GW - ___001___

WORK PLANS

2007 - Present

Chavez, Carl J, EMNRD

From: Monzeglio, Hope, NMENV
Sent: Thursday, September 03, 2009 8:35 AM
To: Schmaltz, Randy
Cc: Kieling, John, NMENV; Cobrain, Dave, NMENV; Martinez, Cynthia, NMENV; Chavez, Carl J, EMNRD; Hains, Allen
Subject: Group 4
Attachments: GRCB 09-001 NOD Grp 4 Invest Wk Pl 9_09.pdf; GRCB 09-001 NOD color fig 9_09 .PDF

Randy

A hard copy is in the mail.

Hope

Hope Monzeglio
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New Mexico Environment Department
Hazardous Waste Bureau

BILL RICHARDSON
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Lieutenant Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 3, 2009

Mr. Randy Schmaltz
Environmental Manager
Western Refining, Bloomfield Refinery
P.O. Box 159
Bloomfield, New Mexico 87413

RE: NOTICE OF DISAPPROVAL
INVESTIGATION WORK PLAN GROUP 4
WESTERN REFINING SOUTHWEST, INC., BLOOMFIELD REFINERY
EPA ID# NMD089416416
HWB-GRCB-09-001

Dear Mr. Schmaltz:

The New Mexico Environment Department (NMED) has reviewed Western Refining Southwest, Inc., Bloomfield Refinery's (Western) *Investigation Work Plan Group 4 SWMU No. 7 Raw Water Ponds, SWMU No. 10 Fire Training Area, and SWMU No. 16 Active Landfill)* (Work Plan), dated December 2008. NMED hereby issues this Notice of Disapproval (NOD). Western must address the following comments before NMED can take action on the Work Plan.

Comment 1
The current format of the Work Plan is difficult to follow and missing information making it hard to complete a thorough technical review. Western must revise the Work Plan as follows:

a. Western must address each Solid Waste Management Unit (SWMU) in separate sections. Each section must include text, tables, figures, photographs, and engineering drawings (if applicable) associated with each SWMU. The text must include a Background (previous investigations), Site Conditions (surface and subsurface), Scope of Services, Investigative Methods, and Monitoring and Sampling

Program subsections. Western must refer to Section X.B (Investigation Work Plan) of the July 27, 2007 Order (Order) for the required information. The associated tables, figures, photographs, and engineering drawings (if applicable) must be separated within the individual SWMU sections with labeled tabs. For example, tab separators should be inserted and titled Section 1 and the Section must include information for a SWMU (e.g., SWMU 7), followed by tab separators within the section titled "tables," figures," etc.

b. The Executive Summary and Section 1(Introduction) of the current Work Plan must be included in the revised Work Plan.

c. Sections 5 (Investigation Methods), Section 6 (Monitoring and Sampling Program), Section 7 (Schedule), and Section 8 (References) of the current Work Plan must also be included in the revised Work Plan but does not need to be included in each SWMU-specific section. Sections 5-8 must be placed after the SWMU specific sections and must be separated by a tab.

The individual sections for each SWMU should follow an identical format. This applies to all future Work Plan submittals as well. In addition, Western must incorporate the requirements in this NOD to all applicable sections. Such formatting requirements will help Western organize and clarify its presentation, and facilitate NMED's review.

Comment 2
In the Section 2 (Background) discussions for each subsection (2.1 (SWMU No. 7 Raw Water Ponds), 2.2 (SWMU No. 10 Fire Training Area), and 2.3 (SWMU No. 16 Active Landfill)), Western must provide the dates of operations of the units.

Comment 3
In Section 2.1 (SWMU No. 7 Raw Water Ponds), Western does not provide the depths of the Raw Water Ponds in the Background Section. The depth of the Raw Water Ponds is important for calculating the volume of water present within each pond and for determining how the sample collection will be conducted. Western must revise the Work Plan to include the depths of the Raw Water Ponds. If this information is unknown, Western must revise the Work Plan to identify how the depths will be determined during the investigation.

Comment 4
In Section 2.1 (SWMU No. 7 Raw Water Ponds), page 3, paragraph 1, Western states "[t]he first recorded site operations in this area were the evaporation ponds. There were two ponds of approximately 2.5 acres each. The northern pond is now the Raw Water Ponds and the southern pond was located immediately south (Figure 2)."

Western must revise the Work Plan to state the current acreage of Raw Water Ponds.

Comment 5
In Section 2.1 (SWMU No. 7 Raw Water Ponds), page 4, paragraph 3, Western states "[t]wo permanent monitoring wells and seven temporary monitoring wells were installed in October 2008, located immediately down-gradient of the Raw Water Ponds....The samples are shown on Figure 8 and the analytical results are provided in Table 1."

The names of the samples shown on Figure 8 ("2008 RFI Sample Locations" (SB2-1, SB2-2, SB2-3, SB2-4, SB2-5/MW-50, SB2-6, SB2-7and SB2-8) do not correlate with the names provided in Table 1 (SWMU2-1, SWMU2-2, SWMU2-3, SWMU2-4, SWMU2-5/MW-50, SWMU2-6, SWMU2-7, SWMU2-8, SWMU2-9/MW-51); it is not clear if the analytical data for the permanent monitoring wells and temporary wells, are provided in Table 1. Western must revise the Work Plan to clarify this discrepancy and include the correct names of the monitoring wells and temporary wells so that the information presented in the text, figures, and tables are consistent.

Comment 6
In Section 2.1 (SWMU No. 7 Raw Water Ponds), page 4, paragraph 3, Western states "[t]wo permanent monitoring wells and seven temporary monitoring wells were installed in October 2008, located immediately down-gradient of the Raw Water Ponds."

In the revised Work Plan, Western must list the names of the two monitoring wells and the seven temporary wells installed in October 2008.

Comment 7
In Section 2.1 (SWMU No. 7 Raw Water Ponds) Western references a *Closure Plan for the Unlined Evaporation Lagoons and the Spray Evaporation Area* which was approved by the New Mexico Oil Conservation Division (OCD).

NMED did not review or approve the closure plan referenced above. Therefore, NMED will not rely on the cited data to make regulatory decisions. No revision is necessary.

Comment 8
In Section 2.2 (SWMU No. 10 Fire Training Area), page 6, paragraph 2, Western states "[t]his area was previously investigated during the 1993 RCRA Facility Investigation with four soil borings located in this area....All of the organic analyses were non-detect and the metals concentrations are reported to be less than the background concentrations developed during the 1993 RCRA Facility Investigation (Groundwater Technology Inc., 1994 and Groundwater Technology Inc., 1995). The analytical results for the soil samples are presented in Table 2."

A background study has not been completed in accordance with Section VIII.H of the Order; therefore, Western cannot compare inorganic constituents to background levels. The Groundwater Technology Inc., 1995 document is the Human Health and Ecological Risk Assessment; this document may no longer be valid, as NMED has since developed risk assessment guidance. Western must remove or qualify the reference to "background concentrations."

Comment 9
In Section 3.1 (Surface Conditions), page 7, Western states "[n]orth of the refinery, surface water flows in a southeasterly direction toward the San Juan River."

It is NMED's understanding that surface water at the refinery generally flows in a northerly direction towards the San Juan River. Western must clarify the surface water flow direction in the revised Work Plan and provide an explanation in the response letter.

Comment 10
In Section 3.1 (Surface Conditions), page 7, paragraph 3, Western states that "[t]he refinery complex is bisected by County Rd #4990 (Sulivan Road), which runs east-west. The process units, storage tanks (crude oil and liquid products), and wastewater treatment systems are located north of the county road. The crude oil and product loading racks, LPG storage tanks and loading racks... are located south of [the] county road."

Western must revise this Section of the Work Plan to include the location of SWMUs 7, 10, and 11 in reference to County Rd #4990.

Comment 11
The Scope of Services, Section 4.0 does not provide enough detail to complete a thorough review. Western must revise the Scope of Services Section in accordance with X.B.7 (Scope of Services) of the Order, specifically to address the statement "[a] section on the scope of activities shall briefly describe a list of all anticipated activities to be performed during the investigation..." See Comments 12 and 13 below.

Comment 12
In Section 4.0 (Scope of Services), Subsection 4.1 (Anticipated Activities), page 9, Western states "[p]ursuant to Section IV of the Order, a scope of services was developed to determine and evaluate the presence, nature, extent, fate, and transport of contaminants. To accomplish this objective, soil, sediment, and groundwater samples will be collected at the SWMU No. 7 Raw Water Ponds, SWMU No. 10 Fire Training Area, and SWMU No. 16 Active Landfill. Soil borings will be installed and samples collected as discussed in Section 5.2. The installation of a monitoring well and collection of groundwater samples is discussed in Section 5.3."

Although Western states that soil, sediment, and groundwater samples will be collected, the Work Plan does not address the specific activities that will be conducted at each SWMU. Section 4.1 of the revised Work Plan must include a list of the anticipated activities to be conducted at each SWMU (e.g., collect six surface samples to a depth of one foot, install 5 borings to a depth of approximately ten feet below ground surface and collect a water sample at the water table if encountered, etc.). Western must refer to Section X.B (Investigation Work Plan), X.B.7 (Scope of Services) of the Order for details to be included in this revision. See also Comment 1.

Comment 13

In Section 4.0 (Scope of Services), Subsection 4.1 (Anticipated Activities), page 9, Western states "[so]il borings will be installed and samples collected as discussed in Section 5.2. The installation of a monitoring well and collection of groundwater samples is discussed in Section 5.3."

Subsection 4.1 refers to Section 5.2 (Soil Sampling) and 5.3 (Ground Water Monitoring) as stated above. It is not clear where within these sections (5.2 and 5.3) the investigation activities (number of borings and monitoring wells) for each SWMU are presented. These sections include information for sampling activities; however, the information is not presented in a clear manner. It is therefore difficult to understand what will be conducted at each SWMU (e.g., number of soil borings, monitoring wells to be installed). Western must revise the Work Plan to briefly describe the soil sampling and groundwater monitoring activities listed in the Scope of Services. See Comment 12.

Comment 14

In Section 5.2 (Soil Sampling), Western states that sediment samples will be collected from the Raw Water Ponds (SWMU No. 7). The Work Plan does not contain details of how the sediment samples will be collected.

The sampling requirements for the Raw Water Ponds (SWMU No. 7) require modifications as sediment sampling is no longer needed. However, Western must consider the following if sediment sampling will be conducted in future investigations. Sediment sampling is different from soil sampling. Sediment sampling must therefore be addressed in a separate section in which the proposed sampling methods and procedures for collection of sediment samples must be described. Western must revise the Work Plan to remove all references to sediment sampling and incorporate the requirements established in Comments 15 and 16 below.

Comment15
Western proposes to collect six sediment samples from the 0 to 6 inch interval at SWMU No. 7 (Raw Water Ponds).

The proposed 0-6 inch interval is not representative of the stratigraphic section beneath the Raw Water Ponds. Based on historical documents and conversations with Western, the stratigraphic section beneath the Evaporation Ponds/Raw Water Ponds (native sediments to the surface) is as follows: the Jackson Lake Terrace Deposit, four to six inches of bentonite, sediment/sludge accumulation from the interval when the Evaporation Ponds were in service, four to six more inches of bentonite and overlying sediment/silt accumulated from the San Juan River (from current service as the Raw Water Ponds). Western must revise the Work Plan to include characterization of the sediments, liners, and soils beneath the Raw Water Ponds (SWMU No. 7) from the water/sediment interface to the native soils. The Investigation Report must include a figure that depicts the thickness of each unit/layer, as well as provide the depths below the tops of the pond embankments and surrounding land surface. See Comment 16 below.

Comment 16
Sampling activities at SWMU No. 7 (Raw Water Ponds) are being modified because sampling has not occurred in 10 years and the previous VOC data may be invalid due to improper sampling methods (samples were composited). Additionally, the Closure Plan submitted to OCD did not describe the sampling methods and procedures, nor did it indicate if soil was removed or if any remedial activities were completed. Finally, the current Work Plan does not include proposed sampling of potentially distinct layers (e.g., liners, sludge) beneath the Raw Water Ponds, nor was any sampling proposed for the South Evaporation Pond. Western must revise the Work Plan to incorporate the following sampling activities.

a. Instead of collecting six sediment samples, Western must advance three soil borings from within the Raw Water Ponds; two soil borings must be advanced within the western Raw Water Pond and one soil boring from within the eastern Raw Water Pond (see attached Figure 8 for the approximate locations). The borings must be continuously logged from the water/sediment interface into the underlying native soil. Samples must be collected from every discernable layer, including the native soil (e.g., sediment, bentonite, sludge, native soil). The samples must be analyzed in accordance with Section 5.8 (Chemical Analysis). Western must revise the text and figures in the Work Plan accordingly.

b. Western must advance a boring within 25 feet of the historic discharge point where wastewater entered into the Evaporation Ponds. The boring must be continuously logged from the water/sediment interface into the native soil. Soil samples must be collected from every discernable layer, including native soil. The samples must be

analyzed in accordance with Section 5.8 (Chemical Analysis). Western must revise the text and figures in the Work Plan accordingly.

c. Western must advance a soil boring at the location where the overflow from the north Evaporation Pond to the South Evaporation Pond occurred. The boring must be continuously logged from the water/sediment interface into the native soil. Soil samples must be collected from every discernable layer, including the native soil. The samples must be analyzed in accordance with Section 5.8 (Chemical Analysis). Western must revise the text and figures in the Work Plan accordingly.

d. Western must advance two soil borings within the Former South Evaporation Pond. The approximate locations are identified in the attached Figure 2. The borings must be continuously logged from the surface into the underlying native soil. Soil samples must be collected from every discernable layer, including native soil. The soil samples must be analyzed for the constituents identified in Section 5.8 (Chemical Analyses). Western must revise the text and figures in the Work Plan accordingly.

e. If groundwater is encountered beneath the former South Pond, a water sample must be collected at the water table and analyzed for the constituents identified in Section 5.8 (Chemical Analyses). Western must revise the text and figures in the Work Plan accordingly.

Comment 17

In reference to SWMU No. 7 (Raw Water Ponds), Western must revise the Work Plan to include the following figures:

a. A figure that identifies the location of the historic inlet pipe that discharged wastewater to the former Evaporation Ponds, the location of the over flow pipe connecting the north evaporation pond to the south evaporation pond, and the location of the existing inlet pipe where water enters from the San Juan River.

b. A figure that depicts the Raw Water Ponds and the Former South Evaporation Pond, and the area in the vicinity of soil boring B-6.

Comment 18

The historical analytical results at the former Evaporation Ponds (existing Raw Water Ponds), provided in Table 2, identified detections of thallium above the New Mexico Soil Screening Levels (soil-to-groundwater screening level). Therefore, Western must revise the Work Plan to include the analysis of thallium to Section 5.8 (Chemical Analysis).

Comment 19
In Section 5.2 (Soil Sampling), page 12 and 13, Western states "[a]s there are individual props located within the area where liquid fuel (e.g., diesel and gasoline) is used and there is the potential for constituents to be released to soils at known locations, a judgmental sampling design is appropriate. Four soil borings are proposed near these locations as shown on Figure 9. In addition, two soil borings will be located within the drainage ditch, which runs along the western side of the area and collects surface water runoff from the area. One of the borings will be located in the small pit on the north end of the ditch."
Western must revise the Work Plan to incorporate the following additional sampling locations at SWMU No. 10 (The Fire Training Area):

a. Soil borings must be installed at all locations where fire is ignited and burning occurs during the fire trainings. All changes must be reflected in the text and figures in the revised Work Plan.

b. A soil boring must be installed from all shaded areas within SWMU No. 10 and as shown in Figure 9, unless an explanation can be provided as to why sampling is unnecessary.

c. Revise Figure 9 (SWMU No. 10 Sample Locations Map) to depict all drainage features and outfalls. In addition, the figure must identify all features in the figure (e.g., all dark spots must be labeled); it is not clear if the shadows are surface staining, actual shadows, or tangible features. This figure must also include the proposed sample locations.

d. The soil samples collected from the soil borings must follow the sampling methods and procedures as presented in the Work Plan.

Comment 20
In Section 5.2 (Soil Sampling), page 13, paragraph 2, Western states "[t]he landfill area of interest was divided into quadrants, with one soil boring located near the center of each quadrant (Figure 10)."

Western addresses how the Active Landfill was divided into quadrants for soil sampling, but the quadrants are not shown in the figure. If Western continues to describe the Active Landfill area as being divided into quadrants, the quadrants must be presented in the figure or the text must be revised to remove reference to the quadrants. In addition, Western must revise the Work Plan to include the following modifications to the Active Landfill investigation:

a. Western must install an additional soil boring in the center of the Active Landfill (see attached Figure 10 for the approximate location). Western must revise the text and figure in the Work Plan accordingly.

b. Western must modify the chemical analysis for all soil samples collected at the Active Landfill; these changes incorporate the OCD sampling requirements. All soil samples collected from the five borings must be analyzed for the metals identified in Section 5.8 (Chemical Analysis) with the addition of aluminum, boron, copper, manganese, molybdenum, iron, and uranium. Soil samples must also be analyzed for chlorides, sulfate, fluoride, and gasoline range organics (GRO). If GRO is detected at concentrations greater than 80 parts per million (ppm), the soil samples also must be analyzed for VOCs. In addition, soil samples must be analyzed for DRO extended (motor oil range organics (MRO)), if DRO is detected at concentrations greater than 200 ppm, the soil samples must be analyzed for semi-volatile organic compounds (SVOCs). Western must revise the text in the Work Plan accordingly.

c. If any water samples are collected, the water samples must be analyzed for the constituents identified in Section 5.8 (Chemical Analyses) in addition to the constituents identified in item b above.

d. Western must determine the total depth of the Active Landfill.

Western must revise the text in the Work Plan to incorporate the above changes.

Comment 21
Western must revise the Work Plan to include a figure(s) that depicts the locations of all sampling locations referenced in Table 1.

Comment 22
In Figure 9, Western has a blue dot that states "Proposed Well" at the north end of SWMU No. 10. The legend also contains a blue dot that states "SB9-1 2008 RFI Sample Location".

As indicated in the figure, it is not clear if the "proposed well" was a sample location in the 2008 RFI. Western must revise Figure 9 in the revised Work Plan to clarify the difference between the blue dots or use different symbols to show the difference between the "proposed well" and the "2008 RFI sample locations."

Comment 23
Western does not mention the installation of a new permanent monitoring well (proposed well) until Section 5.3.2 (Groundwater Sampling), after drilling and installation of a monitoring well has already been discussed. In the revised Work Plan, Western must address the installation of

the monitoring well and its location in the Scope of Services Section, so it is clear that a well is going to be installed. In addition, Section 5.3 (Groundwater Monitoring) discusses monitoring wells, as if more than one monitoring well is being installed. Western must revise Section 5.3 to also make it clear that only one monitoring well will be installed and sampled as part of this investigation.

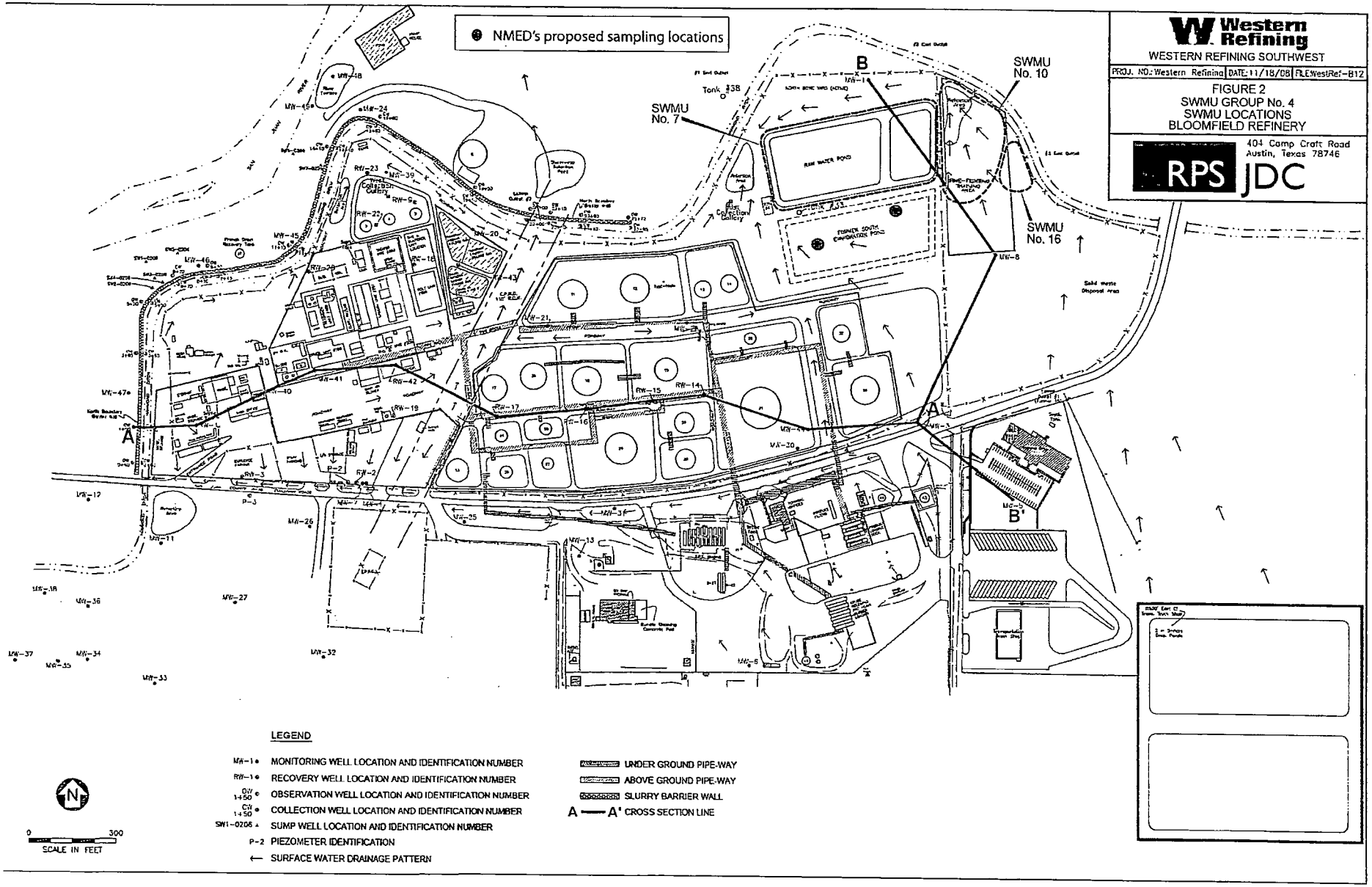
Western must address all comments contained in this NOD and submit a revised Work Plan to NMED on or before January 25, 2010. The revised Work Plan must be submitted with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. In addition, an electronic version of the revised work plan must be submitted that identifies where all changes made in redline strikeout format.

If you have any questions regarding this letter, please contact Hope Monzeglio of my staff at (505) 476-6045.

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

cc: J. Kieling, NMED HWB
D. Cobrain, NMED HWB
H. Monzeglio, NMED HWB
C. Chavez, OCD
A. Hains, Western El Paso
File: GRCB 2009 and Reading
HWB-GRCB-09-001



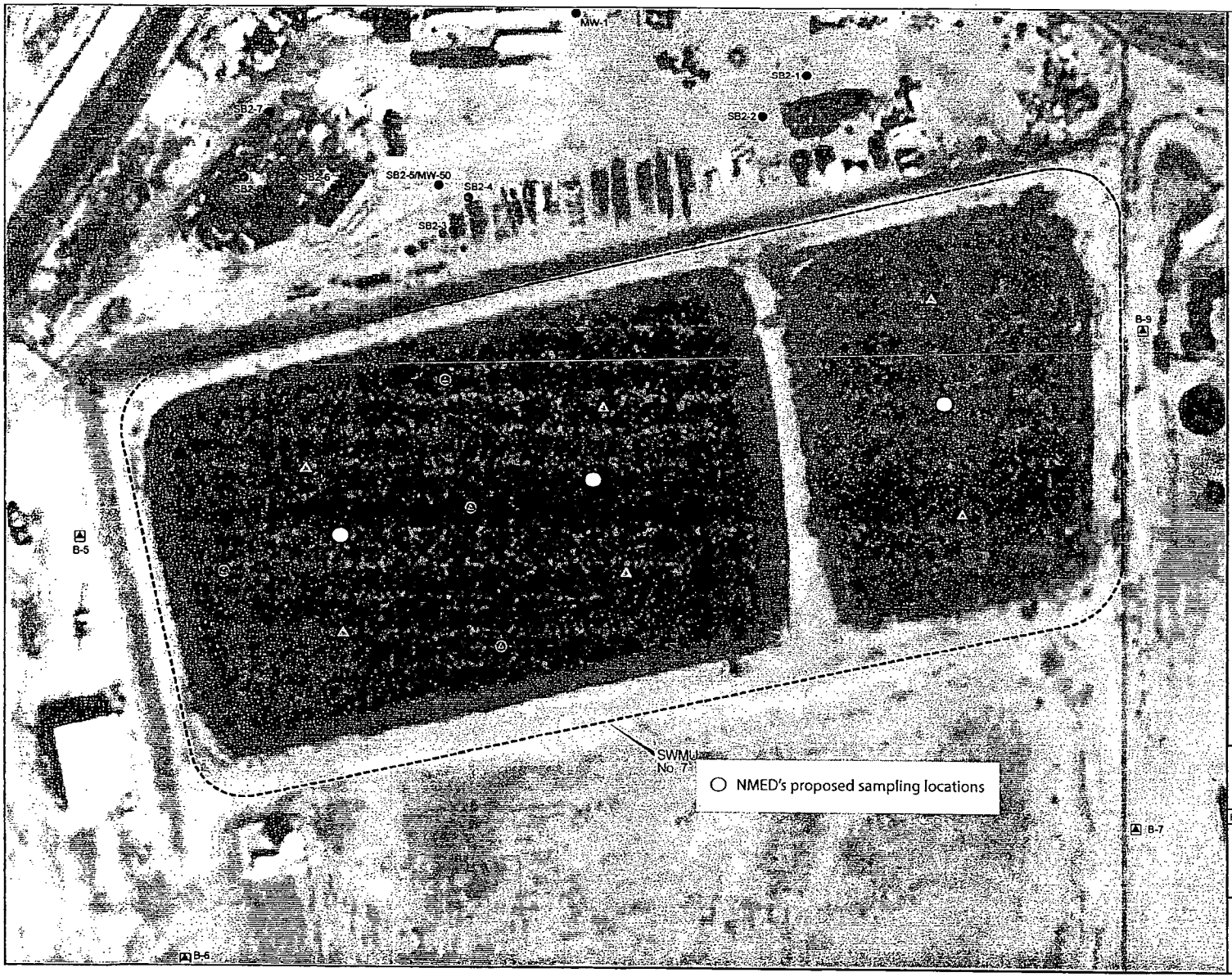
Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 11/18/08 | FILE: WestRef-B12

FIGURE 2
SWMU GROUP No. 4
SWMU LOCATIONS
BLOOMFIELD REFINERY

RPS JDC
404 Camp Craft Road
Austin, Texas 78746



Aerial Map Source: Google Maps, 2008 DigitalGlobe.

N

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SCALE IN FEET

LEGEND

SB2-1 ● 2008 RFI SAMPLE LOCATION

1996 SURFACE SOIL SAMPLE LOCATION

B-5 1994 RFI SOIL BORING LOCATION

PROPOSED SEDIMENT SAMPLE LOCATION

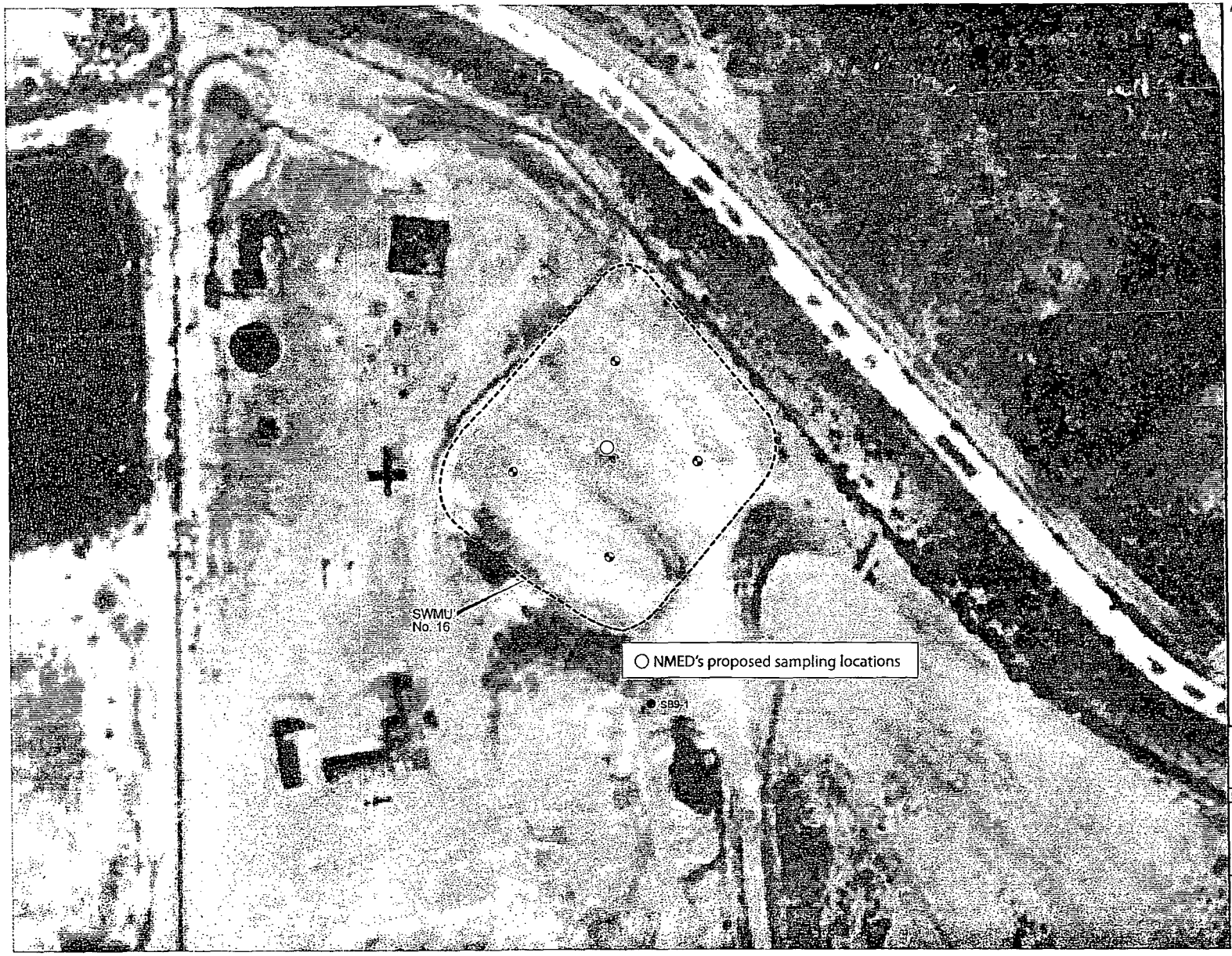
Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 11/18/08 | FILE: WestRef-313

FIGURE 8
SWMU No. 7
SAMPLE LOCATIONS MAP
BLOOMFIELD REFINERY

404 Camp Craft Road
Austin, Texas 78746
RPS JDC



Aerial Map Source: Google Maps, 2008 DigitalGlobe.

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SCALE IN FEET

LEGEND

SB9-1 ● 2008 RFI SAMPLE LOCATION

PROPOSED SOIL BORING LOCATION

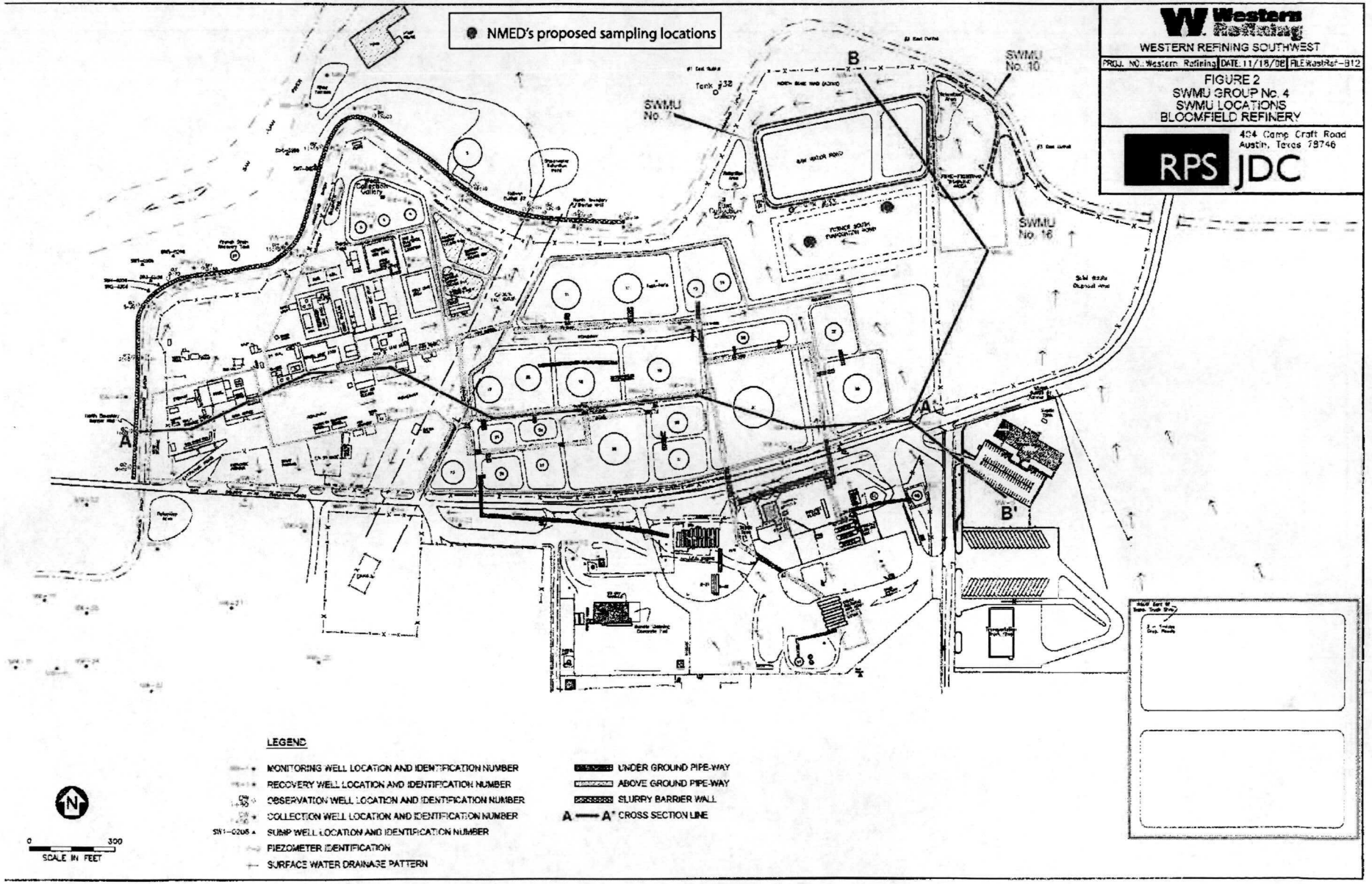
Western Refining

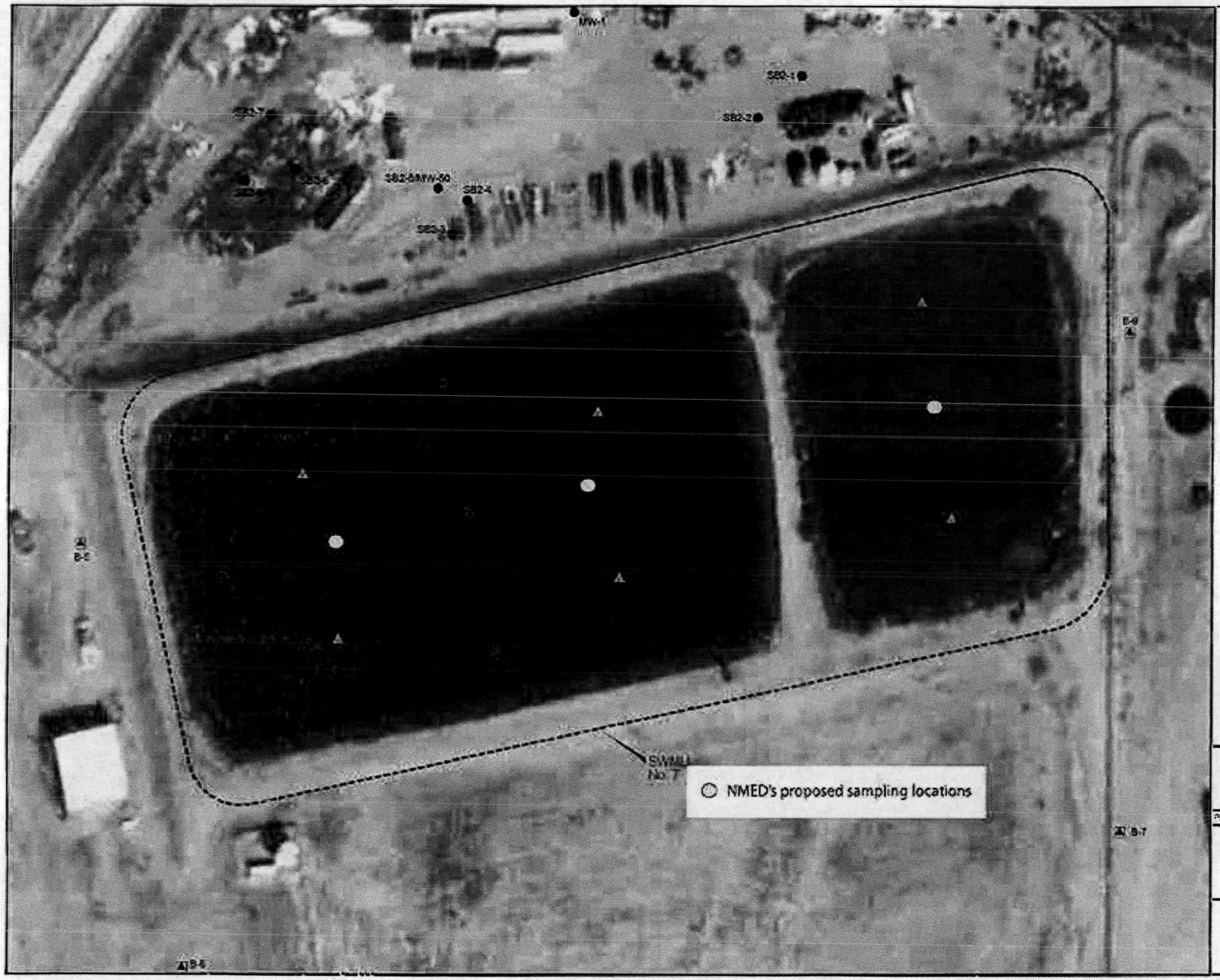
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 11/13/08 | FILE: WestRef-315

FIGURE 10
SWMU No. 16
SAMPLE LOCATIONS MAP
BLOOMFIELD REFINERY

404 Camp Craft Road
Austin, Texas 78746
RPS JDC


NMED's proposed sampling locations
SWMU No. 7
SWMU No. 10
SWMU No. 16
Tank 32
A
A'
B
B'
LEGEND
MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
RECOVERY WELL LOCATION AND IDENTIFICATION NUMBER
OBSERVATION WELL LOCATION AND IDENTIFICATION NUMBER
COLLECTION WELL LOCATION AND IDENTIFICATION NUMBER
SUMP WELL LOCATION AND IDENTIFICATION NUMBER
PIEZOMETER IDENTIFICATION
SURFACE WATER DRAINAGE PATTERN
UNDER GROUND PIPE-WAY
ABOVE GROUND PIPE-WAY
SLURRY BARRIER WALL
A — A' CROSS SECTION LINE
0
300
SCALE IN FEET
Western Refining
WESTERN REFINING SOUTHWEST
PROJ. NO.: Western Refining
DATE: 11/18/08
FILE: WestRef-B12
FIGURE 2
SWMU GROUP No. 4
SWMU LOCATIONS
BLOOMFIELD REFINERY
RPS JDC
404 Camp Craft Road
Austin, Texas 78746



Aerial Map Source: Google Maps, 2006 DigitalGlobe.

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LEGEND

SB2-1 ● 2008 RFI SAMPLE LOCATION
1998 SURFACE SOIL SAMPLE LOCATION
B-5 ▲ 1994 RFI SOIL BORING LOCATION
PROPOSED SEDIMENT SAMPLE LOCATION

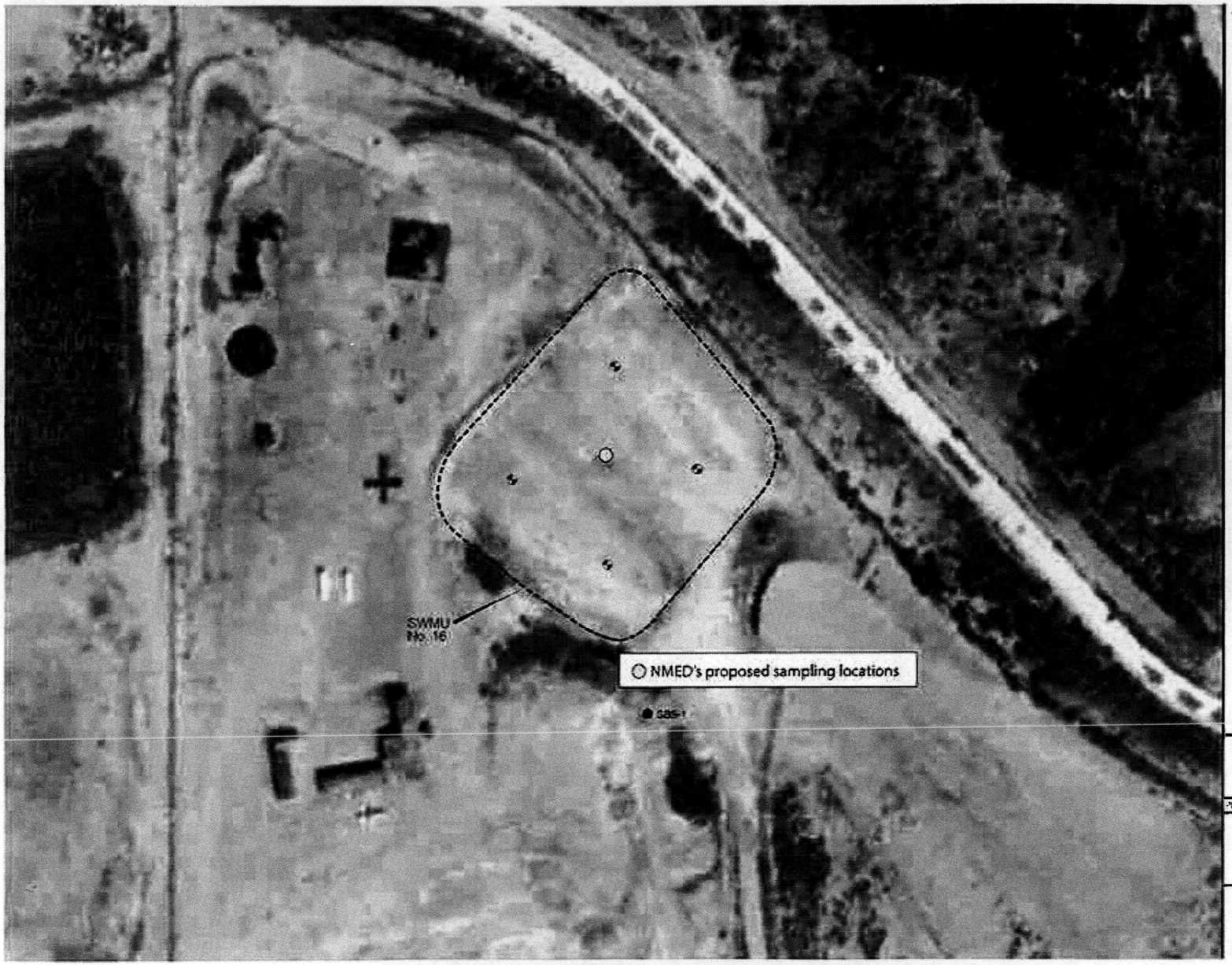
Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 11/13/08 | FILE: WestRef-B13

FIGURE 8
SWMU No. 7
SAMPLE LOCATIONS MAP
BLOOMFIELD REFINERY

RPS JDC
404 Camp Craft Road
Austin, Texas 78746



Aerial Map Source: Google Maps, 2008 DigitalGlobe.

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SCALE IN FEET

LEGEND

SB9-1 ● 2008 RFI SAMPLE LOCATION

PROPOSED SOIL BORING LOCATION

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 11/18/08 | FILE: WestRef-S15

FIGURE 10
SWMU No. 16
SAMPLE LOCATIONS MAP
BLOOMFIELD REFINERY

RPS JDC

404 Camp Craft Road
Austin, Texas 78746

RPS JDC

404 Camp Craft Rd., Austin, TX 78746
Tel: (512) 347 7588 Fax: (512) 347 8243
Internet: www.rpsgroup.com/energy

INVESTIGATION WORK PLAN

Group 4 (SWMU No. 7 Raw Water Ponds, SWMU No. 10 Fire Training Area and SWMU No. 16 Active Landfill)

Bloomfield Refinery
Western Refining Southwest, Inc.
#50 Rd 4990
Bloomfield, New Mexico 87413

December 2008

James R. Schmaltz
Environmental Manager
Western Refining Southwest, Inc.
Bloomfield Refinery

Scott T. Crouch, P.G.
Senior Consultant

RPS JDC, Inc.
404 Camp Craft Rd.
Austin, Texas 78746

Western Refining

BLOOMFIELD REFINERY

WNR LISTED NYSE

RECEIVED

2008 DEC 29 PM 12 49

Fed Ex Tracking # 7006 0810 0003 7020 7360

December 24, 2008

James Bearzi, Bureau Chief
New Mexico Environmental Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Re: Giant Refining Company, Bloomfield Refinery (currently known as Western Refining Southwest, Inc. – Bloomfield Refinery) Order No. HWB 07-34 (CO) Solid Waste Management Unit (SWMU) Group No. 4 Investigation Work Plan

Dear Mr. Bearzi:

Western Refining Southwest, Inc. - Bloomfield Refinery submits the referenced Investigation Work Plan pursuant to Section IV.B.4 of the July 2007 HWB Order. The Investigation Work Plan covers SWMU Group No. 4, which includes SWMU No. 7 Raw Water Ponds; SWMU No. 10 Fire Training Area; and SWMU No. 16 Active Landfill. The Investigation Work Plan was developed and formatted to meet the requirements of Section X.B of the July 2007 HWB Order.

If you have any questions or would like to discuss the Investigation Work Plan, please contact me at (505) 632-4171.

Sincerely,

James R. Schmaltz
Environmental Manager
Western Refining Southwest, Inc.
Bloomfield Refinery

cc: Hope Monzeglio – NMED HWB
Wayne Price – NMOCD (w/attachment)
Dave Cobrain – NMED HWB
Laurie King – EPA Region 6 (w/attachment)
Todd Doyle – Bloomfield Refinery
Allen Hains – Western Refining El Paso

RPS JDC

Table of Contents

List of Sections

RPS JDC

Table of Contents (continued)

List of Tables

List of Figures

List of Appendices

RPS JDC

Executive Summary

The Bloomfield Refinery, which is located in the Four Corners Area of New Mexico, has been in operation since the late 1950s. Past inspections by State and federal environmental inspectors have identified locations where releases to the environment may have occurred. These locations are generally referred to as Solid Waste Management Units (SWMUs) or Areas of Concern (AOCs).

Pursuant to the terms and conditions of an Order issued on July 27, 2007 by the New Mexico Environment Department (NMED) to San Juan Refining Company and Giant Industries Arizona, Inc. for the Bloomfield Refinery, this Investigation Work Plan has been prepared for the SWMUs designated as Group 4. A Class I permit modification was approved on June 10, 2008 to reflect the change in ownership of the refinery to Western Refining Southwest, Inc. The operator is now Western Refining Southwest, Inc. – Bloomfield Refinery

The planned investigation activities include collection of soil, sediment, and groundwater samples, which will be analyzed for potential site-related constituents. The specific sampling locations, sample collection procedures, and analytical methods are included. These activities are based, in part, on the results of previous site investigation activities.

SWMU Group 4 includes SWMU No. 7 Raw Water Ponds, SWMU No. 10 Fire Training Area, and SWMU No. 16 Active Landfill. The Order requires that San Juan Refining Company and Giant Industries Arizona, Inc. ("Western") determine and evaluate the presence, nature, and extent of historical releases of contaminants at the aforementioned SWMUs.

RPS JDC

Section 1
Introduction

The Bloomfield Refinery is located immediately south of Bloomfield, New Mexico in San Juan County (Figure 1). The physical address is #50 Road 4990, Bloomfield, New Mexico 87413. The Bloomfield Refinery is located on approximately 263 acres. Bordering the facility is a combination of federal and private properties. Public property managed by the Bureau of Land Management lies to the south. The majority of undeveloped land in the vicinity of the facility is used extensively for oil and gas production and, in some instances, grazing. U.S. Highway 44 is located approximately one-half mile west of the facility. The topography of the main portion of the site is generally flat with steep bluffs to the north where the San Juan River intersects Tertiary terrace deposits.

The Bloomfield Refinery is a crude oil refinery currently owned by Western Refining Southwest, Inc., which is a wholly owned subsidiary of Western Refining Company, and it is operated by Western Refining Southwest, Inc. – Bloomfield Refinery. The Bloomfield Refinery has an approximate refining capacity of 18,000 barrels per day. Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, sulfur recovery, merox treater, catalytic polymerization, and diesel hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, naphtha, residual fuel, fuel oils, and LPG.

On July 27, 2007, the New Mexico Environment Department (NMED) issued an Order to San Juan Refining Company and Giant Industries Arizona, Inc. ("Western") requiring investigation and corrective action at the Bloomfield Refinery. This Investigation Work Plan has been prepared for the Solid Waste Management Units (SWMUs) designated as Group 4 in the Order. This includes:

- SWMU No. 7 Raw Water Ponds;
- SWMU No. 10 Fire Training Area; and
- SWMU No. 16 Active Landfill.

The location of the individual SWMUs is shown on Figure 2 and all of these SWMUs are located on the northeastern portion of the refinery property. Photographs of the three SWMUs are included in Appendix A.

RPS JDC

The purpose of the site investigation is to determine and evaluate the presence, nature, and extent of releases of contaminants in accordance with 20.4.1.500 New Mexico Administrative Code (NMAC) incorporating 40 Code of Federal Regulations (CFR) Section 264.101. The investigation activities will be conducted in accordance with Section IV of the Order.

RPS JDC

Section 2
Background

This section presents background information for each of the SWMUs, including a review of historical waste management activities for each location to identity the following:

- type and characteristics of all waste and all contaminants handled in the subject SWMU;
- known and possible sources of contamination;
- history of releases; and
- known extent of contamination.

2.1 SWMU No. 7 Raw Water Ponds

The first recorded site operations in this area were the evaporation ponds. There were two ponds of approximately 2.5 acres each. The northern pond is now the Raw Water Ponds and the southern pond was located immediately to the south (Figure 2). The ponds were lined with four to six inches of bentonite with earthen dikes. Process wastewater flowed from the current north aeration lagoon into the northern evaporation pond and then into the southern evaporation pond. The water evaporated or some was pumped to the Spray Irrigation Area. After a Class I injection well was permitted, the evaporation ponds were decommissioned in 1994.

Following Closure Plan activities for the evaporation ponds as approved by the New Mexico Oil Conservation Division (OCD) in May 1996, two Raw Water Ponds were constructed within the former northern evaporation pond. The Raw Water Ponds are currently used as temporary storage for the refinery's fresh water supply. Surface water is pumped from the San Juan River to the ponds, where any entrained sediment is allowed to settle before the water is pumped to the refinery's on-site water treatment plant and subsequently stored in Tank #2, which is a 2,814,000 gallon steel above ground storage tank. These operations are not associated with any waste management activities.

In addition to storage of water pumped from the San Juan River, water that collects in the #1 East Outfall is pumped to the Raw Water Ponds. On July 31, 2003 Western (Giant Industries at the time of the discovery) noted hydrocarbon at the #1 East Outfall. Initially, Western initiated an Emergency Action Plan that included construction of two earthen containment dikes configured in series. Water that collected in this area was transported via vacuum trucks to the refinery's wastewater treatment system. On October 15, 2003, Western notified the OCD of their plans to

install an oil-water separator (Tank #33) to which the fluids would flow through before being diverted to the Raw Water Ponds. Routine sampling of the discharge from Tank #33 to the Raw Water Ponds was initiated and the sample results starting in February of 2005 are included in Table 1. While there have been some periodic increases in concentrations of constituents discharged from Outfall #1, the concentrations have been very low during most of the time period in which water has been discharged to the Raw Water Ponds.

An additional source of water that is diverted to the Raw Water Ponds comes from remediation activities at the river terrace area. Effluent from the dewatering operations at the river terrace area is first treated via carbon adsorption units and then discharged to the Raw Water Ponds. The effluent is routinely sampled before it is discharged and the analytical results indicate that no environmental impacts have occurred to the Raw Water Ponds from the river terrace operations. The analytical results from the effluent testing, which are all non-detect, are included in Table 1.

There have been numerous past sampling events in the area of the Raw Water Ponds. Groundwater has been routinely monitored immediately down-gradient of the ponds at MW-1 since the well was installed in 1984 pursuant to the facility Discharge Permit (GW-1). The historical groundwater results at MW-1 have not indicated any concentrations of chemicals above applicable standards (Table 1). As part of the on-going investigation of the refinery being conducted under the 2007 NMED Order, additional groundwater samples were recently collected immediately down-gradient of the ponds in the area of SWMU No. 2 Drum Storage Area North Bone Yard. Two permanent monitoring wells and seven temporary monitoring wells were installed in October 2008, located immediately down-gradient of the Raw Water Ponds. Groundwater samples were collected from these new locations in October 2008 and analyzed for potential site-related constituents. These recent samples confirm the earlier results of MW-1, that there are no impacts to groundwater from the Raw Water Ponds that exceed applicable standards, with the exception of a few metals. It is common to detect low concentrations of total metals in samples collected from temporary or new wells, where turbidity readings are high and sediment has been entrained in the water samples. The sample locations are shown on Figure 8 and the analytical results are provided in Table 1.

Soil samples were first collected in the area of the ponds during the 1993 RCRA Facility Investigation. Two soil borings (B-5 and B-6) were located immediately west of the evaporation ponds and two soil borings (B-7 and B-9) were located immediately east of the evaporation ponds,

which also places them in SWMU No. 10 Fire Training Area. Soil samples were collected from each of these soil borings and analyzed for volatile and semi-volatile organics, total petroleum hydrocarbons, and metals. All of the organic analyses were non-detect and the metals concentrations were generally low and may be reflective of naturally occurring concentrations of metals in soils. The locations of the soil borings are shown on Figure 8 and the analytical results are provided in Table 2. Copies of the soil boring logs are presented in Appendix B.

After the evaporation ponds were decommissioned 1994, a closure plan entitled, Closure Plan for the Unlined Evaporation Lagoons and the Spray Evaporation Area, was completed on August 13, 1996. A copy of the closure plan is included in Appendix C. The results of analytical testing on soil samples collected from beneath the evaporation ponds are discussed on pages 2 and 3 of the closure plan and are summarized in a table in Attachment C to the closure plan. All organic analyses were non-detect and the metal results do not indicate any impact to soils beneath the ponds. Chloride and sulfate concentrations were elevated in the 0-1' sample but reduced significantly in the sample collected at 3-5 feet below ground surface. A map showing sample locations is included in Attachment B of the closure plan. On page 3 of the closure plan, Giant proposed to use the closed evaporation ponds as raw water ponds. As discussed above, a monitoring well (MW-1) is located down-gradient of ponds and analyses of groundwater samples collected at this well have not detected any environmental impacts from the ponds.

The New Mexico Oil Conservation Division (OCD) approved the Closure Plan for the Unlined Evaporation Lagoons and the Spray Evaporation Area on August 28, 1996 with the requirement to continue monitoring groundwater at MW-1 and MW-5. A copy of the August 28, 1996 OCD letter is included in Appendix C.

2.2 SWMU No. 10 Fire Training Area

The Fire Training Area, which has been identified as SWMU No. 10, is located immediately east of the Raw Water Ponds (Figure 2). It covers a small area approximately 160 wide by 250 long, with a surface drainage ditch along the west side that appears to catch any runoff from the area. The ditch flows into a small depression at the northern end of the Fire Training Area.

This area has been historically used and continues to be used by the on-site fire fighting team for practice and training. There are two small approx. 250-500 gallon above ground storage tanks on the south end of the area that are used to fuel the training fires. One tank contains diesel and

gasoline and the other contains propane. There a number of props arranged in two rows running north-south on both sides of the area where the actual training exercises take place.

This area was previously investigated during the 1993 RCRA Facility Investigation with four soil borings located in this area. Two borings (B-7 and B-9) were placed along the west side in the drainage ditch and the other two borings (B-8 and B-10) were located along the center of the area (Figure 9). One soil sample was collected from each of the borings and analyzed for volatile and semi-volatile organic constituents, total petroleum hydrocarbons, and metals. All of the organic analyses were non-detect and the metals concentrations are reported to be less than the background concentrations developed during the 1993 RCRA Facility Investigation (Groundwater Technology Inc., 1994 and Groundwater Technology Inc., 1995). The analytical results for the soil samples are presented in Table 2.

2.3 SWMU No. 16 Active Landfill

The active landfill is located immediately adjacent to the fire training area, on the east side Figure 2). It occupies an area approximately 120 feet by 150 feet. The landfill is included as an active disposal facility in the refinery's Discharge Plan, which is reviewed and approved by the OCD. The materials disposed of in the landfill include elemental sulfur, which is produced at the sulfur recovery unit, and fines and spent catalyst from the Fluidized Catalytic Cracking (FCC) unit. The FCCU catalyst is a non-hazardous metallic (alumina) solid, which is periodically replaced.

The spent catalyst and elemental sulfur is placed in lifts and covered with clean soil. The lateral extent of the landfill is visibly obvious; however, the thickness of the material placed in the landfill is uncertain but is estimated to be 10 to 15 feet. No historical assessments have been conducted in this area as it is a permitted disposal area. There are no indications of releases from the unit and based on the physical nature of the material placed in the landfill there is little potential for a release.

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Section 3
Site Conditions

The conditions at the site, including surface and subsurface conditions that could affect the fate and transport of any contaminants, are discussed below. This information is based on recent visual observations and historical subsurface investigations.

3.1 Surface Conditions

Regionally, the surface topography slopes toward the floodplain of the San Juan River, which runs along the northern boundary of the refinery complex. To the south of the refinery, the drainage is to the northwest. North of the refinery, surface water flows in a southeasterly direction toward the San Juan River. The active portion of the refinery property, where the process units and storage tanks are located, is generally of low relief with an overall northwest gradient of approximately 0.02 ft/ft. The refinery sits on an alluvial floodplain terrace deposit and there is a steep bluff (approx. drop of 90 feet) at the northern boundary of the refinery where the San Juan River intersects the floodplain terrace, which marks the southern boundary of the floodplain.

There are two locally significant arroyos, one immediately east and another immediately west of the refinery, which collect most of the surface water flows in the area, thus significantly reducing surface water flows across the refinery. A minor drainage feature is located on the eastern portion of the refinery, where the Landfill Pond (SWMU No. 9) is located and there are several steep arroyos along the northern refinery boundary that primarily capture only local surface water flows and minor groundwater discharges.

The refinery complex is bisected by County Rd #4990 (Sulivan Road), which runs east-west. The process units, storage tanks (crude oil and liquid products), and wastewater treatment systems are located north of the county road. The crude oil and product loading racks, LPG storage tanks and loading racks, maintenance buildings/90-day storage area, pipeline offices, transportation truck shop, and the Class I injection well are located south of the county road. There is very little vegetation throughout these areas with most surfaces composed of concrete, asphalt, or gravel. The area between the refinery and the San Juan River does have limited vegetation on slopes that are not too steep to support vegetation.

3.2 Subsurface Conditions

Numerous soil borings and monitoring wells have been completed across the refinery property during previous site investigations and installation of the slurry wall, which runs along the northern and western refinery boundary. Based on the available site-specific and regional subsurface information, the site is underlain by the Quaternary Jackson Lake terrace deposits, which unconformably overlie the Tertiary Nacimiento Formation. The Jackson Lake deposits consist of fine grained sand, silt and clay that grades to coarse sand, gravel and cobble size material closer to the contact with the Nacimiento Formation. The Jackson Lake Formation is over 40 feet thick near the southeast portion of the site and generally thins to the northwest toward the San Juan River. The Nacimiento Formation is primarily composed of fine grained materials (e.g., carbonaceous mudstone/claystone with interbedded sandstones) with a reported local thickness of approximately 570 feet (Groundwater Technology Inc., 1994).

Figures 3 and 4 present cross-sections of the shallow subsurface based on borings logs from on-site monitoring well completions. The uppermost aquifer is under water table conditions and occurs within the sand and gravel deposits of the Jackson Lake Formation. The Nacimiento Formation functions as an aquitard at the site and prevents site related contaminants from migrating to deeper aquifers. The potentiometric surface as measured in April 2007 is presented as Figure 5 and shows the groundwater flowing to the northwest, toward the San Juan River.

Previous site investigations have identified and delineated impacts to groundwater from historical site operations. Figure 6 shows the distribution of SPH in the subsurface based on the apparent thickness of SPH measured in monitoring wells. Dissolved-phase impacts are depicted on Figure 7.

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Section 4
Scope of Services

4.1 Anticipated Activities

Pursuant to Section IV of the Order, a scope of services was developed to determine and evaluate the presence, nature, extent, fate, and transport of contaminants. To accomplish this objective, soil, sediment, and groundwater samples will be collected at the SWMU No. 7 Raw Water Ponds, SWMU No. 10 Fire Training Area, and SWMU No. 16 Active Landfill. Soil borings will be installed and samples collected as discussed in Section 5.2. The installation of a monitoring well and collection of groundwater samples is discussed in Section 5.3.

4.2 Background Information Research

Documents containing the results of previous investigations and subsequent routine groundwater monitoring data from monitoring wells were reviewed to facilitate development of this work plan. The previously collected data provides very good information on the overall subsurface conditions, including hydrogeology and contaminant distribution within groundwater on a site-wide basis. The data collected under this scope of services will supplement the existing groundwater information and provide SWMU-specific information regarding contaminant occurrence and distribution within soils, sediments and groundwater.

4.3 Collection and Management of Investigation Derived Waste

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with soil borings will be contained and characterized using methods based on the boring location, boring depth, drilling method, and type of contaminants suspected or encountered. All purged groundwater and decontamination water will be characterized prior to disposal unless it is disposed in the refinery wastewater treatment system upstream of the API Separator. An IDW management plan is included as Appendix D.

4.4 Surveys

The horizontal coordinates and elevation of each surface sampling location; the surface coordinates and elevation of each boring or test pit, the top of each monitoring well casing, and the ground surface at each monitoring well location, and the locations of all other pertinent structures will be determined by a registered New Mexico professional land surveyor in accordance with the State Plane Coordinate System (NMSA 1978 47-1-49-56 (Repl. Pamp. 1993)). Alternate survey methods may be proposed by the Respondents in site-specific work

plans. Any proposed survey method must be approved by the Department prior to implementation. The surveys will be conducted in accordance with Sections 500.1 through 500.12 of the Regulations and Rules of the Board of Registration for Professional Engineers and Surveyors Minimum Standards for Surveying in New Mexico. Horizontal positions will be measured to the nearest 0.1-ft and vertical elevations will be measured to the nearest 0.01-ft.

To locate the sediment samples that will be collected in the Raw Water Ponds, the four outer corners of the Raw Water Ponds will be surveyed as described above. The sediment samples will be collected as close as possible to the centers of the four quadrants of the western pond and the centers of the north and south halves of the eastern pond. No survey of the actual sediment sample collection point will be made, as the sediment samples will be collected below the water surface inside the ponds.

RPS JDC

Section 5
Investigation Methods

The purpose of the site investigation is to determine and evaluate the presence, nature, and extent of releases of contaminants. Guidance on selecting and developing sampling plans as provided in *Guidance for Choosing a Sampling Design for Environmental Data Collection* (EPA, 2000) was utilized to select the appropriate sampling strategy for each of the SWMUs.

5.1 Drilling Activities

Soil and monitoring well borings will be drilled using either hollow-stem auger or if necessary, air rotary methods including ODEX. Monitoring well construction/completions will be conducted in accordance with the requirements of Section IX of the Order. The preferred method will be hollow-stem auger to increase the ability to recover undisturbed samples and potential contaminants. The drilling equipment will be properly decontaminated before drilling each boring.

The NMED will be notified as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the specified depths or at planned sampling locations. Appropriate actions (e.g., installation of protective surface casing or relocation of borings to a less threatening location) will be taken to minimize any negative impacts from investigative borings. If contamination is detected at the water table, then the boring will be drilled five feet below the water table or to refusal. Soil borings to be completed as permanent monitoring wells will be drilled to the top of bedrock (Nacimiento Formation) and the anticipated completion depth ranges from 20 to 30 feet. Soil samples will be collected continuously and logged by a qualified geologist or engineer. Slotted (0.01 inch) PVC well screen will be placed at the bottom of the well and will extend for 10 to 15 feet to ensure that the well is screened across the water table and to the extent possible the entire saturated zone is open to the well, with approximately five feet of screen above the water table. A 10/20 sand filter pack will be installed to two feet over the top of the well screen.

The drilling and sampling will be accomplished under the direction of a qualified engineer or geologist who will maintain a detailed log of the materials and conditions encountered in each boring. Both sample information and visual observations of the cuttings and core samples will be recorded on the boring log. Known site features and/or site survey grid markers will be used as references to locate each boring prior to surveying the location as described in Section 4.4. The

boring locations will be measured to the nearest foot, and locations will be recorded on a scaled site map upon completion of each boring.

5.2 Soil Sampling

At SWMU No. 7 Raw Water Ponds, the first recorded site operations in this area were the evaporation ponds. There were two ponds of approximately 2.5 acres each. The northern evaporation pond is now the location of the Raw Water Ponds (Figure 8). As discussed in Section 2.1, soil sampling was conducted around the ponds during the 1993 RCRA Facility Investigation. After a Class I injection well was permitted, the evaporation ponds were decommissioned in 1994. Additional soil samples were collected from beneath the ponds in 1996 to support closure of the ponds. The OCD approved the Closure Plan for the Unlined Evaporation Lagoons and the Spray Evaporation Area on August 28, 1996 with the requirement to continue monitoring groundwater at MW-1 and MW-5.

Since soils have already been investigated around and beneath the ponds and there is no evidence of groundwater impacts (see Section 5.3.2), the current assessment activities are focused on sediments within the ponds. The western Raw Water Pond will be divided into four quadrants as shown on Figure 8 and sediment samples will be collected from the 0 to 6" interval at each of the four locations. Similarly, the smaller eastern pond will be divided into to two roughly equal areas as shown on Figure 8 and sediment samples will be collected from the 0 to 6" interval at each of the two locations.

The Fire Training Area Area (SWMU No. 10) is located immediately east of the Raw Water Ponds (Figure 2). This area has been historically used and continues to be used by the on-site fire fighting team for practice and training. This area was previously investigated during the 1993 RCRA Facility Investigation with four soil borings located in this area (see Section 2.2). All of the organic analyses were non-detect and the metals concentrations are reported to be less than the background concentrations developed during the 1993 RCRA Facility Investigation (Groundwater Technology Inc., 1995). Because these samples were collected approximately 14 years ago, new samples are recommended to establish current conditions.

As there are individual props located within the area where liquid fuel (e.g., diesel and gasoline) is used and there is the potential for constituents to be released to soils at known locations, a judgmental sampling design is appropriate. Four soil borings are proposed near these locations

as shown on Figure 9. In addition, two soil borings will be located within the drainage ditch, which runs along the western side of the area and collects surface water runoff from the area. One of the borings will be located in the small pit on the north end of the ditch.

The Active Landfill (SWMU No. 16) is located immediately adjacent to the Fire Training Area, on the east side. It occupies an area approximately 120 feet by 150 feet. The materials disposed of in the landfill include fines and spent catalyst from the FCC unit and elemental sulfur. The waste materials are spread relatively evenly across the landfill area by heavy machinery and thus there are no readily identifiable "hot spots" or obvious concentrations of waste. An evaluation of the possible use of a simple random or stratified sampling design indicates an unreasonably large sample size for such a small area in order to meet common statistical performance criteria (e.g., significance level = 5% & power = 95%). A more appropriate sampling design to locate any areas of contamination within the area of the landfill is a systematic or grid sampling design. The landfill area of interest was divided into quadrants, with one soil boring located near the center of each quadrant (Figure 10). Each boring will represent an area of approximately 4,500 square feet or one tenth of an acre. This is very conservative for a commercial/industrial facility and is less than the half-acre exposure area commonly used for residential properties (EPA, 1991 and EPA, 1996).

The soil borings at the Fire Training Area and Active Landfill will be drilled to a minimum depth of ten feet, or five feet below the deepest detected contamination or waste material, whichever is deeper. A decontaminated split-barrel sampler or continuous five-foot core barrel will be used to obtain samples during the drilling of each boring. Surface samples may be collected using decontaminated, hand-held stainless steel sampling device, shelby tube, or thin-wall sampler, or a pre-cleaned disposable sampling device. A portion of the sample will be placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. The use of an Encore® Sampler or other similar device will be used during collection of soil samples for VOC analysis. The remaining portions of the sample will be used for logging and field screening as discussed in Section 5.2.1. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 5.4.

Discrete soil samples will be collected for laboratory analyses at the following intervals:

- 0-6" (all borings);
- 18-24" (all borings);

- from the 6" interval at the top of saturation;
- the sample from each boring with the greatest apparent degree of contamination, based on field observations and field screening; and
- any additional intervals as determined based on field screening results.

Quality Assurance/Quality Control (QA/QC) samples will be collected to monitor the validity of the soil sample collection procedures as follows:

- field duplicates will be collected at a rate of 10 percent;
- equipment blanks will be collected from all sampling apparatus at a frequency of 10 percent or one per day if disposable sampling equipment is used; and
- field blanks will be collected at a frequency of one per day.

5.2.1 Soil Sample Field Screening and Logging

Samples obtained from the borings will be screened in the field on 2.5 foot intervals for evidence of contaminants. Field screening results will be recorded on the exploratory boring and excavation logs. Field screening results will be used to aid in the selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. Additional screening for site- or release-specific characteristics such as pH or for specific compounds using field test kits may be conducted where appropriate.

Visual screening includes examination of soil samples for evidence of staining caused by petroleum-related compounds or other substances that may cause staining of natural soils such as elemental sulfur or cyanide compounds. Headspace vapor screening targets volatile organic compounds and involves placing a soil sample in a plastic sample bag or a foil sealed container allowing space for ambient air. The container will be sealed and then shaken gently to expose the soil to the air trapped in the container. The sealed container will be allowed to rest for a minimum of 5 minutes while vapors equilibrate. Vapors present within the sample bag's headspace will then be measured by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature will be recorded on the field boring or test pit log for each sample.

The monitoring instruments will be calibrated each day to the manufacturer's standard for instrument operation. A photo-ionization detector (PID) equipped with a 10.6 or higher electron volt (eV) lamp or a combustible gas indicator will be used for VOC field screening. Field

screening results may be site- and boring-specific and the results may vary with instrument type, the media screened, weather conditions, moisture content, soil type, and type of contaminant, therefore, all conditions capable of influencing the results of field screening will be recorded on the field logs.

The physical characteristics of the samples (such as mineralogy, ASTM soil classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations will be recorded in the field log by a qualified geologist or engineer. Detailed logs of each boring will be completed in the field by a qualified engineer or geologist. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling, will be recorded on the logs.

5.3 Groundwater Water Monitoring

5.3.1 Groundwater Levels

Groundwater level and SPH thickness measurements will be obtained at each new monitoring well prior to purging in preparation for a sampling event. Measurement data and the date and time of each measurement will be recorded on a site monitoring data sheet. The depth to groundwater and SPH thickness levels will be measured to the nearest 0.01 ft. The depth to groundwater and SPH thickness will be recorded relative to the surveyed well casing rim or other surveyed datum. A corrected water table elevation will be provided in wells containing SPH by adding 0.8 times the measured SPH thickness to the measured water table elevation. During regularly scheduled groundwater monitoring events, groundwater and SPH levels will be measured in all wells within 48 hours of the start of obtaining water level measurements. All automated and manual extraction of SPH and water from recovery wells, observation wells, and collection wells, which is close enough to affect measurements at the new wells, will be discontinued for 48 hours prior to the measurement of water and product levels.

Groundwater level and SPH thickness measurements will also be obtained at each new monitoring well during the next regularly scheduled facility-wide groundwater sampling event to facilitate preparation of a facility-wide potentiometric surface map.

5.3.2 Groundwater Sampling

Near the Raw Water Ponds (SWMU No. 7), groundwater has been routinely monitored immediately down-gradient of the ponds at MW-1 since the well was installed in 1984 to determine if there are impacts from the ponds. Additionally, groundwater sampling was completed in October 2008 at nine new locations down-gradient of the ponds and the results do not indicate any impacts from the ponds. No additional sampling of groundwater is proposed under this Work Plan for the investigation of the Raw Water Ponds.

One new permanent monitoring well will be completed at the location shown on Figure 9. The location was chosen to evaluate groundwater quality immediately down-gradient of potential source areas in the Fire Training Area (SWMU No. 10) and it should also provide information on water quality down-gradient of the Active Landfill (SWMU No. 16). In addition, if any soil borings located within the Fire Training Area or Active Landfill encounter groundwater, then a groundwater sample will be collected for analysis prior to plugging the boring.

New permanent monitoring wells will be developed once all new wells have been completed and it may take several days to complete well development. Groundwater samples will initially be obtained from newly constructed monitoring wells no later than five days after the completion of well development. A second round of groundwater monitoring and sampling will be conducted no sooner than 30 days and not later than 75 days of the initial sampling event. Subsequent sampling events will be dependent upon the analytical results of the first two sampling events and as specified by the NMED. All monitoring wells scheduled for sampling during a groundwater sampling event will be sampled within 15 days of the start of the monitoring and sampling event.

5.3.3 Well Purging

All zones in each monitoring well will be purged by removing groundwater with a dedicated bailer or disposable bailer prior to sampling in order to ensure that formation water is being sampled. Purge volumes (a minimum of three well volumes including filter pack) will be determined by monitoring, at a minimum, groundwater pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature after every two gallons or each well volume, whichever is less, has been purged from the well. Purging will continue, as needed, until the specific conductance, pH, and temperature readings are within 10 percent between readings for three consecutive measurements. Field water quality parameters will also be compared to

historical data provided in Table 3 to ensure that the measurements are indicative of formation water. The volume of groundwater purged, the instruments used, and the readings obtained at each interval will be recorded on the field-monitoring log. Well purging may also be conducted in accordance with the NMED's Position Paper *Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring* (October 30, 2001, as updated).

5.3.4 Groundwater Sample Collection

Groundwater samples will be collected within 24 hours of the completion of well purging using dedicated bailers or disposal bailers. Alternatively, well sampling may also be conducted in accordance with the NMED's Position Paper *Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring* (October 30, 2001, as updated). Sample collection methods will be documented in the field monitoring reports. The samples will be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 5.4.

Groundwater samples intended for metals analysis will be submitted to the laboratory as total metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as follows:

- Field duplicate water samples will be obtained at a frequency of ten percent, with a minimum, of one duplicate sample per sampling event;
- Field blanks will be obtained at a minimum frequency of one per day. Field blanks will be generated by filling sample containers in the field with deionized water and submitting the samples, along with the groundwater samples, to the analytical laboratory for the appropriate analyses.
- Equipment rinsate blanks will be obtained for chemical analysis at the rate of ten percent or a minimum of one rinsate blank per sampling day. Equipment rinsate blanks will be collected at a rate of one per sampling day if disposable sampling equipment is used. Rinsate samples will be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample will be placed in the appropriate sample container and submitted with the groundwater samples to the analytical laboratory for the appropriate analyses.
- Trip blanks will accompany laboratory sample bottles and shipping and storage containers intended for VOC analyses. Trip blanks will consist of a sample of analyte-free deionized water prepared by the laboratory and placed in an

appropriate sample container. The trip blank will be prepared by the analytical laboratory prior to the sampling event and will be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks will be analyzed at a frequency of one for each shipping container of samples to be analyzed for VOCs.

5.4 Sample Handling

At a minimum, the following procedures will be used at all times when collecting samples during investigation, corrective action, and monitoring activities:

1. Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample;

2. All samples collected of each medium for chemical analysis will be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in Encore® samplers. Sample container volumes and preservation methods will be in accordance with the most recent standard EPA and industry accepted practices for use by accredited analytical laboratories. Sufficient sample volume will be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis; and

3. Sample labels and documentation will be completed for each sample following procedures discussed below. Immediately after the samples are collected, they will be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures, as described below, will be followed for all samples collected. All samples will be submitted to the laboratory soon enough to allow the laboratory to conduct the analyses within the method holding times. At a minimum, all samples will be submitted to the laboratory within 48 hours after their collection.

Chain-of-custody and shipment procedures will include the following:

1. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site.

2. Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA or industry-wide accepted method. The drainage hole at the bottom of the cooler will be sealed and secured in case of sample container leakage. Temperature blanks will be included with each shipping container.

3. Each cooler or other container will be delivered directly to the analytical laboratory.

4. Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.

5. Plastic containers will be protected from possible puncture during shipping using cushioning material.

6. The chain-of-custody form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.

7. Chain-of-custody seals will be used to seal the sample-shipping container in conformance with EPA protocol.

8. Signed and dated chain-of-custody seals will be applied to each cooler prior to transport of samples from the site.

9. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form will be signed as received by the laboratory, and the conditions of the samples will be recorded on the form. The original chain-of-custody form will remain with the laboratory and copies will be returned to the relinquishing party.

10. Copies of all chain-of-custody forms generated as part of sampling activities will be maintained on-site.

5.5 Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination. A designated decontamination area will be established for decontamination of drilling equipment, reusable sampling equipment and well materials. The drilling rig will be decontaminated prior to entering the site or unit. Drilling equipment or other exploration equipment that may come in contact with the borehole will be decontaminated by high pressure washing prior to drilling each new boring.

Sampling or measurement equipment, including but not limited to, stainless steel sampling tools, split-barrel or core samplers, non-dedicated well developing or purging equipment, groundwater quality measurement instruments, and water level measurement instruments, will be decontaminated in accordance with the following procedures or other methods approved by the Department before each sampling attempt or measurement:

1. Brush equipment with a wire or other suitable brush, if necessary or practicable, to remove large particulate matter;

2. Rinse with potable tap water;

3. Wash with nonphosphate detergent or other detergent approved by the Department (examples include Fantastik™, Liqui-Nox®);

4. Rinse with potable tap water; and

5. Double rinse with deionized water.

All decontamination solutions will be collected and stored temporarily as described in Section 4.3. Decontamination procedures and the cleaning agents used will be documented in the daily field log.

5.6 Field Equipment Calibration Procedures

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks will be conducted daily, or at other intervals approved by the Department, and the instruments will be recalibrated, if necessary. Calibration measurements will be recorded in the daily field logs. If field equipment becomes inoperable, its use will be discontinued until the necessary repairs are made. In the interim, a properly calibrated replacement instrument will be used.

5.7 Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded in a field log book. The original field forms will be maintained at the Facility. Copies of the completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink will be used to record all field activities. Photographic documentation of field activities will be performed, as appropriate. The daily record of field activities will include the following:

1. Site or unit designation;
2. Date;
3. Time of arrival and departure;
4. Field investigation team members including subcontractors and visitors;
5. Weather conditions;
6. Daily activities and times conducted;
7. Observations;
8. Record of samples collected with sample designations and locations specified;
9. Photographic log, as appropriate;
10. Field monitoring data, including health and safety monitoring;
11. Equipment used and calibration records, if appropriate;
12. List of additional data sheets and maps completed;
13. An inventory of the waste generated and the method of storage or disposal; and
14. Signature of personnel completing the field record.

5.8 Chemical Analyses

All samples collected for laboratory analysis will be submitted to an accredited laboratory. The laboratory will use the most recent standard EPA and industry-accepted analytical methods for target analytes as the testing methods for each medium sampled. Chemical analyses will be

performed in accordance with the most recent EPA standard analytical methodologies and extraction methods.

Groundwater and soil samples will be analyzed by the following methods:

- SW-846 Method 8260 volatile organic compounds;
- SW-846 Method 8270 semi-volatile organic compounds; and
- SW-846 Method 8015B gasoline range (C5-C10), diesel range (>C10-C28), and motor oil range (>C28-C36) organics.

Groundwater and soil samples will also be analyzed for the following metals using the indicated analytical methods.

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

In addition, groundwater samples will also be analyzed for the following general chemistry parameters.

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SM-2320B
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	EPA method 6010/6020
Magnesium	EPA method 6010/6020
Sodium	EPA method 6010/6020
Potassium	EPA method 6010/6020
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500Fe2+

As discussed in section 5.3.3, field measurements will be obtained for pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature.

5.9 Data Quality Objectives

The Data Quality Objectives (DQOs) were developed to ensure that newly collected data are of sufficient quality and quantity to address the projects goals, including Quality Assurance/Quality Control (QA/QC) issues (EPA, 2006). The project goals are established in the Order and are to determine and evaluate the presence, nature, and extent of releases of contaminants at specified SWMUs. The type of data required to meet the project goals includes chemical analyses of soil, sediment and groundwater to determine if there has been a release of contaminants at the individual SWMUs.

The quantity of data is SWMU specific and is based on the historical operations at individual locations. The quality of data that is required is consistent across locations and is specified in Section VIII.D.7.c of the Order. In general, method detection limits should be 20% or less of the applicable background levels, cleanup standards and screening levels.

Additional DQOs include precision, accuracy, representativeness, completeness, and comparability. Precision is a measurement of the reproducibility of measurements under a given set of circumstances and is commonly stated in terms of standard deviation or coefficient of variation (EPA, 1987). Precision is also specific to sampling activities and analytical performance. Sampling precision will be evaluated through the analyses of duplicate field samples and laboratory replicates will be utilized to assess laboratory precision.

Accuracy is a measurement in the bias of a measurement system and may include many sources of potential error, including the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques (EPA, 1987). An evaluation of the accuracy will be performed by reviewing the results of field/trip blanks, matrix spikes, and laboratory QC samples.

Representativeness is an expression of the degree to which the data accurately and precisely represent the true environmental conditions. Sample locations and the number of samples have been selected to ensure the data is representative of actual environmental conditions. Based on SWMU specific conditions, this may include either biased (i.e., judgmental) locations/depths or unbiased (systematic grid samples) locations, as discussed in Section 5.2 for soils and 5.3.2

for groundwater. In addition, sample collection techniques (e.g., purging of monitoring wells to collect formation water) will be utilized to help ensure representative results. An evaluation of on-going groundwater monitoring results will be performed to assess representativeness.

Completeness is defined as the percentage of measurements taken that are actually valid measurements, considering field QA and laboratory QC problems. EPA Contract Laboratory Program (CLP) data has been found to be 80-85% complete on a nationwide basis and this has been extrapolated to indicate that Level III, IV, and V analytical techniques will generate data that are approximately 80% complete (EPA, 1987). As an overall project goal, the completeness goal is 85%; however, some samples may be critical base on location or field screening results and thus a sample –by-sample evaluation will be performed to determine if the completeness goals have been obtained.

Comparability is a qualitative parameter, which expresses the confidence with which one data set can be compared to another. Industry standard sample collection techniques and routine EPA analytical methods will be utilized to help ensure data are comparable to historical and future data. Analytical results will be reported in appropriate units for comparison to historical data and cleanup levels.

RPS JDC

Section 6
Monitoring and Sampling Program

6.1 Groundwater Monitoring

After the initial investigation activities are completed, a second round of groundwater samples will be collected to confirm the initial groundwater analyses for samples collected at new monitoring wells. The groundwater samples will be collected no sooner than 30 days after the initial sampling event and no later than 75 days after the initial sampling event. If possible, the second sampling event will be timed to coincide with the regularly scheduled semiannual groundwater sampling events. The samples will be analyzed for the same constituents for which the first samples were analyzed.

Any subsequent sampling events will be based on the results of the first two analyses and will be approved by the NMED prior to implementation.

RPS JDC

Section 7
Schedule

This investigation Work Plan will be implemented within 90 days of NMED approval. The estimated timeframes for each of the planned activities is as shown below:

- field work (inclusive of all soil and initial groundwater sampling) -- four weeks;
- laboratory analyses for initial sampling event – four weeks;
- data reduction and validation (soils and initial groundwater event) – three weeks;
- second groundwater sampling event – one week;
- laboratory analyses for second groundwater sampling event – three weeks;
- data reduction and validation (second groundwater event) – two weeks; and
- data gap analysis – three weeks.

Completion of the data gap analysis will complete all activities conducted under this investigation Work Plan. Western will then prepare an Investigation Report pursuant to Section X.C of the Order. The Investigation Report will be submitted to the NMED within 120 calendar days of completion of the data gap analysis.

RPS JDC

Section 8
References

EPA, 1987, Data Quality Objectives for Remedial Response Activities; United States Environmental Protection Agency, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, OSWER Directive 9355.0-7B, 85p

EPA, 1991, Human Health Evaluation Manual, Part B: "Development of Risk-Based Preliminary Remediation Goals; United States Environmental Protection Agency, Office of Solid Waste and Emergency Response; Memorandum December 13, 1991, OSWER Directive 9285.7-01B, 54p.

EPA, 1996, Soil Screening Guidance: User's Guide; United States Environmental Protection Agency, Office of Solid Waste and Emergency Response; Publication 9355.4-23, p. 123.

EPA, 2000, Guidance on Choosing a Sampling Design for Environmental Data Collection, EPA/240/R-02/005, EPA QA/G-5S, 168 p.

EPA, 2006, Guidance on Systematic Planning Using the Data Quality Objectives Process, United States Environmental Protection Agency, Office of Environmental Information; EPA/240/B-06/001, p. 111.

Groundwater Technology Inc., 1994, RCRA Facility Investigation/Corrective Measures Study Report Bloomfield Refining Company #50 County Road 4990 Bloomfield, New Mexico, p.51.

Groundwater Technology Inc., 1995, Human Health and Ecological Risk Assessment; Giant Refining Company #50 County Road 4990 Bloomfield, New Mexico, p.39.

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Tables

Table 1
Groundwater Analytical Results
Group 4 Investigation Work Plan
Western Refining Southwest - Bloomfield Refinery

Analyte	WQCC 20NMAC 6.2.3103	SWMU2-1 GW	SWMU 2-2 GW	SWMU 2-3 GW	SWMU 2-4 GW	SWMU2-5 / MW-50	SWMU 2-6 GW	SWMU 2-7 GW	SWMU 2-8 GW	SWMU 2-9 / MW-51	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1
Date		9/29/2008	9/29/2008	9/29/2008	9/30/2008	10/28/2008	9/30/2008	9/30/2008	10/1/2008	10/28/2008	3/3/2003	8/21/2003	3/3/2004	8/23/2004	4/11/2005	8/5/2005	4/5/2006	8/15/2006	4/1/2007	8/28/2007	4/8/2008	8/13/2008
Total metals (mg/l)																						
Antimony	0.006 [2]	0.0012	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01 [2]	**0.012**	< 0.0010	0.0028	0.005	**0.012**	0.0039	0.0091	0.0034	**0.012**	NA	<0.02 [1]	NA	<0.02	NA	NA	NA	<0.02	NA	<0.2	NA	<0.02
Barium	1.0	**1.5**	0.22	0.24	0.2	0.8	0.53	0.5	0.29	0.2	NA	0.46 [1]	NA	0.052	NA	NA	NA	0.023	NA	0.023	NA	0.15
Beryllium	0.004 [2]	0.0024	< 0.0020	< 0.0020	< 0.0020	0.001	0.0021	**0.0076**	0.0021	<0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005 [2]	<0.0050	< 0.0050	< 0.0050	< 0.0050	<0.001	< 0.0050	< 0.0050	< 0.0050	<0.001	NA	<0.002 [1]	NA	<0.002	NA	NA	NA	<0.002	NA	<0.002	NA	<0.002
Chromium	0.05	0.46	< 0.010	< 0.010	< 0.010	0.02	0.033	0.023	0.028	<0.01	NA	<0.006 [1]	NA	<0.006	NA	<0.006	NA	<0.006	NA	<0.006	NA	<0.006
Cobalt	0.05	0.032	< 0.010	< 0.010	< 0.010	0.01	0.017	**0.058**	0.019	<0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.006 [1]	NA	NA	NA	NA	NA	NA	NA	<0.006	NA	<0.006
Cyanide	0.2	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.05	0.034	< 0.0050	< 0.0050	< 0.0050	0.02	0.022	0.033	0.017	<0.01	NA	<0.005 [1]	NA	<0.005	NA	<0.005	NA	<0.005	NA	<0.005	NA	<0.005
Mercury	0.002	<0.00020	< 0.00020	< 0.00020	< 0.0020	<0.001	0.00021	0.00052	< 0.00020	<0.001	NA	NA	NA	<0.0002	NA		NA	<0.0002	NA	<0.0002	NA	<0.0002
Nickel	0.200	0.097	< 0.020	< 0.020	< 0.020	0.03	< 0.020	0.046	0.025	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	<0.0010	< 0.0010	< 0.0010	< 0.0010	0.001	< 0.0010	0.0019	0.001	<0.001	NA	0.043 [1]	NA	<0.05	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05
Silver	0.05	<0.010	<0.010	<0.010	< 0.010	<0.005	< 0.010	<0.010	<0.010	<0.005	NA	<0.005 [1]	NA	<0.005	NA	NA	NA	<0.005	NA	<0.005	NA	<0.005
Uranium	0.03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1 [1]	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA
Vanadium	0.18 [3]	0.044	< 0.010	< 0.010	< 0.010	<0.1	0.04	0.035	0.017	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	10.0	1.6	1.2	1.4	0.55	0.12	0.14	0.18	0.15	0.05	NA	0.12 [1]	NA	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05
Volatiles (ug/l)																						
1,1,1,2-Tetrachloroethane	0.43 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,1,1-Trichloroethane	60	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,1,2,2-Tetrachloroethane	10	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	NA	< 2.0
1,1,2-Trichloroethane	10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,1-Dichloroethane	25	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,1-Dichloropropene	Ne	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,2,3-Trichlorobenzene	Ne	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,2,3-Trichloropropane	0.034 [3]	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	NA	< 2.0
1,2,4-Trichlorobenzene	70.0 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,2,4-Trimethylbenzene	15.0 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,2-Dibromo-3-chloropropane	0.2 [2]	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	NA	< 2.0
1,2-Dibromoethane (EDB)	0.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,2-Dichlorobenzene	600.0 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,2-Dichloroethane (EDC)	10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,2-Dichloropropane	5.0 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,3,5-Trimethylbenzene	Ne	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,3-Dichlorobenzene	Ne	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,3-Dichloropropane	120 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1,4-Dichlorobenzene	75.0 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
1-Methylnaphthalene	Ne	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 4.0	NA	< 4.0
2,2-Dichloropropane	Ne	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	NA	< 2.0
2-Butanone	710.0 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2-Chlorotoluene	120.0 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
2-Hexanone	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2-Methylnaphthalene	Ne	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 4.0	NA	< 4.0
4-Chlorotoluene	Ne	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
4-Isopropyltoluene	Ne	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
4-Methyl-2-pentanone	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Acetone	5,500 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Benzene	5 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	<1.0	<1.0	1.1	1.3	<0.5	<0.5	<1.0	<0.5	< 1.0	<1.0	< 1.0
Bromobenzene	23.0 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Bromodichloromethane	0.18 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0

Table 1
Groundwater Analytical Results
Group 4 Investigation Work Plan
Western Refining Southwest - Bloomfield Refinery

Analyte	WQCC 20NMAC 6.2.3103	SWMU2-1 GW	SWMU 2-2 GW	SWMU 2-3 GW	SWMU 2-4 GW	SWMU2-5 / MW-50	SWMU 2-6 GW	SWMU 2-7 GW	SWMU 2-8 GW	SWMU 2-9 / MW-51	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1
Date		9/29/2008	9/29/2008	9/29/2008	9/30/2008	10/28/2008	9/30/2008	9/30/2008	10/1/2008	10/28/2008	3/3/2003	8/21/2003	3/3/2004	8/23/2004	4/11/2005	8/5/2005	4/5/2006	8/15/2006	4/1/2007	8/28/2007	4/8/2008	8/13/2008
Bromoform	8.5 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Bromomethane	8.7 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Carbon disulfide	1,000 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Carbon Tetrachloride	5.0 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Chlorobenzene	100.0 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Chloroethane	Ne	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	NA	< 2.0
Chloroform	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Chloromethane	190 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
cis-1,2-DCE	70 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
cis-1,3-Dichloropropene	0.4 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Dibromochloromethane	0.13 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Dibromomethane	Ne	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Dichlorodifluoromethane	390 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Ethylbenzene	700 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<0.5	<1.0	0.65	< 1.0	2.3	< 1.0
Hexachlorobutadiene	0.86 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Isopropylbenzene	Ne	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Methyl tert-butyl ether (MTBE)	11 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<2.5	<1.5	<2.5	<1.0	<2.5	<2.5	<2.5	<1.0	<2.5	< 1.0	<1.5	< 1.0
Methylene Chloride	4.3 [3]	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.0	NA	< 3.0
Naphthalene	Ne	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	NA	< 2.0
n-Butylbenzene	61 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
n-Propylbenzene	61 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
sec-Butylbenzene	61 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Styrene	100 2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
tert-Butylbenzene	61 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Tetrachloroethene (PCE)	5 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Toluene	750	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<0.5	<1.0	0.63	< 1.0	<1.0	< 1.0
trans-1,2-DCE	100 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
trans-1,3-Dichloropropene	0.4 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Trichloroethene (TCE)	5 [2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Trichlorofluoromethane	1,300 [3]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Vinyl chloride	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	< 1.0
Xylenes, Total	620	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	<2.0	<3.0	<3.0	<1.0	1.1	<0.5	<0.5	<1.0	4.3	< 1.5	16	< 1.5
Semivolatiles (ug/l)																						
1,2,4-Trichlorobenzene	70 [2]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
1,2-Dichlorobenzene	49 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
1,3-Dichlorobenzene	14 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
1,4-Dichlorobenzene	0.47 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2,4,5-Trichlorophenol	3,700 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2,4,6-Trichlorophenol	6.1 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2,4-Dichlorophenol	110 [3]	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 20	NA	< 20
2,4-Dimethylphenol	730 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2,4-Dinitrophenol	73 [3]	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 20	NA	< 20
2,4-Dinitrotoluene	73 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2,6-Dinitrotoluene	37 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2-Chloronaphthalene	490 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2-Chlorophenol	30 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2-Methylnaphthalene	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2-Methylphenol	1,800 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2-Nitroaniline	110 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
2-Nitrophenol	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10

Table 1
Groundwater Analytical Results
Group 4 Investigation Work Plan
Western Refining Southwest - Bloomfield Refinery

Analyte	WQCC 20NMAC 6.2.3103	SWMU2-1 GW	SWMU 2-2 GW	SWMU 2-3 GW	SWMU 2-4 GW	SWMU2-5 / MW-50	SWMU 2-6 GW	SWMU 2-7 GW	SWMU 2-8 GW	SWMU 2-9 / MW-51	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1
Date		9/29/2008	9/29/2008	9/29/2008	9/30/2008	10/28/2008	9/30/2008	9/30/2008	10/1/2008	10/28/2008	3/3/2003	8/21/2003	3/3/2004	8/23/2004	4/11/2005	8/5/2005	4/5/2006	8/15/2006	4/1/2007	8/28/2007	4/8/2008	8/13/2008
3,3´-Dichlorobenzidine	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
3+4-Methylphenol	180 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
3-Nitroaniline	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
4,6-Dinitro-2-methylphenol	Ne	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 20	NA	< 20
4-Bromophenyl phenyl ether	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
4-Chloro-3-methylphenol	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
4-Chloroaniline	150 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
4-Chlorophenyl phenyl ether	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
4-Nitroaniline	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
4-Nitrophenol	290 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Acenaphthene	370 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Acenaphthylene	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Aniline	12 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Anthracene	1,800 3	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Azobenzene	0.61 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Benz(a)anthracene	0.029 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Benzo(a)pyrene	0.2 [2]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Benzo(b)fluoranthene	0.029 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Benzo(g,h,i)perylene	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Benzo(k)fluoranthene	0.29 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Benzoic acid	150,000 [3]	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 20	NA	< 20
Benzyl alcohol	11,000 3	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Bis(2-chloroethoxy)methane	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Bis(2-chloroethyl)ether	0.0098 3	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Bis(2-chloroisopropyl)ether	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Bis(2-ethylhexyl)phthalate	4.8 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Butyl benzyl phthalate	7,300 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Carbazole	3.4 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Chrysene	2.9 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Dibenz(a,h)anthracene	0.0029 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Dibenzofuran	12 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Diethyl phthalate	29,000 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Dimethyl phthalate	370,000 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Di-n-butyl phthalate	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Di-n-octyl phthalate	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Fluoranthene	1,500 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Fluorene	240 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Hexachlorobenzene	1.0 [2]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Hexachlorobutadiene	0.86 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Hexachlorocyclopentadiene	50 [2]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Hexachloroethane	4.8 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Indeno(1,2,3-cd)pyrene	0.029 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Isophorone	71 3	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Naphthalene	30	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Nitrobenzene	3.4 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
N-Nitrosodimethylamine	0.00042 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
N-Nitrosodi-n-propylamine	0.0096 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
N-Nitrosodiphenylamine	14 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Pentachlorophenol	1 [2]	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 20	NA	< 20
Phenanthrene	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Phenol	Ne	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10

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Group 4 Investigation Work Plan
Western Refining Southwest - Bloomfield Refinery

Analyte	WQCC 20NMAC 6.2.3103	SWMU2-1 GW	SWMU 2-2 GW	SWMU 2-3 GW	SWMU 2-4 GW	SWMU2-5 / MW-50	SWMU 2-6 GW	SWMU 2-7 GW	SWMU 2-8 GW	SWMU 2-9 / MW-51	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1
Date		9/29/2008	9/29/2008	9/29/2008	9/30/2008	10/28/2008	9/30/2008	9/30/2008	10/1/2008	10/28/2008	3/3/2003	8/21/2003	3/3/2004	8/23/2004	4/11/2005	8/5/2005	4/5/2006	8/15/2006	4/1/2007	8/28/2007	4/8/2008	8/13/2008
Pyrene	180 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
Pyridine	37 [3]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA	< 10
total petroleum hydrocarbons (mg/l)																						
Gasoline Range Organics (GRO)	0.2	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.21	<0.05
Diesel Range Organics (DRO)	0.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	<1.0
Motor Oil Range Organics (MRO)	0.2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5.0	<5.0
general chemistry (mg/l)																						
Alkalinity, Total (As CaCO3)	Ne	370	330	240	230	240	240	240	250	280	NA	NA	NA	NA	NA	NA	NA	NA	NA	290	NA	280
Bicarbonate	Ne	370	330	240	230	240	240	240	250	280	NA	NA	NA	NA	NA	NA	NA	NA	NA	290	NA	280
Calcium	Ne	86	85	48	59	55	65	55	63	102	NA	74	NA	67	NA	68	NA	61	NA	63	NA	NA
Carbonate	Ne	< 2.0	< 2.0	< 2.0	NA	< 2.0	NA	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2	NA	<2
Chloride	250	10	10	12	16	9.9	13	11	25	12	NA	33	NA	29	NA	31	NA	17	NA	16	NA	19
Iron	1	< 0.020	< 0.020	< 0.020	< 0.020	<0.03	< 0.020	0.036	0.20	<0.03	NA	<0.02	NA	0.27	NA	0.14	NA	<0.005	NA	<0.02	NA	<0.02
Magnesium	Ne	17	17	12	16	14	15	14	14	20	NA	18	NA	18	NA	18	NA	16	NA	16	NA	NA
Manganese	0.2	**2.4**	0.18	**1.4**	**1.6**	**1.72**	**1.1**	**0.51**	**0.33**	**1.89**	NA	0.09	NA	0.13	NA	0.14	NA	0.08	NA	0.027	NA	0.022
Nitrogen, Nitrate (As N)	10	1.5	NA	NA	NA	NA	NA	NA	NA	0.68	NA	1.6	NA	1.9	NA	2.1	NA	NA	NA	1.9	NA	1.2
Nitrogen, Nitrite (As N)	Ne	< 0.10	NA	NA	NA	< 0.10	NA	NA	NA	< 0.10	NA	<0.1	NA	<0.1	NA	<0.1	NA	1.2	NA	<0.1	NA	<0.1
Nitrate (As N)+Nitrite (As N)	10	NA	1.3	< 1.0	3.8	< 1.0	6.3	< 1.0	3.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	Ne	2.5	2.5	2.7	4.6	2	3.1	2.5	3.7	3	NA	2.4	NA	2.1	NA	2.7	NA	2.6	NA	2	NA	NA
Sodium	Ne	50	55	40	64	41	72	63	150	53	NA	120	NA	110	NA	140	NA	150	NA	78	NA	NA
Sulfate	600	31	86	25	130	29	130	97	300	150	NA	200	NA	220	NA	190	NA	190	NA	160	NA	130

1 - dissolved metals analyses
2 - Federal Maximum Contaminant Level
3 - USEPA Region VI Human Health Medium-Specific Screening Levels 2008
Ne - not established
NA - not analyzed
units - micrograms/liter (ug/l), milligrams/liter (mg/l)

Table 1
Groundwater Analytical Results
Group 4 Investigation Work Plan
Western Refining Southwest - Bloomfield Refinery

Analyte	WQCC 20NMAC 6.2.3103	Tank #33														
Sample Date		2/23/2005	3/7/2005	4/27/2005	5/4/2005	6/8/2005	7/6/2005	8/24/2005	9/21/2005	10/19/2005	11/9/2005	12/5/2005	1/30/2006	6/15/2006	9/13/2006	10/17/2006
Benzene	5 [1]	**50**	**38**	4.5	1.8	1.2	<0.5	<0.5	0.84	0.93	0.61	<0.5	<1	<1	<1	<1
Ethylbenzene	700 [1]	<5	4.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<1
Toluene	750	20	7.9	2.4	1.1	0.63	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<1
Xylenes, Total	620	22	20	2.4	1.4	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<3	<3	<3	<3

Analyte	WQCC 20NMAC 6.2.3103	Tank #33														
Sample Date		1/3/2007	4/25/2007	7/5/2007	10/9/2007	3/24/2008	4/10/2008	4/15/2008	4/21/2008	4/28/2008	5/5/2008	5/12/2008	5/19/2008	5/27/2008	6/2/2008	6/9/2008
Benzene	5 [1]	<1.0	<1.0	3.0	<1.0	**760**	**130**	**130**	**140**	**190**	**160**	**100**	**93**	**49**	**130**	**91**
Ethylbenzene	700 [1]	<1.0	<1.0	<1.0	<1.0	**1600**	360	200	220	170	150	42	25	21	84	110
Toluene	750	<1.0	<1.0	<1.0	<1.0	170	56	<1.0	30	6.7	7.9	<1.0	<1.0	<1.0	6.8	25
Xylenes, Total	620	<3.0	<2.0	<2.0	<3.0	**4700**	**1200**	**1100**	**1200**	**1600**	**1600**	**1100**	**970**	**790**	**1100**	**2100**
Methyl tertbutyl ether (MTBE)	11.0 [2]	NA	NA	NA	NA	<1.0	NA	<1.0	<1.0	3.6	3.6	<1.0	8.5	<1.0	<1.0	<1.0

Analyte	WQCC 20NMAC 6.2.3103	Tank #33														
Sample Date		6/16/2008	6/26/2008	7/2/2008	7/7/2008	7/16/2008	7/22/2008	7/31/2008	8/5/2008	8/14/2008	8/19/2008	8/25/2008	9/9/2008	9/18/2008	9/25/2008	10/1/2008
Benzene	5 [1]	**11**	**31**	4.9	**41**	**56**	**75**	**71**	**25**	**110**	3.6	**25**	**10**	**8.2**	4.6	3.2
Ethylbenzene	700 [1]	6.1	17	5.1	42	43	54	39	19	120	2.2	10	2.3	14	<1.0	<1.0
Toluene	750	<1.0	<1.0	4.9	2.8	<1.0	<1.0	<1.0	<1.0	6.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylenes, Total	620	140	180	55	410	380	450	430	210	540	24	**790**	16	6.7	<2.0	<2.0
Methyl tertbutyl ether (MTBE)	11.0 [2]	1.0	<1.0	1.9	2.3	<1.0	<1.0	<1.0	1.6	1.9	2.0	1.7	1.8	1.7	1.7	1.5

Analyte	WQCC 20NMAC 6.2.3103	Tank #33					
Sample Date		10/8/2008	10/15/2008	10/22/2008	10/27/2008	11/3/2008	12/2/2008
Benzene	5 [1]	2.5	2.2	2.2	2.3	1.5	1.7
Ethylbenzene	700 [1]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	750	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylenes, Total	620	<2.0	<2.0	<2.0	<2.0	<2.0	2.6
Methyl tertbutyl ether (MTBE)	11.0 [2]	1.5	1.6	2.2	2.4	2.4	<1.0

130 - bolded value exceeds applicable standard
1 - Federal Maximum Contaminant Level
2 - EPA Region VI Human Health Medium Specific Screening Levels 2008
units - micrograms/liter (ug/l)

Table 1
Groundwater Analytical Results
Group 4 Investigation Work Plan
Western Refining Southwest - Bloomfield Refinery

Analyte	WQCC 20NMAC 6.2.3103	River Terrace Groundwater Remediation System Effluent																	
Sample Date		01/18/06	03/01/06	06/08/06	09/13/06	12/13/06	02/20/07	02/27/07	03/13/07	04/02/07	04/16/07	04/25/07	6/20/087	07/12/07	08/14/07	09/10/07	10/09/07	3/6/2008	4/15/2008	7/2/2008
volatiles (ug/l)																				
Benzene	5 [1]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700 [1]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	750	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylenes, Total	620	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
total petroleum hydrocarbons (mg/l)																				
Diesel Range Organics (DRO)	0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	<1.0	<1.0	<1.0	<1.0
Gasoline Range Organics (GRO)	0.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	<0.050	<0.050

1 - Federal Maximum Contaminant Level
units - micrograms/liter (ug/l), milligrams/liter (mg/l)
NA - not analyzed

Table 2
Soil Analytical Results Summary
Group 4 Investigation Work Plan
Western Refining Southwest - Bloomfield Refinery

			Parameters															
			Acetone	Benzene	Toluene	Ethylbenzene	m.p-Xylene	o-Xylene	Methylene chloride	Semi-Volatile Organics	Total Petroleum Hydrocarbons	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Thallium	Zinc
	Soil Screening Levels (mg/kg):		19.1 [3]	0.02 [3]	21.7 [3]	20.2 [3]	2.06 [3]	81.4 [3]	0.17 [3]	Ne	Ne	56.2 [2]	27.5 [3]	100,000 [4]	1030 [3]	800 [1]	953 [3]	3.43 [3]	13,600 [3]
Sample No.	Sample Location	Date Sampled																	
B-5 (2-4')	at SWMU No. 7	2/22/1994	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3	7.2	6.5	ND	5.9	16	26
B-6 (2-4')	at SWMU No. 7	2/22/1994	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.54	3.2	8.1	9.1	ND	6.8	20	33
B-7 (6-8')	at SWMU No. 7 & 10	2/22/1994	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.8	5.7	5.3	ND	4.8	14	21
B-8 (6-8')	at SWMU No. 10	2/22/1994	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.57	3.2	9.3	7.1	ND	7	21	33
B-9 (2-4')	at SWMU No. 7 & 10	2/22/1994	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.77	ND	ND	ND	1.6	ND	8
B-10 (10-12')	at SWMU No. 10	2/22/1994	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	2.3	6	ND	ND	4.7	13	22

Notes:
units milligrams per kilogram (mg/kg)
ND - not detected, quantitation limit not provided in 1994 RFI Investigation Report
Ne - not established
The listed soil screening level is the lowest of the available NMED industrial/occupational, construction, and soil-to-ground water DAF 20 screening levels (Rev. 4 6/2006)
1 - Industrial/Occupational Soil Screening Level
2 - Construction Work Soil Screening Level
3 - Soil-to-Ground Water Screening Level

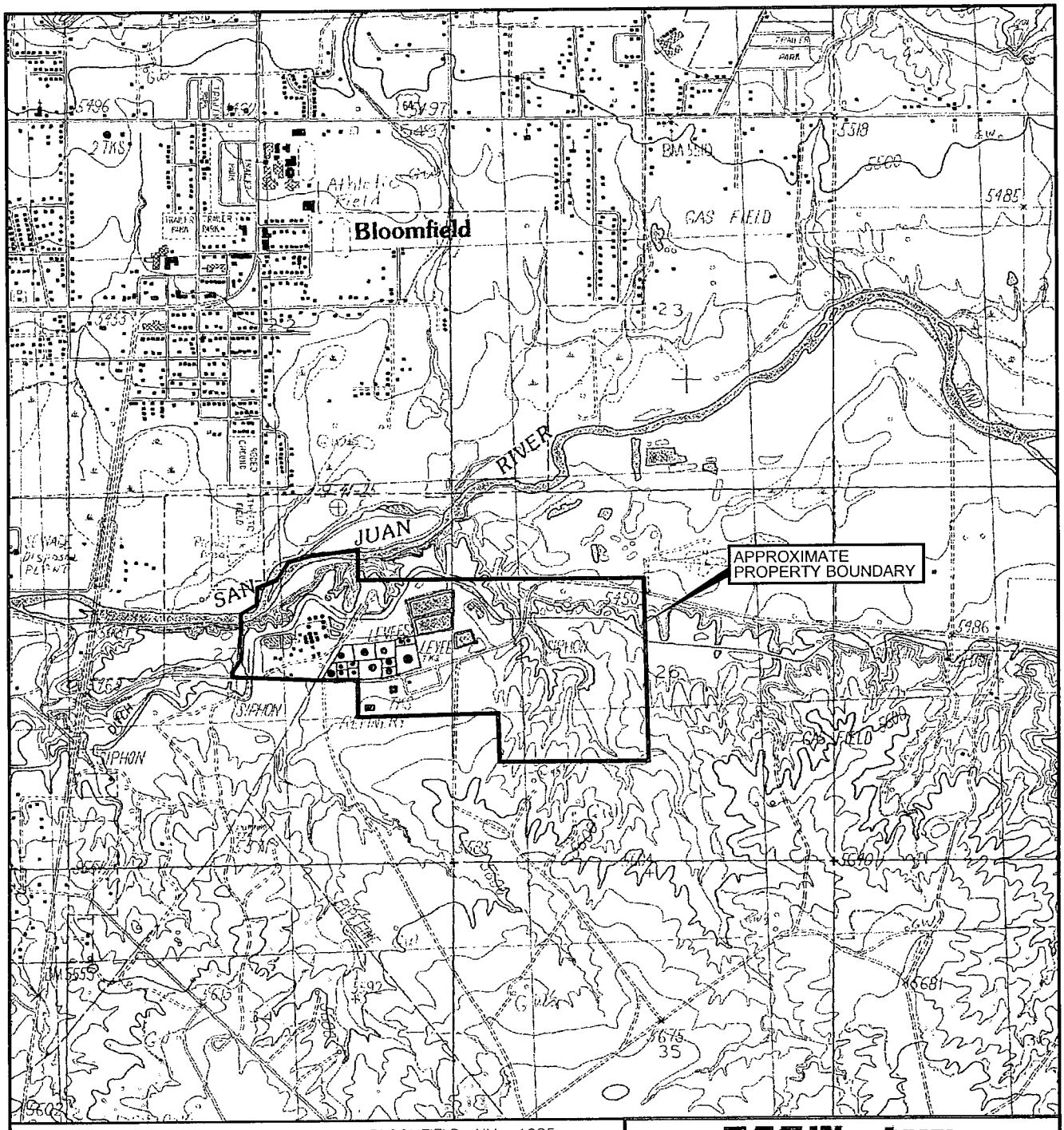
Table 3
Field Measurement Summary
Group 4 Investigation Work Plan
Western Refining Southwest - Bloomfield Refinery

		Field Measurements				
Well ID:	Date Sampled:	E.C. (umhos/cm)	pH (s.u.)	Temperature (deg F)	DO (mg/L)	ORP (--)
MW #1	3/3/2003	1285	8.01	54	NM	NM
	8/21/2003	1001	7.41	63	6.5	105.0
	3/2/2004	887	7.51	53	NM	NM
	8/23/2004	927	6.90	63	5.4	-532.0
	4/1/2005	1115	6.90	54	NM	NM
	8/1/2005	986	7.02	63	9.2	106
	4/6/2006	815	6.84	56	NM	NM
	8/15/2006	952	7.03	64	0.9	223.3
	4/2/2007	811	6.92	56.6	NM	NM
	8/22/2007	854	6.97	64.3	4.0	228

Notes:
deg F = degrees Fahrenheit
E.C. = electrical conductivity
mg/L = milligrams per liter
MW = monitoring well
NM = not measured
ORP = Oxidation Reduction Potential
DO - dissolved oxygen
s.u. = standard units (recorded by portable umhos/cm = micro-mhos per centimeter

RPS JDC

Figures



Map Source: USGS 7.5 Min. Quad Sheet BLOOMFIELD, NM., 1985.

Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 6/19/08	FILE: WestRef-A25

FIGURE 1
SITE LOCATION MAP
BLOOMFIELD REFINERY

N

0 2000
SCALE IN FEET

NEW MEXICO
QUADRANGLE LOCATION

404 Camp Craft Road
Austin, Texas 78746
RPS JDC

Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 11/18/08 | FILE: WestRef-B12

FIGURE 2
SWMU GROUP No. 4
SWMU LOCATIONS
BLOOMFIELD REFINERY

RPS JDC
404 Camp Craft Road
Austin, Texas 78746

SWMU No. 7

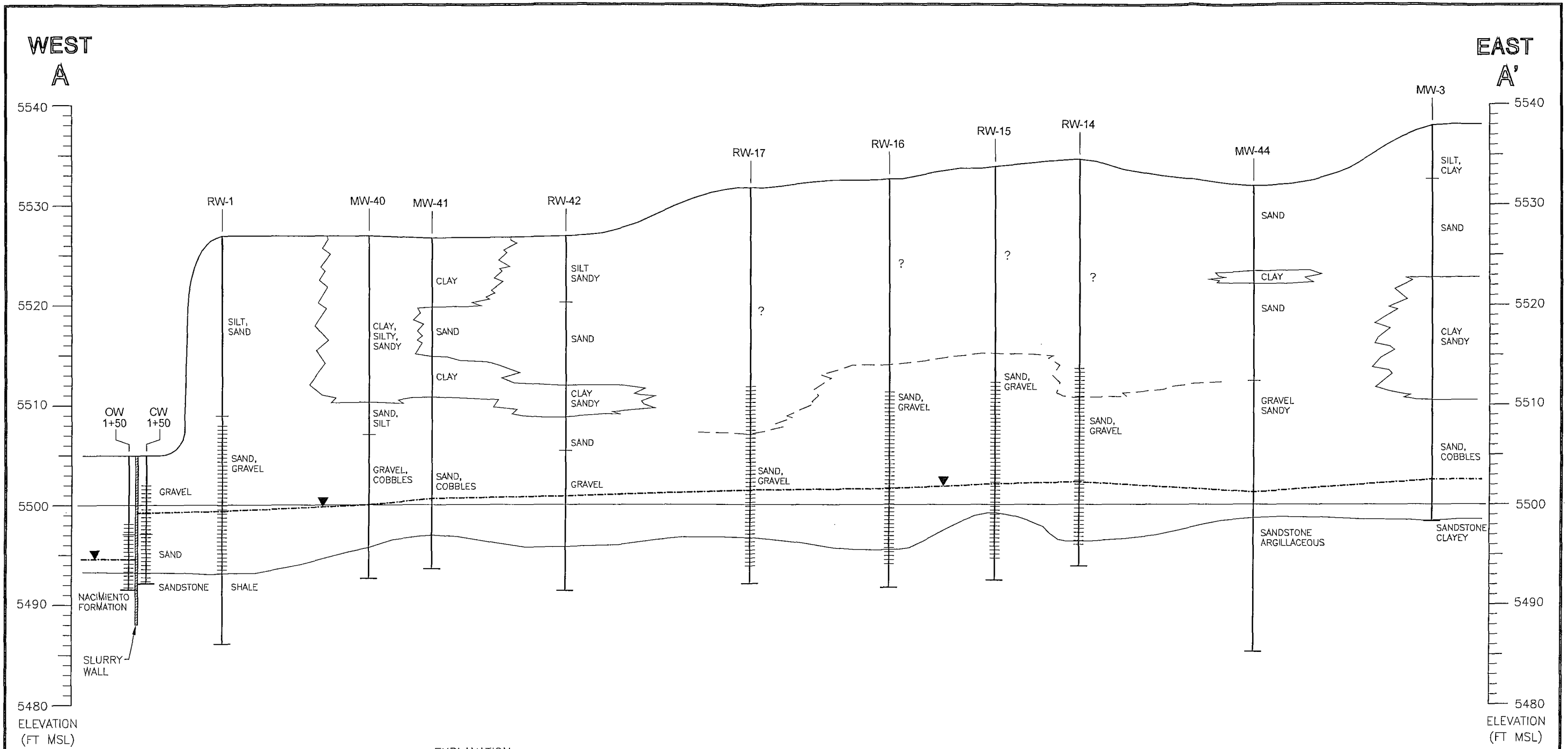
SWMU No. 10

SWMU No. 16

LEGEND

MW-1 ●	MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
RW-1 ⊖	RECOVERY WELL LOCATION AND IDENTIFICATION NUMBER
OW 1+50 ◐	OBSERVATION WELL LOCATION AND IDENTIFICATION NUMBER
CW 1+50 ◑	COLLECTION WELL LOCATION AND IDENTIFICATION NUMBER
SW1-0206 ▲	SUMP WELL LOCATION AND IDENTIFICATION NUMBER
P-2	PIEZOMETER IDENTIFICATION
←	SURFACE WATER DRAINAGE PATTERN
	UNDER GROUND PIPE-WAY
	ABOVE GROUND PIPE-WAY
	SLURRY BARRIER WALL
A — A'	CROSS SECTION LINE

0 300
SCALE IN FEET



EXPLANATION

MW-3 ← WELL IDENTIFICATION

WELL

SCREEN INTERVAL

LITHOLOGIC CONTACTS

– POTENTIOMETRIC SURFACE MEASURED APRIL 2007

10
0
200
SCALE IN FEET
VERTICAL EXAGGERATION = 20X

Western Refining

WESTERN REFINING SOUTHWEST

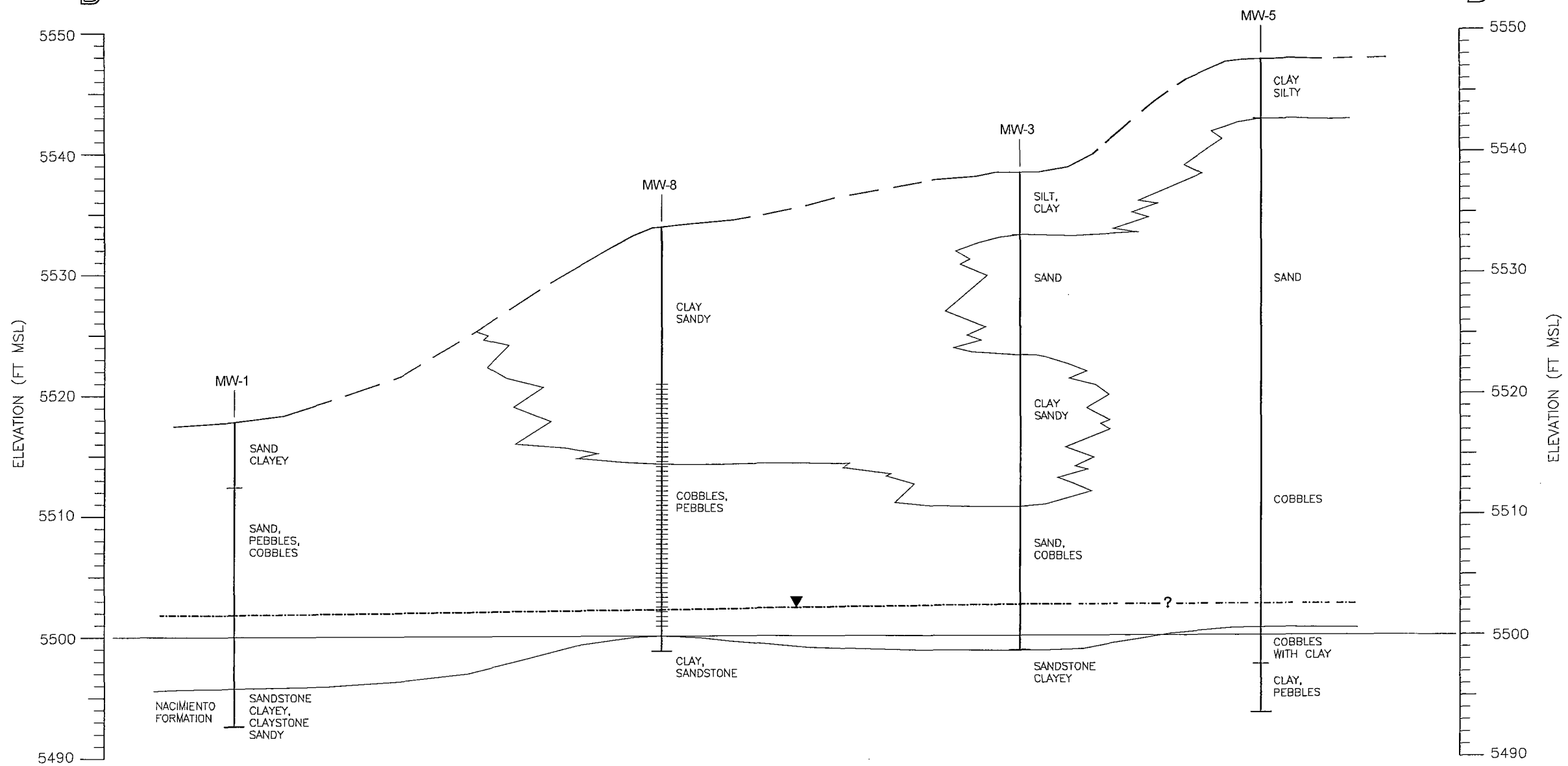
PROJ. NO.: Western Refining | DATE: 6/19/08 | FILE: WestRef-B06

FIGURE 3
CROSS SECTION A-A'
WEST TO EAST
BLOOMFIELD REFINERY

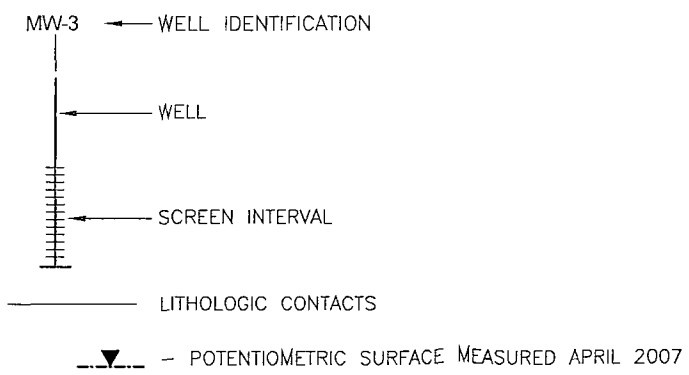
404 Camp Craft Road
Austin, Texas 78746
RPS JDC

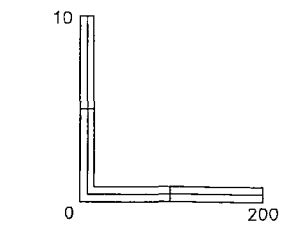
NORTH
B

SOUTH
B'



EXPLANATION





SCALE IN FEET
VERTICAL EXAGGERATION = 20X

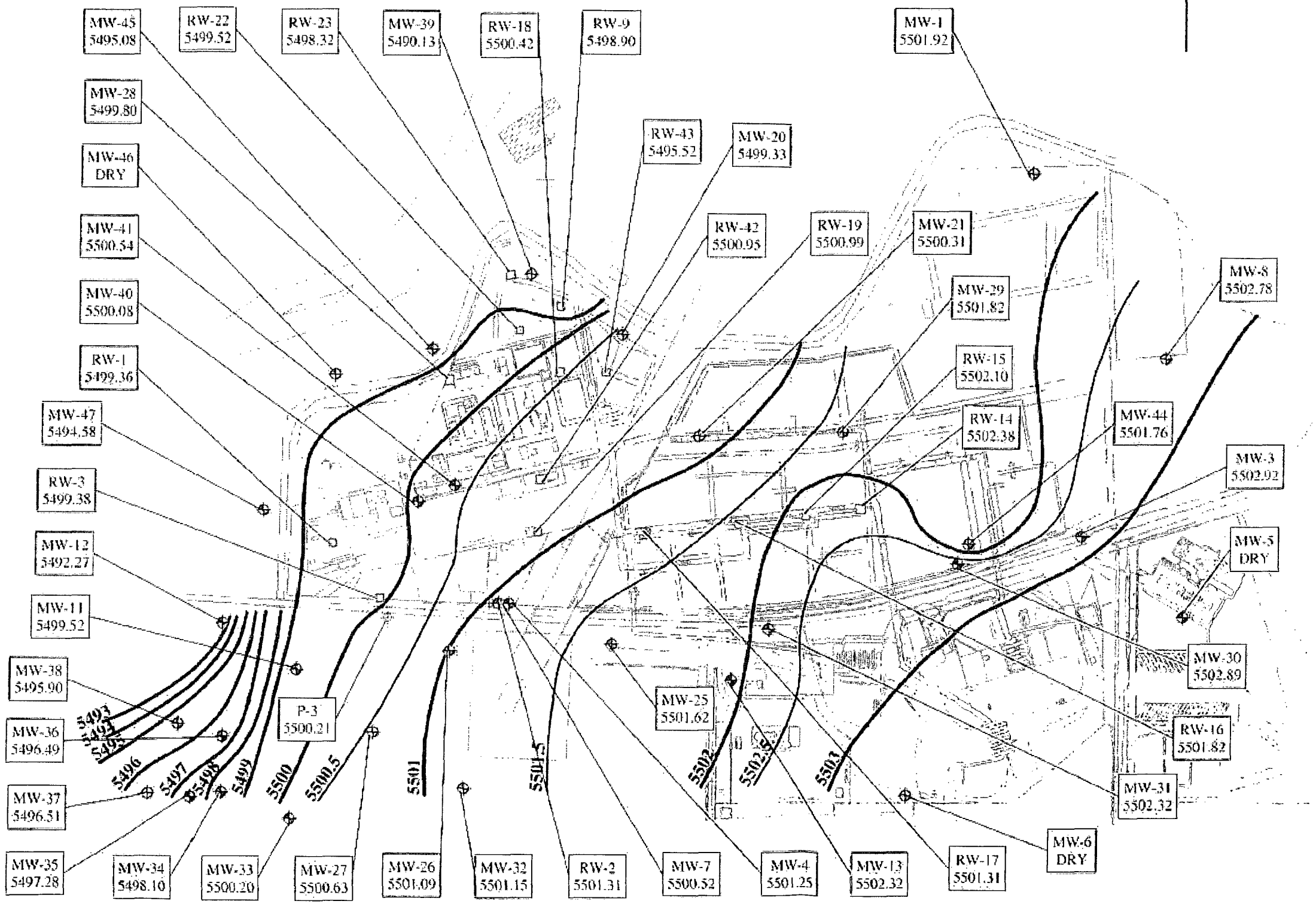
Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 6/19/08 | FILE: WestRef-B07

FIGURE 4
CROSS SECTION B-B'
NORTH TO SOUTH
BLOOMFIELD REFINERY

404 Camp Craft Road
Austin, Texas 78746
RPS JDC



Map Source: Malcolm–Pirnie Facility–Wide Groundwater Monitoring Plan, Western Refining Bloomfield Refinery, Figure 7 Groundwater.mxd, July 2007.

N

0 1200
SCALE IN FEET

Legend

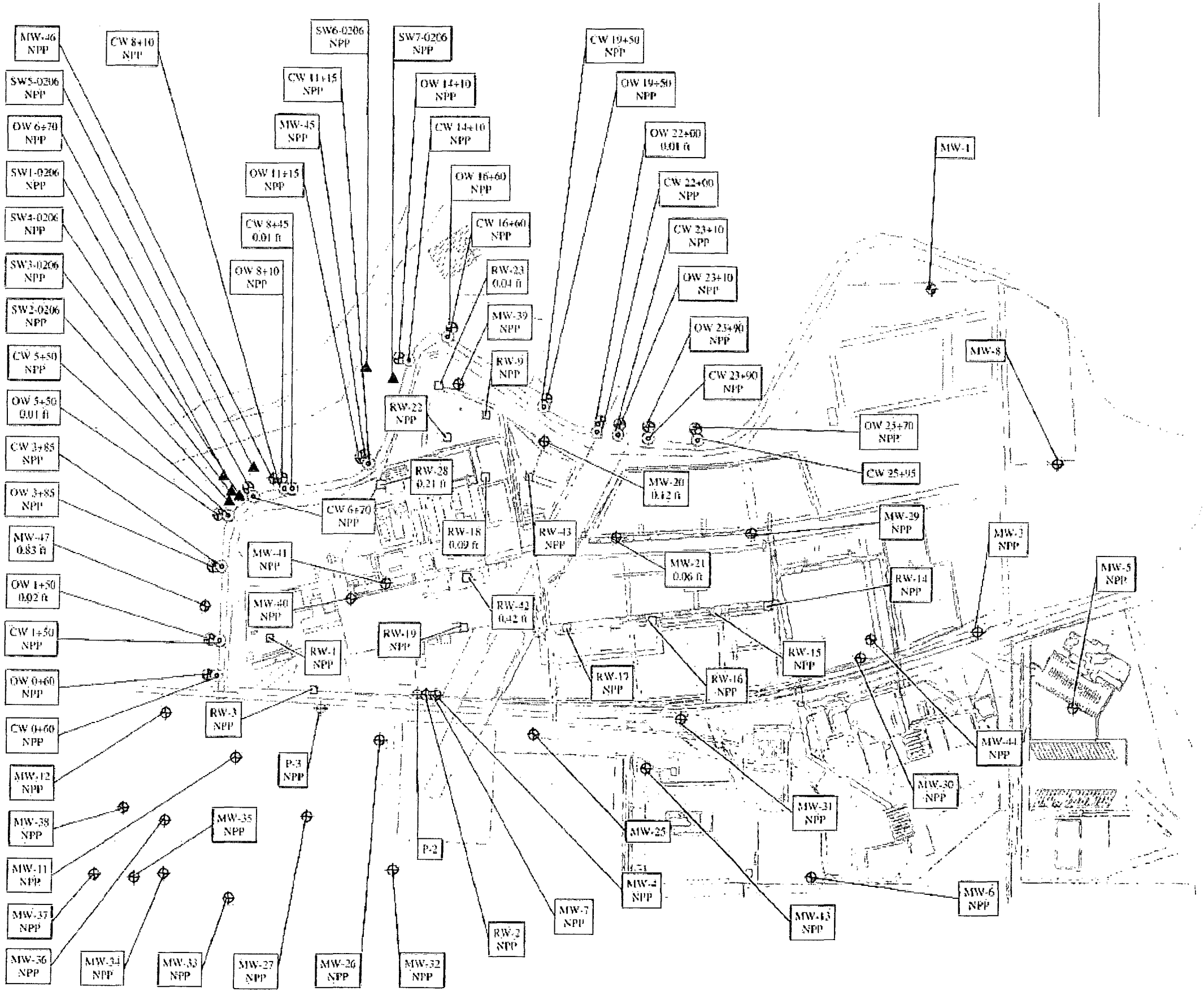
- Monitoring Well
- Recovery Well
- Piezometer
- Groundwater Elevation Contours
- Site
- RW-2 5501.31 - Well ID - Groundwater Elevation (ft amsl)

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 6/19/08 | FILE:WestRef–B08

FIGURE 5
APRIL 2007
POTENTIOMETRIC SURFACE
BLOOMFIELD REFINERY

RPS JDC
404 Camp Craft Road
Austin, Texas 78746



Legend

- Monitoring Well
- Observation Well
- Recovery Well
- Piezometer
- Collection Well
- Sump Well
- Site
- MW-35 NPP - Well ID

ft = Feet

NPP = No Product Present
NA = Not Available

Note:
OWs and CWs were collected on 1/15/07
SWs were collected on 1/2/07

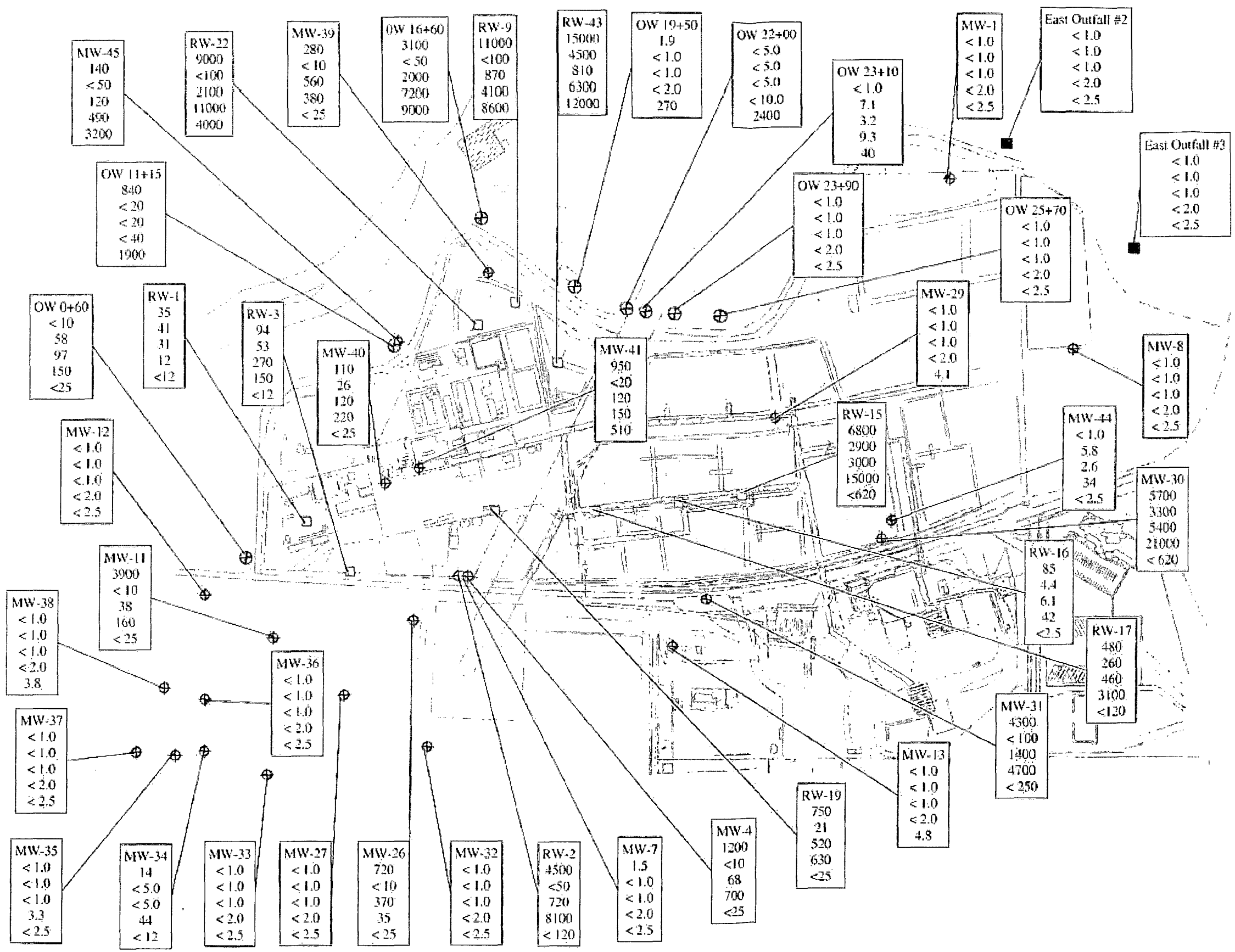
Map Source: Malcolm-Pirnie Facility-Wide Groundwater Monitoring Plan, Western Refining Bloomfield Refinery, Figure 8 Separate Phase Hydrocarbon Map.mxd, July 2007.

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 6/19/08	FILE: WestRef-B09

FIGURE 6
SPRING 2007
SEPARATE PHASE
HYDROCARBON THICKNESS MAP
BLOOMFIELD REFINERY

RPS JDC
404 Camp Craft Road
Austin, Texas 78746



Map Source: Malcolm–Pirnie Facility–Wide Groundwater Monitoring Plan, Western Refining Bloomfield Refinery, Figure 4 Concentration Map.mxd, July 2007.

N

0 1200
SCALE IN FEET

Legend

- Monitoring Well
- Observation Well
- Outfall
- Recovery Well
- Site

MW-35	
< 1.0	- Benzene
< 1.0	- Toluene
< 1.0	- Ethylbenzene
3.3	- Xylenes, Total
< 2.5	- MTBE

All concentrations in micrograms per liter (ug/L)

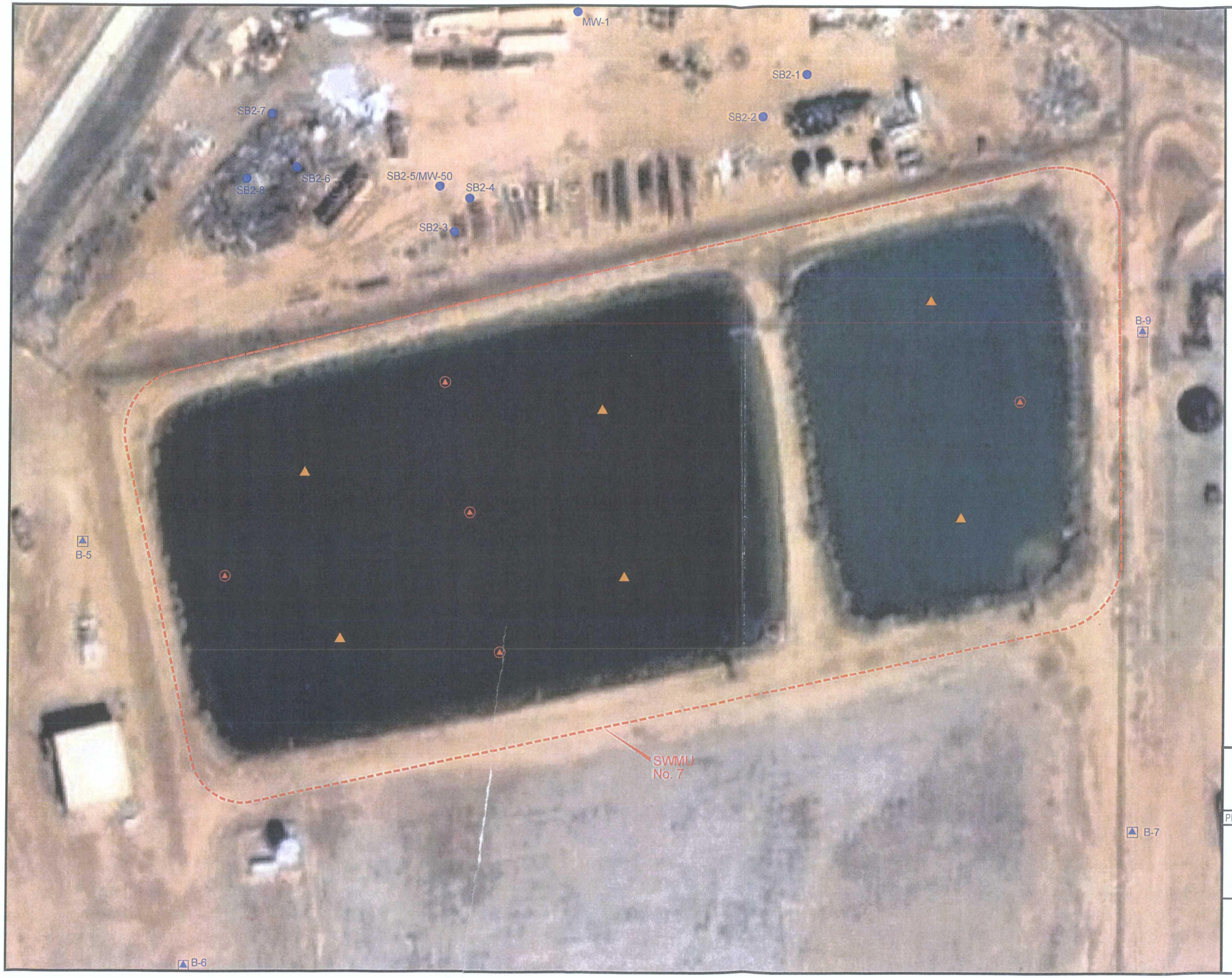
Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 6/19/08 | FILE: WestRef–B10

FIGURE 7
SPRING 2007
DISSOLVED-PHASE
GROUNDWATER DATA
BLOOMFIELD REFINERY

RPS JDC
404 Camp Craft Road
Austin, Texas 78746



Aerial Map Source: Google Maps, 2008 DigitalGlobe.

N

0 60

SCALE IN FEET

LEGEND

SB2-1 2008 RFI SAMPLE LOCATION

1996 SURFACE SOIL SAMPLE LOCATION

B-5 1994 RFI SOIL BORING LOCATION

PROPOSED SEDIMENT SAMPLE LOCATION

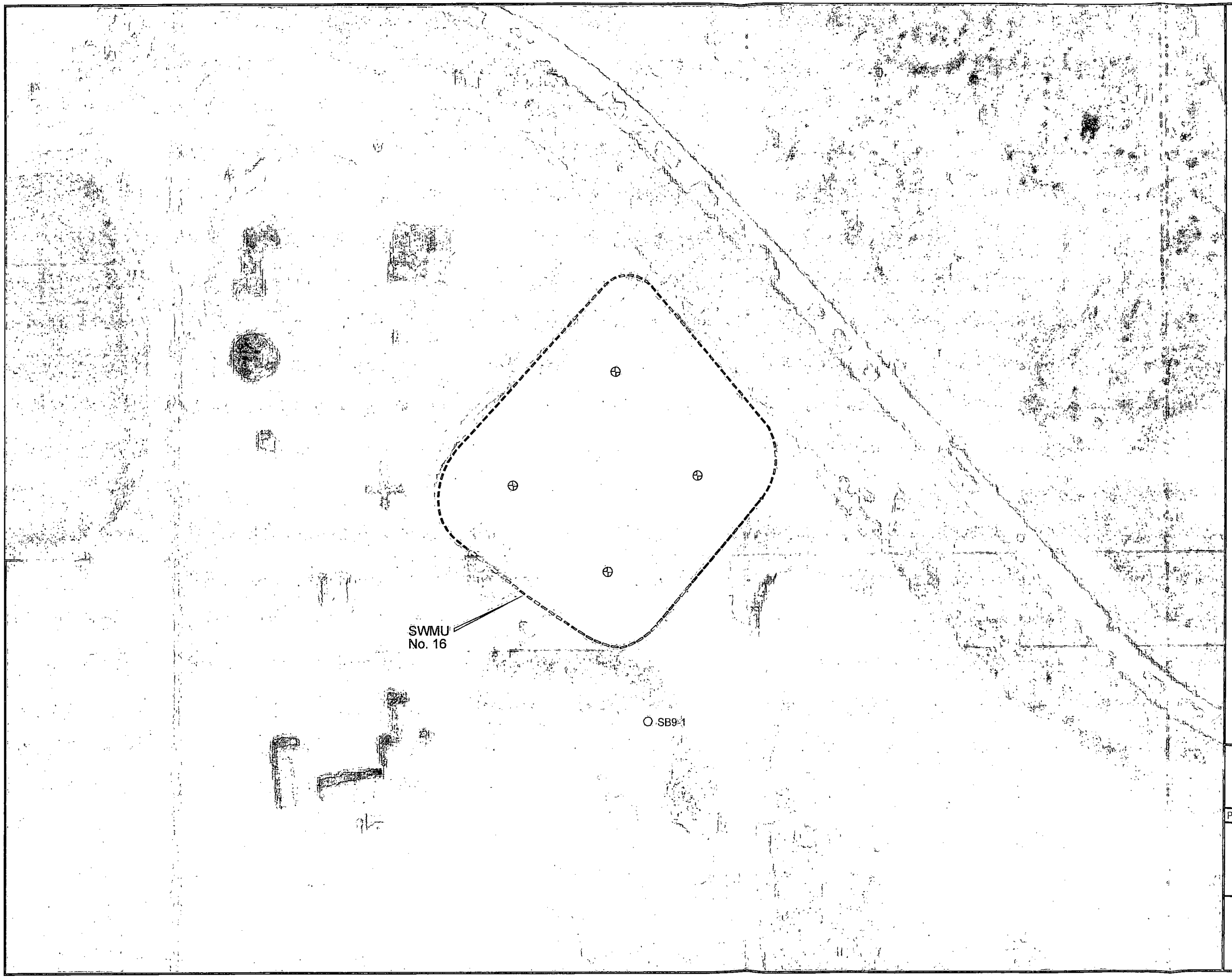
Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 11/18/08 | FILE: WestRef-B13

FIGURE 8
SWMU No. 7
SAMPLE LOCATIONS MAP
BLOOMFIELD REFINERY

RPS JDC
404 Camp Craft Road
Austin, Texas 78746



Aerial Map Source: Google Maps, 2008 DigitalGlobe.

N

0 60
SCALE IN FEET

LEGEND

SB9-1 ○ 2008 RFI SAMPLE LOCATION

⊕ PROPOSED SOIL BORING LOCATION

Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 11/18/08	FILE: WestRef-B15

FIGURE 10
SWMU No. 16
SAMPLE LOCATIONS MAP
BLOOMFIELD REFINERY

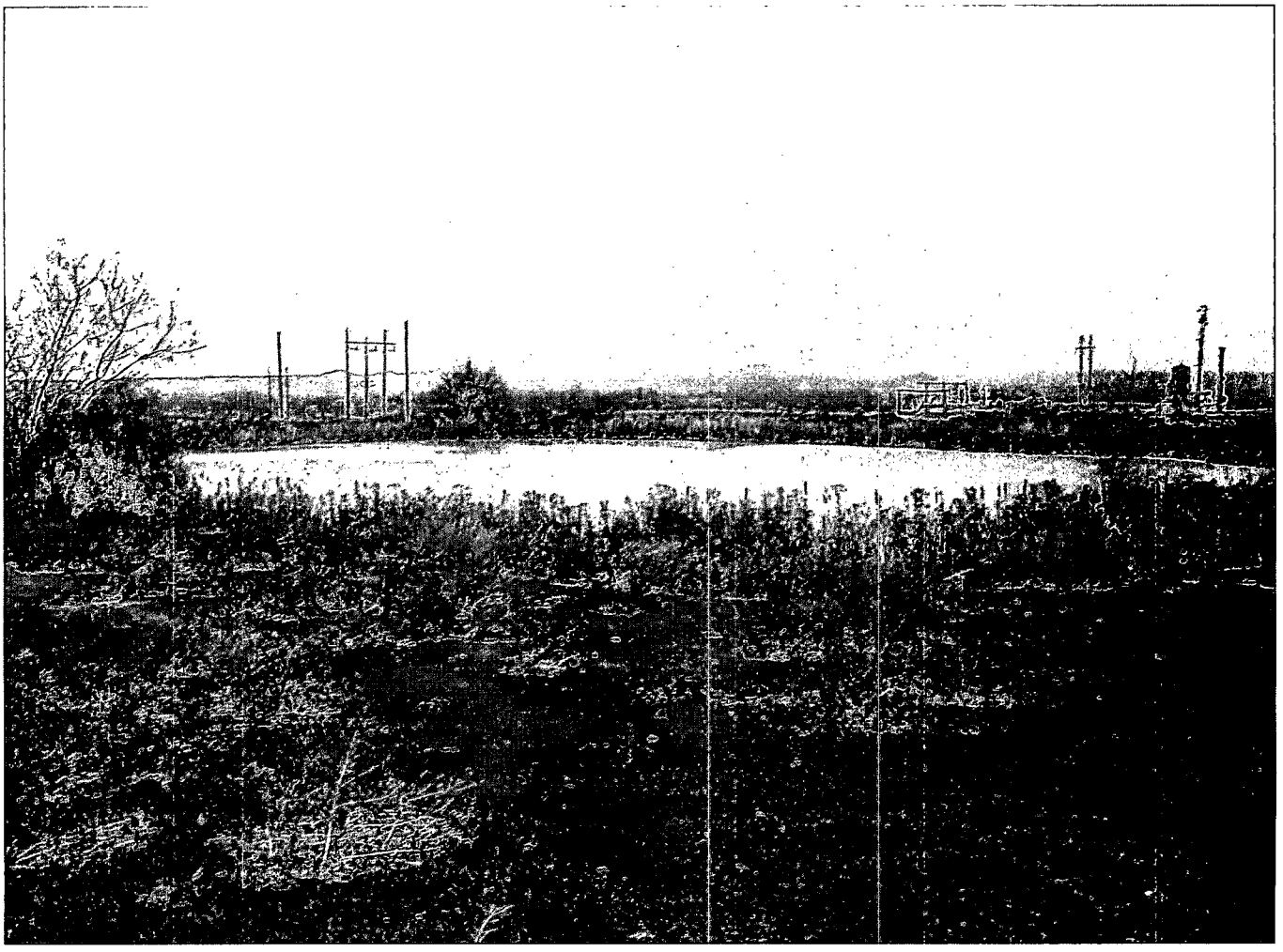
404 Camp Craft Road
Austin, Texas 78746
RPS JDC

RPS JDC

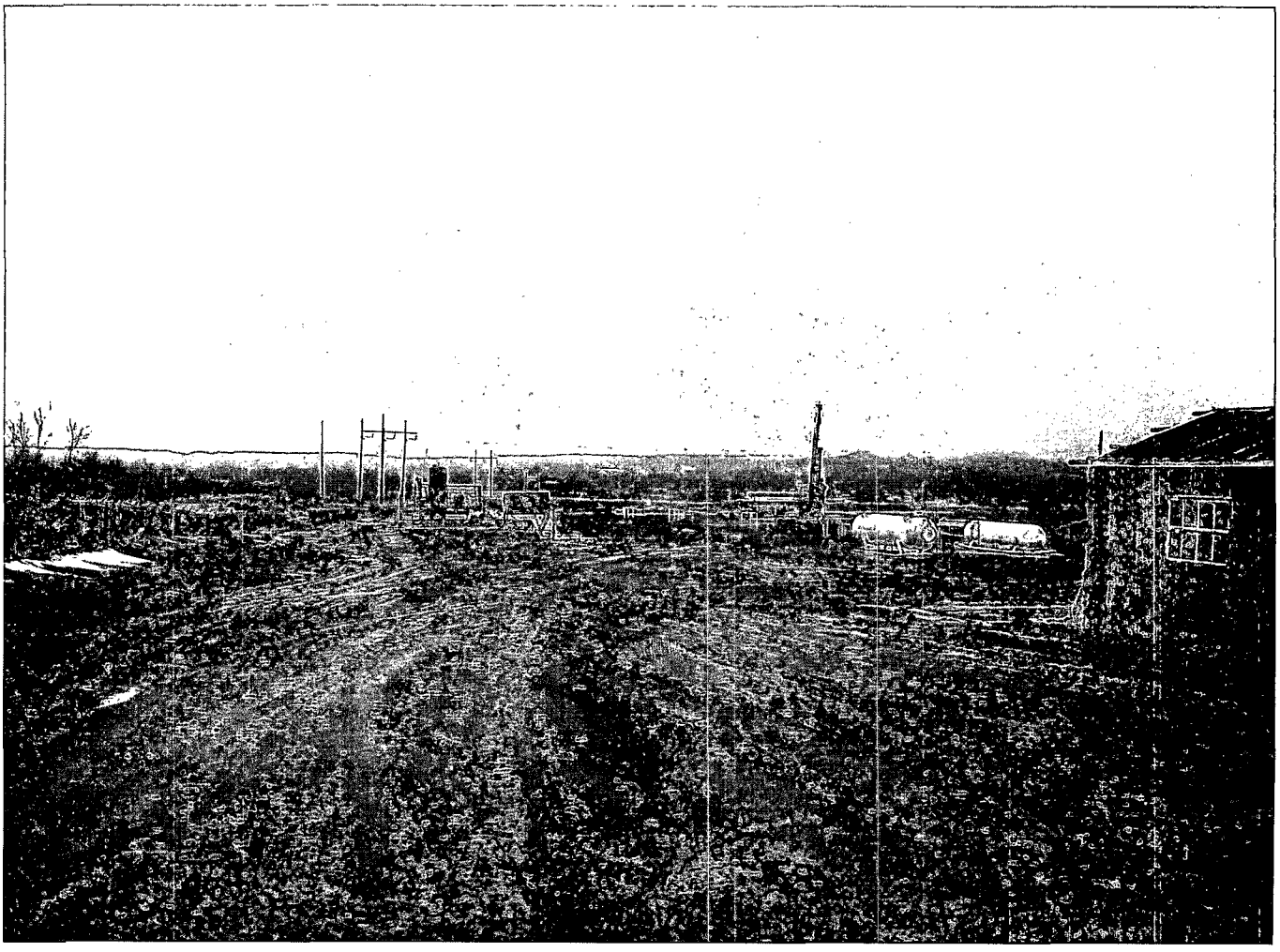
Appendix A

Photographs

Raw Water Ponds (SWMU No. 7) Looking northwest from southeast corner of ponds.



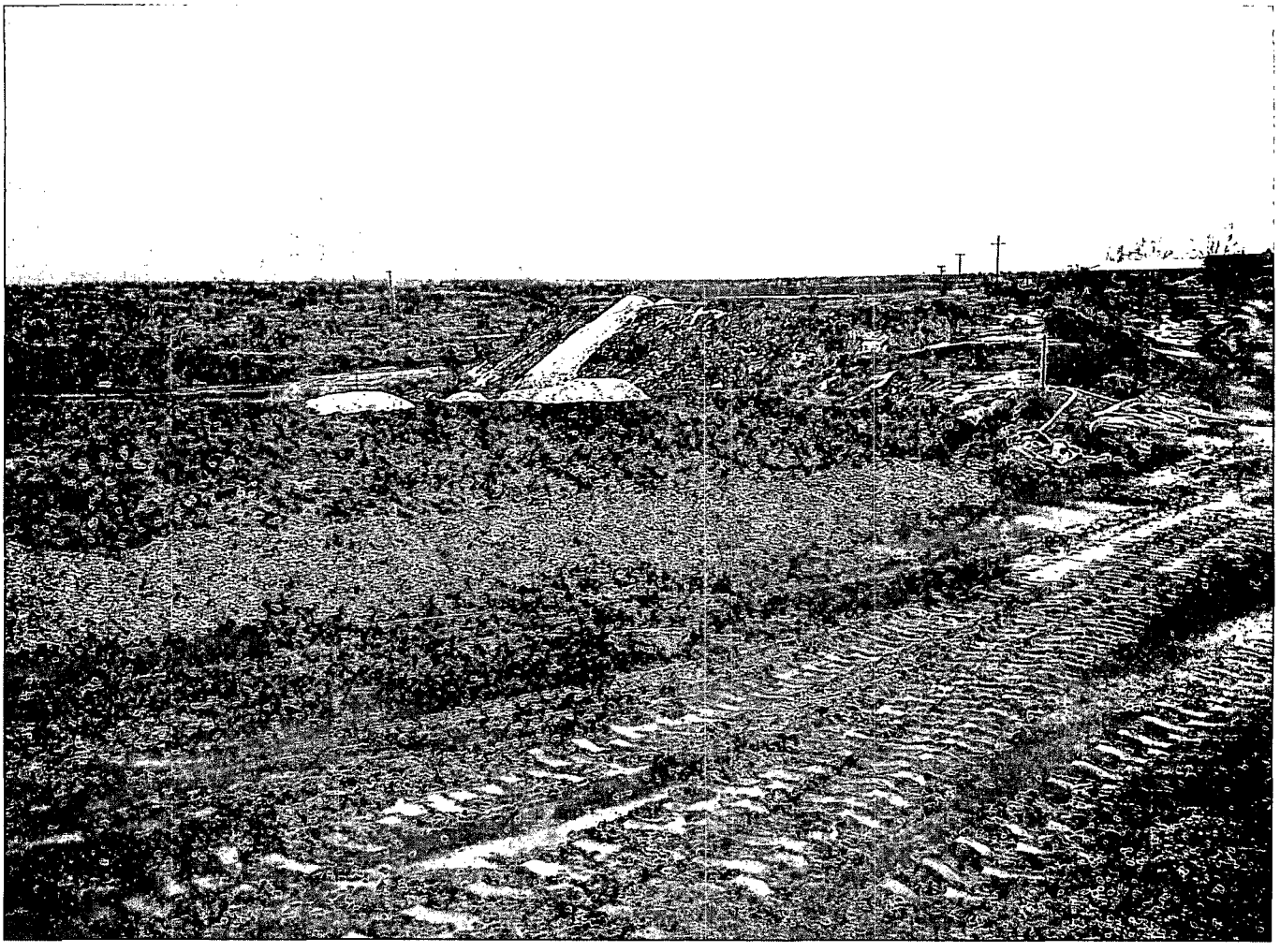
Raw Water Ponds (SWMU No. 7) Looking northwest from southeast corner of westernmost pond.



Fire Training Area (SWMU No. 10) Looking north from location just south of training area.

Fire Training Area (SWMU No. 10) Looking south from location near northeast portion of training area.

Active Landfill (SWMU No. 16) Looking east from western side of landfill.



Active Landfill (SWMU No. 16) Looking southeast from western side of landfill.

RPS JDC

Appendix B

Soil Boring Logs

Drilling Log

GROUNDWATER TECHNOLOGY

Soil Boring B-05

Project *Bloomfield Refining Company* Owner *Bloomfield Refining Company*
Location *West of Evaporation Pond #2* Proj. No. *023353014*
Surface Elev. _____ Total Hole Depth *8 ft.* Diameter _____
Top of Casing _____ Water Level Initial _____ Static _____
Screen: Dia _____ Length _____ Type/Size _____
Casing: Dia _____ Length _____ Type _____
Fill Material _____ Rig/Core *B55*
Drill Co. *Western Technology* Method *Split Spoon/Hollow Stem Auger (7")*
Driller *Rob* Log By *Tim Busby* Date *02/23/94* Permit # _____
Checked By _____ License No. _____

See Site Map For Boring Location

COMMENTS:

Posthole to 2'. Hit cobble layer @ 5'. Poor recovery @ 6'; No sample collected at 6'. Terminated boring. No groundwater encountered. Boring backfilled with cement-bentonite.

Depth (ft.)	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					
0					0-5': Light brown to brown Silty Sand, some clay, moist, no odor
2	0	2/2/5		ML	
4	0	26/34/31			Light brown to gray Sand and gravel and cobbles, moist, no odor
6	0	40/37/39		GW	
8					Total Depth @ 8 feet.
10					
12					
14					
16					
18					
20					
22					
24					

Drilling Log

GROUNDWATER TECHNOLOGY

Soil Boring B-06

Project Bloomfield Refining Company Owner Bloomfield Refining Company
Location West of Evaporation Pond #1 Proj. No. 023353014
Surface Elev. _____ Total Hole Depth 10 ft. Diameter _____
Top of Casing _____ Water Level Initial _____ Static _____
Screen: Dia _____ Length _____ Type/Size _____
Casing: Dia _____ Length _____ Type _____
Fill Material _____ Rig/Core B55
Drill Co. Western Technology Method Split Spoon/Hollow Stem Auger (7")
Driller Rob Log By Tim Busby Date 02/23/94 Permit # _____
Checked By _____ License No. _____

See Site Map For Boring Location

COMMENTS:

Shelby sample collected @ 4–5'; Cobble layer @ ~ 5.5'. Cuttings collected @ 6'. Try to sample @ 8 because driller thinks we're thru layer. 9" into sample blow count=27, bouncing on cobble. No groundwater encountered. Boring filled with cement/bentonite.

Depth (ft.)	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					
0					0–5.5': Light brown to brown Silty Sand, trace clay, moist, no odor
2	0	12/8/8		ML	
4	4	10/11			
6	2				5.5–10': Light brown to tan, Sand and gravel and cobbles, very coarse, poorly graded, moist, no odor
8	0			GW	
10	0				Total Depth @ 10 feet.
12					
14					
16					
18					
20					
22					
24					

Drilling Log

GROUNDWATER TECHNOLOGY

Soil Boring B-07

Project Bloomfield Refining Company Owner Bloomfield Refining Company
Location Southwestern section of Fire Training Area Proj. No. 023353014
Surface Elev. _____ Total Hole Depth 12 ft. Diameter _____
Top of Casing _____ Water Level Initial _____ Static _____
Screen: Dia _____ Length _____ Type/Size _____
Casing: Dia _____ Length _____ Type _____
Fill Material _____ Rig/Core B55
Drill Co. Western Technology Method Split Spoon/Hollow Stem Auger (7")
Driller Rob Log By Tim Busby Date 02/23/94 Permit # _____
Checked By _____ License No. _____

See Site Map For Boring Location

COMMENTS:

Post hole to 2'. No groundwater encountered. Boring backfilled with cement/bentonite.

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0						0-7': Light brown to brown Sandy Silt, moist, no odor
2	0		2/2/1			
4	0		6/5/4		ML	
6	0		12/13/12			
						7-12': Light brown to brown Silty Sand, trace silt, moist, no odor
8	0					
10	0		5/6/7		SM	
12						Total Depth @ 12 feet.
14						
16						
18						
20						
22						
24						

Drilling Log

GROUNDWATER TECHNOLOGY

Soil Boring B-08

Project Bloomfield Refining Company Owner Bloomfield Refining Company
Location Southeastern section of Fire Training Area Proj. No. 023353014
Surface Elev. _____ Total Hole Depth 12 ft. Diameter _____
Top of Casing _____ Water Level Initial _____ Static _____
Screen: Dia _____ Length _____ Type/Size _____
Casing: Dia _____ Length _____ Type _____
Fill Material _____ Rig/Core B55
Drill Co. Western Technology Method Split Spoon/Hollow Stem Auger (7")
Driller Rob Log By Tim Busby Date 02/23/94 Permit # _____
Checked By _____ License No. _____

See Site Map For Boring Location

COMMENTS:

Post hole to 2'. No groundwater encountered. Boring backfilled with cement/bentonite.

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0						0-7.5': Light brown to brown Sandy Silt, moist, no odor
2	0		3/3/4			
4	0		6/5/7		ML	
6	1		8/13/16			
8	0		6/8/9		CL	7.5-8': Clay, trace sand, brown, moist, no odor
10	0		6/10/13		SM	8-12': Silty Sand, light brown to brown, moist, no odor
12						Total Depth @ 12 feet.
14						
16						
18						
20						
22						
24						

Drilling Log

GROUNDWATER TECHNOLOGY

Soil Boring B-09

Project Bloomfield Refining Company Owner Bloomfield Refining Company
Location Northeastern section of Fire Training Area Proj. No. 023353014
Surface Elev. _____ Total Hole Depth 10 ft. Diameter _____
Top of Casing _____ Water Level Initial _____ Static _____
Screen: Dia _____ Length _____ Type/Size _____
Casing: Dia _____ Length _____ Type _____
Fill Material _____ Rig/Core B55
Drill Co. Western Technology Method Split Spoon/Hollow Stem Auger (7")
Driller Rob Log By Tim Busby Date 02/23/94 Permit # _____
Checked By _____ License No. _____

See Site Map For Boring Location

COMMENTS:

Post hole to 2'. No groundwater encountered. Bag samples only @ 8 & 10'. No odor. Boring backfilled with cement/bentonite.

Depth (ft.)	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					
0					0-7.5': Silty Sand, light brown to brown, moist, no odor
2	0	4/3/3			
4	0	4/6/5		ML	
6	0	5/4/12			
8	0			CL	7.5-8': Clay, brown, moist, no odor, cobbles from 8-10'
10	0			GW	8-10': Cobbles Total Depth @ 10 feet.
12					
14					
16					
18					
20					
22					
24					

Drilling Log

GROUNDWATER TECHNOLOGY

Soil Boring B-10

Project Bloomfield Refining Company Owner Bloomfield Refining Company
Location Northwestern section of Fire Training Area Proj. No. 023353014
Surface Elev. _____ Total Hole Depth 12 ft. Diameter _____
Top of Casing _____ Water Level Initial _____ Static _____
Screen: Dia _____ Length _____ Type/Size _____
Casing: Dia _____ Length _____ Type _____
Fill Material _____ Rig/Core B55
Drill Co. Western Technology Method Split Spoon/Hollow Stem Auger (7")
Driller Rob Log By Tim Busby Date 02/23/94 Permit # _____
Checked By _____ License No. _____

See Site Map For Boring Location

COMMENTS:

Post hole to 2'. No groundwater encountered. Boring backfilled with cement/bentonite.

Depth (ft.)	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					
0					0-11': Silty Sand, light brown to brown, moist, no odor
2	0				
4	0	6/7/7			
6	0	4/5/7		ML	
8	0	5/7/4			
10	0	6/6/23			
12				CL	11-12': Clay and cobbles, brown, moist, no odor Total Depth @ 12 feet.
14					
16					
18					
20					
22					
24					

RPS JDC

Appendix C

Closure Plan for Unlined Evaporation Lagoons and the Spray Evaporation Area

CLOSURE PLAN
FOR THE
UNLINED EVAPORATION LAGOONS
AND THE
SPRAY EVAPORATION AREA

GIANT REFINING COMPANY - BLOOMFIELD
#50 COUNTY ROAD 4990
BLOOMFIELD, NEW MEXICO

PREPARED FOR:

NEW MEXICO OIL CONSERVATION DIVISION

PREPARED BY:

LYNN SHELTON
ENVIRONMENTAL MANAGER
GIANT REFINING COMPANY - BLOOMFIELD

AUGUST 13, 1996

TABLE OF CONTENTS

CLOSURE PLAN FOR THE UNLINED EVAPORATION LAGOONS AND THE SPRAY EVAPORATION AREA

GIANT REFINING COMPANY - BLOOMFIELD DISCHARGE PLAN GW-001

I. INTRODUCTION:

The Unlined Evaporation Lagoons and the Spray Evaporation Area (see Site Plan, Attachment A) have been identified in the Discharge Plan as units to be closed. Giant Refining Company - Bloomfield (GRC) has assumed the responsibility for entering into closure of those units. This closure plan will outline the closure activities and the subsequent uses of those units.

II. GENERAL INFORMATION:

1. Name of Discharger, Operator, and Owner

San Juan Refining Company
P.O. Box 159
Bloomfield, New Mexico 87413
(505) 632 8013

2. Facility Contacts

Lynn Shelton, Environmental Manager

3. Location of Facility

286.93 acres, more or less, being that portion of the NW1/4 NE1/4 and the S1/2 NE1/4 and the N1/2 NE1/4 SE1/4 of Section 27, and the S1/2 NW1/4 and the N1/2 NW1/4 SW1/4 and the SE1/4 NW1/4 SW1/4 and the NE1/4 SW1.4 of Section 26, Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico.

4. Type of Operation

Giant Refining Company - Bloomfield (GRC) is a petroleum refinery with a nominal crude capacity in barrels per calendar day (bpcd) of 18,000. Processing units include crude desalting, crude distillation, catalytic hydrotreating, catalytic reforming, fluidized catalytic cracking, catalytic polymerization, diesel hydrodesulfurization, gas concentration and treating, and sulfur recovery.

Crude supplies are delivered by pipeline and tank trucks. Products are sold, via tank trucks, from a product terminal operated by GRC.

III. BACKGROUND INFORMATION:

The Unlined Evaporation Lagoons consist of two earthen dike lagoons (lined with 4-6 inches of bentonite) of approximately 2.5 acres each. The process wastewater effluent flowed from the

North Oily Water Pond into the north Unlined Lagoon and then into the south Unlined Lagoon. The water evaporated in place or was transferred to the Spray Evaporation Area to enhance evaporation. Studies showed the lagoons to seep water at a rate of 10 to 20 gallons per minute. Monitor Well MW-1, which is immediately down-gradient of the lagoons, has traditionally been sampled semi-annually to detect any contamination of the uppermost perched water table that might be associated with the seepage from these lagoons.

After completion of the Class I injection well, the ponds were decommissioned in 1994 and scheduled for closure. The water remaining in the ponds was allowed to evaporate. Soil samples around the lagoons were collected and analyzed in 1993 during the RCRA Facility Investigation and found to be non-hazardous.

The Spray Evaporation Area was used to spray process water from the Unlined Evaporation Lagoons to enhance evaporation. Although diked to prevent runoff, the area did not typically store water. Because of the dikes, the RFI study concluded that the Spray Evaporation Area as well as the Unlined Evaporation Lagoons were unlikely to allow runoff to contaminate surface waters. Monitor Well MW-5 is immediately down-gradient of the evaporation area and has been traditionally sampled semi-annually to detect any contamination to the uppermost perch water table as a result from seepage from the spray evaporation activities.

The Spray Evaporation Area was decommissioned in 1994.

GRC is preparing this Closure Plan as required by the facility's Discharge Plan GW-001, Section 6.1.4 and the Attachment To The Discharge Plan GW-001 Approval Letter, dated January 29, 1996.

IV. GEOLOGY / HYDROLOGY:

Geology and hydrology at the refinery are amply documented in the Discharge Permit GD-001, Section 9.0, Site Characteristics, and is included here by reference.

V. SAMPLING AND ANALYSIS:

GRC arranged for a technician from Philip Environmental to sample the Unlined Evaporation Lagoons, the Spray Evaporation Area, and a background sample on July 10, 1996. The samples were collected according to standard SW-846 protocol at sampling points selected by GRC and approved by the Oil Conservation Division. The sampling event of July 10, 1996 was witnessed by Mr. Denny Foust of the OCD Aztec office.

A copy of the sampling site drawings, the Soil Sample Identification Numbering System, the WQCC constituent list (including both the WQCC standard and the lab reporting limits), the approval letter from OCD dated June 20, 1996, and the soil sampling report from Philip Environmental are included as Attachment B.

The soil samples were analyzed by Inter-Mountain Laboratories, Inc. in Farmington, New Mexico. The results of those analyses were tabulated to expedite reference. The original and tabulated analytical data is presented in Attachment C.

VI. DISCUSSION OF ANALYTICAL RESULTS:

Analytical data indicates that no organic hydrocarbons were detected in either the Unlined Evaporation Lagoons or the Spray Evaporation Area. Elevated levels of some metals over the background sample were observed, particularly Iron and Aluminum. Chromium and Lead were detected at very near background levels, with Selenium not being detected in any sample. Inorganic Chloride and Sulfate were observed at slightly above background levels. pH was observed at relatively neutral levels.

GRC concludes that the analytical data does not present any justification for additional cleanup activities prior to closure and reuse of the affected areas.

VII. CLOSURE:

GRC proposes to enter into clean closure of both the Unlined Evaporation Lagoons and the Spray Evaporation Area. Sampling and analysis performed in 1993 and 1996 has demonstrated that there is no evidence of potential releases at the facility from any future use of either unit. Future uses of the units, which is described below, either make beneficial use of the unit (Unlined Evaporation Lagoons) or require site work at the unit (Spray Evaporation Area) that is similar to what would be performed in normal closure.

Based on the above conclusions, GRC proposes that no additional closure activity other than those described below will be required. Furthermore, GRC proposes that the semi-annual sampling and analysis of monitoring wells MW-1 and MW-5 be discontinued.

VIII. FUTURE USE OF THE UNITS:

GRC proposes to use the decommissioned Unlined Evaporation Lagoons as fresh water make-up ponds. These two lagoons would replace the two smaller make-up ponds that are presently in service. The additional capacity of the new lagoons would provide GRC with additional flexibility in the use of the river water make-up via additional settling time for suspended solids, particularly when the river is turbid, and additional capacity in case of river pump failure. The use of the unlined evaporation lagoons will not create an increased possibility of contamination to the uppermost perched water table. Furthermore, the seepage rates of the two sets of lagoons are nearly identical.

GRC proposes to use the Spray Evaporation Area as the site for Giant's Pipeline and Transportation truck shop and parking area as well as an office complex. Civil work performed at the site will be essentially the same as would be performed by installing and grading a soil cap under normal closure activities. The entire site would be graded and profiled to provide for construction of the new facilities which would eliminate the dikes in the spray evaporation area.

IX. CONCLUSION:

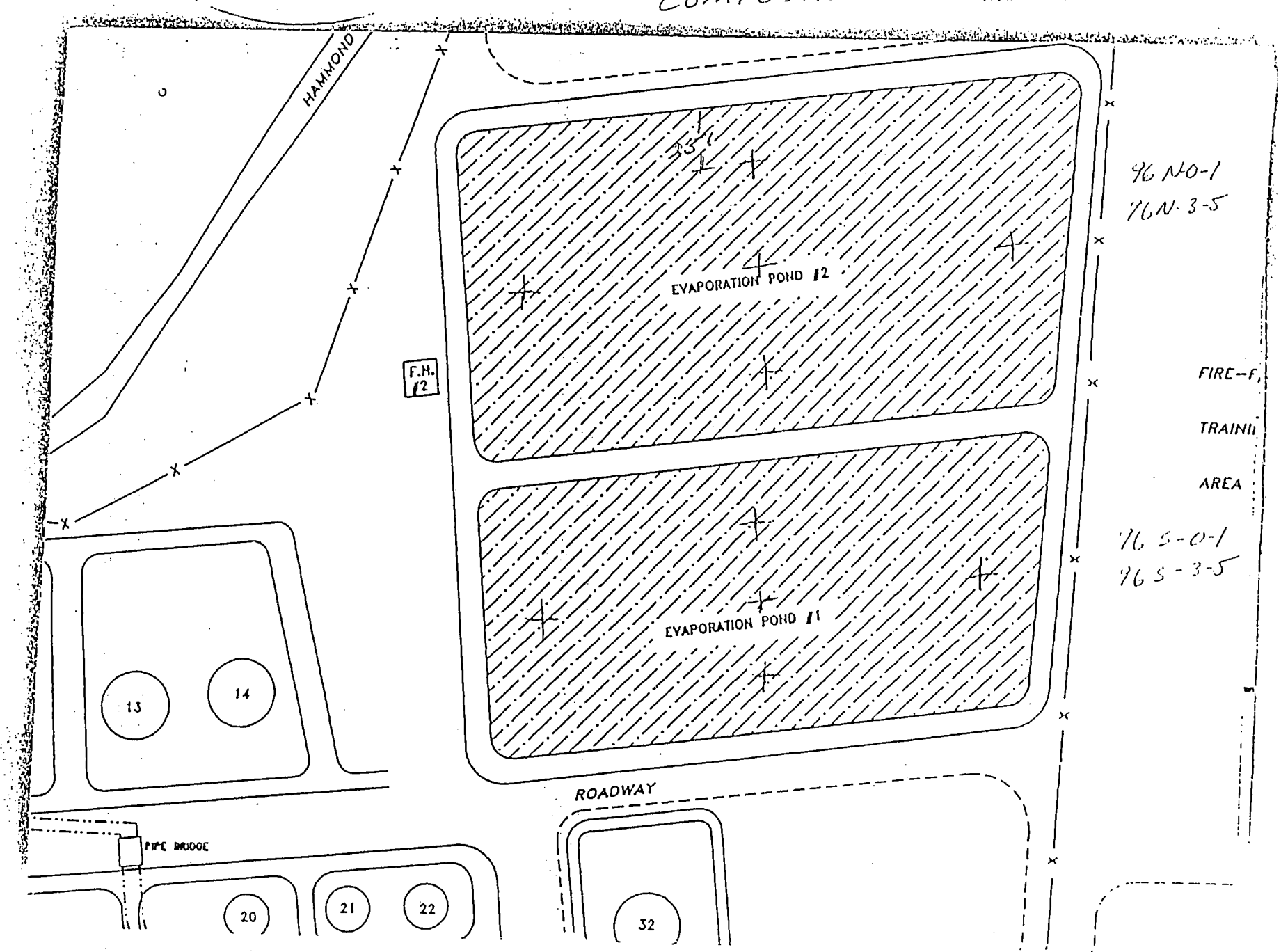
GRC has provided analytical data that corroborates the 1993 RFI data that indicates that no concentrations of hazardous constituents exist in either the Unlined Evaporation Lagoons or the Spray Evaporation Area that would require extraordinary closure activities. The future uses of the affected units will make beneficial use of the land that are occupied by the two units.

ATTACHMENT A

ATTACHMENT B

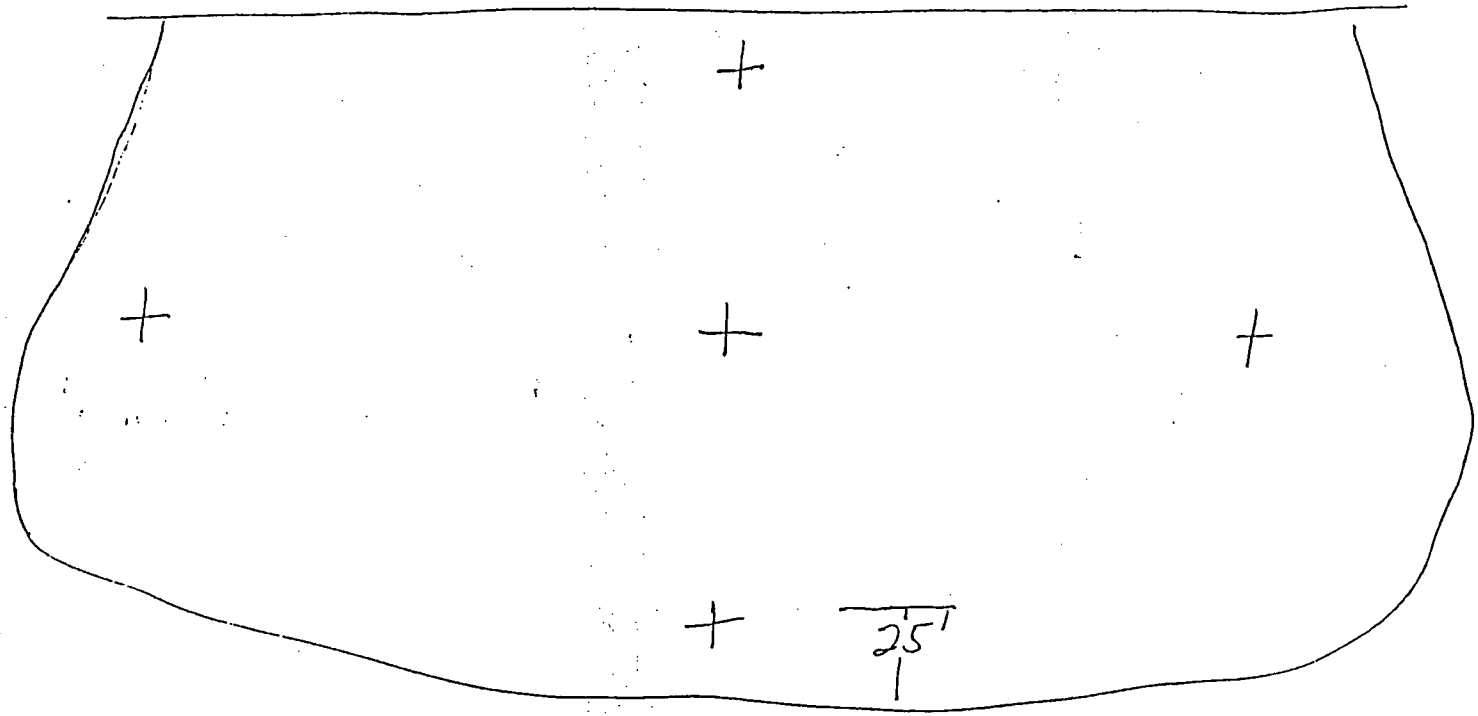
7/1/96

COMPOSITE AT
COMPOSITE AT 3.0



EVAPORATION SPRAY AREA

96E-0-1
96E-3-5



NOT TO SCALE TLS 7/1/96

SOIL SAMPLE IDENTIFICATION NUMBERING SYSTEM

OCD SOIL SAMPLING EVENT
JULY 10, 1996
GIANT REFINING COMPANY - BLOOMFIELD

EXAMPLE:

96 N - 0-1

96	=	1996 Sampling Event
N	=	North Evaporation Lagoon
S	=	South Evaporation Lagoon
E	=	Spray Evaporation Area
B	=	Background Sample
0-1	=	Surface to 1 foot depth interval
3-5	=	Three to five feet depth interval

Total of eight samples, each location composited.

WQCC CONSTITUENT LIST

1996 OCD SAMPLING EVENT

JULY 10, 1996

Parameter	WQCC Standard (mg/l)	Lab Reporting Limit (mg/kg)
Arsenic	0.1	0.25
Barium	1.0	1.0
Cadmium	0.01	0.05
Chromium	0.05	0.5
Cyanide	0.2	0.2
Flouride	1.6	1.6
Lead	0.05	0.25
Total Mercury	0.002	0.2
Nitrate (NO3 as N)	10.0	10.0
Selenium	0.05	0.25
Silver	0.05	0.5
Uranium	5.0	10.0
Benzene	0.01	0.2
Toluene	0.75	0.2
Carbon Tetrachloride	0.01	0.2
1,2-Dichloroethane	0.01	0.2
1,1-Dichloroethylene	0.005	0.2
1,1,2,2-Tetrachloroethylene	0.02	0.2
1,1,2-Trichloroethylene	0.1	0.2
Ethylbenzene	0.75	0.2
Total Xylenes	0.62	0.2
Methylene Chloride	0.1	0.2
Chloroform	0.1	0.2
1,1-Dichloroethane	0.025	0.2
Ethylene Dibromide	0.0001	0.2
1,1,1-Trichloroethane	0.06	0.2
1,1,2-Trichlorethane	0.01	0.2
1,1,2,2-Tetrachloroethane	0.01	0.2
Vinyl Chloride	0.001	0.2
PAHs: total Naphthalene plus monomethylnaphthalenes	0.03	0.6
Benzo(a)pyrene	0.0007	0.5
Chloride	250	250
Copper	1.0	1.0
Iron	1.0	1.25
Manganese	0.2	0.5
Phenols	0.005	1.0
Sulfate (SO4)	600	600
Zinc	10	10.0
pH	6 to 9	6 to 9
Aluminum	5.0	5.0
Boron	0.75	2.5
Cobalt	0.05	0.5
Molybdenum	1.0	1.0
Nickel	0.2	0.5

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

June 20, 1996

CERTIFIED MAIL
RETURN RECEIPT NO.P-594-835-145

Mr. Lynn Shelton
Environmental Manager
Giant Industries
P.O. Box 159
Bloomfield, NM 87413

RE: Soil Sampling Parameters
Faxed to OCD on May 6, 1996

Dear Mr. Shelton:

The New Mexico Oil Conservation Division (OCD) has reviewed the Fax submitted from Giant regarding the sampling of the soil underlying the evaporation lagoons. The OCD approves of the list with the requirement that only WQCC 3103 A, B, and C constituents be analyzed for in the soils utilizing approved sample collection and analysis methods as outlined in SW-846 and approved by the EPA. The OCD will require Giant to contact the Santa Fe Office at (505)-827-7156 and Mr. Denny Foust with the District at 334- 6178 one week before the soil samples are taken so that the OCD may have a representative at the site during the sample collection.

Please submit the results with a cover letter discussing the course of action Giant wishes to pursue with the area that are being sampled for these parameters outlined above to the Santa Fe OCD office for approval with a copy sent to Mr. Denny Foust with the Aztec District OCD office.

If Giant has any questions regarding this matter please feel free to call me at (505)-827-7156.

Sincerely,

Patricio W. Sanchez
Petroleum Engineering Specialist

XC: Mr. Denny Foust

PHILIP ENVIRONMENTAL

Environmental Services Group
Southern Region

July 22, 1996 Project 16633

Mr. Lynn Shelton
Environmental Manager
Giant Refining Company
P.O. Box 159
Bloomfield, New Mexico 87413

RE: Report for Soil Sampling at Giant Refining Company's Evaporation Spray Areas at the Bloomfield Refinery, Bloomfield, New Mexico

Dear Mr. Shelton:

On July 10, 1996, Philip Environmental Services Corporation (Philip) initiated field work for soil sampling at Giant Refining Company's (Giant) Bloomfield Refinery, Bloomfield, New Mexico. Composite soil samples were collected within two separate Evaporation Lagoons and one Evaporation Spray Area, located at the Bloomfield Refinery, in addition to the collection of two composite background samples.

Sampling activities were conducted in the presence of representatives from Giant and the New Mexico Oil Conservation Division. Samples were preserved on ice and hand delivered by Giant, under chain of custody, to Inter-Mountain Laboratories Inc., in Farmington, New Mexico and were analyzed for New Mexico Water Quality Control Commission (WQCC) parameters, which are presented in Attachment A.

METHODOLOGY

Five-point composite soil samples were collected from two distinct layers within each evaporation Lagoon. One sample point was located in the middle of the Lagoon, with the other four sample points at locations 25 feet from each side of the containment dike in each Lagoon. Sample locations are presented in Attachment B. The first five-point composite sample was collected from the surface to approximately 1 foot below ground surface (bgs). The second five-point composite sample was collected from approximately 3 -5 feet bgs.

In addition to the samples collected within the three Evaporation Lagoons, two background samples were collected from an area upgradient of the Evaporation Lagoons. The background samples were collected from two separate borings, which were composited at intervals of 0 -1 foot bgs and 3 -5 foot bgs.

Samples were collected from each boring by advancing a stainless steel hand auger to the desired depth, and placing the soil in a stainless steel bowl. After soil was collected from the specified interval from each of the five separate borings within the Lagoon, it was then composited and containerized. Sample containers were labeled with a unique identification number, depth of collection, and sample time and date. Samples were then preserved on ice prior to delivery to the laboratory.

Prior to sample collection, all sampling equipment was decontaminated with an Alconox™ detergent and potable water wash, followed by a propanol rinse. When not in use, sampling equipment was kept covered to avoid potential contamination.

SUMMARY

A total of six five-point composite samples were collected from the Evaporation Lagoons, with two five-point composite samples collected from the background area. Sample identification numbers, locations, and soil descriptions are presented in Soil Sampling Data Sheets in Attachment C. Soil collected from the North Evaporation Lagoon from the 0 -1 foot and 3 -5 foot bgs intervals exhibited a black discolored sandy clay interval. Soil collected form the South Evaporation Lagoon exhibited a dark gray discolored sandy clay interval within the 0 -1 foot bgs sample interval. Samples collected from the spray evaporation area and the background area did not exhibit any visible discoloration.

If you have any questions or require further information, please feel free to contact Cory M. Chance at Philip's Farmington, New Mexico office at (505) 326-2262.

Sincerely,

PHILIP ENVIRONMENTAL SERVICES CORPORATION

Cory M. Chance

Cory M. Chance
Geologist

Attachments:

A. WQCC Analytical Parameters
B. Sample Locations
C. Soil Sampling Data forms

ATTACHMENT A

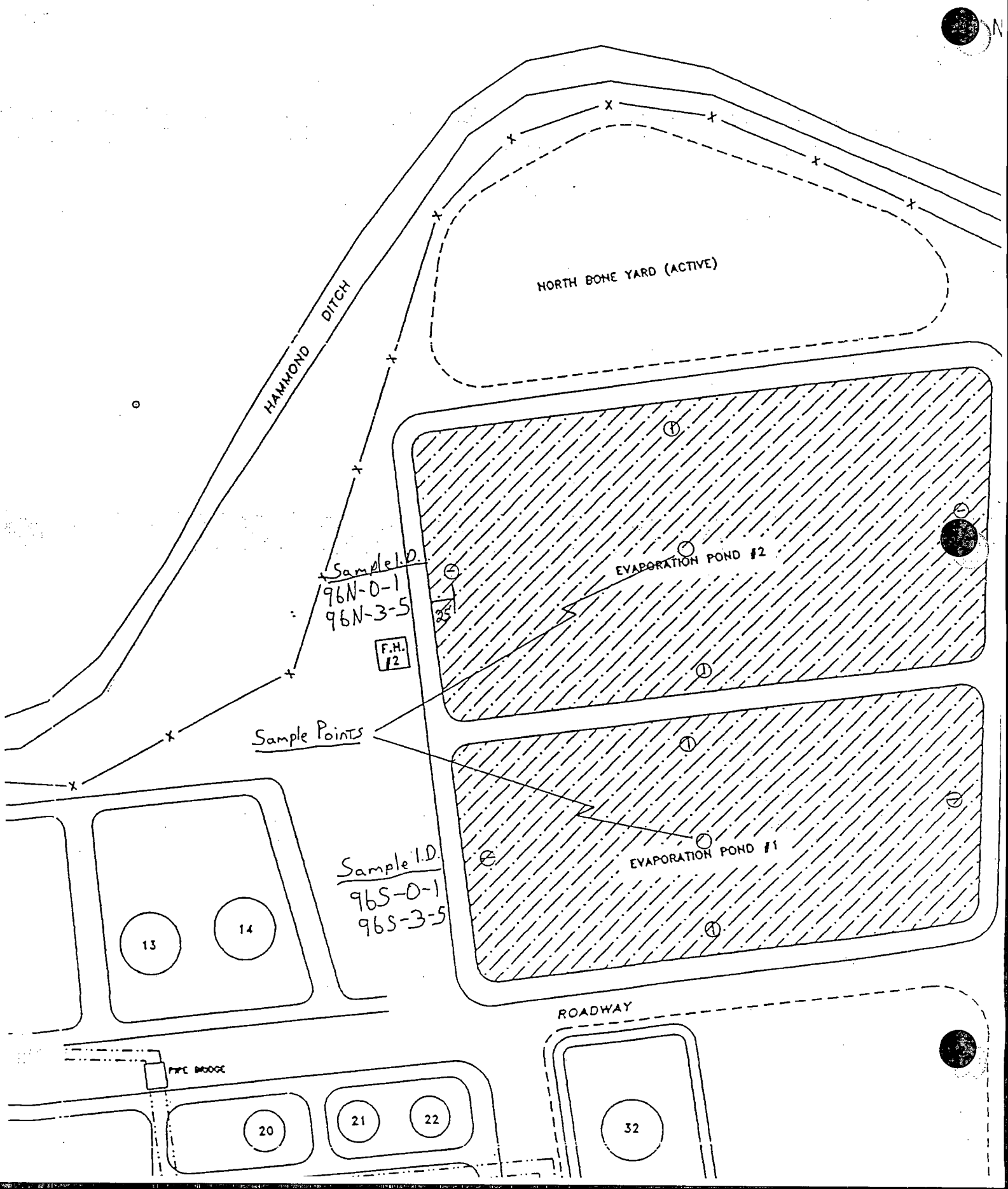
WQCC CONSTITUENT LIST

1996 OCD SAMPLING EVENT

JULY 10, 1996

Parameter	WQCC Standard (mg/l)	Lab Reporting Limit (mg/kg)
Arsenic	0.1	0.25
Barium	1.0	1.0
Cadmium	0.01	0.05
Chromium	0.05	0.5
Cyanide	0.2	0.2
Flouride	1.6	1.6
Lead	0.05	0.25
Total Mercury	0.002	0.2
Nitrate (NO3 as N)	10.0	10.0
Selenium	0.05	0.25
Silver	0.05	0.5
Uranium	5.0	10.0
Benzene	0.01	0.2
Toluene	0.75	0.2
Carbon Tetrachloride	0.01	0.2
1,2-Dichloroethane	0.01	0.2
1,1-Dichloroethylene	0.005	0.2
1,1,2,2-Tetrachloroethylene	0.02	0.2
1,1,2-Trichloroethylene	0.1	0.2
Ethylbenzene	0.75	0.2
Total Xylenes	0.62	0.2
Methylene Chloride	0.1	0.2
Chloroform	0.1	0.2
1,1-Dichloroethane	0.025	0.2
Ethylene Dibromide	0.0001	0.2
1,1,1-Trichloroethane	0.06	0.2
1,1,2-Trichlorethane	0.01	0.2
1,1,2,2-Tetrachloroethane	0.01	0.2
Vinyl Chloride	0.001	0.2
PAHs: total Naphthalene plus monomethylnaphthalenes	0.03	0.6
Benzo(a)pyrene	0.0007	0.5
Chloride	250	250
Copper	1.0	1.0
Iron	1.0	1.25
Manganese	0.2	0.5
Phenols	0.005	1.0
Sulfate (SO4)	600	600
Zinc	10	10.0
pH	6 to 9	6 to 9
Aluminum	5.0	5.0
Boron	0.75	2.5
Cobalt	0.05	0.5
Molybdenum	1.0	1.0
Nickel	0.2	0.5

ATTACHMENT B


N
HAMMOND DITCH
NORTH BONE YARD (ACTIVE)
Sample I.D.
96N-0-1
96N-3-5
F.H. #2
EVAPORATION POND #2
Sample Points
EVAPORATION POND #1
Sample I.D.
96S-0-1
96S-3-5
13
14
ROADWAY
PIPE BRIDGE
20
21
22
32

PHILIP ENVIRONMENTAL

SITE SKETCH

Serial No. SS-

Title Evaporation Spray Area & Backgroun

Project Name Giant Soil Sampling

Project No. 16633

Project Manager CM Chance

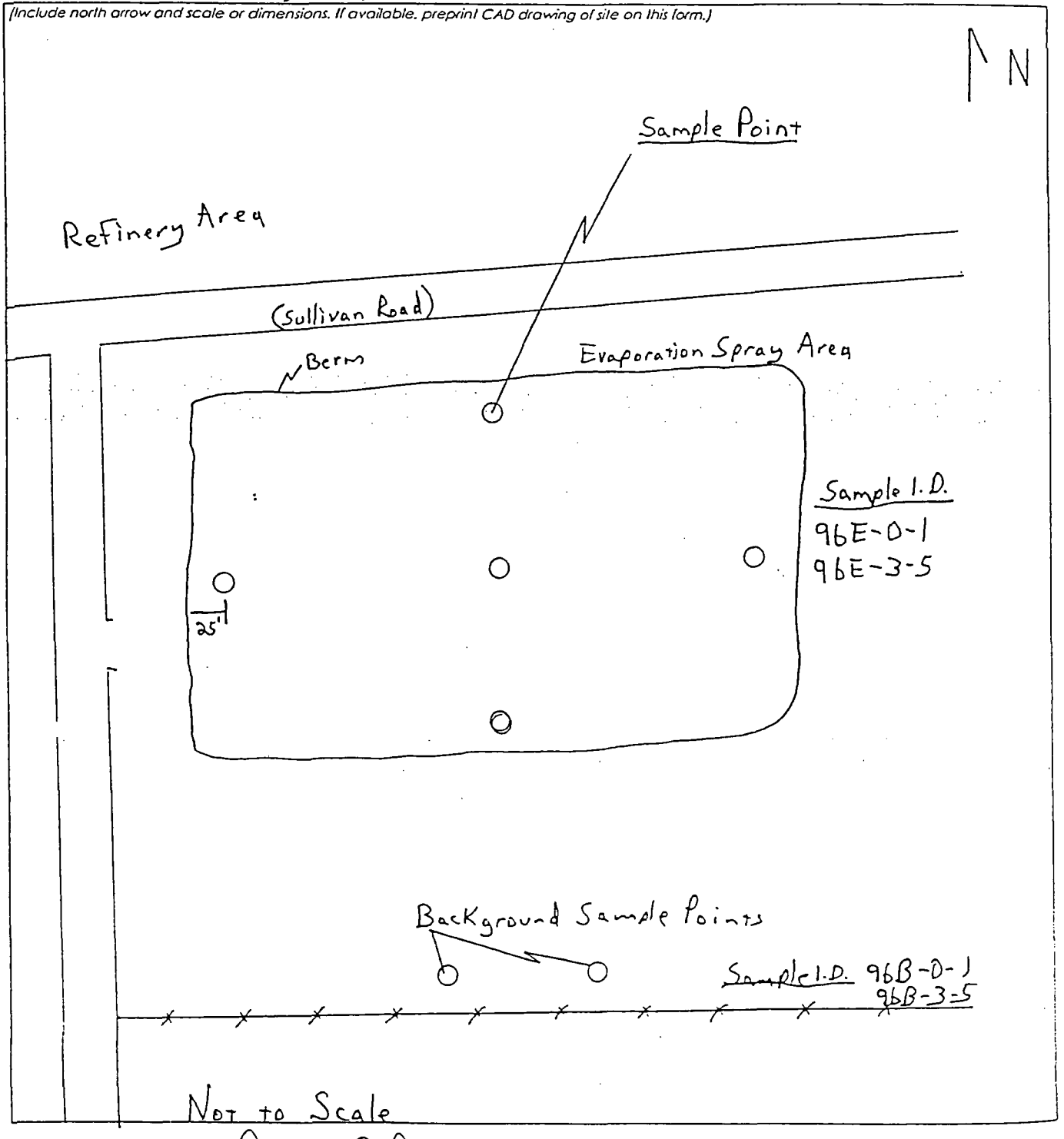
Phase.Task No. 1000.77

Client Company Giant Refining Co

Site Name Bloomfield Refinery

Site Address Bloomfield, NM

(Include north arrow and scale or dimensions. If available, preprint CAD drawing of site on this form.)



Sketched by (signature) Cory Chance

Date 7/11/96

ATTACHMENT C

PHILIP ENVIRONMENTAL

SOIL/SEDIMENT/SLUDGE SAMPLING DATA

Serial No. SSSSD

Date 7/10/96

Project Name Giant Soil Sampling

Project No. 16633

Project Manager CM Chance

Phase.Task No. 1000 .77

Client Company Giant

Site Name Giant Refinery

Site Address Bloomfield, New Mexico

Sampling Method
- ☑ Hand Auger
- ☐ Spoon
- ☐ Backhoe
- ☐ Drill Rig
- ☐ Other

QA
- ☐ Primary
- ☐ Duplicate

Reason For Collection
- ☑ Lab Analysis
- ☐ On-Site Headspace
- ☐ Physical Testing
- ☐ Other

Type of Sample
- ☐ Grab
- ☑ Composite

Portable Screening Instrument Used ☐ None

Type	Manufacturer	Model
☐ PID (Lamp ____ eV)		
☐ FID		
☐ CGI		
☐ Other		
☐ Other		

Sample No.	Location	Time Collected	Sample Type			Volume Collected	Field Instrument Reading
			Soil	Sed.	Slg.		
96N-0-1	North Evaporation Lagoon	1015	✓			3-500 ml 1-1000 ml	
	Lt br-br silty SAND abnt clay, F-med, tr gravel, BIK clayey sand						
96N-3-5	A/A	1130	✓			A/A	
96S-0-1	South Evaporation Lagoon	1345	✓			A/A	
	DK Gry, sandy clay, wet, odor						
96S-3-5	lt br sand, vf-f sand, mod clay, sl moist, tr gravel	1430	✓			A/A	

Chain-of-Custody Form Number

Comments

Signature Cory M Chance Date 7/10/96 Reviewer Date

PHILIP ENVIRONMENTAL

SOIL/SEDIMENT/SLUDGE SAMPLING DATA

Serial No. SSSSD

Date 7/11/96

Project Name Giant Soil Sampling

Project No. 16633

Project Manager CM Chance

Phase.Task No. 1000.77

Client Company Giant

Site Name Giant Refinery (Bloomfield Refinery)

Site Address Bloomfield, New Mexico

Sampling Method
- ☑ Hand Auger
- ☐ Spoon
- ☐ Backhoe
- ☐ Drill Rig
- ☐ Other

QA
- ☐ Primary
- ☐ Duplicate

Reason For Collection
- ☑ Lab Analysis
- ☐ On-Site Headspace
- ☐ Physical Testing
- ☐ Other

Portable Screening Instrument Used ☐ None

Type	Manufacturer	Model
☐ PID (Lamp____eV)		
☐ FID		
☐ CGI		
☐ Other		
☐ Other		

Type of Sample
- ☐ Grab
- ☑ Composite

Sample No.	Location	Time Collected	Sample Type: Soil	Sample Type: Sed.	Sample Type: Slg.	Volume Collected	Field Instrument Reading
96E-0-1	Spray Evaporation Area	0945	✓			3-500ml 1-1000ml	
	Lt Br SILT, trf-med sand, tr-med clay, dry						
96E-3-5	Lt Br silty CLAY, tr f-med sand, dry	1045	✓			A/A	
96B-0-1	Background (S. of Evap. Area along S. fenceline)	1145	✓			A/A	
	lt br silty tr vf-f sand, clay loose, dry						
96B-3-5	Lt br silty sand, vf-f sand, tr clay, loose, dry	1200	✓			A/A	

Chain-of-Custody Form Number _____

Comments _____

Signature Cory M. Chance Date 7/11/96 Reviewer _____ Date _____

ATTACHMENT C

TABULATED ANALYTICAL DATA FOR CLOSURE ACTIVITIES

GIANT REFINING COMPANY - BLOOMFIELD

JULY, 1996

NORTH UNLINED LAGOON

Parameter	Units	0-1 Foot Result	3-5 Feet Result	WQCC Standard	Laboratory Limit
Aluminum	mg/kg	6,144.00	6,020.00	5.00	5.00
Arsenic	mg/kg	<0.50	<0.50	0.10	0.25
Barium	mg/kg	99.40	93.20	1.00	1.00
Boron	mg/kg	49.50	47.30	0.75	2.50
Cadmium	mg/kg	<0.10	<0.10	0.01	0.05
Chromium	mg/kg	8.00	5.80	0.05	0.50
Cobalt	mg/kg	3.38	3.01	0.05	0.50
Copper	mg/kg	6.09	4.68	1.00	1.00
Iron	mg/kg	7,722.00	8,416.00	1.00	1.25
Lead	mg/kg	7.22	6.80	0.05	0.25
Manganese	mg/kg	140.00	173.00	0.20	0.50
Mercury	mg/kg	<0.10	<0.10	0.002	0.20
Molybdenum	mg/kg	<1.00	<1.00	1.00	1.00
Nickel	mg/kg	5.64	5.46	0.20	0.50
Selenium	mg/kg	<0.50	<0.50	0.05	0.25
Silver	mg/kg	<1.00	<1.00	0.05	0.50
Uranium	mg/kg	54.90	60.40	5.00	10.00
Zinc	mg/kg	30.30	23.30	10.00	10.00
Lab pH	s.u.	6.90	8.00	6 to 9	6 to 9
Fluoride	ppm	0.53	1.25	1.60	1.60
Chloride	ppm	3783.00	998.00	250.00	250.00
Sulfate	ppm	3638.00	370.00	600.00	600.00
Cyanide	mg/Kg	<0.10	<0.10	0.20	0.20
Nitrate as Nitrogen	ppm	0.46	0.05	10.00	10.00
Benzene	mg/kg	ND	ND	0.01	0.20
Toluene	mg/kg	ND	ND	0.75	0.20
Carbon Tetrachloride	mg/kg	ND	ND	0.01	0.20
1,2-Dichloroethane	mg/kg	ND	ND	0.01	0.20
1,1-Dichloroethylene	mg/kg	ND	ND	0.0005	0.20
1,1,2,2-Tetrachloroethylene	mg/kg	ND	ND	0.02	0.20
1,1,2-Trichloroethylene	mg/kg	ND	ND	0.1	0.20
Ethylbenzene	mg/kg	ND	ND	0.75	0.20
Total Xylenes	mg/kg	ND	ND	0.62	0.20
Methylene Chloride	mg/kg	ND	ND	0.1	0.20
Chloroform	mg/kg	ND	ND	0.1	0.20
1,1-Dichloroethane	mg/kg	ND	ND	0.025	0.20
Ethylene Dibromide	mg/kg	ND	ND	0.0001	0.20
1,1,1-Trichloroethane	mg/kg	ND	ND	0.06	0.20
1,1,2-Trichloroethane	mg/kg	ND	ND	0.01	0.20
1,1,2,2-Tetrachloroethane	mg/kg	ND	ND	0.01	0.20
Vinyl Chloride	mg/kg	ND	ND	0.01	0.20
PAHs: total Naphthalene plus	mg/kg				
monomethylnaphthalenes	mg/kg	ND	ND	0.03	0.60
Benzo(a)pyrene	mg/kg	ND	ND	0.0007	0.50

TABULATED ANALYTICAL DATA FOR CLOSURE ACTIVITIES

GIANT REFINING COMPANY - BLOOMFIELD

JULY, 1996

SOUTH UNLINED LAGOON

Parameter	Units	0-1 Foot Result	3-5 Feet Result	WQCC Standard	Laboratory Limit
Aluminum	mg/kg	7,646.00	3,820.00	5.00	5.00
Arsenic	mg/kg	<0.50	<0.50	0.10	0.25
Barium	mg/kg	154.00	48.10	1.00	1.00
Boron	mg/kg	47.60	40.80	0.75	2.50
Cadmium	mg/kg	<0.10	<0.10	0.01	0.05
Chromium	mg/kg	30.90	4.20	0.05	0.50
Cobalt	mg/kg	3.99	1.78	0.05	0.50
Copper	mg/kg	10.70	3.46	1.00	1.00
Iron	mg/kg	10,486.00	5,068.00	1.00	1.25
Lead	mg/kg	7.72	4.93	0.05	0.25
Manganese	mg/kg	230.00	107.00	0.20	0.50
Mercury	mg/kg	<0.10	<0.10	0.002	0.20
Molybdenum	mg/kg	<1.00	<1.00	1.00	1.00
Nickel	mg/kg	8.34	3.04	0.20	0.50
Selenium	mg/kg	<0.50	<0.50	0.05	0.25
Silver	mg/kg	3.11	<1.00	0.05	0.50
Uranium	mg/kg	69.50	29.50	5.00	10.00
Zinc	mg/kg	52.30	15.70	10.00	10.00
Lab pH	s.u.	7.10	7.90	6 to 9	6 to 9
Fluoride	ppm	0.35	2.71	1.60	1.60
Chloride	ppm	2711.00	445.00	250.00	250.00
Sulfate	ppm	3193.00	469.00	600.00	600.00
Cyanide	mg/Kg	0.25	<0.10	0.20	0.20
Nitrate as Nitrogen	ppm	0.69	0.08	10.00	10.00
Benzene	mg/kg	ND	ND	0.01	0.20
Toluene	mg/kg	ND	ND	0.75	0.20
Carbon Tetrachloride	mg/kg	ND	ND	0.01	0.20
1,2-Dichloroethane	mg/kg	ND	ND	0.01	0.20
1,1-Dichloroethylene	mg/kg	ND	ND	0.0005	0.20
1,1,2,2-Tetrachloroethylene	mg/kg	ND	ND	0.02	0.20
1,1,2-Trichloroethylene	mg/kg	ND	ND	0.1	0.20
Ethylbenzene	mg/kg	ND	ND	0.75	0.20
Total Xylenes	mg/kg	ND	ND	0.62	0.20
Methylene Chloride	mg/kg	ND	ND	0.1	0.20
Chloroform	mg/kg	ND	ND	0.1	0.20
1,1-Dichloroethane	mg/kg	ND	ND	0.025	0.20
Ethylene Dibromide	mg/kg	ND	ND	0.0001	0.20
1,1,1-Trichloroethane	mg/kg	ND	ND	0.06	0.20
1,1,2-Trichloroethane	mg/kg	ND	ND	0.01	0.20
1,1,2,2-Tetrachloroethane	mg/kg	ND	ND	0.01	0.20
Vinyl Chloride	mg/kg	ND	ND	0.01	0.20
PAHs: total Naphthalene plus	mg/kg				
monomethylnaphthalenes	mg/kg	ND	ND	0.03	0.50
Benzo(a)pyrene	mg/kg	ND	ND	0.0007	0.50

TABULATED ANALYTICAL DATA FOR CLOSURE ACTIVITIES

GIANT REFINING COMPANY - BLOOMFIELD

JULY, 1996

SPRAY EVAPORATION AREA

Parameter	Units	0-1 Foot Result	3-5 Feet Result	WQCC Standard	Laboratory Limit
Aluminum	mg/kg	10,122.00	7,102.00	5.00	5.00
Arsenic	mg/kg	1.16	0.53	0.10	0.25
Barium	mg/kg	195.00	189.00	1.00	1.00
Boron	mg/kg	55.80	56.90	0.75	2.50
Cadmium	mg/kg	0.16	<0.10	0.01	0.05
Chromium	mg/kg	9.48	7.48	0.05	0.50
Cobalt	mg/kg	5.06	4.11	0.05	0.50
Copper	mg/kg	3.58	2.32	1.00	1.00
Iron	mg/kg	13,097.00	10,569.00	1.00	1.25
Lead	mg/kg	11.60	7.69	0.05	0.25
Manganese	mg/kg	223.00	240.00	0.20	0.50
Mercury	mg/kg	<0.10	<0.10	0.002	0.20
Molybdenum	mg/kg	<1.00	1.05	1.00	1.00
Nickel	mg/kg	1.16	7.38	0.20	0.50
Selenium	mg/kg	<0.50	<0.50	0.05	0.25
Silver	mg/kg	<1.00	<1.00	0.05	0.50
Uranium	mg/kg	86.40	66.40	5.00	10.00
Zinc	mg/kg	45.30	30.60	10.00	10.00
Lab pH	s.u.	7.60	7.80	6 to 9	6 to 9
Fluoride	ppm	1.15	1.76	1.60	1.60
Chloride	ppm	2582.00	1235.00	250.00	250.00
Sulfate	ppm	2156.00	724.00	600.00	600.00
Cyanide	mg/Kg	<0.10	<0.10	0.20	0.20
Nitrate as Nitrogen	ppm	6.42	0.51	10.00	10.00
Benzene	mg/kg	ND	ND	0.01	0.20
Toluene	mg/kg	ND	ND	0.75	0.20
Carbon Tetrachloride	mg/kg	ND	ND	0.01	0.20
1,2-Dichloroethane	mg/kg	ND	ND	0.01	0.20
1,1-Dichloroethylene	mg/kg	ND	ND	0.0005	0.20
1,1,2,2-Tetrachloroethylene	mg/kg	ND	ND	0.02	0.20
1,1,2-Trichloroethylene	mg/kg	ND	ND	0.1	0.20
Ethylbenzene	mg/kg	ND	ND	0.75	0.20
Total Xylenes	mg/kg	ND	ND	0.62	0.20
Methylene Chloride	mg/kg	ND	ND	0.1	0.20
Chloroform	mg/kg	ND	ND	0.1	0.20
1,1-Dichloroethane	mg/kg	ND	ND	0.025	0.20
Ethylene Dibromide	mg/kg	ND	ND	0.0001	0.20
1,1,1-Trichloroethane	mg/kg	ND	ND	0.06	0.20
1,1,2-Trichloroethane	mg/kg	ND	ND	0.01	0.20
1,1,2,2-Tetrachloroethane	mg/kg	ND	ND	0.01	0.20
Vinyl Chloride	mg/kg	ND	ND	0.01	0.20
PAHs: total Naphthalene plus	mg/kg				
monomethylnaphthalenes	mg/kg	ND	ND	0.03	0.60
Benzo(a)pyrene	mg/kg	ND	ND	0.0007	0.50

TABULATED ANALYTICAL DATA FOR CLOSURE ACTIVITIES

GIANT REFINING COMPANY - BLOOMFIELD

JULY, 1996

BACKGROUND SAMPLE

Parameter	Units	0-1 Foot Result	3-5 Feet Result	WQCC Standard	Laboratory Limit
Aluminum	mg/kg	6,199.00	3,266.00	5.00	5.00
Arsenic	mg/kg	<0.50	<0.50	0.10	0.25
Barium	mg/kg	166.00	56.00	1.00	1.00
Boron	mg/kg	55.00	51.90	0.75	2.50
Cadmium	mg/kg	0.10	<0.10	0.01	0.05
Chromium	mg/kg	6.85	3.16	0.05	0.50
Cobalt	mg/kg	3.84	1.83	0.05	0.50
Copper	mg/kg	2.18	3.87	1.00	1.00
Iron	mg/kg	9,401.00	4,751.00	1.00	1.25
Lead	mg/kg	8.00	4.99	0.05	0.25
Manganese	mg/kg	205.00	113.00	0.20	0.50
Mercury	mg/kg	<0.10	<0.10	0.002	0.20
Molybdenum	mg/kg	<1.00	<1.00	1.00	1.00
Nickel	mg/kg	7.27	3.46	0.20	0.50
Selenium	mg/kg	<0.50	<0.50	0.05	0.25
Silver	mg/kg	<1.00	<1.00	0.05	0.50
Uranium	mg/kg	84.10	31.10	5.00	10.00
Zinc	mg/kg	33.20		10.00	10.00
Lab pH	s.u.	7.50	8.20	6 to 9	6 to 9
Fluoride	ppm	0.77	0.38	1.60	1.60
Chloride	ppm	1054.00	324.00	250.00	250.00
Sulfate	ppm	2790.00	395.00	600.00	600.00
Cyanide	mg/Kg	<0.10	<0.10	0.20	0.20
Nitrate as Nitrogen	ppm	14.20	<0.05	10.00	10.00
Benzene	mg/kg	ND	ND	0.01	0.20
Toluene	mg/kg	ND	ND	0.75	0.20
Carbon Tetrachloride	mg/kg	ND	ND	0.01	0.20
1,2-Dichloroethane	mg/kg	ND	ND	0.01	0.20
1,1-Dichloroethylene	mg/kg	ND	ND	0.0005	0.20
1,1,2,2-Tetrachloroethylene	mg/kg	ND	ND	0.02	0.20
1,1,2-Trichloroethylene	mg/kg	ND	ND	0.1	0.20
Ethylbenzene	mg/kg	ND	ND	0.75	0.20
Total Xylenes	mg/kg	ND	ND	0.62	0.20
Methylene Chloride	mg/kg	ND	ND	0 1	0.20
Chloroform	mg/kg	ND	ND	0.1	0.20
1,1-Dichloroethane	mg/kg	ND	ND	0.025	0.20
Ethylene Dibromide	mg/kg	ND	ND	0.0001	0.20
1,1,1-Trichloroethane	mg/kg	ND	ND	0.06	0.20
1,1,2-Trichloroethane	mg/kg	ND	ND	0.01	0.20
1,1,2,2-Tetrachloroethane	mg/kg	ND	ND	0.01	0.20
Vinyl Chloride	mg/kg	ND	ND	0.01	0.20
PAHs: total Naphthalene plus	mg/kg				
monomethylnaphthalenes	mg/kg	ND	ND	0.03	0.60
Benzo(a)pyrene	mg/kg	ND	ND	0.0007	0.50

Inter·Mountain
Laboratories, Inc.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

5 August 1996

Lynn Shelton
Giant Refining Co.
P. O. Box 159
Bloomfield, NM 87413

Mr. Shelton:

Enclosed please find the report for the samples received by our laboratory for analysis on July 10, 1996.

If you have any questions about the results of these analyses, please don't hesitate to call me at your convenience.

Sincerely,

Anna Schaerer

Anna Schaerer
Organic Analyst/IML-Farmington

Enclosure

xc: File

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	Giant Refining Co.		
Project:	Bloomfield		
Sample ID:	96S-0-1	Date Reported:	08/05/96
Laboratory ID:	0396G01318	Date Sampled:	07/10/96
Sample Matrix:	Soil	Time Sampled:	1:30 PM
Condition:	Cool/Intact	Date Received:	07/10/96

Parameter	Analytical Result	Units
Lab pH	7.1	s.u.
Fluoride	0.35	ppm
Chloride	2,711	ppm
Sulfate	3,193	ppm
Cyanide	0.25	mg/Kg
Nitrate as Nitrogen	0.69	ppm
Trace Metals (Total)		
Aluminum	7,646	mg/Kg
Arsenic	<0.5	mg/Kg
Barium	154	mg/Kg
Boron	47.6	mg/Kg
Cadmium	<0.10	mg/Kg
Chromium	30.9	mg/Kg
Cobalt	3.99	mg/Kg
Copper	10.7	mg/Kg
Iron	10,486	mg/Kg
Lead	7.72	mg/Kg
Manganese	230	mg/Kg
Mercury	<0.10	mg/Kg
Molybdenum	<1.00	mg/Kg
Nickel	8.34	mg/Kg
Selenium	<0.50	mg/Kg
Silver	3.11	mg/Kg
Uranium	69.5	mg/Kg
Zinc	52.3	mg/Kg

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by _____ Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Stree:
Farmington, New Mexico 87401

Client:	Giant Refining Co.		
Project:	Bloomfield		
Sample ID:	96S-3-5	Date Reported:	08/05/96
Laboratory ID:	0396G01319	Date Sampled:	07/10/96
Sample Matrix:	Soil	Time Sampled:	2:30 PM
Condition:	Cool/Intact	Date Received:	07/10/96

Parameter	Analytical Result	Units
Lab pH	7.9	s.u.
Fluoride	2.71	ppm
Chloride	445	ppm
Sulfate	469	ppm
Cyanide	<0.10	mg/Kg
Nitrate as Nitrogen	0.08	ppm
Trace Metals (Total)		
Aluminum	3,820	mg/Kg
Arsenic	<0.50	mg/Kg
Barium	48.1	mg/Kg
Boron	40.8	mg/Kg
Cadmium	<0.10	mg/Kg
Chromium	4.20	mg/Kg
Cobalt	1.78	mg/Kg
Copper	3.46	mg/Kg
Iron	5,068	mg/Kg
Lead	4.93	mg/Kg
Manganese	107	mg/Kg
Mercury	<0.10	mg/Kg
Molybdenum	<1.0	mg/Kg
Nickel	3.04	mg/Kg
Selenium	<0.50	mg/Kg
Silver	<1.0	mg/Kg
Uranium	29.5	mg/Kg
Zinc	15.7	mg/Kg

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by _____ Reviewed by _____

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	Giant Refining Co.		
Project:	Bloomfield		
Sample ID:	96N-0-1	Date Reported:	08/05/96
Laboratory ID:	0396G01320	Date Sampled:	07/10/96
Sample Matrix:	Soil	Time Sampled:	10:11 AM
Condition:	Cool/Intact	Date Received:	07/10/96

Parameter	Analytical Result	Units
Lab pH	6.9	s.u.
Fluoride	0.53	ppm
Chloride	3,783	ppm
Sulfate	3,638	ppm
Cyanide	<0.10	mg/Kg
Nitrate as Nitrogen	0.46	ppm
Trace Metals (Total)		
Aluminum	6,144	mg/Kg
Arsenic	<0.50	mg/Kg
Barium	99.4	mg/Kg
Boron	49.5	mg/Kg
Cadmium	<0.10	mg/Kg
Chromium	8.00	mg/Kg
Cobalt	3.38	mg/Kg
Copper	6.09	mg/Kg
Iron	7,722	mg/Kg
Lead	7.22	mg/Kg
Manganese	140	mg/Kg
Mercury	<0.10	mg/Kg
Molybdenum	<1.00	mg/Kg
Nickel	5.64	mg/Kg
Selenium	<0.50	mg/Kg
Silver	<1.0	mg/Kg
Uranium	54.9	mg/Kg
Zinc	30.3	mg/Kg

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by _____ Reviewed by _____

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	Giant Refining Co.		
Project:	Bloomfield		
Sample ID:	96N-3-5	Date Reported:	08/05/96
Laboratory ID:	0396G01321	Date Sampled:	07/10/96
Sample Matrix:	Soil	Time Sampled:	11:30 AM
Condition:	Cool/Intact	Date Received:	07/10/96

Parameter	Analytical Result	Units
Lab pH	8.0	s.u.
Fluoride	1.25	ppm
Chloride	998	ppm
Sulfate	370	ppm
Cyanide	<0.10	mg/Kg
Nitrate as Nitrogen	0.05	ppm
Trace Metals (Total)		
Aluminum	6,020	mg/Kg
Arsenic	<0.50	mg/Kg
Barium	93.2	mg/Kg
Boron	47.3	mg/Kg
Cadmium	<0.10	mg/Kg
Chromium	5.80	mg/Kg
Cobalt	3.01	mg/Kg
Copper	4.68	mg/Kg
Iron	8,416	mg/Kg
Lead	6.80	mg/Kg
Manganese	173	mg/Kg
Mercury	<0.10	mg/Kg
Molybdenum	<1.0	mg/Kg
Nickel	5.46	mg/Kg
Selenium	<0.50	mg/Kg
Silver	<1.0	mg/Kg
Uranium	60.4	mg/Kg
Zinc	23.3	mg/Kg

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by _____ Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Quality Control / Quality Assurance

Known Analysis

Total Metals

Client:	Giant Refining	Date Reported:	08/05/96
Project:	Bloomfield	Date Sampled:	07/10/96
Lab ID:	0396G01318-22	Date Received:	07/10/96
Matrix:	Soil		
Condition:	Cool / Intact		

Known Analysis

Parameter	Found Result	Known Result	Units	Percent Recovery
Aluminum	0.94	1.00	mg/L	94%
Arsenic	0.009	0.010	mg/L	90%
Barium	0.91	1.00	mg/L	91%
Boron	0.95	1.00	mg/L	95%
Cadmium	0.004	0.004	mg/L	100%
Chromium	1.02	1.00	mg/L	102%
Cobalt	0.91	1.00	mg/L	91%
Copper	0.005	0.005	mg/L	100%
Iron	0.96	1.00	mg/L	96%
Lead	0.040	0.040	mg/L	100%
Manganese	1.01	1.00	mg/L	101%
Mercury	0.440	0.400	mg/L	110%
Molybdenum	1.01	1.00	mg/L	101%
Nickel	1.01	1.00	mg/L	101%
Selenium	0.010	0.010	mg/L	100%
Silver	0.004	0.004	mg/L	98%
Uranium	1.19	1.00	mg/L	119%
Zinc	1.01	1.00	mg/L	101%

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported By: _____ Reviewed By: _____

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Quality Control / Quality Assurance

Spike Analysis

Total Metals

Client:	**Giant Refining**	Date Reported:	08/05/96
Project:	Bloomfield	Date Sampled:	07/10/96
Lab ID:	0396G01318-22	Date Received:	07/10/96
Matrix:	Soil		
Condition:	Cool / Intact		

Spike Analysis

Parameter	Spiked Sample Result (mg/L	Sample Result (mg/L	Spike Added (mg/L	Percent Recovery
Aluminum	9.14	<0.05	10.0	91%
Arsenic	0.029	0.001	0.030	93%
Barium	1.26	0.88	0.50	92%
Boron	0.89	0.44	0.50	99%
Cadmium	0.002	<0.001	0.002	108%
Chromium	0.58	0.07	0.50	103%
Cobalt	0.47	0.03	0.50	89%
Copper	0.007	0.002	0.005	106%
Iron	9.28	<0.025	10.00	93%
Lead	0.032	0.010	0.025	106%
Manganese	1.63	1.24	0.50	98%
Mercury	0.55	<0.10	0.50	98%
Molybdenum	0.53	<0.10	0.50	105%
Nickel	0.56	0.05	0.50	103%
Selenium	0.024	0.001	0.025	92%
Silver	0.003	<0.001	0.003	108%
Uranium	0.95	0.49	0.50	102%
Zinc	0.79	0.27	0.50	109%

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported By: dt

Reviewed By: JB

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Quality Control / Quality Assurance

Blank Analysis
Total Metals

Client:	Giant Refining		
Project:	Bloomfield	Date Reported:	08/05/96
Lab ID:	0396G01318-22	Date Sampled:	07/10/96
Matrix:	Soil	Date Received:	07/10/96
Condition:	Cool / Intact		

Blank Analysis

Parameter	Result	Detection Limit (mg/L)
Aluminum	ND	5.00
Arsenic	ND	0.50
Barium	ND	1.00
Boron	ND	5.00
Cadmium	ND	0.10
Chromium	ND	1.00
Cobalt	ND	1.00
Copper	ND	0.10
Iron	ND	2.50
Lead	ND	0.50
Manganese	ND	1.00
Mercury	ND	0.10
Molybdenum	ND	1.00
Nickel	ND	1.00
Selenium	ND	0.50
Silver	ND	1.00
Uranium	ND	20.0
Zinc	ND	5.00

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by: _____ Reviewed by: _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	96 S-0-1		Date Reported:	07/30/96
Project ID:	Bloomfield, NM		Date Sampled:	07/10/96
Lab ID:	B965796	0396G01318	Date Received:	07/12/96
Matrix:	Soil		Date Extracted:	07/16/96
			Date Analyzed:	07/18/96

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Hexanone	ND	1.0	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

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Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	96 S-0-1		Date Reported:	07/30/96
Project ID:	Bloomfield, NM		Date Sampled:	07/10/96
Lab ID:	B965796	0396G01318	Date Received:	07/12/96
Matrix:	Soil		Date Extracted:	07/16/96
			Date Analyzed:	07/18/96

Parameter	Result	PQL	Units

Continued

trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	94	70 - 121
Bromofluorobenzene	107	74 - 121
Toluene-d8	109	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client: GIANT REFINING COMPANY
Sample ID: 96 S-0-1
Project ID: Bloomfield, NM
Lab ID: B965796 0396G01318
Matrix: Soil

Date Reported: 07/25/96
Date Sampled: 07/10/96
Date Received: 07/12/96
Date Extracted: 07/17/96
Date Analyzed: 07/22/96

Parameter	Result	PQL	Units
1,2,4-Trichlorobenzene	ND	5.0	mg/kg
1,2-Dichlorobenzene	ND	5.0	mg/kg
1,3-Dichlorobenzene	ND	5.0	mg/kg
1,4-Dichlorobenzene	ND	5.0	mg/kg
2,4,5-Trichlorophenol	ND	10	mg/kg
2,4,6-Trichlorophenol	ND	10	mg/kg
2,4-Dichlorophenol	ND	5.0	mg/kg
2,4-Dimethylphenol	ND	5.0	mg/kg
2,4-Dinitrophenol	ND	10	mg/kg
2,4-Dinitrotoluene	ND	5.0	mg/kg
2,6-Dinitrotoluene	ND	5.0	mg/kg
2-Chloronaphthalene	ND	5.0	mg/kg
2-Chlorophenol	ND	5.0	mg/kg
2-Methylnaphthalene	ND	5.0	mg/kg
2-Methylphenol	ND	5.0	mg/kg
2-Nitroaniline	ND	25	mg/kg
2-Nitrophenol	ND	5.0	mg/kg
3,3'-Dichlorobenzidine	ND	10	mg/kg
3-Methylphenol/4-Methylphenol	ND	5.0	mg/kg
3-Nitroaniline	ND	25	mg/kg
4,6-Dinitro-2-methylphenol	ND	25	mg/kg
4-Bromophenyl-phenylether	ND	5.0	mg/kg
4-Chloro-3-methylphenol	ND	10	mg/kg
4-Chloroaniline	ND	10	mg/kg
4-Chlorophenyl-phenylether	ND	5.0	mg/kg
4-Nitroaniline	ND	10	mg/kg
4-Nitrophenol	ND	10	mg/kg
Acenaphthene	ND	5.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/25/96
Sample ID:	96 S-0-1		Date Sampled:	07/10/96
Project ID:	Bloomfield, NM		Date Received:	07/12/96
Lab ID:	B965796	0396G01318	Date Extracted:	07/17/96
Matrix:	Soil		Date Analyzed:	07/22/96

Parameter	Result	PQL	Units
Continued			
Acenaphthylene	ND	5.0	mg/kg
Anthracene	ND	5.0	mg/kg
Benzo(a)anthracene	ND	5.0	mg/kg
Benzo(a)pyrene	ND	5.0	mg/kg
Benzo(b)fluoranthene	ND	5.0	mg/kg
Benzo(g,h,i)perylene	ND	5.0	mg/kg
Benzo(k)fluoranthene	ND	5.0	mg/kg
Benzoic Acid	ND	25	mg/kg
Benzyl Alcohol	ND	10	mg/kg
bis(2-Chloroethoxy)methane	ND	5.0	mg/kg
bis(2-Chloroethyl)ether	ND	5.0	mg/kg
bis(2-Chloroisopropyl)ether	ND	5.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	25	mg/kg
Butylbenzylphthalate	ND	5.0	mg/kg
Chrysene	ND	5.0	mg/kg
Di-n-Butylphthalate	ND	25	mg/kg
Di-n-Octylphthalate	ND	25	mg/kg
Dibenz(a,h)anthracene	ND	5.0	mg/kg
Dibenzofuran	ND	5.0	mg/kg
Diethylphthalate	ND	5.0	mg/kg
Dimethylphthalate	ND	5.0	mg/kg
Fluoranthene	ND	5.0	mg/kg
Fluorene	ND	5.0	mg/kg
Hexachlorobenzene	ND	10	mg/kg
Hexachlorobutadiene	ND	10	mg/kg
Hexachlorocyclopentadiene	ND	5.0	mg/kg
Hexachloroethane	ND	10	mg/kg
Indeno(1,2,3-cd)pyrene	ND	5.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	96 S-0-1		Date Reported:	07/25/96
Project ID:	Bloomfield, NM		Date Sampled:	07/10/96
Lab ID:	B965796	0396G01318	Date Received:	07/12/96
Matrix:	Soil		Date Extracted:	07/17/96
			Date Analyzed:	07/22/96

Parameter	Result	PQL	Units
Continued			
Isophorone	ND	5.0	mg/kg
N-Nitrosodi-n-propylamine	ND	5.0	mg/kg
N-Nitrosodiphenylamine	ND	5.0	mg/kg
Naphthalene	ND	5.0	mg/kg
Nitrobenzene	ND	5.0	mg/kg
Pentachlorophenol	ND	25	mg/kg
Phenanthrene	ND	5.0	mg/kg
Phenol	ND	5.0	mg/kg
Pyrene	ND	5.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	52	19 - 122
2-Fluorobiphenyl	65	30 - 115
2-Fluorophenol	46	25 - 121
Nitrobenzene-d5	53	23 - 120
Phenol-d6	51	24 - 113
Terphenyl-d14	47	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRA

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: 96 S-3-5
Project ID: Bloomfield, NM
Lab ID: B965797 0396G01319
Matrix: Soil

Date Reported: 07/30/96
Date Sampled: 07/10/96
Date Received: 07/12/96
Date Extracted: 07/16/96
Date Analyzed: 07/18/96

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Hexanone	ND	1.0	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		Date Reported:	07/30/96
Sample ID:	96 S-3-5		Date Sampled:	07/10/96
Project ID:	Bloomfield, NM		Date Received:	07/12/96
Lab ID:	B965797	0396G01319	Date Extracted:	07/16/96
Matrix:	Soil		Date Analyzed:	07/18/96

Parameter	Result	PQL	Units
Continued			
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	90	70 - 121
Bromofluorobenzene	100	74 - 121
Toluene-d8	102	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E.D. 7/31/96

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	96 S-3-5		Date Reported:	07/25/96
Project ID:	Bloomfield, NM		Date Sampled:	07/10/96
Lab ID:	B965797	0396G01319	Date Received:	07/12/96
Matrix:	Soil		Date Extracted:	07/17/96
			Date Analyzed:	07/23/96

Parameter	Result	PQL	Units
1,2,4-Trichlorobenzene	ND	1.0	mg/kg
1,2-Dichlorobenzene	ND	1.0	mg/kg
1,3-Dichlorobenzene	ND	1.0	mg/kg
1,4-Dichlorobenzene	ND	1.0	mg/kg
2,4,5-Trichlorophenol	ND	2.0	mg/kg
2,4,6-Trichlorophenol	ND	2.0	mg/kg
2,4-Dichlorophenol	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
',4-Dinitrotoluene	ND	1.0	mg/kg
⁄,6-Dinitrotoluene	ND	1.0	mg/kg
2-Chloronaphthalene	ND	1.0	mg/kg
2-Chlorophenol	ND	1.0	mg/kg
2-Methylnaphthalene	ND	1.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
2-Nitroaniline	ND	5.0	mg/kg
2-Nitrophenol	ND	1.0	mg/kg
3,3'-Dichlorobenzidine	ND	2.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
3-Nitroaniline	ND	5.0	mg/kg
4,6-Dinitro-2-methylphenol	ND	5.0	mg/kg
4-Bromophenyl-phenylether	ND	1.0	mg/kg
4-Chloro-3-methylphenol	ND	2.0	mg/kg
4-Chloroaniline	ND	2.0	mg/kg
4-Chlorophenyl-phenylether	ND	1.0	mg/kg
4-Nitroaniline	ND	2.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
Acenaphthene	ND	1.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	96 S-3-5		Date Reported:	07/25/96
Project ID:	Bloomfield, NM		Date Sampled:	07/10/96
Lab ID:	B965797	0396G01319	Date Received:	07/12/96
Matrix:	Soil		Date Extracted:	07/17/96
			Date Analyzed:	07/23/96

Parameter	Result	PQL	Units
Continued			
Acenaphthylene	ND	1.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(g,h,i)perylene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
Benzoic Acid	ND	5.0	mg/kg
Benzyl Alcohol	ND	2.0	mg/kg
bis(2-Chloroethoxy)methane	ND	1.0	mg/kg
bis(2-Chloroethyl)ether	ND	1.0	mg/kg
bis(2-Chloroisopropyl)ether	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dibenzofuran	ND	1.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Fluorene	ND	1.0	mg/kg
Hexachlorobenzene	ND	2.0	mg/kg
Hexachlorobutadiene	ND	2.0	mg/kg
Hexachlorocyclopentadiene	ND	1.0	mg/kg
Hexachloroethane	ND	2.0	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	96 S-3-5		Date Reported:	07/25/96
Project ID:	Bloomfield, NM		Date Sampled:	07/10/96
Lab ID:	B965797	0396G01319	Date Received:	07/12/96
Matrix:	Soil		Date Extracted:	07/17/96
			Date Analyzed:	07/23/96

Parameter	Result	PQL	Units
Continued			
Isophorone	ND	1.0	mg/kg
N-Nitrosodi-n-propylamine	ND	1.0	mg/kg
N-Nitrosodiphenylamine	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Nitrobenzene	ND	1.0	mg/kg
Pentachlorophenol	ND	5.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg
ıe	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	55	19 - 122
2-Fluorobiphenyl	62	30 - 115
2-Fluorophenol	58	25 - 121
Nitrobenzene-d5	63	23 - 120
Phenol-d6	64	24 - 113
Terphenyl-d14	47	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)

ference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

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EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	96 N-0-1		Date Reported:	07/30/96
Project ID:	Bloomfield, NM		Date Sampled:	07/10/96
Lab ID:	B965798	0396G01320	Date Received:	07/12/96
Matrix:	Soil		Date Extracted:	07/16/96
			Date Analyzed:	07/18/96

Parameter	Result	PQL	Units
Continued			
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	92	70 - 121
Bromofluorobenzene	107	74 - 121
Toluene-d8	105	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E.D. 7/31/96

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client: GIANT REFINING COMPANY
Sample ID: 96 N-0-1
Project ID: Bloomfield, NM
Lab ID: B965798 0396G01320
Matrix: Soil

Date Reported: 07/25/96
Date Sampled: 07/10/96
Date Received: 07/12/96
Date Extracted: 07/17/96
Date Analyzed: 07/22/96

Parameter	Result	PQL	Units
1,2,4-Trichlorobenzene	ND	5.0	mg/kg
1,2-Dichlorobenzene	ND	5.0	mg/kg
1,3-Dichlorobenzene	ND	5.0	mg/kg
1,4-Dichlorobenzene	ND	5.0	mg/kg
2,4,5-Trichlorophenol	ND	10	mg/kg
2,4,6-Trichlorophenol	ND	10	mg/kg
2,4-Dichlorophenol	ND	5.0	mg/kg
2,4-Dimethylphenol	ND	5.0	mg/kg
2,4-Dinitrophenol	ND	10	mg/kg
2,4-Dinitrotoluene	ND	5.0	mg/kg
2,6-Dinitrotoluene	ND	5.0	mg/kg
2-Chloronaphthalene	ND	5.0	mg/kg
2-Chlorophenol	ND	5.0	mg/kg
2-Methylnaphthalene	ND	5.0	mg/kg
2-Methylphenol	ND	5.0	mg/kg
2-Nitroaniline	ND	25	mg/kg
2-Nitrophenol	ND	5.0	mg/kg
3,3'-Dichlorobenzidine	ND	10	mg/kg
3-Methylphenol/4-Methylphenol	ND	5.0	mg/kg
3-Nitroaniline	ND	25	mg/kg
4,6-Dinitro-2-methylphenol	ND	25	mg/kg
4-Bromophenyl-phenylether	ND	5.0	mg/kg
4-Chloro-3-methylphenol	ND	10	mg/kg
4-Chloroaniline	ND	10	mg/kg
4-Chlorophenyl-phenylether	ND	5.0	mg/kg
4-Nitroaniline	ND	10	mg/kg
4-Nitrophenol	ND	10	mg/kg
Acenaphthene	ND	5.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client: GIANT REFINING COMPANY
Sample ID: 96 N-0-1
Project ID: Bloomfield, NM
Lab ID: B965798 0396G01320
Matrix: Soil

Date Reported: 07/25/96
Date Sampled: 07/10/96
Date Received: 07/12/96
Date Extracted: 07/17/96
Date Analyzed: 07/22/96

Parameter	Result	PQL	Units
Continued			
Isophorone	ND	5.0	mg/kg
N-Nitrosodi-n-propylamine	ND	5.0	mg/kg
N-Nitrosodiphenylamine	ND	5.0	mg/kg
Naphthalene	ND	5.0	mg/kg
Nitrobenzene	ND	5.0	mg/kg
Pentachlorophenol	ND	25	mg/kg
Phenanthrene	ND	5.0	mg/kg
Phenol	ND	5.0	mg/kg
Pyrene	ND	5.0	mg/kg

JALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	49	19 - 122
2-Fluorobiphenyl	58	30 - 115
2-Fluorophenol	44	25 - 121
Nitrobenzene-d5	49	23 - 120
Phenol-d6	49	24 - 113
Terphenyl-d14	42	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed

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EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: 96 N-3-5
Project ID: Bloomfield, NM
Lab ID: B965799 0396G01321
Matrix: Soil

Date Reported: 07/30/96
Date Sampled: 07/10/96
Date Received: 07/12/96
Date Extracted: 07/16/96
Date Analyzed: 07/17/96

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Hexanone	ND	1.0	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg
nzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg

Continued

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EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		Date Reported:	07/30/96
Sample ID:	96 N-3-5		Date Sampled:	07/10/96
Project ID:	Bloomfield, NM		Date Received:	07/12/96
Lab ID:	B965799	0396G01321	Date Extracted:	07/16/96
Matrix:	Soil		Date Analyzed:	07/17/96

Parameter	Result	PQL	Units
Continued			
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	99	70 - 121
Bromofluorobenzene	110	74 - 121
luene-d8	111	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E.D. 7/31/96

Reviewed

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client: GIANT REFINING COMPANY
Sample ID: 96 N-3-5
Project ID: Bloomfield, NM
Lab ID: B965799 0396G01321
Matrix: Soil

Date Reported: 07/25/96
Date Sampled: 07/10/96
Date Received: 07/12/96
Date Extracted: 07/17/96
Date Analyzed: 07/23/96

Parameter	Result	PQL	Units
1,2,4-Trichlorobenzene	ND	1.0	mg/kg
1,2-Dichlorobenzene	ND	1.0	mg/kg
1,3-Dichlorobenzene	ND	1.0	mg/kg
1,4-Dichlorobenzene	ND	1.0	mg/kg
2,4,5-Trichlorophenol	ND	2.0	mg/kg
2,4,6-Trichlorophenol	ND	2.0	mg/kg
2,4-Dichlorophenol	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2,4-Dinitrotoluene	ND	1.0	mg/kg
`-Dinitrotoluene	ND	1.0	mg/kg
ż-Chloronaphthalene	ND	1.0	mg/kg
2-Chlorophenol	ND	1.0	mg/kg
2-Methylnaphthalene	ND	1.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
2-Nitroaniline	ND	5.0	mg/kg
2-Nitrophenol	ND	1.0	mg/kg
3,3'-Dichlorobenzidine	ND	2.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
3-Nitroaniline	ND	5.0	mg/kg
4,6-Dinitro-2-methylphenol	ND	5.0	mg/kg
4-Bromophenyl-phenylether	ND	1.0	mg/kg
4-Chloro-3-methylphenol	ND	2.0	mg/kg
4-Chloroaniline	ND	2.0	mg/kg
4-Chlorophenyl-phenylether	ND	1.0	mg/kg
4-Nitroaniline	ND	2.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
Acenaphthene	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/25/96
Sample ID:	96 N-3-5		Date Sampled:	07/10/96
Project ID:	Bloomfield, NM		Date Received:	07/12/96
Lab ID:	B965799	0396G01321	Date Extracted:	07/17/96
Matrix:	Soil		Date Analyzed:	07/23/96

Parameter	Result	PQL	Units
Continued			
Acenaphthylene	ND	1.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(g,h,i)perylene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
Benzoic Acid	ND	5.0	mg/kg
Benzyl Alcohol	ND	2.0	mg/kg
bis(2-Chloroethoxy)methane	ND	1.0	mg/kg
(2-Chloroethyl)ether	ND	1.0	mg/kg
bis(2-Chloroisopropyl)ether	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dibenzofuran	ND	1.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Fluorene	ND	1.0	mg/kg
Hexachlorobenzene	ND	2.0	mg/kg
Hexachlorobutadiene	ND	2.0	mg/kg
Hexachlorocyclopentadiene	ND	1.0	mg/kg
Hexachloroethane	ND	2.0	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	96 N-3-5		Date Reported:	07/25/96
Project ID:	Bloomfield, NM		Date Sampled:	07/10/96
Lab ID:	B965799	0396G01321	Date Received:	07/12/96
Matrix:	Soil		Date Extracted:	07/17/96
			Date Analyzed:	07/23/96

Parameter	Result	PQL	Units
Continued			
Isophorone	ND	1.0	mg/kg
N-Nitrosodi-n-propylamine	ND	1.0	mg/kg
N-Nitrosodiphenylamine	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Nitrobenzene	ND	1.0	mg/kg
Pentachlorophenol	ND	5.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg
Pyrene	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	51	19 - 122
2-Fluorobiphenyl	51	30 - 115
2-Fluorophenol	44	25 - 121
Nitrobenzene-d5	49	23 - 120
Phenol-d6	50	24 - 113
Terphenyl-d14	46	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RAD

Reviewed WS

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QUALITY ASSURANCE / QUALITY CONTROL

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Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8240
INSTRUMENT BLANK

Date Analyzed: 07/18/96
Lab ID: IBS006200
Matrix:

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg
2-Hexanone	ND	1.0	mg/kg

Continued

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LAB QA/QC
EPA METHOD 8240
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Date Analyzed: 07/18/96
Lab ID: IBS006200
Matrix:

Parameter	Result	PQL	Units
Continued			
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
Bromofluorobenzene	106	74 - 121
1,2-Dichloroethane-d4	89	70 - 121
Toluene-d8	107	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst E.D. 7/31/96

Reviewed WS

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LAB QA/QC
EPA METHOD 8240
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Date Analyzed: 07/17/96
Lab ID: IBS006199
Matrix:

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg
2-Hexanone	ND	1.0	mg/kg

Continued

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LAB QA/QC
EPA METHOD 8240
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Date Analyzed: 07/17/96
Lab ID: IBS006199
Matrix:

Parameter	Result	PQL	Units
Continued			
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
Bromofluorobenzene	111	74 - 121
1,2-Dichloroethane-d4	92	70 - 121
Toluene-d8	110	81 - 117

Analyst E.O. 7/31/96

Reviewed

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LAB QA/QC
EPA METHOD 8240
METHOD BLANK

Date Analyzed: 07/17/96
Lab ID: MBS006198
Matrix: Sand
Date Extracted: 07/16/96

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Hexanone	ND	1.0	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8240
METHOD BLANK

Date Analyzed: 07/17/96
Lab ID: MBS006198
Matrix: Sand
Date Extracted: 07/16/96

Parameter	Result	PQL	Units
Continued			
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	95	70 - 121
Bromofluorobenzene	105	74 - 121
Toluene-d8	110	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst E.O. 7/31/96

Reviewed WS

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8270
METHOD BLANK

Date Analyzed: 07/20/96
Lab ID: MBS96199
Matrix: Soil
Date Extracted: 07/17/96

Parameter	Result	PQL	Units
1,2,4-Trichlorobenzene	ND	1.0	mg/kg
1,2-Dichlorobenzene	ND	1.0	mg/kg
1,3-Dichlorobenzene	ND	1.0	mg/kg
1,4-Dichlorobenzene	ND	1.0	mg/kg
2,4,5-Trichlorophenol	ND	2.0	mg/kg
2,4,6-Trichlorophenol	ND	2.0	mg/kg
2,4-Dichlorophenol	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2,4-Dinitrotoluene	ND	1.0	mg/kg
2,6-Dinitrotoluene	ND	1.0	mg/kg
2-Chloronaphthalene	ND	1.0	mg/kg
2-Chlorophenol	ND	1.0	mg/kg
2-Methylnaphthalene	ND	1.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
2-Nitroaniline	ND	5.0	mg/kg
2-Nitrophenol	ND	1.0	mg/kg
3,3'-Dichlorobenzidine	ND	2.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
3-Nitroaniline	ND	5.0	mg/kg
4,6-Dinitro-2-methylphenol	ND	5.0	mg/kg
4-Bromophenyl-phenylether	ND	1.0	mg/kg
4-Chloro-3-methylphenol	ND	2.0	mg/kg
4-Chloroaniline	ND	2.0	mg/kg
4-Chlorophenyl-phenylether	ND	1.0	mg/kg
4-Nitroaniline	ND	2.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
Acenaphthene	ND	1.0	mg/kg
Acenaphthylene	ND	1.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg

Continued

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8270
METHOD BLANK

Date Analyzed: 07/20/96
Lab ID: MBS96199
Matrix: Soil
Date Extracted: 07/17/96

Parameter	Result	PQL	Units
Benzo(g,h,i)perylene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
Benzoic Acid	ND	5.0	mg/kg
Benzyl Alcohol	ND	2.0	mg/kg
bis(2-Chloroethoxy)methane	ND	1.0	mg/kg
bis(2-Chloroethyl)ether	ND	1.0	mg/kg
bis(2-Chloroisopropyl)ether	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dibenzofuran	ND	1.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Fluorene	ND	1.0	mg/kg
Hexachlorobenzene	ND	2.0	mg/kg
Hexachlorobutadiene	ND	2.0	mg/kg
Hexachlorocyclopentadiene	ND	1.0	mg/kg
Hexachloroethane	ND	2.0	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1.0	mg/kg
Isophorone	ND	1.0	mg/kg
N-Nitrosodi-n-propylamine	ND	1.0	mg/kg
N-Nitrosodiphenylamine	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Nitrobenzene	ND	1.0	mg/kg
Pentachlorophenol	ND	5.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg
Pyrene	ND	1.0	mg/kg

Continued

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Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8270
METHOD BLANK

Date Analyzed: 07/20/96
Lab ID: MBS96199
Matrix: Soil
Date Extracted: 07/17/96

Parameter	Result	PQL	Units

Continued

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	56	19 - 122
2-Fluorobiphenyl	53	30 - 115
2-Fluorophenol	46	25 - 121
Nitrobenzene-d5	51	23 - 120
Phenol-d6	56	24 - 113
Terphenyl-d14	45	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst RBD

Reviewed WS

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8240
BLANK SPIKE / BLANK SPIKE DUPLICATE SUMMARY

Date Analyzed: 07/17/96
Lab ID: BSS60198
Matrix: Sand
Date Extracted: 07/16/96

Original Sample Parameters

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	BS Recovery %	QC Limits Rec.
1,1-Dichloroethene	10	0	8.44	84	59 -172
Benzene	10	0	9.77	98	62 -137
Chlorobenzene	10	0	10.7	107	66 -142
Toluene	10	0	10.8	108	59 -139
Trichloroethene (TCE)	10	0	10.3	103	60 -133

Duplicate Sample Parameters

Parameter	Spike Added (mg/kg)	BSD Result (mg/kg)	BSD Recovery %	RPD %	QC Limits RPD	QC Limits Rec.
1,1-Dichloroethene	10	10.2	102	19	22	59 -172
Benzene	10	10.1	101	3	24	62 -
Chlorobenzene	10	10.8	108	1	21	66 -
Toluene	10	10.8	108	0	21	59 -139
Trichloroethene (TCE)	10	10.5	105	2	21	60 -133

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 10 outside QC limits.
RPD: 0 out of 5 outside QC limits.

Analyst E.D. 7/31/96

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8270
BLANK SPIKE / BLANK SPIKE DUPLICATE SUMMARY

Date Analyzed: 07/20/96
Lab ID: BSS96199
Matrix: Soil
Date Extracted: 07/17/96

Original Sample Parameters

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	BS Recovery %	QC Limits Rec.
1,2,4-Trichlorobenzene	10	0	4.0	40	38 - 107
1,4-Dichlorobenzene	10	0	4.2	42	28 - 104
2,4-Dinitrotoluene	10	0	6.8	68	28 - 89
2-Chlorophenol	20	0	8.3	42	25 - 102
4-Chloro-3-methylphenol	20	0	12	60	26 - 103
4-Nitrophenol	20	0	11	55	11 - 114
Acenaphthene	10	0	6.2	62	31 - 137
N-Nitrosodi-n-propylamine	10	0	8.0	80	41 - 126
Pentachlorophenol	20	0	13	65	17 - 109
Phenol	20	0	8.3	42	26 - 90
Pyrene	10	0	5.1	51	35 - 142

Duplicate Sample Parameters

Parameter	Spike Added (mg/kg)	BSD Result (mg/kg)	BSD Recovery %	RPD %		QC Limits RPD	QC Limits Rec.
1,2,4-Trichlorobenzene	10	5.8	58	37	*	23	38 - 107
1,4-Dichlorobenzene	10	5.9	59	34	*	27	28 - 104
2,4-Dinitrotoluene	10	7.0	70	3		47	28 - 89
2-Chlorophenol	20	12	60	36		50	25 - 102
4-Chloro-3-methylphenol	20	13	65	8		33	26 - 103
4-Nitrophenol	20	12	60	9		50	11 - 114
Acenaphthene	10	6.8	68	9		19	31 - 137
N-Nitrosodi-n-propylamine	10	8.5	85	6		38	41 - 126
Pentachlorophenol	20	14	70	7		47	17 - 109
Phenol	20	12	60	36	*	35	26 - 90
Pyrene	10	5.4	54	6		36	35 - 142

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 22 outside QC limits.
RPD: 3 out of 11 outside QC limits.

Analyst RRA

Reviewed WS

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8270
MATRIX SPIKE

Date Analyzed: 07/23/96
Lab ID: 0596H05797 SK1 0396G01319
Matrix: Soil
Date Extracted: 07/17/96

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	MS Recovery %	QC Limits Rec.
1,2,4-Trichlorobenzene	10	0	5.4	54	38 -107
1,4-Dichlorobenzene	10	0	5.1	51	28 -104
2,4-Dinitrotoluene	10	0	6.4	64	28 - 89
2-Chlorophenol	20	0	12	60	25 -102
4-Chloro-3-methylphenol	20	0	13	65	26 -103
4-Nitrophenol	20	0	11	55	11 -114
Acenaphthene	10	0	6.5	65	31 -137
N-Nitrosodi-n-propylamine	10	0	8.5	85	41 -126
Pentachlorophenol	20	0	12	60	17 -109
Phenol	20	0	12	60	26 - 90
Pyrene	10	0	5.1	51	35 -

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	59	19 -122
2-Fluorobiphenyl	66	30 -115
2-Fluorophenol	60	25 -121
Nitrobenzene-d5	68	23 -120
Phenol-d6	67	24 -113
Terphenyl-d14	44	18 -137

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 11 outside QC limits.

Analyst RAD

Reviewed

imi Inter-Mountain Laboratories, Inc.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSES / PARAMETERS
GIANT REFINING CO - BLMFLD		
Sampler: (Signature)	**Chain of Custody Tape No.**	
LYNN SHELTON		

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	WQCC List				Remarks
96 S-0-1	7/10/96	1330		SOIL	4	X				
96 S-3-5	7/10/96	1430			4	X				
96 N-0-1	7/10/96	1011			4	X				
96 N-3-5	7/10/96	1130			4	X				
										cool + intact

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Lynn S Shelton	7/10/96	5:34PM	Chris Raymer	7-10-96	173
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by laboratory: (Signature)	Date	Time

Inter-Mountain Laboratories, Inc.

☐ 1633 Terra Avenue, Sheridan, Wyoming 82801, Telephone (307) 672-8945

☐ 1701 Phillips Circle, Gillette, Wyoming 82718, Telephone (307) 682-8945

☒ 2506 West Main Street, Farmington, NM 87401, Telephone (505) 326-4737

☐ 1160 Research Dr., Bozeman, Montana 59715, Telephone (406) 586-8450

☐ 11183 SH 30, College Station, TX 77845, Telephone (409) 776-8945

☐ 3304 Longmire Drive, College Station, TX 77845, Telephone (409) 774-4999

37672

Inter·Mountain
Laboratories, Inc.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

5 August 1996

Lynn Shelton
Giant Refining Co.
P. O. Box 159
Bloomfield, NM 87413

Mr. Shelton:

Enclosed please find the report for the samples received by our laboratory for analysis on July 11, 1996.

If you have any questions about the results of these analyses, please don't hesitate to call me at your convenience.

Sincerely,

Anna Schaerer

Anna Schaerer
Organic Analyst/IML-Farmington

Enclosure

xc: File

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

CASE NARRATIVE

Client: GIANT REFINING COMPANY
Project: Bloomfield, NM Received on: 07/16/96
Set ID: 0596H05846 # samples: 4

Suites: 8240 Standard, 8270 PAHs

Samples were received for analysis at Inter-Mountain Laboratories (IML), Bozeman, Montana. Enclosed are the results of these analyses.

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges. Quantitations have been calculated on an as received basis.

Jack Felkey
IML-Bozeman

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	Giant Refining Co.		
Project:	Bloomfield		
Sample ID:	96E-0-1	Date Reported:	08/05/96
Laboratory ID:	0396G01328	Date Sampled:	07/11/96
Sample Matrix:	Soil	Time Sampled:	9:45 AM
Condition:	Cool/Intact	Date Received:	07/11/96

Parameter	Analytical Result	Units
Lab pH	7.6	s.u.
Fluoride	1.15	ppm
Chloride	2,582	ppm
Sulfate	2,156	ppm
Cyanide	<0.10	mg/Kg
Nitrate as Nitrogen	6.42	ppm
Trace Metals (Total)		
Aluminum	10,122	mg/Kg
Arsenic	1.16	mg/Kg
Barium	195	mg/Kg
Boron	55.8	mg/Kg
Cadmium	0.158	mg/Kg
Chromium	9.48	mg/Kg
Cobalt	5.06	mg/Kg
Copper	3.58	mg/Kg
Iron	13,097	mg/Kg
Lead	11.6	mg/Kg
Manganese	223	mg/Kg
Mercury	<0.10	mg/Kg
Molybdenum	<1.00	mg/Kg
Nickel	1.16	mg/Kg
Selenium	<0.50	mg/Kg
Silver	<1.00	mg/Kg
Uranium	86.4	mg/Kg
Zinc	45.3	mg/Kg

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by _____ Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	Giant Refining Co.		
Project:	Bloomfield		
Sample ID:	96E-3-5	Date Reported:	08/05/96
Laboratory ID:	0396G01329	Date Sampled:	07/11/96
Sample Matrix:	Soil	Time Sampled:	10:45 AM
Condition:	Cool/Intact	Date Received:	07/11/96

Parameter	Analytical Result	Units
Lab pH	7.8	s.u.
Fluoride	1.76	ppm
Chloride	1,235	ppm
Sulfate	724	ppm
Cyanide	<0.10	mg/Kg
Nitrate as Nitrogen	0.51	ppm
Trace Metals (Total)		
Aluminum	7,102	mg/Kg
Arsenic	0.527	mg/Kg
Barium	189	mg/Kg
Boron	56.9	mg/Kg
Cadmium	<0.10	mg/Kg
Chromium	7.48	mg/Kg
Cobalt	4.11	mg/Kg
Copper	2.32	mg/Kg
Iron	10,569	mg/Kg
Lead	7.69	mg/Kg
Manganese	240	mg/Kg
Mercury	<0.10	mg/Kg
Molybdenum	1.05	mg/Kg
Nickel	7.38	mg/Kg
Selenium	<0.50	mg/Kg
Silver	<1.00	mg/Kg
Uranium	66.4	mg/Kg
Zinc	30.6	mg/Kg

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by _____ Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

lient:	**Giant Refining Co.**		
Project:	Bloomfield		
Sample ID:	96B-0-1	Date Reported:	08/05/96
Laboratory ID:	0396G01330	Date Sampled:	07/11/96
Sample Matrix:	Soil	Time Sampled:	11:45 AM
Condition:	Cool/Intact	Date Received:	07/11/96

Parameter	Analytical Result	Units
Lab pH	7.5	s.u.
Fluoride	0.77	ppm
Chloride	1,054	ppm
Sulfate	2,790	ppm
Cyanide	<0.10	mg/Kg
Nitrate as Nitrogen	14.2	ppm
Trace Metals (Total)		
Aluminum	6,199	mg/Kg
Arsenic	<0.50	mg/Kg
Barium	166	mg/Kg
Boron	55.0	mg/Kg
Cadmium	0.104	mg/Kg
Chromium	6.85	mg/Kg
Cobalt	3.84	mg/Kg
Copper	2.18	mg/Kg
Iron	9,401	mg/Kg
Lead	8.00	mg/Kg
Manganese	205	mg/Kg
Mercury	<0.10	mg/Kg
Molybdenum	<1.00	mg/Kg
Nickel	7.27	mg/Kg
Selenium	<0.50	mg/Kg
Silver	<1.00	mg/Kg
Uranium	84.1	mg/Kg
Zinc	33.2	mg/Kg

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by _____ Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

lient:	**Giant Refining Co.**		
Project:	Bloomfield		
Sample ID:	96B-3-5	Date Reported:	08/05/96
Laboratory ID:	0396G01331	Date Sampled:	07/11/96
Sample Matrix:	Soil	Time Sampled:	12:30 PM
Condition:	Cool/Intact	Date Received:	07/11/96

Parameter	Analytical Result	Units
Lab pH	8.2	s.u.
Fluoride	0.38	ppm
Chloride	324	ppm
Sulfate	395	ppm
Cyanide	<0.10	mg/Kg
Nitrate as Nitrogen	<0.05	ppm
Trace Metals (Total)		
Aluminum	3,266	mg/Kg
Arsenic	<0.50	mg/Kg
Barium	56.0	mg/Kg
Boron	51.9	mg/Kg
Cadmium	<0.10	mg/Kg
Chromium	3.16	mg/Kg
Cobalt	1.83	mg/Kg
Copper	3.87	mg/Kg
Iron	4,751	mg/Kg
Lead	4.99	mg/Kg
Manganese	113	mg/Kg
Mercury	<0.10	mg/Kg
Molybdenum	<1.00	mg/Kg
Nickel	3.46	mg/Kg
Selenium	<0.50	mg/Kg
Silver	<1.00	mg/Kg
Uranium	31.1	mg/Kg
Zinc		mg/Kg

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by _____ Reviewed by _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Quality Control / Quality Assurance

Spike Analysis

Total Metals

Client:	**Giant Refining**	Date Reported:	08/05/96
Project:	Bloomfield	Date Sampled:	07/11/96
Lab ID:	0396G01328-31	Date Received:	07/11/96
Matrix:	Soil		
Condition:	Cool / Intact		

Spike Analysis

Parameter	Spiked Sample Result (mg/L	Sample Result (mg/L	Spike Added (mg/L	Percent Recovery
Aluminum	9.14	<0.05	10.0	91%
Arsenic	0.029	0.001	0.030	93%
Barium	1.26	0.88	0.50	92%
Boron	0.89	0.44	0.50	99%
Cadmium	0.002	<0.001	0.002	108%
Chromium	0.58	0.07	0.50	103%
Cobalt	0.47	0.03	0.50	89%
Copper	0.007	0.002	0.005	106%
Iron	9.28	<0.025	10.00	93%
Lead	0.032	0.010	0.025	106%
Manganese	1.63	1.24	0.50	98%
Mercury	0.55	<0.10	0.50	98%
Molybdenum	0.53	<0.10	0.50	105%
Nickel	0.56	0.05	0.50	103%
Selenium	0.024	0.001	0.025	92%
Silver	0.003	<0.001	0.003	108%
Uranium	0.95	0.49	0.50	102%
Zinc	0.79	0.27	0.50	109%

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported By: _____ Reviewed By: _____

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Quality Control / Quality Assurance

Known Analysis

Total Metals

Client:	Giant Refining	Date Reported:	08/05/96
Project:	Bloomfield	Date Sampled:	07/11/96
Lab ID:	0396G01328-31	Date Received:	07/11/96
Matrix:	Soil		
Condition:	Cool / Intact		

Known Analysis

Parameter	Found Result	Known Result	Units	Percent Recovery
Aluminum	0.94	1.00	mg/L	94%
Arsenic	0.009	0.010	mg/L	90%
Barium	0.91	1.00	mg/L	91%
Boron	0.95	1.00	mg/L	95%
Cadmium	0.004	0.004	mg/L	100%
Chromium	1.02	1.00	mg/L	102%
Cobalt	0.91	1.00	mg/L	91%
Copper	0.005	0.005	mg/L	100%
Iron	0.96	1.00	mg/L	96%
Lead	0.040	0.040	mg/L	100%
Manganese	1.01	1.00	mg/L	101%
Mercury	0.440	0.400	mg/L	110%
Molybdenum	1.01	1.00	mg/L	101%
Nickel	1.01	1.00	mg/L	101%
Selenium	0.010	0.010	mg/L	100%
Silver	0.004	0.004	mg/L	98%
Uranium	1.19	1.00	mg/L	119%
Zinc	1.01	1.00	mg/L	101%

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported By: _____ Reviewed By: _____

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Quality Control / Quality Assurance

Blank Analysis
Total Metals

Client: Giant Refining
Project: Bloomfield
Lab ID: 0396G01328-31
Matrix: Soil
Condition: Cool / Intact

Date Reported: 08/05/96
Date Sampled: 07/11/96
Date Received: 07/11/96

Blank Analysis

Parameter	Result	Detection Limit (mg/L)
Aluminum	ND	5.00
Arsenic	ND	0.50
Barium	ND	1.00
Boron	ND	5.00
Cadmium	ND	0.10
Chromium	ND	1.00
Cobalt	ND	1.00
Copper	ND	0.10
Iron	ND	2.50
Lead	ND	0.50
Manganese	ND	1.00
Mercury	ND	0.10
Molybdenum	ND	1.00
Nickel	ND	1.00
Selenium	ND	0.50
Silver	ND	1.00
Uranium	ND	20.0
Zinc	ND	5.00

Reference: "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846, United States Environmental Protection Agency, November, 1986.
"Test Methods for Evaluating Solid Wastes", Method 3050, SW-846, 3rd ed., November 1992.

Comments:

Reported by: _____

Reviewed by: _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: 96B-0-1
Project ID: Bloomfield, NM
Lab ID: B965848 0396G01328
Matrix: Soil

Date Reported: 07/31/96
Date Sampled: 07/11/96
Date Received: 07/16/96
Date Extracted: 07/23/96
Date Analyzed: 07/25/96

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Hexanone	ND	1.0	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg

Continued

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Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		Date Reported:	07/31/96
Sample ID:	96B-0-1		Date Sampled:	07/11/96
Project ID:	Bloomfield, NM		Date Received:	07/16/96
Lab ID:	B965848	0396G01328	Date Extracted:	07/23/96
Matrix:	Soil		Date Analyzed:	07/25/96

Parameter	Result	PQL	Units
Continued			
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	90	70 - 121
omofluorobenzene	118	74 - 121
Toluene-d8	113	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E. D. 7/31/96

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	GIANT REFINING COMPANY		Date Reported:	07/29/96
Sample ID:	96B-0-1		Date Sampled:	07/11/96
Project ID:	Bloomfield, NM		Date Received:	07/16/96
Lab ID:	B965848	0396G01328	Date Extracted:	07/23/96
Matrix:	Soil		Date Analyzed:	07/26/96

Parameter	Result	PQL	Units
3-Methylcholanthrene	ND	1.0	mg/kg
Acenaphthene	ND	1.0	mg/kg
Acenaphthylene	ND	1.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(g,h,i)perylene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Fluorene	ND	1.0	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Pyrene	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	65	19 - 122
2-Fluorobiphenyl	57	30 - 115
2-Fluorophenol	49	25 - 121
Nitrobenzene-d5	50	23 - 120
Phenol-d6	69	24 - 113
Terphenyl-d14	47	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RPD

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: 96B-3-5
Project ID: Bloomfield, NM
Lab ID: B965849 0396G01328
Matrix: Soil

Date Reported: 07/31/96
Date Sampled: 07/11/96
Date Received: 07/16/96
Date Extracted: 07/23/96
Date Analyzed: 07/25/96

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Hexanone	ND	1.0	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg

Continued

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EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		Date Reported:	07/31/96
Sample ID:	96B-3-5		Date Sampled:	07/11/96
Project ID:	Bloomfield, NM		Date Received:	07/16/96
Lab ID:	B965849	0396G01328	Date Extracted:	07/23/96
Matrix:	Soil		Date Analyzed:	07/25/96

Parameter	Result	PQL	Units
Continued			
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	94	70 - 121
Bromofluorobenzene	110	74 - 121
Toluene-d8	109	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E.D. 7/31/96

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	GIANT REFINING COMPANY		
Sample ID:	96B-3-5	Date Reported:	07/29/96
Project ID:	Bloomfield, NM	Date Sampled:	07/11/96
Lab ID:	B965849 0396G01328	Date Received:	07/16/96
Matrix:	Soil	Date Extracted:	07/23/96
		Date Analyzed:	07/26/96

Parameter	Result	PQL	Units
3-Methylcholanthrene	ND	1.0	mg/kg
Acenaphthene	ND	1.0	mg/kg
Acenaphthylene	ND	1.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(g,h,i)perylene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Fluorene	ND	1.0	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Pyrene	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	62	19 - 122
2-Fluorobiphenyl	51	30 - 115
2-Fluorophenol	44	25 - 121
Nitrobenzene-d5	45	23 - 120
Phenol-d6	64	24 - 113
Terphenyl-d14	49	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: 96E-0-1
Project ID: Bloomfield, NM
Lab ID: B965846 0396G01328
Matrix: Soil

Date Reported: 07/31/96
Date Sampled: 07/11/96
Date Received: 07/16/96
Date Extracted: 07/23/96
Date Analyzed: 07/25/96

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Hexanone	ND	1.0	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	7.0	5.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg

Continued

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1160 Research Drive
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EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	96E-0-1		Date Reported:	07/31/96
Project ID:	Bloomfield, NM		Date Sampled:	07/11/96
Lab ID:	B965846	0396G01328	Date Received:	07/16/96
Matrix:	Soil		Date Extracted:	07/23/96
			Date Analyzed:	07/25/96

Parameter	Result	PQL	Units
Continued			
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	89	70 - 121
romofluorobenzene	119	74 - 121
Toluene-d8	110	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E.D. 7/31/96

Reviewed

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	GIANT REFINING COMPANY		
Sample ID:	96E-0-1	Date Reported:	07/29/96
Project ID:	Bloomfield, NM	Date Sampled:	07/11/96
Lab ID:	B965846 0396G01328	Date Received:	07/16/96
Matrix:	Soil	Date Extracted:	07/23/96
		Date Analyzed:	07/26/96

Parameter	Result	PQL	Units
3-Methylcholanthrene	ND	1.0	mg/kg
Acenaphthene	ND	1.0	mg/kg
Acenaphthylene	ND	1.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(g,h,i)perylene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Fluorene	ND	1.0	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Pyrene	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	65	19 - 122
2-Fluorobiphenyl	62	30 - 115
2-Fluorophenol	57	25 - 121
Nitrobenzene-d5	58	23 - 120
Phenol-d6	75	24 - 113
Terphenyl-d14	46	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RPD

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	96E-3-5		Date Reported:	07/31/96
Project ID:	Bloomfield, NM		Date Sampled:	07/11/96
Lab ID:	B965847	0396G01328	Date Received:	07/16/96
Matrix:	Soil		Date Extracted:	07/23/96
			Date Analyzed:	07/25/96

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Hexanone	ND	1.0	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg

Continued

Inter-Mountain Laboratories, Inc.

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Bozeman, Montana 59715

EPA METHOD 8240
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		Date Reported:	07/31/96
Sample ID:	96E-3-5		Date Sampled:	07/11/96
Project ID:	Bloomfield, NM		Date Received:	07/16/96
Lab ID:	B965847	0396G01328	Date Extracted:	07/23/96
Matrix:	Soil		Date Analyzed:	07/25/96

Parameter	Result	PQL	Units
Continued			
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	95	70 - 121
romofluorobenzene	110	74 - 121
Toluene-d8	109	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E.D. 7/31/96

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	GIANT REFINING COMPANY		Date Reported:	07/29/96
Sample ID:	96E-3-5		Date Sampled:	07/11/96
Project ID:	Bloomfield, NM		Date Received:	07/16/96
Lab ID:	B965847	0396G01328	Date Extracted:	07/23/96
Matrix:	Soil		Date Analyzed:	07/26/96

Parameter	Result	PQL	Units
3-Methylcholanthrene	ND	1.0	mg/kg
Acenaphthene	ND	1.0	mg/kg
Acenaphthylene	ND	1.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(g,h,i)perylene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Fluorene	ND	1.0	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Pyrene	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	64	19 - 122
2-Fluorobiphenyl	53	30 - 115
2-Fluorophenol	49	25 - 121
Nitrobenzene-d5	49	23 - 120
Phenol-d6	72	24 - 113
Terphenyl-d14	47	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8240
METHOD BLANK

Date Analyzed: 07/26/96
Lab ID: MBS06205
Matrix: Sand
Date Extracted: 07/23/96

Parameter	Result	PQL	Units
1,1,1-Trichloroethane	ND	1.0	mg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	mg/kg
1,1,2-Trichloroethane	ND	1.0	mg/kg
1,1-Dichloroethane	ND	1.0	mg/kg
1,1-Dichloroethene	ND	1.0	mg/kg
1,2-Dichloroethane	ND	1.0	mg/kg
1,2-Dichloropropane	ND	1.0	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Hexanone	ND	1.0	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	1.0	mg/kg
Acetone	ND	5.0	mg/kg
Benzene	ND	1.0	mg/kg
Bromodichloromethane	ND	1.0	mg/kg
Bromoform	ND	1.0	mg/kg
Bromomethane	ND	1.0	mg/kg
Carbon Disulfide	ND	1.0	mg/kg
Carbon Tetrachloride	ND	1.0	mg/kg
Chlorobenzene	ND	1.0	mg/kg
Chloroethane	ND	1.0	mg/kg
Chloroform	ND	1.0	mg/kg
Chloromethane	ND	1.0	mg/kg
cis-1,3-Dichloropropene	ND	1.0	mg/kg
Dibromochloromethane	ND	1.0	mg/kg
Ethylbenzene	ND	1.0	mg/kg
m,p-Xylene	ND	1.0	mg/kg
Methylene chloride	ND	5.0	mg/kg
o-Xylene	ND	1.0	mg/kg
Styrene	ND	1.0	mg/kg
Tetrachloroethene (PCE)	ND	1.0	mg/kg
Toluene	ND	1.0	mg/kg
trans-1,2-Dichloroethene	ND	1.0	mg/kg
trans-1,3-Dichloropropene	ND	1.0	mg/kg
Trichloroethene (TCE)	ND	1.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8240
METHOD BLANK

Date Analyzed: 07/26/96
Lab ID: MBS06205
Matrix: Sand
Date Extracted: 07/23/96

Parameter	Result	PQL	Units
Continued			
Vinyl Chloride	ND	1.0	mg/kg
Xylenes (total)	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	100	70 - 121
Bromofluorobenzene	106	74 - 121
Toluene-d8	105	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst E.D. 7/31/96

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
METHOD 8240
LAB CONTROL SAMPLE

Date Analyzed: 07/26/96
Lab ID: LCS96205
Matrix: Sand
Date Extracted 07/23/96

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	LCS Result (mg/kg)	LCS % Recovery	QC Limits Rec.
1,4-Dichlorobenzene	2.0	0	1.5	75	70 -130
1,1,2-Trichloroethane	2.0	0	2.0	100	70 -130
1,2-Dibromoethane (EDB)	2.0	0	1.8	90	70 -130
1,2-Dichloroethane	2.0	0	1.8	90	70 -130
1,2-Dichloropropane	2.0	0	1.7	85	70 -130
Benzene	2.0	0	1.8	90	70 -130
Bromoform	2.0	0	1.1	55 *	70 -130
Carbon Tetrachloride	2.0	0	1.5	75	70 -130
cis-1,3-Dichloropropene	2.0	0	1.7	85	70 -130
rachloroethene (PCE)	2.0	0	1.6	80	70 -130
richloroethene (TCE)	2.0	0	2.0	100	70 -130
Vinyl Chloride	2.0	0	1.2	60 *	70 -130

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
Bromofluorobenzene	121	74 -121
1,2-Dichloroethane-d4	94	70 -121
Toluene-d8	109	81 -117

Spike Recovery: 2 out of 12 outside QC limits.
Surrogates: Surrogate Recoveries within QC Limits.

Analyst E.D. 7/31/96

Reviewed

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

August 28, 1996

CERTIFIED MAIL
RETURN RECEIPT NO. P-288-258-604

Mr. Lynn Shelton
Environmental Manager
Giant Industries
P.O. Box 159
Bloomfield, NM 87413

RE: Closure Plan for the Unlined Evaporation Lagoons and the Spray Evaporation Area. Date August 13, 1996.

Dear Mr. Shelton:

The New Mexico Oil Conservation Division (OCD) has reviewed the above captioned plan from Giant regarding the closure/modification of the "Unlined Evaporation Lagoons/Spray Evaporation Area." **The OCD approves of the closure and modification as proposed with the following conditions:**

1. The monitoring and sampling of monitoring wells MW-1 and MW-5 will continue as previously approved. When the CMS (dated December 21, 1995) is approved, OCD will be open to reconsidering the continued monitoring of MW-1 and MW-5.

2. Any discharge/spill or leak that is a result of the modification/construction will be reported to the OCD Aztec District office at (505)-334-6178 pursuant to WQCC 1203 and OCD Rule 116.

Please note, OCD approval does not relieve Giant for liability should this closure/modification result in contamination to surface water, groundwater, or the environment. Further, OCD approval does not relieve Giant from responsibility with other Federal, State, or Local Regulations that may apply. Public notice was not issued because this modification was part of the previous discharge plan renewal conditions.

If Giant has any questions regarding this matter please feel free to call me at (505)-827-7152.

Sincerely,

Roger C. Anderson
Bureau Chief

xc: Mr. Denny Foust - Environmental Geologist

RPS JDC

Appendix D

Investigation Derived Waste (IDW) Management Plan

RPS JDC

IDW Management Plan

All IDW will be properly characterized and disposed of in accordance with all federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The IDW may be characterized for disposal based on the known or suspected contaminants potentially present in the waste. It is assumed that there are no listed wastes present in environmental media at any of the planned investigation areas.

A dedicated decontamination area will be setup prior to any sample collection activities. The decontamination pad will be constructed so as to capture and contain all decontamination fluids (e.g., wash water and rinse water) and foreign materials washed off the sampling equipment. The fluids will be pumped directly into suitable storage containers (e.g., labeled 55-gallon drums), which will be located at satellite accumulation areas until the fluids are disposed in the refinery wastewater treatment system upstream of the API separator. The solids captured in the decontamination pad will be shoveled into 55-gallon drums and stored at the designated satellite accumulation area pending proper waste characterization for off-site disposal.

Drill cuttings generated during installation of soil borings and monitoring wells will be placed directly into 55-gallon drums and staged in the satellite accumulation area pending results of the waste characterization sampling. The portion of soil cores, which are not retained for analytical testing, will be placed into the same 55-gallon drums used to store the associated drill cuttings.

The solids (e.g., drill cuttings and used soil cores) will be characterized by testing to determine if there are any hazardous characteristics in accordance with 40 Code of Federal Regulations (CFR) Part 261. This includes tests for ignitability, corrosivity, reactivity, and toxicity. If the materials are not characteristically hazardous, then further testing will be performed pursuant to the requirements of the facility to which the materials will be transported. Depending upon the results of analyses for individual investigation soil samples, additional analyses may TPH and polynuclear aromatic hydrocarbons.

Purge water generated during groundwater sampling activities will be containerized in 55-gallons drums and then disposed in the refinery wastewater treatment system upstream of the API separator. All miscellaneous waste materials (e.g., discarded gloves, packing materials, etc.) will be placed into the refinery's solid waste storage containers for off-site disposal.

GIANT
REFINING COMPANY

Fed Ex Tracking # 8633 9179 3290

December 18, 2007

James Bearzi, Bureau Chief
New Mexico Environmental Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Re: Giant Refining Company, Bloomfield Refinery Order No. HWB 07-34 (CO)
Solid Waste Management Unit (SWMU) Group No. 2 Investigation Work Plan

Dear Mr. Bearzi:

Giant Refining Company, Bloomfield Refinery submits the referenced Investigation Work Plan pursuant to Section IV.B.4 of the July 2007 HWB Order. The Investigation Work Plan covers SWMU Group No. 2, which includes SWMU No. 2 Drum Storage Area North Bone Yard; SWMU No. 8 Inactive Landfill; SWMU No. 9 Landfill pond; SWMU No. 11 Spray Irrigation Area; and SWMU No. 18 Warehouse Yard. The Investigation Work Plan was developed and formatted to meet the requirements of Section X.B of the July 2007 HWB Order.

If you have any questions or would like to discuss the Investigation Work Plan, please contact me at (505) 632-4171.

Sincerely,

James R. Schmaltz
Environmental Manager
San Juan Refining Company
Bloomfield Refinery

cc: Hope Monzeglio – NMED HWB
Wayne Price – NMOCD (w/attachment)
Dave Cobrain – NMED HWB
Cheryl. Frischkorn – NMED HWB
Laurie King – EPA Region 6 (w/attachment)
Todd Doyle – Bloomfield Refinery
Allen Hains – Western Refining El Paso