AP - 001

STAGE 1 & 2 REPORTS

DATE:

Aug. 20, 1999

HUNTSMAN

Brickland Refinery Site Cover Installation Report

Submitted to:

New Mexico Oil Conservation Division
August 20, 1999

Huntsman Polymers Corporation
PO Box 3986
Odessa, TX 79760

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Brickland Refinery Site – Cover Installation Report
Huntsman Polymers Corporation
Odessa, TX

Appendices

Brickland Refinery Site -- Cover Installation Report
Huntsman Polymers Corporation
Odessa, Texas

I. General

Huntsman Polymers is the current owner of a parcel of land known as the former Brickland Refinery Site. The operating facility has been closed since the late 1950's and is located in Dona Ana County, New Mexico. Huntsman has been conducting closure of the facility through the Water Quality Conservation Commission's (WQCC) Abatement Plan provisions. Huntsman has obtained approval of a Stage 1 Abatement Plan and a Stage 2 Abatement Plan from the New Mexico Oil Conservation Division (NMOCD). The Stage 2 Plan was submitted to NMOCD in August, 1998 and approved December 14, 1998. One element of the Stage 2 Plan called for Huntsman to install a soil cover over parts of the land to eliminate lead exposure from surface soils.

Huntsman submitted *Work Plan for Soil Cover* and *Construction Quality Assurance (CQA) Plan* March 29, 1999. On April 26, 1999, Huntsman submitted *Brickland Refinery Site, Sunland Park, New Mexico, Work Plan Addendum.* This report defined various parameters regarding monitoring wells and well points located on the same property. Both submissions were approved, with comments, by the NMOCD on April 16, 1999 and May 5, 1999, respectively. All submissions and the approval letters can be found in Appendices 1 through 6.

This report summarizes the work performed as authorized under these two approved documents.

II. Construction Quality Assurance Plan

The Construction Quality Assurance (CQA) Plan established a set of planned activities and procedures that documented to the owner and to NMOCD that the soil met design specifications. As per the CQA, the following entities were involved with coordination of the project:

1. Representatives and responsibilities:

Permitting Agency - **The New Mexico Oil Conservation Division (NMOCD)**
Agency Contact - Mr. William Olson
Phone number - (505) 827-7154
Responsibilities -Approval of the CQA Plan and the Work Plan
Review of, and a repository for, the final project report

Facility Owner - **Huntsman Polymers Corporation.**
Company Contact - Mr. Reggie Baker and Mr. Roger Martin
Phone Number - (915) 640-8760 and (915) 640-8275
Responsibilities - General direction of the project
Selection of the parties assisting in the cover installation
Main repository for records

Design Engineer/Consultants - **Hicks Consultants, Ltd.**
Company Contact - Mr. Todd Carver
Phone Number - (972) 985-7948
Responsibilities -Prepare documents required for approval by the agency
Prepare the bid package for the contractors
Establish with the general contractor where and how to place and construct the erosion markers
Provide the design of the cover along with the CQA Officer/Engineer

CQA Officer/Engineer - **Hicks Consultants, Ltd.**
Company Contact - Mr. Claude Schleyer, PE
Phone Number - (505) 239-1906*Responsibilities* - Review the design criteria
Design the construction of the cover
Review the raw materials to be recommended for the cover
Review the results for the compaction testing
Provide expert information on the overall project

General Contractor/Construction Contractor - **Indian Environmental Services**
Company Contact - Mr. James Spurgeon
Phone Number - (505) 336-7964
Responsibilities – Prepare a site-specific Health and Safety Plan (HASP)
Provide training and personal protection equipment to personnel present on site
Arrange procurement and transportation of raw materials to the site
Ensure raw materials meet established specifications
Clear the area and install the cover over the designated area
Coordinate the compaction of the cover
Provide quality assurance (compaction) testing and documentation as required using qualified personnel
Set erosion markers where required

Furnish designated reports and photographs
Complete summary report for the project

Soils laboratory - Terracon, Inc.
Company Contact - Mr. Kevin Salcito
Phone Number - (505) 527-1700
Responsibilities - Provide laboratory compactability curve and optimum water contact for soil to be used in the cover by contractor
Test compaction of the cover once installed

2. Inspection Activities

The following activities were conducted pursuant to the approved CQA.

Pre-construction	(1) Conduct visual inspection of the cover raw material. (2) Provide analytical testing for the raw material. (3) Determine the optimum compaction curve for the raw material.
Site Preparation	(4) Visually inspect the site. (5) Reach agreement on special areas.
Cover Installation	(6) Provide documentation on the weather. (7) Visually inspect the loads of incoming raw material (8) Visually inspect the cover. (9) Conduct compaction testing for cover during installation.
Post Installation	(10) Visually inspect and record the location of erosion markers. (11) Visually inspect special areas.

III. Work Plan

The Work Plan, as amended, consisted of three separate activities. These items will be addressed in sections. The elements were:

(1) Soil Cover Installation,
(2) Well Point Removal,
(3) Removal of two sumps found on the site.

1. Soil Cover Installation

The Work Plan consisted of several separate elements. They can be addressed by section as follows:

A. Lateral Extent of Cover

The lateral extent of the cover was, at a minimum, to cover the area where 400 mg/kg concentrations of lead were found in the surface soils. These locations are best illustrated through use of a contour plate of the whole site. See Appendix 11 for this definition. To ensure coverage, the contractor extended the cover to an area at least ten (10) feet beyond the contour. In some cases this extension was much greater than the ten feet as areas were tied together rather than creating a disjointed cover. See Appendix 12 for the location of the cover as installed.

B. Surface/Subsurface Preparation

Surface preparation was accomplished using a front-end loader and grader. Trees, stumps, brush, grass, and debris was removed from the area where cover installation was to be placed. Section 201 of the New Mexico Standards Specifications for Public Works Construction was used as a guideline. Rough leveling of the site was accomplished through using a grader (maintainer). Work of clearing and grubbing commenced on the 8th of June and continued in different areas through the 11th. Areas around foundations were scraped down below grade surface and cleared for cover installation. Debris that was collected from areas to be cleared was placed on site at the northern end of the property where construction and other materials have been located in the past. During the whole process, water was used to reduce the amount of dust blowing. See Appendix 8 -- photographs 5 through 10 for documentation of surface preparation. Views of the site after clearing and leveling operations can be seen in photos 14 through 20.

C. Raw Materials Testing

Terracon of Las Cruces, New Mexico conducted the raw material testing. The basecorse was tested for compaction and maximum dry unit weight and water content was determined. The material was also subjected to testing for particle size distribution. All tests passed and the material from Jobe, Inc., specifically from McKelligan Canyon, was approved. The maximum dry weight was found to be 128.5 pounds per cubic foot with water content of 8.8 percent. Analytical data can be found in Appendix 9. Material from this source was the only material used on-site. Spot samples were taken by Terracon during the installation of the cover to ensure similar material was being used. Drop tickets were also obtained as loads were brought to the site.

D. Cover Parameters

Compaction was achieved using a thirty (30) ton smooth drum roller with a vibratory roll. Three passes were made in the vibrating mode and two additional passes were completed for the final compaction. The minimum of 95% of the maximum density was achieved in all cases except for Area C. Twenty-eight (28) nuclear tests (using a 3430 Traxler instrument) were conducted per ASTM D-1557. See the Appendix 13 – Plate for Compaction Testing for locations of the tests conducted on the cover. Results of the testing are compiled in Appendix 10.

Area C was not tested because compaction was not performed in the area. This was due to "pumping" of the soils when heavy equipment was used. This action allows for cracks in the cover as machinery is passed over the area. Its root cause is due to close-to-the-surface water in the area and the presence of an old septic system's leaching field. In order to compensate for this, the contractor conducted a stabilization test using portland cement. Initial results did not show improvement and heavy equipment became stuck in the area. The second approach was to place an additional one (1) foot of cover, grade, and leave uncompacted. A crown on this cover segment was installed in order to promote drainage and water runoff. This method allowed for a continuous cover and met more than the six-inch requirement for the installation. It is expected that the additional basecorse will firm over time and provide for a stable cover. Later checks of the area indicated that it did indeed firm as it weathered.

Fifty-five (55) erosion markers were set at approximately 200-foot centers across the cover. See the plate in Appendix 12. This Plate also indicates where the markers were set.

A surveyor measured the depth of the cover. Prior to cover installation, a base elevation was obtained at various locations throughout using the bases of monitoring wells as reference elevations. Initial work was conducted on the 12th and 13th of June. Once the cover was placed, measurements were again recorded and comparisons made. See the plate in Appendix 12.

E. Inspection and Documentation

Documentation in the form of logs, compaction testing results, photographs of various stages of the project, as-built cover diagram, and other items are covered in this report. This report functions as the main format for providing this information.

F. Health and Safety plan

This plan was prepared by Indian Environmental Services. It is not included with this report.

G. Post Installation Inspection

This section of the Work Plan concerns inspections of the cover in the future. No comments are provided in this report for this section.

Regulatory approval for the Work Plan, CQA, and the Addendum to the Work Plan were obtained from the NMOCD prior to commencement of work. On the 17th of June, during the installation phase of the project, Mr. William Olson of the NMOCD was on-site to view the construction and its progress. His comments were positive and work continued until completion

2. Well Point Removal

Thirty-nine (39) well points were located throughout the site to initially determine the extent of free phase hydrocarbon in the soil and to assist in definition of contamination of groundwater. The analyses over the period since their installation did not reveal any significant concentrations or free phase in most of the well points. Huntsman requested permission to remove these well points and two monitoring wells (MW-2 and -13) in the work plan addendum.

Well points were removed in accordance with the approval by NMOCD. Indian Environmental Services removed the well points on the 8th and 9th of June. A total of 25 well points were removed. Two were removed from Area C, seven were pulled from Area D, four were taken from Area E, and twelve were removed from Area F. (See Appendix 7 for field comments.) Specific well point locations are:

Area F: WP-4, WP-5, WP-6, WP-8, WP-9, WP-10, WP-21, WP-22, WP-23, WP-24, WP-34, and WP-35.
Area E: WP-11, WP-12, WP-13, and WP-29
Area D: WP-17, WP-18, WP-19, WP-20, WP-28, WP-36, and WP-37.
Area C: WP-15 and WP-16.

Only well point WP-14 was left in any of these areas. (Area C) , and all well points located in Area G were left in place. (See Appendix 14 for locations of these well points.) Removal was accomplished by attaching a chain around the well point and lifting it with a front-end loader. The holes were plugged with granular bentonite. Plugged areas were inspected after a time to allow for settling and were filled back to grade where necessary. Typical removal of a well point can be seen in photographs 12 and 13 in Appendix 8.

Terracon oversaw the removal of the two monitoring wells. Huntsman will provide details of that removal in a separate document.

3. Sump Removal

Two sumps were found on the site. One was located in Area C, near the foundations of the old houses. The second was at the northeast corner of a large concrete foundation in Area D. This slab was the building foundation for a large Quonset hut, which was used for trucking and other vehicles. The location of these two sub-surface structures is indicated in the attached appendix. (Appendix 15)

Indian Environmental Services removed the tops of both sumps on the 9th of June. Three samples were taken from each sump and it was determined from physical characteristics of the samples that the contents were sewage and storm water. That afternoon, the two sumps were emptied of approximately 2000 gallons by OK Pump Service and transported for disposal. Disposal was approved and completed at the following facility:

WWTP Septic Station Bustamante
10001 Southside Road
El Paso, TX 79927

After removal of all liquids, the sumps were back filled with surrounding soil. Photographs of this operation are available in this report. See photographs 21 through 24 in photo section -- Appendix 8

Appendices

1. Stage 2 Abatement Plan Approval Letter, NMOCD, dated December 17, 1998
2. Work Plan for Soil Cover, Hicks Consultants, dated March 29, 1999
3. Construction Quality Assurance Plan, Hicks Consultants, dated March 29, 1999
4. Work Plan Addendum, Hicks Consultants, dated April 26, 1999
5. Stage 2 Abatement Plan Cap Construction Approval Letter, NMOCD, dated April 26, 1999
6. Cap Construction Addendum Approval Letter, NMOCD, dated May 5, 1999
7. Field Services Summary Report, Indian Environmental, dated June 9, 1999
8. Photograph Log and Photos, Indian Environmental
9. Laboratory Compaction and Particle Size Data, Terracon, dated June 14, 1999
10. Cover Compaction Testing Results, Terracon
11. Plate-- Lead Analytical Data and Contour of 400 mg/kg Concentration
12. Plate-- Soil Cover, and affidavit from Surveyor
13. Plate—Location of Compaction Testing
14. Plate—Well Point Locations
15. Map-Location of Two Sumps

Appendices

Appendix 1

Stage 2 Abatement Plan Approval Letter
NMOCD
December 17, 1998

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

December 17, 1998

CERTIFIED MAIL
RETURN RECEIPT NO. Z-274-520-582

Mr. Reggie Baker
Huntsman Corporation
P.O. Box 3986
Odessa, Texas 79760

RE: STAGE 2 ABATEMENT PLAN PROPOSAL
BRICKLAND REFINERY
SUNLAND PARK, NEW MEXICO

Dear Mr. Baker:

The New Mexico Oil Conservation Division (OCD) has completed a review of Huntsman Corporation's (HC) October 6, 1998 "STAGE 2 ABATEMENT PLAN FOR FORMER BRICKLAND REFINERY SITE" and August 14, 1998 "STAGE 2 ABATEMENT PLAN, FORMER BRICKLAND REFINERY SITE, HUNTSMAN POLYMERS CORPORATION". These documents contain HC's draft Stage 2 Abatement Plan Proposal for remediation of contaminated soil and ground water identified during Rexene's Stage 1 site investigations at the former Brickland Refinery in Sunland Park, New Mexico. The documents also contain proof of notice of HC's Stage 2 Abatement Plan.

The OCD did not receive any public comments or requests for a public hearing during the 60-day notice period. Therefore, pursuant to New Mexico Water Quality Control Commission (WQCC) regulation 4109.C., the above referenced Stage 2 Abatement Plan is approved with the following conditions:

1. All tanks that contain fluids other than fresh water will be placed within an impermeable containment system bermed to contain one and one-third times the volume of the largest tank or one and one-third times the volume of all interconnected tanks, whichever is greater.

2. All below-grade wastewater lines will be pressure tested to a minimum of 3 psi above normal operating pressure prior to operation. The results of any testing will be provided to the OCD.

3. All wastes generated will be disposed of at an OCD-approved facility.

4. All water quality samples will be obtained and analyzed using EPA-approved methods and quality assurance/quality control (QA/QC) procedures.

5. The annual report will be submitted to the OCD by February 2 of each year. The report will be submitted to the OCD Santa Fe Office with a copy provided to the OCD Artesia District Office. The report will contain:

   a. A description of all monitoring and remediation activities that occurred during the previous calendar year including conclusions and recommendations.

   b. Summary tables of all past and present laboratory analytical results of ground water and surface water sampling and plots of concentration vs. time for contaminants of concern for each monitoring point. Copies of the previous calendar year laboratory analytical data sheets and associated QA/QC data will also be included.

   c. A semiannual water table elevation map using the water table elevation of the ground water in all monitor wells and well points.

   d. Plots of water table elevation vs. time for each ground water monitoring point.

   e. An annual free product thickness map created using the free product thickness in all monitor wells and well points.

   f. Isopleth maps for all contaminants of concern (*ie.*, benzene, BTEX, etc.)

   g. The total semiannual volume of fluid pumped from each recovery well and the total volume recovered to date.

   h. The semiannual volume of product recovered and the total recovered to date.

   i. The disposition of all wastes generated.

   j. As built construction details of the recovery system.

   k. The results of all below-grade line testing.

   l. A map showing the locations of the soil cap areas and all as-built construction details of the soil cap system including soil test results verifying that the cap design criteria have been met.

Please be advised that OCD approval does not relieve HC of liability if the Stage 2 Abatement Plan fails to adequately protect surface water, ground water, human health or the environment or if the plan fails to adequately remediate and monitor contamination at the site. In addition, OCD approval does not relieve HC of responsibility for compliance with any other federal, state or local laws and regulations.

If you have any questions, please contact Bill Olson of my staff at (505) 827-7154.

Sincerely,

Lori Wrotenbery

Lori Wrotenbery
Director

xc: OCD Artesia Office
Mora Hanning, NMED Superfund Program Manager
Reid Bandeen, TRW Systems & Information Technology
Yusuf E. Farran, International Boundary and Water Commission

Appendix 2

Work Plan for Soil Cover
Hicks Consultants
March 29, 1999

R.T. HICKS CONSULTANTS, LTD.

4668 Indian School NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

Mr. William Olson
State of New Mexico
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

March 29, 1999

Re: **Brickland Refinery Site, Sunland Park, New Mexico**
Construction Quality Assurance Plan and Work Plan Approval

Dear Bill,

On behalf of Huntsman Polymers Corporation (Huntsman), Hicks Consultants is pleased to submit the following two documents for your approval. These submittals are the Work Plan and the Construction Quality Assurance Plan for the Brickland Refinery Site. The documents are requirements of the Stage 2 Abatement Plan that was approved on December 17, 1998.

Sampling and analytical work defining the distribution of lead in the near-surface soils is included with these documents. Several sampling events were required in December and February to complete this determination. The contour lines indicating the regulatory level of 400 mg/kg is also indicated on the plate. After the approval of the documents, bids will be requested to install the cover.

Thank you in advance for your consideration and timely review of the documents. As always, if there are any additional questions that should arise, please feel free to contact me at (972) 985-7948 or Roger Martin of Huntsman at (915) 640-8275.

Best Regards,

Todd

Todd Carver

Enclosures:

cc: Roger Martin, Huntsman
Randy Hicks, Hicks Consultants

Work Plan for Soil Cover

Date: March 29, 1999

Re: Brickland Refinery Site, Sunland Park, New Mexico

Introduction

Huntsman Polymers Corporation (Huntsman) is the current owner of the property known as The Brickland Refinery Site. The site is located at 3010 Old McNutt Road near Sunland Park, New Mexico in Dona Ana County. Huntsman is seeking to resolve outstanding regulatory issues of the New Mexico Water Quality Control Commission (NMWQCC) as administered by the New Mexico Oil Conservation Division (NMOCD). Previous submissions addressed Abatement Plan requirements for Stage 1 (site characterization) and Stage 2 (abatement method selection and design). NMOCD approved the Stage 1 Abatement Plan on May 21, 1997 and the Stage 2 Abatement Plan on December 17, 1998. BDM Environmental prepared both of these submissions for Huntsman. The Stage 2 Abatement Plan Proposal identified the need for a soil cover to help isolate lead from the biosphere, minimizing the potential for inhalation, ingestion and adsorption. Huntsman provided preliminary descriptions of the soil cover work plan and the construction quality assurance (CQA) plan in the Stage 2 Abatement Plan and other written responses to NMOCD's questions. Hicks Consultants submits this memorandum for approval as the final work plan to construct the soil cover required by the Stage 2 Abatement Plan proposal.

In order to produce a cover that will have longevity with minimal maintenance, the design must consider compaction and composition factors. In addition to the Stage 1 and Stage 2 Abatement Plan proposals, Hicks Consultants employed the EPA publications entitled *Seminar Publication: Design and Construction of RCRA/CERCLA Final Covers (EPA/625/4-91/025)* and *Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities (EPA/600/R-93/182)* as guidance for developing this work plan.

Lateral Extent of Soil Cover:

This submission describes work elements necessary to install a soil cover over areas of the Site where near surface samples (0-6 inches deep) exhibit lead concentration above 400 mg/kg. Hicks Consultants used shallow soil sampling results from field campaigns conducted in December 1998 and February 1999 and analytical results from previous BDM sampling events to define the extent of the soil cover. Table 1

shows the lead concentration of each of these samples and Figure 1 provides a map showing these results and the planned extent of the soil cover.

Surface/Subgrade Preparation:
The majority of the site is relatively smooth and flat and will accept the soil cover with little or no surface/subgrade preparation. However, in the north end of the site, construction rubble covers a large portion of the original grade. In other areas, vegetation, rock, large boulders, building foundations, and discarded trash interrupt the otherwise smooth ground surface.

The site areas where the construction rubble is at least 6 inches thick do not require an additional soil cover. The construction rubble serves the same purpose as placing a new soil cover: it minimizes exposure to any lead that may exist in surface or near-surface soil.

Areas where the rubble is less than 6 inches thick (or non-existent) shall be cleared of all objectionable materials (e.g. trash, large rocks, vegetation). Grading of the Site should be conducted as to smooth the general immediate area yet maintain the natural contour of the area. Section 201 of the New Mexico Standard Specification for Public Works Construction provides guidance on clearing and grubbing; Section 210 provides guidance on land leveling. Areas near fences and other large, impervious obstructions (such as foundations) shall be cleared directly up to the fence or object. Since the cover does not have any requirements for hydraulic conductivity, there is no need to do further sub-grade or surface preparation. All materials removed during this preparation shall be deposited on-site at a location approved by the project manager.

Cover Construction Material:
The soil used in the construction of the cover shall be natural sub-base material suitable for street construction as described in the New Mexico Standard Specifications for Public Works Construction (Section 303). The cover will be constructed in one lift. The material shall contain a satisfactory composition of fines, gravel, stones and rocks and have a plasticity index sufficient to enable compaction to the desired levels. The material will be imported from off-site and free of any deleterious substance. The earth-work contractor will submit a representative sample of the proposed material to the soils laboratory for testing and the project manager for approval prior to its use.

Compaction and Cover Parameters:
The soil shall be compacted with a smooth wheeled roller to a target of 95% of maximum density for the body of the cover and a minimum of 70 % where obstructions such as fence lines and other immovable objects exist. All testing

shall be conducted according to the American Society for Testing and Materials (ASTM) test method D1557 (dry weights). The minimum compacted thickness of the cover shall be 6 inches as determined by relative elevation measurements at the site. The edge of the cover shall extend at least one foot beyond the area of concern as defined in Figure 1.

All sides of the cover shall be sloped at approximately 3% grade to reduce erosion. The contractor will place erosion markers at the corners of the cover and along an approximately 100-foot grid traversing the cover. These markers will aid in rapid determination of new erosion. The markers will be constructed of a 2-inch pipe with cap or a similar device placed at grade so that if the marker is observed, the amount of erosion is easily measured. No sealing between the marker and the completed cover is required.

Inspection and Documentation of Cover Installation:
The General Contractor's Personnel will inspect and test the cover in accordance with the Construction Quality Assurance (CQA) Plan to determine if it meets the design parameters. Compaction testing (water content and density) shall be conducted in the field approximately once per 1000 cubic yards of cover. If the cover is approximately 6 inches in thickness, this calculates to one sample every 54,000 square feet of coverage. However, to account for varying heights in the sub-grade, the cover will be tested once every 40,000 square feet. Additionally, each separate cover area, regardless of actual size, will be tested at least once. The CQA covers documentation requirements for the cover installation. Documentation including, but not limited to, photographs, construction logs, figures used in the construction, as-constructed drawings and a report covering the project will be collected. Copies of all documentation will be provided to Huntsman, the City of Sunland Park, NMOCD (2 copies), and R.T. Hicks Consultants.

Health and Safety Plan:
The contractor installing the cover shall develop a Health and Safety Plan with information provided by personnel familiar with the site. The condition of concern is inhalation of lead via suspension of loose soil due to disturbance by construction equipment. Leveling is to be kept to a minimum and, when required, shall be done with a minimum of disturbance. All personnel will wear dust masks during these activities and at other times designated by the contractor's Health and Safety Officer. The contractor's Health and Safety Officer will determine general personal protection requirements. At a minimum, we expect these to include hard hats, safety shoes, leather gloves and long coveralls in addition to the dust masks. Site visitors will adhere to the Contractor's Heath and Safety Plan.

Post-Installation Inspections:
Semi-annual inspections shall be conducted to identify any deterioration of the cover. The City of Sunland Park may conduct these inspections in accordance with an agreement with Huntsman. We anticipate inspection by Sunland Park employees where the cover lies in the area of their proposed future operations. Hicks Consultants will coordinate training for Sunland Park personnel, to advise them of requirements for inspection of the cover and notification to Huntsman.

Regulatory Approval:
Huntsman will not commence site work until NMOCD has approved the Work Plan, the CQA Plan, the Health and Safety Plan, and the construction plans and specifications.

Appendix 3

Construction Quality Assurance Plan
Hicks Consultants
March 29, 1999

Construction Quality Assurance Plan

Date: March 29, 1999

Re: Brickland Refinery Site, Sunland Park, New Mexico

Introduction

The Construction Quality Assurance (CQA) Plan provides a set of planned activities and procedures that document to the owner and permitting agency that the soil cover for the above-mentioned site meets design specifications. The CQA describes the protocol for inspection, verification and evaluation of materials and construction methods used to complete the work elements described in the work plan.

Hicks Consultants referred to two EPA documents to develop this CQA Plan. These resources were the *Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities (EPA/530-(S)SW-86-031)* and the *Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities (EPA/600/R-93/182)*. Although the Brickland Refinery Site is neither a hazardous land disposal facility nor a "containment" facility, the guidance documents provide insight and information applicable to soil cover for lead-containing soils.

This CQA plan is a site-specific document that addresses the following five areas:

1. **Responsibility and Authority** – delineates the responsibilities of all people involved with the construction of the cover.
2. **CQA Personnel Qualifications** – identifies the qualifications of the CQA officer and inspection personnel.
3. **Inspection Activities** – lists the observations and tests that will be conducted to demonstrate that the construction meets or exceeds the design parameters.
4. **Sampling Strategies** – describes the sampling activities, frequency of testing, location of samples, and methods used.
5. **Documentation** – includes detailed reporting requirements for logs and other data.

Responsibility and Authority

The following entities are involved with coordination of the project:

Permitting Agency - **The New Mexico Oil Conservation Division (NMOCD).**
Agency Contact - Mr. William Olson
Phone number - (505) 827-7154
Responsibilities - Approval of the CQA Plan and the Work Plan
Review of, and a repository for, the final project report

Facility Owner - **Huntsman Polymers Corporation.**
Company Contact - Mr. Reggie Baker
Phone Number - (915) 640-8760
Responsibilities - General direction of the project
Selection of the parties assisting in the cover installation
Main repository for records

Design Engineer/Consultants - **Hicks Consultants, Ltd.**
Company Contact - Mr. Todd Carver
Phone Number - (972) 985-7948
Responsibilities - Prepare documents required for approval by the agency
Prepare the bid package for the contractors
Delineate the area to be included under the cover
Establish with the general contractor where and how to place and construct the erosion markers
Provide the design of the cover along with the CQA Officer/Engineer

CQA Officer/Engineer - **Hicks Consultants, Ltd.**
Company Contact - Mr. Claude Schleyer, P.E.
Phone Number - (505) 248-4619
Responsibilities - Review the design criteria
Design the construction of the cover
Review the raw materials to be recommended for the cover
Review the results for the compaction testing
Provide expert information on the overall project

General Contractor/Construction Contractor-**To Be Determined**
Responsibilities – Prepare a site-specific Health and Safety Plan (HASP)
Provide training and personal protection equipment to personnel present on site
Review with design engineer and facility owner the overall plan for the cover installation

Arrange procurement and transportation of raw materials to the site
Ensure raw materials meet established specifications
Clear the area and install the cover over the designated area
Coordinate the compaction of the cover
Provide quality assurance (compaction) testing and documentation as required using qualified personnel
Set erosion markers where required
Furnish designated reports and photographs
Completes summary report for the project

Soils laboratory - **To Be Determined**
Responsibilities - Provide laboratory compactability curve and optimum water contact for soil to be used in the cover by contractor

Personnel Qualifications

Owner's Representative – Mr. Reggie Baker, Huntsman Polymers, has knowledge of the project, the site, the specifications for the cover installation and the requirements of the agency.

Design Engineer/Consultant – Mr. Todd Carver, Hicks Consultants, Ltd., is a degreed engineer who possesses an intimate knowledge of the site, the parties involved and the regulatory requirements. He is familiar with the testing for the constituents of concern and the area where the cover is to be located. He has managerial experience to enable coordination of all aspects of the project with the agency, owner and contractor.

CQA Officer – Mr. Claude Schleyer, Hicks Consultants, Ltd., is a degreed civil engineer and registered Professional Engineer in the State of New Mexico (license number 8209). He has experience in the construction of covers at similar sites, such as landfills.

CQC Personnel – Employed by the general contractor, selected personnel will be familiar with compaction, water content and density testing and have sufficient experience to perform these analyses.

General Contractor/Construction Contractor – The selected contractor will have experience in installations of this type and size. Personnel will be trained and familiar with hazardous waste handling and have knowledge of general health and safety procedures and requirements. Where applicable, they will be certified in the operation of the equipment employed on the site. The contractor will provide documentation of insurance for worker compensation, vehicle insurance and

liability. They must be (or will prepare paperwork to become) on the Huntsman approved contractor's list.

Soils Laboratory – The selected laboratory will be certified to perform the required soils testing. Personnel will be trained in using the test equipment and experienced in analysis and reporting.

Inspection Activities

Before the cover installation begins, the design engineer, the CQA engineer and the contractor will meet on site to transfer and coordinate knowledge of the requirements for all records. The Quality Assurance Engineer or his representative will conduct the inspections outlined below.

Pre-construction

(1) Conduct visual inspection of the cover raw material. The soil must conform to the specifications of the New Mexico Standard Specification for Public Works Construction (Section 303) and should be free of any deleterious materials.

(2) Provide analytical testing for the raw material. The General Contractor will provide the CQA Engineer with documentation that the cover raw material meets the specifications for Public Works Construction (Section 303 for sub-base preparation).

(3) Determine the optimum compaction curve for the raw material. Field and laboratory personnel will determine the compaction parameters for the raw material and develop moisture content and compaction curves (Modified Proctor test-ASTM D-1557). The CQA Engineer will witness a portion of the testing program and review all test results.

Site Preparation

(4) Visually inspect the site. Before cover installation, The CQA Engineer will verify that the area is grubbed and leveled, that markers are set to indicate both the depth and areal extent of the cover and that the area is clear of all removable obstructions.

(5) Reach agreement on special areas. Through inspection and discussion, The CQA Engineer and the General Contractor will address areas of concern where obstructions, such as concrete foundations, are not readily movable.

Cover Installation

(6) Provide documentation on the weather. The General Contractor will note the weather conditions in the field log to document that the weather will not adversely affect the installation of the cover.

(7) Visually inspect the loads of incoming raw material. Each load received on site will be inspected by the General Contractor for determination of deleterious components contained in the material. The results of each inspection will be documented in the field log. Periodically the CQA Engineer will independently inspect the raw material.

(8) Visually inspect the cover. The CQA Engineer will check the minimum depth, the areal extent and the designated slope at the edges of the cover against design parameters.

(9) Conduct compaction testing for cover during installation. The General Contractor will conduct the water content, rapid test method, (ASTM method D-3017 nuclear test or ASTM D-4643 microwave oven) and total density, rapid test method, (ASTM D-2922 nuclear or equivalent) once per 40,000 square feet of coverage. A minimum of one test per non-continuous cover location will also be performed, regardless of area. Field testers will record the number of passes of the roller required to achieve the desired compaction and record the compaction levels achieved in areas with immovable obstacles. The General Contractor shall retain records of testing and observations in a field log book. Periodically, the CQA Engineer will witness this testing program.

Post Installation

(10) Visually inspect and record the location of erosion markers. The contractor will note on a drawing the location of each marker relative to the cover area.

(11) Visually inspect special areas. The CQA Engineer will determine whether coverage is adequate in areas with immovable objects such as fence lines and foundations.

The General Contractor will provide all inspection records and logs to the CQA engineer and the design engineer. The engineers will review these records as soon after construction as possible to ensure all required records are present.

Sampling Strategy

The format referenced by EPA includes this section as a discussion for the detailed description of extensive sampling and delineation of the frequency of testing. Since this project is not particularly complex, in comparison with landfill and containment construction activities, the sampling strategy is straightforward. Therefore, this section is abbreviated to only list the sampling requirements. Rather than repeat what has been stated in the inspection activities section, reference is made to that section of the document.

Raw Materials-Hicks Consultants recommends duplicate qualification testing by the soils laboratory for the raw material to document that the material meets specifications. The material to be tested should be representative of the borrow material. Samples of the raw material should also be viewed by the CQA engineer. Random sampling from the incoming loads of raw material may be conducted at the request of the CQA engineer.

Cover Construction-Personnel will test compactive properties every 40,000 square feet of cover and in each discontinuous cover. Previous qualification of the raw material will demonstrate that the soil can be compacted to the desired level. Therefore, sampling on site will aid in refining the compaction techniques required to achieve the target level.

Documentation

The Final Construction Report from the Contractor shall contain:

- The testing and compaction curves developed as qualification of the raw material
- The location and result of each compaction test plotted on a site map.
- All records of visual observations as indicated in the inspection activities section
- All construction or field log books and records
- Photographs of selected construction activities and field testing programs

The CQA Engineer will review the Contractors Final Report against his own field notes. Hicks Consulting will then issue an opinion letter regarding the conformance of the final installation with the design specifications. Final payment to the General Contractor shall be withheld until any deficiencies in the opinion letter are resolved.

TABLE 1
Analytical Results for Lead in Soils-Brickland Refinery Site

Fraction	Sample ID	ALLResult	MthRepUnits	Sample Date	CalcRDL	CompRegDescrip
9812170-01A	**B28**	**491**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-02A	**B32**	**782**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-03A	**B41**	**207**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812170-04A	**B42**	**296**	mg / Kg	12/15/1998	10	Test: SW846-7000 series AA-FL
9812170-05A	**B43**	**265**	mg / Kg	12/15/1998	10	Test: SW846-7000 series AA-FL
9812170-06A	**B51**	**26.4**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812170-07A	**B52**	**11.2**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812170-08A	**B53**	**353**	mg / Kg	12/15/1998	10	Test: SW846-7000 series AA-FL
9812170-09A	**B54**	**338**	mg / Kg	12/15/1998	10	Test: SW846-7000 series AA-FL
9812170-10A	**C12**	**566**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-11A	**C13**	**458**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-12A	**C14**	**672**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-13A	**C15**	**471**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-14A	**C16**	**644**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-15A	**C17**	**298**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-18A	**C22**	**1950**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812170-19A	**C23**	**1140**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812170-20A	**C24**	**1630**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812170-21A	**C25**	**1050**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812170-22A	**C26**	**165**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812170-24A	**C32**	**421**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-25A	**C33**	**1660**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812170-26A	**C34**	**6380**	mg / Kg	12/15/1998	250	Test: SW846-7000 series AA-FL
9812170-27A	**C35**	**464**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-31A	**C43**	**544**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-32A	**C44**	**5190**	mg / Kg	12/15/1998	250	Test: SW846-7000 series AA-FL
9812170-33A	**C45**	**980**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812170-34A	**C46**	**10.2**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812170-35A	**G42**	**10.9**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812170-16A	**C18**	**623**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812170-17A	**C21**	**1290**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812170-23A	**C27**	**87.6**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812170-28A	**C36**	**153**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812170-29A	**C37**	**16.4**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812170-30A	**C42**	**598**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL

Fraction	Sample ID	ALLResult	MthRepUnits	Sample Date	CalcRDL	CompRegDescrip
9812169-01A	**G45**	**6.4**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-02A	**G46**	**20.2**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-03A	**G47**	**7.9**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-04A	**G48**	**51.6**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-05A	**G51**	**6.2**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-06A	**G52**	**ND**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-07A	**G53**	**ND**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-08A	**G54**	**ND**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-09A	**G12**	**58.2**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-10A	**G21**	**17.1**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-11A	**G27**	**267**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812169-12A	**G31**	**18.0**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-13A	**G55**	**6.2**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-14A	**G56**	**8.0**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-15A	**G57**	**ND**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-16A	**G58**	**ND**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-17A	**G61**	**17.6**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-18A	**G62**	**59.6**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-19A	**G63**	**6.6**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-20A	**G64**	**8.6**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-21A	**G65**	**6.2**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-22A	**G66**	**9.3**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-23A	**G67**	**33.3**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-24A	**G72**	**142**	mg / Kg	12/15/1998	5	Test: SW846-7000 series AA-FL
9812169-25A	**F89**	**958**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812169-26A	**F810**	**938**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812169-27A	**B14**	**652**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812169-28A	**B15**	**521**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL
9812169-29A	**B16**	**1660**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812169-30A	**B17**	**3630**	mg / Kg	12/15/1998	125	Test: SW846-7000 series AA-FL
9812169-31A	**B22**	**1160**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812169-32A	**B23**	**238**	mg / Kg	12/15/1998	10	Test: SW846-7000 series AA-FL
9812169-33A	**B24**	**6170**	mg / Kg	12/15/1998	500	Test: SW846-7000 series AA-FL
9812169-34A	**B25**	**1160**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812169-35A	**B26**	**1190**	mg / Kg	12/15/1998	50	Test: SW846-7000 series AA-FL
9812169-36A	**B27**	**468**	mg / Kg	12/15/1998	25	Test: SW846-7000 series AA-FL

Fraction	Sample ID	ALLResult	MthRepUnits	Sample Date	RunDF	CalcRDL	CompRegDescrip
9812167-01A	**E15**	**1200**	mg / Kg	12/15/1998	25	125	Test: SW846-7000 series AA-FL
9812167-02A	**E16**	**688**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-03A	**E17**	**267**	mg / Kg	12/15/1998	3	15	Test: SW846-7000 series AA-FL
9812167-04A	**E21**	**444**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-05A	**E22**	**270**	mg / Kg	12/15/1998	3	15	Test: SW846-7000 series AA-FL
9812167-06A	**E23**	**92.4**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-07A	**E24**	**1040**	mg / Kg	12/15/1998	10	50	Test: SW846-7000 series AA-FL
9812167-08A	**E25**	**1030**	mg / Kg	12/15/1998	10	50	Test: SW846-7000 series AA-FL
9812167-09A	**E26**	**847**	mg / Kg	12/15/1998	10	50	Test: SW846-7000 series AA-FL
9812167-10A	**E27**	**175**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-11A	**E31**	**ND**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-12A	**E32**	**13.1**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-13A	**E33**	**1280**	mg / Kg	12/15/1998	10	50	Test: SW846-7000 series AA-FL
9812167-14A	**E34**	**362**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-15A	**E35**	**1950**	mg / Kg	12/15/1998	10	50	Test: SW846-7000 series AA-FL
9812167-16A	**E36**	**477**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-17A	**E37**	**1720**	mg / Kg	12/15/1998	10	50	Test: SW846-7000 series AA-FL
9812167-18A	**E43**	**993**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-19A	**E44**	**24.9**	mg / Kg	12/15/1998	10	1	Test: SW846-7000 series AA-FL
9812167-20A	**E45**	**34.0**	mg / Kg	12/15/1998	10	1	Test: SW846-7000 series AA-FL
9812167-21A	**G13**	**0.7**	mg / Kg	12/15/1998	1	0.1	Test: SW846-7000 series AA-FL
9812167-22A	**G14**	**1.2**	mg / Kg	12/15/1998	1	0.1	Test: SW846-7000 series AA-FL
9812167-23A	**G22**	**1.4**	mg / Kg	12/15/1998	1	0.1	Test: SW846-7000 series AA-FL
9812167-24A	**G23**	**22.9**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-25A	**E46**	**44.1**	mg / Kg	12/15/1998	25	2.5	Test: SW846-7000 series AA-FL
9812167-26A	**E47**	**67.6**	mg / Kg	12/15/1998	25	2.5	Test: SW846-7000 series AA-FL
9812167-27A	**E52**	**6.3**	mg / Kg	12/15/1998	5	0.5	Test: SW846-7000 series AA-FL
9812167-28A	**E53**	**15.1**	mg / Kg	12/15/1998	5	0.5	Test: SW846-7000 series AA-FL
9812167-29A	**E55**	**18.7**	mg / Kg	12/15/1998	5	0.5	Test: SW846-7000 series AA-FL
9812167-30A	**E56**	**960**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-31A	**E63**	**430**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-32A	**E64**	**13.6**	mg / Kg	12/15/1998	5	0.5	Test: SW846-7000 series AA-FL
9812167-33A	**E65**	**535**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-34A	**E12**	**137**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-35A	**E13**	**18.0**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-36A	**E14**	**5.5**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-37A	**F29**	**876**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-38A	**F210**	**65.6**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-39A	**F35**	**1240**	mg / Kg	12/15/1998	10	50	Test: SW846-7000 series AA-FL
9812167-40A	**F36**	**518**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-41A	**F37**	**1340**	mg / Kg	12/15/1998	10	50	Test: SW846-7000 series AA-FL
9812167-42A	**F38**	**530**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-43A	**F39**	**530**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-44A	**F310**	**55.2**	mg / Kg	12/15/1998	1	5	Test: SW846-7000 series AA-FL
9812167-45A	**F85**	**775**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-46A	**F86**	**219**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-47A	**F87**	**565**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL
9812167-48A	**F88**	**564**	mg / Kg	12/15/1998	5	25	Test: SW846-7000 series AA-FL

Fraction	Sample ID	ALLResult	MthRepUnits	Sample Date	CompRegDescrip
9902077-01A	BC32	277	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-02A	ED31	268	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-03A	ED35	634	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-04A	ED48	593	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-05A	ED44	23.4	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-06A	ED47	654	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-07A	ED32	864	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-08A	ED36	669	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-09A	BC33	20.0	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-10A	BC23	36.2	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-11A	BC27	1610	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-12A	BC26	430	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-13A	BC21	273	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-14A	BC34	247	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-15A	BC25	208	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-16A	ED33	262	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-17A	ED37	846	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-18A	ED46	510	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-19A	ED45	820	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-20A	ED38	570	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-21A	ED34	ND	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-22A	ED19	413	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-23A	BC22	129	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902077-24A	ED17	490	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL

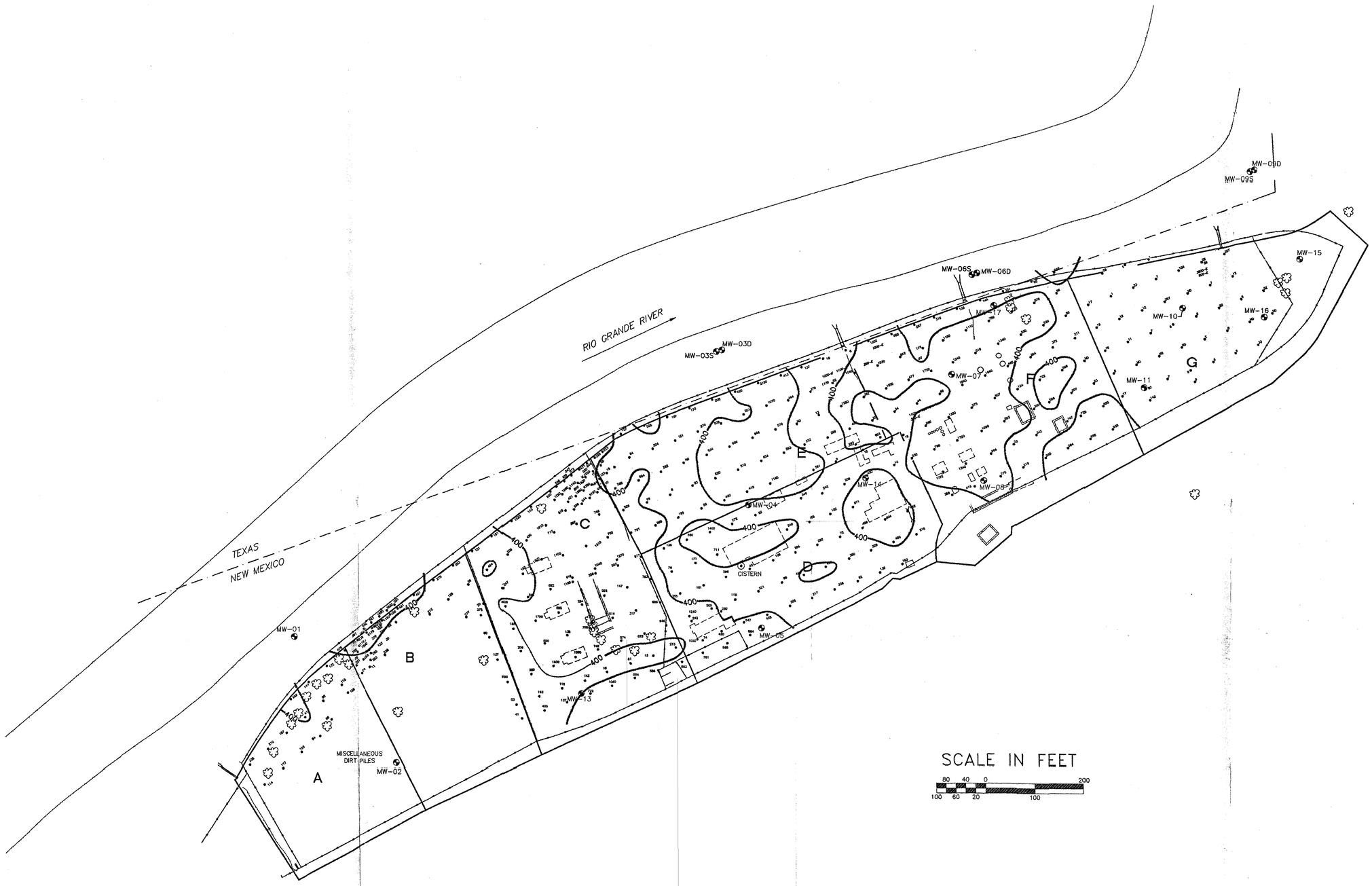
Fraction	Sample ID	ALLResult	MthRepUnits	Sample Date	CompRegDescrip
9902076-01A	ED86	108	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-02A	ED87	264	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-03A	ED88	292	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-04A	ED89	72.5	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-05A	ED810	426	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-06A	ED811	804	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-07A	ED812	442	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-08A	ED714	1770	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-09A	F74	1540	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-10A	ED43	7.6	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-11A	ED51	701	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-12A	ED56	412	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-13A	ED108	338	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-14A	ED97	468	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-15A	ED911	450	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-16A	ED42	98.9	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-17A	ED52	986	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-18A	ED69	242	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-19A	ED106	306	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-20A	ED98	423	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-21A	912	218	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-22A	ED41	525	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-23A	ED54	49.4	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-24A	ED610	208	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-25A	ED95	321	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-26A	ED99	350	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-27A	ED814	358	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-28A	F84	416	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-29A	ED910	229	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-30A	ED96	86.4	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-31A	ED55	430	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902076-32A	ED1011	193	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL

Fraction	Sample ID	ALLResult	MthRepUnits	Sample Date	CompRegDescrip
9902075-01A	ED18	2180	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-02A	BC35	182	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-03A	BC36	1300	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-04A	BC37	717	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-05A	BC38	287	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-06A	ED12	127	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-07A	ED13	508	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-08A	ED14	167	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-09A	ED15	170	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-10A	ED16	208	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-11A	ED22	63.6	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-12A	ED23	224	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-13A	ED24	151	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-14A	ED25	274	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-15A	ED26	508	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-16A	ED27	201	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-17A	ED28	1070	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-18A	ED49	322	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-19A	ED59	591	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-20A	ED410	299	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-21A	ED411	466	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-22A	ED512	653	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-23A	ED77	548	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-24A	ED68	346	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-25A	ED66	52.2	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-26A	ED57	1160	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-27A	ED65	272	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-28A	ED53	169	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-29A	ED78	105	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-30A	ED79	182	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-31A	ED710	871	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-32A	ED1010	135	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-33A	ED109	62.2	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-34A	ED107	217	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-35A	ED105	428	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902075-36A	ED85	40.4	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL

Fraction	Sample ID	ALLResult	MthRepUnits	Sample Date	CompRegDescrip
9902074-01A	BC17	143	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-02A	A33	103	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-03A	B18	521	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-04A	BC14	151	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-05A	BC18	900	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-06A	BC39	742	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-07A	BC49	765	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-08A	BC48	1310	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-09A	BC59	1270	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-10A	BC58	1040	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-11A	BC57	618	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-12A	BC47	1100	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-13A	F410	211	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-14A	A35	85.8	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-15A	BC12	275	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-16A	BC16	1230	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-17A	F49	372	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-18A	A34	63.6	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-19A	BC11	481	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-20A	BC15	181	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-21A	BC28	818	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-22A	A32	177	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-23A	A36	156	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-24A	BC13	203	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-25A	A17	478	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-26A	A16	172	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-27A	A26	112	mg / Kg	2/8/99	Test: SW846 3050A/7000 series AA-FL
9902074-28A	A25	80.1	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-29A	A14	999	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-30A	A31	114	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-31A	A21	338	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-32A	A22	210	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-33A	A23	187	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-34A	A24	411	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-35A	A15	141	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL
9902074-36A	BC24	494	mg / Kg	2/5/99	Test: SW846 3050A/7000 series AA-FL

Fraction	Sample ID	Sample Date	ALLResult	MthRepUn	CompRegDescrip
9902234-01A	CD 61	2/25/1999	275	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-02A	CD 62	2/25/1999	406	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-03A	CD 63	2/25/1999	395	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-04A	CD 64	2/25/1999	692	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-05A	CD 65	2/25/1999	1160	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-06A	CD 66	2/25/1999	258	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-07A	CD 67	2/25/1999	553	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-08A	CD 68	2/25/1999	817	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-09A	CD 69	2/25/1999	136	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-10A	CD 610	2/25/1999	560	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-11A	CD 611	2/25/1999	1400	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-12A	CD 71	2/25/1999	80.0	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-13A	CD 72	2/25/1999	165	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-14A	CD 73	2/25/1999	1790	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-15A	CD 74	2/25/1999	585	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-16A	CD 75	2/25/1999	284	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-17A	CD 76	2/25/1999	292	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-18A	CD 77	2/25/1999	147	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-19A	CD 78	2/25/1999	783	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-20A	CD 79	2/25/1999	76.2	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-21A	CD 710	2/25/1999	171	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-22A	CD 711	2/25/1999	946	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-23A	CD 81	2/25/1999	137	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-24A	CD 82	2/25/1999	206	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-25A	CD 83	2/25/1999	886	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-26A	CD 84	2/25/1999	138	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-27A	CD 85	2/25/1999	708	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-28A	CD 86	2/25/1999	514	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-29A	CD 87	2/25/1999	317	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-30A	CD 88	2/25/1999	686	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-31A	CD 89	2/25/1999	355	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-32A	CD 810	2/25/1999	181	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-33A	CD 811	2/25/1999	296	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-34A	CD 91	2/25/1999	190	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-35A	CD 92	2/25/1999	280	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-36A	CD 93	2/25/1999	1600	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-37A	CD 94	2/25/1999	1560	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-38A	CD 95	2/25/1999	742	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-39A	CD 96	2/25/1999	574	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-40A	CD 97	2/25/1999	625	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-41A	CD 98	2/25/1999	949	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-42A	CD 99	2/25/1999	1210	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-43A	CD 910	2/25/1999	509	mg / Kg	Test: SW846 3050A/7000 series AA-FL
9902234-44A	CD 911	2/25/1999	119	mg / Kg	Test: SW846 3050A/7000 series AA-FL

Fraction	Sample ID	ALLResult	MthRepUnits	Sample Date	CompRegDescrip
9902235-01A	CD 101	52.9	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-02A	CD 102	193	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-03A	CD 103	119	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-04A	CD 104	143	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-05A	CD 105	18.3	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-06A	CD 106	80.8	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-07A	CD 107	13.0	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-08A	CD 108	273	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-09A	CD 109	1020	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-10A	CD 1010	420	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-11A	CD 1011	547	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-12A	CD 1101	40.8	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-13A	CD 1102	400	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-14A	CD 1103	137	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-15A	CD 1104	722	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-16A	CD 1105	1060	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-17A	CD 1106	564	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-18A	CD 1107	586	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-19A	CD 1108	503	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-20A	CD 1109	761	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-21A	CD 1110	568	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL
9902235-22A	CD 1111	564	mg / Kg	2/25/1999	Test: SW846 3050A/7000 series AA-FL



SCALE IN FEET

80 40 0 200

100 60 20 100

LEGEND

- CONCRETE SLAB/PAD – BLDG FOUNDATION
- WALL – MASONRY
- TREE
- FENCE
- INTERMITTENT STREAM
- MW-01 — MONITORING WELL
- STORM WATER OUTFALL WITH A DITCH
- 3800 — TRW SAMPLING LOCATION (AND RESULTS IN mg/kg)
- 23 — ENVIROMAN SAMPLING LOCATION (AND RESULTS IN mg/kg)
- 400 — CONTOUR OF 400 mg/kg SOIL LEAD CONCENTRATION

TRW

FIGURE 1
DISTRIBUTION OF LEAD IN SURFACE SOIL SAMPLES

CLIENT: HUNTSMAN	
DATE: 1/26/99	REV. NO.:
AUTHOR: RFB	DRAWN BY: DAG
CK'D BY: RFB	FILE: LEAD-ANALYS-1.dwg

Appendix 4

Work Plan Addendum
Hicks Consultants
April 26, 1999

R.T. HICKS CONSULTANTS, LTD.

4665 Indian School NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

Mr. William Olson
State of New Mexico
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

April 26, 1999

Re: **Brickland Refinery Site, Sunland Park, New Mexico**
Work Plan Addendum

Dear Bill,

On March 29, 1999, Hicks Consultants submitted to NMOCD the Work Plan and the Construction Quality Assurance Plan for the installation of a cover at the Brickland Refinery Site. The documents are requirements of Huntsman Polymers Corporation's (Huntsman) Stage 2 Abatement Plan that was approved on December 17, 1998. The Work Plan consisted of elements associated solely with installation of a cover over the areas of soil contamination where lead exceeded the screening level of 400 mg/kg.

Huntsman wishes to amend the Work Plan for the site to include the removal of thirty three (33) Well Points and two (2) Monitoring Wells as proposed in the attached analyses. The removal of these particular Well Points and Monitoring Wells will not adversely affect the data collection at the Site. However, their removal will provide improved access to the area during installation of the cover or eliminate concerns regarding tampering of the Monitoring Wells following transfer of the land surrounding the wells to the City of Sunland Park. It is requested that you approve this addendum to the Work Plan to allow for the removal of these Well Points and Monitoring Wells in the contractor bid packages.

Thank you in advance for your consideration and timely review of this letter and the attached documents. As always, if there are any additional questions that should arise, please feel free to contact Roger Martin of Huntsman Polymers Corporation at (915) 640-8275 or me at (972) 985-7948.

Best Regards,

Todd Carver

Attachments: (2)
cc: Roger Martin, Huntsman
Randy Hicks, Hicks Consultants

Brickland Refinery Site

WELL POINTS ANALYSIS

There are 37 well points (WP) currently located throughout the Brickland Refinery Site property. They were initially established to determine the presence of free phase (fp) material. As the project moves forward with the installation of a cover over most of the site, these well points create an obstacle to its construction. Therefore, an analysis was conducted in which to review the data and recommend well points for potential removal and plugging. The WP can be grouped into four (4) separate categories based on whether they are in the area of where the cover is to be installed or whether they have had a free phase reading. Additional breakdown is provided as given below.

Location of Well Points

Total number:	37	(39 when counting shallow and deep)
WP in cover area:	16	(5, 6, 8, 9, 10, 15, 16, 17, 21, 22, 23, 24, 29, 34, 35, 37)
WP out of cover area:	23	(1, 2, 3, 4, 7, 11, 12, 13, 14, 18, 19, 20, 25, 26(s), 26(d), 27(s), 27(d), 28, 30, 31, 32, 33, 36)

Free Phase Criteria

WP with fp readings: 16 (1, 6, 10, 14, 15, 17, 18, 19, 21, 25, 26, 27(s), 27(d), 29, 33, 37)
(fp reading could be any comment on the result.)

WP w/fp in cover:	7	(6, 10, 15, 17, 21, 29, 37)
WP w/fp out cover:	9	(1, 14, 18, 19, 25, 26, 27(s), 27(d), 33)

By looking at the data for just the past two years (1998 and 1997), the data does not change significantly.

WP with fp measurements last two years: 14
WP with fp in cover-last two years: (6, 15, 17, 21, 29, 37) (drop #10)
WP with fp out cover-last two years: (1, 14, 18, 25, 26, 27(s), 27(d), 33) (drop #19)

Chronological Table of Readings for Well Points

WP	12-98	6-98	1-98	7-97	12-96	6-96	12-95	3-95	12-94	9-94	7-94	3-94	12-93	9-93
1	.74	0.00	dry	0.00	tr.	nm	.16	nm	0.00	0.00	0.00	nm	nm	nm
6	0.00	0.00	tr.	0.00	0.00	nm	0.00	nm	0.00	0.00	0.00	nm	nm	nm
10	dry	0.00	dry	0.00	dry	nm	0.00	nm	dry	.2	0.00	nm	nm	nm
14	tar	tar	tar	tar	tar	nm	.14	nm	nm	tar	0.00	nm	nm	nm
15	0.00	0.00	dry	.20	0.00	nm	0.00	nm	0.00	0.00	0.00	nm	nm	nm
17	dry	0.00	dry	.12	dry	nm	0.00	nm	dry	dry	0.00	nm	nm	nm
18	0.00	0.00	dry	tr.	tr.	nm	0.00	nm	0.00	0.00	0.00	nm	nm	nm
19	0.00	0.00	0.00	0.00	0.00	nm	0.00	nm	0.00	0.00	0.00	nm	.01	nm
21	dry	0.00	dry	.06	dry	nm	0.00	nm	0.00	0.00	0.00	nm	nm	nm
25	1.05	0.00	tr.	nm	nm	nm	1.56	nm	.20	nm	.22	nm	.05	.05
26s	.39	0.00	tar	1.29	0.00	nm	0.00	nm	1.53	2.59	2.20	nm	.12	nm
27s	.07	0.00	0.00	0.00	0.00	nm	nm	nm	0.00	0.00	0.00	nm	nm	nm
27d	0.00	0.00	1.18	.44	.48	nm	nm	nm	.49	.45	.11	nm	nm	nm
29	0.00	0.00	0.00	tr.	0.00	nm	0.00	nm	0.00	0.00	0.00	nm	nm	nm
33	0.00	0.00	0.00	tr.	tr..	nm	0.00	nm	0.00	0.00	0.00	nm	nm	nm
37	0.00	0.00	0.00	.17	.04	nm	0.00	nm	0.00	0.00	0.00	nm	nm	nm

Location of wells that have had no free phase measurement:

LOCATED IN PROJECTED COVER AREA:

WP	Approximate Location
5	Area F, near road, NW of MW-11
8	Area F, near MW-7
9	Area F, near MW-7
16	Area C, near road and MW-13
22	Area F, west of MW-7
23	Area F, SW of MW-7, ½ way to MW-11
24	Area F, near MW-8
34	Area F, near MW-8
35	Area F, near MW-7

LOCATED OUT of PROJECTED COVER AREA:

WP	Approximate Location
2	Area G, east side of property , E of MW-10
3	Area G, east side of property , NE of MW-10
4	Area F, ½ way between MW-10 and MW-7
7	Area G, just W of MW-10
11	Area E, east side of property, South section
12	Area E, east side of property, Mid section
13	Area e, east side of property, North section
20	Area D, NE of MW-14
26d	Area G, near MW-10
28	Area D, NW of MW-14
30	Area G, 2/3 way from MW-10 towards MW-11
31	Area G, near MW-16
32	Area G, near MW-15
36	Area D, near MW-4

WP with free phase comment but without measurable quantity, only a trace reading, or only a "tar" reading, last three years:

WP	Comment	Location
6	Only one trace reading	Area F, S of MW-8
10	No measured amounts-all dry or zero	Area F, eastside, NW of MW-17
14	All tar readings	Area C, eastside, north section
18	One dry and two trace readings	Area D, ½ between MW-5 and MW-14
19	No measured amounts	Area D, west side near fence, S of MW-5
29	Only one trace reading	Area E, SE of MW-4 and NE of MW-14
33	Only two trace readings	Area G, next to MW-11

Only the following WP have free phase measurable readings:
(Highlighted ones are within the expected cover area.)

WP	12-98	6-98	1-98	7-97	12-96	6-96	12-95	3-95	12-94	9-94	7-94	3-94	12-93	9-93
1	.74		dry		tr.	nm	.16	nm				nm	nm	nm
15			dry	.20		nm		nm				nm	nm	nm
17	dry		dry	.12	dry	nm		nm	dry	dry		nm	nm	nm
21	dry		dry	.06	dry	nm		nm				nm	nm	nm
25	1.05		tr.	nm	nm	nm	1.56	nm	.20	nm	.22	nm	.05	.05
26s	.39		tar	1.29		nm		nm	1.53	2.59	2.20	nm	.12	nm
27s	.07					nm	nm	nm				nm	nm	nm
27d			1.18	.44	.48	nm	nm	nm	.49	.45	.11	nm	nm	nm
37				.17	.04	nm		nm				nm	nm	nm

No indication in a cell represents a reading of 0.00.

These well points have the following reference locations.

WP	Readings	Approximate Location
1	2	Area G, east of and near MW-10.
15	1	Area C, north of and near MW-13
17	1	Area D, north of and near MW-5
21	1	Area F, north and west of and near MW-8
25	6	Area G, just south of MW-10.
26s	6	Area G, next to MW-10.
27s	1	Area G, east of and near MW-15.
27d	6	Area G, east of and near MW-15.
37	2	Area D, next to MW-5

SUMMARY

Since most (23 out of 39 locations) WP have never had readings of free phase, they are not providing any data. Additionally, several WP (7 of the remaining 16 locations) at the site have not had a quantifiable reading. These WP are also located near monitoring wells. Of the remaining nine locations, four of them are contained in the projected area to be covered. These well points have only had one measurable reading (three cases) or two readings (one case). In most cases the well points are located adjacent to or upgradient of a monitoring well. The one exception to this is in area C, where WP-14 would be downgradient to the other wells. The remaining five well points are located in Area G where the presence of free phase has been seen in the various lenses.

PROPOSAL

Therefore, WP-14 as well as the five Well Points in area G [WP-1, 25, 26(s), 26(d), and 27(d)] are proposed to remain on-site. The other Well Points will be removed by pulling them from the ground and filling the holes with bentonite or by cutting off the pipe, capping, and cementing or grouting the casings.

REVIEW OF MONITORING WELLS MW-2 AND MW-13

Monitoring wells were installed at the Brickland Site starting in the spring of 1990. These wells were used to initiate a study for groundwater contamination. Volatile, semi-volatile, and metals analysis screening was conducted in April through July of 1990.

RESULTS

MW-2

MW-2 is located in Area A in the northern most section of the plant Site. It is approximately 90 feet from the western edge of the property and 300 feet south of the northwest corner of the site. It is situated in the area of construction debris/rubble that lies in the northern section. The well was sampled in 1990 for volatile organic chemicals, semi-volatile chemicals, and metals. Results were contained in the October 1990 report by Eder Associates entitled *Phase 1 Site Investigation, Field Investigation Report for Old Brickland Refinery Site, Sunland Park, New Mexico.*

Results:

BTEX	none detected (2 samples)
Semi-Volatiles	none detected (2 samples)
	(analysis was run for 2-methylnapthalene, Napthalene, 2,4-dimethyphenol, Flourene, Phenanthrene, Phenol, bis (2-chloroisopryl)ether, 2-methylphenol, 3-methylphenol, and Anthracene)
	five unknown semi-volatile compounds were detected at concentrations less than 30 ppb.
Metals	numerous ions and metals were detected (2 samples)
Free Phase	no free phase hydrocarbons were ever detected

MW-13

MW-13 is located in Area C in the northern half of the plant Site. It is approximately 60 feet from the western edge of the property and 700 feet south of the northwest corner of the site. It is situated in an area where plant housing was once located. The monitoring well is in an area where concrete foundations exist nearby. The well was sampled in 1990 for volatile organic chemicals, semi-volatile chemicals, and metals. Results were contained in the October 1990 report by Eder Associates entitled *Phase 1 Site Investigation, Field Investigation Report for Old Brickland Refinery Site, Sunland Park, New Mexico.*

Results:

BTEX	none detected (2 samples)
Semi-Volatiles	none detected (2 samples)

(analysis was run for 2-methylnapthalene, Napthalene, 2,4-dimethyphenol, Flourene, Phenanthrene, Phenol, bis (2-chloroisopryl)ether, 2-methylphenol, 3-methylphenol, and Anthracene)

two unknown semi-volatile organics were detected at concentrations less than 15 ppb

Metals	numerous ions and metals were detected (2 samples)
Free Phase	no free phase hydrocarbons were ever detected

It appears that following this initial work, the wells were not tested further for any constituents. Water levels were determined since then but no component analysis was noted in any of the records.

PROPOSAL

Remove these two monitoring wells. This will assist in the installation of the cover (in the case of MW-13) but more importantly both MW-2 and MW-13 are situated in the parcel of land that is intended to be transferred to the City of Sunland Park in the near future. Plugging and abandoning these wells will eliminate concerns over contamination or physical damage.

Appendix 5

Stage 2 Abatement Plan Cap Construction Approval Letter
NMOCD
April 26, 1999

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

April 26, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-274-520-644

Mr. Reggie Baker
Huntsman Corporation
P.O. Box 3986
Odessa, Texas 79760

RE: STAGE 2 ABATEMENT PLAN
CAP CONSTRUCTION
BRICKLAND REFINERY
SUNLAND PARK, NEW MEXICO

Dear Mr. Baker:

The New Mexico Oil Conservation Division (OCD) has completed a review of Huntsman Corporation's (HC) March 29, 1999 "BRICKLAND REFINERY SITE, SUNLAND PARK, NEW MEXICO, CONSTRUCTION QUALITY ASSURANCE PLAN AND WORK PLAN APPROVAL" which was submitted on behalf of HC by their consultant R.T. Hicks Consultant, Ltd. These documents contain HC's work plan for construction of the cap for lead contaminated soils identified at the former Brickland Refinery in Sunland Park, New Mexico.

The above referenced work plan is approved with the following conditions:

1. All wastes generated will be disposed of at an OCD-approved facility or in an OCD approved manner.

2. The final construction report will be submitted to the OCD within 60 days of completion of the cap construction. The report will be submitted to the OCD Santa Fe Office with a copy provided to the OCD Artesia District Office.

Please be advised that OCD approval does not relieve HC of liability if the work plan fails to adequately protect surface water, ground water, human health or the environment at the site. In addition, OCD approval does not relieve HC of responsibility for compliance with any other federal, state or local laws and regulations.

If you have any questions, please contact me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrologist
Environmental Bureau

xc: OCD Artesia Office
Mora Hanning, NMED Superfund Program Manager
Todd Carver, R.T. Hicks Consultants, Ltd.
Yusuf E. Farran, International Boundary and Water Commission

Appendix 6

Cap Construction Addendum Approval Letter
NMOCD
May 5, 1999

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

May 5, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-274-520-650

Mr. Reggie Baker
Huntsman Corporation
P.O. Box 3986
Odessa, Texas 79760

RE: CAP CONSTRUCTION ADDENDUM
BRICKLAND REFINERY STAGE 2 ABATEMENT PLAN

Dear Mr. Baker:

The New Mexico Oil Conservation Division (OCD) has reviewed Huntsman Corporation's (HC) April 26, 1999 "BRICKLAND REFINERY SITE, SUNLAND PARK, NEW MEXICO, WORK PLAN ADDENDUM" which was submitted on behalf of HC by R.T. Hicks Consultant, Ltd. This document contains modifications to HC's work plan for construction of a cap for lead contaminated soils at the former Brickland Refinery in Sunland Park, New Mexico. The modifications consist of plugging and abandoning and monitor wells MW-2 and MW-13 and majority of the site well points in order to facilitate installation of the cap.

The above referenced work plan addendum is approved with the following conditions:

1. HC shall not plug and abandon any of the well points in Area G.

2. HC shall plug monitor wells MW-2 and MW-13 from bottom to top with a cement grout containing 3-5% bentonite.

Please be advised that OCD approval does not relieve HC of liability if the work plan fails to adequately protect surface water, ground water, human health or the environment at the site. In addition, OCD approval does not relieve HC of responsibility for compliance with any other federal, state or local laws and regulations.

If you have any questions or comments, please contact me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrologist
Environmental Bureau

xc: OCD Artesia Office
Mora Hanning, NMED Superfund Program Manager
Todd Carver, R.T. Hicks Consultants, Ltd.
Yusuf E. Farran, International Boundary and Water Commission

Appendix 7

Field Services Summary Report
Indian Environmental
June 9, 1999

Indian Environmental Services

(A Division of Indian Fire & Safety, Inc)

FIELD SERVICES SUMMARY REPORT

Date: June 9, 1999

Client: Huntsman Polymers Corporation

Project: Brickland Refinery Site, Soil Cover Installation

Project Number (IES): 98012H

Client Reference: None

June 7, 1999

Mobilized equipment and personnel to the site. Began setting up staging areas for equipment, supplies, Field Office and Sanitary Facilities. At 1300, held a preliminary safety meeting with subcontractors. Meeting covered an overview of the site, and general scope of work. The meeting ended at 1500. Gathered additional supplies, shut down and secured the site at 1630.

June 8, 1999

Arrived on site at 0700. Held safety meeting and performed equipment inspections. Located, marked and pulled well points in Section F. These included:

WP-10	WP-35	WP-24	WP-4	WP-9	WP-8
WP-23	WP-21	WP-6	WP-5	WP-34	WP-22

Located, marked and pulled well points in Section E. These included:

WP-11	WP-12	WP-13	WP-29

Located, marked and pulled well points in Section D. These included:

WP-17	WP-18	WP-19	WP-20
WP-28	WP-36	WP-37	

After pulling the well points, the holes were plugged to surface with granular bentonite and hydrated. Plugged areas were inspected later for subsidence and filled back to grade (if needed).

Began clearing and leveling operations. Continued to 1530 hrs. Shutdown equipment, decontaminated personnel, secured site for the day.

June 9, 1999

Arrived on site at 0700. Mobilized in water truck for dust control and backhoe for leveling operations. Held safety meeting and performed equipment inspections. Removed the tops from the 2 sumps located in Sections C & D. Took 3 samples from each sump. Continued with clearing and leveling operation and debris removal. Pulled well points WP-15 and WP-16 in Section C.

At 0920, called Roger Martin with Huntsman. Discussed the physical characteristics of the contents of the sump. Agreed that the contents were sewage and stormwater. Approved removal and subsequent transport to local wastewater treatment facility.

The sumps were emptied at 1345 hours by OK Pump Service (915) 858-2317. A total of 2000 gallons of fluid were removed and transported to the following facility for disposal:

WWTP Septic Station Busta Mante
10001 Southside Road
El Paso, TX 79927

The load was received and approved by the facility.

At 1530, the Land Group notified Indian that they are not be able to work on the project. Contacted the Huntsman Representative (Roger Martin). Informed him that we are in the process of trying to secure another surveyor as they will be needed on Friday. He (Roger) said to get whomever we needed to be able to properly survey the site. Indian will notify Huntsman as soon as a surveyor is secured.

Began staging cover material on to the site. Plan to try to survey the site after leveling (tomorrow) and begin cover placement.

Shut down site operations at 1615. Decontaminated personnel and secured site.

June 10, 1999
On site at 0700. Held safety meeting and performed equipment inspections. Began working around foundations clearing and leveling. Finished clearing operations in Sections A & B. Continued leveling of site and began compacting along with maintaining dust control operations. Continued until 1500, shut down, performed decontamination operations and secured site at 1530.

June 11-13, 1999
On site at 0700. Held safety meeting and performed equipment inspections. Continued with grading and leveling operations on all applicable sections. At approximately 0900, leveling operations on Section "C" were suspended because of "pumping" of the surface soils when heavy equipment moved on it. It was suspected that this was due to a high water table in the area (water was found at 1 foot.). Alerted Roger Martin with Huntsman of the problem. Roger and the Project Manager will evaluate the situation on-site on Monday, June 14, 1999. Shutdown and secured site at 1530 hrs. Surveyors worked on-site on June 12 & 13 measuring and establishing reference points for the base prior to installation of cover. No other activities were performed over the weekend.

June 14, 1999
On site at 0630. Held safety meeting and performed equipment inspections. Additional water truck mobilized to assist in dust control. Began hauling cover material and spreading.

Met on-site with Roger Martin and Claude Schleyer on possible solutions for stabilizing the pumping action in Section "C" to allow cover installation and compaction. It was agreed upon to proceed with

a 10,000 square foot test area within section "C" consisting of a 3" thick base soil cover blended with 4% cement. Once stabilized, an additional 3" of soil would be placed over this mixture then compacted.

Plan to attempt test area June 15th or 16th. Delivered a total of 2584.15 tons of cover to site (105 loads). Utilized 14 loads of water for dust control. Shut down at 1700. Decontaminated personnel, secured site at 1730.

June 15, 1999
On site at 0630. Held safety meeting and performed equipment inspections. Removed small rubble piles from Sections C & F. Ordered 6 tons of cement for the test area in Section C. Mobilized second grader for spreading operations in the test area. Began covering, leveling and compacting Section F. Terracon arrived on site and performed proctor testing. Compaction rate is 96 - 99.99%. Continues moving cover material, leveling and compacting in Sections F, E, & D.

The graders had become stuck while finishing the spreading of the cement over the test area in Section "C". After discussion with Roger Martin, authorization was given to mobilize a bulldozer to extricate the graders and use to finish the spreading operation. However, after authorization had been given, the graders were freed without the need of the bulldozer.

Further investigation in to the area in Section "C" that is pumping has found that there is a distinct layer of pea gravel approximately 1-2' below the surface. This layer extends vertically for approximately 1 foot and is situated directly down gradient of Sump Number 2. It is believed that this may be an old leach field attached to the sump and encompasses an area of approximately 30,000 square feet.

Transported, spread and installed 135 loads of cover or 3292.32 tons. Cumulative totals are 240 loads or 5876.47 tons of cover material. Utilized 17 loads of water for dust control. Decontaminated personnel, shut down and secured site at 1600.

June 16, 1999
On Site at 0630. Held safety meeting and performed equipment inspection. Began spreading and compacting cover material in Sections F, D, & E.

A conference call was held at 0955 (c.s.t.) with Messrs. Roger Martin and Reggie Baker of Huntsman and Messrs. James Spurgeon and Fred Holmes of Indian.

A background of the site conditions was given by Mr. Spurgeon. Following this it was recommended by Indian that:

1. The small rubble from within the section be placed in the furrows and depressions created where equipment was stuck.

2. The area be covered with ~ 1' of cover material and crowned to allow for sufficient compaction and promote drainage.

Cost for completion of this task is $10,000.00 and was agreed to by Huntsman. Furthermore, Mr.

Spurgeon will contact Roger Martin by 1600 hours to give a progress report.

Moved equipment to Section C and began placing cover material into soft areas. First area covered with the new method began to firm up very well.

Contacted Roger Martin at 1300 hours and gave an update on the progress of the cover in Section C. Also discussed that due to the nature of the base, that achieving compaction in these areas would not be feasible. (Estimate between 75-80% best possible). However, with an additional 1 foot of cover over the area, that over time, the area would achieve the desired rate and still leave an excess of cover over the six inches that were specified.

Roger agreed to give a variance to these areas.

Continued to spread and compact Section C and F around foundations. Decontaminated personnel and secured the site at 1600.

Total daily material 2923.77 tons (122 loads) cumulative 8800.24 tons (362 loads). Utilized 16 loads of water for dust control.

June 17, 1999
On site at 0630. Held safety meeting and performed equipment inspections. Continued to spread and compact material in Section C. Evaluation of the "Soft" areas shows that the additional cover has set very well with no problems.

At 1130 Mr. William Olson with the NMOCD arrived on site. He was given a tour and shown the "soft" area in Section C. Following the inspection Mr. Olson stated that everything looked very good and that he had no concerns.

Continued to spread, cover and compact Sections C & G. Decontaminated personnel and secured the site at 1600.

Daily material total 3243.70 ton (136 loads). Cumulative total 12,043.94 tons (498 loads). Utilized 16 loads of water for dust control.

June 18, 1999
Operations were suspended for rain. Plan to resume operations on June 21, 1999.

June 21, 1999
On site at 0630. Held safety meeting and performed equipment inspections. Continued compaction of Section G and spread and filled spot areas in different sections. Maintained operations until 1600. Shut down operations, decontaminated personnel and secured site.

Daily material total 682.72 tons (29 loads). Cumulative total 12,726.66 tons (527 loads). Utilized 2 loads of water for dust control.

June 22, 1999
On site at 0630. Held safety meeting and performed equipment inspections. Continued spreading, filling and compacting Sections A & B. Todd Carver arrived on-site at 0930 and began inspection of the site. Completed Section A and continued spot work on other sections. Also, performed minor cleanup operations on fence lines.

Completed hauling of cover material. All areas were approved by Todd Carver as covered. Erosion markers were set on a 200 foot grid as per Mr. Carver's instructions. Road repairs to consist of mechanical broom as per discussion between Mr. Carver and Mr. Cudahy (President of American Eagle Brick Co.). Mr. Carver left site at 1630.

Shut down operations, decontaminated personnel and secured site at 1730.

Daily material total 840.60 tons (36 loads). Cumulative total of 13,567.26 tons (563 loads). Utilized 2 loads of water for dust control.

June 23, 1999
On site at 0630. Held safety meeting and performed equipment inspections. Scheduled Terracon to take tests for 6/24/99. Continued to set erosion markers, and touch-up operations. Mr. Carver called at 1235 requesting that pipe be removed from concrete pads and other miscellaneous items outside of the scope. Authorized $1,500.00 to perform the work.

Began final survey of site and demobilization of equipment. Shut down at 1500.

June 24, 1999
On site at 0645. Held safety meeting and performed equipment inspections. Performed additional work as requested by Mr. Carver on 6/23/99. Terracon on-site, all tests performed resulted in 96% or better compaction rate. Completed work and secured site at 1200 hours.

Appendix 8

Photograph Log and Photos
Indian Environmental

HUNTSMAN POLYMERS CORPORATION
PHOTOGRAPH LOG
DESCRIPTION SUMMARY

PHOTO NUMBER	DESCRIPTION
1.	View showing the mobilization of equipment on site.
2.	View of equipment staging area and general site conditions.
3.	Site conditions at project start, looking towards the south end of the site.
4.	Site conditions at project start, looking southwest.
5.	Clearing operations starting on southeast corner.
6.	Clearing debris and brush along east side.
7.	Southeast side during clearing operations.
8.	Clearing and cutting down operations around slabs.
9.	Opposite view, photo number 8.
10.	Clearing around slabs and piling rubble accumulations on slabs.
11.	North end of location prior to clearing.
12.	Attaching to well point prior to removal.
13.	Well point after removal.
14.	North view after clearing operations. Slab edges can be seen in the background.
15.	North view with clearing operations completed and leveling in progress.
16.	View of slabs after clearing and leveling.
17.	Overview from the southwest corner after clearing. Slab areas are clearing visible.
18.	Overview of the south end of the site. Survey crew is in the background taking measurements before installation of the cover.
19.	Clearing operations completed on east side with survey in progress.
20.	Clearing operations completed view, east side.
21.	Sump "A" after removal of cover.
22.	Sump "A" during liquids removal.
23.	Sump "A" after liquids removal.
24.	Uncovering of Sump "B"
25.	Area "C", soft spot during leveling operations.
26.	Area "C" with equipment stuck.
27.	Area "C" after removal of equipment. Water can be observed migrating back into the tire tracks.

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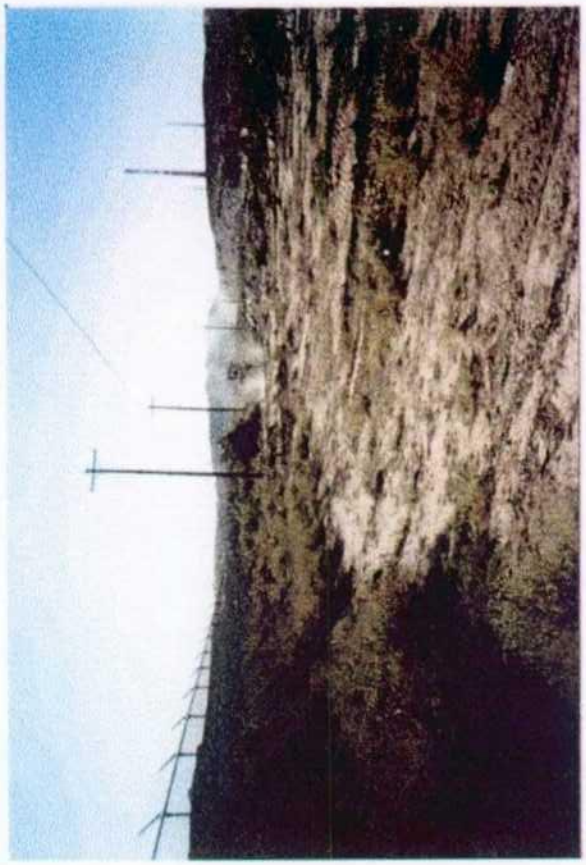

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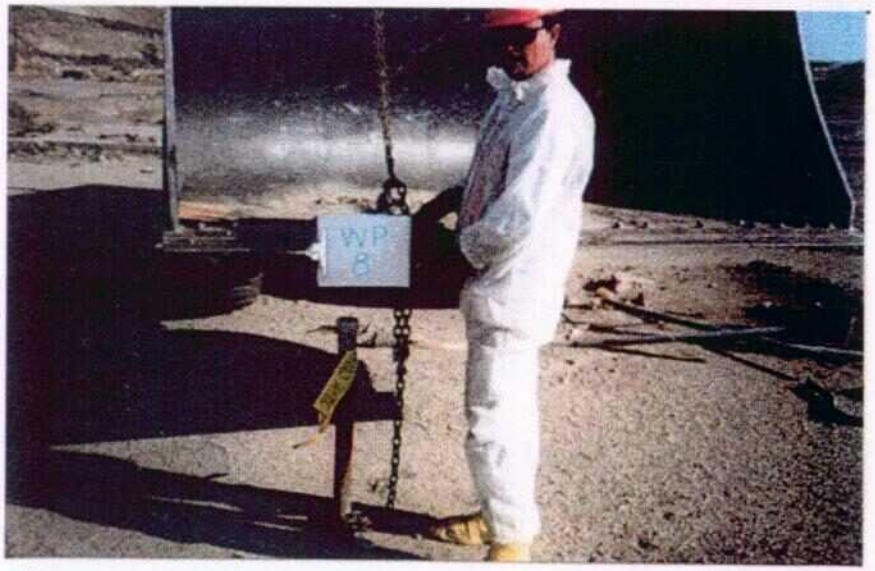

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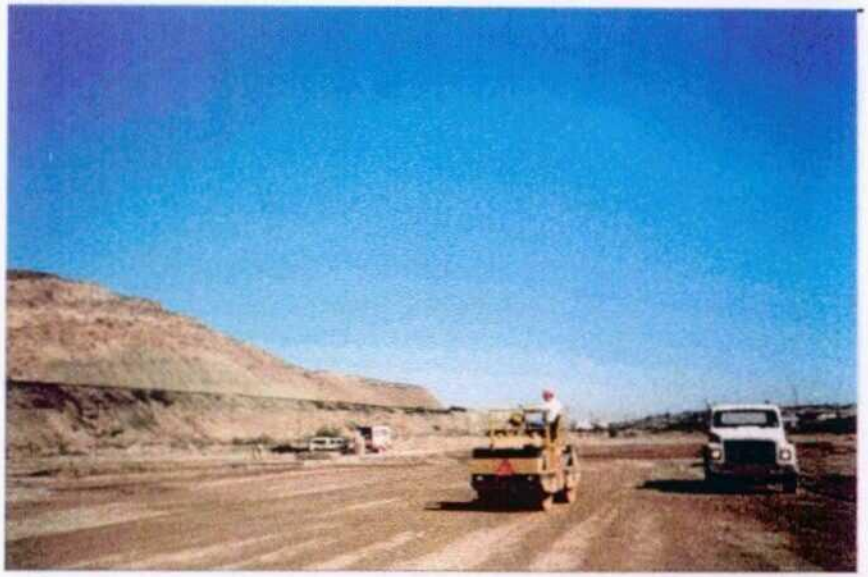

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Appendix 9

Laboratory Compaction and Particle Size Data
Terracon
June 14, 1999

Terracon

Laboratory Compaction Characteristics of Soil

PO Box 5067
Las Cruces, NM 88003
(505) 527-1700

Client Name: Indian Environmental Services
Project Name: Former Brickland Refinery Site
Location: Sunland Park, NM

Project No.: 66992026 Date: 6/14/99

TEST RESULTS

Maximum Dry Unit Wt.: 128.5 pcf
Optimum Water Content: 8.8 %

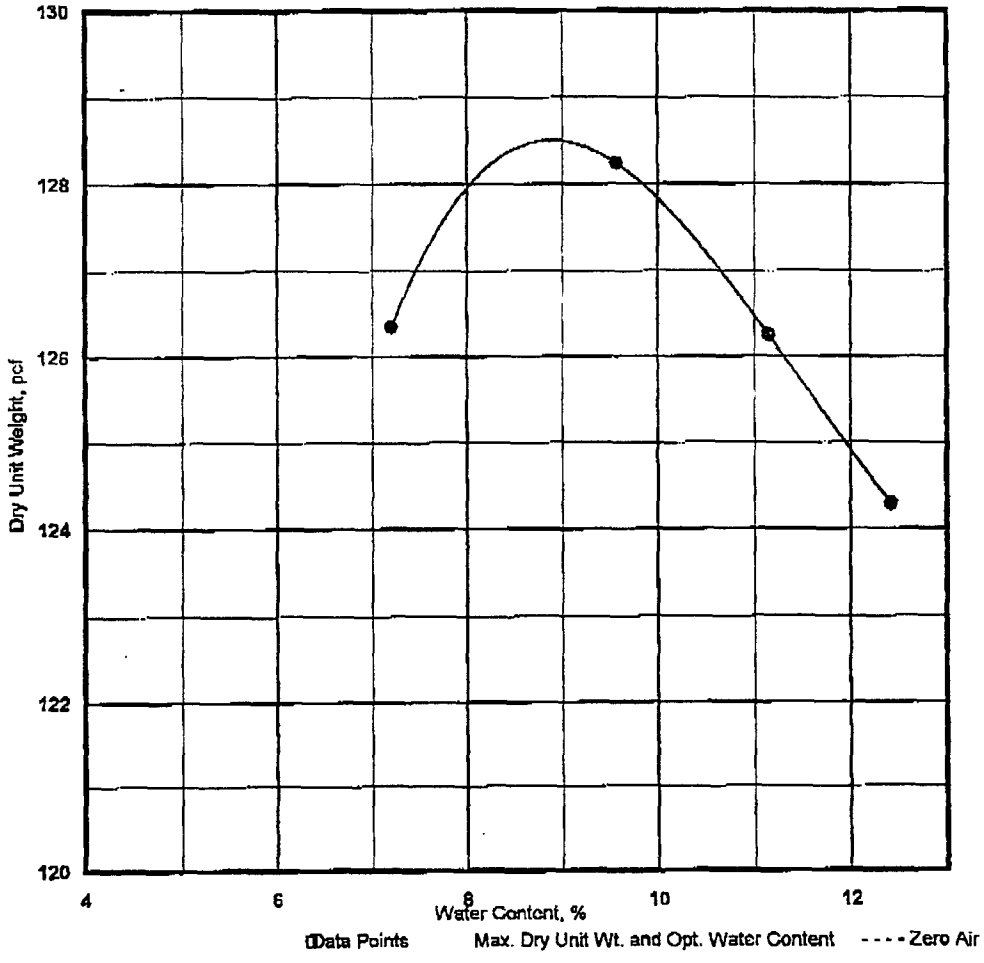
Source Material: McKelligan Canyon
Sample Description: Sandy Gravel with Silt

Material Designation: Basecourse Sample date: 6/11/99
Test Method: D-1557
Test Procedure: Method C
Sample Preparation: Air dry
Rammer: ___ Mechanical X Manual

Liquid Limit: ___ Plastic Limit: ___
Plasticity Index: ___
% passing # 200 sieve: 9.6

Reviewed by: _____

Zero air voids for specific gravity of 0.00



SIEVE ANALYSIS

Project Name:
Indian Environmental
Project Location:
Sunland Park, NM
Job No.: 66992026

Date: 6-14-99

Source: McKelligan Canyon

Supplier: Jobe

Sieve	Weight Retained	% Retained	% Passing Accumulative	Specifications
4				
3				
2				
1-1/2				
1-1/4				
1	56	2.2	97.8	100
3/4	120	4.8	95.2	80-100
1/2				
3/8	592	23.7	76.3	
1/4, 3				
#4	1056	42.4	57.6	30-60
				Tech.
		Wet Weight Before Wash		
		Dry Weight Before Wash	2493	
		Weight After Wash		
		Elutriation		
10	1419	56.9	43.1	20-45
16				
30				
40	1804	72.4	27.6	
50				
100				
200	2253	90.4	9.6	3-10
Finer Than 200				

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Appendix 10

Cover Compaction Testing Results
Terracon

Summary of Field Density Test Results
ASTM D 2922

Terracon
PO Box 5067
Las Cruces, NM 88003
(505) 527-1700

Client Name: Indian Environmental Services
Address: P.O. Box 1306
Hobbs, NM 88214

Project Name: Former Brickland Refinery Site
Location Sunland Park, NM
Datum:

Project Number: 66992026 Date of Report: 6/15/99

Laboratory Compaction Characteristics:
Test Method: ASTM D-1557 B
Field Technician: G Grijalva
Gauge ID: 29006 Mode: 6"
Daily Standard Counts: Density-3301, Moisture-693
Reviewed by: K. Salcido

Test No.	Date	Location	Lift or Elev.	Wet Unit Wt., pcf	Dry Unit Wt., pcf	Lab Max. Dry Unit Wt., pcf	% Lab Max Dry Unit Wt.	Req'd.% Lab Max Dry Unit Wt.	% Water Content	Req'd.% Water Content	Mat'l Desig-nation
1	6/15/99	Area "F" 60'E of Hicks Sampling Point # 1040	Cap	139.2	128.4	128.5	99	95.0	8.4	8.8	Fill
2	6/15/99	Area "F" 65'W of Hicks Sampling Point # 1280	Cap	138.3	126.8	128.5	99	95.0	9.1	8.8	Fill
3	6/15/99	Area "F" 80'W of Hicks Sampling Point # 847	Cap	139.0	127.2	128.5	99	95.0	9.3	8.8	Fill
4	6/15/99	Area "F" 20'E of Hicks Sampling Point # 960	Cap	136.9	124.9	128.5	97	95.0	9.6	8.8	Fill
5	6/15/99	Area "F" 50'E of Monitoring Well # 7	Cap	132.9	122.0	128.5	95	95.0	8.9	8.8	Fill
6	6/15/99	Area "F" 30'W of Monitoring Well# 7	Cap	133.2	122.1	128.5	95	95.0	9.1	8.8	Fill
7	6/15/99	Area "F" 30'S of Hicks Sampling Point # 1180	Cap	136.5	125.5	128.5	98	95.0	8.8	8.8	Fill
8	6/15/99	Area "F" 20'E of Hicks Sampling Point # 907	Cap	136.2	123.6	128.5	96	95.0	10.2	8.8	Fill
9	6/15/99	Area "F" 20'W of Hicks Sampling Point # 1340	Cap	133.6	122.8	128.5	96	95.0	8.8	8.8	Fill
10	6/15/99	Area "F" 10'W of Hicks Sampling Point # 530	Cap	136.5	122.5	128.5	95	95.0	11.4	8.8	Fill

Summary of Field Density Test Results
ASTM D 2922

PO Box 5067
Las Cruces, NM 88003
(505) 527-1700

Client Name: Indian Environmental Services
Address: P.O. Box 1306
Hobbs, NM 88214

Project Name: Former Brickland Refinery Site
Location Sunland Park, NM
Datum:

Project Number: 66992026 Date of Report: 6/17/99

Laboratory Compaction Characteristics:
Test Method: ASTM D-1557 C
Field Technician: G Grijalva
Gauge ID: 29006 Mode: 6"
Daily Standard Counts: Density-3312, Moisture-695
Reviewed by: K. Salcido

Test No.	Date	Location	Lift or Elev.	Wet Unit Wt., pcf	Dry Unit Wt., pcf	Lab Max. Dry Unit Wt., pcf	% Lab Max Dry Unit Wt.	Req'd.% Lab Max Dry Unit Wt.	% Water Content	Req'd.% Water Content	Mat'l Desig--nation
11	6/17/99	Area "F" 20'E of Hicks Sampling Point # 564	Cap	131.1	123.1	128.5	99	95.0	6.5	8.8	Fill
12	6/17/99	Area "F" 40'E of Hicks Sampling Point # 936	Cap	132.2	123.8	128.5	96	95.0	6.8	8.8	Fill
13	6/17/99	Area "F" 30'E of Hicks Sampling Point # 775	Cap	133.1	124.3	128.5	97	95.0	7.1	8.8	Fill
14	6/17/99	Area "F" 20'W of Hicks Sampling Point # 1720	Cap	132.8	124.2	128.5	97	95.0	6.9	8.8	Fill
15	6/17/99	Area "F" 50'W of Monitoring Well # 8	Cap	130.6	122.3	128.5	95	95.0	6.8	8.8	Fill
16	6/17/99	Area "F" 25'W of Hicks Sampling Point # 722	Cap	130.8	123.2	128.5	96	95.0	6.2	8.8	Fill
17	6/17/99	Area "F" 20'W of Monitoring Well # 14	Cap	132.8	124.8	128.5	97	95.0	6.4	8.8	Fill
18	6/17/99	Area "F" 20'W of Hicks Sampling Point # 426	Cap	131.9	123.2	128.5	96	95.0	7.1	8.8	Fill

Summary of Field Density Test Results
ASTM D 2922

Terracon
PO Box 5067
Las Cruces, NM 88003
(505) 527-1700

Client Name: Indian Environmental Services
Address: P.O. Box 1306
Hobbs, NM 88214

Project Name: Former Brickland Refinery Site
Location Sunland Park, NM
Datum:

Project Number: 66992026 Date of Report: 6/24/99

Laboratory Compaction Characteristics:
Test Method: ASTM D-1557 C
Field Technician: G Grijalva
Gauge ID: 29006 Mode: 6"
Daily Standard Counts: Density-3391, Moisture-698
Reviewed by: K. Salcido

Test No.	Date	Location	Lift or Elev.	Wet Unit Wt., pcf	Dry Unit Wt., pcf	Lab Max. Dry Unit Wt., pcf	% Lab Max Dry Unit Wt.	Req'd.% Lab Max Dry Unit Wt.	% Water Content	Req'd.% Water Content	Mat'l Desig-nation
19	6/24/99	10' S of Monitoring Well # 5	Cap	130.7	123.0	128.5	96	95.0	6.3	8.8	Fill
20	6/24/99	25' W of Monitoring Well # 13	Cap	130.7	122.7	128.5	96	95.0	6.5	8.8	Fill
21	6/24/99	25' W of Hicks Sampling Point # 1060	Cap	130.8	122.9	128.5	96	95.0	6.4	8.8	Fill
22	6/24/99	Area "B" 20'S of Hicks Sampling Point # 460	Cap	130.8	122.6	128.5	95	95.0	6.7	8.8	Fill
23	6/24/99	40' W of Hicks Sampling Point # 560	Cap	130.1	122.9	128.5	96	95.0	5.9	8.8	Fill
24	6/24/99	25' W of Hicks Sampling Point # 593	Cap	130.7	122.4	128.5	95	95.0	6.8	8.8	Fill
25	6/24/99	20' W of Hicks Sampling Point # 634	Cap	130.5	122.3	128.5	95	95.0	6.7	8.8	Fill
26	6/24/99	20' W of Hicks Sampling Point # 546	Cap	131.1	123.3	128.5	96	95.0	6.3	8.8	Fill
27	6/24/99	Area "A" Hicks Sampling Point # 999	Cap	130.0	122.3	128.5	95	95.0	6.3	8.8	Fill
28	6/24/99	Area "B" 10'S of Hicks Sampling Point # 1500	Cap	130.6	123.1	128.5	96	95.0	6.1	8.8	Fill

DAILY REPORT

Terracon

P.O. Box 5067
42-00 Research Drive, Bldg. C
Las Cruces, NM 88003
Phone (505) 527-1700
Fax: (505) 527-1069

Date: 6/15/99

Indian Environmental Services
P.O. Box 1306
Hobbs, NM 88214

Via Facsimile: (915) 833-6338

Attn: James Spurgeon, President

Re: **Former Brickland Refinery Site**
Compaction Testing
Sunland Park, NM
Terracon Project # 66992026

WORK PERFORMED: Arrived on site at 10:00 am. Observed processing of material and compacting. Established a rolling pattern to enable the operator to maintain compaction of material. Performed 10 nuclear density tests in area "F" of site. Left the site at 12:00 pm.

REMARKS: Will return to site on Thur. or Fri.

Technician: Gustavo Grijalva
Reviewed by: Kevin P. Salcido, E. I. T.

Copies to: Addressee (1)
Fred Holmes Via Fax: (915) 520-3172

n:\66992026\6/15/99dailyrpt.doc

DAILY REPORT

Terracon

P.O. Box 5067
42-00 Research Drive, Bldg. C
Las Cruces, NM 88003
Phone: (505) 527-1700
Fax: (505) 527-1069

Date: 6/24/99

Indian Environmental Services
P.O. Box 1306
Hobbs, NM 88214

Via Facsimile: (915) 833-6338

Attn: James Spurgeon, President

Re: **Former Brickland Refinery Site**
Compaction Testing
Sunland Park, NM
Terracon Project # 66992026

WORK PERFORMED: Performed 10 nuclear density tests.

JUN 28 1999

REMARKS:

Technician: Gustavo Grijalva
Reviewed by: Kevin P. Salcido, E. I. T.

Copies to: Addressee (1)
Fred Holmes Via Fax: (915) 520-3172

n:\66992026\6/24/99dailyrpt.doc

DAILY REPORT

Terracon

P.O. Box 5067
42-00 Research Drive, Bldg. C
Las Cruces, NM 88003
Phone: (505) 527-1700
Fax: (505) 527-1089

Date: 6/17/99

Indian Environmental Services
P.O. Box 1306
Hobbs, NM 88214

Via Facsimile: (915) 833-6338

EL9900 1

Attn: James Spurgeon, President

Re: **Former Brickland Refinery Site**
Compaction Testing
Sunland Park, NM
Terracon Project # 66992026

WORK PERFORMED: Arrived on site at 10:00 am. Performed 8 nuclear density tests. Informed James Spurgeon of the nuclear density results. Left the site at 1:30 pm.

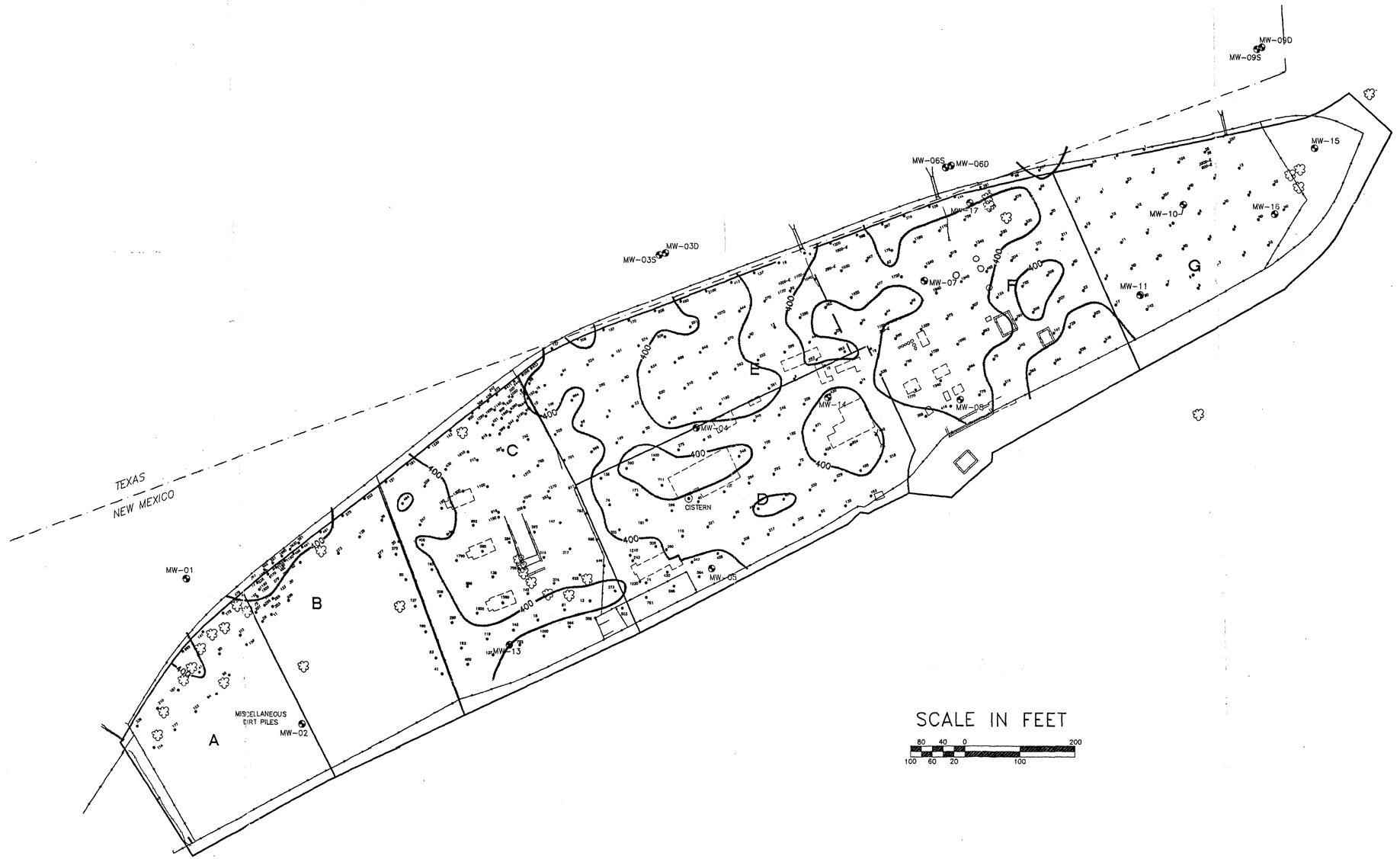
REMARKS: Will return to site on Mon. or Tues.

Technician: Gustavo Grijalva
Reviewed by: Kevin P. Salcido, E. I. T.

Copies to: Addressee (1)
Fred Holmes Via Fax: (915) 520-3172

Appendix 11

Plate
Lead Analytical Data
and Contour of 400 mg/kg Concentration



SCALE IN FEET

80 40 0 200
100 60 20 100

N

LEGEND

- CONCRETE SLAB/PAD – BLDG FOUNDATION
- WALL – MASONRY
- TREE
- FENCE
- MW-01 — MONITORING WELL
- STORM WATER OUTFALL WITH A DITCH
- 3800 — TRW SAMPLING LOCATION (AND RESULTS IN mg/kg)
- 23 — HICKS CONSULTING SAMPLING LOCATION (AND RESULTS IN mg/kg)
- 400 — CONTOUR OF 400 mg/kg SOIL LEAD CONCENTRATION

TRW

FIGURE 1
DISTRIBUTION OF LEAD IN SURFACE SOIL SAMPLES

CLIENT: HUNTSMAN	
DATE: 04/02/99	REV. NO.:
AUTHOR: RFB	DRAWN BY: DAG
CK'D BY: RFB	FILE: LEAD-ANALYS-1.dwg

Appendix 12

Plate
Soil Cover
and affidavit from Surveyor

AGUILAR ENGINEERING & SURVEYING CO.

1420 GERONIMO DRIVE, BLDG. D, STE. 220, EL PASO, TEXAS 79925
PHONE : (915) 771-6747 FAX (915) 771-7614

JULY 12, 1999

DEAR MR. JAMES STURGEON:

ENCLOSED IS THE MAP SHOWING THE AREAS THAT WERE COVERED WITH AT LEAST SIX INCHES OF FLEXIBLE BASE. THE AREAS WHICH ARE SHOWN ON THE MAP ARE THE AREAS THAT WERE OBTAINED BY GOING APPROXIMATELY 10-FEET PARALLEL AND TO THE OUTSIDE OF THE CONTOUR LINES THAT REPRESENT THE SOIL LEAD CONCENTRATION OF 400 MG/KG SHOWN ON THE BLUE LINE COPY OF FIGURE 2 (DISTRIBUTION OF LEAD IN SURFACE SOIL SAMPLES) BY THE FIRM TRW.

THE BASIS FOR THE COORDINATES FOR THE PROJECT IS THE LINE BETWEEN MONITORING WELL NO.5 AND NO.7. MONITORING WELL NO.5 WAS ASSIGNED COORDINATE N 5000.00, E 5000.00 AND THE LINE WAS ASSUMED AS NORTH 00 DEGREES 00 MINUTES 00 SECONDS EAST.

THE CHAIN-LINK FENCE SHOWN IS APPROXIMATE, AS IT WAS SCALED BY THE BLUE LINE PRINT THAT YOU PROVIDED ME.

PLEASE NOTE THAT SOME OF THE AREAS WERE CONNECTED, SO THAT THE LAYOUT IN THE FIELD COULD BE FOLLOWED WITH LITTLE DIFFICULTY.

PLEASE ADVISED IF FURTHER INFORMATION IS REQUIRED.

TRULY,

Sergio I. Aguilar

SERGIO I. AGUILAR, P.E.

HUNTSMAN POLYMER
BRICKLAND REFINERY SITE

NOTE:
SHADED AREA IS COVERED WITH SIX INCHES OR MORE OF FLEXIBLE BASE

LEGEND:

- CHAIN-LINK FENCE
- MW-5 MONITORING WELL
- EM 13 N 5484.49 E 4884.39 EROSION MARKERS
- LIMITS OF FLEXIBLE BASE

EM 53 N 4274.46 E 4680.17
EM 54 N 4958.99 E 4299.84
EM 55 N 4964.97 E 4315.96
EM 58 N 4417.36 E 4311.89
EM 51 N 4461.43 E 4325.08
EM 50 N 4549.09 E 4344.05
EM 49 N 4624.89 E 4369.99
EM 41 N 4806.24 E 4429.21
EM 53 N 4724.97 E 4445.65
EM 46 N 4710.91 E 4559.63
EM 47 N 4670.48 E 4699.89
EM 48 N 4609.15 E 4750.08

Match Line

EM 18 N 5082.62 E 4618.14
EM 14 N 5431.64 E 4733.87
EM 9 N 5630.15 E 4861.99
EM 1 N 5986.22 E 5049.68
EM 34 N 4973.95 E 4482.54
EM 26 N 5101.86 E 4616.37
EM 19 N 5273.53 E 4731.22
EM 16 N 5358.74 E 4776.54
EM 41 N 4806.24 E 4429.21
EM 53 N 4724.97 E 4445.65
EM 40 N 4854.62 E 4511.80
EM 33 N 4941.93 E 4566.65
EM 29 N 50081.18 E 46630.48
EM 21 N 5189.04 E 4673.65
EM 13 N 5484.49 E 4884.39
EM 10 N 5560.24 E 4929.64
EM 8 N 5656.65 E 4984.09
EM 6 N 5750.98 E 5030.16
EM 2 N 5835.38 E 5080.60
EM 20 N 5262.81 E 4837.24
MW-7
EM 42 N 4805.73 E 4603.34
EM 35 N 4896.98 E 4652.97
EM 30 N 4974.50 E 4717.17
EM 27 N 5078.05 E 4750.36
EM 25 N 5138.69 E 4826.84
EM 22 N 5185.85 E 4858.33
EM 17 N 5361.11 E 4971.17
EM 12 N 5524.19 E 5070.50
EM 3 N 5807.99 E 5164.18
EM 46 N 4710.91 E 4559.63
EM 47 N 4670.60 E 4679.89
EM 44 N 4759.30 E 4694.10
EM 39 N 4851.94 E 4727.79
EM 32 N 4937.43 E 4795.47
EM 28 N 5083.02 E 4818.09
EM 23 N 5139.83 E 4911.63
EM 15 N 5264.11 E 5060.49
EM 11 N 5375.71 E 5160.00
EM 7 N 5682.67 E 5199.48
EM 5 N 5764.01 E 5264.45
EM 4 N 5781.44 E 5350.29
N 00°00'00" E 628.00' Basis of Coordinates
EM 38 N 4895.59 E 4853.87
EM 24 N 5147.29 E 5052.59
EM 48 N 4609.15 E 4750.08
EM 43 N 4805.34 E 4860.60
EM 36 N 4904.81 E 4921.51
EM 31 N 4990.57 E 4969.26
EM 37 N 4864.22 E 4941.92
MW-5 N 5000.00 E 5000.00

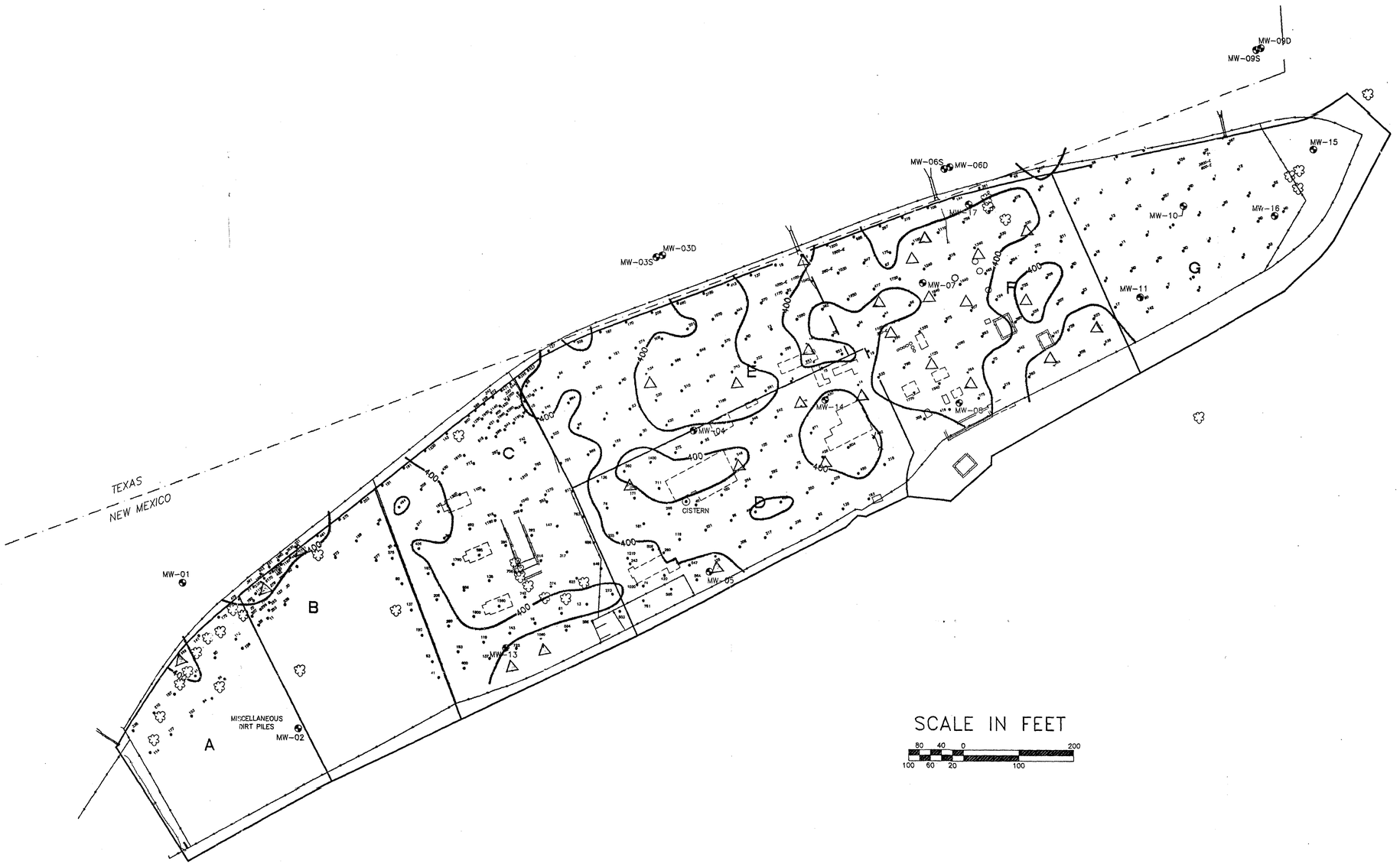
Match Line

AGUILAR engineering & surveying co.

DRAWN BY: J.P.
CHECKED BY: S.I.A.
SCALE: 1" = 50'
DATE: 7-9-99

Appendix 13

Plate
Location of Compaction Testing



SCALE IN FEET

80 40 0 200
100 60 20 100

LEGEND

- CONCRETE SLAB/PAD – BLDG FOUNDATION
- WALL – MASONRY
- TREE
- FENCE
- MW-01 — MONITORING WELL
- STORM WATER OUTFALL WITH A DITCH
- 3800 — TRW SAMPLING LOCATION (AND RESULTS IN mg/kg)
- 23 — HICKS CONSULTING SAMPLING LOCATION (AND RESULTS IN mg/kg)
- 400 — CONTOUR OF 400 mg/kg SOIL LEAD CONCENTRATION
- COMPACTION TEST LOCATION

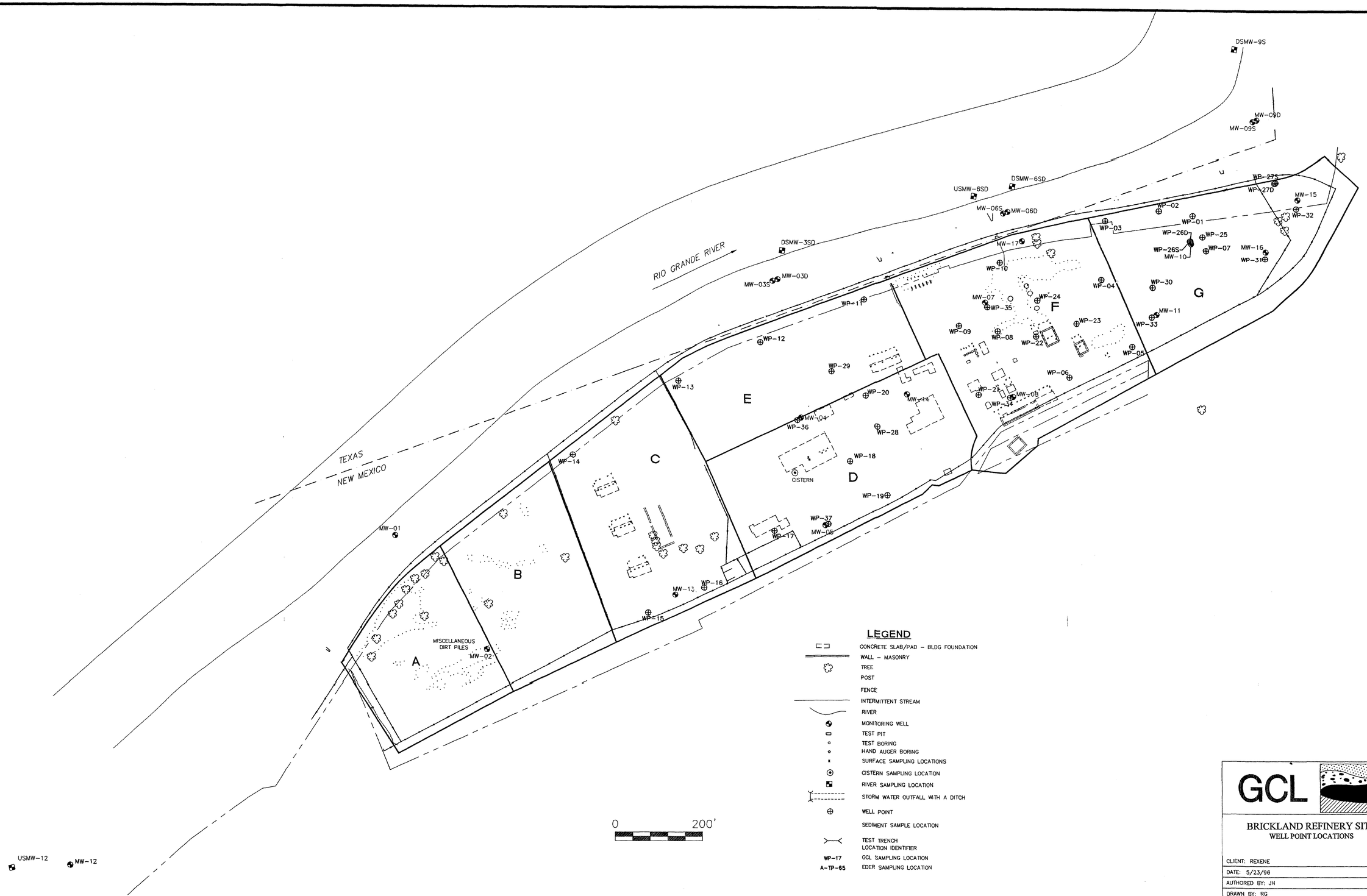
TRW

COMPACTION TEST LOCATIONS
(approximate)

CLIENT: HUNTSMAN	
DATE:	REV. NO.:
AUTHOR:	DRAWN BY:
CK'D BY:	FILE:

Appendix 14

Plate
Well Point Locations



LEGEND

- CONCRETE SLAB/PAD – BLDG FOUNDATION
- WALL – MASONRY
- TREE
- POST
- FENCE
- INTERMITTENT STREAM
- RIVER
- MONITORING WELL
- TEST PIT
- TEST BORING
- HAND AUGER BORING
- SURFACE SAMPLING LOCATIONS
- CISTERN SAMPLING LOCATION
- RIVER SAMPLING LOCATION
- STORM WATER OUTFALL WITH A DITCH
- WELL POINT
- SEDIMENT SAMPLE LOCATION
- TEST TRENCH LOCATION IDENTIFIER
- WP-17 GCL SAMPLING LOCATION
- A-TP-65 EDER SAMPLING LOCATION

GCL

BRICKLAND REFINERY SITE
WELL POINT LOCATIONS

CLIENT:	REXENE
DATE:	5/23/96
AUTHORED BY:	JH
DRAWN BY:	RG
CHECKED BY:	MWS
DWG. NO.:	D:\REXENE\RXBASE2.DWG

Appendix 15

Map
Location of Two Sumps

LOCATION OF SUMPS / PIT