well cap and lock the cap.

Order of Collection

Samples should be collected in the order listed below:

Parameter	Bottle Type
Volatile Organics	VOA vials with septa cap of Teflon™
TOX	Pint amber glass with septa cap, H2SO4
TOC, Phenols, Nitrate, Ammonia	Quart glass jar, H2SO4
Extractable Organics	Quart glass jar with Teflon™ cap
Chloride and Sulfate	Quart plastic, no preservative
Cyanide	Quart glass, NaOH
Radionuclides	Quart plastic, HNO3
Metals*	Pint plastic

* Prefiltration bottle for dissolved metals which is subsequently filtered and transferred to a pint Plastic with HNO3.

Filtration

Ground water samples are filtered prior to *dissolved metals* analysis. For dissolved metals, sample water is poured into a jar and then extracted with a syringe. The syringe is then used to force the sample water through a 0.45 micron pore filter paper filter into the proper sample bottle to collect dissolved metals samples. Filtration must be performed within two hours of sample collection. Pour the filtrate into a sample bottle containing HNO3 preservative.

For samples destined for *total metals* analysis, do not filter the sample, and preserve with HNO3 to pH <2 in the field.

Ciniza sampling personnel carry a cell phone when gathering groundwater and other water samples. While sampling procedures are generally well known and the appropriate sample bottles are ordered to match each sampling event, occasional questions do arise from unforeseen circumstances which may develop during sampling. At such times, sampling personnel contact Hall Environmental Analytical Laboratory to verify that sampling is correctly performed.

General Well Sampling and Sample Handling Procedures

For safety protection and sampling purity, rubber gloves are worn and changed between each activity.

Prepare for sampling event by making out sample bottle labels and have bottles separated into plastic bags for each well to be sampled and place in ice chest ready to take into the field.

Bring along a note book and sample log.

Starting with well MW-1, document weather conditions, sample date and time.

Fill in label with location, date, time, analysis, preservative, and your name.

Start sampling by adjusting converter speed for each well.

Affix sample label and fill bottle according to lab instructions. For samples intended for VOC analysis, use bottles with septa lids, fill bottle to neck and add final amount of water with cap to form meniscus. Turn bottles upside down to examine for bubbles. If bubbles show repeat previous sentence. If no bubbles show, secure lids and pack in bubble wrap and place in cooler until sampling is completed.

Decontaminate equipment that is not dedicated for use in a particular well. Decontaminate by first washing with a non-phosphate soapy water mixture then triple rinse with distilled or deionized water.

Refrigerate completed samples until shipping to lab. Be sure to check holding times and arrange the appropriate shipping.

Equipment Calibration Procedures

Myron L Digital PH and Conductivity Meter:
Conductivity Calibration:

1. Select 20 mS (micro Siemens) range. Remove bottom cover of instrument.
2. Rinse the cell cup three times with 442-15,000 standard solution and refill.
3. Press and hold the black button on instrument.
4. Adjust the calibration control the reading is correct. Discard the used solution.

pH Calibration:

1. Using pH 7 buffer, adjust "zero" control to read 7.00
2. Using pH 4 or 10 buffer, adjust "gain" control to read 4.00 or 10.00

Appendix C: Statistical Analysis

OW-11* Monitoring Results

Choride, Fluorides, and Total Dissolved Solids

OW-11 Sampling Date	Chloride (mg/l)	$(x_n$ - mean)2 Chloride	Fluoride (mg/l)	$(x_n$ - mean)2 Fluoride	Total Dissolved Solids (mg/l)	$(x_n$ - mean)2 TDS
9/29/2005	87	841	2.3	0.09		
4/4/2001	100	256	2.81	0.0441	1,880	164836
Spring 1998	85	961			1,850	141376
Spring 1997	88	784			1,874	160000
Spring 1996	108	64			1,630	24336
4/28/1993	160	1936			1,100	139876
4/22/1992	160	1936			2,300	682276
9/13/1990	118	4			1,220	64516
6/13/1990	117	1			1,180	86436
4/4/1990	123	49			1,110	132496
Jun-89	129	169			1,080	155236
Feb-89	114	4			986	238144
Mean:	**116**		**2.6**		**1,474**	
Standard Deviation (sigma)	**19**		**1**		**64**	
95% Upper Tolerance Limit	**179**		**6**		**1,689**	
Site Maximum Detected Concentration	**46**		**2**		**1,500**	

Because each *site maximum detected concentration* is within the 95% Upper Tolerance Limit the detected values are within the background reference value.

*OW-11 is an upgradient well and therefore should qualify as representative of natural conditions.

In This Issue

- Statistical Tolerance Limits
- STRATEGY Upgrades and Tips
- Short Class Notes & Schedules
- Process Builder Seeks a New Primary Training Partner

Statistical Tolerance Limits

By William D. Kappele

Statistical Tolerance limits provide you with a range in which some percentage of all your products will lie. Here is an example:

Suppose you are making ball bearings. You know that you have response variation in your process, so you know that the ball bearings produced over time will vary in diameter. You calculate the average and standard deviation from the diameter measurements of ten randomly selected ball bearings from your process. You find an average diameter of 0.125 inches with a standard deviation of 0.004 inches. You would like to know lower and upper limits on the diameters of ball bearings produced by your process.

As is often the case in the real world, you cannot define these limits for ALL of the ball bearings made. You can, though, determine limits on 99% of all ball bearings made. These limits are called "Tolerance Limits on 99% of the Population." As is also often the case in the real world, you cannot be 100% confident that these limits are correct. However, you can be 95% confident that they are correct. These limits are then called "95% Tolerance limits on 99% of the Population."

If your diameter measurements fall in bell-shaped piles (are "Normally Distributed") then you can calculate 95% Tolerance Limits on 99% of the Population using the simple formula,

Lower Tolerance Limit = Average - Ks

Upper Tolerance Limit = Average + Ks

s is the standard deviation and K is a number from a table of K values. You can find a table at http://www.~~MathOptions.com/tolerance.htm.~~
www.objectiveDOE.com

For the ball bearing example,

Lower Tolerance Limit = 0.125 - 4.433 * 0.004 = 0.107

Upper Tolerance Limit = 0.125 + 4.483 * 0.004 = 0.143

So over the course of ball bearing production we would expect 99% of all of the ball bearings produced to have diameters between 0.107 inches and 0.143 inches. We are also 95% confident that these limits are correct.

Tolerance limits for different percentages of the population are also easy to calculate. You can also change the level of confidence. You use the same formula, but a different value for K. You can find a thorough table of K values at [illegible]

Bill Kappele is the president of Math Options. He would be delighted to receive your letter at Bill@MathOptions.com

Visit him at his web site and sign up for his free newsletter, E-Math News.

http://www.MathOptions.com

Table of Contents

STRATEGY Upgrades and Tips

A maintenance upgrade of STRATEGY (version 11.4.1) has just been released. It clears up the problem where STRATEGY refuses to accept certain valid linear constraints when defining a GridSearch. This upgrade is free to all current STRATEGY subscribers. For your convenience, here is a link to our download information form.

http://www.processbuilder.com/doe/Software/strategy/downloads.htm

If you are not using the linear constraints in GridSearch, you may want to start. Let's say that you have run an experiment that contains both a mixture and process factors. Use a constraint to tell GridSearch which factors are parts of the mixture.

There are two ways to do this. Note that both of these methods assume that the regression analysis did not include one of the mixture factors. The entry point for each option is after you have successfully run your regression analysis and defined your other GridSearch criteria.

Option 1 -- Using an Inequality Constraint

Go to the Linear Constraints Tab of the GridSearch Definition Form. The main grid on the page shows one column for each factor starting just to the right of a lower limit and upper limit. Each row of the grid is a different constraint.

Statistical Tolerance Limits

Statistical Tolerance limits provide you with a range in which some percentage of all your products will lie. Here is an example.

Suppose you are making ball bearings. You know that you have response variation in your process, so you know that the ball bearings produced over time will vary in diameter. You calculate the average and standard deviation from the diameter measurements of ten randomly selected ball bearings from your process. You find an average diameter of 0.125 inches with a standard deviation of 0.004 inches. You would like to know lower and upper limits on the diameters of ball bearings produced by your process.

As is often the case in the real world, you cannot define these limits for ALL of the ball bearings made. You can, though, determine limits on 99% of all ball bearings made. These limits are called "Tolerance Limits on 99% of the Population." As is also often the case in the real world, you cannot be 100% confident that these limits are correct. However, you can be 95% confident that they are correct. These limits are then called "95% Tolerance limits on 99% of the Population."

If your diameter measurements fall in bell-shaped piles (are "Normally Distributed") then you can calculate 95% Tolerance Limits on 99% of the Population using the simple formula.

Lower Tolerance Limit = Average - Ks

Upper Tolerance Limit = Average + Ks

s is the standard deviation and K is a number from the table below.

For the ball bearing example,

Lower Tolerance Limit = 0.125 - 4.433 * 0.004 = 0.107

Upper Tolerance Limit = 0.125 + 4.433 * 0.004 = 0.143

So, over the course of ball bearing production we would expect 99% of all of the ball bearings produced to have diameters between 0.107 inches and 0.143 inches. We are also 95% confident that these limits are correct.

How to read the table: First decide on the confidence level you want. The columns are grouped by confidence level. (95% is the usual confidence level.) Second decide what percentage of all of the future products you will make should be included between the limits. Choose the column for this percentage from the three columns under your confidence level. (99% is normal.) Third you will move down the column just chosen until you find the row with the number of replicates you ran.

Table of K Values for Calculating Tolerance Limits

	90% Confidence			95% Confidence			99% Confidence		
	95%	99%	99.9%	95%	99%	99.9%	95%	99%	99.9%
2	18.800	24.167	30.227	37.674	48.430	60.573	188.491	242.300	303.054
3	6.919	8.974	11.309	9.916	12.861	16.208	22.401	29.055	36.616
4	4.943	6.440	8.149	6.370	8.299	10.502	11.150	14.527	18.383
5	4.152	5.423	6.879	5.079	6.634	8.415	7.855	10.260	13.015
6	3.723	4.870	6.188	4.414	5.775	7.337	6.345	8.301	10.548
7	3.452	4.521	5.750	4.007	5.248	6.676	5.488	7.187	9.142
8	3.264	4.278	5.446	3.732	4.891	6.226	4.936	6.468	8.234
9	3.125	4.098	5.220	3.532	4.631	5.899	4.550	5.966	7.600
10	3.018	3.959	5.046	3.379	4.433	5.649	4.265	5.594	7.129
15	2.713	3.562	4.545	2.954	3.878	4.949	3.507	4.605	5.876
20	2.564	3.368	4.300	2.752	3.615	4.614	3.168	4.161	5.312
25	2.474	3.251	4.151	2.631	3.457	4.413	2.972	3.904	4.985
30	2.413	3.170	4.049	2.549	3.350	4.278	2.841	3.733	4.768
35	2.368	3.112	3.974	2.490	3.272	4.179	2.748	3.611	4.611
40	2.334	3.066	3.917	2.445	3.213	4.104	2.677	3.518	4.493
45	2.306	3.030	3.871	2.408	3.165	4.042	2.621	3.444	4.399
50	2.284	3.001	3.833	2.379	3.126	3.993	2.576	3.385	4.323
55	2.265	2.976	3.801	2.354	3.094	3.951	2.538	3.335	4.260
60	2.248	2.955	3.774	2.333	3.066	3.916	2.506	3.293	4.206
65	2.235	2.937	3.751	2.315	3.042	3.886	2.478	3.257	4.160
70	2.222	2.920	3.730	2.299	3.021	3.859	2.454	3.225	4.120
75	2.211	2.906	3.712	2.285	3.002	3.853	2.433	3.197	4.084
80	2.202	2.894	3.696	2.272	2.986	3.814	2.414	3.173	4.053
85	2.193	2.882	3.682	2.261	2.971	3.795	2.397	3.150	4.024
90	2.185	2.872	3.669	2.251	2.958	3.778	2.382	3.130	3.999
95	2.178	2.863	3.657	2.241	2.945	3.763	2.368	3.112	3.976
100	2.172	2.854	3.646	2.233	2.934	3.748	2.355	3.096	3.954
110	2.160	2.839	3.626	2.218	2.915	3.723	2.333	3.066	3.917
120	2.150	2.826	3.610	2.205	2.898	3.702	2.314	3.041	3.885
130	2.141	2.814	3.595	2.194	2.883	3.683	2.298	3.019	3.857
140	2.134	2.804	3.582	2.184	2.870	3.666	2.283	3.000	3.833
150	2.127	2.795	3.571	2.175	2.859	3.652	2.270	2.983	3.811
160	2.121	2.787	3.561	2.167	2.848	3.638	2.259	2.968	3.792
170	2.116	2.780	3.552	2.160	2.839	3.527	2.248	2.955	3.774
180	2.111	2.774	3.543	2.154	2.831	3.616	2.239	2.942	3.759
190	2.106	2.768	3.536	2.148	2.823	3.606	2.230	2.931	3.744
200	2.102	2.762	3.529	2.143	2.816	3.597	2.222	2.921	3.731
250	2.085	2.740	3.501	2.121	2.788	3.561	2.191	2.880	3.678
300	2.073	2.725	3.481	2.106	2.767	3.535	2.169	2.850	3.641
400	2.057	2.703	3.453	2.084	2.739	3.499	2.138	2.809	3.589
500	2.046	2.689	3.434	2.070	2.721	3.475	2.117	2.783	3.555
600	2.038	2.678	3.421	2.060	2.707	3.458	2.102	2.763	3.530
700	2.032	2.670	3.411	2.052	2.697	3.445	2.091	2.748	3.511
800	2.027	2.663	3.402	2.046	2.688	3.434	2.082	2.736	3.495
900	2.023	2.658	3.396	2.040	2.682	3.426	2.075	2.726	3.483
1000	2.019	2.654	3.390	2.036	2.676	3.418	2.068	2.718	3.472
Inf.	1.960	2.576	3.291	1.960	2.576	3.291	1.960	2.576	3.291

Values in the table are from, "Experimental Statistics," by Mary Natrella, currently out of print.

Standard deviation

From Wikipedia, the free encyclopedia

In probability and statistics, the **standard deviation** of a probability distribution, random variable, or population or multiset of values is a measure of the spread of its values. It is defined as the square root of the variance.

The standard deviation is the root mean square (RMS) deviation of values from their arithmetic mean. For example, in the population {4, 8}, the mean is 6 and the standard deviation is 2. This may be written: {4, 8} ≈ 6±2. In this case 100% of the values in the population are at one standard deviation of the mean.

The standard deviation is the most common measure of statistical dispersion, measuring how widely spread the values in a data set are. If the data points are close to the mean, then the standard deviation is small. Conversely, if many data points are far from the mean, then the standard deviation is large. If all the data values are equal, then the standard deviation is zero.

The standard deviation (σ) of a population can be estimated by a modified standard deviation (s) of a sample. The formulae are given below.

Contents

- 1 Definition and calculation
  - 1.1 Standard deviation of a random variable
  - 1.2 Estimating population standard deviation from sample standard deviation
- 2 Example
- 3 Interpretation and application
  - 3.1 Real-life examples
    - 3.1.1 Weather
    - 3.1.2 Sports
    - 3.1.3 Finance
  - 3.2 Geometric interpretation
  - 3.3 Rules for normally distributed data
  - 3.4 Chebyshev rules
- 4 Relationship between standard deviation and mean
- 5 Rapid calculation methods
- 6 An axiomatic approach
- 7 See also
- 8 External links

Definition and calculation

Standard deviation of a random variable

The standard deviation of a random variable X is defined as:

$$\sigma = \sqrt{\mathrm{E}((X - \mathrm{E}(X))^2)} = \sqrt{\mathrm{E}(X^2) - (\mathrm{E}(X))^2}$$

where E(X) is the expected value of X.

Not *all* random variables have a standard deviation, since these expected values need not exist. For example, the standard deviation of a random variable which follows a Cauchy distribution is undefined.

If the random variable X takes on the values $x_1,\ldots,x_N$ (which are real numbers) with equal probability, then its standard deviation can be computed as follows. First, the mean of X, $\overline{x}$, is defined as:

$$\overline{x} = \frac{1}{N}\sum_{i=1}^{N} x_i = \frac{x_1 + x_2 + \cdots + x_N}{N}$$

(see sigma notation) where N is the number of samples taken. Next, the standard deviation simplifies to:

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \overline{x})^2}$$

In other words, the standard deviation of a discrete uniform random variable X can be calculated as follows:

1. For each value x_i calculate the difference $x_i - \overline{x}$ between x_i and the average value $\overline{x}$.
2. Calculate the squares of these differences.
3. Find the average of the squared differences. This quantity is the variance σ^2.
4. Take the square root of the variance.

Estimating population standard deviation from sample standard deviation

In the real world, finding the standard deviation of an entire population is unrealistic except in certain cases, such as standardized testing, where every member of a population is sampled. In most cases, the standard deviation is estimated by examining a random sample taken from the population. The most common measure used is the *sample standard deviation*, which is defined by

$$s = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \overline{x})^2},$$

where $\{x_1, x_2, \ldots, x_N\}$ is the sample and $\overline{x}$ is the mean of the sample.

The reason for this definition is that s^2 is an unbiased estimator for the variance σ^2 of the underlying population, if that variance exists and the sample values are drawn independently with replacement. However, s is *not* an unbiased estimator for the standard deviation σ; it tends to underestimate the population standard deviation. Although an unbiased estimator for σ is known when the random variable is normally distributed, the formula is complicated and amounts to a minor correction. Moreover, unbiasedness, in this sense of the word, is not always desirable; see bias of an estimator.

Another estimator sometimes used is the similar expression

$$\sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \overline{x})^2}\ .$$

This form has a uniformly smaller mean squared error than does the unbiased estimator, and is the maximum-likelihood estimate when the population is normally distributed.

Example

We will show how to calculate the standard deviation of a population. Our example will use the ages of four young children: { 5, 6, 8, 9 }.

Step 1. Calculate the mean average, $\overline{x}$:

$$\overline{x} = \frac{1}{N}\sum_{i=1}^{N} x_i$$

We have $N = 4$ because there are four data points:

$$\begin{aligned} x_1 &= 5 \\ x_2 &= 6 \\ x_3 &= 8 \\ x_4 &= 9 \end{aligned}$$

$$\overline{x} = \frac{1}{4}\sum_{i=1}^{4} x_i \qquad \text{Replacing } N \text{ with 4}$$

$$\overline{x} = \frac{1}{4}(x_1 + x_2 + x_3 + x_4)$$

$$\overline{x} = \frac{1}{4}(5 + 6 + 8 + 9)$$

$\overline{x} = 7$ This is the mean.

Step 2. Calculate the standard deviation σ:

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \overline{x})^2}$$

$$\sigma = \sqrt{\frac{1}{4}\sum_{i=1}^{4}(x_i - \overline{x})^2} \qquad \text{Replacing } N \text{ with 4}$$

$$\sigma = \sqrt{\frac{1}{4}\sum_{i=1}^{4}(x_i - 7)^2} \qquad \text{Replacing } \overline{x} \text{ with } 7$$

$$\sigma = \sqrt{\frac{1}{4}\left[(x_1 - 7)^2 + (x_2 - 7)^2 + (x_3 - 7)^2 + (x_4 - 7)^2\right]}$$

$$\sigma = \sqrt{\frac{1}{4}\left[(5 - 7)^2 + (6 - 7)^2 + (8 - 7)^2 + (9 - 7)^2\right]}$$

$$\sigma = \sqrt{\frac{1}{4}\left((-2)^2 + (-1)^2 + 1^2 + 2^2\right)}$$

$$\sigma = \sqrt{\frac{1}{4}(4 + 1 + 1 + 4)}$$

$$\sigma = \sqrt{\frac{10}{4}}$$

$$\sigma = \sqrt{\frac{5}{2}} \approx 1.5811$$

So, the standard deviation is the square root of five halves, or approximately 1.5811.

Were this set a sample drawn from a larger population of children, and the question at hand was the standard deviation of the population, convention would replace the N (or 4) here with $N-1$ (or 3).

Interpretation and application

A large standard deviation indicates that the data points are far from the mean and a small standard deviation indicates that they are clustered closely around the mean.

For example, each of the three data sets (0, 0, 14, 14), (0, 6, 8, 14) and (6, 6, 8, 8) has a mean of 7. Their standard deviations are 7, 5, and 1, respectively. The third set has a much smaller standard deviation than the other two because its values are all close to 7. In a loose sense, the standard deviation tells us how far from the mean the data points tend to be. It will have the same units as the data points themselves. If, for instance, the data set (0, 6, 8, 14) represents the ages of four siblings, the standard deviation is 5 *years*.

As another example, the data set (1000, 1006, 1008, 1014) may represent the distances traveled by four athletes in 3 minutes, measured in meters. It has a mean of 1007 meters, and a standard deviation of 5 *meters*.

In the age example above, a standard deviation of 5 may be considered large; in the distance example above, 5 may be considered small (small to the mathematician, not so small to the athletes).