GW - 4

REPORTS

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FINAL INVESTIGATION REPORT

Texaco Exploration and Production, Inc.

Eunice #2 (North) Gas Plant

Lea County, New Mexico

May 1997

Prepared for

Prepared by

Highlander Environmental Corp.

Texaco Exploration
and Production Inc

500 North Loraine
Midland TX 79701

P O Box 3109
Midland TX 79702

May 27, 1997

Mr. P. W. Sanchez
Petroleum Engineer - Environmental Bureau
State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

GW-004

RE: TEXACO EUNICE NO. 2 (NORTH) GAS PLANT
LEA COUNTY, NEW MEXICO

Dear Pat,

As requested, please find attached a copy of the results of the comprehensive investigation of soils and groundwater at Texaco Exploration and Production, Inc.'s Eunice No. 2 (North) Gas Plant located in Eunice, Lea County, New Mexico. This workplan was prepared by Highlander Environmental Corp. at the request of Texaco.

Please be advised that Texaco and Highlander would like to meet with you in person to review the results of this investigation as well as to discuss any proposed future activities concerning remedial activities at the North Plant. It is suggested that this meeting be scheduled for the end of June or the first half of July.

Texaco reserves all rights it may have available to it in this matter, particularly as it may regard potential adverse environmental impacts at its site from third parties. As usual, Texaco appreciates your cooperation and assistance in these matters. Please contact me at (915) 688-4804 should you have questions or comments concerning this submittal. Otherwise, you may contact Mr. Tim Reed or Mark Larson with Highlander Environmental Corp. at (915) 682-4559.

Sincerely,

Robert W Browning

Robert W. Browning
Environmental Coordinator
Texaco Exploration & Production, Inc.

cc: Mr. Wayne Price
NMOCD District I - Hobbs, NM

FINAL INVESTIGATION REPORT
TEXACO EXPLORATION AND PRODUCTION, INC.
EUNICE #2 (NORTH) GAS PLANT
LEA COUNTY, NEW MEXICO

Prepared for

Texaco Exploration and Production, Inc.
500 North Lorraine
Midland, Texas

May 1997

Mark J. Larson
Project Manager/Sr. Hydrogeologist

Timothy M. Reed, REM
Vice President

(H:\oil-gas\787\cfi.rep)

Highlander Environmental Corp.

Midland, Texas

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1910 N. Big Spring • Midland, Texas 79705 • (915) 682-4559 • Fax (915) 682-3946

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FINAL SITE INVESTIGATION REPORT

TEXACO EXPLORATION AND PRODUCTION, INC.

EUNICE #2 (NORTH) GAS PLANT

LEA COUNTY, NEW MEXICO

1.0 INTRODUCTION

Texaco Exploration and Production, Inc. (Texaco) has retained Highlander Environmental Corp. (Highlander) to conduct a comprehensive facility investigation (CFI) for its Eunice #2 (North) Gas Plant (Site). The CFI was conducted in accordance with the Comprehensive Facility Investigation Work Plan, prepared by Highlander (February 10, 1997), and approved by the State of New Mexico Energy, Minerals and Natural Resources Department, Oil Conservation Division (OCD) on February 27, 1997. Appendix A presents correspondence from OCD to Texaco. The CFI was required by the OCD, in accordance with Title 20 of the New Mexico Administrative Code (NMAC), 6.2.3109.E. The purpose of the CFI is to delineate and characterize the lateral and vertical extent of groundwater contamination identified at the Site, based on the results of a previous subsurface environmental investigation conducted by Highlander during August 1996. The Comprehensive Facility Investigation Work Plan was prepared in accordance with the State of New Mexico Ground and Surface Water Quality Protection Regulations for Stage 1 Abatement Plan (20 NMAC 6.2.4106 C).

1.1 Background and Location

The Site was constructed in the 1940's, subsequently modified and currently operates as a turbo expander type natural gas processing plant for extraction of NGLC natural gas liquids. The Site is located approximately 0.25 miles north of Eunice, New Mexico, in the southeast quarter (SE/4), of the northeast quarter (NE/4), and the NE/4 of the SE/4, Section 21, Township 21 South, Range 37 East. Figure 1 presents a Site location and topographic map. Figure 2 presents a drawing for the Site.

1.2 Previous Investigations

1.2.1 Compressor Building Investigation

During October 1995, Texaco requested Highlander to conduct a subsurface investigation in the vicinity of the compressor building at the Site. The subsurface investigation was conducted to determine if impacts to the shallow soil were present as a result of leaks from the compressor engines. The subsurface investigation consisted of installing thirteen (13) shallow hand auger borings (AH-1 through AH-13), which were spaced approximately fifty (50) feet apart along the north and south sides of the compressor building. The soil borings were advanced to a maximum depth of approximately fifteen (15) feet below ground. Soil samples were collected at approximately one and two foot increments from each boring for visual examination and field screening. The soil samples were field screened for petroleum hydrocarbons using a photoionization detector (Thermo Environmental Instruments, Model 580 B Organic Vapor Meter (OVM)). The soil sample field screening results indicated that detectable levels of petroleum hydrocarbons were present in soil samples from borings AH-4, AH-5, AH-6, AH-7, AH-9, AH-10, and AH-11. Ten (10) additional soil borings were installed to determine the horizontal extent of the hydrocarbon affected soils at these locations.

Based on the field screening results, soil samples were selected from each boring for laboratory testing. The soil samples were submitted to Trace Analysis, Inc., Lubbock, Texas, and analyzed for total petroleum hydrocarbons (TPH) by EPA Method 418.1. Soil samples from borings AH-4, AH-5, AH-6, AH-7 and AH-10 were analyzed for benzene, toluene, ethylbenzene, xylene (collectively referred to as BTEX) by EPA Method SW-846-8020. Samples from borings AH-6, AH-7, AH-10, and AH-11 were analyzed for polychlorinated biphenyl (PCB). Soil samples from borings AH-4, AH-5, AH-6, AH-7, AH-10, and AH-11 were analyzed for total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by EPA Method SW-846-6010.

The laboratory reported that TPH was present in samples from all borings, except AH-5. The highest TPH measurement reported was 142,000 milligrams per kilogram (mg/kg) in sample AH-4, from a depth of approximately 4.0 to 4.5 feet below ground surface (BGS). The laboratory test results revealed that the TPH level in soil at location AH-4 decreased to 226 mg/kg at a depth of approximately 10 to 10.5 feet below ground. Assuming a TPH cleanup level of 1000 mg/kg for soil, based on the OCD's Recommended Remediation Action Levels (RRAL), as presented in "Guidelines for Remediation of Leaks, Spills and Releases, August 13, 1993", the TPH levels reported in soil samples from borings AH-4, AH-6, AH-7, AH-8, AH-9, AH-11, and AH-12, exceeded the RRAL. The vertical extent of the TPH impact to soil was defined at locations AH-1, AH-2, AH-3, AH-4, AH-5, AH-9, AH-10, and AH-12. The analysis also indicated that the horizontal extent of the TPH impact to soil at locations AH-4, AH-6 and AH-7, extended about 7 to 10 feet from the compressor building.

The BTEX analysis of soil samples from borings AH-4 through AH-7, and AH-10 did not report benzene, toluene, and ethylbenzene above test method detection limit concentrations. Xylene was reported in soil samples from borings AH-5 and AH-7 at 0.555 mg/kg and 0.211 mg/kg, respectively. The highest total BTEX level reported in the soil samples, 0.555 mg/kg from boring AH-5, was below the OCD's RRAL of 50 mg/kg. No PCB compounds were reported in the soil samples from borings AH-6, AH-7, AH-10, and AH-11. The total metal analysis of soil samples from borings AH-4 through AH-7, AH-10, and AH-11 only reported detectable levels of barium, cadmium, chromium, lead and mercury. Barium was reported at concentrations ranging from 25.8 mg/kg in sample AH-4 (0 to 0.5 feet) to 1900 mg/kg in sample AH-5 (0 to 0.5 feet). Chromium ranged in concentration from 20.7 mg/kg (AH-11, 0 to 0.5 feet) to 1580 mg/kg (AH-5, 0 to 0.5 feet). Cadmium (2.7 mg/kg) and lead (64.4 mg/kg) were only reported in soil sample AH-5 (0 to 0.5 feet). Mercury (0.34 mg/kg) was only reported in soil sample AH-6 (3.2 to 3.9 feet). The results of laboratory tests determined that the levels of barium, cadmium, chromium and lead reported in the soil sample from boring AH-5 (0.0 to 0.5 feet), and mercury (0.34 mg/kg) reported in the soil sample from boring AH-6 (3.2 to 3.9 feet) were elevated in comparison to the levels of these

constituents reported in the remaining soil samples. However, no Site-specific background concentrations were available to compare to these data.

On March 28, 1996, Highlander installed four (4) additional hand auger soil borings (AH-6-2, AH-7-2, AH-8-2, and AH-11-2) in the vicinity of borings AH-6, AH-7, AH-8 and AH-11. The purpose of the soil borings was to delineate the vertical extent of the TPH impact to soil at these locations. The soil borings were drilled to depths ranging from approximately 5.5 feet (AH-11-2) to approximately 14 feet (AH-7-2). Soil samples were collected from each boring for field screening, and possible laboratory testing. Based on the field screening results, soil samples were selected for testing, and analyzed for TPH by EPA Method 418.1. Soil samples from borings AH-6-2 and AH-7-2 were also analyzed for gasoline range petroleum hydrocarbons using EPA Method 8015 modified. The laboratory reported that TPH (EPA Method 418.1) was present in the soil samples at concentrations of 1420 mg/kg (AH-6-2, 12.5 to 13.0 feet), and 58, 300 mg/kg (AH-7-2, 13.5 to 14.0 feet). These results indicate that the TPH impact in soil at locations AH-6-2 and AH-7-2 extends to depths greater than 13.0 and 14.0 feet, respectively. The laboratory analysis for gasoline range petroleum hydrocarbons, by EPA Method 8015 Modified, reported concentrations of less than the test method detection limit of 10, 000 micrograms per kilogram (ug/kg) or 10 mg/kg in sample AH-6-2, 12.5 to 13.0 feet, and 35,100 ug/kg or 35.1 mg/kg in sample AH-7-2, 13.5 to 14.0 feet. These results suggest that the TPH impact to soil at locations AH-6-2 and AH-7-2 is likely from oil leaks and spills from compressor engines, rather than gasoline associated hydrocarbons. Boring AH-7-2 was terminated on a dense layer of caliche, which prevented further drilling.

Soil samples from borings AH-8-2 and AH-11-2 were analyzed for TPH (EPA Method 418.1), and reported 18 mg/kg and <10 mg/kg, respectively. The laboratory tests indicate that the vertical extent of TPH impact to soil at these locations was defined. The results of the preliminary subsurface investigation were presented to Texaco in the report titled, "Subsurface Investigation of the Compressor Building at Texaco North Eunice Gas Plant, November 1995", and included as Appendix A in the report titled, "Subsurface Environmental Assessment, Texaco Exploration and

Production, Inc., Eunice # 2 (North) Gas Plant, Lea County, New Mexico, September 1996", which was submitted to the OCD.

Due to dense caliche encountered at locations AH-7-2, and AH-6-2, Highlander was unable to define the vertical extent of TPH impact to soil at these locations. The locations of subsurface piping and overhead structures in the vicinity of these locations also prevented use of a conventional drilling rig for exploration. The OCD, therefore, requested that Texaco install one (1) groundwater monitor well hydraulically down gradient (southeast) of the compressor building, and soil boring locations AH-6-2 and AH-7-2, to determine if groundwater had been affected from the TPH impacts identified in soil. The monitor well, MW-1, was installed in accordance with a work plan prepared by Highlander titled, "Monitor Well Work Plan, Texaco Exploration and Production, Inc., North Eunice Gas Plant, Lea County, New Mexico". The Work Plan was submitted to the OCD on April 18, 1996, and approved on June 27, 1996.

The monitor well was drilled on July 22, 1996, by Scarborough Drilling, Inc., Lamesa, Texas, under the direct supervision of a geologist from Highlander. The monitor well was drilled to a depth of approximately 57 feet BGS using a truck-mounted rotary drilling rig. Mud additive was used during drilling to prevent caving of the unconsolidated sand formation, which underlies the Site. Soil samples were collected during drilling and screened for petroleum hydrocarbons using the OVM. Based on the screening results, soil samples from depths of 25 to 27 feet and 55 to 57 feet were submitted to Trace Analysis, Inc., and analyzed for BTEX and TPH.

The laboratory tests did not report BTEX above the test method detection limits in the soil sample from 25 to 27 feet. Also, benzene was not reported above the test method detection limit in the soil sample from 55 to 57 feet. Toluene, ethylbenzene, and xylene were reported in the soil sample from 55 to 57 feet at concentrations of 243 ug/kg, 1130 ug/kg and 3443 ug/kg, respectively. The total BTEX concentration in the soil sample from 55 to 57 feet was 4,816 ug/kg or 4.816 mg/kg, and was below the OCD's RRAL of 50 mg/kg. The TPH concentrations reported in these soil

samples were 17.6 mg/kg (25 to 27 feet) and 90.2 mg/kg (55 to 57 feet). Based on the OCD's RRALs for BTEX and TPH, the levels of these constituents detected in the soil samples would not normally require remediation.

1.2.2 Groundwater Discharge Plan Investigation

During the period from August 5-15, 1996, Highlander conducted a subsurface investigation to determine if environmental impacts to soil and groundwater had occurred as a result of subsurface releases of petroleum hydrocarbons from Site process area sumps, and waste management areas (i.e., waste oil, water storage area and trash pit). The subsurface investigation was conducted in response to the OCD's review of the document, titled, "Groundwater Discharge Plan, Texaco Exploration and Production Eunice North Gas Processing Plant, Lea County, New Mexico", which was prepared by Texaco. The OCD required that the subsurface investigation be conducted prior to approval of the Groundwater Discharge Plan. The surface investigation consisted of installing three (3) hand augured and ten (10) machine drilled soil borings. Soil samples were collected from the soil borings for field and laboratory testing. Groundwater samples were also obtained from monitor well MW-1, installed during the previous investigation, and from an active water well (WW-1), to assess the quality of groundwater beneath the Site. Figure 2 presents the locations of the environmental investigation areas, soil borings, and monitor wells.

The investigation results indicated that surface spills from petroleum hydrocarbons had occurred in the vicinity of the waste oil and water storage area, however, the levels of benzene and total BTEX detected in soil samples from borings were below the RRAL established by the OCD. The investigation results further revealed that no impact to soil was evidenced at the north and south engine rooms sumps, concluding that no release(s) of petroleum hydrocarbons had occurred. No volatile or semi-volatile organic constituents were reported in soil samples from the trash pit area. Only arsenic (10.4 mg/kg) and barium (163.0 mg/kg) were detected in soil samples from the trash pit area. No Site-specific background level are available for these parameters to determine if an

environmental impact has occurred, however, these levels appear to be consistent with regional background concentrations.

Soil samples were collected from depths of 10 to 12 feet and 50 to 52 feet from soil borings BH-1 and BH-2, installed near the North Sumps (Northeast of Facility), and were analyzed for BTEX. The benzene and total BTEX levels reported in the 10 to 12 feet interval soil samples from borings BH-1 and BH-2 were below the OCD's RRAL of 10 mg/kg and 50 mg/kg, respectively. The benzene levels reported in the 50 to 52 feet interval soil samples were also below the RRAL of 10 mg/kg. The total BTEX levels reported in the 50 to 52 feet interval soil samples from borings BH-1 (101,000 ug/kg) and BH-2 (76,960 ug/kg) exceeded the OCD's RRAL of 50 parts per million (ppm). However, the laboratory test results and field observations suggest that the elevated BTEX levels in the soil samples may be from hydrocarbons in groundwater, which have been incorporated into the unsaturated zone soil due to fluctuations of the groundwater surface. The investigation results also suggest that phase-separated hydrocarbons may be present on the groundwater in the vicinity of the North Sumps.

Chromium, nitrate, fluoride and chloride were detected in groundwater from water well WW-1, at concentrations above the New Mexico Water Quality Control Commission (WQCC) standards. No purgeable aromatic or volatile organic hydrocarbons, other than dichlorodifluoromethane (113 ug/L), were detected in groundwater samples from the water well. Dichlorodifluoromethane is a widely used degreasing compound, for which no drinking water standard is available. The water well is located on the north (up gradient) side of the Site. Detectable levels of BTEX were reported in the groundwater sample from monitor well MW-1, however, the BTEX levels were below the New Mexico WQCC standards for groundwater of less than 10,000 mg/l TDS. The TPH level reported in the groundwater samples from monitor well MW-1 was 582 ug/L, however, there is no New Mexico WQCC standard for TPH in groundwater. The results of the investigation were presented in the report titled, "Subsurface Environmental Assessment, Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant, Lea County, New Mexico, September 1996".

1.3 Site Setting

1.3.1 Topography

The topography of the Site gently slopes from west to east. The elevation of the Site ranges from about 3430 feet above mean sea level (AMSL) along the west side to about 3420 feet AMSL along the east side. Storm water runoff generally follows the topography of the Site. The nearest surface water body to the Site is greater than two miles east. There is one water well at the Site (Water Well WW-1) which is used for industrial purposes (i.e. cooling towers, etc.).

1.3.2 Soils

The Site is underlain by soils of the Pyote Series and Berino Series (Turner, et.al., 1974). The Pyote Series is represented by the Pyote and Maljamar fine sands (0 to 3 percent slopes) soil. The Berino Series is represented by the Berino-Cacique loamy fine sands association (0 to 3 percent) soil.

The Pyote and Maljamar fine sands (PU) is the predominant soil type at the Site and consists of a surface layer of fine grained brown sand, approximately 30 inches thick. The surface layer is underlain by several subsoil strata consisting of fine sandy loam, varying from strong brown to light brown in color and approximately 30 inches thick. The Pyote and Maljamar fine sands soil has moderately rapid permeability and low corrosivity potential to uncoated steel. The principal uses of Pyote and Maljamar fine sands soil are range, wildlife habitat and recreational areas. The Pyote and Maljamar fine sand soil occupies the central part of the Site.

The Berino-Cacique loamy fine sands association (BE) is present along the north and south boundaries of the Site. The Berino-Cacique loamy fine sands soil consists of a thin surface layer, approximately 6 inches thick of reddish-brown loamy fine sand. The surface layer is underlain

by several substrata consisting of sandy clay loam, varying in color from red to light brown and approximately 54 inches thick. The Berino-Cacique loamy fine sands soil has a moderate permeability and moderate corrosivity potential to uncoated steel. Uses of Berino-Cacique loamy fine sands soil include rangeland, recreational areas and wildlife habitat.

1.3.3 Geology

The area in vicinity of the Site is underlain by deposits of Recent-age windblown sand ranging in thickness from about a few feet to as much as 40 feet. The windblown sand deposits consist of unconsolidated fine to medium grained sand. The windblown sand is underlain by the Pliocene-age Ogallala Formation. The Ogallala Formation consists of semiconsolidated deposits of fine grained calcareous sand, capped by a layer of caliche. The Ogallala Formation also contains minor amounts of clay, silt and gravel (Nicholson and Clebsch, 1961 and Brown, 1976). The Ogallala Formation ranges in thickness from a few inches to about 300 feet.

1.3.4 Groundwater

Groundwater occurs in the Pliocene-age Ogallala Formation. The Ogallala Formation, commonly referred to as the High Plains Aquifer, occurs under unconfined conditions. The regional direction of groundwater flow in the vicinity of the Site is from west-northwest to south-southeast. Recharge to the Ogallala Formation occurs through infiltration of precipitation from rainfall and snow melt. Discharge from the Ogallala Formation occurs principally through pumping from wells.

Based on Site-specific data, groundwater beneath the Site on April 22-23, 1997, ranged from 48.24 feet BGS at well MW-4, to 66.46 feet BGS at water well WW-1. Figure 4 presents a depth-to-groundwater map for the Site on April 22-23, 1997. Referring to Figure 4, the depth-to-groundwater at the Site on April 22-23, 1997 was generally influenced by pumping from water well WW-1. Pumping from well WW-1 has also influenced the groundwater potentiometric

surface. Figure 5 presents a drawing of the groundwater potentiometric surface on April 22-23, 1997. Referring to Figure 5, the elevation of the groundwater surface on April 22-23, 1997 ranged from 3376.69 feet above mean sea level (AMSL) at well MW-4, located near the southeast corner of the Site, to 3362.32 at well WW-1. Groundwater flow beneath the Site is generally controlled by well WW-1 during pumping. The influence of well WW-1 from pumping has created a cone of depression which extends radially away from the well and causes groundwater to flow towards well WW-1. The cone of depression caused from pumping well WW-1 would generally prevent contaminants which may enter the groundwater from migrating off the Site.

2.0 COMPREHENSIVE FACILITY INVESTIGATION ACTIVITIES

From March 31, 1997 through May 12, 1997, Highlander conducted a Comprehensive Facility Investigation for the purpose of delineating and characterizing the lateral and vertical extent of impacts detected in soil and groundwater, based on the results of the previous Site investigations. The CFI was conducted in accordance with 20 NMAC, 6.4102.C, and consisted of installation of hand auger and rotary soil borings, collection of soil samples for field and laboratory analysis, installation of monitor wells, collection of groundwater samples for laboratory analysis, aquifer slug testing, phase-separated hydrocarbon product evaluation, and a water well inventory. A summary of the CFI activities is presented below.

2.1 Hand Auger Soil Borings

In accordance with CFI Work Plan, five (5) hand auger soil borings were installed near boring location AH-5, located on the north side of the compressor building. The soil borings were installed to delineate the lateral and vertical extent of chromium and barium detected in soil at boring location AH-5 during the previous investigation. The borings (AH-5-1 through AH-5-5) were installed using a three inch diameter stainless-steel bucket-type hand auger, and drilled to depths varying from approximately 0.5 feet BGS (AH-5-2) to approximately 3.3 feet BGS (AH-5-3).

Boring AH-5-1 was placed adjacent to the previously drilled hole, AH-5. The hand auger soil borings were terminated on a competent caliche layer, which prevented further drilling. Figure 2 presents the location of soil boring AH-5, installed near the north side of the compressor building. Figure 6 presents a detailed drawing showing the locations of borings AH-5-1 through AH-5-5.

Soil samples were collected at various depth intervals from each hand auger soil boring for laboratory testing. The soil samples were collected and preserved according to EPA protocols, and analyzed within appropriate holding times. Table 1 presents a summary of drilling details for the hand augered soil borings. Section 2.4 presents a discussion of the soil sampling activities.

The auger bucket was thoroughly washed between each borehole location and sampling event using potable water and laboratory grade detergent, followed by rinsing with deionized water. Soil cuttings were placed on plastic, covered and retained onsite until proper disposal was arranged. The hand augered boreholes were plugged to ground surface after completions of field activities using a cement and bentonite grout.

2.2 Rotary Drilled Soil Borings

Highlander supervised drilling of five (5) rotary drilled boreholes at the Site. The rotary drilled boreholes were placed at locations identified in the CFI Work Plan. Soil boring MW-2 was installed near the northwest corner of the Site for the purpose of determining "background"soil and groundwater conditions for the Site. Soil borings MW-3 and MW-4 were installed near the southeast corner and east side of the Site, respectively, to determine down gradient groundwater conditions. Soil borings MW-5 and MW-6 near installed adjacent to the north sump for the purpose of evaluating groundwater quality and the presence of phase-separated hydrocarbons (PSH). Figure 2 presents a drawing showing the locations of the rotary drilled boreholes. All borings were completed as groundwater monitoring wells following drilling. Section 2.5 presents a discussion of the monitor well installation details.

The borings were drilled by Scarborough Drilling, Inc., Lamesa, Texas using a truck-mounted rotary drilling rig. Mud additive was used during rotary drilling to prevent caving of the unconsolidated sand formation, which underlies the Site. At location MW-2 (background), soil samples were collected at depths from 10-11 feet, 20-22 feet, 30-32 feet, 40-42 feet, and 50-52 feet BGS using a 2-foot long split spoon sampler. The soil samples were collected for laboratory testing and headspace gas screening. Table 1 presents a summary of soil boring drilling details. Appendix B presents the lithological sample logs.

The drilling rig and all down-hole equipment (i.e., drill rods, bits, etc.) were thoroughly washed between boreholes using a high pressure hot water washer. The drill cuttings were placed on plastic in a secured area onsite and covered until proper disposal was arranged.

2.3 Soil Headspace Gas Survey

The soil headspace gas survey is a measurement of the relative concentration of volatile organic constituents in soil. The Ambient Temperature Headspace (ATH) method was used at the Site for the soil headspace gas survey. The ATH method consists of collecting discrete or composite soil samples from a drilled borehole and placing the sample in a clean plastic sample bag, leaving a vacant headspace in the top of the bag. The bag is sealed and after approximately fifteen minutes at ambient temperature storage the concentration of organic vapors in the sample bag headspace is measured using a photo ionization detector.

Soil samples collected during rotary drilling at location MW-2 were collected using a split spoon sampler. The spilt spoon sampler was thoroughly decontaminated between sample intervals using a laboratory grade detergent wash, followed by rinsing with deionized water. Soil sample were collected from depths of 10-11 feet, 20-22 feet, 30-32 feet, 40-42 feet and 50-52 feet BGS. A portion of the soil sample from each sampling interval was placed in a plastic bag and field screen for organic vapors. The soil samples were field screened using a Thermo Environmental Equipment

Model 580B, Organic Vapor Meter (OVM). The OVM was calibrated to a 100 parts per million (ppm) isobutylene gas standard and has a detection limit of 0.1 ppm. Table 2 presents a summary of soil headspace gas readings of soil samples. The soil headspace gas readings are also presented on the lithological sample logs presented in Appendix B.

2.4 Soil Sampling and Analysis

Soil samples were collected at various depth intervals from hand auger borings AH-5-1 through AH-5-5, and from intervals of 10-11 feet, 20-22 feet, 30-32 feet, 40-42 feet, and 50-52 feet from rotary drilled boring MW-2. Soil samples from rotary drilled boring MW-2 were analyzed for total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by EPA methods SW-846-3051, 6010, and 7471. These soil samples were collected and analyzed to determine "background" concentrations for these constituents. Soil samples from hand auger drilled borings AH-5-1 through AH-5-5 were analyzed for total chromium and total barium to determine the lateral and vertical extent of these constituents in soil in the vicinity of the compressor building. The soil samples were analyzed by EPA method SW- 846-3051 and 6010. The soil sample from borings AH-5-1 through AH-5-5 exhibiting the highest total chromium level was also tested for chromium by the Toxicity Characteristic Leaching Procedure (TCLP) to determine if the soil was hazardous by its toxicity characteristic. All analysis were performed by Trace Analysis, Inc., Lubbock, Texas. Table 3 presents a summary of the total metals and TCLP analysis of soil samples. Appendix C presents the analytical laboratory reports, chain of custody forms, and Quality Assurance/Quality Control (QA/QC) documentation.

2.5 Monitor Well Installations

In accordance with the CFI Work Plan, five (5) monitor wells were installed during the investigation to determine the extent of impact to the unconfined groundwater system, and to assess the presence of phase-separated hydrocarbons (PSH) on groundwater. Previously (July 22, 1996),

monitor well MW-1 was installed near the central area of the Site. Monitor well MW-2 was installed hydraulically up gradient near the northwest corner of the Site. Monitor wells MW-3 and MW-4 were installed hydraulically down gradient near the southeast corner and east side of the Site, respectively. These monitor wells were installed to determine the quality of groundwater hydraulically up gradient and down gradient of the Site. Monitor wells MW-5 and MW-6 were installed on the east and west side of the north sump, respectively, for the purpose of determining groundwater quality conditions, and to evaluate the presence of PSH on the groundwater in this area of the Site.

Monitor wells MW-2 through MW-6 were drilled from March 31, 1997 to April 2, 1997 by Scarborough Drilling, Inc., Lamesa, Texas. The monitor wells were installed in the rotary drilled borings, which ranged in depth from approximately 66.5 feet BGS (MW-4) to approximately 68 feet BGS (MW-2, MW-3, MW-5, and MW-6). The monitor wells were completed with 4 inch diameter, screw threaded, schedule 40 PVC casing, and 0.020 inch factory slotted screen. The well screen, approximately twenty (20) feet in length, was installed across the groundwater surface to evaluate the presence of PSH on the groundwater. The well screen was surrounded by a graded (20-40) silica sand, which was placed to a depth approximately two (2) feet above the screen. A bentonite pellet seal, approximately 2 feet thick was placed over the sand, and the remainder of the boring was filled with cement-bentonite grout. The surface of each well, except well MW-3, is secured with a locking cap, and at-grade well cover. Well MW-3 is secured with a locking cap, and above-grade well cover. The well covers were placed in a concrete pad measuring approximately 3 X 3 feet. Table 1 presents a summary of monitor well drilling and completion details. Appendix D presents the monitor well completion records.

Following installation, the monitor wells were developed by Scarborough Drilling, Inc. using the drilling rig and a three (3) inch diameter well bailer. The well bailer was thoroughly decontaminated between wells by washing with a high pressure hot water washer, and rinsed. The purged groundwater was stored in 55-gallon drums, and transferred to the waste oil and water storage

tanks via the north sump.

2.6 Groundwater Sampling and Analysis

On April 22-23, 1997, Highlander collected samples of groundwater from the Site water well, WW-1, and monitor wells MW-1 through MW-6. Prior to purging and sampling, each well was measured for depth-to-groundwater, total well depth, and inspected for the presence of PSH. The monitor wells were then purged to remove stagnant water from the well casing. The monitor wells were purged by pumping with an electric submersible pump. A minimum of three (3) casing volumes of groundwater was removed from each well. The purged groundwater was measured for pH, specific conductance, and temperature to determine if these parameters had stabilized. The purged groundwater was contained in a 200-gallon portable tank and transferred to the waste oil and water storage area via the north sump. Water well WW-1 contained a shaft-driven turbine pump, and was pumping at the time of sample collection.

Following purging, groundwater samples were collected from monitor wells MW-1 through MW-6 using dedicated disposable PVC bailers and line. Groundwater samples were collected from water well WW-1 from a sample port installed at the well head. The groundwater samples were carefully transferred to appropriately labeled and preserved sample containers provided by the analytical laboratory (Trace Analysis, Inc., Lubbock, Texas). The groundwater samples were analyzed for volatile and semi-volatile (PAH) organic compounds by EPA methods SW-846-8240 and 8270, respectively, filtered (dissolved) metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), chloride, and total dissolved solids (TDS). Table 4 presents a summary of the volatile organic analysis. Table 5 presents a summary of the semi-volatile (PAH) organic analysis. Table 6 presents a summary of the filtered metals, chloride, and TDS analysis. Appendix C presents the analytical laboratory reports, chain of custody control forms, and QA/QC documentation.

2.7 Hydraulic Conductivity (Slug) Testing

In accordance with the CFI Work Plan, three (3) monitor wells (MW-2, MW-3, and MW-4) were selected for hydraulic conductivity (slug) testing. Due to process water demand (i.e., cooling water, etc.), water well WW-1 could not be used for conducting a pumping test, and pumping from well WW-1 would have created interference during a pumping test. The slug (falling head and rising head) tests were conducted by inserting (falling head) and removing (rising head) a slug, consisting of a PVC tube, measuring approximately 2 inches in diameter by 60 inches in length. The slug was filled with inert silica sand, and capped at both ends to overcome buoyancy and prevent leakage into the slug. The changes in water level, by inserting and removing the slug, were measured in the well with an In-situ, Inc., Model 1000C data logger, and 30 psi pressure transducer. The resulting field data was evaluated and the hydraulic conductivity was calculated using the Bouwer and Rice (1976) method. Table 7 presents a summary of the falling head and rising head slug test results for monitor wells MW-2, MW-3, and MW-4. Appendix E presents the field data, calculations, and graphical plots.

2.8 Phase Separated Hydrocarbon (PSH) Assessment

Monitor wells MW-5 and MW-6, located adjacent to the north sumps, were installed to evaluate the presence of PSH on groundwater. Monitor well MW-5 was installed on the east side of the sump, and monitor well MW-6 was installed on the west side of the sump. The monitor wells were periodically inspected for the presence of PSH. On May 12, 1997, PSH was observed on the groundwater in wells MW-5 and MW-6. The thickness of the PSH was determined with an electronic oil and water interface probe, which detected 0.02 feet (approximately 0.25 inches) in MW-5, and 0.15 feet (1.5 inches) in MW-6. The thickness of PSH on the groundwater in well MW-5 was not sufficient for sample collection, however, a sample of the PSH from well MW-6 was collected for laboratory testing. The sample was submitted to Trace Analysis, Inc., Lubbock, Texas,

for "fingerprint" analysis using gas chromatography (GC) and flame ionization detection (FID). The thickness of PSH on the groundwater in wells MW-5 and MW-6 was insufficient to conduct bailout testing to determine the actual formation thickness. Appendix C presents the GC fingerprint analysis.

2.9 Water Well Survey

A survey was conducted to determine the locations of water wells within a one (1) mile radius of the Site. The water well survey was conducted by visual observations from public roadways, and a review of records of the State of New Mexico, Office of the State Engineer, Roswell, New Mexico. The water well survey identified records for twelve (12) water wells. Table 8 presents a summary of available records for water wells within a 1-mile radius of the Site. Figure 6 presents a location map for the water wells.

3.0 COMPREHENSIVE FACILITY INVESTIGATION RESULTS

3.1 Background Soil Headspace Gas Results

Soil samples from boring MW-2 (background) were field screened to determine if impacts to soil at the background location had occurred from petroleum hydrocarbons. Table 2 presents a summary of the soil headspace gas survey results. Referring to Table 2, the highest OVM reading measured in the soil samples from boring MW-2 was 1 ppm, from a depth of 50 to 52 feet. The OVM readings in the remaining soil samples were below the level detectable by the instrument. The OVM reading from 50 to 52 feet is also below the general background air concentration for the Site, and does not indicate that an environmental impact has occurred.

3.2 Soil Sample Results

Soil samples were collected during drilling at rotary drilled boring MW-2 (background), and analyzed for total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). The soil samples were obtained from depths of 10-11 feet, 20-22 feet, 30-32 feet, 40-42 feet, and 50-52 feet. Table 3 presents a summary of the laboratory test results.

Referring to Table 3, arsenic; cadmium, lead, mercury, selenium, and silver were not detected above the test method detection limits in samples from boring MW-2. Total barium was detected at levels ranging from non-detectable (<10 mg/kg) in samples from 40-42 feet and 50-52 feet, to 270 mg/kg in the sample from 20-22 feet. Chromium was detected at levels ranging from non-detectable (<5.0 mg/kg) in samples from 10-11 feet, 20-22 feet, and 40-42 feet, to 62 mg/kg in the sample from 50-52 feet. Based on the background sample data, the levels of cadmium (2.7 mg/kg) and lead (64.4 mg/kg) reported in the soil samples from 0-0.5 feet at boring AH-5 (October 17, 1995) are slightly elevated above the background levels for the Site, but are within the range expected for the region. The levels of barium and chromium reported in the background soil samples are generally lower in concentration than levels reported in soil samples from borings AH-5, and AH-5-1 through AH-5-5.

Soil samples were collected from various depth intervals from borings AH-5, and AH-5-1 through AH-5-5, installed on the north side of the compressor building. The depths of the borings ranged from approximately 0.5 feet BGS (AH-5 and AH-5-2) to 3.3 feet BGS (AH-5-3). Soil samples from the borings were analyzed for total chromium and total barium. Referring to Table 3, the chromium levels reported in the soil samples from the borings ranged in concentration from 6.2 mg/kg (AH-5-1, 1.5-2.0 feet) to 4400 mg/kg (AH-5-2, 0-0.5 feet). Levels of total chromium in soil samples from the borings generally decreased below background below depths of 1 foot. The highest total chromium levels were reported in the 0-0.5 foot depth interval samples, and ranged in

concentration from 390 mg/kg (AH-5-4) to 4400 mg/kg (AH-5-3). Based on the laboratory tests, the vertical extent of elevated total chromium was determined. However, the area of elevated chromium in soil extends west of boring AH-5, AH-5-1, and AH-5-2 at least ten (10) feet, and west of boring AH-5-5. The soil affected by the elevated total chromium extend north of the compressor building approximately 5 feet. The area of soil affected by the elevated chromium is estimated to be approximately 125 square feet or approximately 5 cubic yards of soil.

The soil sample from boring AH-5-2, 0-0.5 feet, which exhibited the highest total chromium reading (4400 mg/kg) was tested by the TCLP method for toxicity. The TCLP level for chromium in the sample was less than the test method detection limit of 0.05 mg/l, concluding that the soil does not exhibit a hazardous characteristic.

3.3 Groundwater Sample Results

Groundwater samples were collected from monitor wells MW-1 through MW-6, and water well WW-1 on April 22-23, 1997. The groundwater samples were analyzed for volatile organic compounds, semi-volatile organic compounds, filtered metals, chloride and TDS. Table 4 presents a summary of the volatile organic laboratory test results. Table 5 presents a summary of the semi-volatile organic test results, and Table 6 presents a summary of the metals, chloride, and TDS analysis.

3.3.1 Volatile Organic Compounds

Referring to Table 4, six (6) volatile organic compounds were detected in groundwater at varying levels above the EPA method 8240 detection limits. The six (6) volatile organic compounds were BTEX, dichlorodifluoromethane, and tetrachloroethene. The New Mexico WQCC has established Human Health Standards (20 NMAC, 6.2.3103.A) for all of these compounds, except dichlorodifluoromethane, and tetrachloroethene. The Human Health Standards for the BTEX

compounds are 10 ug/L (benzene), 750 ug/L (toluene and ethylbenzene), and 620 ug/L (xylenes). BTEX was only detected in groundwater from monitor wells MW-1, MW-5, and MW-6. The benzene levels in groundwater from these wells ranged from 11 ug/L (MW-1) to 540 ug/l (MW-5). Previously (August 8, 1996), benzene was reported in groundwater from well MW-1 at 9 ug/L. Toluene was reported in groundwater from these wells at concentrations ranging from 33 ug/L (MW-1) to 310 ug/L (MW-5). Ethylbenzene was reported at concentrations ranging from 75 ug/L (MW-1) to 110 ug/L (MW-6). Xylenes were reported at concentrations ranging from 49 ug/L (MW-1) to 330 ug/L (MW-6). The concentrations of toluene, ethylbenzene, and xylenes in groundwater from wells MW-1, MW-5, and MW-6 were below the WQCC standards. The toluene, ethylbenzene, and xylenes concentrations reported in groundwater from well MW-1 on April 23, 1997 were considerably lower than the levels for these constituents reported from well MW-1 on August 1, 1996. However, the levels reported on August 1, 1996 were also below the WQCC standards. Groundwater samples from the up gradient monitor well, MW-2, and down gradient monitor wells, MW-3 and MW-4 did not report BTEX levels above the test method detection limits, concluding that the BTEX impacts to groundwater are localized and confined to the Site.

Dichlorodifluoromethane was reported in groundwater samples from all wells, except the up gradient well, MW-2. The concentrations of dichlorodifluoromethane reported in the groundwater samples ranged from 6 ug/L (MW-3), to 98 ug/L (MW-1). Previously, dichlorodifluoromethane was reported in groundwater from water well WW-1 at 113 ug/L (June 14, 1996). The level of dichlorodifluoromethane reported in groundwater from this well on April 23, 1997 was 66 ug/L. Tetrachloroethene was only detected at 1 ug/L (test method detection limit) in groundwater from water well WW-1. The WQCC does not have Human Health Standards for dichlorodifluoromethane and tetrachloroethene. However, dichlorodifluoromethane and tetrachloroethene are listed as toxic pollutants, in accordance with the WQCC definition (20 NMAC 6.2.1101.TT). In accordance with 20 NMAC 6.2.1101.TT, dichlorodifluoromethane and tetrachloroethene are considered toxic pollutant(s) if these contaminants are in the environment at concentrations, shown by publicly available scientific information, to have the potential for causing

injuries to health upon exposure, ingestion, or assimilation. Highlander evaluated the U.S. EPA, Region III, Risk-Based Concentration Table, and the Office of Water, Drinking Water Regulations and Health Advisories (EPA 822-B-96-002), to obtain information on human health exposure data for these compounds. Based on the review, the Lifetime Drinking Water Health Advisory (HA) for dichlorodifluoromethane, for an adult (70-kg), is 1 mg/L (1,000 ug/L). The Lifetime HA is defined as the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects over a lifetime of exposure, with a margin of safety. No Lifetime HA was available for tetrachloroethene. However, the Drinking Water Equivalent Level (DWEL) for tetrachloroethene is 0.5 mg/L, or 500 ug/L. The DWEL is defined as a lifetime exposure concentration protective of adverse, non-cancer health effects, that exposure to a contaminant is from a drinking water source. Based on the information reviewed, the levels of dichlorodifluoromethane and tetrachloroethene reported in the groundwater samples do not pose a risk to human health.

3.3.2 Semi-volatile Organic Compounds

Referring to Table 5, seven (7) semi-volatile organic compounds were reported at varying concentrations in groundwater above the EPA method 8270 detection limits. The seven (7) semi-volatile organic compounds were acetophenone, naphthalene, 2-methylnaphthalene, 2-methylphenol, 4-methylphenol/3-methylphenol, fluorene, and anthracene. The only compound for which there is a WQCC Human Health Standard is total naphthalene, plus monometylnaphthalenes (0.03 mg/L). Naphthalene was only detected above the test method detection limit in groundwater from monitor wells MW-5 and MW-6. The concentration of total naphthalene plus mononaphthalenes detected in the groundwater samples from wells MW-5 and MW-6 was 0.120 mg/L and 0.016 mg/L, respectively. However, naphthalene was not detected in down gradient well MW-4, therefore, the extent of naphthalene impact to groundwater appears to be localized, and contained to the Site.

Acetophenone (0.005 mg/L) was only detected in groundwater from well MW-1. The compounds 2-methylphenol (0.004 mg/L), and 4-methylphenol/3-methylphenol (0.002 mg/L) were

only detected in groundwater from well MW-6. There are no WQCC standards, or EPA Drinking Water Health Advisories for acetophenone, 2-methylphenol or 4-methylphenol/3-methylphenol in groundwater, nor are these compounds listed as toxic pollutants, in accordance with 20 NMAC 6.2.1101.TT.

The compound 2-methylnaphthalene was detected in the groundwater samples from monitor wells MW-5 and MW-6, at concentrations of 0.022 mg/L and 0.026 mg/L, respectively. Fluorene (0.002 mg/L) was only detected in the groundwater sample from well MW-5. Anthracene was detected in the groundwater samples from well MW-6 (0.002 mg/L), and water well WW-1 (0.002 mg/L). There are no WQCC standards for these compounds in groundwater, however, these compounds are considered toxic pollutants, in accordance with 20 NMAC 6.2.1101.TT. Highlander evaluated the U.S. EPA, Region III, Risk-Based Concentration Table, and the Office of Water, Drinking Water Regulations and Health Advisories (EPA 822-B-96-002), to obtain information on human health exposure data for these compounds. Based on the review, the risk based standard for anthracene in tap water is 2200 ug/L, or 2.20 mg/L, and 1500 ug/L, or 1.5 mg/ for fluorene. There is no risk based standard or HA for 2-methylnaphthalene. Based on the information reviewed, the levels of anthracene and fluorene reported in the groundwater samples do not pose a risk to human health.

3.3.3 Metals, Chloride, and TDS Results

Groundwater samples from monitor wells MW-1 through MW-6, and water well WW-1 were tested for filtered metals (arsenic, barium, cadmium. chromium, lead, mercury, selenium, and silver), chloride, and TDS. Referring to Table 6, only barium, chromium, and lead were detected in the groundwater samples above the EPA methods 3015, 6010, and 7470 detection limits. Barium (0.3 mg/L) was only detected in groundwater from monitor well MW-6. The barium level reported in the groundwater sample from well MW-6 was below the WQCC standard of 1.0 mg/L. Chromium was reported in groundwater at concentrations of 0.36 mg/L (MW-3), 0.08 mg/L (MW-4), and 0.52

mg/L (WW-1). The concentrations of chromium in groundwater from these wells exceeded the WQCC standard of 0.05 mg/L. However, the EPA drinking water Maximum Contaminant Level (MCL) for chromium is 0.1 mg/l. The chromium level reported in groundwater from well WW-1 on April 23, 1997 (0.52 mg/L) is lower than the concentration reported from this well on August 1, 1996 (0.82 mg/L). Lead was reported in groundwater at concentrations of 0.1 mg/L from monitor wells MW-1, MW-4, and MW-6. The lead levels reported in groundwater samples from these wells exceeded the WQCC standard of 0.05 mg/L.

Chloride concentrations in groundwater samples from monitor wells MW-1 through MW-6, and water well WW-1 on April 22-23, 1997 ranged from 200 mg/L (MW-1) to 1500 mg/L (MW-6). Figure 7 presents a isopleth map showing the distribution of chloride in groundwater at the Site. Referring to Figure 7, the chloride levels are generally highest in groundwater in the vicinity of the north sump, and at water well WW-1. The chloride levels in samples from these wells ranged from 800 mg/L (MW-5 and WW-1) to 1500 mg/L (MW-6). The chloride levels reported in groundwater from well MW-6 indicates that an impact has occurred in this area. The pumping from well WW-1 appears to have captured the chloride impact at wells MW-5 and MW-6, since groundwater sample analysis from monitor well MW-4 (290 mg/L) is below the background level reported in the sample from well MW-2 (350 mg/L). Contribution of chloride from off site sources may also be a factor to the elevated chloride level in well WW-1, due to the cone of depression, which appears to extend north (up gradient) of the Site. The chloride levels reported in groundwater samples from all wells, excluding well MW-1, located near the central area of the Site, exceeded the WQCC standard of 250 mg/L for domestic water supply (20 NMAC 6.2.3103.B).

The TDS levels reported in groundwater from wells MW-1 through MW-6, and water well WW-1 ranged from 1200 mg/L (MW-2) to 3200 mg/L (MW-6). The TDS levels are consistent for water quality at the Site, and vicinity. However, the TDS levels reported in groundwater from the wells at the Site, including the background monitor well (MW-2), exceeded the WQCC standard of 1000 mg/L for domestic water supply (20 NMAC 6.2.3103.B).

3.4 Hydraulic Conductivity (Slug) Test Results

In situ hydraulic conductivity (slug) tests were conducted in monitor wells MW-2, MW-3, and MW-4. The slug test results are summarized in Table 7. Referring to Table 7, the results of falling head slug tests from wells MW-2 through MW-4 reported horizontal hydraulic conductivity values ranging from 4.47 x 10^{-5} feet per second (Ft./Sec.), or 3.8643 feet per day (Ft./Day) at well MW-4, to 7.02 x 10^{-5} Ft./Sec., or 6.0642 Ft./Day at well MW-3. The average horizontal hydraulic conductivity measured from the falling head slug tests was 5.51 x 10^{-5} Ft./Sec., or 4.7604 Ft./Day. The results of rising head slug tests from wells MW-2 through MW-4 reported horizontal hydraulic conductivity values ranging from 5.35 x 10^{-5} feet per second (Ft./Sec.), or 4.6251 feet per day (Ft./Day) at well MW-1, to 9.56 x 10^{-5} Ft./Sec., or 8.2592 Ft./Day at well MW-4. The average horizontal hydraulic conductivity measured from the rising head slug tests was 7.73 x 10^{-5} Ft./Sec., or 6.6847 Ft./Day. The overall average horizontal hydraulic conductivity of the unconfined aquifer, based on the falling head and rising head slug tests was 6.62 x 10^{-5} Ft./Sec., or 5.7225 Ft./Day.

3.5 Phase Separated Hydrocarbon Assessment Results

Phase separated hydrocarbons were only observed on the groundwater in monitor wells MW-5 and MW-6. The thickness of the PSH was measured at 0.25 inches (MW-5), and 1.50 inches (MW-6). A sample of the PSH was obtained from well MW-6 and analyzed for GC fingerprint by GC-FID method. Appendix C presents the laboratory test results. Based on the GC fingerprint analysis, the PSH collected from well MW-6 exhibited peaks in the C-10 to C-12 carbon range, and was consistent with diesel fuel. These analysis are also consistent with the semi-volatile organic compounds reported in the groundwater samples from wells MW-5 and MW-6. The GC fingerprint scan also reported lesser amounts of lighter chain hydrocarbons in the C-6 to C-10 range, consistent with natural gas condensate or gasoline.

3.6 Water Well Survey

A search for water wells within a one (1) mile radius of the Site was conducted through a search of the State of New Mexico, Office of the State Engineer's files, and visual observations. Based on the water well survey, records for twelve (12) water wells were identified. Figure 6 presents a map showing the locations for the wells. Table 8 presents a summary of water well drilling and completion details. Appendix F presents the water well records.

Referring to Figure 1, the nearest water well hydraulically down gradient of the Site is well number 7, located approximately 500 feet southeast of the Site. The legal description for this well is the NW/4, NW/4, SW/4, Section 27, Township 21 South, Range 37 East, Lea County, New Mexico. According to State of New Mexico, Office of the State Engineer's records, this well was drilled on March 7, 1963, to an approximate depth of 93 feet BGS. There is no data available to determine the current status of this well (i.e., active, inactive, or plugged), or its use. The next closest well down gradient to the Site is located in the S/2, NE/4, SE/4, Section 28, Township 21 South, Range 37 East, Lea County, New Mexico. This well is located approximately 1,625 feet south of the Site. According to the State Engineer's records, this well was drilled on July 26-27, 1988, to an approximate depth of 105 feet BGS. This well is screened from 86 to 101 feet BGS, and the static water level was approximately 80 feet BGS. It is unlikely that groundwater at this well location has been affected by operations at the Site.

4.0 Conclusions

1. Based on Site-specific data, groundwater beneath the Site on April 22-23, 1997, ranged from 48.24 feet BGS at well MW-4, to 66.46 feet BGS at water well WW-1.

The depth-to-groundwater was generally influenced by pumping from water well WW-1. Pumping from well WW-1 has also influenced the groundwater potentiometric surface. The elevation of the groundwater surface on April 22-23, 1997 ranged from 3376.69 feet above mean sea level (AMSL) at well MW-4, located near the southeast corner of the Site, to 3362.32 at well WW-1. Groundwater flow beneath the Site is generally controlled by well WW-1 during pumping. The influence of well WW-1 from pumping has created a cone of depression which extends radially away from the well and causes groundwater to flow towards well WW-1. The cone of depression caused from pumping well WW-1 would generally prevent contaminants which may enter the groundwater from migrating off the Site.

2. Soil samples from boring MW-2 (background) were field screened for the presence of petroleum hydrocarbons using the OVM. The highest OVM reading measured in the soil samples from boring MW-2 was 1 ppm, from a depth of 50 to 52 feet. The OVM readings in the remaining soil samples were below the level detectable by the instrument. The OVM reading from 50 to 52 feet is also below the general background air concentration for the Site, and does not indicate that an environmental impact has occurred.

3. Soil samples were collected from boring MW-2 (background), and analyzed for total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). The soil samples were obtained from depths of 10-11 feet, 20-22 feet, 30-32 feet, 40-42 feet, and 50-52 feet. Arsenic, cadmium, lead, mercury, selenium, and silver were not detected above the test method detection limits in samples from boring MW-2. Total barium was detected at levels ranging from non-detectable (<10 mg/kg) in samples from 40-42 feet and 50-52 feet, to 270 mg/kg in the sample from 20-22 feet.

Chromium was detected at levels ranging from non-detectable (<5.0 mg/kg) in samples from 10-11 feet, 20-22 feet, and 40-42 feet, to 62 mg/kg in the sample from 50-52 feet.

Based on the background sample data, the levels of cadmium (2.7 mg/kg) and lead (64.4 mg/kg) reported in the soil samples from 0-0.5 feet at boring AH-5 (October 17, 1995) are slightly elevated above the background levels for the Site, but are within the range expected for the region. The levels of barium and chromium reported in the background soil samples are generally lower in concentration than levels reported in soil samples from borings AH-5, and AH-5-1 through AH-5-5.

4. Soil samples were collected from borings AH-5, and AH-5-1 through AH-5-5, installed on the north side of the compressor building. The depths of the borings ranged from approximately 0.5 feet BGS (AH-5 and AH-5-2) to 3.3 feet BGS (AH-5-3). Soil samples from the borings were analyzed for total chromium and total barium. The total chromium levels reported in the soil samples ranged from 6.2 mg/kg (AH-5-1, 1.5-2.0 feet) to 4400 mg/kg (AH-5-2, 0-0.5 feet). Levels of total chromium in the soil samples generally decreased below background below depths of 1 foot. The highest total chromium levels were reported in the 0-0.5 foot depth interval samples, and ranged in concentration from 390 mg/kg (AH-5-4) to 4400 mg/kg (AH-5-3). Based on the laboratory tests, the vertical extent of elevated total chromium was determined. However, the area of elevated chromium in soil extends west of boring AH-5, AH-5-1, and AH-5-2 at least ten (10) feet, and west of boring AH-5-5. The soil affected by the elevated total chromium extend north of the compressor building approximately 5 feet. The area of soil affected by the elevated chromium is estimated to be approximately 125 square feet or approximately 5 cubic yards of soil.

The soil sample from 0-0.5 feet (AH-5-2), which exhibited a chromium reading of 4400 mg/kg was tested by the TCLP method for toxicity. The TCLP level for chromium in the sample was less than the test method detection limit of 0.05 mg/l, concluding that the soil does not exhibit a hazardous characteristic.

5. Six (6) volatile organic compounds (BTEX, dichlorodifluoromethane, and tetrachloroethene) were detected above the EPA method 8240 detection limits in the groundwater. BTEX was only detected in groundwater from monitor wells MW-1, MW-5, and MW-6. Benzene ranged in concentration from 11 ug/L (MW-1) to 540 ug/l (MW-5), and exceeded the WQCC standard of 10 ug/L. The toluene, ethylbenzene, and xylenes reported in groundwater samples from wells MW-1, MW-5, and MW-6 were below the WQCC standards. The groundwater samples from wells MW-3 and MW-4 (down gradient) did not report BTEX levels above the test method detection limits, concluding that the BTEX impacts to groundwater are localized and confined to the Site.

6. Dichlorodifluoromethane was reported in groundwater samples from all wells, except MW-2 (up gradient), at concentrations ranging from 6 ug/L (MW-3), to 98 ug/L (MW-1). Tetrachloroethene was only detected at 1 ug/L (test method detection limit) in groundwater from water well WW-1. Dichlorodifluoromethane and tetrachloroethene are listed as toxic pollutants, in accordance with the WQCC definition (20 NMAC 6.2.1101.TT). Highlander evaluated the U.S. EPA, Region III, Risk-Based Concentration Table, and the Office of Water, Drinking Water Regulations and Health Advisories (EPA 822-B-96-002), to obtain information on human health exposure data for these compounds. Based on the review, the levels of dichlorodifluoromethane and tetrachloroethene reported in the groundwater samples do not pose a risk to human health.

7. Seven (7) semi-volatile organic compounds (acetophenome, naphthalene, 2-methylnaphthalene, 2-methylphenol, 4-methylphenol/3-methylphenol, fluorene, and anthracene) were reported in groundwater at varying concentrations. Naphthalene was only detected in groundwater from monitor wells MW-5 (0.120 mg/L), and MW-6 (0.016 mg/L). The concentration of naphthalene in groundwater from monitor well MW-5 exceeded the WQCC standard of 0.03 mg/L. However, naphthalene was not detected in down gradient well MW-3, and, therefore, appears to be localized, and contained to the Site. Acetophenone (0.005 mg/L) was only detected in groundwater from well MW-1, and 2-methylphenol (0.004 mg/L), and 4-methylphenol/3-methylphenol (0.002 mg/L) were only detected in groundwater from well MW-6. No WQCC standards exist for these compounds. The compound 2-methylnaphthalene was detected in the groundwater samples from monitor wells MW-5 and MW-6, at concentrations of 0.022 mg/L and 0.026 mg/L, respectively. Fluorene (0.002 mg/L) was only detected in the groundwater sample from well MW-5. Anthracene was detected in the groundwater samples from well MW-6 (0.002 mg/L), and water well WW-1 (0.002 mg/L). These compounds are considered toxic pollutants, in accordance with 20 NMAC 6.2.1101.TT. Highlander evaluated the U.S. EPA, Region III, Risk-Based Concentration Table, and the Office of Water, Drinking Water Regulations and Health Advisories (EPA 822-B-96-002), to obtain information on human health exposure data for these compounds. Based on the information reviewed, the levels of anthracene and fluorene reported in the groundwater samples do not pose a risk to human health. There is no risk based standard or HA for 2-methylnaphthalene.

8. Barium (0.3 mg/L), chromium (0.08 mg/L to 0.52 mg/L), and lead (0.01 mg/L) were the only metals detected in groundwater samples above the EPA methods detection limits. Barium in groundwater from well MW-6 (0.3 mg/L), was below the WQCC standard of 1.0 mg/L. Chromium in groundwater from well MW-3 (0.36 mg/L),

MW-4 (0.08 mg/L), and WW-1 (0.52 mg/L) exceeded the WQCC standard of 0.05 mg/L. However, the EPA drinking water MCL for chromium is 0.1 mg/L. Lead in groundwater from wells MW-1, MW-4, and MW-6, exceeded the WQCC standard of 0.05 mg/L.

9. Chloride in groundwater ranged in concentration from 200 mg/L (MW-1) to 1500 mg/L (MW-6), and exceeded the WQCC standard of 250 mg/L for domestic water supply in all wells, with the exception of well MW-1, located near the central area of the Site. Elevated chloride was detected in groundwater from wells MW-5 and MW-6, and appears to be contained to the Site, as a result of pumping from water well WW-1. Pumping from WW-1 has created a cone of depression, which may also be capturing chloride from potential sources offsite and up gradient.

10. Levels of TDS in groundwater ranged from 1200 mg/L (MW-2) to 3200 mg/L (MW-6), and exceeded the WQCC standard of 1000 mg/L for domestic water supply. However, the TDS levels reported in groundwater from background well MW- 2 (1200 mg/L) may be indicative of regional groundwater quality.

11. The overall average horizontal hydraulic conductivity of the unconfined aquifer, based on falling head and rising head slug tests conducted in wells MW-2, MW-3, and MW-4 was calculated to be approximately 6.62 x 10^{-5} Ft./Sec., or 5.7225 Ft./Day.

12. The GC fingerprint analysis of PSH collected from well MW-6 exhibited peaks in the C-10 to C-12 carbon range, consistent with diesel fuel. Lesser amounts of lighter chain hydrocarbons, consistent with natural gas condensate or gasoline, were also reported.

13. Based on a review of the State of New Mexico, Office of the State Engineer's records, the nearest water well hydraulically down gradient of the Site, is located approximately 500 feet southeast of the Site. The well is located in the MW/4, NW/4, SW/4, Section 27, Township 21 South, Range 37 East, Lea County, New Mexico. , and was drilled on March 7, 1963. This well is approximately 93 feet deep. There was no data available to determine the current status of this well (i.e., active, inactive, or plugged), or its use.

5.0 RECOMMENDATIONS

Based on the results of laboratory tests for filtered metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) in groundwater from wells MW-3 and MW-4 on April 22-23, 1997, Texaco will resample these wells and test the samples for filtered metals to confirm the earlier results. Following receipt of the analytical data from the laboratory, Texaco will submit the sample results to the OCD.

TABLES

Table 1: Summary of Soil Boring, and Monitor Well Drilling and Completion Details
Texaco Exploration and Production Inc., Eunice #2 (North) Gas Plant
Lea County, New Mexico

Drilling Area	Soil Boring/ Monitor Well No.	Date Drilled	Drilled Depth, Feet	Ground Elev., Feet, AMSL	TOC Elev., Feet, AMSL	Well Diameter Inches	Well Screen, Feet, BGL	Depth-to-Ground Water, Feet, BGL, 04/22-23/97
Compressor	MW-1	07/22/96	68	3428.78	3428.59	4	48-68	52.34
Water Well	WW-1	--	100	3428.78	3429.98	6	--	66.46
North Sump	BH-1	07/29/96	52	3424.85	--	--	--	--
	BH-2	07/29/96	52	3425.03	--	--	--	--
	MW-5	04/02/97	68	3425.06	3424.76	4	48-68	49.30
	MW-6	04/02/97	68	3425.06	3424.25	4	48-68	49.26
N. Sump E.R.	AH-1	08/09/96	6.8	3428.09	--	--	--	--
S. Sump E.R.	AH-1	08/09/96	8.4	3427.72				
Trash Pit	AH-1	08/09/96	4.7	3426.92	--	--	--	--
Upgradient	MW-2	03/31/97	68	3432.49	3432.18	4	48-68	55.95
Downgradient	MW-3	04/01/97	68	3426.48	3428.27	4	48-68	49.79
	MW-4	04/01/97	66.5	3423.70	3423.38	4	46.5-66.5	48.24

Notes: 1. AMSL: Denotes elevation in feet above mean sea level
2. BGL: Denotes depth in feet below ground surface

Table 2: Summary of OVM Headspace Gas Readings on Soil Samples
Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant
Lea County, New Mexico

Investigation Area	Date	Soil Boring No.	Soil Sample No.	Sample Depth (ft)	OVM Reading (ppm)	Comments
Waste Oil and Water Storage Area	7/23/96	BH-1	1	5-7	1	
			2	10-12	2	
			3	15-17	2	
			4	20-22	3	
			5	25-27	2	
			6	30-32	2	
	7/24/96	BH-2	1	5-7	1	
			2	10-12	2	
			3	15-17	2	
			4	20-22	4	
			5	25-27	2	
	7/24/96	BH-3	1	5-7	1	
			2	10-12	2	
			3	15-17	2	
			4	20-22	1	
			5	25-27	1	
	7/24/96	BH-4	1	5-7	5	
			2	10-12	28	
			3	15-17	58	
			4	20-22	69	
			5	25-27	154	
			6	30-32	39	
			7	35-37	8	
	7/24/96	BH-5	1	5-7	588	
			2	10-12	500	
			3	15-17	353	
			4	19-20	143	
			5	25-27	7	
			6	30-32	12	
			7	35-37	3	
	7/24/96	BH-6	1	5-7	478	
			2	10-12	496	
			3	15-17	418	
			4	20-22	487	
			5	25-27	35	
			6	30-32	33	
			7	35-37	13	
			8	40-42	6	

Note: OVM soil headspace gas readings are in parts per million (ppm) of total ionizable hydrocarbon.

Table 2: (continued) Summary of OVM Headspace Gas Readings on Soil Samples
Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant
Lea County, New Mexico

Investigation Area	Date	Soil Boring No.	Soil Sample No.	Sample Depth (ft)	OVM Reading (ppm)	Comments
Waste Oil and Water Storage Area	7/25/96	BH-7	1	0.5-1	489	
			2	5-7	415	
			3	10-12	450	
			4	15-17	153	
			5	20-22	26	
			6	25-27	19	
			7	30-32	7	
			8	35-37	6	
	7/25/96	BH-8	1	0.5-1	99	
			2	5-7	435	
			3	10-12	5	
			4	15-17	18	
			5	20-22	43	
			6	25-27	2	
North Sump	7/29/96	BH-1	1	5-7	206	
			2	10-12	233	
			3	15-17	28	
			4	20-22	239	
			5	25-27	207	
			6	30-32	122	
			7	35-37	159	
			8	40-42	69	
			9	45-47	255	
			10	50-52	421	
	7/29/96	BH-2	1	5-7	415	
			2	10-12	448	
			3	15-17	177	
			4	20-22	497	
			5	25-27	384	
			6	30-32	440	
			7	35-37	127	
			8	40-42	29	
			9	45-47	327	
			10	50-52	-	

Note: OVM soil headspace gas readings are in parts per million (ppm) of total ionizable hydrocarbon.

Table 2: (continued) Summary of OVM Headspace Gas Readings on Soil Samples
Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant
Lea County, New Mexico

Investigation Area	Date	Soil Boring No.	Soil Sample No.	Sample Depth (ft)	OVM Reading (ppm)	Comments
Compressor Building	7/23/96	MW-1 (BH-1)	1	0-5	6	
			2	10-12	2	
			3	15-17	3	
			4	20-22	2	
			5	25-27	4	
			6	30-32	7	
			7	35-37	1	
			8	40-42	2	
			9	45-47	2	
			10	50-52	2	
			11	55-57	414	
Sump South of Engine Room	8/09/96	AH-1	1	2-2.5	0	
			2	4-4.5	0	
			3	6-6.3	0	
			4	6.3-6.8	1	
Sump North of Engine Room	8/09/96	AH-1	1	2-2.5	0.00	
			2	4-4.5		
			3	6-6.5		
			4	8.2-8.4		
Trash Pit	8/09/96	AH-1	1	2-2.5	0	
			2	4.5-4.7	0	
Upgradient	3/31/97	MW-2	--	0-10	--	
			1	10-12	0	
			2	20-22	0	
			3	30-32	0	
			4	40-42	0	
			5	50-52	1	
			--	60-68	--	

Note: OVM soil headspace gas readings are in parts per million (ppm) of total ionizable hydrocarbon.

Table 3: Summary of Total Metals and TCLP (Chromium) Analysis of Soil Samples, Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant Lea County, New Mexico

Investigation Area	Soil Boring Number	Sample Depth (ft)	Sample Date	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	TCLP-Chromium (mg/L)
Compressor Building	AH-5	0-0.5	10/17/95	<20	1900	2.7	1580	64.4	<0.25	<20	<0.5	-
	AH-5-1	0-0.5	04/03/97	-	320	-	3800	-	-	-	-	-
	AH-5-1	0.5-1.0	04/03/97	-	250	-	360	-	-	-	-	-
	AH-5-1	1.5-2.0	04/03/97	-	26	-	6.2	-	-	-	-	-
	AH-5-2	0-0.5	04/03/97	-	290	-	4400	-	-	-	-	<0.05
	AH-5-3	0-0.5	04/03/97	-	92	-	430	-	-	-	-	-
	AH-5-3	1.5-2.0	04/03/97	-	21	-	6.6	-	-	-	-	-
	AH-5-3	2.7-3.3	04/03/97	-	<20	-	7.3	-	-	-	-	-
	AH-5-4	0-0.5	04/03/97	-	150	-	390	-	-	-	-	-
	AH-5-4	0.5-1.0	04/03/97	-	230	-	1500	-	-	-	-	-
	AH-5-4	2.0-2.5	04/03/97	-	<20	-	63	-	-	-	-	-
	AH-5-5	0-0.5	04/03/97	-	330	-	2900	-	-	-	-	-
	AH-5-5	1.5-2.0	04/03/97	-	<20	-	9.6	-	-	-	-	-
Background	MW-2	10-11	03/31/97	<10	61	<5.0	<5.0	<10	<0.25	<10	<5.0	-
		20-22	03/31/97	<10	270	<5.0	<5.0	<10	<0.25	<10	<5.0	-
		30-32	03/31/97	<10	170	<5.0	37	<10	<0.25	<10	<5.0	-
		40-42	03/31/97	<10	<20	<5.0	<5.0	<10	<0.25	<10	<5.0	-
		50-52	03/31/97	<10	<20	<5.0	62	<10	<0.25	<10	<5.0	-

Notes: All analysis performed by Trace Analysis, Inc., Lubbock, Texas

1. ft.: Denotes sample depth interval in feet below ground surface
2. mg/kg: Denotes analyte concentration in milligrams per kilogram
3. --: No data available
4. TCLP: Analysis by Toxicity Characterristic Leaching Procedure
5. mg/L: Denotes analyte concentration in milligrams per liter

Table 4: Summary of Volatile Organic Analysis of Groundwater Samples from Monitor Wells and Water Wells
Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant
Lea County, New Mexico

Well Number	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Dichlorodifluoromethane (µg/L)	Tetrachloroethene (µg/L)
MW-1	08/01/96	9	69	82	169	-	-
	04/23/97	11	33	75	49	98	<1
MW-2	04/22/97	<1	<1	<1	<1	<1	<1
MW-3	04/22/97	<1	<1	<1	<1	6	<1
MW-4	04/23/97	<1	<1	<1	<1	8	<1
MW-5	04/22/97	540	310	93	245	37	<1
MW-6	04/22/97	340	280	110	330	50	<1
WW-1	06/14/96	<1	<1	<1	<1	113	<1
	04/23/97	<1	<1	<1	<1	66	1

Notes: All analysis performed by Trace Analysis, Inc., Lubbock, Texas
1. µg/L: Denotes analytic concentration in micrograms per liter
2. <: Denotes analytic concentration below the analytical test method detection limit
3. --: No data available

Table 5: Summary of Semi-Volatile Organic Analysis of Groundwater Samples from Monitor Wells and Water Wells
Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant
Lea County, New Mexico

Well Number	Sample Date	Acetophenome (mg/L)	Naphthalene (mg/L)	2-methylnaphthalene (mg/L)	2-methylphenol (mg/L)	4-methylphenol/ 3-methylphenol (mg/L)	Fluorene (mg/L)	Anthracene (mg/L)
MW-1	04/23/97	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-2	04/22/97	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-3	04/22/97	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-4	04/23/97	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-5	04/22/97	<0.050	0.120	0.022	<0.010	<0.010	<0.010	<0.010
MW-6	04/22/97	<0.005	0.016	0.026	0.004	0.002	0.002	0.002
WW-1	04/23/97	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.002

Notes: All analysis performed by Trace Analysis, Inc., Lubbock, Texas
1. mg/L: Denotes analytic concentration in milligrams per liter
2. <: Denotes analytic concentration below the test method detection limit

Table 6: Summary of Metals and General Chemistry Analysis of Groundwater Samples from Monitor Wells and Water Wells
Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant
Lea County, New Mexico

Well No.	Sample Date	Arsenic (mg/L)	Baruim (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Mercury (mg/L)	Selenium (mg/L)	Silver (mg/L)	Potassium (mg/L)	Magnesium (mg/L)	Calcium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	Alkalinity (mg/L)	Nitrate (mg/L)	TDS (mg/L)
MW-1	04/23/97	<0.10	<0.20	<0.02	<0.05	0.1	<0.001	<0.10	<0.01	-	-	-	-	200	-	-	-	-	2000
MW-2	04/22/97	<0.10	<0.20	<0.02	<0.05	<0.10	<0.001	<0.10	<0.01	-	-	-	-	350	-	-	-	-	1200
MW-3	04/22/97	<0.10	<0.20	<0.02	0.36	<0.10	<0.001	<0.10	<0.01	-	-	-	-	430	-	-	-	-	2000
MW-4	04/23/97	<0.10	<0.20	<0.02	0.08	0.1	<0.001	<0.10	<0.01	-	-	-	-	290	-	-	-	-	1600
MW-5	04/22/97	<0.10	<0.20	<0.02	<0.05	<0.10	<0.001	<0.10	<0.01	-	-	-	-	800	-	-	-	-	2800
MW-6	04/22/97	<0.10	0.3	<0.02	<0.05	0.1	<0.001	<0.10	<0.01	-	-	-	-	1500	-	-	-	-	3200
WW-1	06/14/96	<0.10	<0.20	<0.02	0.66	<0.10	<0.001	<0.1	<0.01	12.4	142	268	393	782	2.6	913	340	10.4	-
	08/01/96	-	-	-	0.82	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	04/23/97	<0.10	<0.20	<0.02	0.52	<0.10	<0.001	<0.10	<0.01	-	-	-	-	800	-	-	-	-	2600

Note: All analysis performed by Trace Analysis, Inc., Lubbock, Texas.
1. mg/L: Denotes analyte concentration in milligrams per liter
2. <: Denotes analyte concentration below test method detection limit
3. -: No Data Available

Table 7: Summary of Horizontal Hydraulic Conductivity Measurements from Monitor Wells by Slug Test Method
Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant
Lea County, New Mexico

Monitor Well	Test Date	Falling Head Test		Rising Head Test	
		Ft./Sec.	Ft./Day	Ft./Sec.	Ft./Day
MW-2	04/11/97	5.04×10^{-5}	4.3527	5.35×10^{-5}	4.6251
MW-3	04/11/97	7.02×10^{-5}	6.0642	8.30×10^{-5}	7.1699
MW-4	04/11/97	4.47×10^{-5}	3.8643	9.56×10^{-5}	8.2592
Average:		5.51×10^{-5}	4.7604	7.73×10^{-5}	6.6847
Overall Average:		6.62×10^{-5} Feet/Sec. 5.7225 Feet/Day			

Notes: All data evaluated by Bouwer and Rice method for unconfined aquifers.
1. Ft/Sec: Denotes horizontal hydraulic conductivity in feet per second
2. Ft/Day: Deontes horizontal hydraulic conductivity in feet per day

Table 8: Summary of Water Wells Within 1-Mile Radius
Texaco Exploration and Production, Inc., Eunice #2 (North) Gas Plant
Lea County, New Mexico

Well No.	Well Permit No.	Well Owner	Legal Location	Date Drilled	Drilled Depth Ft., BGL	Screen Interval Ft., BGL	Depth-to Ground Water Ft./BGL	Status
1	CP-735	Charles Jennings	S/2 NE/4 SE/4 Sec. 28, T-21-S, R-37-E	7/26-27/97	105	86-101	80	V. weak water
2	CP-322	Millard Peck	SW/4 Sec. 28, T-21-S, R-37-E	6/8-10/66	138	70-138	73	
3	CP-749	D.M. Criswell	NE/4 SE/4 SW/4 Sec. 28, T-21-S, R-37-E	6/15-22/90	123	113-123	75	Salty
4	CP-513	Gulf Oil Corp.	SE/4 NW/4 SW/4 Sec. 28, T-21-S, R-37-E	11/5-21/92	5000	4374-4888	4374	
5	-	Skelly Gas Plant #2	SW/4 SE/4 NE/4 Sec. 28, T-21-S, R-37-E	12/02/64	112	-	-	Industrial Well
6	CP-711	Loyd Black	SE/4 NE/4 NE/4 Sec. 28, T-21-S-R-37-E	10/1-2/87	65	80-95	65	
7	-	R.L. McLean	NW/4 NW/4 SW/4 Sec. 27, T-21-S, R-37-E	3/07/63	93	-	-	
8	-	Skelly Gas Plant #2	SE/4 SW/4 NE/4 Sec. 27, T-21-S, R-37-E	5/02/62	120	-	-	
9	-	Gulf Oil Corp.	NW/4 SE/4 NE/4 Sec. 27, T-21-S, R-37-E	-	180	150-180	-	
10	-	Gulf Oil Corp.	NE/4 SW/4 NE/4 Sec. 27, T-21-S, R-37-E	1948	99	69-99	-	
11	CP-736	Ronnie Worden	SW/4 NW/4 Sec. 27, T-21-S, R-37-E	9/10/88	120	77-97	76	
12	CP-733	Shell Western E&P, Inc.	S/2 SW/4 SW/4 Sec. 22, T-21-S, R-37-E	6/3-21/88	7864	4073-4960	-	

Notes: All records from file of New Mexico State Engineer Office
1. BGL: Denotes depth in feet below ground surface
2. -: No data available

FIGURES

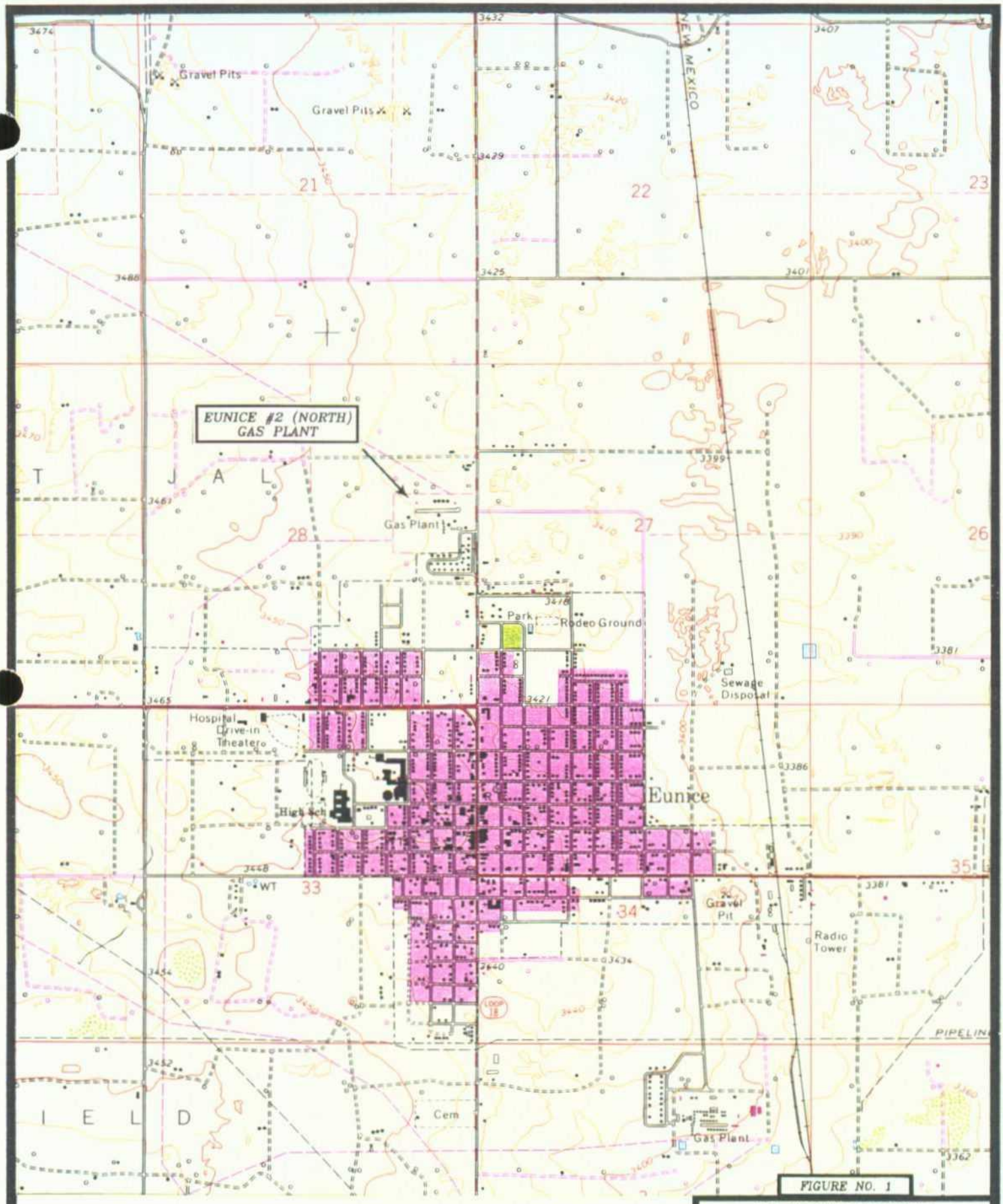


FIGURE NO. 1

LEA COUNTY, NEW MEXCIO

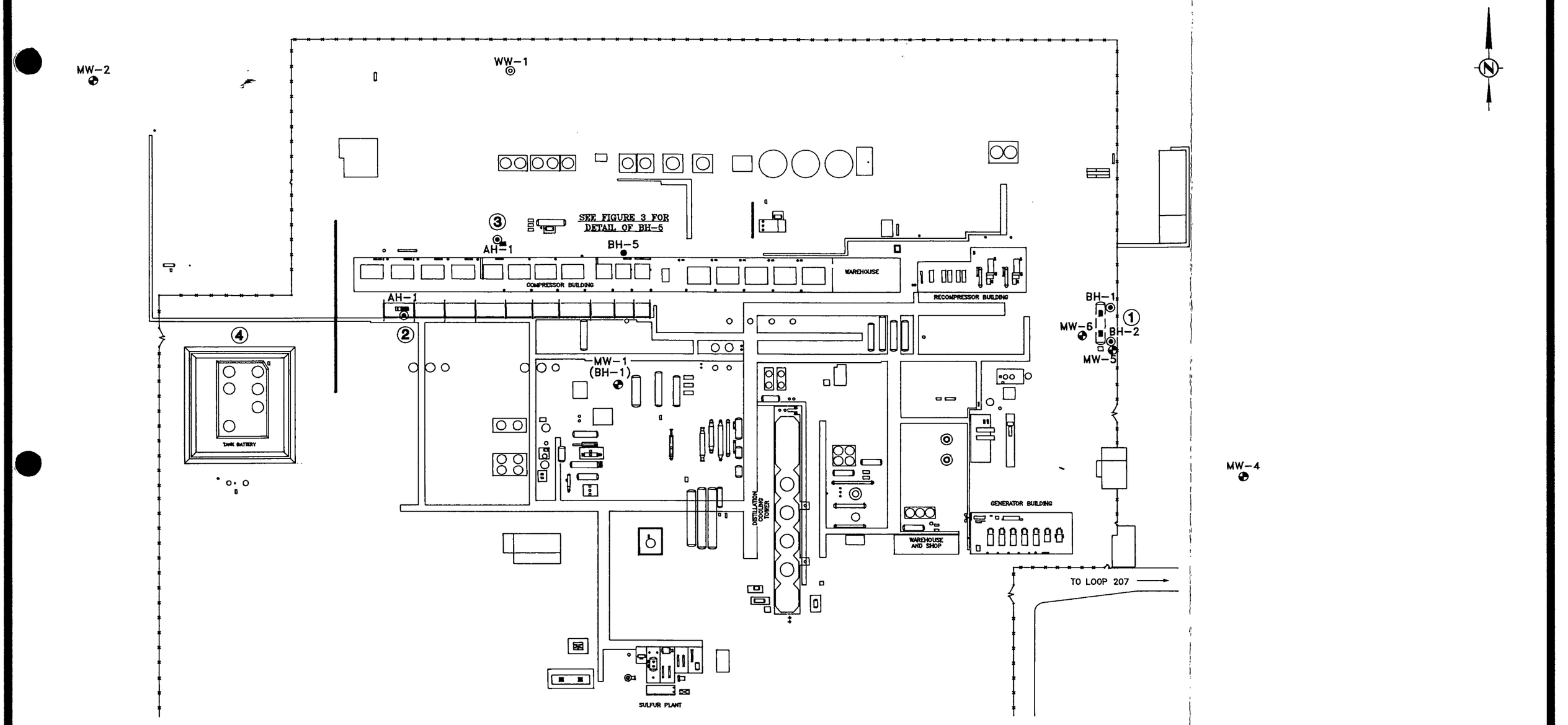
TEXACO
EXPLORATION & PRODUCTION

TOPOGRAPHIC MAP

HIGHLANDER ENVIRONMENTAL
MIDLAND, TEXAS

TAKEN FROM U.S.G.S.
RATTLESNAKE CANYON, NM
7.5' QUADRANGLE

SCALE: 1" = 2,000'



LEGEND

- BH-1 — BOREHOLE LOCATION
- MW-1 — MONITOR WELL LOCATION
- WW-1 — WATER WELL LOCATION
- BH-5 — AUGER BORING LOCATION
- SUMP LOCATION

ENVIRONMENTAL INVESTIGATION AREAS

1. NORTH SUMP
2. SUMP SOUTH OF ENGINE ROOM
3. SUMP NORTH OF ENGINE ROOM
4. WASTE OIL & WATER STORAGE AREA
5. TRASH PIT

SCALE (IN FEET)
25 0 50 100

FIGURE NO. 2

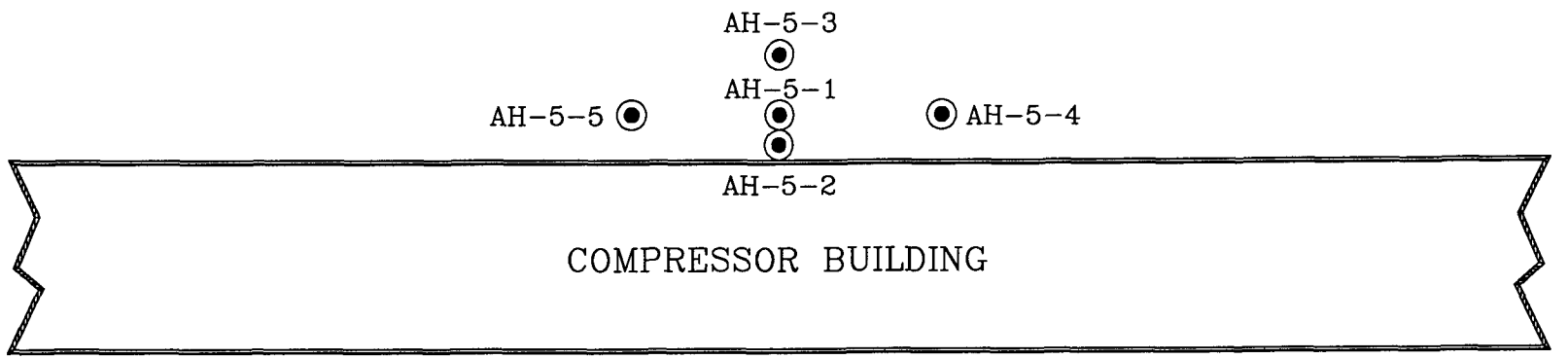
LEA COUNTY, NEW MEXICO

TEXACO
EXPLORATION & PRODUCTION, INC.

EUNICE #2 (NORTH) GAS PLANT) SITE MAP

HIGHLANDER ENVIRONMENTAL MIDLAND, TEXAS

DATE: 9/18/96
DWN. BY: R.C.P.
FILE: C:\787\NTH-SITE



SCALE
(IN FEET)

10 0 10

LEGEND

AH-5 ◉ BOREHOLE LOCATION

FIGURE NO. 3

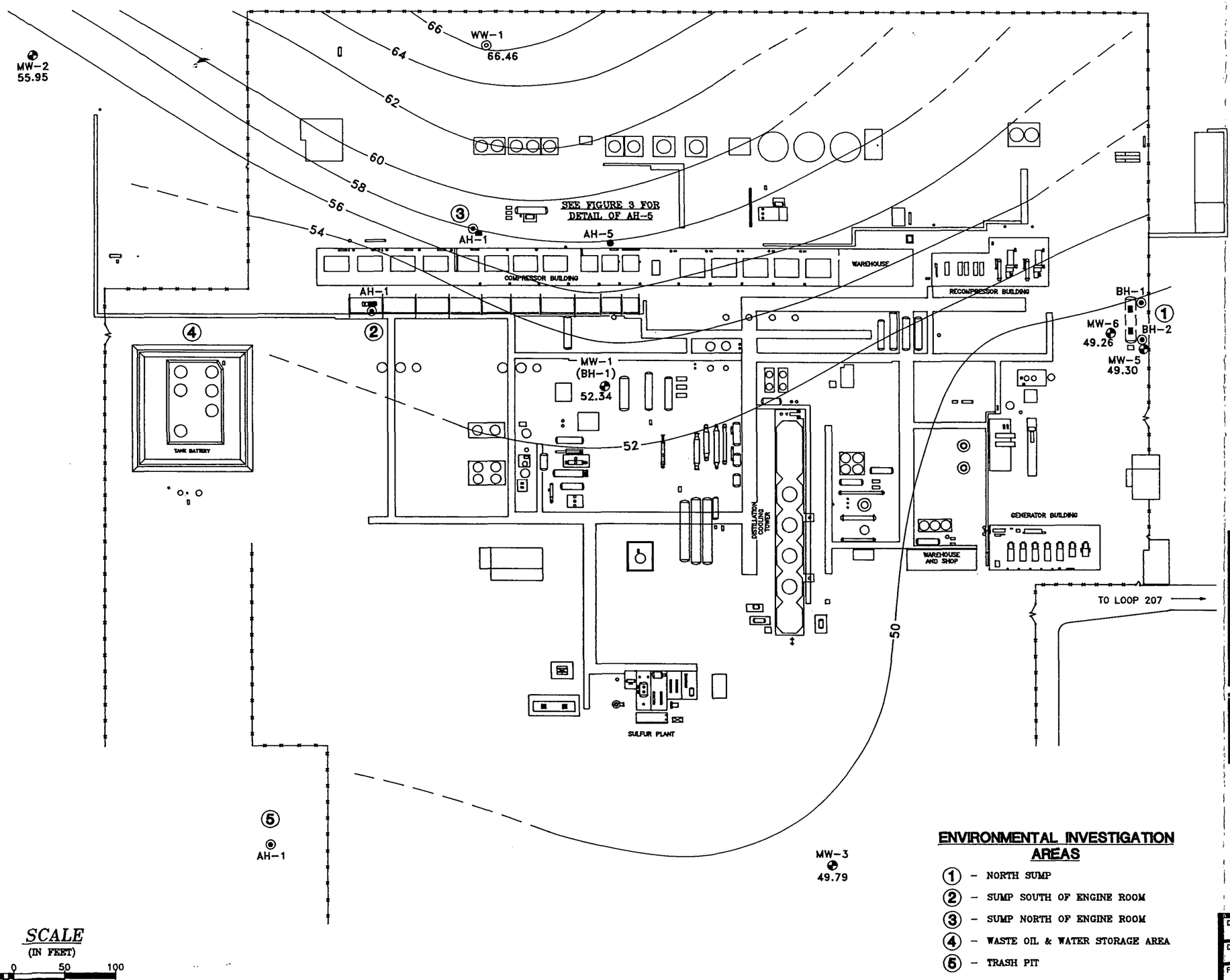
LEA COUNTY, NEW MEXICO

TEXACO
EXPLORATION & PRODUCTION, INC.

DETAIL OF AH-5
AUGER HOLES

DATE: 5/15/97
DWN. BY: R.C.P.
FILE: C:\787\AH-5

HIGHLANDER ENVIRONMENTAL
MIDLAND, TEXAS



LEGEND

MW-1 ⊕ 52.34	MONITOR WELL LOCATION AND DEPTH TO GROUNDWATER FEET BGL, 4/22-23/97
WW-1 ⊙ 66.46	WATER WELL LOCATION AND DEPTH TO GROUNDWATER FEET BGL, 4/22-23/97
50	CONTOUR OF DEPTH TO GROUNDWATER FEET BGL, 4/22-23/97
BH-1 ⊙	BOREHOLE LOCATION
AH-5 ●	AUGER BORING LOCATION
■	SUMP LOCATION

MONITOR WELL DATA		
MONITOR WELL NUMBER	GROUND ELEVATION FEET AMSL	TOP OF CASING ELEVATION, FEET AMSL
MW-1	3428.78	3428.59
MW-2	3432.49	3432.18
MW-3	3426.48	3428.27
MW-4	3423.70	3423.38
MW-5	3425.06	3424.76
MW-6	3425.06	3425.25

WATER WELL DATA		
WATER WELL NUMBER	GROUND ELEVATION FEET AMSL	TOP OF CASING ELEVATION, FEET AMSL
WW-1	3428.78	3429.98

ENVIRONMENTAL INVESTIGATION AREAS

1. NORTH SUMP
2. SUMP SOUTH OF ENGINE ROOM
3. SUMP NORTH OF ENGINE ROOM
4. WASTE OIL & WATER STORAGE AREA
5. TRASH PIT

DATE: 9/18/96
DWN. BY: R.C.P.
FILE: \787\DEPTH-GW

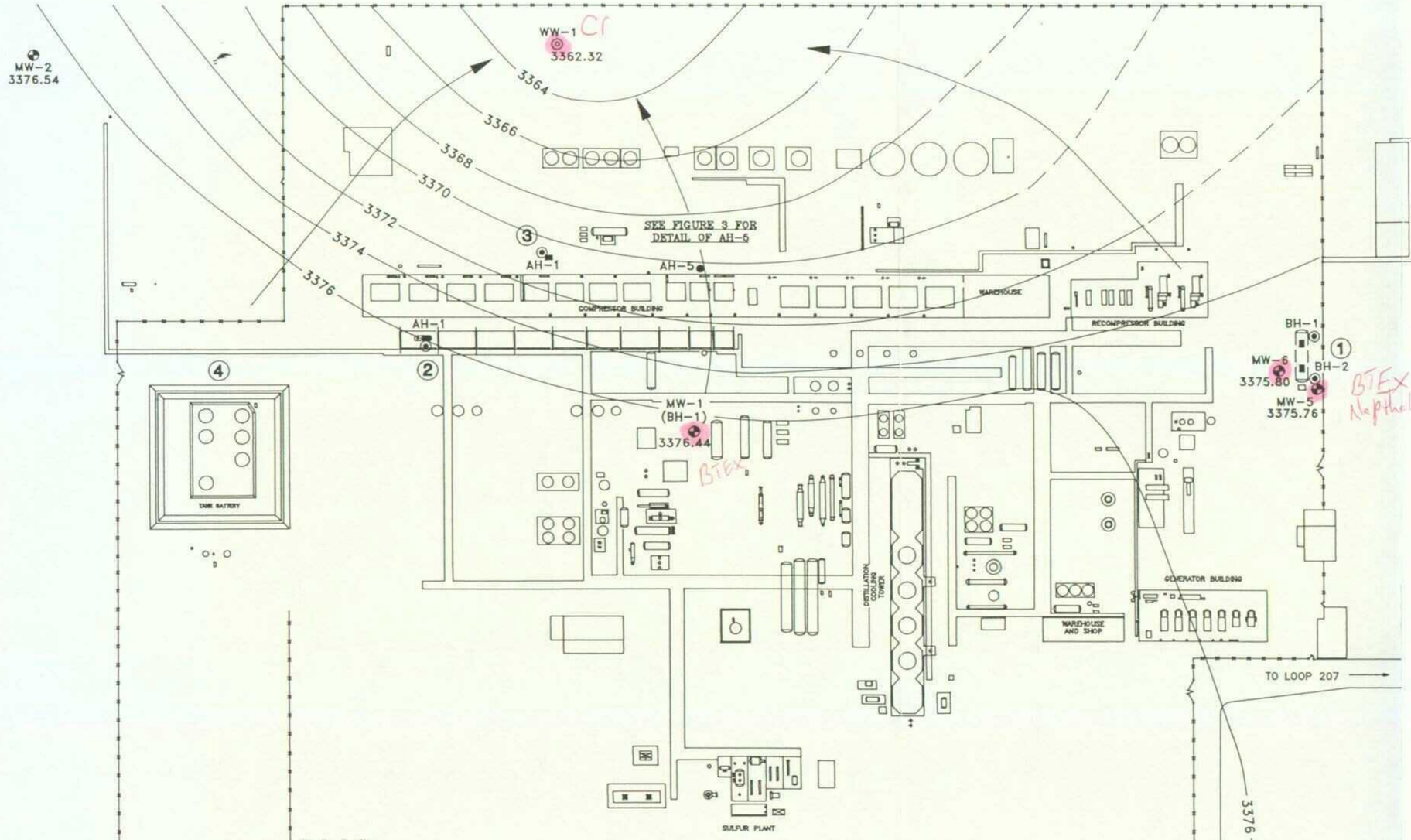
FIGURE NO. 4

LEA COUNTY, NEW MEXICO

TEXACO
EXPLORATION & PRODUCTION, INC.

EUNICE #2 (NORTH) GAS PLANT
DEPTH TO GROUNDWATER
MAP 4/22-23/97

HIGHLANDER ENVIRONMENTAL
MIDLAND, TEXAS



LEGEND

MW-1 3376.44	MONITOR WELL LOCATION AND GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION, FEET AMSL, 4/22-23/97
WW-1 3376.69	WATER WELL LOCATION AND GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION, FEET AMSL, 4/22-23/97
3364	CONTOUR OF GROUNDWATER POTENTIOMETRIC SURFACE, ELEVATION, FEET AMSL, 4/22-23/97
	GROUNDWATER FLOW DIRECTION
BH-1	BOREHOLE LOCATION
BH-5	AUGER BORING LOCATION
	SUMP LOCATION

MONITOR WELL DATA

MONITOR WELL NUMBER	GROUND ELEVATION FEET AMSL	TOP OF CASING ELEVATION, FEET AMSL
MW-1	3428.78	3428.59
MW-2	3432.49	3432.18
MW-3	3426.48	3428.27
MW-4	3423.70	3423.38
MW-5	3425.06	3424.76
MW-6	3425.06	3425.25

WATER WELL DATA

WATER WELL NUMBER	GROUND ELEVATION FEET AMSL	TOP OF CASING ELEVATION, FEET AMSL
WW-1	3428.78	3429.98

ENVIRONMENTAL INVESTIGATION AREAS

1. NORTH SUMP
2. SUMP SOUTH OF ENGINE ROOM
3. SUMP NORTH OF ENGINE ROOM
4. WASTE OIL & WATER STORAGE AREA
5. TRASH PIT

SCALE (IN FEET)
25 0 50 100

FIGURE NO. 5

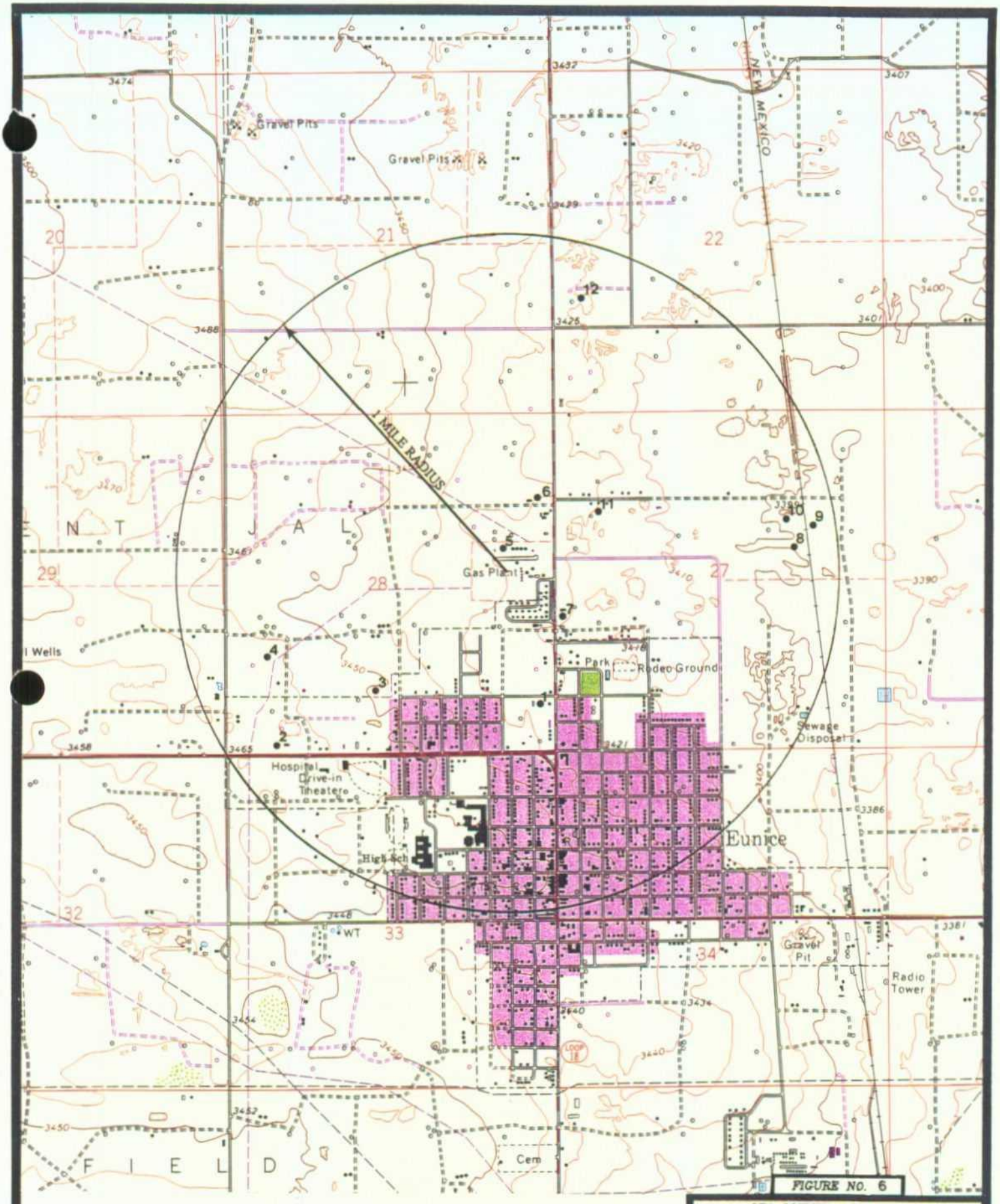
LEA COUNTY, NEW MEXICO

TEXACO
EXPLORATION & PRODUCTION, INC.

EUNICE #2 (NORTH) GAS PLANT
GROUNDWATER POTENTIOMETRIC SURFACE MAP 4/22-23/97

DATE: 5/15/97
DWN. BY: R.C.P.
FILE: C:\787\POTMETIC

HIGHLANDER ENVIRONMENTAL
MIDLAND, TEXAS



TAKEN FROM U.S.G.S.
EUNICE, NM
7.5' QUADRANGLE

N

LEGEND

• 1 WATER WELL LOCATION
REFER TO TABLE FOR
ADDITIONAL INFORMATION

SCALE: 1"=2,000'

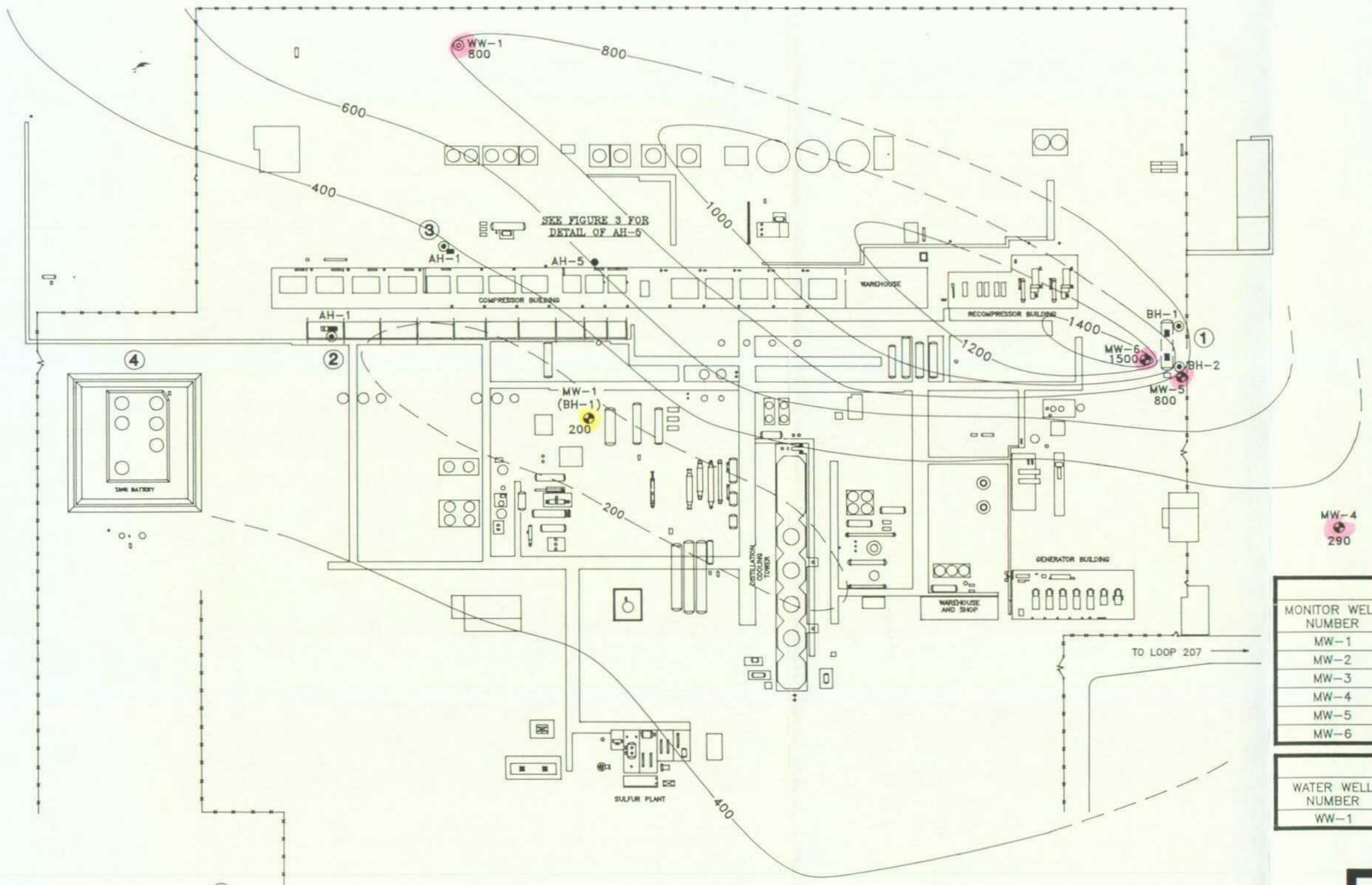
FIGURE NO. 6

LEA COUNTY, NEW MEXCIO

TEXACO
EXPLORATION & PRODUCTION

WATER WELLS
WITHIN 1 MILE RADIUS

HIGHLANDER ENVIRONMENTAL
MIDLAND, TEXAS



LEGEND

MW-1 / 200	MONITOR WELL LOCATION AND CHLORIDE CONCENTRATION IN GROUNDWATER, mg/L, 4/22-23/97
WW-1 / 3376.69	WATER WELL LOCATION AND CHLORIDE CONCENTRATION IN GROUNDWATER, mg/L, 4/22-23/97
3364	CONTOUR OF CHLORIDE CONCENTRATION IN GROUNDWATER, mg/L, 4/22-23/97
BH-1	BOREHOLE LOCATION
AH-5	AUGER BORING LOCATION
	SUMP LOCATION

MONITOR WELL DATA

MONITOR WELL NUMBER	GROUND ELEVATION FEET AMSL	TOP OF CASING ELEVATION, FEET AMSL
MW-1	3428.78	3428.59
MW-2	3432.49	3432.18
MW-3	3426.48	3428.27
MW-4	3423.70	3423.38
MW-5	3425.06	3424.76
MW-6	3425.06	3425.25

WATER WELL DATA

WATER WELL NUMBER	GROUND ELEVATION FEET AMSL	TOP OF CASING ELEVATION, FEET AMSL
WW-1	3428.78	3429.98

SCALE
(IN FEET)
25 0 50 100

ENVIRONMENTAL INVESTIGATION AREAS

1. NORTH SUMP
2. SUMP SOUTH OF ENGINE ROOM
3. SUMP NORTH OF ENGINE ROOM
4. WASTE OIL & WATER STORAGE AREA
5. TRASH PIT

DATE: 5/14/97
DWN. BY: R.C.P.
FILE: C:\787\CHLORIDE

FIGURE NO. 7

LEA COUNTY, NEW MEXICO

TEXACO
EXPLORATION & PRODUCTION, INC.

EUNICE #2 (NORTH) GAS PLANT
ISOPLETH MAP OF CHLORIDE CONCENTRATION 4/22-23/97

HIGHLANDER ENVIRONMENTAL
MIDLAND, TEXAS

APPENDICES

APPENDIX A

Regulatory Correspondence

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

February 27, 1997

CERTIFIED MAIL
RETURN RECEIPT NO. P-288-258-776

Mr. Robert W. Browning
Texaco Exploration and Production, Inc.
P.O. Box 3109
Midland, Texas 79702

RE: GROUND WATER DELINEATION
EUNICE NORTH GAS PLANT
DISCHARGE PLAN GW-004
LEA COUNTY, NEW MEXICO

Dear Mr. Browning:

The New Mexico Oil Conservation Division (OCD) has received the Texaco Exploration and Production, Inc. (TEPI) "Comprehensive Facility Investigation Work Plan" dated February 10, 1997. The work plan was required by the OCD on November 12, 1996 pursuant to 20 NMAC 6.2.3109.E. The purpose of the work plan is to delineate and characterize the lateral and vertical extent of the groundwater contamination at the facility in a manner consistent with 20 NMAC 6.2.4106.

Based on the site assessment work committed to in the "Comprehensive Facility Investigation Work Plan, **the work plan is hereby approved** subject to the following conditions:

1. TEPI will complete the work by **April 28, 1997** and will submit a "Final site Investigation Report" by **May 28, 1997** to the Santa Fe OCD Office for approval. The report will contain all the data gathered during the site investigation.

   Note: All groundwater and soil analysis submitted to the OCD will be originals and include the appropriate QA/QC documentation. All analytical methods will be EPA approved methods, such as those referenced in 20 NMAC 6.2.3107.B.

2. TEPI will notify the Santa Fe Office 72 hours in advance of any field activity at (505)-827-7156, and Mr. Wayne Price of the OCD Hobbs Office at (505)-393-6161.

3. The "Final Site Investigation Report" will be submitted in duplicate to the OCD Santa Fe Office and a copy to the OCD Hobbs District Office.

All OCD rules, regulations, and guidelines are available on the Internet at the following website address: **www.emnrd.state.nm.us/ocd/**

If you have any questions, please contact Pat Sanchez of my staff at (505) 827-7156.

Sincerely,

Roger C. Anderson
Environmental Bureau Chief

RCA/pws

c: Mr. Jerry Sexton, OCD Hobbs - District Supervisor
Mr. Wayne Price, OCD Hobbs - Environmental Engineer

APPENDIX B

Lithological Soil Sample Logs

SAMPLE LOG

Boring/Well: MW-2
Site Location: Texaco E & P Eunice (North) Gas Plant
Location: Eunice, New Mexico
Total Depth: 68 feet
Date Installed: 3/31/97

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-10	-	Tan, fine grain sand and reddish clay, some white caliche, dense
10-12	0	Tan, fine grain sand, with trace of red clay and caliche
20-22	0	Tan, fine grain sand and white caliche
30-32	0	Tan, fine grain sand, some dense layers of caliche and cemented sandstone
40-42	0	Tan, fine grain sand, 1.0 thick of cemented sandstone from 46'-47'
50-52	1	Brown, fine grain sand, and some layers of cemented sandstone
60-68	-	Brown, fine grain sand, well sorted, and loose
		TD-68'

SAMPLE LOG

Boring/Well: MW-3
Site Location: Texaco E & P Eunice (North) Gas Plant
Location: Eunice, New Mexico
Total Depth: 68 feet
Date Installed: 4/1/97

DEPTH (Ft)	SAMPLE DESCRIPTION
0-10	Tan, fine grain sand and reddish clay matrix, some caliche layer dense
10-20	Tan, fine grain sand and white caliche
20-30	Tan, fine grain sand, traces of white caliche
30-40	Tan, fine grain sand, dense layers of cemented sandstone at 38'-40'
40-50	Tan, fine grain sand, dense layer 1.0 thick of cemented sandstone at 46'-47'
50-60	Brown, fine grain sand, some layer of sandstone, dense
60-68	Brown, fine grain sand, well sorted, and loose
	TD-68'

SAMPLE LOG

Boring/Well: MW-4
Site Location: Texaco E & P Eunice (North) Gas Plant
Location: Eunice, New Mexico
Total Depth: 66.5 feet
Date Installed: 4/1/97

DEPTH (Ft)	SAMPLE DESCRIPTION
0-10	Tan, fine grain sand and reddish sand and clay matrix, some traces of caliche, dense
10-20	Tan, fine grain sand and white caliche from 15-'20'
20-30	Tan, fine grain sand, traces of white caliche
30-40	Tan, fine grain sand, loose
40-50	Tan, fine grain sand, loose
50-60	Brown, fine grain sand, some layer of sandstone, dense
60-68	Brown, fine grain sand, well sorted, and loose
	TD-66.5'

SAMPLE LOG

Boring/Well: MW-5
Site Location: Texaco E & P Eunice (North) Gas Plant
Location: Eunice, New Mexico
Total Depth: 68 feet
Date Installed: 4/2/97

DEPTH (Ft)	SAMPLE DESCRIPTION
0-10	Grayish staining, fine grain sand, some traces of dense caliche at 7'-10'
10-20	Fine grain sand, dense caliche and sandstone layers, grayish staining
20-30	Tan, fine grain sand, traces of white caliche
30-40	Tan, fine grain sand, loose, dense layer of cemented sandstone at 38'-40'
40-50	Tan, fine grain sand, loose
50-60	Brown, fine grain sand, some layer of sandstone, dense
60-68	Brown, fine grain sand, well sorted, and loose
	TD-68'

SAMPLE LOG

Boring/Well: MW-6
Site Location: Texaco E & P Eunice (North) Gas Plant
Location: Eunice, New Mexico
Total Depth: 68 feet
Date Installed: 4/2/97

DEPTH (Ft)	SAMPLE DESCRIPTION
0-10	Grayish staining, fine grain sand, some traces of dense caliche at 7'-10'
10-20	Fine grain sand, dense caliche and sandstone layers, grayish staining
20-30	Tan, fine grain sand, traces of white caliche
30-40	Tan, fine grain sand, loose, dense layer of cemented sandstone at 38'-40'
40-50	Tan, fine grain sand, loose
50-60	Brown, fine grain sand, some layer of sandstone, dense
60-68	Brown, fine grain sand, well sorted, and loose
	TD-68'

APPENDIX C

Analytical Laboratory Reports

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER SERVICES
Attention: Ike Tavarez
1910 N. Big Spring St.
Midland, TX 79705

April 23, 1997
Receiving Date: 04/14/97
Sample Type: Soil
Project No: 787
Project Location: New Mexico

Prep Date: 04/16/97
Analysis Date: 04/16/97
Sampling Date: 03/31/97
Sample Condition: I & C
Sample Received by: JH
Client/Project: Texaco E & P/
Texaco North Gas Plant,
Lea County, New Mexico

TOTAL METALS (mg/kg)

TA#	Field Code	As	Se	Cd	Cr	Pb	Ag	Ba	Hg
T71368	MW-2 (10-11')	<10	<10	<5.0	<5.0	<10	<5.0	61	<0.25
T71369	MW-2 (20-22')	<10	<10	<5.0	<5.0	<10	<5.0	270	<0.25
T71370	MW-2 (30-32')	<10	<10	<5.0	37	<10	<5.0	170	<0.25
T71371	MW-2 (40-42')	<10	<10	<5.0	<5.0	<10	<5.0	<20	<0.25
T71372	MW-2 (50-52')	<10	<10	<5.0	62	<10	<5.0	<20	<0.25
QC	Quality Control	4.8	4.9	4.9	4.9	5.0	0.96	5.0	0.0051
Reporting Limit		10	10	5.0	5.0	10	5.0	20	0.25
RPD		14	12	13	14	14	2	15	2
% Extraction Accuracy		95	81	95	92	94	114	99	104
% Instrument Accuracy		97	98	99	98	99	96	100	104

CHEMIST: As, Se, Cd, Cr, Pb, Ag, Ba: RR Hg: CB
METHODS: EPA SW 846-3051, 6010, 7471.
TOTAL METALS SPIKE: 150 mg/kg As, Se, Cd, Cr, Pb, Ba; 100 mg/kg Ag; 2.5 mg/kg Hg.
TOTAL METALS QC: 5.0 mg/L As, Se, Cd, Cr, Pb, Ba; 1.0 mg/L Ag; 0.005 mg/L Hg.

Director, Dr. Blair Leftwich

4-23-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL CORP.
Attention: Ike Tavarez
1910 N. Big Spring St.
Midland, TX 79705

April 23, 1997
Receiving Date: 04/14/97
Sample Type: Soil
Project No: 787
Project Location: New Mexico

Prep Date: 04/16/97
Analysis Date: 04/17/97
Sampling Date: 04/03,09/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P/
Texaco North Gas Plant,
Lea County, New Mexico

TA#	FIELD CODE	TOTAL Cr (mg/kg)	TOTAL Ba (mg/kg)
T71356	AH-5-1 (0-0.5')	3,800	320
T71357	AH-5-1 (0.5-1.0')	360	250
T71358	AH-5-1 (1.5-2.0')	6.2	26
T71359	AH-5-2 (0-0.5')	4,400	290
T71360	AH-5-3 (0-0.5')	430	92
T71361	AH-5-3 (1.5-2.0')	6.6	21
T71362	AH-5-3 (2.7-3.3')	7.3	<20
T71363	AH-5-4 (0-0.5')	390	150
T71364	AH-5-4 (0.5-1.0')	1,500	230
T71365	AH-5-4 (2.0-2.5')	63	<20
T71366	AH-6-5 (0-0.5')	2,900	330
T71367	AH-6-5 (1.5-2.0')	9.6	<20
QC	Quality Control	4.9	4.9
Reporting Limit		5.0	20
RPD		6	2
% Extraction Accuracy		80	83
% Instrument Accuracy		97	99

METHODS: EPA SW 846-3051, 6010.
CHEMIST: RR
TOTAL Ba SPIKE: 200 mg/kg TOTAL Ba.
TOTAL Ba QC: 5.0 mg/L TOTAL Ba.
TOTAL Cr SPIKE: 200 mg/kg TOTAL Cr.
TOTAL Cr QC: 5.0 mg/L TOTAL Cr.

Director, Dr. Blair Leftwich

4-23-97
DATE

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL CORP.
Attention: Ike Tavarez
1910 N. Big Spring St.
Midland, TX 79705

May 09, 1997
Receiving Date: 04/14/97
Sample Type: Soil
Project No: 787
Project Location: New Mexico

Prep Date: 05/06/97
Analysis Date: 05/06/97
Sampling Date: 04/03,09/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P/
Texaco North Gas Plant,
Lea County, New Mexico

TA#	FIELD CODE	TCLP Cr (mg/L)
	EPA LIMIT =	5.0
T71359	AH-5-2 (0-0.5')	<0.05
QC	Quality Control	0.102
Reporting Limit		0.05
RPD		5
% Extraction Accuracy		120
% Instrument Accuracy		102

METHODS: EPA SW 846-1311, 7191.
CHEMIST: RR
TCLP Cr SPIKE: 0.025 mg/L TCLP Cr.
TCLP Cr QC: 0.100 mg/L TCLP Cr.

Director, Dr. Blair Leftwich

5-9-97
DATE

71356-72

291

Highlander Services Corp.

306 W. Wall • Suite 320 • Midland, TX 79701 • (915)682-4559

Analysis Request and Chain of Custody Record

Project No. 787

Client/Project Texaco E&P / Texaco North Gas Plant, Lea County, New Mexico.

Field Sample No./ Identification		Date and Time	Grab	Comp	Sample Type(Liquid Sludge,Ect.)	Preser-vative	ANALYSIS REQUESTED
AH-5-1 (0-0.5')	71356	4/3/97	✓		Soil	ice	total barium, total chromium.
AH-5-1 (0.5-1.0')	57	4/3/97	✓		↓	↓	total barium, total chromium.
AH-5-1 (1.5'-2.0')	58	4/3/97	✓		↓	↓	total barium, total chromium.
AH-5-2 (0-0.5)	59	4/3/97	✓		↓	↓	total barium, total chromium.
AH-5-3 (0-0.5)	60	4/3/97	✓		↓	↓	total barium, total chromium.
AH-5-3 (1.5-2.0')	61	4/3/97	✓		↓	↓	total barium, total chromium.
AH-~~5-4~~ 5-3 (2.7-3.3')	62	4/3/97	✓		↓	↓	total barium, total chromium.

Samplers: (Print) Ike Tavarez	Relinquished by: (Signature) Robert McNeil	Date: 4/11/97 Time: 3:15 PM	Recieved by: (Signature) Helen Shelton	Date: 4/11/97 Time: 3:15 PM
	Relinquished by: (Signature) Helen Shelton	Date: 4/11/97 Time: 6:30PM	Recieved by: (Signature) [illegible] Hardell	Date: 4/14/97 Time: 10:45A
	Relinquished by: (Signature)	Date: Time:	Data Results To: 1. Ike Tavarez	
Results by: ______	Delivered To: Trace Lab.		2.	
Rush Charges Authorized Yes ___ No ___	REMARKS:			

Please Fill out all copies – Deliverer retains White copy for file – Lab retains Yellow copy & Return Pink copy to Highlander Services Corp. at above address

CH

V-21

T-AAN[illegible] – H[illegible]

10UUR

Highlander Services Corp.

306 W. Wall • Suite 320 • Midland, TX 79701 • (915)682-4559

Analysis Request and Chain of Custody Record

Project No. 787 | Client/Project: Texaco E&P / Texaco North Cass Plant, Lea County, New Mexico.

Field Sample No./ Identification		Date and Time	Grab	Comp	Sample Type(Liquid Sludge,Ect.)	Preservative	ANALYSIS REQUESTED
AH-5-4 (0-0.5')	71363	4/9/97			Soil		total barium, total chromium.
AH-5-4 (0.5-1.0')	64	4/9/97			Soil		total barium, total chromium
AH-5-4 (2.0'-2.5')	65	4/9/97			Soil		total barium, total chromium.
AH-6-5 (0-0.5')	66	4/9/97			Soil		total barium, total chromium.
AH-6-5 (1.5-2.0')	67	4/9/97			Soil.		total barium, total chromium.

Samplers: (Print): IKE Tavarez

Results by: _____

Rush Charges Authorized: Yes ___ No ___

Relinquished by: (Signature) Robert McNeill — Date: 4/11/97 Time: 3:15 PM

Recieved by: (Signature) Helen Shelton — Date: 4/11/97 Time: 3:15 PM

Relinquished by: (Signature) Helen Shelton — Date: 4/11/97 Time: 10:30 PM

Recieved by: (Signature) [signature] — Date: 4/14/97 Time: 10:45 A

Relinquished by: (Signature) — Date: Time:

Data Results to: 1. Joe Tarver 2.

Delivered To: Trace.

REMARKS:

Please Fill out all copies – Deliverer retains White copy for file – Lab retains Yellow copy & Return Pink copy to Highlander Services Corp. at above address

C/I 5 Sandell - HS 104AB

241

Highlander Services Corp.

306 W. Wall • Suite 320 • Midland, TX 79701 • (915)682-4559

Analysis Request and Chain of Custody Record

Project No. 787

Client/Project: Texaco E&P / Texaco North Gas Plant, Lea County, New Mexico.

Field Sample No./Identification		Date and Time	Grab	Comp	Sample Type(Liquid Sludge,Ect.)	Preser-vative	ANALYSIS REQUESTED
							7 45
MW-2 (10-11')	71368	3/31/97	X		Soil	ice	total metals
MW-2 (20-22')	69	3/31/97	X		Soil	ice	total metals
MW-2 (30-32')	70	3/31/97	X		Soil	ice	total metals
MW-2 (40-42')	71	3/31/97	X		Soil	ice	total metals
MW-2 (50-52')	72	3/31/97	X		Soil	ice	total metals

Samplers: (Print) Ike Tavarez

Relinquished by: (Signature) Robert McNeil — Date: 4/11/97 Time: 3:15 PM

Recieved by: (Signature) Helen Shelton — Date: 4/11/97 Time: 3:15 PM

Relinquished by: (Signature) Helen Shelton — Date: 4/11/97 Time: 6:30PM

Recieved by: (Signature) [illegible] — Date: 4/14/97 Time: 10:45A

Relinquished by: (Signature) — Date: — Time:

Data Results To:
1. Ike Tavarez
2.

Results by: ________

Delivered To: Trace. Lab.

Rush Charges Authorized — Yes ____ No ____

REMARKS:

Please Fill out all copies – Deliverer retains White copy for file – Lab retains Yellow copy & Return Pink copy to Highlander Services Corp. at above address

C/T E [illegible] - HS [illegible]

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVIC
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

May 05, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Prep Date: 04/29/97
Analysis Date: 04/29/97
Sampling Date: 04/23/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P, Inc.

FIELD CODE: MW-1
TA #: T72311

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dichlorodifluoromethane	98	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	11	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	33	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

HIGHLANDER ENVIRONMENTAL SERVICES
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
FIELD CODE: MW-1
TA #: T72311

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	75	1
m & p-Xylene	27	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	22	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2

Tentatively Identified Compounds and Estimated concentrations (ug/L)

	RT	CONC.
(1) methyl-cyclopentane	10.49	8
(2) Cyclohexane	11.53	17
(3) methyl-cyclohexane	13.20	29
(4) cis-1,3-dimethyl-cyclohexane	14.64	9
(5) trans-1,2-dimethyl-cyclohexane	15.23	8
(6) Unidentified hydrocarbon	16.19	7
(7) propyl-benzene	19.31	9
(8) 1,2,4-trimethyl-benzene	19.57	10
(9) 1-ethyl-2-methyl-benzene	20.01	12
(10) 1,3,5-trimethyl-benzene	20.30	18

SURROGATES	**% RECOVERY**
Dibromofluoromethane	96
Toluene-d8	101
4-Bromofluorobenzene	98

ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8260.
CHEMIST: RP

Director, Dr. Blair Leftwich

5-5-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

TRACEANALYSIS, INC.

A Laboratory for Advanced Environmental Research and Analysis

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVIC
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

May 05, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Prep Date: 04/29/97
Analysis Date: 04/29/97
Sampling Date: 04/22/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P, Inc.

FIELD CODE: MW-2
TA #: T72312

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

HIGHLANDER ENVIRONMENTAL SERVICES
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
FIELD CODE: MW-2
TA #: T72312

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2

SURROGATES	**% RECOVERY**
Dibromofluoromethane	96
Toluene-d8	102
4-Bromofluorobenzene	95

ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8260.
CHEMIST: RP

Director, Dr. Blair Leftwich

5-5-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

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6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVIC
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

May 05, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Prep Date: 04/29/97
Analysis Date: 04/29/97
Sampling Date: 04/22/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P, Inc.

FIELD CODE: MW-3
TA #: T72313

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dichlorodifluoromethane	6	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

HIGHLANDER ENVIRONMENTAL SERVICES
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
FIELD CODE: MW-3
TA #: T72313

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2

SURROGATES	**% RECOVERY**
Dibromofluoromethane	96
Toluene-d8	102
4-Bromofluorobenzene	96

ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8260.
CHEMIST: RP

Director, Dr. Blair Leftwich

5-5-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

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6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVIC
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

May 05, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Prep Date: 04/29/97
Analysis Date: 04/29/97
Sampling Date: 04/23/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P, Inc.

FIELD CODE: MW-4
TA #: T72314

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dichlorodifluoromethane	8	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

HIGHLANDER ENVIRONMENTAL SERVICES
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
FIELD CODE: MW-4
TA #: T72314

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2

SURROGATES	**% RECOVERY**
Dibromofluoromethane	93
Toluene-d8	102
4-Bromofluorobenzene	97

ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8260.
CHEMIST: RP

Director, Dr. Blair Leftwich

5-5-91
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

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6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVIC
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

May 05, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Prep Date: 04/29/97
Analysis Date: 04/29/97
Sampling Date: 04/22/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P, Inc.

FIELD CODE: MW-5
TA #: T72315

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dichlorodifluoromethane	37	10
Chloromethane	ND	10
Vinyl chloride	ND	10
Bromomethane	ND	50
Chloroethane	ND	10
Trichlorofluoromethane	ND	10
1,1-Dichloroethene	ND	10
Iodomethane	ND	50
Carbon disulfide	ND	10
Methylene chloride	ND	50
trans-1,2-Dichloroethene	ND	10
1,1-Dichloroethane	ND	10
Vinyl acetate	ND	10
2-Butanone	ND	500
Chloroform	ND	10
1,1,1-Trichloroethane	ND	10
1,2-Dichloroethane	ND	10
Benzene	540	10
Carbon Tetrachloride	ND	10
1,2-Dichloropropane	ND	10
Trichloroethene	ND	10
Bromodichloromethane	ND	10
cis-1,3-Dichloropropene	ND	10
4-Methyl-2-pentanone	ND	500
trans-1,3-Dichloropropene	ND	10
Toluene	310	10
1,1,2-Trichloroethane	ND	10
2-Hexanone	ND	500

HIGHLANDER ENVIRONMENTAL SERVICES
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
FIELD CODE: MW-5
TA #: T72315

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dibromochloromethane	ND	10
Tetrachloroethene	ND	10
Chlorobenzene	ND	10
Ethylbenzene	93	10
m & p-Xylene	230	10
Bromoform	ND	10
Styrene	ND	10
o-Xylene	15	10
1,1,2,2-Tetrachloroethane	ND	10
trans 1,4-Dichloro-2-butene	ND	50
cis 1,4-Dichloro-2-butene	ND	50
1,4-Dichlorobenzene	ND	20
1,3-Dichlorobenzene	ND	20
1,2-Dichlorobenzene	ND	20

Tentatively Identified Compounds and Estimated concentrations (ug/L)

	RT	CONC.
(1) Hexane	9.45	54
(2) Cyclohexane	10.48	183
(3) methyl-cyclopentane	11.51	340
(4) cis-1,2-dimethyl-cyclopentane	12.15	62
(5) methyl-cyclohexane	13.19	220
(6) 1-ethyl-2-methyl-benzene	19.42	99
(7) 1,3,5-trimethyl-benzene	20.28	140

SURROGATES	% RECOVERY
Dibromofluoromethane	96
Toluene-d8	101
4-Bromofluorobenzene	96

ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8260.
CHEMIST: RP

Director, Dr. Blair Leftwich

5-5-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVIC
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

May 05, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Prep Date: 04/29/97
Analysis Date: 04/29/97
Sampling Date: 04/22/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P, Inc.

FIELD CODE: MW-6
TA #: T72316

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dichlorodifluoromethane	50	10
Chloromethane	ND	10
Vinyl chloride	ND	10
Bromomethane	ND	50
Chloroethane	ND	10
Trichlorofluoromethane	ND	10
1,1-Dichloroethene	ND	10
Iodomethane	ND	50
Carbon disulfide	ND	10
Methylene chloride	ND	50
trans-1,2-Dichloroethene	ND	10
1,1-Dichloroethane	ND	10
Vinyl acetate	ND	10
2-Butanone	ND	500
Chloroform	ND	10
1,1,1-Trichloroethane	ND	10
1,2-Dichloroethane	ND	10
Benzene	340	10
Carbon Tetrachloride	ND	10
1,2-Dichloropropane	ND	10
Trichloroethene	ND	10
Bromodichloromethane	ND	10
cis-1,3-Dichloropropene	ND	10
4-Methyl-2-pentanone	ND	500
trans-1,3-Dichloropropene	ND	10
Toluene	280	10
1,1,2-Trichloroethane	ND	10
2-Hexanone	ND	500

HIGHLANDER ENVIRONMENTAL SERVICES
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
FIELD CODE: MW-6
TA #: T72316

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dibromochloromethane	ND	10
Tetrachloroethene	ND	10
Chlorobenzene	ND	10
Ethylbenzene	110	10
m & p-Xylene	210	10
Bromoform	ND	10
Styrene	ND	10
o-Xylene	120	10
1,1,2,2-Tetrachloroethane	ND	10
trans 1,4-Dichloro-2-butene	ND	50
cis 1,4-Dichloro-2-butene	ND	50
1,4-Dichlorobenzene	ND	20
1,3-Dichlorobenzene	ND	20
1,2-Dichlorobenzene	ND	20

Tentatively Identified Compounds and Estimated concentrations (ug/L)

	RT	CONC.
(1) methyl-cyclopentane	10.47	190
(2) Cyclohexane	11.50	310
(3) methyl-cyclohexane	13.18	150
(4) 1-ethyl-4-methyl-benzene	19.41	66
(5) 1,3,5-trimethyl-benzene	20.28	120

SURROGATES	**% RECOVERY**
Dibromofluoromethane	93
Toluene-d8	101
4-Bromofluorobenzene	97

ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8260.
CHEMIST: RP

Director, Dr. Blair Leftwich

5-5-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVIC
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

May 05, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Prep Date: 04/29/97
Analysis Date: 04/29/97
Sampling Date: 04/23/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P, Inc.

FIELD CODE: WW-1 (Water Well)
TA #: T72317

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dichlorodifluoromethane	66	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

HIGHLANDER ENVIRONMENTAL SERVICES
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
FIELD CODE: WW-1 (Water Well)
TA #: T72317

8240 Compounds	Concentration (ug/L)	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	1	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2

SURROGATES	**% RECOVERY**
Dibromofluoromethane	92
Toluene-d8	94
4-Bromofluorobenzene	96

ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8260.
CHEMIST: RP

Director, Dr. Blair Leftwich

5-5-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER SERVICES CORP.
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

April 30, 1997
Receiving Date: 04/25/97
Sample Type: Water
Sampling Date: 04/23/97
Sample Condition: I & C
Sample Received by: JH
Client/Project: Texaco E & P, Inc.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Extraction Date: 04/29/97
Analysis Date: 04/29/97

TA #T72311
Field Code: MW-1

EPA 8270 - BNA's (mg/L)	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
N-Nitrosodimethylamine	0.001	ND				
2-Picoline	0.001	ND				
Methyl methanesulfonate	0.001	ND				
Ethyl methanesulfonate	0.001	ND				
Phenol	0.001	ND	77	17	20	96
Aniline	0.005	ND				
bis(2-Chloroethyl)ether	0.005	ND				
2-Chlorophenol	0.005	ND		19	43	
1,3-Dichlorobenzene	0.001	ND				
1,4-Dichlorobenzene	0.001	ND	85	20	44	106
Benzyl alcohol	0.005	ND				
1,2-Dichlorobenzene	0.001	ND				
2-Methylphenol	0.001	ND				
bis(2-chloroisopropyl)ether	0.005	ND				
4-Methylphenol/3-Methylphenol	0.001	ND				
Acetophenone	0.005	0.005				
n-Nitrosodi-n-propylamine	0.001	ND		17	48	
Hexachloroethane	0.001	ND				
Nitrobenzene	0.001	ND				
N-Nitrosopiperidine	0.005	ND				
Isophorone	0.005	ND				
2-Nitrophenol	0.005	ND	80			100
2,4-Dimethylphenol	0.005	ND				
bis(2-Chloroethoxy)methane	0.001	ND				
Benzoic acid	0.01	ND				
2,4-Dichlorophenol	0.005	ND	78			98
1,2,4-Trichlorobenzene	0.001	ND		12	51	
a,a-Dimethylphenethylamine	0.01	ND				
Naphthalene	0.001	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

[redacted] 72311
FIELD CODE: MW-1

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Chloroaniline	0.005	ND				
2,6-Dichlorophenol	0.005	ND				
Hexachlorobutadiene	0.001	ND	81			101
N-Nitroso-di-n-butylamine	0.005	ND				
4-Chloro-3-methylphenol	0.005	ND	75	8	66	94
2-Methylnaphthalene	0.001	ND				
1,2,4,5-Tetrachlorobenzene	0.001	ND				
Hexachlorocyclopentadiene	0.005	ND				
2,4,6-Trichlorophenol	0.005	ND	80			100
2,4,5-Trichlorophenol	0.005	ND				
2-Chloronaphthalene	0.001	ND				
1-Chloronaphthalene	0.001	ND				
2-Nitroaniline	0.005	ND				
Dimethylphthalate	0.001	ND				
Acenaphthylene	0.001	ND				
2,6-Dinitrotoluene	0.001	ND				
3-Nitroaniline	0.005	ND				
[redacted]naphthene	0.001	ND	81	9	73	101
2,4-Dinitrophenol	0.025	ND				
Dibenzofuran	0.005	ND				
Pentachlorobenzene	0.001	ND				
4-Nitrophenol	0.005	ND		9	44	
1-Napthylamine	0.005	ND				
2,4-Dinitrotoluene	0.001	ND		0	110	
2-Napthylamine	0.005	ND				
2,3,4,6-Tetrachlorophenol	0.005	ND				
Fluorene	0.001	ND				
Diethylphthalate	0.001	ND				
4-Chlorophenyl-phenylether	0.001	ND				
4-Nitroaniline	0.005	ND				
4,6-Dinitro-2-methylphenol	0.005	ND				
n-Nitrosodiphenylamine & Diphenylamine	0.001	ND	79			99
Diphenylhydrazine	0.005	ND				

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

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HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
[redacted]# T72311

FIELD CODE: MW-1

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Bromophenyl-phenylether	0.001	ND				
Phenacetin	0.005	ND				
Hexachlorobenzene	0.001	ND				
4-Aminobiphenyl	0.005	ND				
Pentachlorophenol	0.005	ND	82	2	96	103
Pentachloronitrobenzene	0.005	ND				
Pronamide	0.001	ND				
Phenanthrene	0.001	ND				
Anthracene	0.001	ND				
Di-n-butylphthalate	0.001	ND				
Fluoranthene	0.001	ND	80			100
Benzidine	0.01	ND				
Pyrene	0.001	ND		9	106	
[redacted]imethylaminoazobenzene	0.001	ND				
Butylbenzylphthalate	0.001	ND				
Benzo[a]anthracene	0.001	ND				
3,3-Dichlorobenzidine	0.001	ND				
Chrysene	0.001	ND				
bis(2-Ethylhexyl)phthalate	0.005	ND				
Di-n-octlphthalate	0.001	ND	78			98
Benzo[b]fluoranthene	0.001	ND				
7,12-Dimethylbenz(a)anthracene	0.001	ND				
Benzo[k]fluoranthene	0.001	ND				
Benzo[a]pyrene	0.001	ND	81			101
3-Methylcholanthrene	0.001	ND				
Dibenzo(a,j)acridine	0.001	ND				
Indeno[1,2,3-cd]pyrene	0.001	ND				
Dibenz[a,h]anthracene	0.001	ND				
Benzo[g,h,i]perylene	0.001	ND				

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

A Laboratory for Advanced Environmental Research and Analysis

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

TA# 72311
FIELD CODE: MW-1

TENTATIVELY IDENTIFIED COMPOUNDS AND ESTIMATED CONCENTRATIONS (mg/L)

	EST. CONC.	RT
(1) 2-methylbunzoic acid	0.021	6.91
(2) 1,2-dimethylbenzene	0.014	4.12
(3) 1,2,3-trimethylbenzene	0.005	4.93
(4) 1,2,4-trimethylbenzene	0.008	5.17
(5) alpha-methylbenzene methanol	0.008	5.45
(6) Unidentified compound	0.010	6.02
(7) 2-fluoro-6-nitrophenol	0.005	6.16
(8) 2,6-dimethylbenzoic acid	0.003	7.47
(9) Unidentified Compound	0.006	7.69
(10) 1-isocyanato-3-methylbenzene	0.005	9.49

ND = NOT DETECTED

SURROGATES	% RECOVERY
2-Fluorophenol SURR	25
Phenol-d6 SURR	19
Nitrobenzene-d5 SURR	50
2-Fluorobiphenyl SURR	50
2,4,6-Tribromophenol SURR	72
erphenyl-d14 SURR	91

METHOD: EPA SW 846-8270, 3510.
CHEMIST: HC/CC

Director, Dr. Blair Leftwich

5-8-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

TRACEANALYSIS, INC.

A Laboratory for Advanced Environmental Research and Analysis

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER SERVICES CORP.
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

April 30, 1997
Receiving Date: 04/25/97
Sample Type: Water
Sampling Date: 04/22/97
Sample Condition: I & C
Sample Received by: JH
Client/Project: Texaco E & P, Inc.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Extraction Date: 04/29/97
Analysis Date: 04/29/97

TA #T72312
Field Code: MW-2

EPA 8270 - BNA's (mg/L)	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
N-Nitrosodimethylamine	0.001	ND				
2-Picoline	0.001	ND				
Methyl methanesulfonate	0.001	ND				
Ethyl methanesulfonate	0.001	ND				
Phenol	0.001	ND	77	17	20	96
Aniline	0.005	ND				
bis(2-Chloroethyl)ether	0.005	ND				
2-Chlorophenol	0.005	ND		19	43	
1,3-Dichlorobenzene	0.001	ND				
1,4-Dichlorobenzene	0.001	ND	85	20	44	106
Benzyl alcohol	0.005	ND				
1,2-Dichlorobenzene	0.001	ND				
2-Methylphenol	0.001	ND				
bis(2-chloroisopropyl)ether	0.005	ND				
4-Methylphenol/3-Methylphenol	0.001	ND				
Acetophenone	0.005	ND				
n-Nitrosodi-n-propylamine	0.001	ND		17	48	
Hexachloroethane	0.001	ND				
Nitrobenzene	0.001	ND				
N-Nitrosopiperidine	0.005	ND				
Isophorone	0.005	ND				
2-Nitrophenol	0.005	ND	80			100
2,4-Dimethylphenol	0.005	ND				
bis(2-Chloroethoxy)methane	0.001	ND				
Benzoic acid	0.01	ND				
2,4-Dichlorophenol	0.005	ND	78			98
1,2,4-Trichlorobenzene	0.001	ND		12	51	
a,a-Dimethylphenethylamine	0.01	ND				
Naphthalene	0.001	ND				

Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

[redacted] 72312
FIELD CODE: MW-2

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Chloroaniline	0.005	ND				
2,6-Dichlorophenol	0.005	ND				
Hexachlorobutadiene	0.001	ND	81			101
N-Nitroso-di-n-butylamine	0.005	ND				
4-Chloro-3-methylphenol	0.005	ND	75	8	66	94
2-Methylnaphthalene	0.001	ND				
1,2,4,5-Tetrachlorobenzene	0.001	ND				
Hexachlorocyclopentadiene	0.005	ND				
2,4,6-Trichlorophenol	0.005	ND	80			100
2,4,5-Trichlorophenol	0.005	ND				
2-Chloronaphthalene	0.001	ND				
1-Chloronaphthalene	0.001	ND				
2-Nitroaniline	0.005	ND				
Dimethylphthalate	0.001	ND				
Acenaphthylene	0.001	ND				
2,6-Dinitrotoluene	0.001	ND				
3-Nitroaniline	0.005	ND				
[redacted]aphthene	0.001	ND	81	9	73	101
2,4-Dinitrophenol	0.025	ND				
Dibenzofuran	0.005	ND				
Pentachlorobenzene	0.001	ND				
4-Nitrophenol	0.005	ND		9	44	
1-Napthylamine	0.005	ND				
2,4-Dinitrotoluene	0.001	ND		0	110	
2-Napthylamine	0.005	ND				
2,3,4,6-Tetrachlorophenol	0.005	ND				
Fluorene	0.001	ND				
Diethylphthalate	0.001	ND				
4-Chlorophenyl-phenylether	0.001	ND				
4-Nitroaniline	0.005	ND				
4,6-Dinitro-2-methylphenol	0.005	ND				
n-Nitrosodiphenylamine & Diphenylamine	0.001	ND	79			99
Diphenylhydrazine	0.005	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
T72312

FIELD CODE: MW-2

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Bromophenyl-phenylether	0.001	ND				
Phenacetin	0.005	ND				
Hexachlorobenzene	0.001	ND				
4-Aminobiphenyl	0.005	ND				
Pentachlorophenol	0.005	ND	82	2	96	103
Pentachloronitrobenzene	0.005	ND				
Pronamide	0.001	ND				
Phenanthrene	0.001	ND				
Anthracene	0.001	ND				
Di-n-butylphthalate	0.001	ND				
Fluoranthene	0.001	ND	80			100
Benzidine	0.01	ND				
Pyrene	0.001	ND		9	106	
[redacted]methylaminoazobenzene	0.001	ND				
Butylbenzylphthalate	0.001	ND				
Benzo[a]anthracene	0.001	ND				
3,3-Dichlorobenzidine	0.001	ND				
Chrysene	0.001	ND				
bis(2-Ethylhexyl)phthalate	0.005	ND				
Di-n-octlphthalate	0.001	ND	78			98
Benzo[b]fluoranthene	0.001	ND				
7,12-Dimethylbenz(a)anthracene	0.001	ND				
Benzo[k]fluoranthene	0.001	ND				
Benzo[a]pyrene	0.001	ND	81			101
3-Methylcholanthrene	0.001	ND				
Dibenzo(a,j)acridine	0.001	ND				
Indeno[1,2,3-cd]pyrene	0.001	ND				
Dibenz[a,h]anthracene	0.001	ND				
Benzo[g,h,i]perylene	0.001	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

TA# 72312
FIELD CODE: MW-2

ND = NOT DETECTED

SURROGATES	% RECOVERY
2-Fluorophenol SURR	34
Phenol-d6 SURR	25
Nitrobenzene-d5 SURR	62
2-Fluorobiphenyl SURR	69
2,4,6-Tribromophenol SURR	72
Terphenyl-d14 SURR	107

METHOD: EPA SW 846-8270, 3510.
CHEMIST: HC/CC

Director, Dr. Blair Leftwich

5-8-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER SERVICES CORP.
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

April 30, 1997
Receiving Date: 04/25/97
Sample Type: Water
Sampling Date: 04/22/97
Sample Condition: I & C
Sample Received by: JH
Client/Project: Texaco E & P, Inc.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Extraction Date: 04/29/97
Analysis Date: 04/29/97

TA #T72313
Field Code: MW-3

EPA 8270 - BNA's (mg/L)	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
N-Nitrosodimethylamine	0.001	ND				
2-Picoline	0.001	ND				
Methyl methanesulfonate	0.001	ND				
Ethyl methanesulfonate	0.001	ND				
Phenol	0.001	ND	77	17	20	96
Aniline	0.005	ND				
bis(2-Chloroethyl)ether	0.005	ND				
2-Chlorophenol	0.005	ND		19	43	
1,3-Dichlorobenzene	0.001	ND				
1,4-Dichlorobenzene	0.001	ND	85	20	44	106
Benzyl alcohol	0.005	ND				
1,2-Dichlorobenzene	0.001	ND				
2-Methylphenol	0.001	ND				
bis(2-chloroisopropyl)ether	0.005	ND				
4-Methylphenol/3-Methylphenol	0.001	ND				
Acetophenone	0.005	ND				
n-Nitrosodi-n-propylamine	0.001	ND		17	48	
Hexachloroethane	0.001	ND				
Nitrobenzene	0.001	ND				
N-Nitrosopiperidine	0.005	ND				
Isophorone	0.005	ND				
2-Nitrophenol	0.005	ND	80			100
2,4-Dimethylphenol	0.005	ND				
bis(2-Chloroethoxy)methane	0.001	ND				
Benzoic acid	0.01	ND				
2,4-Dichlorophenol	0.005	ND	78			98
1,2,4-Trichlorobenzene	0.001	ND		12	51	
a,a-Dimethylphenethylamine	0.01	ND				
Naphthalene	0.001	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

 # 72313
FIELD CODE: MW-3

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Chloroaniline	0.005	ND				
2,6-Dichlorophenol	0.005	ND				
Hexachlorobutadiene	0.001	ND	81			101
N-Nitroso-di-n-butylamine	0.005	ND				
4-Chloro-3-methylphenol	0.005	ND	75	8	66	94
2-Methylnaphthalene	0.001	ND				
1,2,4,5-Tetrachlorobenzene	0.001	ND				
Hexachlorocyclopentadiene	0.005	ND				
2,4,6-Trichlorophenol	0.005	ND	80			100
2,4,5-Trichlorophenol	0.005	ND				
2-Chloronaphthalene	0.001	ND				
1-Chloronaphthalene	0.001	ND				
2-Nitroaniline	0.005	ND				
Dimethylphthalate	0.001	ND				
Acenaphthylene	0.001	ND				
2,6-Dinitrotoluene	0.001	ND				
3-Nitroaniline	0.005	ND				
[illegible]aphthene	0.001	ND	81	9	73	101
2,4-Dinitrophenol	0.025	ND				
Dibenzofuran	0.005	ND				
Pentachlorobenzene	0.001	ND				
4-Nitrophenol	0.005	ND		9	44	
1-Napthylamine	0.005	ND				
2,4-Dinitrotoluene	0.001	ND		0	110	
2-Napthylamine	0.005	ND				
2,3,4,6-Tetrachlorophenol	0.005	ND				
Fluorene	0.001	ND				
Diethylphthalate	0.001	ND				
4-Chlorophenyl-phenylether	0.001	ND				
4-Nitroaniline	0.005	ND				
4,6-Dinitro-2-methylphenol	0.005	ND				
n-Nitrosodiphenylamine & Diphenylamine	0.001	ND	79			99
Diphenylhydrazine	0.005	ND				

FIELD CODE: MW-3

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Bromophenyl-phenylether	0.001	ND				
Phenacetin	0.005	ND				
Hexachlorobenzene	0.001	ND				
4-Aminobiphenyl	0.005	ND				
Pentachlorophenol	0.005	ND	82	2	96	103
Pentachloronitrobenzene	0.005	ND				
Pronamide	0.001	ND				
Phenanthrene	0.001	ND				
Anthracene	0.001	ND				
Di-n-butylphthalate	0.001	ND				
Fluoranthene	0.001	ND	80			100
Benzidine	0.01	ND				
Pyrene	0.001	ND		9	106	
[redacted]methylaminoazobenzene	0.001	ND				
Butylbenzylphthalate	0.001	ND				
Benzo[a]anthracene	0.001	ND				
3,3-Dichlorobenzidine	0.001	ND				
Chrysene	0.001	ND				
bis(2-Ethylhexyl)phthalate	0.005	ND				
Di-n-octlphthalate	0.001	ND	78			98
Benzo[b]fluoranthene	0.001	ND				
7,12-Dimethylbenz(a)anthracene	0.001	ND				
Benzo[k]fluoranthene	0.001	ND				
Benzo[a]pyrene	0.001	ND	81			101
3-Methylcholanthrene	0.001	ND				
Dibenzo(a,j)acridine	0.001	ND				
Indeno[1,2,3-cd]pyrene	0.001	ND				
Dibenz[a,h]anthracene	0.001	ND				
Benzo[g,h,i]perylene	0.001	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

TA# 72313
FIELD CODE: MW-3

ND = NOT DETECTED

SURROGATES	% RECOVERY
2-Fluorophenol SURR	30
Phenol-d6 SURR	22
Nitrobenzene-d5 SURR	55
2-Fluorobiphenyl SURR	61
2,4,6-Tribromophenol SURR	67
Terphenyl-d14 SURR	110

METHOD: EPA SW 846-8270, 3510.
CHEMIST: HC/CC

Director, Dr. Blair Leftwich

5-8-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER SERVICES CORP.
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

April 30, 1997
Receiving Date: 04/25/97
Sample Type: Water
Sampling Date: 04/23/97
Sample Condition: I & C
Sample Received by: JH
Client/Project: Texaco E & P, Inc.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Extraction Date: 04/29/97
Analysis Date: 04/29/97

TA #T72314
Field Code: MW-4

EPA 8270 - BNA's (mg/L)	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
N-Nitrosodimethylamine	0.001	ND				
2-Picoline	0.001	ND				
Methyl methanesulfonate	0.001	ND				
Ethyl methanesulfonate	0.001	ND				
Phenol	0.001	ND	77	17	20	96
Aniline	0.005	ND				
bis(2-Chloroethyl)ether	0.005	ND				
2-Chlorophenol	0.005	ND		19	43	
1,3-Dichlorobenzene	0.001	ND				
1,4-Dichlorobenzene	0.001	ND	85	20	44	106
Benzyl alcohol	0.005	ND				
1,2-Dichlorobenzene	0.001	ND				
Methylphenol	0.001	ND				
bis(2-chloroisopropyl)ether	0.005	ND				
4-Methylphenol/3-Methylphenol	0.001	ND				
Acetophenone	0.005	ND				
n-Nitrosodi-n-propylamine	0.001	ND		17	48	
Hexachloroethane	0.001	ND				
Nitrobenzene	0.001	ND				
N-Nitrosopiperidine	0.005	ND				
Isophorone	0.005	ND				
2-Nitrophenol	0.005	ND	80			100
2,4-Dimethylphenol	0.005	ND				
bis(2-Chloroethoxy)methane	0.001	ND				
Benzoic acid	0.01	ND				
2,4-Dichlorophenol	0.005	ND	78			98
1,2,4-Trichlorobenzene	0.001	ND		12	51	
a,a-Dimethylphenethylamine	0.01	ND				
Naphthalene	0.001	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

[redacted] 72314
FIELD CODE: MW-4

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Chloroaniline	0.005	ND				
2,6-Dichlorophenol	0.005	ND				
Hexachlorobutadiene	0.001	ND	81			101
N-Nitroso-di-n-butylamine	0.005	ND				
4-Chloro-3-methylphenol	0.005	ND	75	8	66	94
2-Methylnaphthalene	0.001	ND				
1,2,4,5-Tetrachlorobenzene	0.001	ND				
Hexachlorocyclopentadiene	0.005	ND				
2,4,6-Trichlorophenol	0.005	ND	80			100
2,4,5-Trichlorophenol	0.005	ND				
2-Chloronaphthalene	0.001	ND				
1-Chloronaphthalene	0.001	ND				
2-Nitroaniline	0.005	ND				
Dimethylphthalate	0.001	ND				
Acenaphthylene	0.001	ND				
2,6-Dinitrotoluene	0.001	ND				
3-Nitroaniline	0.005	ND				
[redacted]aphthene	0.001	ND	81	9	73	101
2,4-Dinitrophenol	0.025	ND				
Dibenzofuran	0.005	ND				
Pentachlorobenzene	0.001	ND				
4-Nitrophenol	0.005	ND		9	44	
1-Napthylamine	0.005	ND				
2,4-Dinitrotoluene	0.001	ND		0	110	
2-Napthylamine	0.005	ND				
2,3,4,6-Tetrachlorophenol	0.005	ND				
Fluorene	0.001	ND				
Diethylphthalate	0.001	ND				
4-Chlorophenyl-phenylether	0.001	ND				
4-Nitroaniline	0.005	ND				
4,6-Dinitro-2-methylphenol	0.005	ND				
n-Nitrosodiphenylamine & Diphenylamine	0.001	ND	79			99
Diphenylhydrazine	0.005	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
[redacted]# T72314

FIELD CODE: MW-4

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Bromophenyl-phenylether	0.001	ND				
Phenacetin	0.005	ND				
Hexachlorobenzene	0.001	ND				
4-Aminobiphenyl	0.005	ND				
Pentachlorophenol	0.005	ND	82	2	96	103
Pentachloronitrobenzene	0.005	ND				
Pronamide	0.001	ND				
Phenanthrene	0.001	ND				
Anthracene	0.001	ND				
Di-n-butylphthalate	0.001	ND				
Fluoranthene	0.001	ND	80			100
Benzidine	0.01	ND				
Pyrene	0.001	ND		9	106	
[redacted]methylaminoazobenzene	0.001	ND				
Butylbenzylphthalate	0.001	ND				
Benzo[a]anthracene	0.001	ND				
3,3-Dichlorobenzidine	0.001	ND				
Chrysene	0.001	ND				
bis(2-Ethylhexyl)phthalate	0.005	ND				
Di-n-octlphthalate	0.001	ND	78			98
Benzo[b]fluoranthene	0.001	ND				
7,12-Dimethylbenz(a)anthracene	0.001	ND				
Benzo[k]fluoranthene	0.001	ND				
Benzo[a]pyrene	0.001	ND	81			101
3-Methylcholanthrene	0.001	ND				
Dibenzo(a,j)acridine	0.001	ND				
Indeno[1,2,3-cd]pyrene	0.001	ND				
Dibenz[a,h]anthracene	0.001	ND				
Benzo[g,h,i]perylene	0.001	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

TA# 72314
FIELD CODE: MW-4

ND = NOT DETECTED

SURROGATES	% RECOVERY
2-Fluorophenol SURR	32
Phenol-d6 SURR	23
Nitrobenzene-d5 SURR	57
2-Fluorobiphenyl SURR	61
2,4,6-Tribromophenol SURR	73
Terphenyl-d14 SURR	109

METHOD: EPA SW 846-8270, 3510.
CHEMIST: HC/CC

Director, Dr. Blair Leftwich

5-8-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER SERVICES CORP.
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

April 30, 1997
Receiving Date: 04/25/97
Sample Type: Water
Sampling Date: 04/22/97
Sample Condition: I & C
Sample Received by: JH
Client/Project: Texaco E & P, Inc.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Extraction Date: 04/29/97
Analysis Date: 04/29/97

TA #T72315
Field Code: MW-5

EPA 8270 - BNA's (mg/L)	Reporting Limit*	Concentration (mg/L)	QC	RPD	%EA	%IA
N-Nitrosodimethylamine	0.01	ND				
2-Picoline	0.01	ND				
Methyl methanesulfonate	0.01	ND				
Ethyl methanesulfonate	0.01	ND				
Phenol	0.01	ND	77	17	20	96
Aniline	0.05	ND				
bis(2-Chloroethyl)ether	0.05	ND				
2-Chlorophenol	0.05	ND		19	43	
1,3-Dichlorobenzene	0.01	ND				
1,4-Dichlorobenzene	0.01	ND	85	20	44	106
Benzyl alcohol	0.05	ND				
1,2-Dichlorobenzene	0.01	ND				
2-Methylphenol	0.01	ND				
bis(2-chloroisopropyl)ether	0.05	ND				
4-Methylphenol/3-Methylphenol	0.01	ND				
Acetophenone	0.05	ND				
n-Nitrosodi-n-propylamine	0.01	ND		17	48	
Hexachloroethane	0.01	ND				
Nitrobenzene	0.01	ND				
N-Nitrosopiperidine	0.05	ND				
Isophorone	0.05	ND				
2-Nitrophenol	0.05	ND	80			100
2,4-Dimethylphenol	0.05	ND				
bis(2-Chloroethoxy)methane	0.01	ND				
Benzoic acid	0.1	ND				
2,4-Dichlorophenol	0.05	ND	78			98
1,2,4-Trichlorobenzene	0.01	ND		12	51	
a,a-Dimethylphenethylamine	0.1	ND				
Naphthalene	0.01	0.12				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

72315
FIELD CODE: MW-5

EPA 8270 - BNA's	Reporting Limit*	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Chloroaniline	0.05	ND				
2,6-Dichlorophenol	0.05	ND				
Hexachlorobutadiene	0.01	ND	81			101
N-Nitroso-di-n-butylamine	0.05	ND				
4-Chloro-3-methylphenol	0.05	ND	75	8	66	94
2-Methylnaphthalene	0.01	0.022				
1,2,4,5-Tetrachlorobenzene	0.01	ND				
Hexachlorocyclopentadiene	0.05	ND				
2,4,6-Trichlorophenol	0.05	ND	80			100
2,4,5-Trichlorophenol	0.05	ND				
2-Chloronaphthalene	0.01	ND				
1-Chloronaphthalene	0.01	ND				
2-Nitroaniline	0.05	ND				
Dimethylphthalate	0.01	ND				
Acenaphthylene	0.01	ND				
2,6-Dinitrotoluene	0.01	ND				
3-Nitroaniline	0.05	ND				
[illegible]aphthene	0.01	ND	81	9	73	101
2,4-Dinitrophenol	0.25	ND				
Dibenzofuran	0.05	ND				
Pentachlorobenzene	0.01	ND				
4-Nitrophenol	0.05	ND		9	44	
1-Napthylamine	0.05	ND				
2,4-Dinitrotoluene	0.01	ND		0	110	
2-Napthylamine	0.05	ND				
2,3,4,6-Tetrachlorophenol	0.05	ND				
Fluorene	0.01	ND				
Diethylphthalate	0.01	ND				
4-Chlorophenyl-phenylether	0.01	ND				
4-Nitroaniline	0.05	ND				
4,6-Dinitro-2-methylphenol	0.05	ND				
n-Nitrosodiphenylamine & Diphenylamine	0.01	ND	79			99
Diphenylhydrazine	0.05	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
[redacted]# T72315

FIELD CODE: MW-5

EPA 8270 - BNA's	Reporting Limit*	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Bromophenyl-phenylether	0.01	ND				
Phenacetin	0.05	ND				
Hexachlorobenzene	0.01	ND				
4-Aminobiphenyl	0.05	ND				
Pentachlorophenol	0.05	ND	82	2	96	103
Pentachloronitrobenzene	0.05	ND				
Pronamide	0.01	ND				
Phenanthrene	0.01	ND				
Anthracene	0.01	ND				
Di-n-butylphthalate	0.01	ND				
Fluoranthene	0.01	ND	80			100
Benzidine	0.1	ND				
Pyrene	0.01	ND		9	106	
[redacted]methylaminoazobenzene	0.01	ND				
Butylbenzylphthalate	0.01	ND				
Benzo[a]anthracene	0.01	ND				
3,3-Dichlorobenzidine	0.01	ND				
Chrysene	0.01	ND				
bis(2-Ethylhexyl)phthalate	0.05	ND				
Di-n-octlphthalate	0.01	ND	78			98
Benzo[b]fluoranthene	0.01	ND				
7,12-Dimethylbenz(a)anthracene	0.01	ND				
Benzo[k]fluoranthene	0.01	ND				
Benzo[a]pyrene	0.01	ND	81			101
3-Methylcholanthrene	0.01	ND				
Dibenzo(a,j)acridine	0.01	ND				
Indeno[1,2,3-cd]pyrene	0.01	ND				
Dibenz[a,h]anthracene	0.01	ND				
Benzo[g,h,i]perylene	0.01	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

LA# 72315
FIELD CODE: MW-5

TENTATIVELY IDENTIFIED COMPOUNDS AND ESTIMATED CONCENTRATIONS (mg/L)

	EST. CONC.	RT
(1) Toluene	0.090	2.94
(2) p-Xylene	0.065	3.90
(3) 1,2-dimethylbenzene	0.089	4.11
(4) 1-ethyl-3-methylbenzene	0.034	4.68
(5) 1,2,3-trimethylbenzene	0.072	4.93
(6) 1,2,4-trimethylbenzene	0.065	5.17
(7) 1-methylnaphthalene	0.025	7.56
(8) Dodecane	0.012	8.09
(9) 1-(3-methylphenyl)ethanone	0.013	6.32
(10) 2,7-dimethylnaphthalene	0.013	8.53

ND = NOT DETECTED

SURROGATES	% RECOVERY
2-Fluorophenol SURR	78
Phenol-d6 SURR	88
Nitrobenzene-d5 SURR	82
2-Fluorobiphenyl SURR	42
2,4,6-Tribromophenol SURR	94
Terphenyl-d14 SURR	104

***NOTE: Elevated reporting limits due to sample matrix interference.**

METHOD: EPA SW 846-8270, 3510.
CHEMIST: HC/CC

Director, Dr. Blair Leftwich

5-8-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER SERVICES CORP.
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

April 30, 1997
Receiving Date: 04/25/97
Sample Type: Water
Sampling Date: 04/22/97
Sample Condition: I & C
Sample Received by: JH
Client/Project: Texaco E & P, Inc.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Extraction Date: 04/29/97
Analysis Date: 04/29/97

TA #T72316
Field Code: MW-6

EPA 8270 - BNA's (mg/L)	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
N-Nitrosodimethylamine	0.001	ND				
2-Picoline	0.001	ND				
Methyl methanesulfonate	0.001	ND				
Ethyl methanesulfonate	0.001	ND				
Phenol	0.001	ND	77	17	20	96
Aniline	0.005	ND				
bis(2-Chloroethyl)ether	0.005	ND				
2-Chlorophenol	0.005	ND		19	43	
1,3-Dichlorobenzene	0.001	ND				
1,4-Dichlorobenzene	0.001	ND	85	20	44	106
Benzyl alcohol	0.005	ND				
1,2-Dichlorobenzene	0.001	ND				
2-Methylphenol	0.001	0.004				
bis(2-chloroisopropyl)ether	0.005	ND				
4-Methylphenol/3-Methylphenol	0.001	0.002				
Acetophenone	0.005	ND				
n-Nitrosodi-n-propylamine	0.001	ND		17	48	
Hexachloroethane	0.001	ND				
Nitrobenzene	0.001	ND				
N-Nitrosopiperidine	0.005	ND				
Isophorone	0.005	ND				
2-Nitrophenol	0.005	ND	80			100
2,4-Dimethylphenol	0.005	ND				
bis(2-Chloroethoxy)methane	0.001	ND				
Benzoic acid	0.01	ND				
2,4-Dichlorophenol	0.005	ND	78			98
1,2,4-Trichlorobenzene	0.001	ND		12	51	
a,a-Dimethylphenethylamine	0.01	ND				
Naphthalene	0.001	0.016				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

72316
FIELD CODE: MW-6

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Chloroaniline	0.005	ND				
2,6-Dichlorophenol	0.005	ND				
Hexachlorobutadiene	0.001	ND	81			101
N-Nitroso-di-n-butylamine	0.005	ND				
4-Chloro-3-methylphenol	0.005	ND	75	8	66	94
2-Methylnaphthalene	0.001	0.026				
1,2,4,5-Tetrachlorobenzene	0.001	ND				
Hexachlorocyclopentadiene	0.005	ND				
2,4,6-Trichlorophenol	0.005	ND	80			100
2,4,5-Trichlorophenol	0.005	ND				
2-Chloronaphthalene	0.001	ND				
1-Chloronaphthalene	0.001	ND				
2-Nitroaniline	0.005	ND				
Dimethylphthalate	0.001	ND				
Acenaphthylene	0.001	ND				
2,6-Dinitrotoluene	0.001	ND				
3-Nitroaniline	0.005	ND				
Acenaphthene	0.001	ND	81	9	73	101
2,4-Dinitrophenol	0.025	ND				
Dibenzofuran	0.005	ND				
Pentachlorobenzene	0.001	ND				
4-Nitrophenol	0.005	ND		9	44	
1-Napthylamine	0.005	ND				
2,4-Dinitrotoluene	0.001	ND		0	110	
2-Napthylamine	0.005	ND				
2,3,4,6-Tetrachlorophenol	0.005	ND				
Fluorene	0.001	0.002				
Diethylphthalate	0.001	ND				
4-Chlorophenyl-phenylether	0.001	ND				
4-Nitroaniline	0.005	ND				
4,6-Dinitro-2-methylphenol	0.005	ND				
n-Nitrosodiphenylamine & Diphenylamine	0.001	ND	79			99
Diphenylhydrazine	0.005	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

[redacted]# T72316

FIELD CODE: MW-6

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Bromophenyl-phenylether	0.001	ND				
Phenacetin	0.005	ND				
Hexachlorobenzene	0.001	ND				
4-Aminobiphenyl	0.005	ND				
Pentachlorophenol	0.005	ND	82	2	96	103
Pentachloronitrobenzene	0.005	ND				
Pronamide	0.001	ND				
Phenanthrene	0.001	ND				
Anthracene	0.001	0.002				
Di-n-butylphthalate	0.001	ND				
Fluoranthene	0.001	ND	80			100
Benzidine	0.01	ND				
Pyrene	0.001	ND		9	106	
[redacted]imethylaminoazobenzene	0.001	ND				
Butylbenzylphthalate	0.001	ND				
Benzo[a]anthracene	0.001	ND				
3,3-Dichlorobenzidine	0.001	ND				
Chrysene	0.001	ND				
bis(2-Ethylhexyl)phthalate	0.005	ND				
Di-n-octlphthalate	0.001	ND	78			98
Benzo[b]fluoranthene	0.001	ND				
7,12-Dimethylbenz(a)anthracene	0.001	ND				
Benzo[k]fluoranthene	0.001	ND				
Benzo[a]pyrene	0.001	ND	81			101
3-Methylcholanthrene	0.001	ND				
Dibenzo(a,j)acridine	0.001	ND				
Indeno[1,2,3-cd]pyrene	0.001	ND				
Dibenz[a,h]anthracene	0.001	ND				
Benzo[g,h,i]perylene	0.001	ND				

Project No: 787

Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Client/Project: Texaco E & P, Inc.

TA# 72316

FIELD CODE: MW-6

TENTATIVELY IDENTIFIED COMPOUNDS AND ESTIMATED CONCENTRATIONS (mg/L)

	EST. CONC.	RT
(1) Toluene	0.083	2.95
(2) 1,3-dimethylbenzene	0.078	4.11
(3) 1-ethyl-4-methylbenzene	0.036	4.67
(4) p-Xylene	0.068	3.91
(5) 1-ethyl-2-methylbenzene	0.038	4.83
(6) 1,3,5-trimethylbenzene	0.025	4.73
(7) 1,2,3-trimethylbenzene	0.051	4.94
(8) 1,2,4-trimethylbenzene	0.037	5.17
(9) 1-methylnaphthalene	0.017	7.56
(10) 1,2-dimethylnaphthalene	0.043	8.53

ND = NOT DETECTED

SURROGATES	% RECOVERY
2-Fluorophenol SURR	28
Phenol-d6 SURR	22
Nitrobenzene-d5 SURR	57
2-Fluorobiphenyl SURR	61
2,4,6-Tribromophenol SURR	95
erphenyl-d14 SURR	107

METHOD: EPA SW 846-8270, 3510.

CHEMIST: HC/CC

Director, Dr. Blair Leftwich

5-8-97

Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER SERVICES CORP.
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

April 30, 1997
Receiving Date: 04/25/97
Sample Type: Water
Sampling Date: 04/23/97
Sample Condition: I & C
Sample Received by: JH
Client/Project: Texaco E & P, Inc.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Extraction Date: 04/29/97
Analysis Date: 04/29/97

TA #T72317
Field Code: WW-1 (Water Well)

EPA 8270 - BNA's (mg/L)	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
N-Nitrosodimethylamine	0.001	ND				
2-Picoline	0.001	ND				
Methyl methanesulfonate	0.001	ND				
Ethyl methanesulfonate	0.001	ND				
Phenol	0.001	ND	77	17	20	96
Aniline	0.005	ND				
bis(2-Chloroethyl)ether	0.005	ND				
2-Chlorophenol	0.005	ND		19	43	
1,3-Dichlorobenzene	0.001	ND				
1,4-Dichlorobenzene	0.001	ND	85	20	44	106
Benzyl alcohol	0.005	ND				
1,2-Dichlorobenzene	0.001	ND				
2-Methylphenol	0.001	ND				
bis(2-chloroisopropyl)ether	0.005	ND				
4-Methylphenol/3-Methylphenol	0.001	ND				
Acetophenone	0.005	ND				
n-Nitrosodi-n-propylamine	0.001	ND		17	48	
Hexachloroethane	0.001	ND				
Nitrobenzene	0.001	ND				
N-Nitrosopiperidine	0.005	ND				
Isophorone	0.005	ND				
2-Nitrophenol	0.005	ND	80			100
2,4-Dimethylphenol	0.005	ND				
bis(2-Chloroethoxy)methane	0.001	ND				
Benzoic acid	0.01	ND				
2,4-Dichlorophenol	0.005	ND	78			98
1,2,4-Trichlorobenzene	0.001	ND		12	51	
a,a-Dimethylphenethylamine	0.01	ND				
Naphthalene	0.001	ND				

Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.

72317
FIELD CODE: WW-1 (Water Well)

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Chloroaniline	0.005	ND				
2,6-Dichlorophenol	0.005	ND				
Hexachlorobutadiene	0.001	ND	81			101
N-Nitroso-di-n-butylamine	0.005	ND				
4-Chloro-3-methylphenol	0.005	ND	75	8	66	94
2-Methylnaphthalene	0.001	ND				
1,2,4,5-Tetrachlorobenzene	0.001	ND				
Hexachlorocyclopentadiene	0.005	ND				
2,4,6-Trichlorophenol	0.005	ND	80			100
2,4,5-Trichlorophenol	0.005	ND				
2-Chloronaphthalene	0.001	ND				
1-Chloronaphthalene	0.001	ND				
2-Nitroaniline	0.005	ND				
Dimethylphthalate	0.001	ND				
Acenaphthylene	0.001	ND				
2,6-Dinitrotoluene	0.001	ND				
3-Nitroaniline	0.005	ND				
Acenaphthene	0.001	ND	81	9	73	101
2,4-Dinitrophenol	0.025	ND				
Dibenzofuran	0.005	ND				
Pentachlorobenzene	0.001	ND				
4-Nitrophenol	0.005	ND		9	44	
1-Napthylamine	0.005	ND				
2,4-Dinitrotoluene	0.001	ND		0	110	
2-Napthylamine	0.005	ND				
2,3,4,6-Tetrachlorophenol	0.005	ND				
Fluorene	0.001	ND				
Diethylphthalate	0.001	ND				
4-Chlorophenyl-phenylether	0.001	ND				
4-Nitroaniline	0.005	ND				
4,6-Dinitro-2-methylphenol	0.005	ND				
n-Nitrosodiphenylamine & Diphenylamine	0.001	ND	79			99
Diphenylhydrazine	0.005	ND				

HIGHLANDER SERVICES CORP.
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM
Client/Project: Texaco E & P, Inc.
T72317

FIELD CODE: WW-1 (Water Well)

EPA 8270 - BNA's	Reporting Limit	Concentration (mg/L)	QC	RPD	%EA	%IA
4-Bromophenyl-phenylether	0.001	ND				
Phenacetin	0.005	ND				
Hexachlorobenzene	0.001	ND				
4-Aminobiphenyl	0.005	ND				
Pentachlorophenol	0.005	ND	82	2	96	103
Pentachloronitrobenzene	0.005	ND				
Pronamide	0.001	ND				
Phenanthrene	0.001	ND				
Anthracene	0.001	0.002				
Di-n-butylphthalate	0.001	ND				
Fluoranthene	0.001	ND	80			100
Benzidine	0.01	ND				
Pyrene	0.001	ND		9	106	
[redacted]imethylaminoazobenzene	0.001	ND				
Butylbenzylphthalate	0.001	ND				
Benzo[a]anthracene	0.001	ND				
3,3-Dichlorobenzidine	0.001	ND				
Chrysene	0.001	ND				
bis(2-Ethylhexyl)phthalate	0.005	ND				
Di-n-octlphthalate	0.001	ND	78			98
Benzo[b]fluoranthene	0.001	ND				
7,12-Dimethylbenz(a)anthracene	0.001	ND				
Benzo[k]fluoranthene	0.001	ND				
Benzo[a]pyrene	0.001	ND	81			101
3-Methylcholanthrene	0.001	ND				
Dibenzo(a,j)acridine	0.001	ND				
Indeno[1,2,3-cd]pyrene	0.001	ND				
Dibenz[a,h]anthracene	0.001	ND				
Benzo[g,h,i]perylene	0.001	ND				

HIGHLANDER SERVICES CORP.

Project No: 787

Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Client/Project: Texaco E & P, Inc.

TA# 72317

FIELD CODE: WW-1 (Water Well)

TENTATIVELY IDENTIFIED COMPOUNDS AND ESTIMATED CONCENTRATIONS (mg/L)

	EST. CONC.	RT
(1) 1-isocyanato-3-methylbenzene	0.006	9.51
(2) bromacil	0.004	13.43
(3) 6-chloro-N,N'-diethyl-1,3,5-triazine-2,4-diamine	0.002	11.46
(4) 2,4,6-trimethylbenzoic acid	0.001	8.38
(5) Unidentified Compound	0.001	6.02
(6) Unidentified Compound	0.002	7.60
(7) Unidentified Compound	0.002	6.75
(8) Unidentified Compound	0.002	8.95

ND = NOT DETECTED

SURROGATES	% RECOVERY
2-Fluorophenol SURR	30
Phenol-d6 SURR	23
Nitrobenzene-d5 SURR	57
2-Fluorobiphenyl SURR	62
2,4,6-Tribromophenol SURR	80
erphenyl-d14 SURR	108

METHOD: EPA SW 846-8270, 3510.

CHEMIST: HC/CC

BL

Director, Dr. Blair Leftwich

5-8-97

Date

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVICES
Attention: Ike Tavarez
1910 N. Big Spring St.
Midland, TX 79705

May 07, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant, Lea County, NM

Extraction Date: 05/01/97
Analysis Date: 05/01/97
Sampling Date: 04/22-23/97
Sample Condition: I & C
Sample Received by: JH
Project Name: Texaco E & P, Inc.

TOTAL METALS (mg/L)

TA#	Field Code	As	Se	Cd	Cr	Pb	Ag	Ba	Hg
T72311	MW-1	<0.10	<0.10	<0.02	<0.05	0.1	<0.01	<0.20	<0.001
T72312	MW-2	<0.10	<0.10	<0.02	<0.05	<0.10	<0.01	<0.20	<0.001
T72313	MW-3	<0.10	<0.10	<0.02	0.36	<0.10	<0.01	<0.20	<0.001
T72314	MW-4	<0.10	<0.10	<0.02	0.08	0.1	<0.01	<0.20	<0.001
T72315	MW-5	<0.10	<0.10	<0.02	<0.05	<0.10	<0.01	<0.20	<0.001
T72316	MW-6	<0.10	<0.10	<0.02	<0.05	0.1	<0.01	0.3	<0.001
T72317	MW-1 (Water Well)	<0.10	<0.10	<0.02	0.52	<0.10	<0.01	<0.20	<0.001
QC	Quality Control	5.4	5.0	5.0	5.0	4.9	0.98	5.0	0.0045
Reporting Limit		0.10	0.10	0.02	0.05	0.10	0.01	0.20	0.001
RPD		4	2	4	2	2	2	4	5
% Extraction Accuracy		93	94	85	92	81	115	85	86
% Instrument Accuracy		109	100	100	100	97	98	100	90

METHODS: EPA SW 846-3015, 6010, 7470.
CHEMIST: As, Se, Cd, Cr, Pb, Ag, Ba: RR Hg: RC
TOTAL METALS SPIKE: 2.0 mg/L As, Se, Cd, Pb, Ba; 1.5 mg/L Cr; 0.1 mg/L Ag; 0.005 mg/L Hg.
TOTAL METALS QC: 5.0 mg/L As, Se, Cd, Cr, Pb, Ba; 1.0 mg/L Ag; 0.005 mg/L Hg.

Director, Dr. Blair Leftwich

5-7-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVICES
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

May 07, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant,
Lea County, NM

Prep Date: 05/06/97
Analysis Date: 05/06/97
Sampling Date: 04/22-23/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P, Inc.

TA#	FIELD CODE	CHLORIDE (mg/L)
T72311	MW-1	200
T72312	MW-2	350
T72313	MW-3	430
T72314	MW-4	290
T72315	MW-5	800
T72316	MW-6	1,500
T72317	MW-1 (Water Well)	800
QC	Quality Control	24
REPORTING LIMIT		10
RPD		0
% Extraction Accuracy		96
% Instrument Accuracy		96

METHODS: EPA 300.0.
CHEMIST: MS
CHLORIDE SPIKE: 25 mg/L CHLORIDE.
CHLORIDE QC: 24 mg/L CHLORIDE.

BL 5-7-97

Director, Dr. Blair Leftwich — DATE

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER ENVIRONMENTAL SERVICES
Attention: Ike Tavarez
1910 N. Big Spring
Midland, TX 79705

May 05, 1997
Receiving Date: 04/25/97
Sample Type: Water
Project No: 787
Project Location: Texaco Eunice (North) Gas Plant,
Lea County, NM

Prep Date: 04/27/97
Analysis Date: 04/27/97
Sampling Date: 04/22-23/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco E & P, Inc.

TA#	FIELD CODE	TDS (mg/L)
T72311	MW-1	2,000
T72312	MW-2	1,200
T72313	MW-3	2,000
T72314	MW-4	1,600
T72315	MW-5	2,800
T72316	MW-6	3,200
T72317	MW-1 (Water Well)	2,600
RPD		0

METHODS: EPA 160.1.
CHEMIST: MS

Director, Dr. Blair Leftwich

5-5-97
DATE

Highlander Services Corp.

306 W. Wall · Suite 320 · Midland, TX 79701 · (915)682-4559

Analysis Request and Chain of Custody Record

Project No. 787 | Client/Project Texaco E & P Inc / Texaco Eunice (North) Gas Plant, Lea County, NM

Field Sample No./ Identification		Date and Time	Grab	Comp	Sample Type(Liquid Sludge,Ect.)	Preservative	ANALYSIS REQUESTED
MW-1	72311	4/23/97 9:40	X		water	HCl/4°	Volatile Organics. (8240)
						4°	Semi Volatiles (8270) BNA's only
						HNO_3/4°	Total metals
						4°	Chloride + TDS.
MW-2	72312	4/22/97 4:30pm	X		water	HCl/4°	Volatile Organics (8240)
DUP						4°	Semi Volatiles (8270) BNA
						HNO_3/4°	Total metals.
						4°	Chloride + TDS.
Trip Blk.	72318 72318	4/22/97			water	4°	VOA (8240) (Hold)

Samplers: (Print)	Relinquished by: (Signature) Ike Tavarez	Date: 4/24/97 Time: 2:25	Recieved by: (Signature) Helen Shelton	Date: 4/24/97 Time: 2:25 PM
Ike Tavarez	Relinquished by: (Signature) Helen Shelton	Date: 4/24/97 Time: 9:00 PM	Recieved by: (Signature)	Date: 4/25/97 Time: 10:10
Vijay Kurki	Relinquished by: (Signature)	Date: Time:	Data Results To: 1. Ike Tavarez. B	
Results by:	Delivered To: Trace Lab.		2. C/T	
Rush Charges Authorized Yes ___ No ___	REMARKS:		samples received @ 0°/1°/5°C	

Please Fill out all copies – Deliverer retains White copy for file – Lab retains Yellow copy & Return Pink copy to Highlander Services Corp. at above address

Shipped Greyhound 126-6891-8682-8 14 samples - HS115AJ

Highlander Services Corp.

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Analysis Request and Chain of Custody Record

Project No. 787 | Client/Project TEXACO E&P Inc. / TEXACO EUNICE (NORTH) GAS PLANT, LEA COUNTY, NM

Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Type (Liquid Sludge, Ect.)	Preservative	ANALYSIS REQUESTED
MW-3 72313	4/22/97 5:05pm.	X		water	HCl/ice	· Volatile Organics (8240)
					ice	· Semi Volatiles (8270) BNA
					HNO3/ice	Total metal
					ice	Chloride + TDS.
MW-4 72314	4/23/97 10:15 Am.	X		water	HCl/ice	· Volatile Organics (8240)
					ice	· Semi-Volatiles (8270) BNA
					HNO3/ice	Total metals
					ice.	Chloride + TDS.

Samplers: (Print)
IKE Tavarez
Vijay Kurki
Results by:

Rush Charges Authorized
Yes ___ No ___

Relinquished by: (Signature) [signature] Date: 4/24/97 Time: 2:25
Relinquished by: (Signature) Helen Shelton Date: 4/24/97 Time: 9:00PM
Relinquished by: (Signature) Date: Time:
Delivered To: Trace Lab.
REMARKS:

Recieved by: (Signature) Helen Shelton Date: 4/24/97 Time: 2:25 PM
Recieved by: (Signature) [signature] Date: 4/25/97 Time: 1010A
Data Results To:
1. IKE Tavarez
2.

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Shipped Greyhound 126-689-868-8 12 samples-HS 115AJ

Highlander Services Corp.

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Analysis Request and Chain of Custody Record

Project No. 787 | Client/Project Texaco E&P Inc. / Texaco Eunice (North) Gas Plant, Lea County, NM

Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Type(Liquid Sludge,Ect.)	Preservative	ANALYSIS REQUESTED
MW-5 72315	4/22/97 6:20pm	x		water	HCl/ice	Volatile Organic (8240)
					ice	Semi-Volatile (8270) BNA
					HNO3/ice	Total metals
					ice	Chloride + TDS
MW-6 72316	4/22/97 5:50pm	x		water	HCl/ice	Volatile Organic (8240)
					ice	Semi-Volatile (8270) BNA
					HNO3/ice	Total metals
					ice	Chloride + TDS

Samplers: (Print)
IKE Tavarez
Vijay Kurki

Results by:

Rush Charges Authorized
Yes ___ No ___

Relinquished by: (Signature) [signature] Date: 4/24/97 Time: 2:25
Relinquished by: (Signature) Helen Shelton Date: 4/24/97 Time: 9:00 PM
Relinquished by: (Signature) Date: Time:
Delivered To: Trace Lab

REMARKS:

Recieved by: (Signature) Helen Shelton Date: 4/24/97 Time: 2:25 PM
Recieved by: (Signature) [signature] Date: 4/25/97 Time: 10104
Data Results To:
1. IKE Tavarez
2.

Please Fill out all copies – Deliverer retains White copy for file – Lab retains Yellow copy & Return Pink copy to Highlander Services Corp. at above address

Shipped Greyhound 126-689-868-8 12 samples-HS 11SAT

Highlander Services Corp.

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Analysis Request and Chain of Custody Record

Project No. 787 | Client/Project TEXACO E&P Inc. / TEXACO Eunice (North) GAS Plant, Lea County, NM.

Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Type (Liquid Sludge, Ect.)	Preservative	ANALYSIS REQUESTED
WW-1 (water well) 72317	4/23/97 9:05AM	x		water	HCl/ice	• Volatile Organic (8240)
					ice	• Semi-Volatile (8270) BNA
					HNO3/ice	Total metal
					ice	Chloride + TDS.

Samplers: (Print)

IKE Tavarez

Vijay Kurki

Results by:

Rush Charges Authorized

Yes ___ No ___

Relinquished by: (Signature) [signature] Date: 4/24/97 Time: 2:25

Relinquished by: (Signature) Helen Shelton Date: 4/24/97 Time: 9:00PM

Relinquished by: (Signature) Date: Time:

Delivered To: Trace Lab.

REMARKS:

Recieved by: (Signature) Helen Shelton Date: 4/24/97 Time: 2:25PM

Recieved by: (Signature) [signature] Date: 4/25/97 Time: 1010

Data Results To:

1. IKE Tavarez

2. C/E

Please Fill out all copies – Deliverer retains White copy for file – Lab retains Yellow copy & Return Pink copy to Highlander Services Corp. at above address

Shipped Greyhound 126-689-868-8 6 samples - HS 115AT

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
HIGHLANDER SERVICES
Attention: Mark Larson
1910 N. Big Spring St.
Midland, TX 79705

May 15, 1997
Receiving Date: 05/14/97
Sample Type: Water/Free Product
Project No: 787
Project Location: NA

Prep Date: 05/14/97
Analysis Date: 05/14/97
Sampling Date: 05/12/97
Sample Condition: Intact & Cool
Sample Received by: JH
Client/Project: Texaco -
Evaluation North Plant

T73613 - MW-5 - Fingerprint

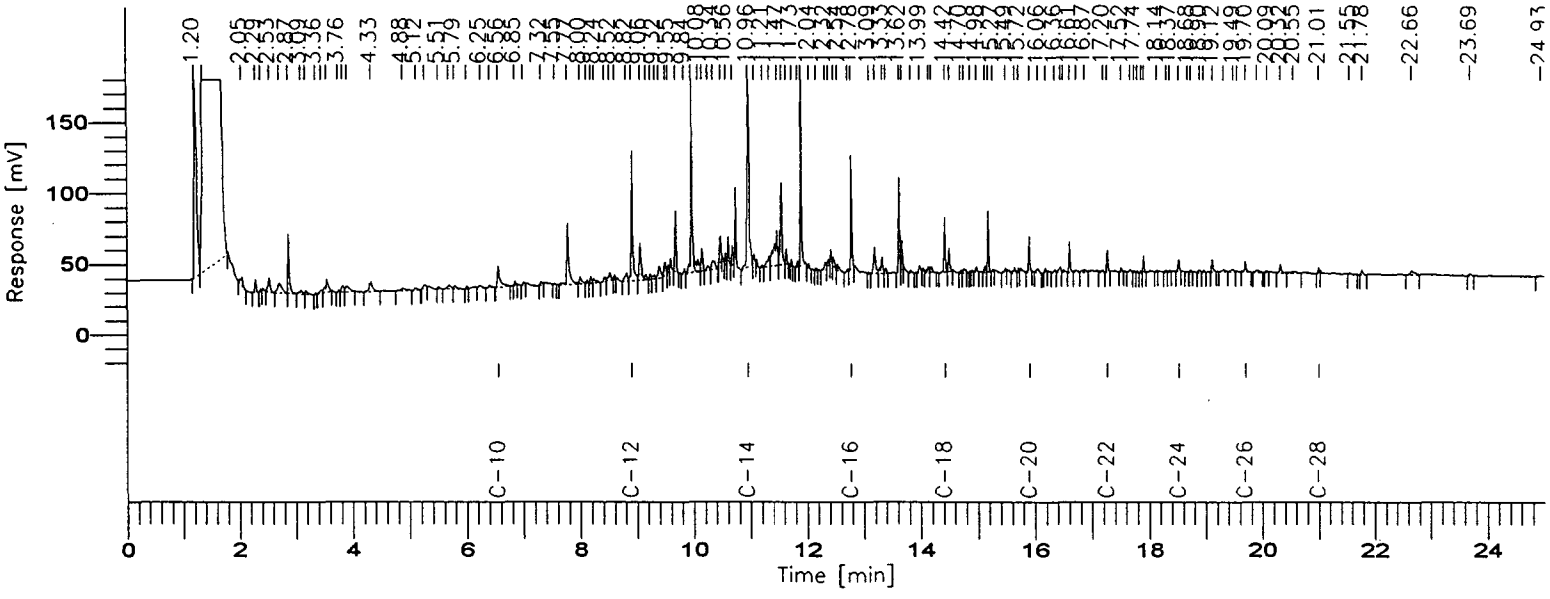
Fingerprint exhibited significant hydrocarbon peaks in the C10-C28 range consistent with Diesel Fuel. Lighter Hydrocarbons also present at lesser amount in the C6-C10 range consistent with condensate or gasoline.

CHEMIST: DH

Director, Dr. Blair Leftwich

5-15-97
DATE

Software Version: 4.1<0G07>
Date: 5/14/97 07:47 PM
Sample Name : 73613*1000
Data File : C:\TC4\DATA3\D514006.RAW Date: 5/14/97 07:18 PM
Sequence File: C:\TC4\SEQUENCE\DIES0514.SEQ Cycle: 6 Channel : B
Instrument : AUTOSYS_-_GC3 Rack/Vial: 0/6 Operator:
Sample Amount : 1.0000 Dilution Factor : 1.00



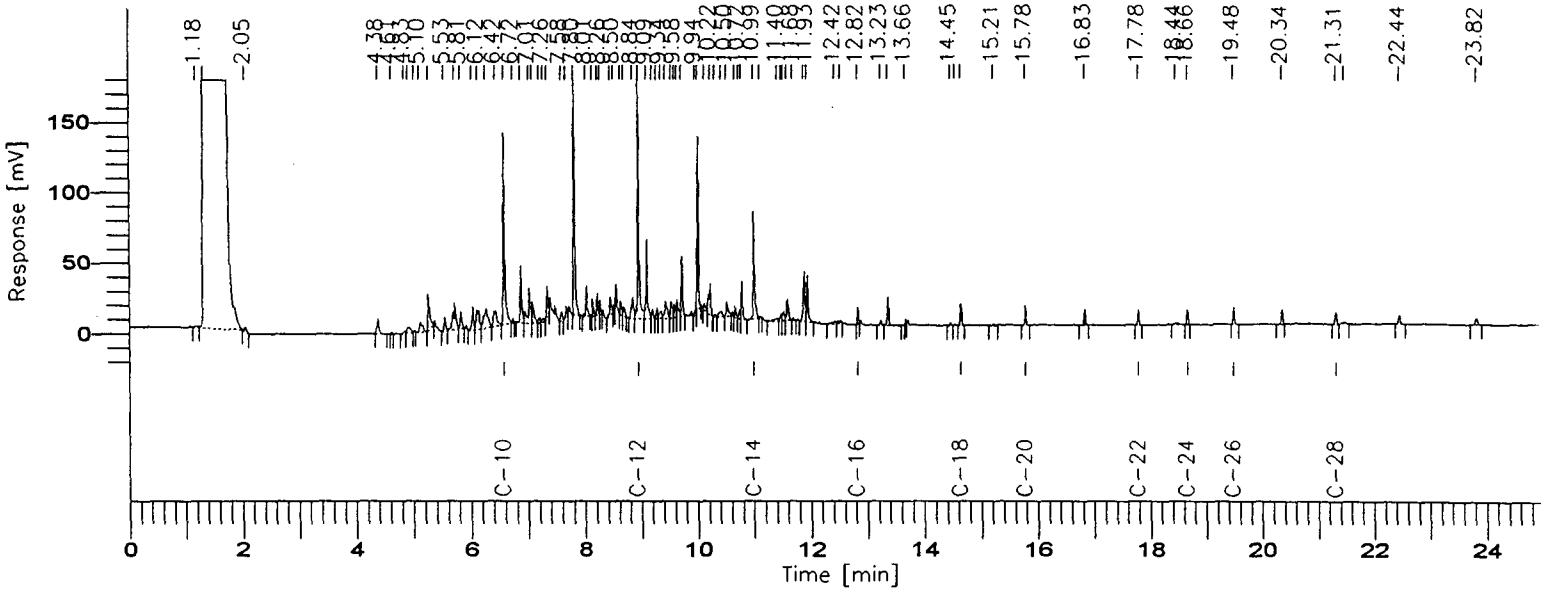
DRO REPORT

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
12.75	DIESEL RANGE ORGANIC	193.6	193.6	2871712.5	1677403.6
19.70	C-26	1.1	1.1	15571.9	7729.4
21.01	C-28	0.6	0.6	7411.8	4086.9

Group Report For : DIESEL RANGE ORGANICS

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
6.56	C-10	2.7	2.7	49314.4	15086.1
6.85		5.7e-03	5.7e-03	5667.5	3038.6
7.00		4.3e-03	4.3e-03	4333.0	2147.2
[illegible]2		4.8e-03	4.8e-03	4823.8	2407.6
7.55		2.0e-03	2.0e-03	2030.5	1238.6
7.77		0.1	0.1	107372.6	52585.6
8.00		0.0	0.0	14943.3	5467.1

Software Version: 4.1<0G07>
Date: 5/14/97 04:05 PM
Sample Name : KER
Data File : C:\TC4\DATA3\D514001.RAW Date: 5/14/97 03:36 PM
Sequence File: C:\TC4\SEQUENCE\DIES0514.SEQ Cycle: 1 Channel : B
Instrument : AUTOSYS_-_GC3 Rack/Vial: 0/1 Operator:
Sample Amount : 1.0000 Dilution Factor : 1.00



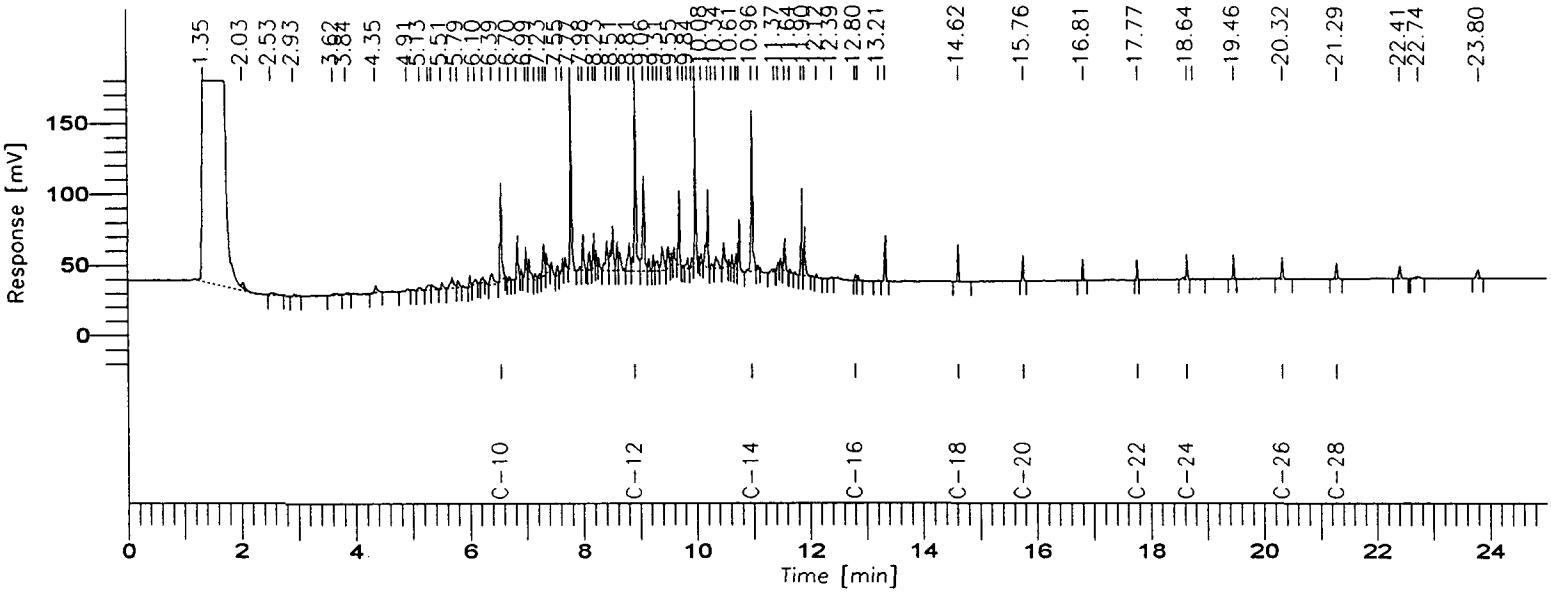
DRO REPORT

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
12.75	DIESEL RANGE ORGANIC	169.0	169.0	2507184.6	1495500.9
19.48	C-26	1.3	1.3	18139.9	11990.4
21.31	C-28	1.4	1.4	17462.3	8426.8

Group Report For : DIESEL RANGE ORGANICS

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
6.57	C-10	13.6	13.6	246537.4	159565.4
6.72		5.3e-03	5.3e-03	5320.2	3291.0
6.86		0.1	0.1	66501.1	40945.3
7.01		0.1	0.1	73447.7	26769.6
7.07		0.0	0.0	37320.5	15298.5
7.19		9.0e-03	9.0e-03	8982.1	3848.9
7.26		7.4e-03	7.4e-03	7431.1	3063.1

Software Version: 4.1<0G07>
Date: 5/14/97 04:52 PM
Sample Name : JET
Data File : C:\TC4\DATA3\D514002.RAW Date: 5/14/97 04:23 PM
Sequence File: C:\TC4\SEQUENCE\DIES0514.SEQ Cycle: 2 Channel : B
Instrument : AUTOSYS - GC3 Rack/Vial: 0/2 Operator:
Sample Amount : 1.0000 Dilution Factor : 1.00



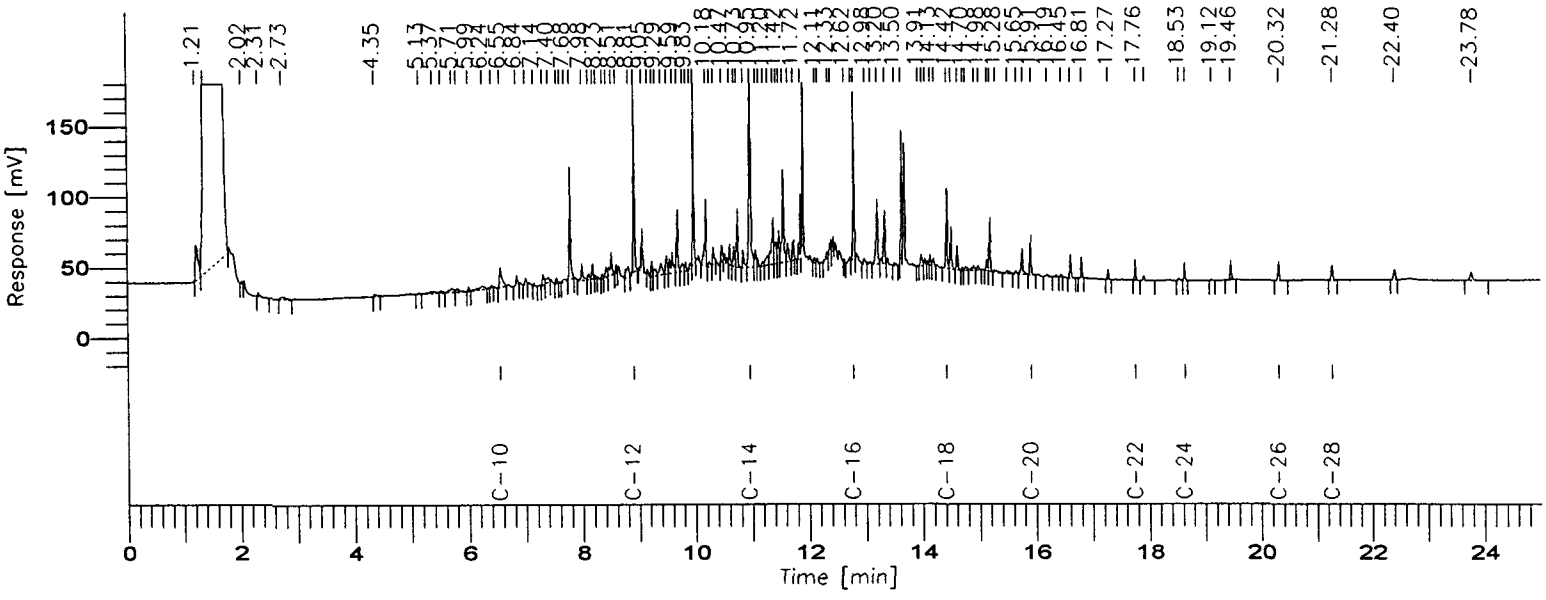
DRO REPORT

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
12.75	DIESEL RANGE ORGANIC	203.0	203.0	3010930.5	1840080.8
20.32	C-26	2.0	2.0	28083.4	14929.9
21.29	C-28	2.1	2.1	25716.2	11480.1

Group Report For : DIESEL RANGE ORGANICS

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
6.54	C-10	7.1	7.1	128887.7	84073.7
6.70		4.4e-03	4.4e-03	4410.0	2834.3
6.83		0.0	0.0	49626.2	34830.4
6.99		0.0	0.0	38035.3	21377.2
7.04		0.0	0.0	35673.3	14232.5
7.15		0.0	0.0	10794.6	5218.1
7.23		8.7e-03	8.7e-03	8653.3	3853.9

Software Version: 4.1<0G07>
Date: 5/14/97 06:20 PM
Sample Name : DIES
Data File : C:\TC4\DATA3\D514004.RAW Date: 5/14/97 05:51 PM
Sequence File: C:\TC4\SEQUENCE\DIES0514.SEQ Cycle: 4 Channel : B
Instrument : AUTOSYS_-_GC3 Rack/Vial: 0/4 Operator:
Sample Amount : 1.0000 Dilution Factor : 1.00



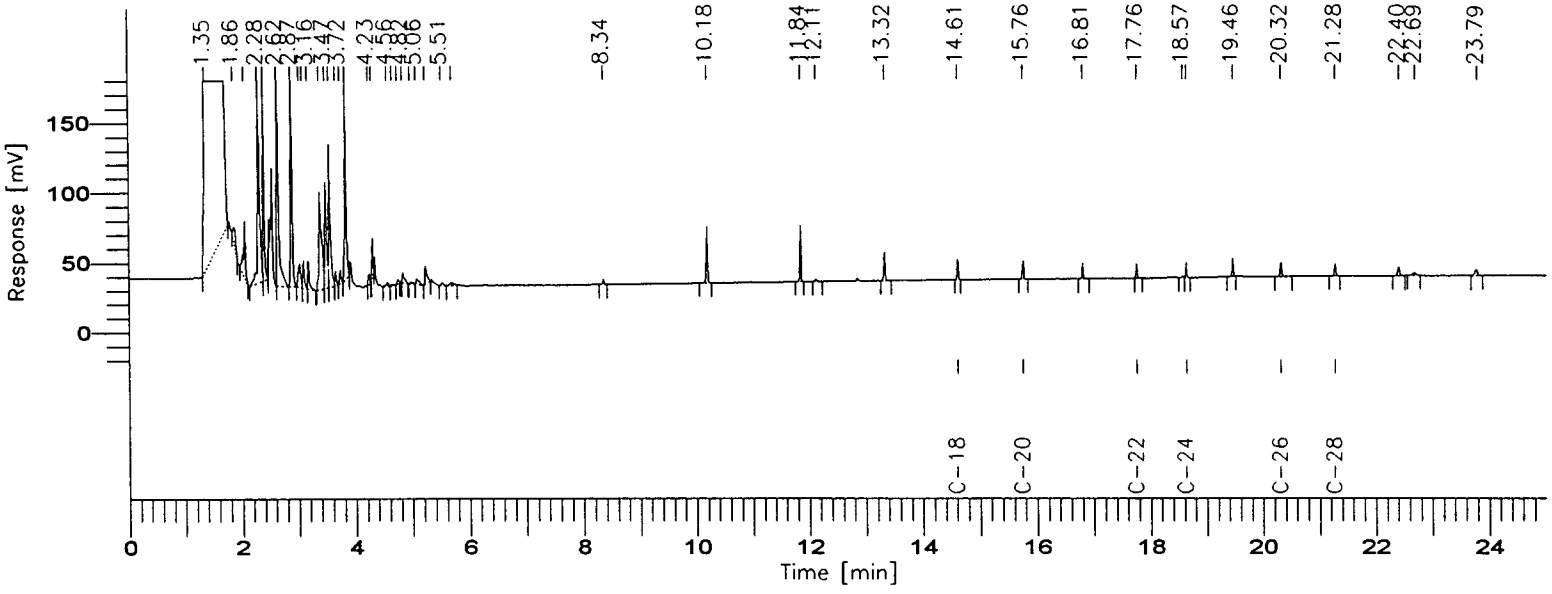
DRO REPORT

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
12.75	DIESEL RANGE ORGANIC	213.8	213.8	3171308.6	1939755.8
20.32	C-26	1.7	1.7	24059.3	14316.9
21.28	C-28	1.8	1.8	22171.8	11033.4

Group Report For : DIESEL RANGE ORGANICS

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
6.55	C-10	2.5	2.5	45094.7	15975.1
6.84		0.0	0.0	12876.4	7385.5
6.99		8.8e-03	8.8e-03	8810.1	4739.5
7.14		3.6e-03	3.6e-03	3573.8	2337.4
7.30		0.0	0.0	17798.3	8954.5
7.40		0.0	0.0	14350.6	3352.1
7.54		8.9e-03	8.9e-03	8912.1	4328.3

Software Version: 4.1<0G07>
Date: 5/14/97 07:04 PM
Sample Name : COND
Data File : C:\TC4\DATA3\D514005.RAW Date: 5/14/97 06:34 PM
Sequence File: C:\TC4\SEQUENCE\DIES0514.SEQ Cycle: 5 Channel : B
Instrument : AUTOSYS_-_GC3 Rack/Vial: 0/5 Operator:
Sample Amount : 1.0000 Dilution Factor : 1.00



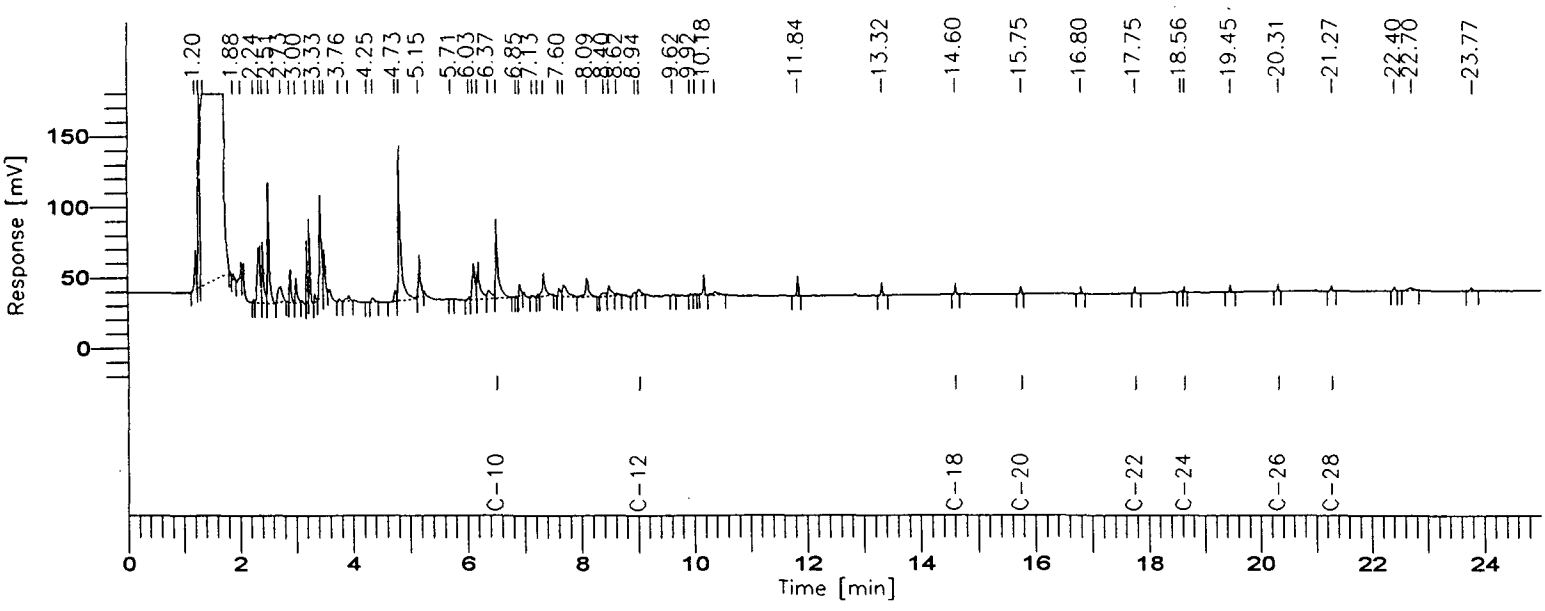
DRO REPORT

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
12.75	DIESEL RANGE ORGANIC	17.2	17.2	255399.0	176935.0
20.32	C-26	1.4	1.4	20235.4	11004.5
21.28	C-28	1.5	1.5	18895.3	9679.3

Group Report For : DIESEL RANGE ORGANICS

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
8.34		6.4e-03	6.4e-03	6414.7	4548.5
10.18		0.1	0.1	59023.3	40827.3
11.84		0.1	0.1	55215.8	40122.3
12.11		4.2e-03	4.2e-03	4225.4	2064.1
13.32		0.0	0.0	32861.1	22668.8
14.61	C-18	1.3	1.3	23995.2	17355.9
15.76	C-20	1.1	1.1	19430.5	13748.1

Software Version: 4.1<0G07>
Date: 5/14/97 05:36 PM
Sample Name : GAS
Data File : C:\TC4\DATA3\D514003.RAW Date: 5/14/97 05:07 PM
Sequence File: C:\TC4\SEQUENCE\DIES0514.SEQ Cycle: 3 Channel : B
Instrument : AUTOSYS_-_GC3 Rack/Vial: 0/3 Operator:
Sample Amount : 1.0000 Dilution Factor : 1.00



DRO REPORT

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
6.50	C-10	8.9	8.9	162348.7	58885.7
12.75	DIESEL RANGE ORGANIC	28.1	28.1	416574.9	153713.1
20.31	C-26	0.6	0.6	8456.0	4868.4
21.27	C-28	0.7	0.7	8365.5	3863.6

Group Report For : DIESEL RANGE ORGANICS

Time [min]	Component Name	Adjusted Amount	Raw Amount	Area [uV*sec]	Height [µV]
6.85		1.8e-03	1.8e-03	1790.4	1189.1
6.91		0.0	0.0	18018.9	8734.8
7.13		5.1e-03	5.1e-03	5085.7	1613.1
7.23		3.5e-03	3.5e-03	3538.3	2297.6
7.33		0.1	0.1	55982.0	16551.5
7.60		0.0	0.0	18136.1	5591.3

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Analysis Request and Chain of Custody Record

Page 1 of 1

Project No. 787

Client/Project Texaco - North Plant

Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Type(Liquid Sludge,Ect.)	Preser-vative	ANALYSIS REQUESTED
MW-5	5/12/97			water/free prod.		G.C. Fingerprint 73613 product layer only
						F 5-15-97

Samplers: (Print) Gary Miller

Relinquished by: (Signature) Lynn C. Ward — Date: 5/13/97 Time: 4:15pm

Relinquished by: (Signature) — Date: Time:

Relinquished by: (Signature) — Date: Time:

Recieved by: (Signature) [signature] — Date: 5/13 Time: 4:10

Recieved by: (Signature) [signature] — Date: 5-14-97 Time: 9:20A

Data Results To: 1. Mark Larson B C/E

2.

Results by: 5/15

Rush Charges Authorized Yes X No ___

Delivered To: Trace Analysis

REMARKS: I need this no later Thurs.

0°/0°/0°

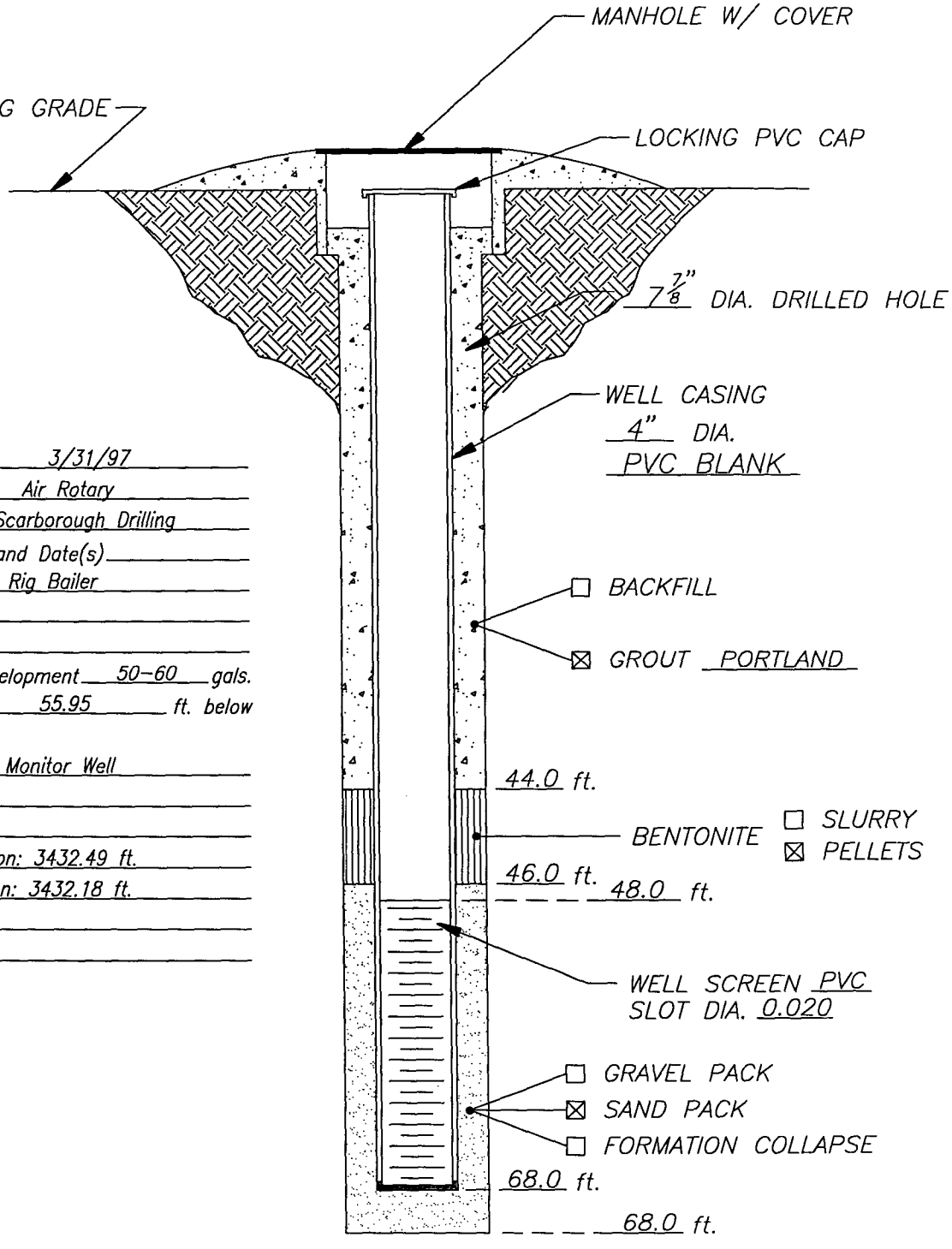
Please Fill out all copies – Deliverer retains White copy for file – Lab retains Yellow copy & Return Pink copy to Highlander Services Corp. at above address

134AB

APPENDIX D

Monitor Well Installation Records

WELL CONSTRUCTION LOG



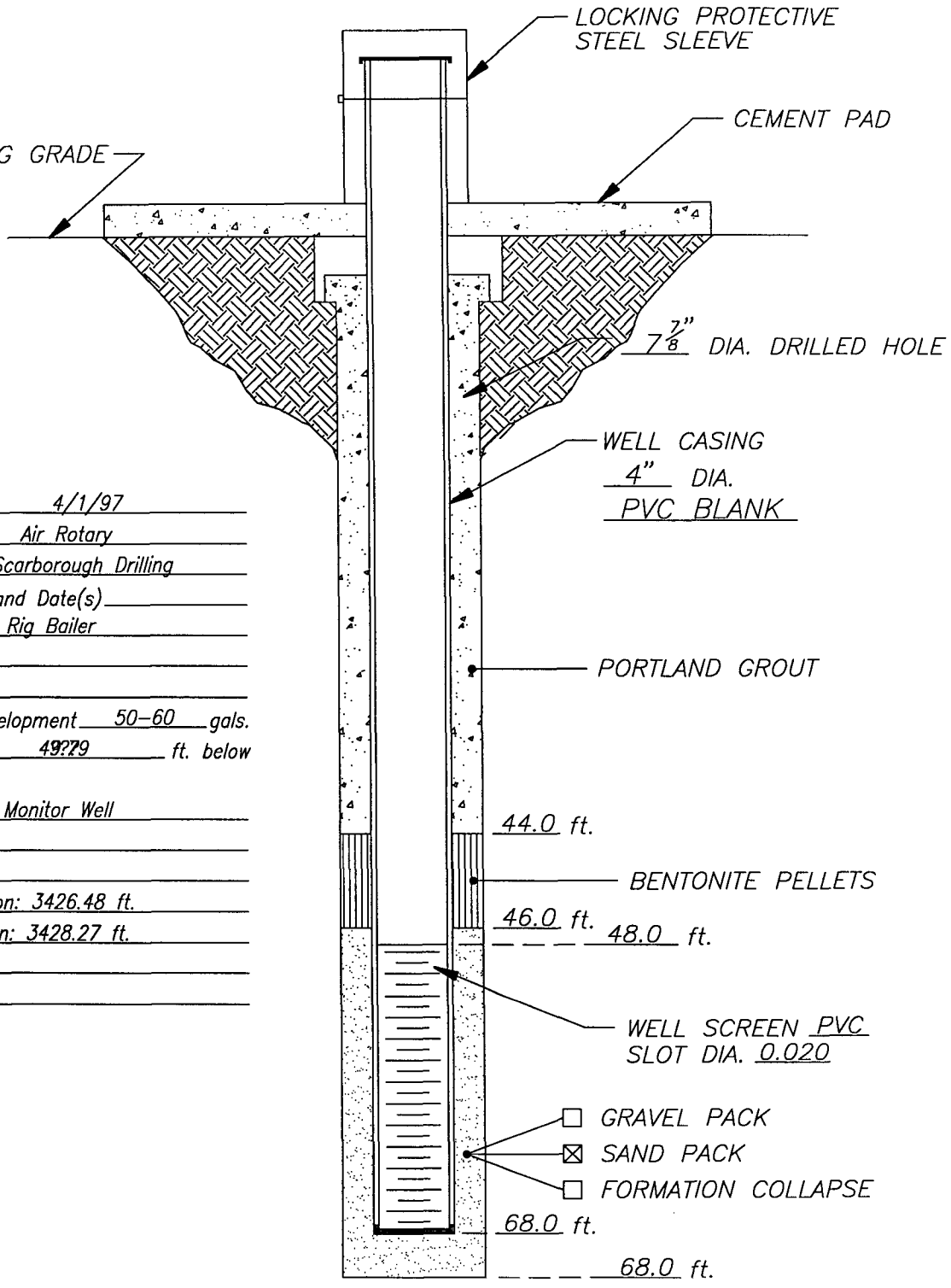
Installation Date(s) 3/31/97
Drilling Method Air Rotary
Drilling Contractor Scarborough Drilling
Development Technique(s) and Date(s)
4/4/97 - Rig Bailer

Water Removed During Development 50-60 gals.
Static Depth to Water 55.95 ft. below Ground Level
Well Purpose Monitor Well

Remarks
Ground Elevation: 3432.49 ft.
T.O.C. Elevation: 3432.18 ft.

DATE: 4/14/97	CLIENT: Texaco Exploration & Production, Inc.	WELL NO.
Highlander Environmental	PROJECT: Eunice #1 (North) Plant	MW-2
	LOCATION: Lea County, New Mexico	

WELL CONSTRUCTION LOG



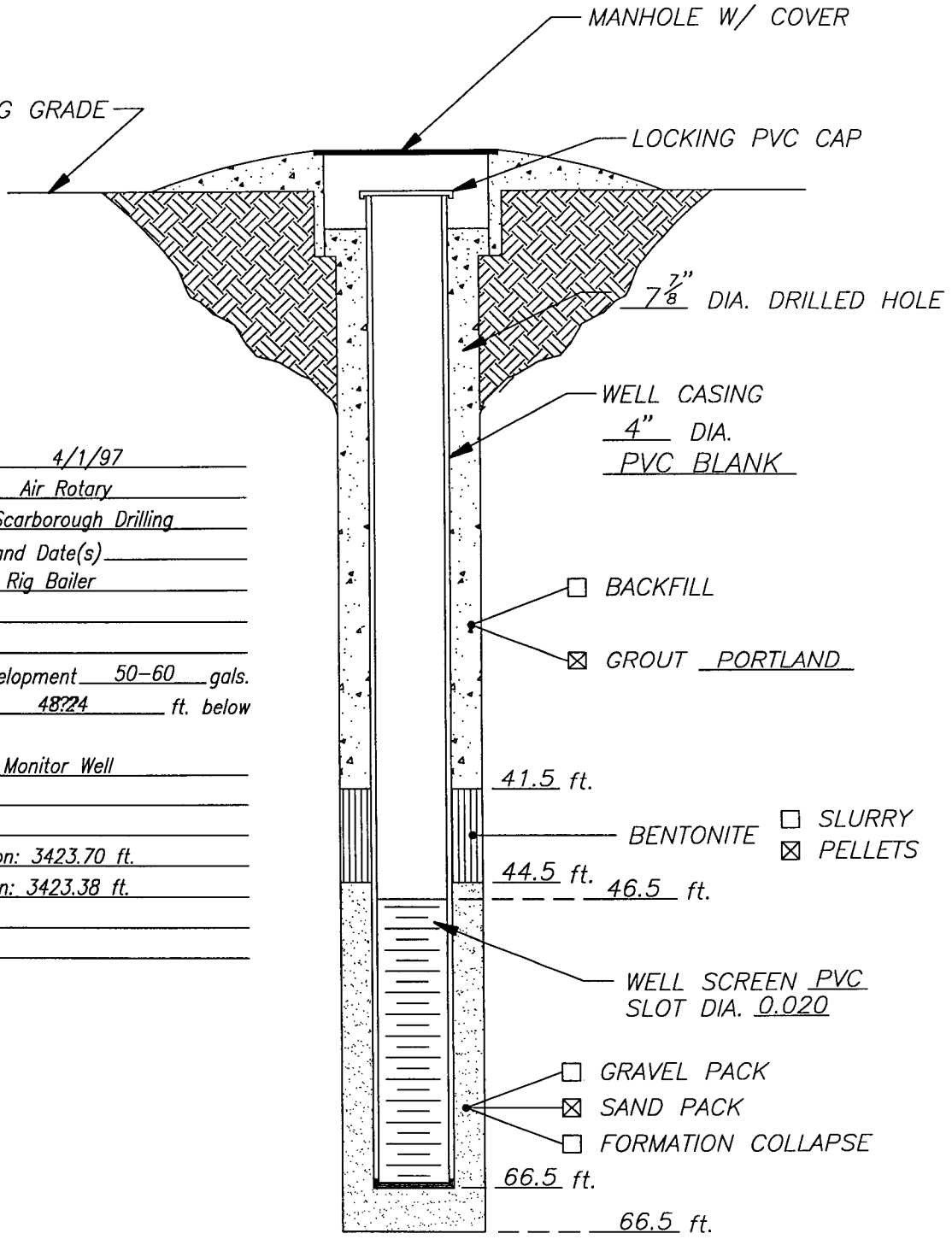
Installation Date(s) 4/1/97
Drilling Method Air Rotary
Drilling Contractor Scarborough Drilling
Development Technique(s) and Date(s)
4/4/97 – Rig Bailer

Water Removed During Development 50–60 gals.
Static Depth to Water 49.79 ft. below Ground Level
Well Purpose Monitor Well

Remarks
Ground Elevation: 3426.48 ft.
T.O.C. Elevation: 3428.27 ft.

DATE: 4/14/97	CLIENT: Texaco Exploration & Production, Inc.	WELL NO.
Highlander Environmental	PROJECT: Eunice #1 (North) Plant	MW–3
	LOCATION: Lea County, New Mexico	

WELL CONSTRUCTION LOG



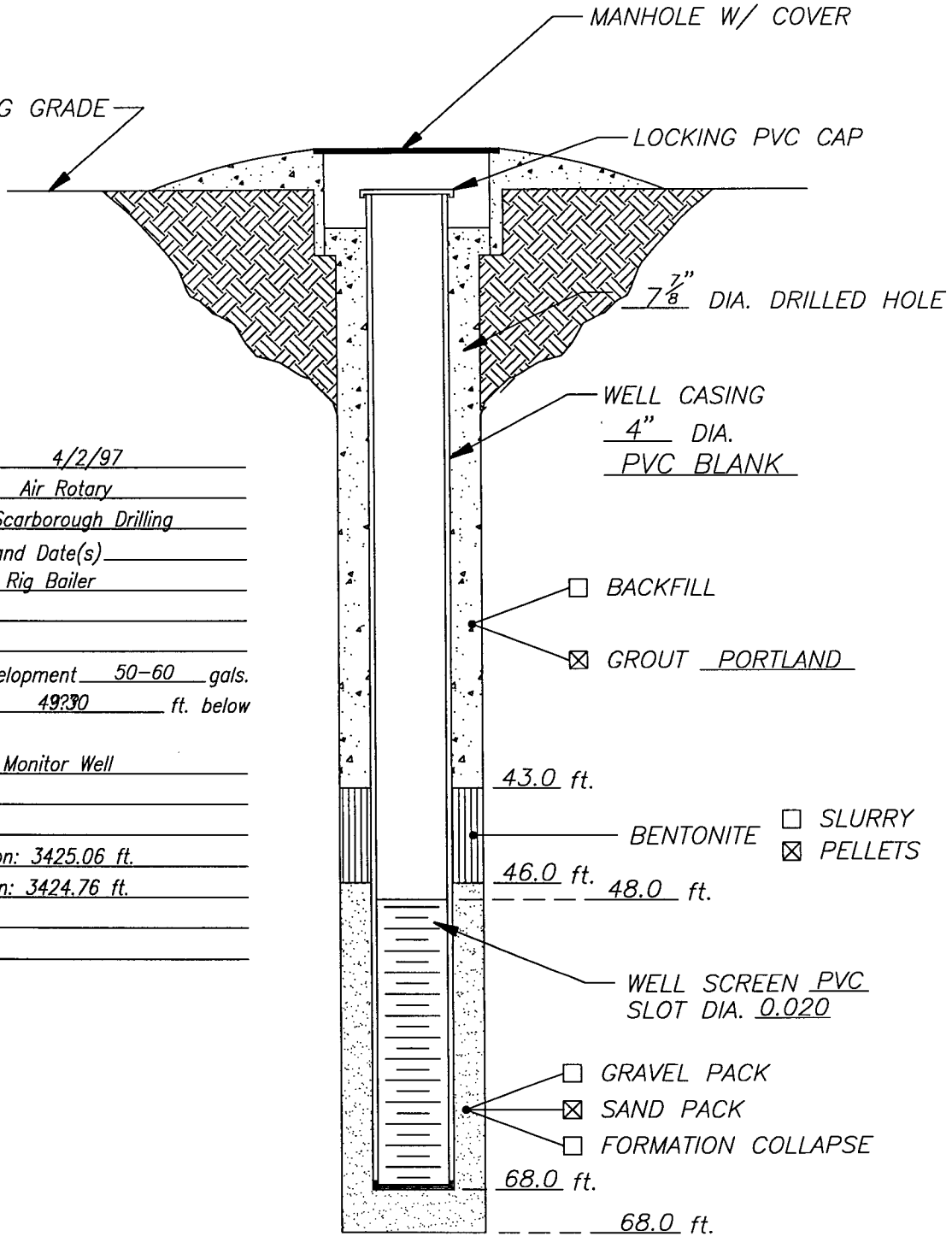
Installation Date(s) 4/1/97
Drilling Method Air Rotary
Drilling Contractor Scarborough Drilling
Development Technique(s) and Date(s)
4/4/97 – Rig Bailer

Water Removed During Development 50–60 gals.
Static Depth to Water 48.24 ft. below Ground Level
Well Purpose Monitor Well

Remarks
Ground Elevation: 3423.70 ft.
T.O.C. Elevation: 3423.38 ft.

DATE: 4/14/97	CLIENT: Texaco Exploration & Production, Inc.	WELL NO.
Highlander Environmental	PROJECT: Eunice #1 (North) Plant	MW–4
	LOCATION: Lea County, New Mexico	

WELL CONSTRUCTION LOG



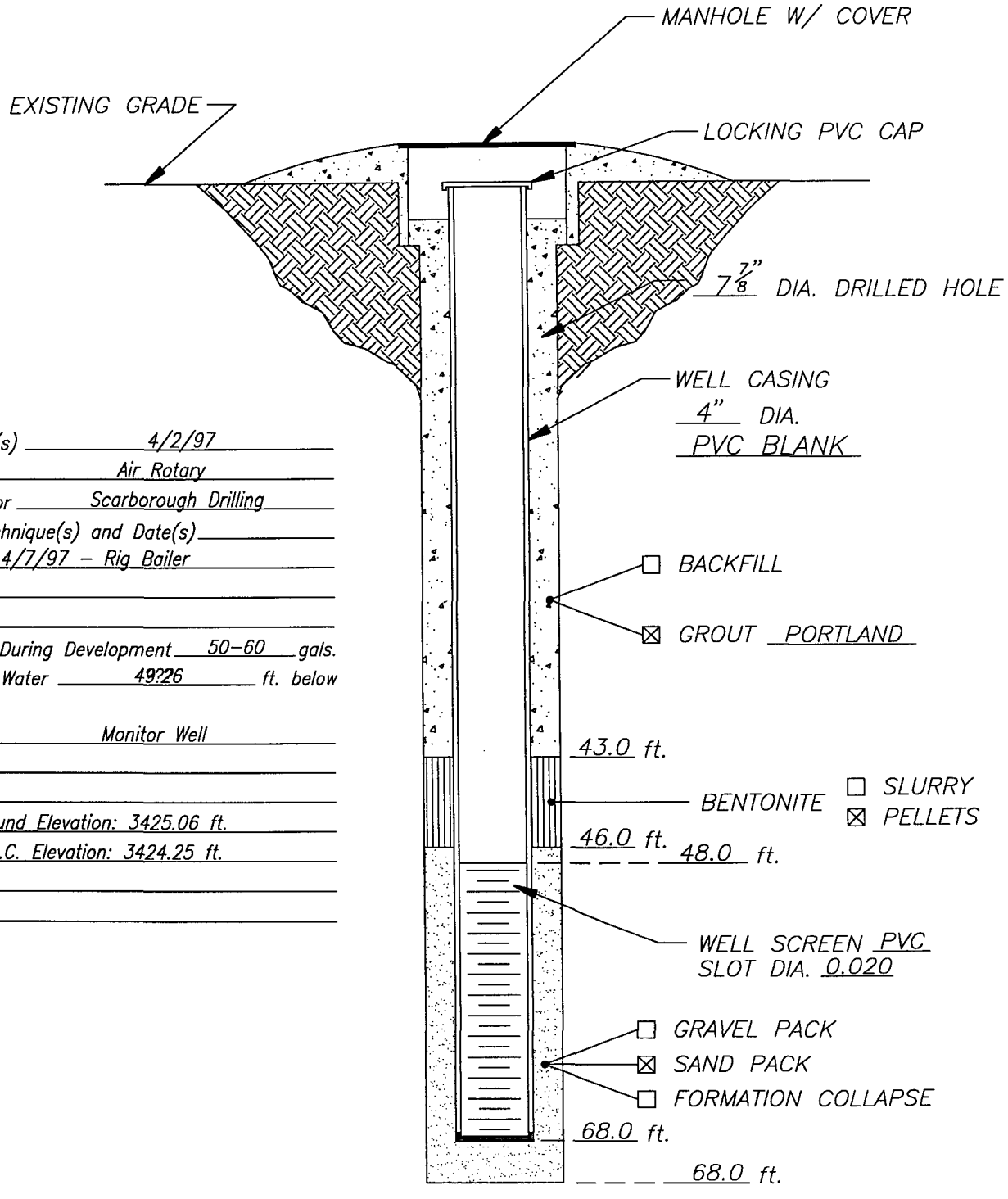
Installation Date(s) 4/2/97
Drilling Method Air Rotary
Drilling Contractor Scarborough Drilling
Development Technique(s) and Date(s)
4/7/97 – Rig Bailer

Water Removed During Development 50–60 gals.
Static Depth to Water 49?30 ft. below Ground Level
Well Purpose Monitor Well

Remarks
Ground Elevation: 3425.06 ft.
T.O.C. Elevation: 3424.76 ft.

DATE: 4/14/97	CLIENT: Texaco Exploration & Production, Inc.	WELL NO.
Highlander Environmental	PROJECT: Eunice #1 (North) Plant	MW–5
	LOCATION: Lea County, New Mexico	

WELL CONSTRUCTION LOG



Installation Date(s) 4/2/97
Drilling Method Air Rotary
Drilling Contractor Scarborough Drilling
Development Technique(s) and Date(s)
4/7/97 – Rig Bailer

Water Removed During Development 50–60 gals.
Static Depth to Water 49.26 ft. below Ground Level
Well Purpose Monitor Well

Remarks
Ground Elevation: 3425.06 ft.
T.O.C. Elevation: 3424.25 ft.

DATE: 4/14/97	CLIENT: Texaco Exploration & Production, Inc.	WELL NO.
Highlander Environmental	PROJECT: Eunice #1 (North) Plant	MW–6
	LOCATION: Lea County, New Mexico	

APPENDIX E

Hydraulic Conductivity (Slug) Tests

Texaco - Eunice North Gas Plant, NM.
Eunice, NM.

Hydraulic Conductivity Calculations
Using Bouwer and Rice Method for Unconfined Aquifers
Monitor well: MW-2 *Date:* 04/11/97

L =	13.02	feet	Length of the screen (if greater than H, take L = H)
rw =	0.3281	feet	Well radius or radius of casing plus thickness of gravel envelope
rc =	0.2275	feet	Well casing radius
D =	50	feet	Saturated thickness of the aquifer at the well
H =	13.02	feet	Height of the static water column in the well
L/rw =	*39.68*		
ln[(D-H)/rw]	*4.72*		(If ln[(D-H)/rw] exceeds 6 use the maximum value of 6)

From Figure relating coefficients A, B, C to L/rw

A = 2.8
B = 0.5
C = NA Used only if D = H

From Y v/s t graph

Yt = 0.50 feet @ t = 60 sec
Yo = 0.96 feet (Initial drawdown)
(1/t) ln(Yo/Yt) = 0.0109 1/sec

ln(Re/rw) = [1.1/ln(H/rw) + (A + B ln[(D-H)/rw])/(L/rw)]^-1 for D>H
= [1.1/ln(H/rw) + C/(L/rw)]^-1 for D=H
= 2.3314

Where Re = Effective radius and A, B, and C are derived from Bouwer & Rice curves.

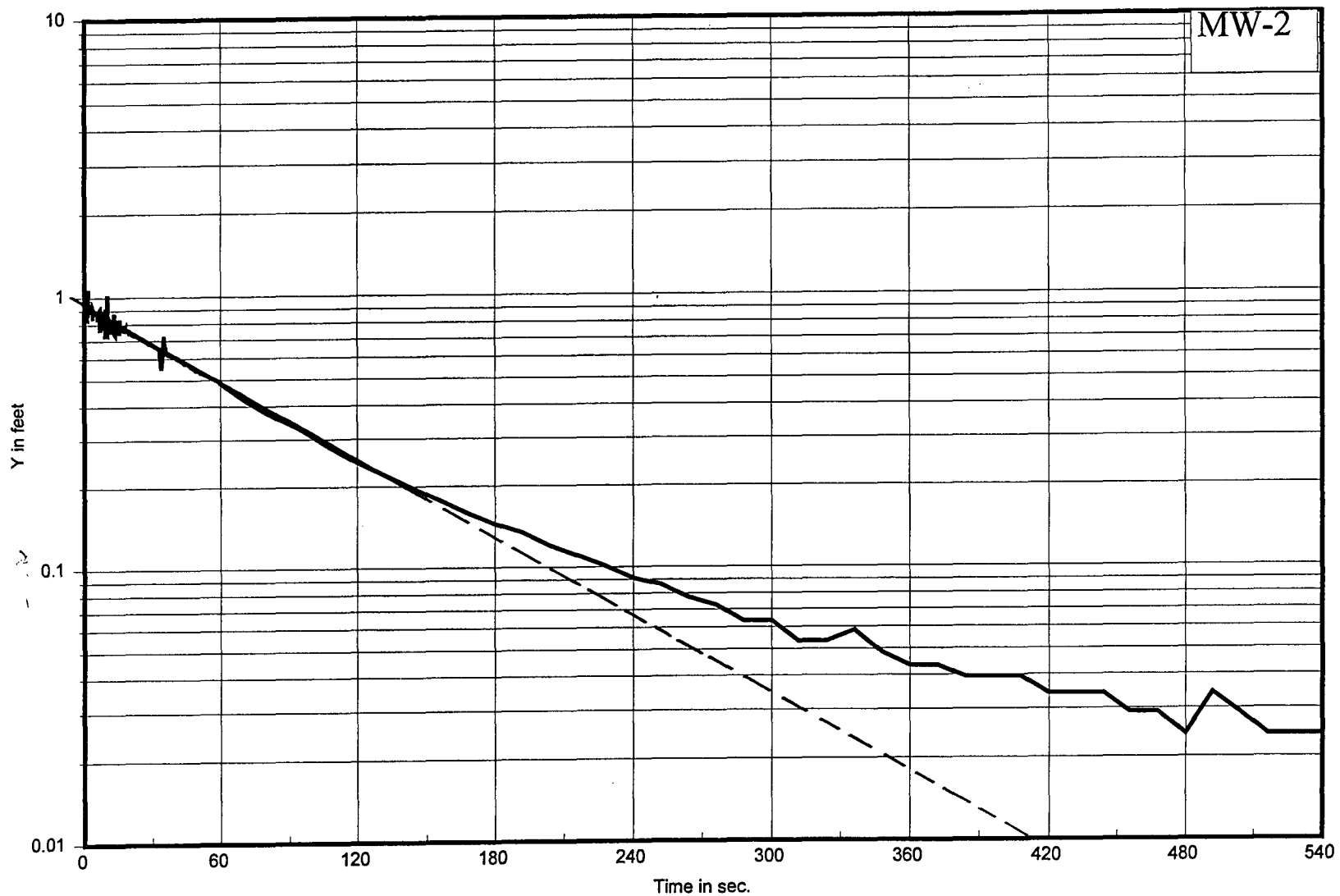
Falling head slug test

$$K = \frac{r_c^2 \ln\left(R_e / r_w\right)}{2L} \frac{1}{t} \ln\left(\frac{y_o}{y_t}\right)$$

K = 5.04E-05 ft/sec
4.3527 ft/day

Texaco - Eunice North Gas Plant

MW-2 Falling Head Slug Test



ø

SE1000C
Environmental Logger
04/14 08:11

Unit# 02098 Test 1

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	05029
Reference	55.630
Linearity	0.110
Scale factor	15.060
Offset	-0.320
Delay mSEC	50.000

Step 0 04/11 12:36:39

Elapsed Time	INPUT 1
0.0000	54.483
0.0033	54.670
0.0066	54.737
0.0100	54.703
0.0133	54.627
0.0166	54.651
0.0200	54.780
0.0233	54.813
0.0266	54.565
0.0300	54.775
0.0333	54.684
0.0366	54.727
0.0400	54.713
0.0433	54.722
0.0466	54.727
0.0500	54.727
0.0533	54.732
0.0566	54.727
0.0600	54.703
0.0633	54.794
0.0666	54.722
0.0700	54.737
0.0733	54.746
0.0766	54.746
0.0800	54.746
0.0833	54.751
0.0866	54.756
0.0900	54.760
0.0933	54.760

0.0966	54.760
0.1000	54.760
0.1033	54.765
0.1066	54.746
0.1100	54.737
0.1133	54.751
0.1166	54.780
0.1200	54.875
0.1233	54.727
0.1266	54.784
0.1300	54.746
0.1333	54.794
0.1366	54.808
0.1400	54.784
0.1433	54.784
0.1466	54.765
0.1500	54.813
0.1533	54.803
0.1566	54.717
0.1600	54.913
0.1633	54.789
0.1666	54.913
0.1700	54.612
0.1733	54.808
0.1766	54.870
0.1800	54.789
0.1833	54.803
0.1866	54.803
0.1900	54.832
0.1933	54.813
0.1966	54.803
0.2000	54.842
0.2033	54.813
0.2066	54.827
0.2100	54.827
0.2133	54.813
0.2166	54.813
0.2200	54.756
0.2233	54.889
0.2266	54.894
0.2300	54.794
0.2333	54.851
0.2366	54.832
0.2400	54.842
0.2433	54.842
0.2466	54.846
0.2500	54.842
0.2533	54.818
0.2566	54.851
0.2600	54.894
0.2633	54.827
0.2666	54.856

0.2700	54.851
0.2733	54.856
0.2766	54.856
0.2800	54.856
0.2833	54.861
0.2866	54.861
0.2900	54.866
0.2933	54.866
0.2966	54.861
0.3000	54.870
0.3033	54.870
0.3066	54.870
0.3100	54.870
0.3133	54.875
0.3166	54.875
0.3200	54.875
0.3233	54.875
0.3266	54.875
0.3300	54.885
0.3333	54.880
0.3500	54.894
0.3666	54.904
0.3833	54.904
0.4000	54.913
0.4166	54.923
0.4333	54.932
0.4500	54.937
0.4666	54.947
0.4833	54.956
0.5000	54.961
0.5166	54.971
0.5333	54.975
0.5500	54.985
0.5666	55.080
0.5833	54.932
0.6000	55.009
0.6166	55.014
0.6333	55.018
0.6500	55.023
0.6666	55.028
0.6833	55.037
0.7000	55.042
0.7166	55.047
0.7333	55.057
0.7500	55.061
0.7666	55.066
0.7833	55.076
0.8000	55.080
0.8166	55.090
0.8333	55.090
0.8500	55.100
0.8666	55.104

0.8833	55.109
0.9000	55.114
0.9166	55.119
0.9333	55.123
0.9500	55.128
0.9666	55.133
0.9833	55.138
1.0000	55.147
1.2000	55.219
1.4000	55.271
1.6000	55.310
1.8000	55.353
2.0000	55.386
2.2000	55.410
2.4000	55.434
2.6000	55.453
2.8000	55.472
3.0000	55.486
3.2000	55.496
3.4000	55.510
3.6000	55.520
3.8000	55.529
4.0000	55.539
4.2000	55.544
4.4000	55.553
4.6000	55.558
4.8000	55.567
5.0000	55.567
5.2000	55.577
5.4000	55.577
5.6000	55.572
5.8000	55.582
6.0000	55.587
6.2000	55.587
6.4000	55.591
6.6000	55.591
6.8000	55.591
7.0000	55.596
7.2000	55.596
7.4000	55.596
7.6000	55.601
7.8000	55.601
8.0000	55.606
8.2000	55.596
8.4000	55.601
8.6000	55.606
8.8000	55.606
9.0000	55.606
9.2000	55.610
9.4000	55.606
9.6000	55.615
9.8000	55.610

10.0000	55.615
12.0000	55.615
14.0000	55.620
16.0000	55.625
18.0000	55.625
20.0000	55.696

Texaco - Eunice North Gas Plant, NM.
Eunice, NM.

Hydraulic Conductivity Calculations
Using Bouwer and Rice Method for Unconfined Aquifers
Monitor well: MW-2 *Date:* 04/11/97

L =	13.02	feet	Length of the screen (if greater than H, take L = H)
rw =	0.3281	feet	Well radius or radius of casing plus thickness of gravel envelope
rc =	0.2275	feet	Well casing radius
D =	50	feet	Saturated thickness of the aquifer at the well
H =	13.02	feet	Height of the static water column in the well
L/rw =	39.68		
ln[(D-H)/rw] =	4.72		(If (D-H)/rw exceeds 6 use the maximum value of 6)

From Figure relating coefficients A, B, C to L/rw

A = 2.8
B = 0.5
C = NA Used only if D = H

From Y v/s t graph

Yt = 0.50 feet @ t = 60 sec
Yo = 1.00 feet (Initial drawdown)
(1/t) ln(Yo/Yt) = 0.0116 1/sec

ln(Re/rw) = [1.1/ln(H/rw) + (A + B ln[(D-H)/rw])/(L/rw)]^-1 for D>H
= [1.1/ln(H/rw) + C/(L/rw)]^-1 for D=H
= 2.3314

Where Re = Effective radius and A, B, and C are derived from Bouwer & Rice curves.

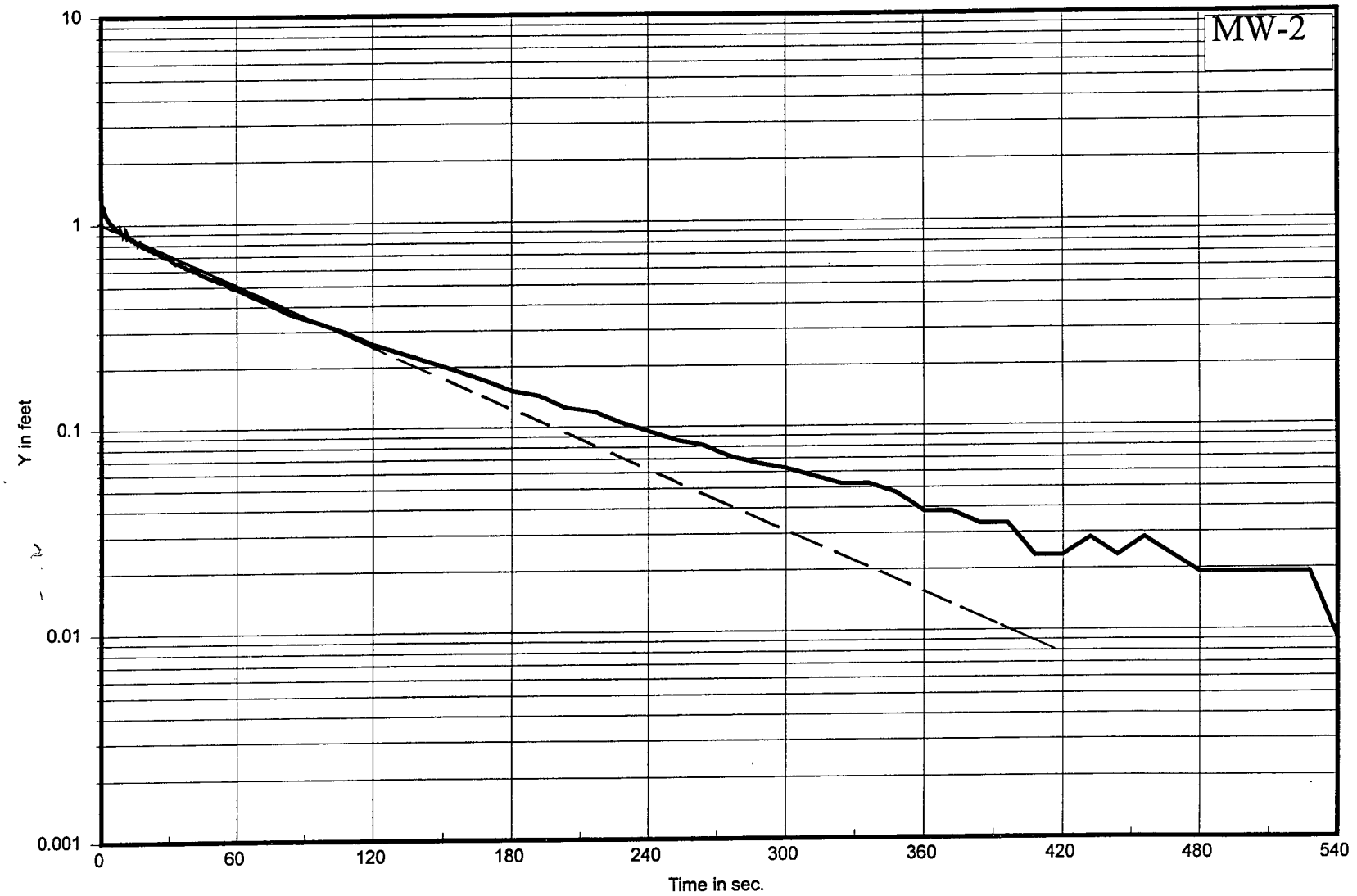
Rising head slug test

$$K = \frac{r_c^2 \ln\left(R_e / r_w\right)}{2L} \frac{1}{t} \ln\left(\frac{y_o}{y_t}\right)$$

K = 5.35E-05 ft/sec
4.6251 ft/day

Texaco - Eunice North Gas Plant

MW-2 Rising Head Slug Test



SE1000C
Environmental Logger
04/14 08:15

Unit# 02098 Test 1

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	05029
Reference	55.630
Linearity	0.110
Scale factor	15.060
Offset	-0.320
Delay mSEC	50.000

Step 1 04/11 12:56:57

Elapsed Time	INPUT 1
0.0000	56.952
0.0033	56.923
0.0066	56.894
0.0100	56.861
0.0133	56.842
0.0166	56.842
0.0200	56.813
0.0233	56.780
0.0266	56.775
0.0300	56.766
0.0333	56.747
0.0366	56.732
0.0400	56.727
0.0433	56.718
0.0466	56.708
0.0500	56.699
0.0533	56.689
0.0566	56.680
0.0600	56.675
0.0633	56.665
0.0666	56.661
0.0700	56.656
0.0733	56.651
0.0766	56.642
0.0800	56.642
0.0833	56.632
0.0866	56.627
0.0900	56.622
0.0933	56.618

0.0966	56.613
0.1000	56.608
0.1033	56.608
0.1066	56.599
0.1100	56.594
0.1133	56.594
0.1166	56.589
0.1200	56.584
0.1233	56.579
0.1266	56.579
0.1300	56.575
0.1333	56.570
0.1366	56.570
0.1400	56.560
0.1433	56.556
0.1466	56.551
0.1500	56.556
0.1533	56.546
0.1566	56.541
0.1600	56.541
0.1633	56.541
0.1666	56.532
0.1700	56.527
0.1733	56.532
0.1766	56.522
0.1800	56.522
0.1833	56.517
0.1866	56.522
0.1900	56.503
0.1933	56.508
0.1966	56.517
0.2000	56.494
0.2033	56.494
0.2066	56.508
0.2100	56.494
0.2133	56.489
0.2166	56.489
0.2200	56.489
0.2233	56.484
0.2266	56.484
0.2300	56.484
0.2333	56.474
0.2366	56.474
0.2400	56.474
0.2433	56.470
0.2466	56.465
0.2500	56.465
0.2533	56.465
0.2566	56.460
0.2600	56.455
0.2633	56.455
0.2666	56.455

0.2700	56.451
0.2733	56.446
0.2766	56.451
0.2800	56.436
0.2833	56.441
0.2866	56.436
0.2900	56.436
0.2933	56.432
0.2966	56.427
0.3000	56.432
0.3033	56.427
0.3066	56.422
0.3100	56.422
0.3133	56.417
0.3166	56.417
0.3200	56.417
0.3233	56.412
0.3266	56.412
0.3300	56.408
0.3333	56.408
0.3500	56.393
0.3666	56.384
0.3833	56.374
0.4000	56.360
0.4166	56.355
0.4333	56.346
0.4500	56.336
0.4666	56.327
0.4833	56.322
0.5000	56.317
0.5166	56.303
0.5333	56.293
0.5500	56.279
0.5666	56.279
0.5833	56.274
0.6000	56.264
0.6166	56.255
0.6333	56.245
0.6500	56.241
0.6666	56.236
0.6833	56.226
0.7000	56.221
0.7166	56.217
0.7333	56.207
0.7500	56.198
0.7666	56.193
0.7833	56.188
0.8000	56.179
0.8166	56.174
0.8333	56.169
0.8500	56.164
0.8666	56.159

0.8833	56.155
0.9000	56.150
0.9166	56.145
0.9333	56.136
0.9500	56.126
0.9666	56.121
0.9833	56.117
1.0000	56.112
1.2000	56.050
1.4000	55.992
1.6000	55.959
1.8000	55.926
2.0000	55.887
2.2000	55.863
2.4000	55.840
2.6000	55.821
2.8000	55.801
3.0000	55.782
3.2000	55.773
3.4000	55.754
3.6000	55.749
3.8000	55.735
4.0000	55.725
4.2000	55.716
4.4000	55.711
4.6000	55.701
4.8000	55.696
5.0000	55.692
5.2000	55.687
5.4000	55.682
5.6000	55.682
5.8000	55.677
6.0000	55.668
6.2000	55.668
6.4000	55.663
6.6000	55.663
6.8000	55.653
7.0000	55.653
7.2000	55.658
7.4000	55.653
7.6000	55.658
7.8000	55.653
8.0000	55.649
8.2000	55.649
8.4000	55.649
8.6000	55.649
8.8000	55.649
9.0000	55.639
9.2000	55.639
9.4000	55.644
9.6000	55.644
9.8000	55.649

10.0000	55.639
12.0000	55.644
14.0000	55.639
16.0000	55.634

Texaco - Eunice North Gas Plant, NM.
Eunice, NM.

Hydraulic Conductivity Calculations
Using Bouwer and Rice Method for Unconfined Aquifers

Monitor well: *MW-3* *Date:* *04/11/97*

L =	19.07	feet	Length of the screen (if greater than H, take L = H)
rw =	0.3281	feet	Well radius or radius of casing plus thickness of gravel envelope
rc =	0.2275	feet	Well casing radius
D =	50	feet	Saturated thickness of the aquifer at the well
H =	19.13	feet	Height of the static water column in the well
L/rw =	*58.12*		
ln[(D-H)/rw] =	*4.54*		(If ln[(D-H)/rw] exceeds 6 use the maximum value of 6)

From Figure relating coefficients A, B, C to L/rw

A = 2.8
B = 0.5
C = NA Used only if D = H

From Y v/s t graph

Yt = 0.28 feet @ t = 60 sec
Yo = 0.85 feet (Initial drawdown)
(1/t) ln(Yo/Yt) = 0.0185 1/sec

ln(Re/rw) = [1.1/ln(H/rw) + (A + B ln[(D-H)/rw])/(L/rw)]^-1 for D>H
= [1.1/ln(H/rw) + C/(L/rw)]^-1 for D=H
= 2.7947

Where Re = Effective radius and A, B, and C are derived from Bouwer & Rice curves.

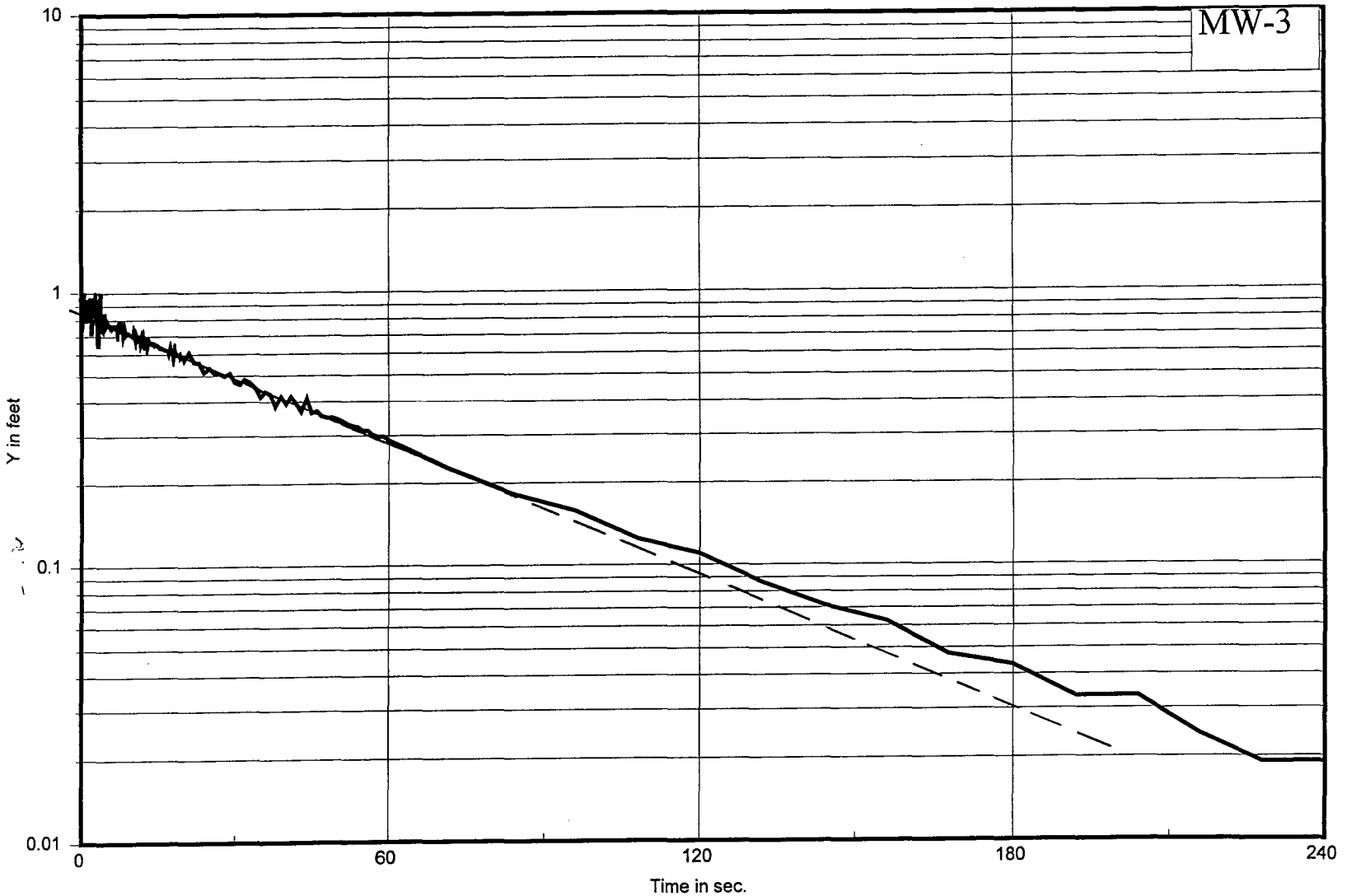
Falling head slug test

$$K = \frac{r_c^2 \ln\left(R_e / r_w\right)}{2L} \frac{1}{t} \ln\left(\frac{y_o}{y_t}\right)$$

K = 7.02E-05 ft/sec
6.0642 ft/day

Texaco - Eunice North Gas Plant

MW-3 Falling Head Slug Test



SE1000C
Environmental Logger
04/14 08:21

Unit# 02098 Test 2

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	05029
Reference	48.190
Linearity	0.110
Scale factor	15.060
Offset	-0.320
Delay mSEC	50.000

Step 0 04/11 13:44:12

Elapsed Time	INPUT 1
0.0000	46.956
0.0033	47.453
0.0066	47.429
0.0100	47.186
0.0133	47.334
0.0166	47.401
0.0200	47.338
0.0233	47.243
0.0266	47.319
0.0300	47.410
0.0333	47.229
0.0366	47.491
0.0400	47.338
0.0433	47.286
0.0466	47.214
0.0500	47.300
0.0533	47.491
0.0566	47.558
0.0600	47.458
0.0633	47.186
0.0666	47.453
0.0700	47.463
0.0733	47.420
0.0766	47.348
0.0800	47.448
0.0833	47.434
0.0866	47.410
0.0900	47.420
0.0933	47.439

0.0966	47.429
0.1000	47.434
0.1033	47.448
0.1066	47.439
0.1100	47.444
0.1133	47.439
0.1166	47.458
0.1200	47.491
0.1233	47.424
0.1266	47.467
0.1300	47.467
0.1333	47.439
0.1366	47.496
0.1400	47.482
0.1433	47.453
0.1466	47.487
0.1500	47.482
0.1533	47.482
0.1566	47.487
0.1600	47.491
0.1633	47.491
0.1666	47.496
0.1700	47.501
0.1733	47.477
0.1766	47.520
0.1800	47.491
0.1833	47.510
0.1866	47.496
0.1900	47.501
0.1933	47.539
0.1966	47.506
0.2000	47.525
0.2033	47.506
0.2066	47.553
0.2100	47.506
0.2133	47.510
0.2166	47.553
0.2200	47.525
0.2233	47.534
0.2266	47.539
0.2300	47.544
0.2333	47.539
0.2366	47.549
0.2400	47.544
0.2433	47.549
0.2466	47.549
0.2500	47.553
0.2533	47.558
0.2566	47.563
0.2600	47.563
0.2633	47.563
0.2666	47.568

0.2700	47.568
0.2733	47.573
0.2766	47.573
0.2800	47.577
0.2833	47.582
0.2866	47.592
0.2900	47.563
0.2933	47.582
0.2966	47.592
0.3000	47.611
0.3033	47.573
0.3066	47.601
0.3100	47.596
0.3133	47.601
0.3166	47.601
0.3200	47.596
0.3233	47.611
0.3266	47.606
0.3300	47.606
0.3333	47.625
0.3500	47.592
0.3666	47.635
0.3833	47.639
0.4000	47.682
0.4166	47.663
0.4333	47.687
0.4500	47.687
0.4666	47.697
0.4833	47.687
0.5000	47.721
0.5166	47.730
0.5333	47.711
0.5500	47.721
0.5666	47.744
0.5833	47.778
0.6000	47.759
0.6166	47.768
0.6333	47.811
0.6500	47.778
0.6666	47.802
0.6833	47.778
0.7000	47.802
0.7166	47.826
0.7333	47.783
0.7500	47.830
0.7666	47.826
0.7833	47.840
0.8000	47.845
0.8166	47.845
0.8333	47.850
0.8500	47.854
0.8666	47.864

0.8833	47.869
0.9000	47.873
0.9166	47.883
0.9333	47.883
0.9500	47.892
0.9666	47.897
0.9833	47.897
1.0000	47.907
1.2000	47.969
1.4000	48.012
1.6000	48.036
1.8000	48.069
2.0000	48.083
2.2000	48.107
2.4000	48.122
2.6000	48.131
2.8000	48.146
3.0000	48.150
3.2000	48.160
3.4000	48.160
3.6000	48.169
3.8000	48.174
4.0000	48.174
4.2000	48.179
4.4000	48.184
4.6000	48.179
4.8000	48.184
5.0000	48.189
5.2000	48.189
5.4000	48.189
5.6000	48.193
5.8000	48.193
6.0000	48.193
6.2000	48.193
6.4000	48.193
6.6000	48.193
6.8000	48.193
7.0000	48.193
7.2000	48.189
7.4000	48.193
7.6000	48.193
7.8000	48.193
8.0000	48.193
8.2000	48.193
8.4000	48.193
8.6000	48.193
8.8000	48.193
9.0000	48.193
9.2000	48.198
9.4000	48.193
9.6000	48.198
9.8000	48.193

10.0000	48.193
12.0000	48.198
14.0000	48.193
16.0000	48.193
18.0000	48.193

Texaco - Eunice North Gas Plant, NM.
Eunice, NM.

Hydraulic Conductivity Calculations
Using Bouwer and Rice Method for Unconfined Aquifers
Monitor well: *MW-3* *Date:* *04/11/97*

L =	13.02	feet	Length of the screen (if greater than H, take L = H)
rw =	0.3281	feet	Well radius or radius of casing plus thickness of gravel envelope
rc =	0.2275	feet	Well casing radius
D =	50	feet	Saturated thickness of the aquifer at the well
H =	13.02	feet	Height of the static water column in the well
L/rw =	*39.68*		
ln[(D-H)/r	*4.72*		(If (D-H)/rw exceeds 6 use the maximum value of 6)

From Figure relating coefficients A, B, C to L/rw
A = 2.8
B = 0.5
C = NA Used only if D = H

From Y v/s t graph
Yt = 0.28 feet @ t = 60 sec
Yo = 0.82 feet (Initial drawdown)
(1/t) ln(Yo/Yt) = 0.0179 1/sec

ln(Re/rw) = [1.1/ln(H/rw) + (A + B ln[(D-H)/rw])/(L/rw)]^-1 for D>H
= [1.1/ln(H/rw) + C/(L/rw)]^-1 for D=H
= 2.3314
Where Re = Effective radius and A, B, and C are derived from Bouwer & Rice curves.

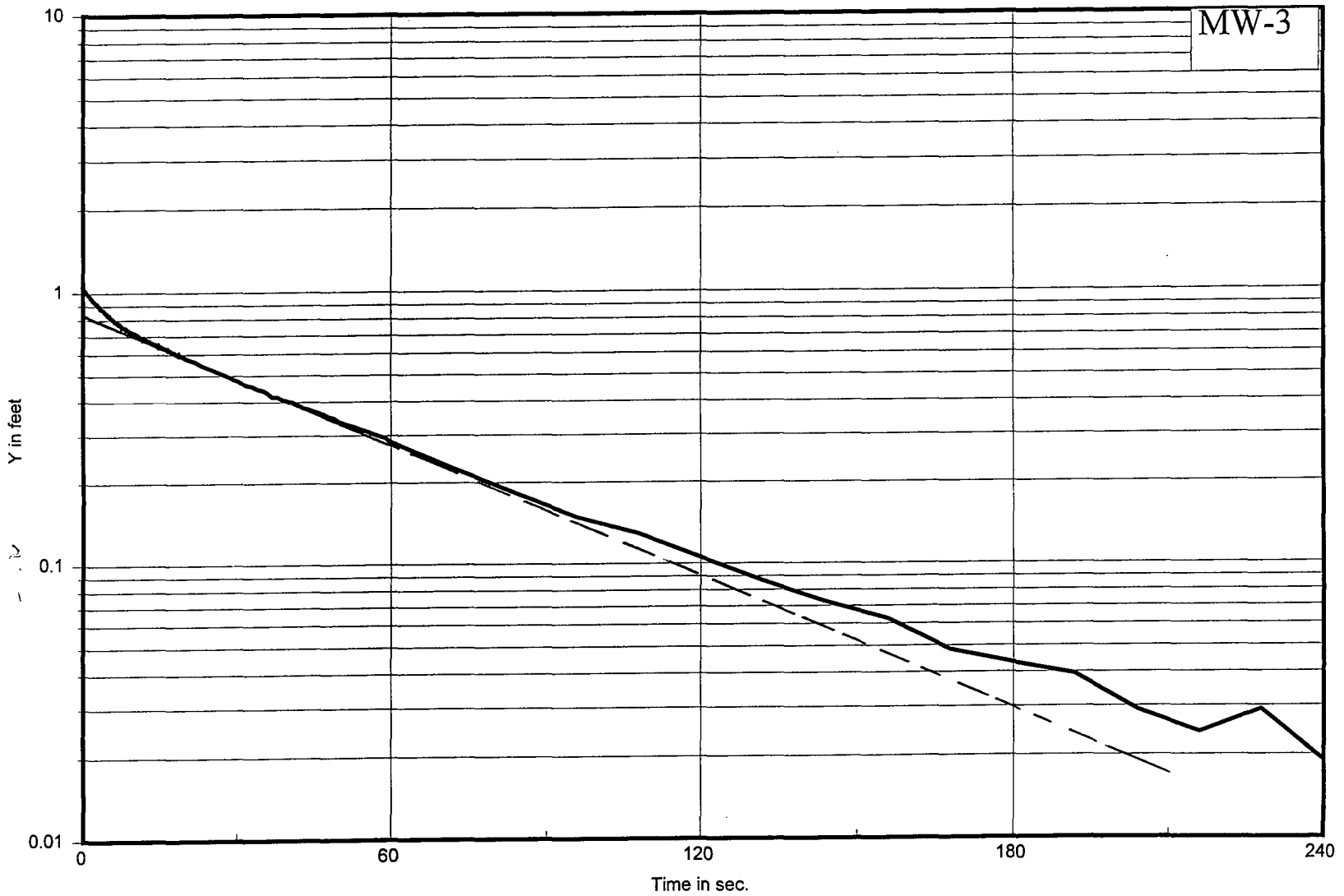
Rising head slug test

$$K = \frac{r_c^2 \ln\left(R_e / r_w\right)}{2L} \frac{1}{t} \ln\left(\frac{y_o}{y_t}\right)$$

K = 8.30E-05 ft/sec
7.1699 ft/day

Texaco - Eunice North Gas Plant

MW-3 Rising Head Slug Test



SE1000C
Environmental Logger
04/14 08:24

Unit# 02098 Test 2

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	05029
Reference	48.190
Linearity	0.110
Scale factor	15.060
Offset	-0.320
Delay mSEC	50.000

Step 1 04/11 14:04:09

Elapsed Time	INPUT 1
0.0000	49.239
0.0033	49.224
0.0066	49.215
0.0100	49.201
0.0133	49.196
0.0166	49.182
0.0200	49.177
0.0233	49.162
0.0266	49.153
0.0300	49.148
0.0333	49.134
0.0366	49.129
0.0400	49.115
0.0433	49.110
0.0466	49.105
0.0500	49.096
0.0533	49.086
0.0566	49.076
0.0600	49.067
0.0633	49.062
0.0666	49.057
0.0700	49.048
0.0733	49.038
0.0766	49.034
0.0800	49.024
0.0833	49.024
0.0866	49.014
0.0900	49.005
0.0933	49.000

0.0966	48.995
0.1000	48.986
0.1033	48.981
0.1066	48.976
0.1100	48.971
0.1133	48.962
0.1166	48.967
0.1200	48.962
0.1233	48.952
0.1266	48.943
0.1300	48.943
0.1333	48.938
0.1366	48.938
0.1400	48.929
0.1433	48.929
0.1466	48.924
0.1500	48.919
0.1533	48.914
0.1566	48.914
0.1600	48.909
0.1633	48.905
0.1666	48.905
0.1700	48.895
0.1733	48.900
0.1766	48.895
0.1800	48.890
0.1833	48.886
0.1866	48.881
0.1900	48.881
0.1933	48.871
0.1966	48.876
0.2000	48.871
0.2033	48.866
0.2066	48.866
0.2100	48.862
0.2133	48.862
0.2166	48.862
0.2200	48.852
0.2233	48.852
0.2266	48.847
0.2300	48.847
0.2333	48.843
0.2366	48.843
0.2400	48.838
0.2433	48.833
0.2466	48.838
0.2500	48.828
0.2533	48.833
0.2566	48.828
0.2600	48.824
0.2633	48.824
0.2666	48.819

0.2700	48.819
0.2733	48.819
0.2766	48.814
0.2800	48.809
0.2833	48.809
0.2866	48.809
0.2900	48.800
0.2933	48.800
0.2966	48.800
0.3000	48.795
0.3033	48.790
0.3066	48.790
0.3100	48.785
0.3133	48.790
0.3166	48.781
0.3200	48.781
0.3233	48.781
0.3266	48.776
0.3300	48.776
0.3333	48.771
0.3500	48.761
0.3666	48.752
0.3833	48.738
0.4000	48.728
0.4166	48.718
0.4333	48.709
0.4500	48.699
0.4666	48.690
0.4833	48.680
0.5000	48.671
0.5166	48.661
0.5333	48.652
0.5500	48.647
0.5666	48.637
0.5833	48.633
0.6000	48.623
0.6166	48.609
0.6333	48.609
0.6500	48.599
0.6666	48.594
0.6833	48.590
0.7000	48.580
0.7166	48.570
0.7333	48.566
0.7500	48.561
0.7666	48.556
0.7833	48.551
0.8000	48.542
0.8166	48.537
0.8333	48.528
0.8500	48.523
0.8666	48.518

0.8833	48.513
0.9000	48.508
0.9166	48.504
0.9333	48.499
0.9500	48.494
0.9666	48.489
0.9833	48.485
1.0000	48.475
1.2000	48.418
1.4000	48.375
1.6000	48.341
1.8000	48.322
2.0000	48.298
2.2000	48.279
2.4000	48.265
2.6000	48.255
2.8000	48.241
3.0000	48.236
3.2000	48.232
3.4000	48.222
3.6000	48.217
3.8000	48.222
4.0000	48.212
4.2000	48.217
4.4000	48.208
4.6000	48.208
4.8000	48.203
5.0000	48.198
5.2000	48.198
5.4000	48.198
5.6000	48.198
5.8000	48.198
6.0000	48.193
6.2000	48.193
6.4000	48.193
6.6000	48.193
6.8000	48.193
7.0000	48.189
7.2000	48.198
7.4000	48.193
7.6000	48.193
7.8000	48.189
8.0000	48.193
8.2000	48.193
8.4000	48.193
8.6000	48.193
8.8000	48.193
9.0000	48.193
9.2000	48.189
9.4000	48.193
9.6000	48.193
9.8000	48.189

10.0000	48.193

Texaco - Eunice North Gas Plant, NM.
Eunice, NM.

Hydraulic Conductivity Calculations
Using Bouwer and Rice Method for Unconfined Aquifers

Monitor well: MW-4 *Date:* 04/11/97

L =	18.86	feet	Length of the screen (if greater than H, take L = H)
rw =	0.3281	feet	Well radius or radius of casing plus thickness of gravel envelope
rc =	0.2275	feet	Well casing radius
D =	50	feet	Saturated thickness of the aquifer at the well
H =	18.86	feet	Height of the static water column in the well
L/rw =	*57.48*		
ln[(D-H)/rw] =	*4.55*		(If ln[(D-H)/rw]exceeds 6 use the maximum value of 6)

From Figure relating coefficients A, B, C to L/rw

A = 2.8
B = 0.5
C = NA *Used only if D = H*

From Y v/s t graph

Yt = 0.47 feet @ t = 60 sec
Yo = 0.95 feet (Initial drawdown)
(1/t) ln(Yo/Yt) = 0.0117 1/sec

ln(Re/rw) = [1.1/ln(H/rw) + (A + B ln[(D-H)/rw])/(L/rw)]^-1 for D>H
= [1.1/ln(H/rw) + C/(L/rw)]^-1 for D=H
= 2.7792

Where Re = Effective radius and A, B, and C are derived from Bouwer & Rice curves.

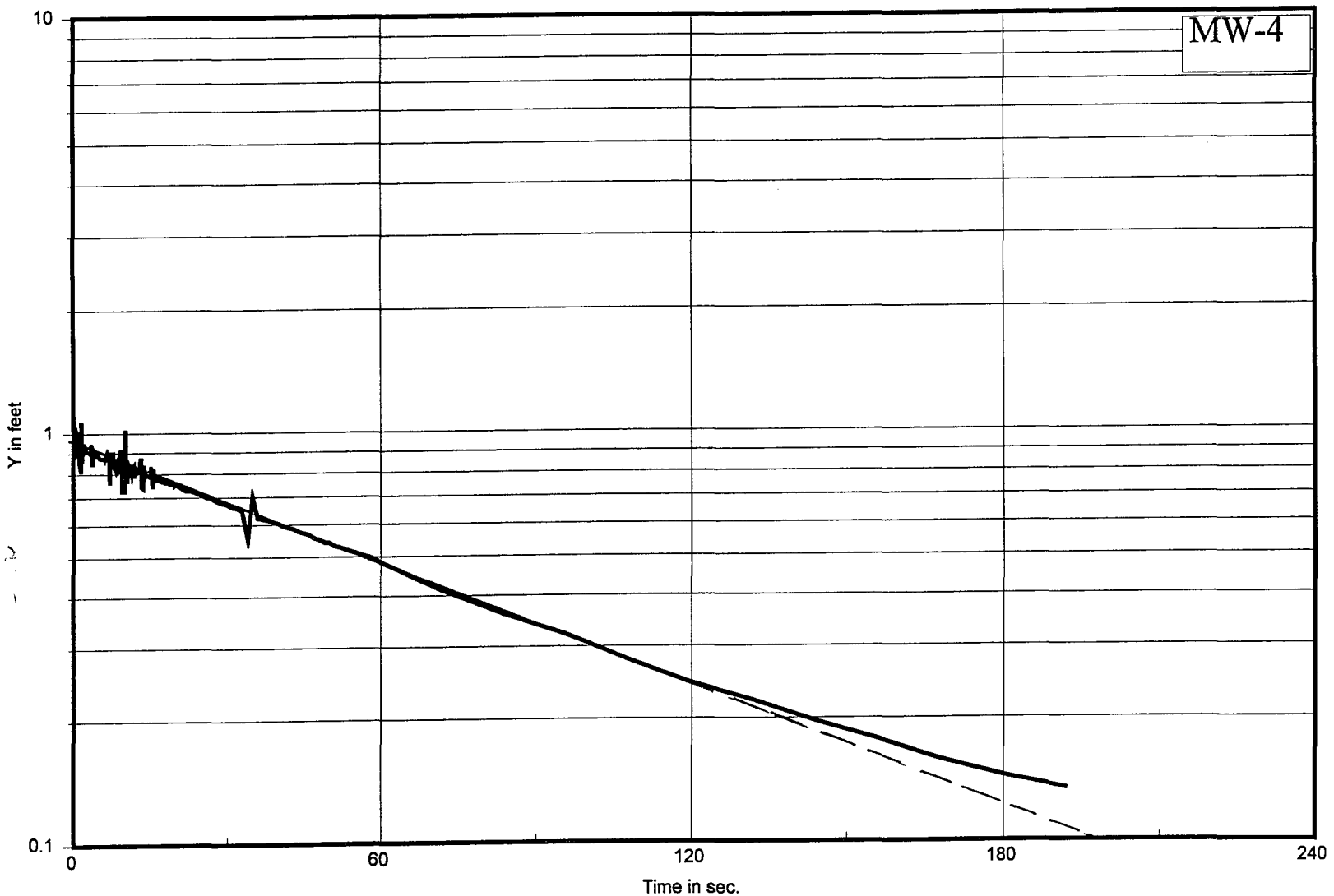
Falling head slug test

$$K = \frac{r_c^2 \ln\left(R_e / r_w\right)}{2L} \frac{1}{t} \ln\left(\frac{y_o}{y_t}\right)$$

K = 4.47E-05 ft/sec
3.8643 ft/day

Texaco - Eunice North Gas Plant

MW-4 Falling Head Slug Test



Highlander Environmental Corp., 1910 N. Big Spring St., Midland, TX - 79705.

SE1000C
Environmental Logger
04/14 08:27

Unit# 02098 Test 3

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	05029
Reference	47.850
Linearity	0.110
Scale factor	15.060
Offset	-0.320
Delay mSEC	50.000

Step 0 04/11 14:31:58

Elapsed Time	INPUT 1
0.0000	46.894
0.0033	47.138
0.0066	46.985
0.0100	46.780
0.0133	47.042
0.0166	47.009
0.0200	47.138
0.0233	47.014
0.0266	46.980
0.0300	47.128
0.0333	47.076
0.0366	47.057
0.0400	47.095
0.0433	47.085
0.0466	47.085
0.0500	47.104
0.0533	47.100
0.0566	47.104
0.0600	47.109
0.0633	47.114
0.0666	47.119
0.0700	47.119
0.0733	47.128
0.0766	47.128
0.0800	47.133
0.0833	47.143
0.0866	47.100
0.0900	46.899
0.0933	47.009
0.0966	46.765
0.1000	46.861
0.1033	46.866
0.1066	47.052

0.1100	48.284
0.1133	47.730
0.1166	46.603
0.1200	47.038
0.1233	47.358
0.1266	47.286
0.1300	46.995
0.1333	47.272
0.1366	47.214
0.1400	47.157
0.1433	47.186
0.1466	47.233
0.1500	47.181
0.1533	47.214
0.1566	47.210
0.1600	47.214
0.1633	47.219
0.1666	47.214
0.1700	47.224
0.1733	47.224
0.1766	47.229
0.1800	47.233
0.1833	47.233
0.1866	47.238
0.1900	47.238
0.1933	47.243
0.1966	47.248
0.2000	47.248
0.2033	47.252
0.2066	47.257
0.2100	47.257
0.2133	47.262
0.2166	47.257
0.2200	47.272
0.2233	47.272
0.2266	47.272
0.2300	47.276
0.2333	47.272
0.2366	47.286
0.2400	47.281
0.2433	47.286
0.2466	47.286
0.2500	47.291
0.2533	47.291
0.2566	47.295
0.2600	47.300
0.2633	47.300
0.2666	47.305
0.2700	47.305
0.2733	47.310
0.2766	47.310
0.2800	47.310
0.2833	47.315
0.2866	47.319
0.2900	47.319
0.2933	47.324

0.2966	47.324
0.3000	47.329
0.3033	47.329
0.3066	47.329
0.3100	47.324
0.3133	47.362
0.3166	47.329
0.3200	47.348
0.3233	47.343
0.3266	47.348
0.3300	47.348
0.3333	47.348
0.3500	47.362
0.3666	47.377
0.3833	47.386
0.4000	47.401
0.4166	47.405
0.4333	47.415
0.4500	47.429
0.4666	47.439
0.4833	47.448
0.5000	47.458
0.5166	47.434
0.5333	47.472
0.5500	47.482
0.5666	47.491
0.5833	47.506
0.6000	47.491
0.6166	47.510
0.6333	47.525
0.6500	47.530
0.6666	47.534
0.6833	47.539
0.7000	47.549
0.7166	47.558
0.7333	47.563
0.7500	47.568
0.7666	47.587
0.7833	47.606
0.8000	47.587
0.8166	47.558
0.8333	47.587
0.8500	47.558
0.8666	47.620
0.8833	47.592
0.9000	47.616
0.9166	47.620
0.9333	47.625
0.9500	47.630
0.9666	47.611
0.9833	47.635
1.0000	47.639
1.2000	47.687
1.4000	47.730
1.6000	47.754
1.8000	47.768

2.0000	47.787
2.2000	47.797
2.4000	47.802
2.6000	47.816
2.8000	47.816
3.0000	47.826
3.2000	47.826
3.4000	47.830
3.6000	47.830
3.8000	47.835
4.0000	47.835
4.2000	47.835
4.4000	47.840
4.6000	47.840
4.8000	47.845
5.0000	47.845
5.2000	47.845
5.4000	47.850
5.6000	47.850
5.8000	47.850
6.0000	47.845
6.2000	47.850
6.4000	47.845
6.6000	47.850
6.8000	47.845
7.0000	47.845
7.2000	47.845
7.4000	47.850
7.6000	47.850
7.8000	47.845
8.0000	47.850
8.2000	47.850
8.4000	47.854
8.6000	47.850
8.8000	47.854
9.0000	47.845
9.2000	47.850
9.4000	47.850
9.6000	47.850
9.8000	47.850
10.0000	47.854
12.0000	47.854

Texaco - Eunice North Gas Plant, NM.
Eunice, NM.

Hydraulic Conductivity Calculations
Using Bouwer and Rice Method for Unconfined Aquifers
Monitor well: *MW-4* *Date:* *04/11/97*

L =	18.86	feet	Length of the screen (if greater than H, take L = H)
rw =	0.3281	feet	Well radius or radius of casing plus thickness of gravel envelope
rc =	0.2275	feet	Well casing radius
D =	50	feet	Saturated thickness of the aquifer at the well
H =	18.86	feet	Height of the static water column in the well
L/rw =	*57.48*		
ln[(D-H)/rw] =	*4.55*		(If ln[(D-H)/rw] exceeds 6 use the maximum value of 6)

From Figure relating coefficients A, B, C to L/rw

A = 2.8
B = 0.5
C = NA Used only if D = H

From Y v/s t graph

Yt = 0.20 feet @ t = 60 sec
Yo = 0.90 feet (Initial drawdown)
(1/t) ln(Yo/Yt) = 0.0251 1/sec

ln(Re/rw) = [1.1/ln(H/rw) + (A + B ln[(D-H)/rw])/(L/rw)]^-1 for D>H
= [1.1/ln(H/rw) + C/(L/rw)]^-1 for D=H
= 2.7792

Where Re = Effective radius and A, B, and C are derived from Bouwer & Rice curves.

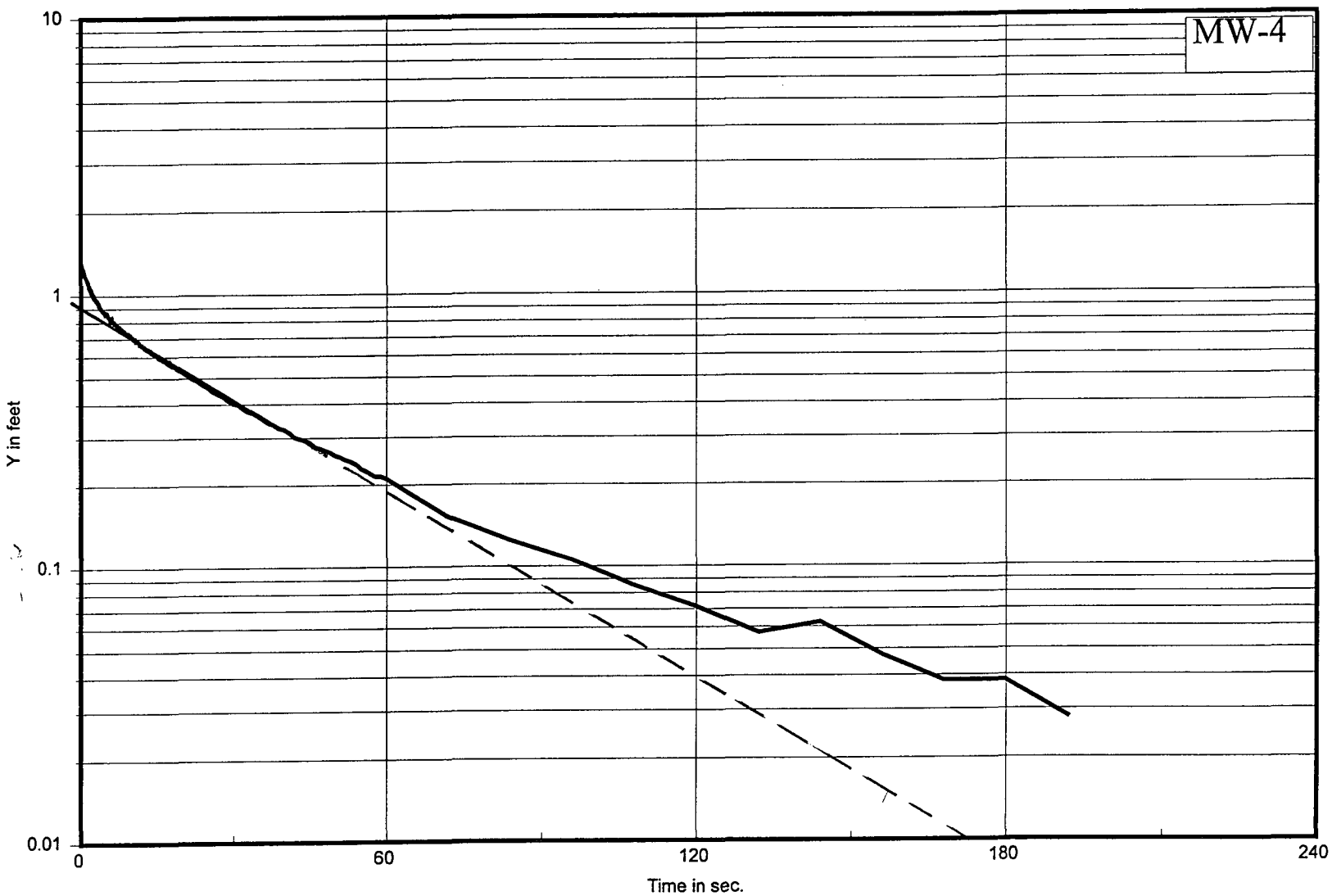
Rising head slug test

$$K = \frac{r_c^2 \ln\left(R_e / r_w\right)}{2L} \frac{1}{t} \ln\left(\frac{y_o}{y_t}\right)$$

K = 9.56E-05 ft/sec
8.2592 ft/day

Texaco - Eunice North Gas Plant

MW-4 Rising Head Slug Test



SE1000C
Environmental Logger
04/14 08:30

Unit# 02098 Test 3

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	05029
Reference	47.850
Linearity	0.110
Scale factor	15.060
Offset	-0.320
Delay mSEC	50.000

Step 1 04/11 14:45:48

Elapsed Time	INPUT 1
0.0000	49.191
0.0033	49.148
0.0066	49.110
0.0100	49.086
0.0133	49.053
0.0166	49.019
0.0200	49.000
0.0233	48.971
0.0266	48.952
0.0300	48.914
0.0333	48.900
0.0366	48.876
0.0400	48.857
0.0433	48.838
0.0466	48.819
0.0500	48.809
0.0533	48.795
0.0566	48.785
0.0600	48.766
0.0633	48.752
0.0666	48.742
0.0700	48.733
0.0733	48.723
0.0766	48.718
0.0800	48.704
0.0833	48.709
0.0866	48.695
0.0900	48.690
0.0933	48.680
0.0966	48.656
0.1000	48.671
0.1033	48.656
0.1066	48.652

0.1100	48.642
0.1133	48.637
0.1166	48.633
0.1200	48.623
0.1233	48.618
0.1266	48.618
0.1300	48.604
0.1333	48.604
0.1366	48.594
0.1400	48.594
0.1433	48.590
0.1466	48.580
0.1500	48.580
0.1533	48.575
0.1566	48.566
0.1600	48.566
0.1633	48.556
0.1666	48.551
0.1700	48.547
0.1733	48.542
0.1766	48.542
0.1800	48.532
0.1833	48.532
0.1866	48.528
0.1900	48.523
0.1933	48.513
0.1966	48.508
0.2000	48.508
0.2033	48.504
0.2066	48.499
0.2100	48.494
0.2133	48.489
0.2166	48.485
0.2200	48.485
0.2233	48.480
0.2266	48.480
0.2300	48.475
0.2333	48.470
0.2366	48.465
0.2400	48.461
0.2433	48.461
0.2466	48.456
0.2500	48.451
0.2533	48.451
0.2566	48.442
0.2600	48.442
0.2633	48.437
0.2666	48.437
0.2700	48.432
0.2733	48.427
0.2766	48.427
0.2800	48.422
0.2833	48.418
0.2866	48.418
0.2900	48.413
0.2933	48.418

0.2966	48.408
0.3000	48.403
0.3033	48.403
0.3066	48.399
0.3100	48.399
0.3133	48.394
0.3166	48.389
0.3200	48.389
0.3233	48.384
0.3266	48.380
0.3300	48.380
0.3333	48.375
0.3500	48.360
0.3666	48.346
0.3833	48.337
0.4000	48.322
0.4166	48.308
0.4333	48.294
0.4500	48.284
0.4666	48.274
0.4833	48.260
0.5000	48.251
0.5166	48.246
0.5333	48.232
0.5500	48.222
0.5666	48.217
0.5833	48.208
0.6000	48.198
0.6166	48.189
0.6333	48.184
0.6500	48.174
0.6666	48.169
0.6833	48.160
0.7000	48.150
0.7166	48.146
0.7333	48.141
0.7500	48.136
0.7666	48.126
0.7833	48.122
0.8000	48.117
0.8166	48.112
0.8333	48.107
0.8500	48.103
0.8666	48.098
0.8833	48.093
0.9000	48.088
0.9166	48.079
0.9333	48.074
0.9500	48.069
0.9666	48.064
0.9833	48.064
1.0000	48.060
1.2000	48.002
1.4000	47.974
1.6000	47.955
1.8000	47.935

2.0000	47.921
2.2000	47.907
2.4000	47.912
2.6000	47.897
2.8000	47.888
3.0000	47.888
3.2000	47.878
3.4000	47.878
3.6000	47.878
3.8000	47.878
4.0000	47.869
4.2000	47.873
4.4000	47.869
4.6000	47.869
4.8000	47.869
5.0000	47.864
5.2000	47.859
5.4000	47.864
5.6000	47.864
5.8000	47.859
6.0000	47.864
6.2000	47.859
6.4000	47.859
6.6000	47.859
6.8000	47.859
7.0000	47.859
7.2000	47.859
7.4000	47.859
7.6000	47.859
7.8000	47.854
8.0000	47.859
8.2000	47.859
8.4000	47.859
8.6000	47.854
8.8000	47.859
9.0000	47.859
9.2000	47.850
9.4000	47.854
9.6000	47.859
9.8000	47.854
10.0000	47.859

APPENDIX F

Water Well Records

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well CHARLES W. JENNINGS Owner's Well No. _____
Street or Post Office Address BOX 833 1405 AVE S
City and State EUNICE, NM 88231

Well was drilled under Permit No. CP-735 and is located in the:

a. _____ ¼ S½ ¼ NE ¼ SE ¼ of Section 28 Township 21-S Range 37-E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. 19 of Block No. 2 of the NORTH EUNICE ADD.
Subdivision, recorded in LEA County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor W. L. VAN NOY License No. WD-208
Address BOX 7, OIL CENTER, NM 88266

Drilling Began 7-26-88 Completed 7-27-88 Type tools CABLE Size of hole 6 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 105 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 80 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
100 S½	105	5	RED BED	VERY WEAK WATER

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
5½	STEEL	PIPE	0	105	105	none	86	101

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by: _____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received August 1, 1988
Quad _____ FWL _____ FSL _____
File No. CP-735 Use DOMESTIC Location No. 21.37.28.42411

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	5	5	TOP SOIL
5	45	40	CALICHE
45	80	35	BROWN SAND
80	100	20	WATER SAND
100	105	5	red bed very weak water

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This for ld be executed in triplicate, preferably typewritten, and submitted appropriate district office of the State Engineer. All ons, except Section 5, shall be answered as completely and accurat possible when any well

Form WR-23 STATE ENGINEER OFFICE

FIELD ENGR. LOG

WELL RECORD

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the nearest district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1A and Section 5 need be completed.

Section 1

(Plat of 640 acres)

(A) Owner of well Millard Peck

Street and Number Box 409

City Eunice State New Mexico

Well was drilled under Permit No. CP-322 and is located in the SW ¼ ¼ ¼ of Section 28 Twp. 21 S Rge. 37 E

(B) Drilling Contractor L. L. Lyon License No. WD-208

Street and Number P. O. Box 74

City Oil Center, State New Mexico

Drilling was commenced June 8, 19 66

Drilling was completed June 10, 19 66

Elevation at top of casing in feet above sea level Total depth of well 138'

State whether well is shallow or artesian Depth to water upon completion 73'

Section 2 PRINCIPAL WATER-BEARING STRATA

No.	Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation
1	100	130	30	Very fine water sand.
2				
3				
4				
5				

Section 3 RECORD OF CASING

Dia in.	Pounds ft.	Threads in	Depth Top	Depth Bottom	Feet	Type Shoe	Perforations From	Perforations To
5 "	Welded		0	138	138	none	70	138

Section 4 RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Diameter Hole in in.	Tons Clay	No. Sacks of Cement	Methods Used

Section 5 PLUGGING RECORD

Name of Plugging Contractor License No.

Street and Number City State

Tons of Clay used Tons of Roughage used Type of roughage

Plugging method used Date Plugged 19

Plugging approved by:

Basin Supervisor

Cement Plugs were placed as follows:

No.	Depth of Plug From	Depth of Plug To	No. of Sacks Used

FOR USE OF STATE ENGINEER ONLY

Date Received

4

.343333

File No. CP-322 Use Dom Location No. 21.37.28.300

Section 6

LOG OF WELL

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color	Type of Material Encountered
0	5	5		Top soil
5	30	25	Grey	Shale
30	65	35	Grey	Lime rock
65	100	35	Grey	Dry sand
100	130	30	Grey	Very fine water sand
130	138	8	Red	Red bed.

L S Elev _____

Depth to K _____ Trc _____

Elev of K _____ Trc _____

Loc. No. [illegible]

Hydro. Survey _____ Field Check _____

SOURCE OF ALTITUDE GIVEN

Interpolated from Topo. Sheet

Determined by Inst. Leveling [illegible]

Other _____

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

W. L. Varnell Driller

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well D. M. CRISWELL Owner's Well No. _____
Street or Post Office Address PO BOX 1214
City and State EUNICE, NM 88231

Well was drilled under Permit No. CP-749 and is located in the:

a. NE ¼ SE ¼ SW ¼ ¼ of Section 28 Township 21-S Range 37-E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. 5 of Block No. 2 of the Herman Addition
Subdivision, recorded in Lea County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor W. L. Van Noy License No. WD-208

Address POBox 7, Oil Center, NM 88266

Drilling Began 6-15-90 Completed 6-22-90 Type tools Cable Size of hole 10" in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 123 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 75 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
75	100	25	Water bearing sand	
100	120	20	Red Bed	
			WATER TO SALTY TO USE	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
5" PVC			0	123			113	123

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by: _____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received July 3, 1990

Quad _____ FWL _____ FSL _____

File No. CP-749 Use DOMESTIC Location No. 21.37.28.34214

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	10	10	Top Soil
10	50	40	Caliche
50	75	25	Water Bearing sand
75	100	25	Sand Rock and sand
100	120	20	Red Bed
120	123	3	RED Bed
	Water to salty to use -		
	~~WELL TO SALTY TO USE~~ WATER		

Section 7. REMARKS AND ADDITIONAL INFORMATION

3 AM 8 21
STATE ... OFFICE
ROSWELL, ... MEXICO

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This fo... ould be executed in triplicate, preferably typewritten, and submitted ... appropriate district office of the State Engineer. A... ons, except Section 5, shall be answered as completely and accurat...

Revised June 1972

STATE ENGINEER OFFICE

FIELD ENGR. LOG

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Gulf Oil Corporation Owner's Well No. _____
Street or Post Office Address Box 670
City and State Hobbs, New Mexico

Well was drilled under Permit No. CP-513 and is located in the:

a. SW¼SE ¼ SW¼NW ¼ SW ¼ _____ ¼ of Section 28 Township 21 S Range 37E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Moranco License No. WD-449

Address Box 1919, Hobbs, New Mexico

Drilling Began Nov. 5/1972 Completed Nov. 21/1972 Type tools _____ Size of hole 9 5/8 in.

Elevation of land surface or _____ at well is 3463 ft. Total depth of well 5000 ft.

Completed well is ☐ shallow ☐ artesian. San Andres Depth to water upon completion of well 4374 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
4000	5000	1000	Dolomite	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
13 3/8	48	8	0	1241	1241	Guide	---	
9 5/8	32.3 & 36	8	0	4999	4999	Guide	4374	4888

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	1241	17 ½	----	1012	Pump and Plug
2148	4999	12 ¼	----	770	Pump and Plug

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received May 22, 1973 8:38 AM

Quad _____ FWL _____ FSL _____

File No. CP-513 Use SRO Location No. 21.37.28.31343

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	1188	1188	Red bed and sand
1188	1365	177	Anhy.
1365	2429	1064	Salt
2429	2565	136	Anhy, salt and dolomite
2565	3620	1055	Sandstone, anhy and dolomite
3620	4000	380	Dolomite and sandstone
4000	5000	1000	Dolomite

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

K. D. McPeters
Driller

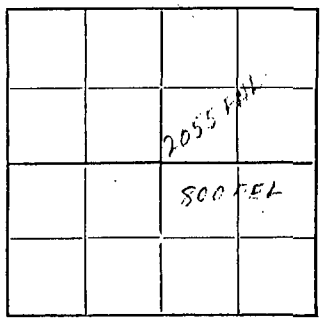
INSTRUCTIONS: This form ...ld be executed in triplicate, preferably typewritten, and submitted to ...ppropriate district office of the State Engineer. All ... ns, except Section 5, shall be answered as completely and accurately ...

Form WR-23 STATE ENGINEER OFFICE

WELL RECORD

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the nearest district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1A and Section 5 need be completed.

Section 1



(Plat of 640 acres)

(A) Owner of well Skelly Plant #2 Well #16

Street and Number

City State

Well was drilled under Permit No. and is located in the SW ¼ SE ¼ NE ¼ of Section 28 Twp. 21S Rge. 37E

(B) Drilling Contractor Grady Roberts License No.

Street and Number

City Eunice State N.M.

Drilling was commenced 19

Drilling was completed December 2, 19 64

Elevation at top of casing in feet above sea level 3428.1 Total depth of well 112'

State whether well is shallow or artesian Depth to water upon completion

Section 2 PRINCIPAL WATER-BEARING STRATA

No.	Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation
1				
2				
3				
4				
5				

Section 3 RECORD OF CASING

Dia in.	Pounds ft.	Threads in	Depth Top	Depth Bottom	Feet	Type Shoe	Perforations From	Perforations To

Section 4 RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Diameter Hole in in.	Tons Clay	No. Sacks of Cement	Methods Used

Section 5 PLUGGING RECORD

Name of Plugging Contractor License No.

Street and Number City State

Tons of Clay used Tons of Roughage used Type of roughage

Plugging method used Date Plugged 19

Plugging approved by:

Basin Supervisor

Cement Plugs were placed as follows:

No.	Depth of Plug From	Depth of Plug To	No. of Sacks Used

FOR USE OF STATE ENGINEER ONLY

Date Received

File No. Use Location No. 21.37.28.243221

Skelly Plant #2 Well #16
Drilled: December 2, 1964
Driller: Grady Roberts, Eunice, N.M.
Location: 21.37.28.243 Elevation: 3428.1

Section 6

LOG OF WELL

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color	Type of Material Encountered
0	4			Soil
4	24			Caliche
24	70			Sand and caliche
70	75			Sand
75	87			Water sand
87	106			Shale--sand--gravel
106	112			Red shale
				L S Elev 3428'
				Depth to K Trc 106'
				Elev of K Trc 3322'
				Loc. No. 21.37.28.243221
				Hydro. Survey X Field Check
				SOURCE OF ALTITUDE GIVEN
				Interpolated from Topo. Sheet
				Determined by Inst. Leveling X
				Other

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

Well Driller

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well LOYD G. BLACK Owner's Well No. _____
Street or Post Office Address BOX 863
City and State EUNICE, NM 88231

Well was drilled under Permit No. CP-711 and is located in the:

a. S/E ¼ ____ ¼ NE ¼ N/E ¼ of Section 28 Township 21S Range 37E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in LEA County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor W. L. VAN NOY License No. WD 208

Address BOX 7, OIL CENTER, NM 88266

Drilling Began 10-1-87 Completed 10-2-87 Type tools CABLE Size of hole 10 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 100 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 65 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
65	100	35	water sand	
100			red bed	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
5"		PVC	0	100			80	95

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by: _____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received October 28, 1987

Quad _____ FWL _____ FSL _____

File No. CP-711 Use DOMESTIC Location No. 21.37.28.22441

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	8	8	TOP SOIL
8	65	57	CALICHE & BROWN SAND
65	100	35	BROWN SAND WATER SAND
100			RED BED

Section 7. REMARKS AND ADDITIONAL INFORMATION

STATE ENGINEER
ROSWELL, NM
OCT 28 8 21 AM '87

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This for ld be executed in triplicate, preferably typewritten, and submitt e appropriate district office of the State Engine ns, except Section 5, shall be answered as completely and accu

Form WR-23 STATE ENGINEER OFFICE

WELL RECORD

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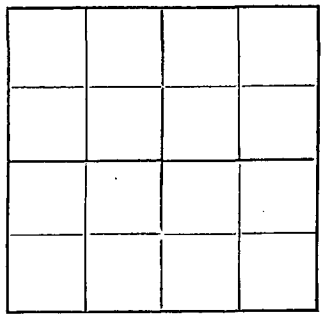
Section 1



(Plat of 640 acres)

(A) Owner of well R. L. McLean (at residence) Well #2

Street and Number

City State

Well was drilled under Permit No. and is located in the SW¼ NW ¼ NW ¼ SW ¼ of Section 27 Twp. 21S Rge. 37E

(B) Drilling Contractor Grady Roberts License No.

Street and Number

City Eunice State N.M.

Drilling was commenced 19

Drilling was completed March 7 19 63

Elevation at top of casing in feet above sea level 3419.5 Total depth of well 93'

State whether well is shallow or artesian Depth to water upon completion

Section 2 PRINCIPAL WATER-BEARING STRATA

No.	Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation
1				
2				
3				
4				
5				

Section 3 RECORD OF CASING

Dia in.	Pounds ft.	Threads in	Depth Top	Depth Bottom	Feet	Type Shoe	Perforations From	Perforations To

Section 4 RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Diameter Hole in in.	Tons Clay	No. Sacks of Cement	Methods Used

Section 5 PLUGGING RECORD

Name of Plugging Contractor License No.

Street and Number City State

Tons of Clay used Tons of Roughage used Type of roughage

Plugging method used Date Plugged 19

Plugging approved by:

Basin Supervisor

Cement Plugs were placed as follows:

No.	Depth of Plug From	Depth of Plug To	No. of Sacks Used

FOR USE OF STATE ENGINEER ONLY

Date Received

File No. Use Location No. 21.37.27.3113

R. L. McLean (at residence) Well #2
Drilled: March 7, 1963
Driller: Grady Roberts, Eunice, N.M.
Location: 21.37.27.3113 Elevation: 3419.5

Section 6

LOG OF WELL

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color	Type of Material Encountered
0	5			Soil
5	23			Caliche
23	34			Sand and caliche
34	60			Sand--dry
60	62			Sand--water
62	73			Sand
73	80			Coarse sand
80	85			Sand, gravel, red shale
85	90			Sand and gravel
90	93			Red shale

L S Elev 3420
Depth to K Trc 90
Elev of K Trc 3330

Loc. No. 21.37.27.3113?
Hydro. Survey Field Check X

SOURCE OF ALTITUDE GIVEN
Interpolated from Topo. Sheet
Determined by Inst. Leveling X
Other

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

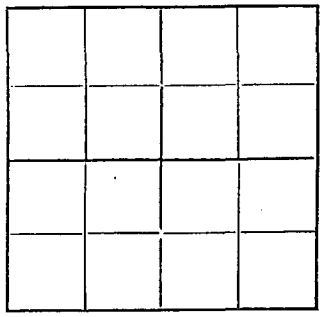
Well Driller

Form WR-23 STATE ENGINEER OFFICE

WELL RECORD

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the nearest district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1A and Section 5 need be completed.

Section 1



(Plat of 640 acres)

(A) Owner of well Skelly Plant #2 Well #11

Street and Number

City State

Well was drilled under Permit No. and is located in the NE¼SE ¼ SW ¼ NE ¼ of Section 27 Twp. 21S Rge. 37E

(B) Drilling Contractor Grady Roberts License No.

Street and Number

City Eunice State N.M.

Drilling was commenced 19

Drilling was completed May 2, 1962 19

Elevation at top of casing in feet above sea level 3397.2 Total depth of well 120'

State whether well is shallow or artesian Depth to water upon completion

Section 2 PRINCIPAL WATER-BEARING STRATA

No.	Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation
1				
2				
3				
4				
5				

Section 3 RECORD OF CASING

Dia in.	Pounds ft.	Threads in	Depth Top	Depth Bottom	Feet	Type Shoe	Perforations From	Perforations To

Section 4 RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Diameter Hole in in.	Tons Clay	No. Sacks of Cement	Methods Used

Section 5 PLUGGING RECORD

Name of Plugging Contractor License No.

Street and Number City State

Tons of Clay used Tons of Roughage used Type of roughage

Plugging method used Date Plugged 19

Plugging approved by:

Basin Supervisor

Cement Plugs were placed as follows:

No.	Depth of Plug From	Depth of Plug To	No. of Sacks Used
			133

FOR USE OF STATE ENGINEER ONLY

Date Received

File No. Use Location No. 21.37.27.2342 24313

Skelly Plant #2 Well #11
Drilled: May 2, 1962
Driller: Grady Roberts, Eunice, N.M.
Location: 21.37.27.2342 Elevation: 3397.2

Section 6

LOG OF WELL

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color	Type of Material Encountered
0	4			Sand
4	28			Caliche
28	40			Sand and caliche
40	45			Sand--dry
45	60			Water sand
60	70			Red shale and sand
70	88			Coarse sand
88	117			Sand and gravel
117	120			Red shale

L S Elev 3397
Depth to K Trc 117
Elev of K Trc 3280

Loc. No 21.37.27.
Hydro. Survey Field Check X

SOURCE OF ALTITUDE GIVEN
Interpolated from Topo. Sheet
Determined by Inst. Leveling X
Other

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

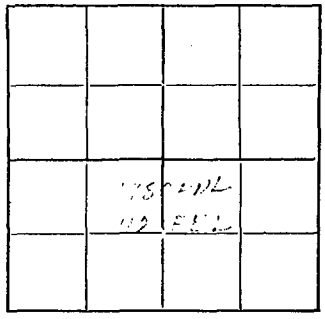
Well Driller

Form WR-23 STATE ENGINEER OFFICE

WELL RECORD

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the nearest district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1A and Section 5 need be completed. Gulf Eunice Gasoline Plant Well #4

Section 1



(Plat of 640 acres)

(A) Owner of well Gulf Oil Corp.

Street and Number

City State

Well was drilled under Permit No. and is located in the NW ¼ SE ¼ NE ¼ of Section 27 Twp. 21 Rge. 37

(B) Drilling Contractor License No.

Street and Number

City State

Drilling was commenced 19

Drilling was completed 19

Elevation at ~~top of casing~~ LS in feet above sea level 3397.1 Total depth of well 180

State whether well is shallow or artesian Depth to water upon completion

Section 2 PRINCIPAL WATER-BEARING STRATA

No.	Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation
1				
2				
3				
4				
5				

Section 3 RECORD OF CASING

Dia. in.	Pounds ft.	Threads in	Depth Top	Depth Bottom	Feet	Type Shoe	Perforations From	Perforations To
7					107		30' perf. at bottom	

Section 4 RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Diameter Hole in in.	Tons Clay	No. Sacks of Cement	Methods Used

Section 5 PLUGGING RECORD

Name of Plugging Contractor License No.

Street and Number City State

Tons of Clay used Tons of Roughage used Type of roughage

Plugging method used Date Plugged 19

Plugging approved by:

Basin Supervisor

Cement Plugs were placed as follows:

No.	Depth of Plug From	Depth of Plug To	No. of Sacks Used

FOR USE OF STATE ENGINEER ONLY

Date Received Copied from USGS Well

Schedule of Oct. 2, 1953-A.Nicholson

File No. Use Dom-Ind. Location No. 21.37.27.241 343

Section 6

LOG OF WELL

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color	Type of Material Encountered
0	49			no log
49	89			sand
89	100			sandy shale
100	180			red shale

L.S. Elev [illegible] 3397
Depth to [illegible] 89
Elev of [illegible] 3308

Loc. No. 21.37.27.24143
Hydro. Survey Field Check X

[illegible] GIVEN
[illegible] Sheet
Determined by Inst. Leveling X
Other

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

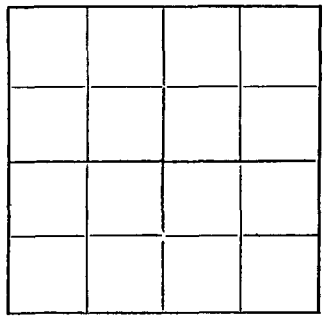
Well Driller

Form WR-23 STATE ENGINEER OFFICE

WELL RECORD

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the nearest district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1A and Section 5 need be completed. Gulf Eunice Gasoline Plant Well

Section 1



(Plat of 640 acres)

(A) Owner of well Gulf Oil Corp.

Street and Number

City State

Well was drilled under Permit No. and is located in the NE ¼ SW ¼ NE ¼ of Section 27 Twp. 21 Rge. 37

(B) Drilling Contractor License No.

Street and Number

City State

Drilling was commenced 19

Drilling was completed 19 48

Elevation at ~~top of casing~~ LS in feet above sea level 3399.5 Total depth of well 99

State whether well is shallow or artesian Depth to water upon completion

Section 2 PRINCIPAL WATER-BEARING STRATA

No.	Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation
1				
2				
3				
4				
5				

Section 3 RECORD OF CASING

Dia in.	Pounds ft.	Threads in	Depth Top	Depth Bottom	Feet	Type Shoe	Perforations From	Perforations To
7							30' at bottom	

Section 4 RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Diameter Hole in in.	Tons Clay	No. Sacks of Cement	Methods Used

Section 5 PLUGGING RECORD

Name of Plugging Contractor License No.

Street and Number City State

Tons of Clay used Tons of Roughage used Type of roughage

Plugging method used Date Plugged 19

Plugging approved by:

Basin Supervisor

Cement Plugs were placed as follows:

No.	Depth of Plug From	Depth of Plug To	No. of Sacks Used

FOR USE OF STATE ENGINEER ONLY

Date Received Copied from USGS Well
Schedule of Oct. 2, 1953-A.Nicholson

File No. Use Dom-Ind. & Obs. Location No. 21.37.27.232 324

#14

Section 6

LOG OF WELL

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color	Type of Material Encountered
0	55			no log
55	70			sand
70	82			sand and gravel
82	90			gravel
90	99			red bed
				L S Elev 3400'
				Depth to K Tic 90'
				Elev of K Tic 3310'
				Loc No 21.37.27.232321
				Hydro Survey Field Check X
				SOURCE OF ALTITUDE GIVEN
				Interpolated from Topo. Sheet
				Determined by Instrument Leveling X
				Other

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

Well Driller

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Ronnie Worden Owner's Well No. _____
Street or Post Office Address Eunice, NM
City and State _____

Well was drilled under Permit No. CP 736 and is located in the:

a. ____ ¼ ____ ¼ SW ¼ ~~XX~~NW ¼ of Section 27 Township 21S Range 37E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ Lea _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Larry's Drilling & Pump Co. License No. WD882

Address 2116 W. Bender, Hobbs, NM 88240

Drilling Began 9-10-88 Completed 9-10-88 Type tools 7 7/8 Button bit Size of hole 7 7/8 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 120 ft.

Completed well is [X] shallow [ ] artesian. Depth to water upon completion of well 76 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
64	108	44	sand & sandstone	30

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
5 1/2	160PVC		3	97	94		77	97

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received September 22, 1988

Quad _____ FWL _____ FSL _____

File No. CP-736 Use DOMESTIC Location No. 21.37.27.1310

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	7	7	top soil blow sand
7	20	13	clay & sand
20	34	14	calachie
34	60	26	sand
60	80	20	sand & red clay
80	108	28	red clay & gravel
108	115	7	red clay
115	120	5	red bed

Section 7. REMARKS AND ADDITIONAL INFORMATION

SEP 77

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This for[m] [shou]ld be executed in triplicate, preferably typewritten, and submitt[ed] [to th]e appropriate district office of the State Engineer. Al[l] [item]s, except Section 5, shall be answered as completely and accu[rately] [as] is possible when any well is

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well SHELL WESTERN E&P INC. Owner's Well No. NEDU 919S

Street or Post Office Address P.O. BOX 576

City and State HOUSTON, TX 77001-0576

Well was drilled under Permit No. CP-733 and is located in the:

a. ___ ¼ S/2 ¼ SW ¼ SW ¼ of Section 22 Township 21S Range 37E N.M.P.M.

b. Tract No. ___ of Map No. ___ of the ___

c. Lot No. ___ of Block No. ___ of the ___
Subdivision, recorded in ___ County.

d. X= ___ feet, Y= ___ feet, N.M. Coordinate System ___ Zone in the ___ Grant.

(B) WORKOVER Contractor X-PERT WELL SERVICING License No. ___

Address P.O. BOX 1918; HOBBS, NM 88241

ECOMPLETION Began 6-03-88 Completed 6-21-88 Type tools PULLING UNIT Size of top csg 13-3/8 in. 0.

Elevation of land surface or ------ at well is 3427 ft. Total depth of well 7864 ft.
PBTD @ 5056'

Completed well is [X] shallow [ ] artesian. Depth to water upon completion of well ___ ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
4010	4900	890	SAN ANDRES	400

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
13-3/8	48	8R	0	208	208			
8-5/8	32	8R	0	2926	2926	BAKER		
5-1/2" LNR	15.5, 17	8R	2730	7785	5055	LARKIN	4073	4960

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	208	17-1/4"		198	PUMP & PLUG
208	2926	11"		3102	PUMP & PLUG
2926	7785	7-7/8"		1280	PUMP & PLUG

Section 5. PLUGGING RECORD

Plugging Contractor ___

Address ___

Plugging Method ___

Date Well Plugged ___

Plugging approved by:

___
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received November 3, 1988 Quad ___ FWL ___ FSL ___

File No. CP-733 Use NOI Location No. 21.37.22.33 CTR S½ LETTE

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	6500	6500	NO SAMPLES TAKEN
6500	7373	873	DOLOMITE, LIME, SHALE
7373	7615	242	SHALE, SAND, LIME
7615	7715	100	LIME
7715	7850	135	DOLOMITE
7850	7864	14	GRANITE WASH

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

A. J. FORE

xxDxxIxxx

SUPV. REG. & PERMITTING

INSTRUCTIONS: This form 'd be executed in triplicate, preferably typewritten, and submitted tc opropriate district office of the State Engineer. All s , except Section 5, shall be answered as completely and accurate. ossible when any well is drilled, repaired or deepened