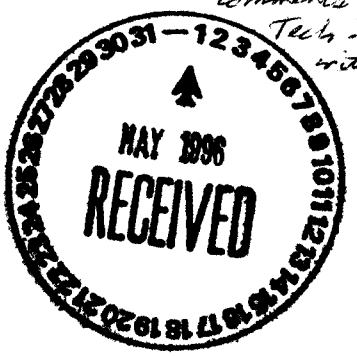
GIANT
INDUSTRIES, INC.

Barbara ✓
Ron K ✓
Michael —
get in contact with James Harris on this, also get comments from Tech - (coordin with Ron)

Route 3, Box 7
Gallup, New Mexico
87301

April 29, 1996



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

Dear Mr. Garcia:

SUBJECT: CORRECTIVE ACTION PLAN SWMU-6 PRODUCT RECOVERY

Giant Refining Company (Giant) is in receipt of your April 24, 1996, letter informing Giant that New Mexico has obtained RCRA Corrective Action Authorization through its Hazardous and Radioactive Materials Bureau. Recently, on April 15, 1996, Giant transmitted the Environmental Protection Agency (EPA) Region 6 and the New Mexico Oil Conservation Division (OCD) a Corrective Action Plan (CAP) for recovering free product located below Solid Waste Management Unit 6 (SWMU-6). Giant requested that the USEPA and NMOCD review the CAP and if they had any questions to contact me or Mr. David Pavlich.

Enclosed, for your review, is a copy of the CAP submitted to the USEPA and NMOCD. I want to note that this document is intended to be a "living" document and may be modified as additional information is obtained.

If there are any questions in this matter, please contact me at (505) 722-0227 or Mr. David Pavlich at (505) 722-0217.

Sincerely,

Edward L. Horst, Environmental Manager
Giant Refining Company
Ciniza Refinery

cc: Mr. Ronald Kern, Manager, RCRA Technical Compliance Program, NMED/HRMB
Ms. Barbara Hoditscheck, Manager, RCRA Permits Program, NMED/HRMB
Mr. Patricio W. Sanchez, Petroleum Engineer, NMOCD **w/o enclosure**
Mr. David Neleigh, Chief, New Mexico Federal Facilities Section, EPA Region 6
Mr. Dick Platt, General Manager Giant Refining Company **w/o enclosures**
Mr. David Pavlich, HSE Manager Giant Refining Company **w/o enclosures**
Mr. Kim Bullerdick, Legal Counsel, Giant Industries Arizona

GIANT
INDUSTRIES, INC.

Route 3, Box 7
Gallup, New Mexico
87301

April 15, 1996

Mr. Patricio W. Sanchez
Petroleum Engineer
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

Dear Mr. Sanchez:

SUBJECT: CORRECTIVE ACTION PLAN SWMU-6 PRODUCT RECOVERY.

Enclosed is Giant Refining Company's Corrective Action Plan for product recovery at the area known as the Tank Farm and identified as part of the Solid Waste Management Unit (SWMU) - 6. A copy of this document is being transmitted to Mr. James Harris, Region 6, U. S. Environmental Protection Agency (USEPA) for his review. Please review this document and if there are any questions please contact me at (505) 722-0227 or Mr. David Pavlich at (505) 722-0217.

Thank you for all the help you have given to me on this issue.

Sincerely

Edward L. Horst, Environmental Manager
Giant Refining Company
Ciniza Refinery

cc: Mr. James Harris, RCRA Facility Manager/Geologist
U. S. Environmental Protection Agency Region 6

w/o enclosure
Kim Bullerdick, Legal Counsel, Giant Industries Arizona
Dick Platt, General Manager Giant Refining Company
David Pavlich, HSE Manager
Steve Morris, Environmental Spec.

1.0 INTRODUCTION

Giant Refining Company (Giant) owns and operates the Ciniza Refinery Located 17 miles east of Gallup, New Mexico (Figure 1). In August, 1987, a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) was conducted at the refinery. As a result of this RFA, 14 potential solid waste management units (SWMUs) were identified. Between 1990 and 1992, Giant conducted a series of RCRA Facility Investigations (RFIs) to characterize all of the SWMUs. The RFI was performed in three phases. Phase I is the site-specific investigation schedule for SWMUs # 6, 8, 9, 10, and 12. Phase II covers the site-specific investigation schedule for SWMUs # 1, 2, and 13. While Phase III is concerned with the site specific investigation schedule for SWMUs # 3, 4, 5, 7, 11, and 12.

Phase I of the RFI, as it applies to SWMU-6, states that soil borings will be drilled near and under each tank that contained leaded gasoline. The borings will be drilled to a depth of 7.5 feet below the ground surface. Samples will be taken from each boring and analyzed. As a result, additional drilling,

sampling and analytical work was necessary to complete SWMU-6 site characterization.

As a result of these efforts, it has been determined that a corrective action plan (CAP) be submitted for the remediation and recovery of hydrocarbons found in monitoring wells B-2 and BG-4.

This report is the CAP for the remediation and recovery of hydrocarbons found in monitoring wells B-2 and BG-4.

2.0 SITE CONDITIONS

The Ciniza Refinery site is located on clays, silts, shales , and thin interbedded sand units of the Triassic Chinle Formation (Fm). The Chinle has a structural dip of approximately two degrees to the northwest. The uppermost aquifer unit that underlies the entire facility, including SWMU-6, is the Sonsela Sandstone. The top of the Sonsela Sandstone in this area occurs at a depth of approximately 55 feet. Ground water in the Sonsela is confined under artesian conditions by the relatively impermeable Chinle clays and shales above and below. A localized, lenticular, water-bearing sand body, locally called the Ciniza Sand, has also been identified underlying the northwestern part of the refinery area, but it is not present in the vicinity of SWMU-6.

Field observations and aquifer test data suggest that the shales and clays of the Chinle Formation do not contain free ground water and that low hydraulic conductivity inhibits horizontal and vertical migration of water, qualifying the Chinle as an aquitard.

2.1. SUBSURFACE GEOLOGY

The Ciniza Refinery site is located on predominantly clayey soil derived from weathering of the underlying Petrified Forest Member of the Triassic Chinle Formation (Figure 2). Clay, silt, and shale, along with thin interbedded sand units were encountered in borings drilled across the refinery site. The clay and shale of the Petrified Forest Member overlie the Sonsela Sandstone, which occurs at depths ranging from approximately 30 feet in the southeastern part of the refinery to over 100 feet to the northwest (Figure 2). The Sonsela Sandstone is composed of fine to coarse-grained quartz sand which is partially cemented with silica and carbonate. The Sonsela unit is approximately 10 to 30 feet thick and dips to the northeast and northwest beneath the Ciniza refinery location (Figure 2). The near surface fine-grained sequence is thickest towards the northwestern part of the refinery property and thins to the southeast. The clay and shale unit is predominantly reddish brown, highly weathered, and dry. It also contains relatively high background concentrations of naturally occurring metals.

2.2 HYDROGEOLOGY

The principle aquifer units in west central New Mexico are the Sonsela Sandstone and the San Andres Formations. Both are confined, artesian aquifers and both underlie the Ciniza Refinery site. The San Andres is present at a depth of approximately 800 feet. Wells completed in the San Andres produce in excess of a 1,000 gallons per minute (gpm) of good quality water, and the aquifer is the principle water supply source to the refinery. In comparison, the Sonsela Aquifer is present from 30 to over 100 feet below ground and produces 1 to 10 gallons per minute (gpm) of fair to poor quality water. Ground water, of poor quality, is also present under confined conditions in the "Ciniza Sand" beneath the northwestern part of the refinery. Clays and shales overlying both the Sonsela and Ciniza units are dry and act as aquitards (GCL, 1986).

2.2.1 Sonsela Sandstone Aquifer

The Sonsela Sandstone is the uppermost aquifer underlying the Ciniza Refinery and occurs at depths ranging from 30 to over 100 feet. The

Sonsela is confined above and below by clay and shale of the Chinle formation. Resulting artesian conditions in the Sonsela are manifest by artesian heads ranging from 30 to 100 feet in the refinery area (Figures 3 and 4). The resulting upward gradient between the Sonsela and the overlying Chinle aquitard results in localized saturation of Chinle shales and clay immediately above the Sonsela contact.

The potentiometric surface of ground water in the Sonsela dips to the northeast, roughly parallel with structural dips observed in the Sonsela Sandstone (Figure 5). The potentiometric surface has a gradient of approximately 0.010 ft/ft and is relatively uniform across the site (Figure 3).

Aquifer slug and pump test data in the western area of the refinery indicates that the hydraulic conductivity of the Sonsela Sandstone is 3.9×10^{-6} ft./sec. or 0.35 ft/day (Shomaker, 1984). Assuming an average porosity of 10 percent and a gradient of 0.010 ft./ft., the ground water velocity would be 13 feet per year.

2.2.2 Chinle Aquitard

The Sonsela Aquifer in confined above and below by low permeability clays and shales of the Chinle aquitard. Aquifer slug and pump tests indicate that the Chinle aquitard has a hydraulic conductivity of 8.3×10^{-9} ft./sec. or 7.1×10^{-4} ft./day (Shomaker, 1984). Assuming an average porosity of 40 percent and a gradient of 0.010 ft./ft., free ground water flow in the Chinle aquitard, if it exists, would be at a rate of 0.007 ft/yr. With the exception of shale and clay immediately overlying the Sonsela Aquifer, no ground water has been noted in Chinle shales and clays beneath the refinery site.

2.3 SUBSURFACE CONDITIONS IN SWMU-6 AREA

In March, 1995, eleven (11) borings and two (2) wells were drilled as part of the RCRA Facility Investigation (RFI). The identification, geologist log and respective locations for each boring drilled during the RFI are shown in Attachment "A". Clays, shales, and water bearing sands were encountered in all borings. It should be noted that a hydrocarbon order was

present in most borings; and both of the wells (BG-4 and B-2) did contain floating "free product".

3.0 SITE ASSESSMENT

SWMU 6 consists of seven hydrocarbon storage tanks (ranging in size from 1,000 to 24,000 barrels) that have contained leaded gasoline (that is, gasoline blended with the compound tetraethyl lead). After reviewing the first set of data results (samples collected from 0-0.5 feet, 3.5-4 feet, and 7-7.5 feet from drilling locations throughout SWMU-6), Giant decided that it would be necessary to collect samples at deeper intervals. It was agreed as part of the supplemental sampling requirements that ten (10) additional samples would be collected at depths from 11-11.5 feet. These samples would all be analyzed for BTEX with two (2) of the samples being analyzed for metals.

After Giant conducted the supplemental sampling events and reviewed the results of the sample analyses, it was determined that additional samples should be collected around TANK 569. Three additional borings were made with one sample collected from each boring. These samples were collected at different depth intervals as follows: 11-11.5 feet, 14-14.5 feet, and 16-16.5 feet.

Because BTEX levels were all below any of the proposed corrective actions levels, Giant proposed no corrective action be performed. EPA did not agree and stated:

"Giant shall complete additional soil borings as close as possible to the following sample points (numbers correspond to previous RFI sampling points competed in May, 1991): 21, 22, 23, 25 , 26, 27, 30 and 31. The sampling interval shall be at 16 feet with the exception of sample point 31 which shall be sampled at 20 feet. Samples will be analyzed for BTEX constituents. Sampling must extend vertically until no subsequent increase in contamination levels is likely to occur. A minimum of two (2) "clean" samples are required to verify delineation. The results of this sampling event shall be submitted to EPA by October 1, 1994."

EPA's required drilling, sampling and analytical work was performed and, as a result, it was discovered that there exists a plume of free product. Through laboratory "finger printing", the free product appears to be gasoline.

3.1 ORGANIC COMPOUNDS

Hydrocarbon contamination was detected in all but two borings, B1 and BG3. The hydrocarbon contamination was laboratory "finger printed" as gasoline. This is consistent with the type of materials historically stored in tanks located within the boundaries of SWMU-6.

4.0 REMEDIAL ACTION

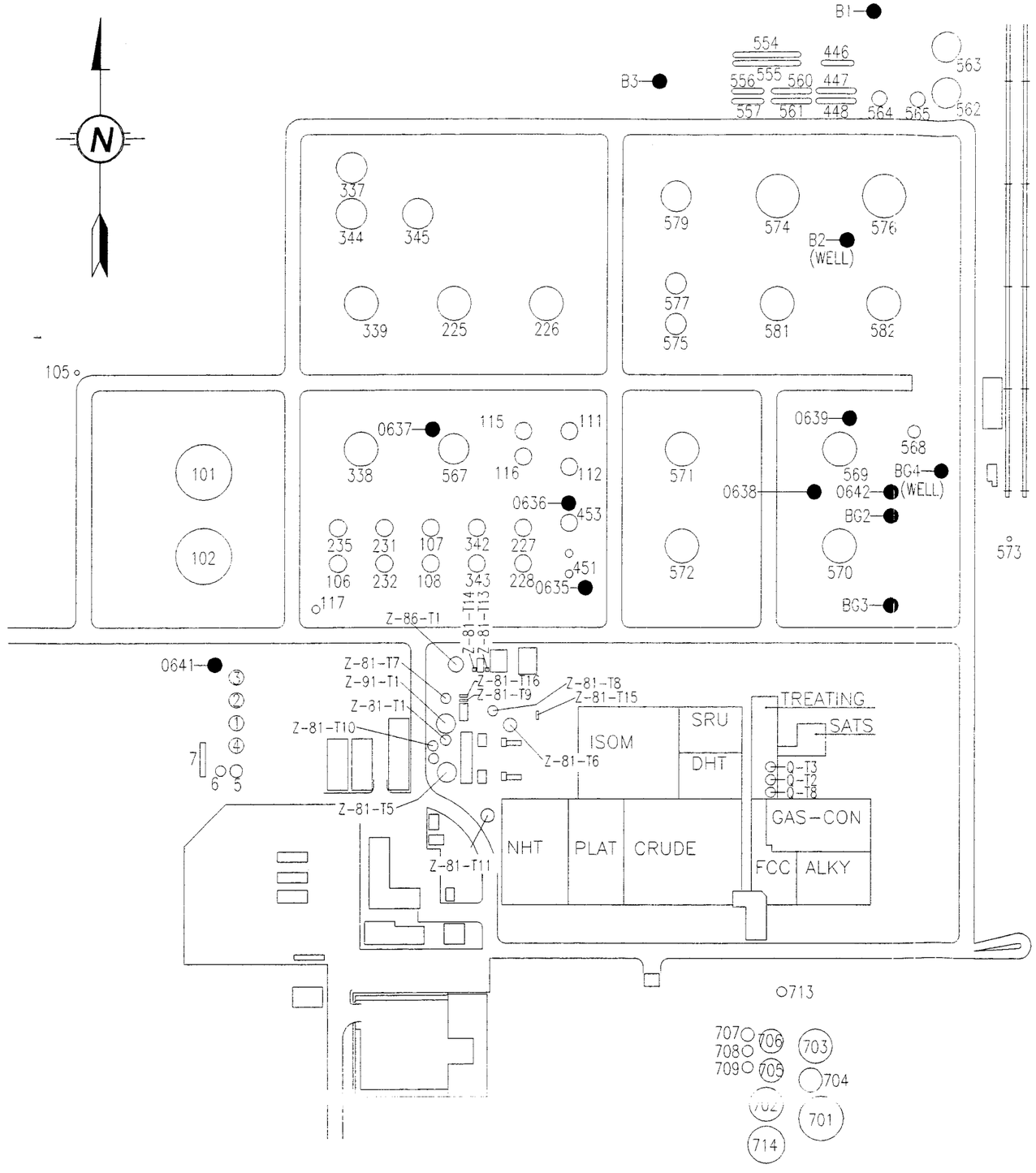
Giant Refining proposes to begin remediation through a pump and treat method. Initially, two (2) submergible pumps will be installed at wells B-2 and BG-4, see Appendix "A". Free product removed from these wells will be sent to the API Separator, via the sewer system, where the water will be removed and the product recovered and sent back through the refining process.

This operation will continue until all the recoverable free product has been removed. Monitoring of the success of this operation will be conducted

through water sampling at down gradient wells OW-14 and OW-13. One additional boring will be drilled down gradient of OW-14, and water samples will be gathered and analyzed for BTEX. Once the analytical results have been received and evaluated, Giant will be able to determine if additional drilling is necessary.

In the first year of operations, Giant will submit written quarterly progress reports to the regulatory authority(ies). After the first year, Giant will submit written progress reports on an annual basis.

As in many operations of this nature, unforeseen events may occur and adjustments to this plan will be necessary. In an effort to maintain continuous and uninterrupted operations, Giant proposes to make any necessary adjustments and contact the regulatory authority(ies), by telephone within 72 hours of implementing adjustments. A written follow-up report would then be submitted within 30 days.



ATTACHMENT "A"

GIANT REFINING CO.

CINIZA REFINERY — A DIVISION OF GIANT INDUSTRIES — GALLUP NEW MEXICO

BORING PLAN

DRILLING PLAN

MARK	DATE	DESCRIPTION	BY	APRVD
REVISIONS				

SCALE: NONE	APRVD	
DRN BY: CLM	1=1	REV 0
DATE: 04-10-96	DWG NO. Z86-09-131	