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# REPORTS

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# **CLOSURE REPORT**

**FINAL CLOSURE REPORT  
C. J. SAUNDERS EXCAVATION  
LEA COUNTY, NEW MEXICO**

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ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

**Prepared for:**

**Texaco Exploration and Production Inc.  
500 North Loraine  
Midland, Texas**

**and**

**EOTT Energy Pipeline Limited Partnership  
5805 East Highway 80  
Midland, Texas**

**Prepared by:**

**Larson & Associates, Inc.  
2501 Learmont Drive  
Midland, Texas**

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## **1.0 INTRODUCTION**

Larson and Associates, Inc. (LA) was retained to prepare a final report for closure of an excavation (Site) at the State of New Mexico C. J. Saunders Lease, located in unit letter "J", Section 18, Township 19 South, Range 36 East, Lea County, New Mexico. Figure 1 presents a Site location and topographic map.

## **2.0 BACKGROUND**

In February 1995, a crude oil spill occurred from a pipeline owned by Texas–New Mexico Pipeline Company (TNMPL). Response actions were initiated by TNMPL, and included excavating soil from the spill area to about 6 feet below ground surface (BGS). The soil was stockpiled adjacent to the excavation.

In June 1995, the New Mexico Oil Conservation Division (NMOCD) inspected the Site, and required TNMPL to excavate additional soil from the spill area to reduce concentrations of total petroleum hydrocarbons (TPH). During the excavating process, Allstate Services, a contractor retained by TNMPL, encountered a closed emergency pit previously associated with the C. J. Saunders Federal Tank Battery #1, located north of the Site. Nine soil borings (SB-1 through SB-9) were drilled under Allstate's supervision, and soil samples were collected for laboratory analysis to delineate the boundaries of the spill and former pit. One monitoring well (MW-1) was drilled north (upgradient), and two wells (MW-2 and MW-3) were drilled south (downgradient) of the Site to assess groundwater conditions. The wells were drilled between 55 to 57 feet BGS, and constructed with 4-inch diameter schedule 40 PVC threaded screen and riser.

Texaco previously operated the C. J. Saunders Federal Tank Battery #1, and submitted a sundry notice (Form C-103) to the NMOCD on August 7, 1995, providing notification of its intent to perform remedial work at the Site. Texaco proposed to excavate the hydrocarbon-affected soil from the pit, and blend clean soil to achieve a total petroleum hydrocarbon (TPH) remediation level of 1,000 milligrams per kilogram (mg/kg). The estimated pit dimensions were about 60 x 150 feet. The impact was estimated to extend

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to approximately 36 feet BGS, based on laboratory analysis of soil samples collected from the borings.

Between August 14 and October 3, 1995, Environmental Spill Control, Inc. (ESCI) excavated the pit. Dense sandstone was encountered at approximately 28 feet BGS, which prevented further digging. The excavation measured approximately 110 x 140 feet. On October 3, 1995, ESCI prepared a work plan, and proposed to collect soil samples from 5 to 7 borings drilled to about 7 to 10 feet below the bottom of the excavation to delineate the vertical limit of hydrocarbons remaining in soil below the dense sandstone. ESCI proposed to convert one boring to a temporary monitoring well, and install one permanent monitoring well (MW-4) immediately south (downgradient) of the excavation. The work plan was approved by the NMOCD on October 6, 1995.

On October 4, 1995, monitoring well MW-4 was drilled to about 53 feet BGS. The well was completed with 2-inch diameter schedule 40 PVC threaded screen and riser. ESCI installed eight borings (BH-1 through BH-8) in the bottom of the excavation on December 7, 1995, and collected soil samples for laboratory analysis. ESCI submitted a letter to the NMOCD on December 8, 1995, and stated that hydrocarbon was observed in soil samples from seven of eight borings drilled in the bottom of the excavation, and water was encountered at approximately 9 feet below the excavation. ESCI also observed groundwater and PSH in a test hole it dug to about twelve feet near the north end of the excavation. In its letter, ESCI proposed to install 5 additional monitoring wells around the excavation to monitor groundwater quality.

Monitoring wells MW-5 through MW-12 were drilled between December 9, 1995 and January 25, 1996, to depths ranging from about 54 to 95 feet BGS. Monitoring well MW-10 was drilled to about 95 feet BGS. The boring was plugged from 55 to 95 feet BGS with bentonite prior to installing the well. The well was later plugged and abandoned. All wells were constructed with 2-inch diameter schedule 40 PVC threaded screen and riser. Figure 2 presents a Site drawing showing locations of the pipeline spill, emergency pit, monitoring wells and soil piles.

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In December 1995, TNMPL deepened the excavation to about 36 feet BGS, and installed a recovery trench in the bottom of the excavation to recover PSH observed on the groundwater (January 1996). Approximately 15.72 barrels (bbls) of PSH, and 375.88 bbls of water were removed from the trench between January and May 1996.

In May 1996, TNMPL retained KEI consultants to collect groundwater samples from the monitoring wells (June and July 1996). KEI also installed eleven temporary monitoring wells (TMW-1 through TMW-11) in the bottom of the excavation (October 1996) to replace the recovery trench. KEI initiated quarterly groundwater monitoring and monthly PSH gauging of monitoring wells in October 1996, and compiled field and laboratory analyses of soil and groundwater samples collected from the previous investigations, including geologic logs and monitoring well completion diagrams, in a report titled, "Crude Oil Pipeline Release Response Summary Report, Saunders Excavation/TNM-10-95, Lea County, New Mexico, November 4, 1996", incorporated by reference. The report included data collected from borings and monitoring wells installed the Site between June 1995 and October 1996.

On August 26, 1998, the NMOCD requested TNMPL to submit a work plan to remediate hydrocarbon-affected below the bottom of the excavation (below approximately 36 feet BGS). KEI prepared a work plan (September 10, 1998), and proposed to excavate soil from the bottom the excavation to the top-of-groundwater (approximately 42 feet BGS). The work plan was approved by the NMOCD on January 26, 1999, and work began shortly thereafter. The excavated soil was replaced with clean soil to a depth about 36 feet BGS.

In early 1999 EOTT ENERGY Pipeline Limited Partnership (EOTT) acquired TNMPL, and submitted a letter to the NMOCD requesting closure of the Site based on results of soil and water samples collected from the bottom and sides of the excavation following removal of the additional soil (May 17, 1999). The NMOCD denied the closure request based on an inspection of the Site that noted hydrocarbon stained soil in the southwest

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corner of the excavation (June 17, 2000). On September 2, 1999, the NMOCD requested additional information from EOTT, including past and present groundwater quality monitoring and laboratory reports of all samples not previously submitted to the NMOCD, and a drawing showing locations of the spill, former pit, direction and magnitude of the hydraulic gradient for the Site.

On January 25, 2000, the NMOCD met with representatives of Texaco, EOTT, consultants, and personnel of the State of New Mexico Land Office to discuss options for closing the excavation. The meeting was held at the Site, and the NMOCD agreed that removing residual hydrocarbon stained soil near the southwest corner of the excavation was not practical. The NMOCD requested that the companies install two additional monitoring wells near the west and southwest edges of the excavation to determine how far the residual impact extended beyond the wall the excavation, and to assess PSH and groundwater quality. The NMOCD was receptive to filling the excavation with soil from the stockpiles as long as the soil was blended to achieve an acceptable TPH remediation level. The meeting concluded with Texaco and EOTT agreeing to jointly prepare and submit a work plan to the NMOCD agreed remedial options.

Texaco prepared a draft work plan that was reviewed and approved by EOTT. The work plan was submitted to the NMOCD on February 9, 2000. In a letter dated March 28, 2000, the NMOCD requested additional information, including justification for the proposed TPH remediation level for the blended soil, details for construction of the clay cap and monitoring wells, sampling and analysis procedures to verify attainment of the soil remediation level, protocols for monitoring well development, and groundwater sampling and analytical procedures. A response was prepared and submitted to the NMOCD on April 24, 2000 (“Response to Work Plan for Saunders Excavation Site, Unit Letter “J”, Section 18, Township 19 South, Range 37 East, Lea County, New Mexico”). The response included procedures to justify blending of the soil piles to achieve a TPH remediation level of 3,000 to 5,000 mg/kg.

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On April 13, 2000, composite soil samples were collected from the soil piles and discrete samples were collected from the bottom of the excavation. The samples were delivered under chain-of-custody control to Trace Analysis, Inc. (Trace), and analyzed for TPH, including gasoline range organics (GRO) and diesel range organics (DRO), using EPA method SW-846-8015. Samples Comp. #2 and #11 from soil piles #2 and #11, respectively, were also analyzed for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) since headspace readings exceeded 100 parts per million (ppm), as allowed by the NMOCD. The sample recording the highest GRO and DRO measurements (Sample Comp. #4) was tested using the synthetic precipitation leaching procedure (SPLP) to determine if hydrocarbons in the soil sample were mobile. The SPLP procedure was performed by Trace using EPA test method SW-846-1312.

The laboratory did not report benzene above the test method detection limit of 0.05 mg/kg in samples Comp. # 2 and #11, and was well below the NMOCD Recommended Remediation Action Level (RRAL) of 10 mg/kg. Total BTEX was reported at 1.624 mg/kg (Comp. #2), and 0.742 mg/kg (Comp. #11), and was also below the RRAL of 50 mg/kg. Sample Comp. #4 reported the highest TPH concentration (2527 mg/kg), and was tested using the SPLP method, and analyzed for GRO and DRO using method 8015. The GRO or DRO concentrations were below the test method detection limits of 5 mg/kg. The results were submitted to the NMOCD in a letter dated May 8, 2000 (“Laboratory Analysis of Soil Samples from Stockpiles and Excavation, C.J. Saunders Site, Unit Letter “J”, Section 18, Township 19 South, Range 37 East, Lea County, New Mexico”). The work plan was approved by the NMOCD on May 10, 2000. Appendix A presents correspondence from the NMOCD.

### **3.0 EXCAVATION CLOSURE ACTIVITIES**

#### **3.1 Buffer Soil Placement**

A layer (buffer) of clean soil, approximately 2 feet thick, was placed over clean soil in the bottom of the excavation that replaced soil previously excavated to groundwater. Environmental Plus, Inc. (EPI), located in Eunice, New Mexico, was retained to close the

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excavation. Closure activities commenced on May 30, 2000. EPI installed grade stakes in the bottom of the excavation to control placement of the clean soil.

The depth to the top of the buffer soil was recorded near well locations MW-4 and MW-12 after the clean soil was placed in the excavation and compacted. The top of the clean soil was recorded at 35 and 38 feet BGS at well locations MW-4 and MW-12, respectively. The measurements were used to construct cross-sections for the excavation following closure. Figure 3 presents a north to south cross-section of the excavation. Figure 4 presents a west to east cross-section of the excavation. Figure 2 presents a Site drawing and cross-section locations. Appendix B (pages 1-2) presents photographs showing placement of the clean soil in the bottom of the excavation.

**3.2 Soil Blending**

Excavated soil had been piled adjacent to the west, south and east sides of the excavation, as shown on Figure 2. The soil was moved to an area near the south side of the Site in 2,500 to 3,000 cubic yard lifts for blending. The blending area measured approximately 100 x 350 feet, and had a calculated capacity of 2500 to 3000 cubic yards, assuming a lift thickness of approximately 24-inches. Grade stakes were placed around the perimeter of the blending area to ensure placement of soil to a uniform depth.

Soil from pile #8 (Comp. #8) was clean overburden removed during final excavation of the Site, and was spread across the blending area to provide a buffer between the hydrocarbon affected (blended) soil and native soil. The remaining piles of soil were moved to the blending area in 2,500 to 3,000 cubic yard lifts, and spread using two front-end loaders. Grab samples were collected from 0 to 12 inches at six (6) randomly selected locations following soil blended. The samples were composited in a sample jar, labeled, chilled in an ice chest, and hand-delivered under chain-of-custody control to Cardinal Laboratories, Inc., located in Hobbs, New Mexico. One composite sample was collected for each lift (cell) of blended soil. Forty composite samples were collected during the soil blending activities, and analyzed for GRO and DRO using method SW-846-8015. A portion of each composite sample was also retained in a plastic sample bag,

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and analyzed for headspace vapors using a PID in accordance with NMOCD guidelines. The PID was calibrated with a 100 parts per million (ppm) isobutylene standard, and measured the concentration of ionizable hydrocarbon in the headspace. No headspace readings exceeded 100 ppm, therefore, BTEX analysis was not required as allowed by the NMOCD. Table 1 presents a summary of the PID and TPH analysis of the blended soil, and calibration readings. Appendix C presents the laboratory reports.

Soil from the first lift (Cell #1), blended on June 6, 2000, recorded a PID reading of 6.5 ppm, and TPH concentration 553 mg/kg (sum of GRO and DRO). The soil was treated with an application of liquid fertilizer prior to placement in the excavation. During a telephone call on June 8, 2000, the NMOCD agreed that the blended soil would only require an application of fertilizer if the TPH concentrations were greater than 2000 mg/kg. The NMOCD also allowed the companies to apply Micro-Blaze, a commercially available bioremediation compound, to the blended soils instead of fertilizer. Micro-Blaze is a liquid nutrient additive, mixed with water at the manufacture's prescribed ratio, applied to the soil using a portable sprayer to promote degradation of the hydrocarbons by native soil microbes. The telephone call was documented in a letter to the NMOCD on June 12, 2000. Appendix D presents correspondence to the NMOCD. Appendix E presents information for the Micro-Blaze product.

Six (6) composite samples (#17, #20, #22, #35, #37 and #38) reported TPH concentrations above 2000 mg/kg that required treatment with Micro-Blaze. The TPH concentrations ranged from 2010 mg/kg (#17) to 3775 mg/kg (#35). The soil from lift #35 was placed near the top of the excavation. Sample #40 consisted of the clean buffer soil placed under the blending area, and recorded a TPH concentration of 174 mg/kg. EOTT also obtained approval from the NMOCD to place approximately 900 cubic yards of rock (caliche) into the excavation from a nearby location. No additional soil was needed to fill the excavation.

Piper Surveying Company (Piper) was contracted to survey the perimeter of the excavation, and monitoring well locations. The survey was performed on June 20, 2000,

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prior to filling the excavation, to document the location of the excavation, and provide controls for installing the additional monitoring wells that were required by the NMOCD. Appendix B (pages 3-11) presents photographs of the soil blending and nutrient application, excavation filling process.

**3.3 Clay Cap and Topsoil Placement**

A cap consisting of compacted red clay was placed over the blended soil after the excavation was filled. The clay was acquired from a borrow area located near the Site, and was compacted to a uniform thickness of approximately 2 feet. The cap was contoured to the surrounding topography to promote storm water runoff.

John West Engineering (West) was contracted to perform field density tests to ensure compaction to 95% proctor density. Field density tests were performed at ten locations in accordance with method ASTM D-2922 on September 28, 2000. The density tests were performed at a depth of approximately 12 inches, and ranged from 95.27% to 100.5% standard proctor density. West also collected a sample of the clay, which was analyzed for standard proctor density by Pettigrew and Associates using method ASTM D-698. Figure 2 presents the density test locations. Table 2 presents a summary of the field density tests results. Appendix F presents the field and laboratory density test data.

The cap was covered with approximately 18 inches of clean soil, and contoured to the natural drainage (south and southeast). The Site will be seeded to New Mexico State Land Office requirements. Appendix B (pages 12-13) presents photographs showing placement of the clay cap, topsoil and final grade.

**3.4 Monitoring Well Installations and Soil Samples**

Monitoring wells MW-13 and MW-14 were installed under LA supervision on December 4, 2000. The wells were installed at locations shown on Figure 2 and in accordance with the work plan. Scarborough Drilling, Inc., drilled the wells to depths of 60 feet BGS using a truck-mounted air rotary drilling rig, and collected soil samples at depths of 10, 20, 30, 35, 40, and 43 feet BGS using a 1-foot long core (jam tube) sampler. The

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samples were placed in clean sample containers, labeled, chilled in an ice chest and delivered under chain-of-custody control to Trace Analysis, Inc. The samples were analyzed for GRO and DRO using method SW-846-8015. The samples from 43 feet BGS were not analyzed since groundwater stabilized in wells MW-13 and MW-14 at 43.92 and 42.67 feet BGS, respectively. A portion of each sample was also retained in a plastic sample bag and analyzed using a PID. The TPH and PID analyses are summarized in Table 3. Appendix C presents the laboratory reports.

Referring to Table 3, TPH was below the test method detection limits of 5 mg/kg (GRO) and 50 mg/kg (DRO) in all samples analyzed. These results confirm that native soils at locations MW-13 and MW-14 are not impacted by petroleum hydrocarbon. Further, these results conclude that residual hydrocarbon staining observed near the southwest corner of the excavation has limited lateral extent. The PID readings ranged from 4.1 ppm (MW-14, 10 feet) to 7.7 ppm (MW-14, 35 feet). The soil samples were not analyzed for BTEX since PID readings were well below 100 ppm, as allowed by the NMOCD. Appendix G presents boring logs for wells MW-13 and MW-14.

Monitoring wells MW-13 and MW-14 were constructed with 2-inch diameter schedule 40 PVD threaded screen and riser. Depth-to-groundwater was measured in wells MW-3, MW-4, and MW-8 through MW-12 on December 4, 2000, to determine vertical placement of well screens in wells MW-13 and MW-14. The depth-to-groundwater ranged from 41.46 feet BGS (MW-3) to 45.16 feet BGS (MW-8), and groundwater was estimated at approximately 44 feet BGS at the proposed well locations. The well screens were positioned in the boreholes with approximately 15 feet of screen in groundwater. Approximately 5 feet of screen extends above groundwater to observe PSH, and compensate for seasonal groundwater fluctuation. The well screens were surrounded with 8-16 graded silica sand placed to a depth approximately 2 feet above the screen. A layer of bentonite chips, approximately 2 feet thick, was placed above the sand, and hydrated with potable water. The remainder of the borehole annulus was filled with cement and bentonite grout to approximately one (1) foot BGS. Each well was secured with a steel locking above-grade cover anchored in a concrete apron measuring

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approximately 3' x 3' x 6". Table 4 presents a summary of drilling and completion details for monitoring wells. Appendix G presents construction diagrams for wells MW-13 and MW-14.

An electric submersible pump was used to remove fine-grained sediment disturbed during drilling. The water was conveyed to a portable tank through dedicated polyethylene tubing that was discarded between wells. The purged water was later disposed in a permitted well operated by Chaparral Services. The submersible pump and electric lead were thoroughly washed between wells using a solution of potable water and laboratory-grade detergent, and rinsed with distilled water. Piper surveyed the wells for top-of-casing and ground elevation on December 15, 2000.

**3.5 Depth-to-Groundwater and Groundwater Samples**

Depth-to-groundwater was measured in all wells on June 20, 2000 prior to filling the excavation, and December 5, 2000, following installation of wells MW-13 and MW-14. Measurements were collected on June 20, 2000, to evaluate groundwater elevation fluctuations that may have occurred during closure of the excavation. Measurements were obtained on December 5, 2000, to prepare a final depth-to-groundwater and groundwater potentiometric surface drawings for the Site. Table 4 presents depth-to-groundwater measurements from the wells on June 20, 2000 and December 5, 2000. Figure 5 presents a depth-to-groundwater map for the Site on December 5, 2000. Figure 6 presents a groundwater potentiometric map for the Site on December 5, 2000. Depth-to-groundwater measurements for wells MW-13 and MW-14 are also displayed on boring logs and well completion diagrams presented in Appendix G.

Referring to Figure 5, depth-to-groundwater ranged from 44.72 feet BGS at well MW-8 (upgradient) to 41.23 feet BGS at well MW-3 (downgradient) on December 5, 2000. The groundwater level was well below the bottom of the blended soil, which was placed in the excavation at approximately 36 feet BGS. The depth-to-groundwater decreases from northwest to southeast across the Site, and is consistent with the topographic slope. Depth-to-groundwater measurements from June 20, 2000 and

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December 5, 2000, indicate that depth-to-groundwater increased slightly, likely due to natural fluctuation of the groundwater surface. No PSH was observed in the wells on June 20, 2000 or December 4, 2000.

Referring to Figure 6, the elevation of the groundwater (potentiometric) surface ranged from 3644.02 feet above mean sea level (AMSL) at location MW-6 (upgradient) to 3643.33 feet AMSL at location MW-2 (downgradient) on December 5, 2000. The direction of groundwater flow was from northwest to southeast at a gradient of approximately 0.0001 feet per foot. The Site groundwater flow direction is consistent with the regional groundwater flow direction.

Groundwater samples were collected from the monitoring well MW-9 on December 5, 2000, and from the remaining wells on December 6, 2000. The wells were purged prior to sampling using an electric submersible pump. Approximately 3 casing-volumes of groundwater was removed from each well, and conveyed to a portable tank through dedicated polyethylene tubing. The purged water was later disposed in a permitted well operated by Chaparral Services. The tubing was discarded between wells, and the submersible pump and electric lead were thoroughly washed between wells using a solution of potable water and laboratory-grade detergent, and rinsed with distilled water.

Groundwater samples were collected from the wells using dedicated disposable polyethylene bailers and nylon line. The groundwater was carefully transferred from the bailer to laboratory-prepared containers, labeled, chilled in an ice chest, and transferred under chain-of-custody control to Trace Analysis, Inc., located in Lubbock, Texas. The samples were analyzed for BTEX, anions, cations, and total dissolved solids (TDS). A duplicate sample and trip blank (BTEX only) were also analyzed for Quality Assurance/Quality Control (QA/QC). Field measurements of pH, specific conductivity, temperature and TDS were collected at each well using a calibrated field instrument, and values were recorded in a bound field notebook. The dedicated bailers and line were discarded after each use. Table 5 presents a summary of the BTEX analyses of

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groundwater samples. Table 6 presents a summary of the anion, cation and TDS analyses of the groundwater samples. Appendix C presents the laboratory reports.

Referring to Table 5, BTEX was not detected above the test method detection limit of 0.005 milligram per liter (mg/L) in the groundwater samples from wells MW-1 through MW-14, excluding well MW-10, or the QA/QC samples. The State of New Mexico Water Quality Control Commission (NMWQCC) has established groundwater standards for the following inorganic parameters: chloride (250 mg/L), fluoride (1.6 mg/L), nitrate (10 mg/L), sulfate (600 mg/L) and TDS (1000 mg/L). Chloride ranged from 25 mg/L in wells MW-13 and MW-14 to 810 mg/L (MW-6). The chloride value reported in the sample collected from well MW-6 (810 mg/L) may be due to sediment that had accumulated in the well as a result of damage to the well casing from impact heavy equipment. The casing stick-up at well MW-6 was observed to be broken at the time the well was sampled, and a significant amount of sediment was present in the bottom of the well. The well was thoroughly purged to remove as much of the accumulated sediment as possible, however, residual chloride may have been dissolved in the groundwater. The highest chloride value reported in the remaining samples was 160 mg/L (MW-5). Fluoride was found to be above the NMWQCC standard of 1.6 mg/L in groundwater sample from all wells except MW-1, MW-5, MW-6 and MW-7. The fluoride levels are likely attributed to natural background concentrations, and are below the EPA maximum contaminant level (MCL) of 4.0 mg/L. Nitrate was not observed above the test method detection limit concentration of 1.0 mg/L in samples from wells MW-1, MW-4, MW-11 and MW-12, and was highest in the sample from MW-5 (3.5mg/L). The nitrate levels were well below the NMWQCC groundwater standard of 10 mg/L. Sulfate ranged from 35 mg/L in groundwater from well MW-4 (downgradient) to 850 mg/L was reported in the groundwater sample from well MW-7. The reading from well MW-7 is anomalous compared to the samples from the remaining wells, and was only slightly above the NMWQCC groundwater standard of 600 mg/L. The highest sulfate concentration, other than MW-7, was 160 mg/L in the sample from well MW-9. The concentrations of TDS reported in the groundwater samples ranged from 260 mg/L from well MW-4

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(downgradient) to 1900 mg/L reported in samples from wells MW-6 and MW-7 (upgradient). The NMWQCC groundwater standard for TDS is 1000 mg/L.

Environmental Technology Group, Inc. (ETGI), on behalf of EOTT, collected groundwater samples from the monitoring wells on a quarterly schedule during 2000. Groundwater samples were collected on March 22, 2000, June 28, 2000, September 25, 2000, December 8, 2000, and submitted under chain-of-custody control to Environmental Labs of Texas, Inc. Samples were not collected from well MW-6 after June 28, 2000, indicating that the well casing was likely damaged between March and June 2000. The samples were analyzed for BTEX, and TPH by method 418.1. The samples from March 22, 2000, September 25, 2000 and December 8, 2000 were also analyzed for TPH (GRO and DRO) by method SW-846-8015. ETGI is currently preparing an annual groundwater monitoring report for submittal to the NMOCD. The laboratory reports, data tables, field measurements (i.e., depth-to-groundwater and groundwater surface elevation measurements) and chain-of-custody forms are presented in Appendix H.

Referring to Appendix H, the highest benzene concentration was reported in groundwater from well MW-4 (0.01 mg/L) on March 22, 2000. The benzene concentration decreased to 0.008 mg/L on June 28, 2000, and was below the test method detection limit of 0.001 mg/L on September 25, 2000 and December 8, 2000. The NMWQCC groundwater standard for benzene is 0.01 mg/L. Toluene, ethylbenzene or xylenes were also detected at concentrations well below the NMWQCC groundwater standards of 0.75 mg/L (toluene and ethylbenzene) and 0.62 mg/L (xylenes). No concentrations of BTEX were reported above the test method detection limits in the groundwater samples on September 25, 2000 and December 8, 2000. TPH was only reported in samples from wells MW-6 (0.6 mg/L, DRO) and MW-4 (1.1 mg/L, DRO) on March 22, 2000. The NMWQCC does not have a groundwater standard for TPH.

The results of quarterly groundwater monitoring for September and December 2000 are consistent with sample results from December 15, 2000. No impacts to groundwater are

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evident at the Site based on the quarterly analysis groundwater samples from the onsite monitoring wells during 2000.

**4.0 CONCLUSIONS**

The following conclusions are based on the results of laboratory analysis of soil and groundwater samples collected during Site closure activities.

1. Soil and water sample analyses submitted by EOTT, and collected from the bottom and sides of the excavation following removal of soil in the bottom of the excavation did not report BTEX concentrations above the test method detection limits. The maximum TPH concentration (DRO) in the soil samples was 24 mg/kg;
2. The maximum TPH concentration reported in composite samples from the soil piles and bottom of the excavation (April 13, 2000) was 2527 mg/kg in sample Comp. #4. The leachate from the SPLP analysis of this sample was analyzed for TPH (GRO and DRO), and did not report concentrations above the test method detection limit of 5 mg/kg;
3. The NMOCD requested a barrier of clean soil, approximately 2 feet thick, be placed in the bottom of the excavation to provide a barrier for groundwater protection from the blended soil. The clean soil was placed in the excavation between May 30, 2000, and June 20, 2000, and compacted. The barrier of clean soil was placed over a layer of clean soil placed in the bottom of the excavation by TNMPL following removal of hydrocarbon-affected soil to the top-of-groundwater (approximately 36 to 42 feet BGS). The combined thickness of clean soil in the bottom of the excavation is estimated to be between 8 and 10 feet thick. The initial lift of blended soil (2500 to 3000 cubic yards) was also treated with liquid fertilizer prior to placing into the excavation as another barrier of protection;

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4. TPH was only reported above 2000 mg/kg in samples from six (6) lifts of soil (#17, #20, #22, #35, #37 and #38). The highest TPH value was reported in sample #35, which reported a TPH value of 3775 mg/kg. This TPH value is within the remediation level of 3000 to 5000 mg/kg approved by the NMOCD on May 10, 2000. Soil from #35 was placed near the top of the excavation. The TPH concentrations of the remaining samples ranged from 174 mg/kg (#40) to 1940 mg/kg (#18);
  
5. A layer of red clay (cap) approximately 2 feet thick was placed over the top of the blended soil, and compacted to 95% proctor density. The cap was installed, compacted and contoured to reduce infiltration from precipitation. The density measurements, performed at a depth of approximately 12 inches, ranged from 95.27 to 100.5% of standard proctor density. A layer of clean top soil, approximately 18 inches thick, was placed over the cap, and graded to contour with the natural drainage (south and southeast);
  
6. Two additional monitoring wells (MW-13 and MW-14) were installed adjacent to the west and southwest edges of the excavation, and soil samples were collected from 10, 20, 30, 35, 40 and 43 feet BGS for PID and laboratory analyses. The PID analysis of the soil samples ranged from 4.1 ppm (MW-14, 10 feet) to 7.7 ppm (MW-14, 35 feet). The laboratory reported no TPH (GRO and DRO) concentrations in the soil samples above the test method detection limit concentrations of 5 mg/kg (GRO) or 50 mg/kg (DRO). These results conclude that soils in the unsaturated zone at locations MW-13 and MW-14 are free of hydrocarbon impacts. Hydrocarbon staining observed near the southwest corner of the excavation has limited lateral extent;
  
7. On December 5, 2000, depth-to-groundwater ranged from 41.23 feet BGS at well MW-3 (downgradient) to 44.72 feet BGS at well MW-8 (upgradient). The groundwater level was well below the bottom of the blended soil, which was placed in the excavation at approximately 36 feet BGS. The depth-to-

**Final Closure Report – C. J. Saunders Excavation Site  
Lea County, New Mexico**

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groundwater decreases from northwest to southeast across the Site, and is consistent with the topographic slope;

8. The elevation of the groundwater surface ranged from 3644.02 AMSL at well MW-6 (upgradient) to 3643.33 feet AMSL at location MW-2 (downgradient). Groundwater flow was from northwest to southeast at a gradient of 0.0001 feet per foot. The groundwater flow across the Site was consistent with the regional groundwater flow direction.
9. Groundwater samples collected from well MW-1 through MW-14, excluding well MW-10, did not report BTEX concentrations above the test method detection limit of 0.005 milligram per liter (mg/L) on December 5-6, 2000. These results conclude that groundwater at the Site is free of impacts from aromatic hydrocarbons;
10. Chloride ranged from 25 mg/L in wells MW-13 and MW-14 to 810 mg/L (MW-6). The chloride value reported in the sample collected from well MW-6 (810 mg/L) may be due to sediment that had accumulated in the well as a result of damage to the well casing from impact heavy equipment. The highest chloride value reported in the remaining samples was 160 mg/L (MW-5);
11. Fluoride was found to above the NMWQCC standard of 1.6 mg/L in groundwater sample from all wells except MW-1, MW-5, MW-6 and MW-7. The fluoride levels are likely attributed to natural background concentrations, and are below the EPA maximum contaminant level (MCL) of 4.0 mg/L;
12. Nitrate was not found above the NMWQCC groundwater standard of 10 mg/L;
13. Sulfate ranged from 35 mg/L in groundwater from well MW-4 (downgradient) to 850 mg/L in the sample from well MW-7. The sulfate concentration reported in groundwater from well MW-7 is anomalous compared to the samples from the

**Final Closure Report – C. J. Saunders Excavation Site  
Lea County, New Mexico**

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remaining wells, and was only slightly above the NMWQCC groundwater standard of 600 mg/L. The highest sulfate concentration, other than MW-7, was 160 mg/L in the sample from well MW-9;

14. The TDS concentrations ranged from 260 mg/L from well MW-4 (downgradient) to 1900 mg/L reported in samples from wells MW-6 and MW-7 (upgradient). The NMWQCC groundwater standard for TDS is 1000 mg/L.
15. Groundwater samples were collected from the monitoring wells on a quarterly schedule during 2000, and analyzed for BTEX and TPH. No BTEX concentrations exceeded the NMWQCC groundwater standards. Detectable levels of TPH were only reported in samples from wells MW-6 (0.6 mg/L, DRO) and MW-4 (1.1 mg/L, DRO) on March 22, 2000. No impacts to groundwater are evident at the Site based on the quarterly analysis

#### **5.0 RECOMMENDATIONS**

The companies request that the NMOCD consider granting closure for the Site based on the results and conclusions presented herein. The companies also request approval from the NMOCD to discontinue groundwater monitoring since it has been satisfactorily demonstrated that groundwater at the Site is not impacted as a result of the crude oil spill or emergency pit. The monitoring wells will be plug and abandoned in accordance with State of New Mexico requirements, and a letter will be submitted to the NMOCD with documentation that the wells were properly plugged and abandoned.

**TABLES**

**Table 1: Summary of Field and Laboratory Analyses of Soil Samples from Blending Area  
C.J. Saunders Excavation Site  
Unit Letter J, Section 18, Township 19 South, Range 36 East  
Lea County, New Mexico**

Lift Number	Sample Number	Sample Date	PID (ppm)	GRO C6 - C10 (mg/kg)	DRO >C10 - C28 (mg/kg)	TPH C6 - C28 (mg/kg)	*PID Calibration (ppm)
1	S000606T201	06-Jun-00	6.5	<50	553	553	101
2	S000608T202	08-Jun-00	40.2	<50	916	916	115
3	S000613T203	13-Jun-00	13.4	<50	928	928	101
4	S000614T204	14-Jun-00	9.1	<50	844	844	101
5	S000616T205	16-Jun-00	16.9	<50	916	916	102
6	S000621T206	21-Jun-00	11.7	<50	462	462	103
7	S000623T207	23-Jun-00	19.5	<50	711	711	101
8	S000628T208	28-Jun-00	29.4	<50	1420	1420	102
9	S000711T209	11-Jul-00	9.8	<50	1480	1480	101
10	S000717T210	17-Jul-00	7.3	<50	964	964	103
11	S000719T211	19-Jul-00	12.8	<50	804	804	102
12	S000721T212	21-Jul-00	12.2	<50	684	684	103
13	S000724T213	24-Jul-00	7.5	<50	926	926	102
14	S000726T214	26-Jul-00	21.1	<50	1430	1430	101
15	S000728T215	28-Jul-00	34.8	<50	1490	1490	102
16	S000731T216	31-Jul-00	28.5	<50	1660	1660	101
17	S00082T217	02-Aug-00	70.7	<50	2010	2010	101
18	S00082T218	02-Aug-00	33.2	53.2	1940	1993.2	101
19	S00087T219	07-Aug-00	27.5	<50	1710	1710	101
20	S00087T220	07-Aug-00	75.5	78.1	2000	2078.1	101
21	S00089T221	09-Aug-00	28.9	<50	1660	1660	101
22	S000811T222	11-Aug-00	26.2	<50	2140	2140	100
23	S000814T223	14-Aug-00	17.4	<50	1360	1360	100

Notes: Laboratory analyses by Cardinal Laboratories, Inc., Hobbs, New Mexico  
PID analyses by Environmental Plus, Inc., Eunice, New Mexico

1. ppm: Concentration in parts per million
2. mg/kg: Concentration in milligrams per kilogram (equivalent to parts per million)
3. \*: Calibrated to isobutylene (100 parts per million)

**Table 1: Summary of Field and Laboratory Analyses of Soil Samples from Blending Area  
C.J. Saunders Excavation Site  
Unit Letter J, Section 18, Township 19 South, Range 36 East  
Lea County, New Mexico**

Lift Number	Sample Number	Sample Date	PID (ppm)	GRO C6 - C10 (mg/kg)	DRO >C10 - C28 (mg/kg)	TPH C6 - C28 (mg/kg)	*PID Calibration (ppm)
24	S000816T224	16-Aug-00	25.0	<50	580	580	100
25	S000817T225	17-Aug-00	8.2	<50	268	268	100
26	S000821T226	21-Aug-00	7.3	<50	444	444	101
27	S000823T227	23-Aug-00	7.3	<50	534	534	101
28	S000824T228	24-Aug-00	27.8	<50	815	815	100
29	S000825T229	25-Aug-00	13.6	<50	605	605	101
30	S000828T230	28-Aug-00	7.9	<50	603	603	101
31	S000830T231	30-Aug-00	3.5	<50	660	660	101
32	S000831T232	31-Aug-00	10.5	<50	1060	1060	100
33	S000901T233	01-Sept-00	18.7	<50	1380	1380	100
34	S000905T234	05-Sept-00	11.9	<50	1240	1240	100
35	S000906T235	06-Sept-00	40.0	165	3610	3775	100
36	S000907T236	07-Sept-00	41.3	<50	1450	1450	100
37	S000911T237	11-Sept-00	23.5	<50	2030	2030	100
38	S000912T238	12-Sept-00	15.5	<50	2560	2560	100
39	S000915T239	15-Sept-00	13.0	<50	1410	1410	100
40	S000925T240	25-Sept-00	4.1	<50	174	174	101

Notes: Laboratory analyses by Cardinal Laboratories, Inc., Hobbs, New Mexico  
PID analyses by Environmental Plus, Inc., Eunice, New Mexico

1. ppm: Concentration in parts per million
2. mg/kg: Concentration in milligrams per kilogram (equivalent to parts per million)
3. \*: Calibrated to isobutylene (100 parts per million)

Table 2:

**Summary of Field Density Tests of Compacted Clay Soils  
 C.J. Saunders Excavation Site  
 Unit Letter J, Section 18, Township 19 South, Range 36 East  
 Lea County, New Mexico**

Test Number	Test Date	Test Depth (Inches)	Dry Density (%)	Moisture Content (%)
1	28-Sept-00	12	98.98	12.32
2	28-Sept-00	12	97.96	12.85
3	28-Sept-00	12	98.30	15.48
4	28-Sept-00	12	96.37	15.03
5	28-Sept-00	12	95.79	14.25
6	28-Sept-00	12	96.76	13.08
7	28-Sept-00	12	100.50	14.32
8	28-Sept-00	12	97.37	14.65
9	28-Sept-00	12	95.27	14.32
10	28-Sept-00	12	95.60	11.11

Notes: Field analyses by John West Engineering Company, Hobbs, New Mexico

1. ppm: Concentration in parts per million
2. mg/kg: Concentration in milligrams per kilogram (equivalent to parts per million)
3. \*: Calibrated to isobutylene (100 parts per million)

**Table 3: Summary of Field and Laboratory Analyses of Soil Samples from Borings  
C.J. Saunders Excavation Site  
Unit Letter J, Section 18, Township 19 South, Range 36 East  
Lea County, New Mexico**

Soil Boring	Sample Depth (Feet BGS)	Sample Date	PID (ppm)	GRO (mg/kg)	DRO (mg/kg)	TPH (mg/kg)
MW-13	10	04-Dec-00	6.3	<5	<50	<55
	20	04-Dec-00	4.5	<5	<50	<55
	30	04-Dec-00	4.3	<5	<50	<55
	35	04-Dec-00	4.8	<5	<50	<55
	40	04-Dec-00	4.5	<5	<50	<55
	43	04-Dec-00	4.4	--	--	--
MW-14	10	04-Dec-00	4.1	<5	<50	<55
	20	04-Dec-00	7.4	<5	<50	<55
	30	04-Dec-00	6.2	<5	<50	<55
	35	04-Dec-00	7.7	<5	<50	<55
	43	04-Dec-00	7.6	--	--	--

Notes: Laboratory analyses by Trace Analysis, Inc., Lubbock, Texas

1. BGS: Depth in feet below ground level
2. ppm: Concentration in parts per million
3. mg/kg: Concentration in milligrams per kilogram (equivalent to parts per million)
4. --: No data available

Table 4: Summary of Monitoring Well Drilling and Completion Details  
 C.J. Saunders Excavation Site  
 Unit Letter J, Section 18, Township 19 South, Range 36 East  
 Lea County, New Mexico

Well Number	Installation Date	Drilled Depth Feet BGS	Well Diameter (inches)	Well Depth Feet TOC 05-Dec-00	Top-of-Casing Elevation Feet AMSL	Ground Elevation Feet AMSL	Screen Interval Feet BGS	Depth-to-Groundwater Feet BGS 20-Jun-00	Depth-to-Groundwater Feet BGS 05-Dec-00	Groundwater Elevation Feet AMSL 05-Dec-00
MW-1	--	--	4	58.73	3698.93	3687.38	--	44.23	44.47	3642.91
MW-2	--	--	4	58.50	3687.70	3685.11	--	41.65	41.78	3643.33
MW-3	--	--	4	58.38	3687.49	3684.88	--	41.23	41.42	3643.46
*MW-4	04-Oct-95	57	2	55.48	3687.57	3685.43	34 - 53	41.65	41.76	3643.67
*MW-5	09-Dec-95	60	2	57.05	3690.79	3687.93	35 - 59	43.74	43.97	3643.96
*MW-6	11-Dec-95	61	2	60.25	3691.32	3688.37	36 - 60	44.19	44.35	3644.02
*MW-7	15-Dec-95	61	2	59.82	3691.00	3688.62	36 - 60	44.43	44.68	3643.94
*MW-8	16-Dec-95	65	2	62.10	3691.53	3688.94	32 - 61	44.72	45.09	3643.85
*MW-9	19-Dec-95	65	2	58.00	3689.81	3687.08	35 - 59	42.99	43.17	3643.97
*MW-10	24-Jan-96	P/A	P/A	P/A	P/A	P/A	P/A	P/A	P/A	P/A
*MW-11	24-Jan-96	55	2	55.85	3688.61	3686.01	34 - 53	42.22	42.30	3643.71
*MW-12	25-Jan-96	52	2	56.55	3688.67	3686.55	30 - 50	42.69	42.88	3643.67
MW-13	04-Dec-00	60	2	61.50	3689.43	3687.75	39.57 - 59.13	--	43.92	3643.83
MW-14	04-Dec-00	60	2	60.84	3688.00	3686.40	39.01 - 58.57	--	42.67	3643.73

Notes:

1. BGS: Depth in feet below ground surface
2. AMSL: Elevation in feet above mean sea level, based on surveys by Piper Surveying Company (June 20, 2000 and December 15, 2000)
3. TOC: Depth in feet below top-of-casing
4. \*: Data from previous consultant's report
5. --: No data available
6. P/A: Well plugged and abandoned

**Table 5: Summary of BTEX Analyses of Groundwater Samples from Monitoring Wells**

**C.J. Saunders Excavation Site**

**Unit Letter J, Section 18, Township 19 South, Range 36 East**

**Lea County, New Mexico**

Page 1 of 1

Well Number	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylene mg/L	Total BTEX mg/L
MW-1	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-2	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-3	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-4	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-5	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-6	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-7	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-8	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-9	05-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-10	P/A	P/A	P/A	P/A	P/A	P/A
MW-11	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-12	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-13	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
MW-14	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02
Duplicate (MW-12)	06-Dec-00	<0.005	<0.005	<0.005	<0.005	<0.02

Notes: Analyses by Trace Analysis, Inc., Lubbock, Texas

1. mg/L: Concentration in milligrams per liter (equivalent to parts per million)
2. <: Analyte not detected above test method detection limit
3. P/A: Well plugged and abandoned (no data available)

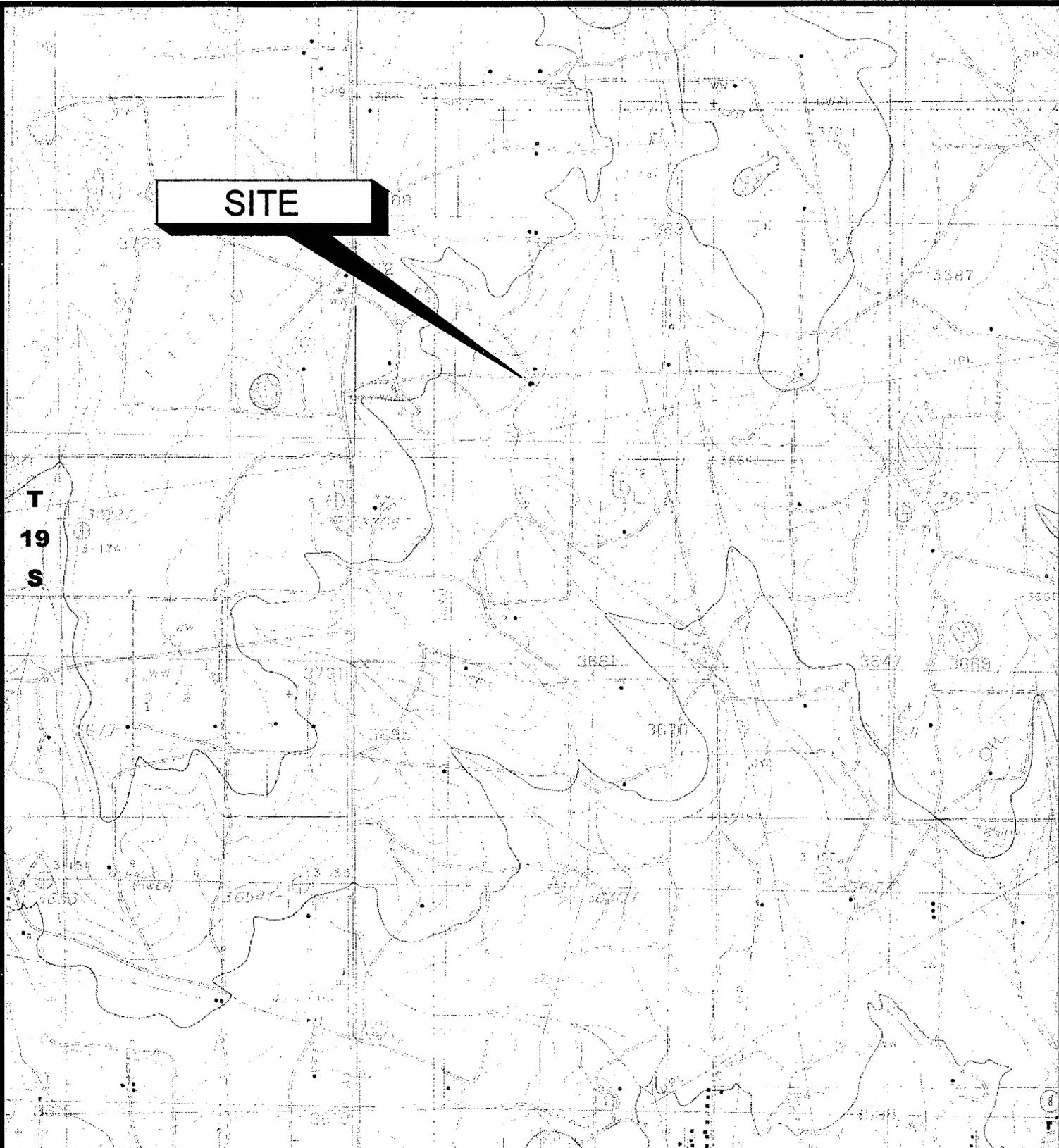
Table 6: Summary of Inorganic Analyses of Groundwater Samples from Monitoring Wells  
 C.J. Saunders Excavation Site  
 Unit Letter J, Section 18, Township 19 South, Range 36 East  
 Lea County, New Mexico

Monitor Well	Sample Date	Hydroxide (mg/L)	Carbonate (mg/L)	Bicarbonate (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Nitrate (N) (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	TDS (mg/L)
MW-1	06-Dec-00	<1.0	<1.0	486	65	1.3	<1.0	140	300	35	6.7	76	1400
MW-2	06-Dec-00	<1.0	<1.0	190	57	1.9	2.4	69	96	10	4.3	32	460
MW-3	06-Dec-00	<1.0	<1.0	204	26	2.0	2.6	64	87	8.0	4.1	29	410
MW-4	06-Dec-00	<1.0	<1.0	150	11	3.3	<1.0	35	59	5.6	3.1	13	260
MW-5	06-Dec-00	<1.0	<1.0	580	160	1.4	3.5	56	314	36	6.8	73	1400
MW-6	06-Dec-00	<1.0	<1.0	394	810	1.6	2.8	74	448	52	8.4	112	1900
MW-7	06-Dec-00	<1.0	<1.0	360	140	1.6	2.2	850	324	33	8.3	216	1900
MW-8	06-Dec-00	<1.0	<1.0	178	26	2.0	2.7	51	72	6.6	3.8	30	380
MW-9	05-Dec-00	<1.0	<1.0	488	29	1.2	1.6	160	226	24	4.7	20.4	870
MW-10	P/A	P/A	P/A	P/A	P/A	P/A	P/A	P/A	P/A	P/A	P/A	P/A	P/A
MW-11	06-Dec-00	<1.0	<1.0	326	120	3.2	<1.0	59	104	22	4.9	94	720
MW-12	06-Dec-00	<1.0	<1.0	288	36	2.9	<1.0	90	83	31	3.3	52	570
MW-13	06-Dec-00	<1.0	<1.0	172	25	2.2	2.7	48	72	6.8	3.9	25	350
MW-14	06-Dec-00	<1.0	<1.0	166	25	2.1	2.6	50	71	7.6	4.1	26	360
Duplicate (MW-12)	06-Dec-00	<1.0	<1.0	280	34	2.6	<1.0	91	85	31	3.3	57	560

Notes: Analyses by Trace Analysis, Inc., Lubbock, Texas

1. mg/L: Concentration in milligrams per liter (equivalent to parts per million)
2. <: Analyte not detected above test method detection limit
3. P/A: Well plugged and abandoned (no data available)

FIGURES



**SITE**

**T  
19  
S**

R-36-E

R-37-E

FIGURE #1  
LEA COUNTY, NEW MEXICO

TEXACO EXPLORATION and  
PRODUCTION INC. and  
EOTT ENERGY OPERATING, LP  
C.J. SAUNDERS SITE

LOCATION & TOPOGRAPHIC MAP

TAKEN FROM U.S.G.S.  
7.5' QUADRANGLES  
MONUMENT NORTH, NEW MEXICO  
1985



SCALE: 1"=2000'

DATE:	11/29/00
NAME:	
FILE:	00-0110

**Larson & Associates, Inc.**  
Environmental Consultants

A'  
SOUTH

A  
NORTH

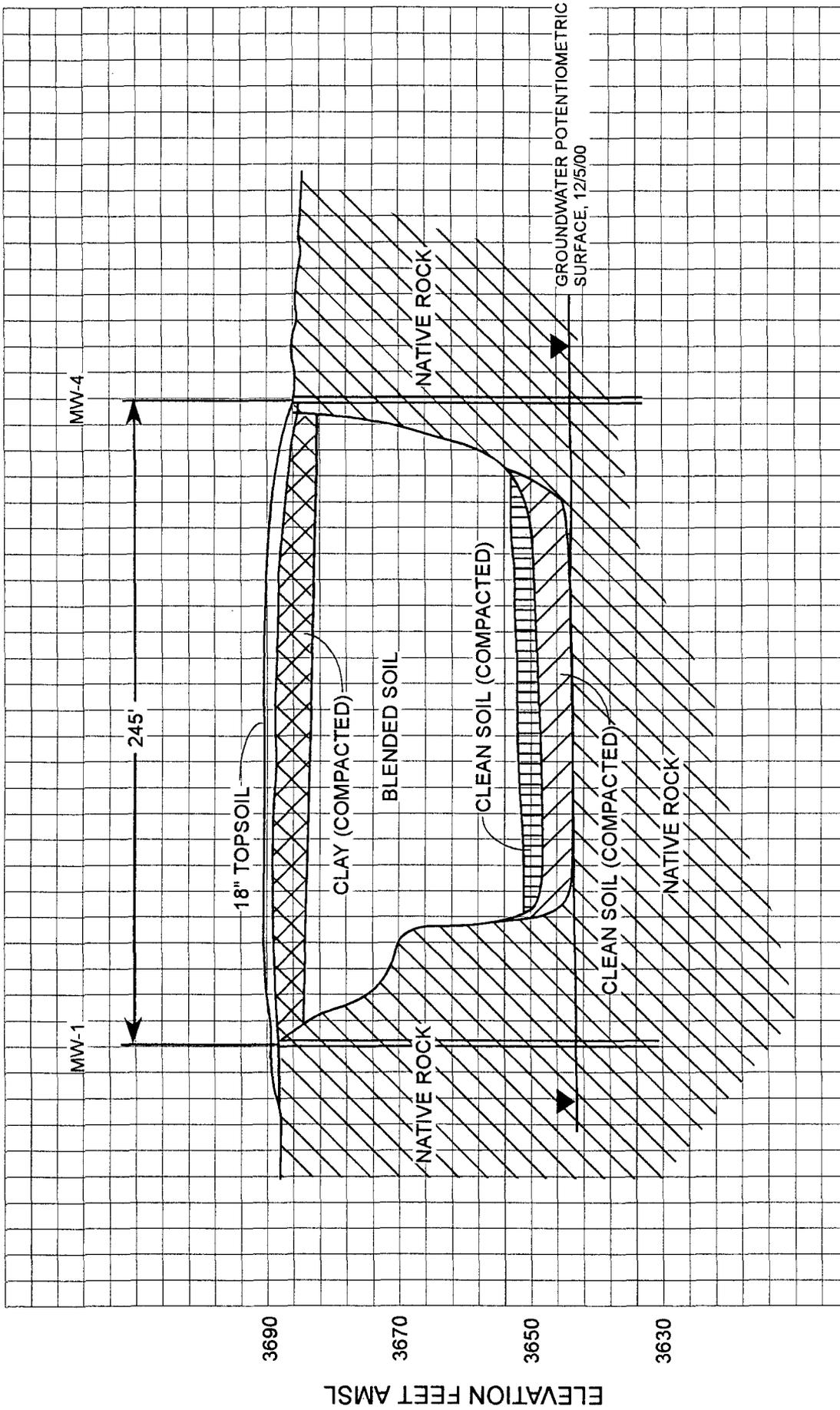


FIGURE #3

LEA COUNTY, NEW MEXICO  
 TEXACO EXPLORATION and  
 PRODUCTION INC. &  
 BOTT ENERGY PIPELINE, L.P.  
 C.J. SAUNDERS SITE

NORTH - SOUTH CROSS SECTION  
 A-A'

**A**areon &  
 sassociates, Inc.  
 Environmental Consultants

DATE: 1/12/01  
 NAME:  
 FILE:

HORIZONTAL SCALE: 1"=50'  
 VERTICAL SCALE: 1"=20'  
 VERTICAL EXAGGERATION: X 2.5  
 REFER TO FIGURE 2 for CROSS SECTION LOCATION

**APPENDIX A**

**Correspondence for NMOCD**



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
2040 S. PACHECO  
SANTA FE, NEW MEXICO 87505  
(505) 827-7131

May 10, 2000

**CERTIFIED MAIL**  
**RETURN RECEIPT NO: 5051-3075**

Mr. Rodney Bailey  
Texaco Exploration & Production, Inc.  
205 E. Bender Blvd.  
Hobbs, NM 88240

**CERTIFIED MAIL**  
**RETURN RECEIPT NO: 5051-3068**

Mr. Glen Waldrop  
EOTT Energy Pipeline Limited Partnership  
P.O. Box 1660  
Midland, Texas 79702

**RE: TNM-95-10/SAUNDERS SITE  
MONUMENT, NEW MEXICO**

Dear Sirs:

The New Mexico Oil Conservation Division (OCD) has reviewed the April 24, 2000 "RESPONSE TO WORK PLAN FOR SAUNDERS EXCAVATION SITE, UNIT LETTER "J", SECTION 18, TOWNSHIP 19 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO" and May 8, 2000 "LABORATORY ANALYSES OF SOIL SAMPLES FROM STOCKPILES AND EXCAVATION, C.J. SAUNDERS SITE, UNIT LETTER "J": SECTION 18, TOWNSHIP 19 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO:" which was jointly submitted by Texaco Exploration & Production, Inc. (Texaco) and EOTT Energy Pipeline Limited Partnership (EOTT). This document contains Texaco and EOTT's work plan for backfilling the open excavation and installation of additional monitoring wells at the Saunders/TNM-95-10 site.

The work plan as contained in the above referenced documents is approved with the following conditions:

1. Soil samples shall be obtained at five foot intervals during drilling of the new monitor wells to determine the extent of residual soil contamination in the former pit area. The samples shall be obtained and analyzed for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX) and total petroleum hydrocarbons using EPA approved methods and quality assurance/quality control (QA/QC).

2. The completion report shall be submitted to the OCD Santa Fe Office by July 10, 2000 with a copy provided to the OCD Hobbs District Office.

Please be advised that OCD approval does not limit EOTT and Texaco to the proposed work plan should the actions fail to adequately remediate or investigate contamination related to their activities, or if contamination exists which is outside the scope of the work plan. In addition, OCD approval does not relieve EOTT and Texaco of responsibility for compliance with any other federal, state or local laws and regulations.

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

Sincerely,



William C. Olson  
Hydrologist  
Environmental Bureau

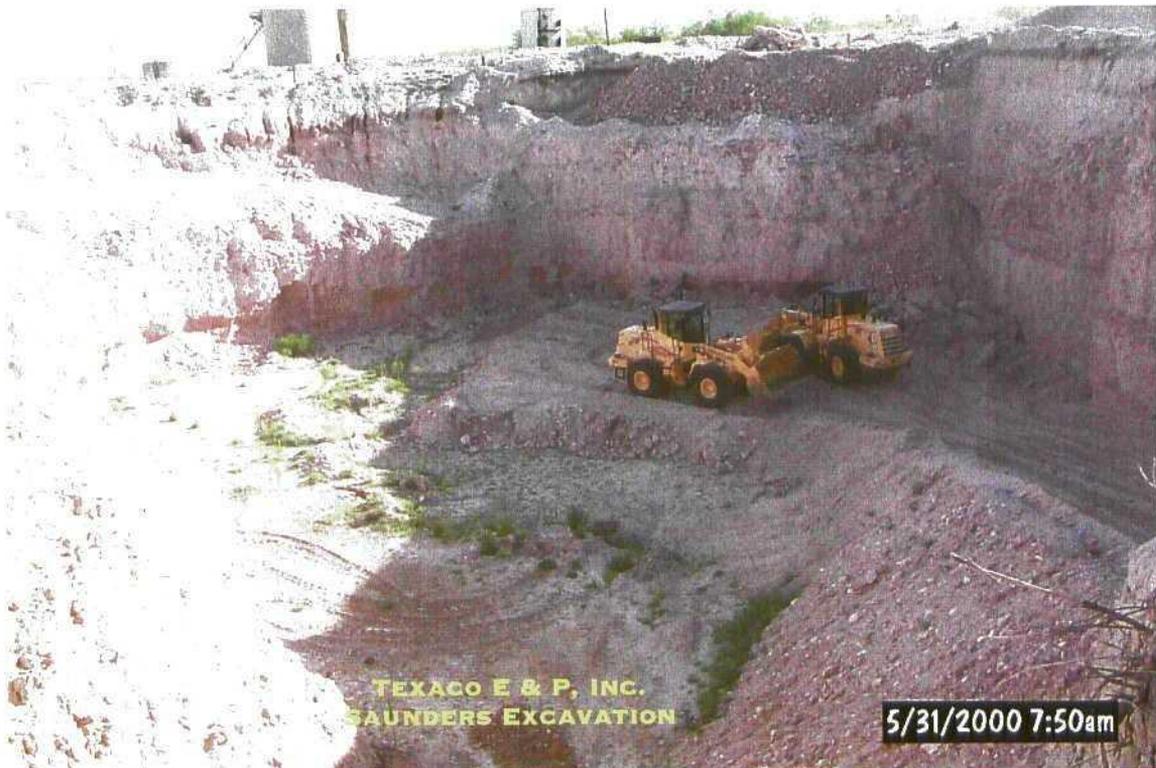
xc: Chris Williams, OCD Hobbs District Office

**APPENDIX B**

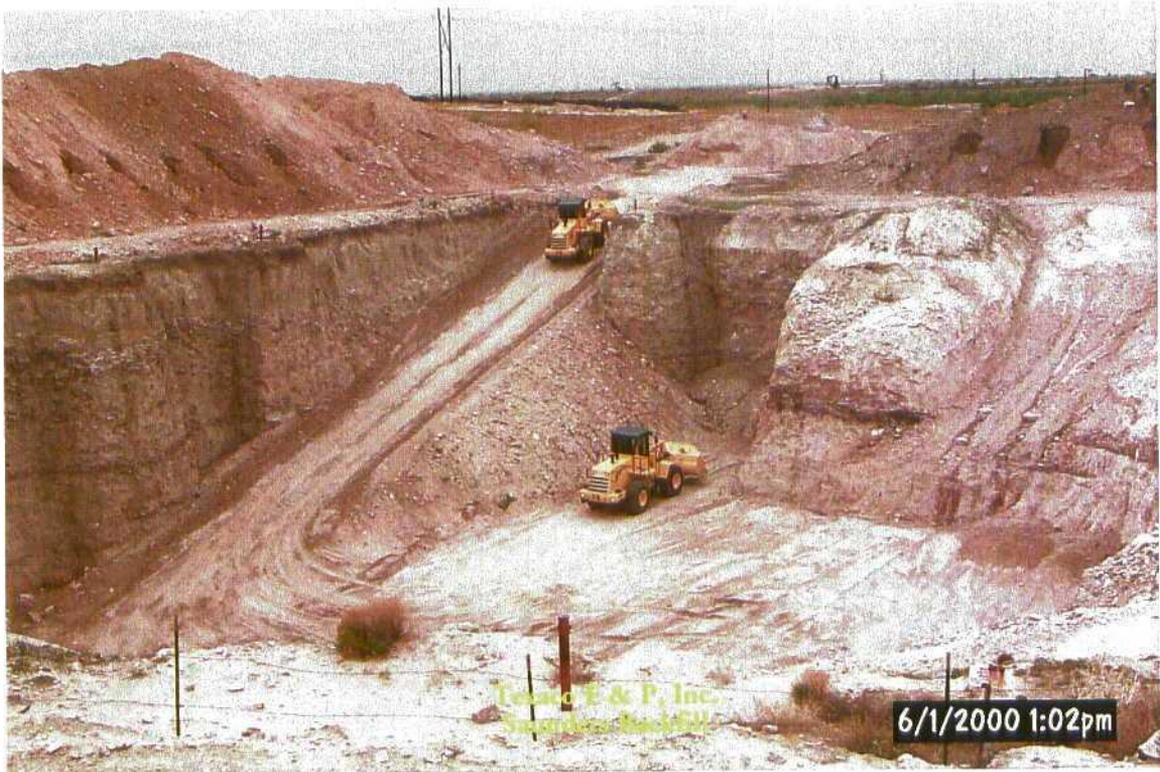
**Photographs**



Backfilling initial 2' Lift



Backfilling initial 2' Lift



Backfilling looking south



Backfilling



Blending and Treating Area – Lift ready for sampling



Contaminated soil being moved into Blending and Treating area.  
Two soil lifts, i.e., East and West, compensated for lag time between sampling, receiving results, treating, and backfilling.



Pushing soil to the loaders



Nutrients being applied to blended and tested lift



Treated soil emplaced in excavation bottom



Treated soil being pushed for loading and emplacement



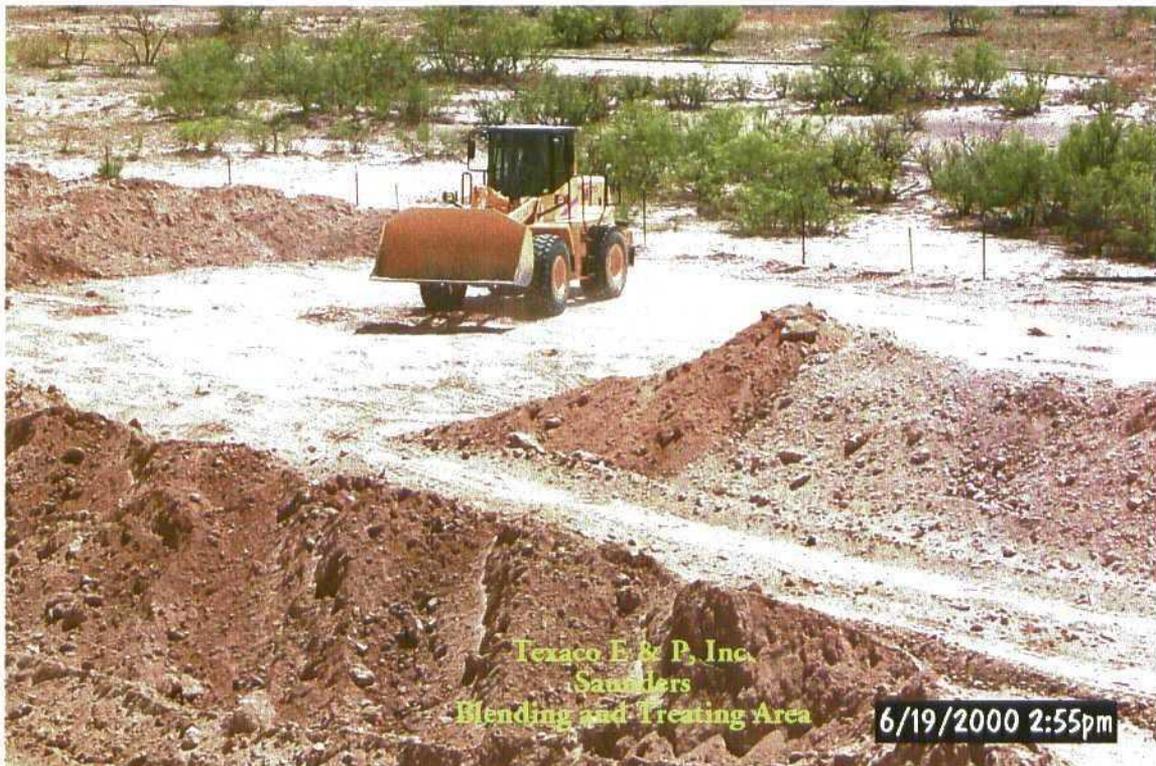
Moving tested and treated soil from Blending and Treating Area to Excavation



Excavation looking north



Emplacing tested soil from the Blending/Treating Area.



Blending and Treating Area



Spreading backfill (liquid is rain water)



Blending and Treating Area



Backfilling



Blending and Treating Area



Backfilling



Preparing for barrier installation



Preparing for barrier installation



Preparing for barrier installation



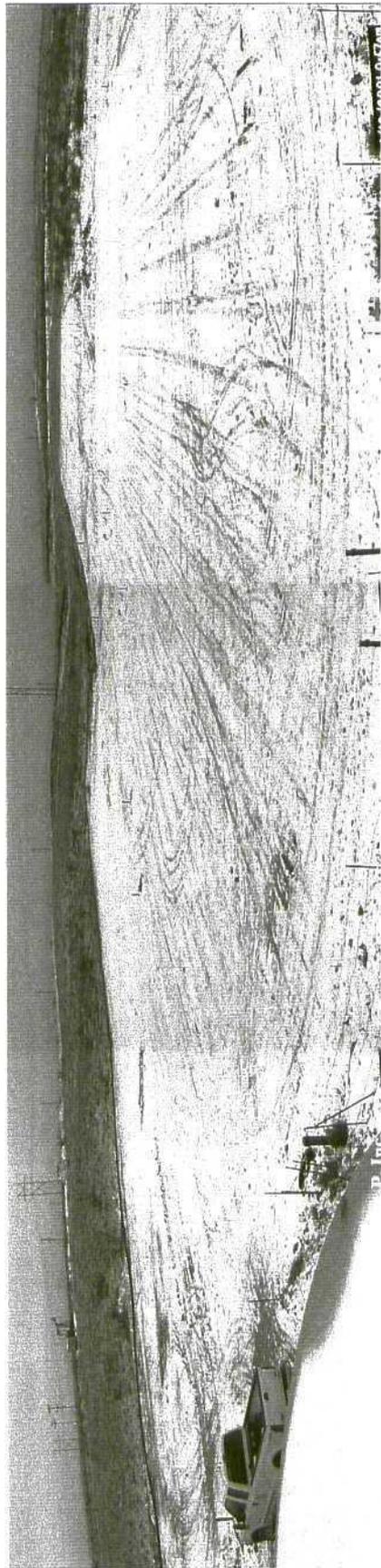
Clay barrier installation and compaction



Clay barrier installation and compaction



Compacting Clay Barrier looking west September 25, 2000



Construction Complete  
(photograph taken January 10, 2001 following a light snow)

**APPENDIX C**

**Laboratory Reports**



**ARDINAL  
LABORATORIES**

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
205 E. BENDER  
HOBBS, NM 88240  
FAX TO: (505) 397-0450

Receiving Date: 06/06/00  
Reporting Date: 06/07/00  
Project Number: NOT GIVEN  
Project Name: NOT GIVEN  
Project Location: NOT GIVEN

Sampling Date: 06/06/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
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LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		06/06/00	06/06/00
H4924-1	S000606T201	<50	553
Quality Control		996	952
True Value QC		1000	1000
% Recovery		99.6	95.2
Relative Percent Difference		0.5	0.7

METHOD: SW-846 8015 M

*Bugeth J. Cashe*  
Chemist

*6/7/00*  
Date

H4924.XLS

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





**ARDINAL  
LABORATORIES**

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 06/08/00  
Reporting Date: 06/09/00  
Project Number: NOT GIVEN  
Project Name: NOT GIVEN  
Project Location: NOT GIVEN

Sampling Date: 06/08/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		06/08/00	06/08/00
H4928-1	S000608T202	<50	916
Quality Control		996	952
True Value QC		1000	1000
% Recovery		99.6	95.2
Relative Percent Difference		0.5	0.7

METHOD: SW-846 8015 M

Burgess J. Coche  
Chemist

6/9/00  
Date

H4928.XLS

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.









**ARDINAL  
LABORATORIES**

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

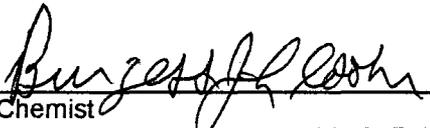
ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 06/14/00  
Reporting Date: 06/15/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: MONUMENT, NM

Sampling Date: 06/14/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		06/14/00	06/14/00
H4934-1	S000614TZ04	<50	844
Quality Control		790	836
True Value QC		800	800
% Recovery		98.7	105
Relative Percent Difference		2.5	6.7

METHOD: SW-846 8015 M

  
Chemist

  
Date

H4934.XLS  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.







**CHAIN-OF-CUSTODY AND ANALYSIS REQUEST**

**CARDINAL LABORATORIES, INC.**

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240  
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

Company Name: <u>TEXACO PIPING</u>		BILL TO		PO #:	
Project Manager: <u>Rodney Bailey</u>		Company:			
Address:		Attn:			
City: <u>MIDLAND</u> State: <u>TX</u> Zip:		Address:			
Phone #: <u>505-631-9005</u>		City:			
Fax #:		State:		Zip:	
Project #: <u>SAUNDERS</u>		Project Owner:			
Project Name: <u>SAUNDERS</u>		Phone #:			
Project Location:		Fax #:			
FOR LAB USE ONLY		MATRIX		PRES. SAMPLING	
LAB I.D.		GROUNDWATER		ICE / COOL	
Sample I.D.		WASTEWATER		ACID	
H4947-1		SLUDGE		OTHER:	
5000667205		OIL		OTHER:	
		SOL		DATE	
		WASTEWATER		TIME	
		GROUNDWATER		6-16	
		SLUDGE		915	
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**ARDINAL  
LABORATORIES**

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 06/21/00  
Reporting Date: 06/22/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: MONUMENT, NM

Sampling Date: 06/21/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		06/21/00	06/21/00
H4957-1	S000621TZ06	<50	462
Quality Control		790	836
True Value QC		800	800
% Recovery		98.7	105
Relative Percent Difference		2.5	6.7

METHOD: SW-846 8015 M

  
Chemist

6/22/00  
Date

H4957.XLS

PLEASE NOTE: **Liability and Damages.** Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





**ARDINAL  
LABORATORIES**

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 06/23/00  
Reporting Date: 06/23/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: MONUMENT, NM

Sampling Date: 06/23/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		06/23/00	06/23/00
H4967-1	S000623TZ07	<50	711
Quality Control		790	836
True Value QC		800	800
% Recovery		98.7	105
Relative Percent Difference		2.5	6.7

METHOD: SW-846 8015 M

*Roy A. Cash*  
Chemist

6/23/00  
Date

H4967.XLS  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





**ARDINAL  
LABORATORIES**

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 06/28/00  
Reporting Date: 06/29/00  
Project Number: NOT GIVEN  
Project Name: NOT GIVEN  
Project Location: NOT GIVEN

Sampling Date: 06/28/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		06/28/00	06/28/00
H4973-1	S000628TZ08	<50	1420
Quality Control		790	836
True Value QC		800	800
% Recovery		98.7	105
Relative Percent Difference		2.5	6.7

METHOD: SW-846 8015 M

Buyers J. Rooh  
Chemist

6/29/00  
Date

**H4973.XLS**

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.







# CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Company Name: <u>TEXACO 3rd INC</u>		BILL TO PO #:	
Project Manager: <u>RODNEY BAILEY</u>		Company:	
Address: <u>P.O. BOX 3109</u>		Attn:	
City: <u>MIDLAND</u> State: <u>TX</u> Zip: <u>79705</u>		Address:	
Phone #: <u>505-631-9005</u>		City:	
Fax #:		State:	
Project #: <u>SAUNDERS</u>		Phone #:	
Project Location:		Fax #:	
FOR LAB USE ONLY			
LAB I.D.	Sample I.D.	MATRIX	PRES.
<u>H5010-1</u>	<u>5000717Z10</u>	GROUNDWATER	ICE / COOL
		WASTEWATER	ACID
		SLUDGE	OTHER
		OIL	OTHER
		SOIL	
		WASTEWATER	
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**ARDINAL**  
LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 07/19/00  
Reporting Date: 07/20/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 07/19/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		07/19/00	07/19/00
H5019-1	S000717TZ11	<50	804
Quality Control		956	1018
True Value QC		1000	1000
% Recovery		95.6	102
Relative Percent Difference		0.5	7.1

METHOD: SW-846 8015 M

*Bryan A. Cohen*  
Chemist

7/20/00  
Date

H5019.XLS  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





**ARDINAL  
LABORATORIES**

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

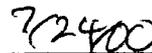
Receiving Date: 07/21/00  
Reporting Date: 07/24/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 07/21/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		07/21/00	07/21/00
H5025-1	S000721TZ12	<50	684
Quality Control		956	1018
True Value QC		1000	1000
% Recovery		95.6	102
Relative Percent Difference		0.5	7.1

METHOD: SW-846 8015 M

  
Chemist

  
Date

**H5025.XLS**  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



# CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020  
101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Company Name: <b>TEXACO E&amp;P INC</b>		BILTO PO #:	
Project Manager: <b>Rodney Bailey</b>		Company:	
Address:		Attn:	
City: <b>MIDLAND</b> State: Zip:		Address:	
Phone #:		City:	
Fax #:		State: Zip:	
Project #: <b>SAUNDERS</b> Project Owner:		Phone #:	
Project Name:		Fax #:	
Project Location:			
FOR LAB USE ONLY			
LAB I.D.	Sample I.D.	MATRIX	PRES.
H50251	50007217212	WASTEWATER	ICE / COOL
		GROUNDWATER	ACID
		WASTEWATER	OTHER
		SOIL	SLUDGE
		OIL	OTHER
		SLUDGE	DATE
		WASTEWATER	TIME
		GROUNDWATER	8:30
		SOIL	7-21
		OIL	8:30
		SLUDGE	8:30
		OTHER	8:30
		ACID	8:30
		ICE / COOL	8:30
		OTHER	8:30
		SLUDGE	8:30
		OTHER	8:30
		ACID	8:30
		ICE / COOL	8:30
		OTHER	8:30
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**ARDINAL  
LABORATORIES**

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 07/24/00  
Reporting Date: 07/25/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 07/24/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		07/24/00	07/24/00
H5029-1	S000724TZ13	<50	926
Quality Control		956	1018
True Value QC		1000	1000
% Recovery		95.6	102
Relative Percent Difference		0.5	7.1

METHOD: SW-846 8015 M

*Burgess J. Cohe*  
Chemist

*7/25/00*  
Date

**H5029 XLS**  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



# CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240  
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: <b>TEXACO Exp INC</b>		BILL TO PO #:		
Project Manager: <b>Rodney Bailey</b>		Company:		
Address: <b>PO Box 3109</b>		Attn:		
City: <b>MIDLAND</b> State: <b>TX</b> Zip: <b>79702</b>		Address:		
Phone #: <b>505-631-9005</b>		City:		
Fax #:		State:		
Project #: _____		Zip:		
Project Name: <b>SAUNTERS</b>		Phone #:		
Project Location:		Fax #:		
FOR LAB USE ONLY				
LAB I.D.	Sample I.D.	MATRIX	PRES.	SAMPLING
		GROUNDWATER	ACID:	
		WASTEWATER	ICE / COOL	
		OTHER:	OTHER:	
		SLUDGE	DATE	TIME
		OIL	7-24	7:45
		SOIL		
		WASTEWATER		
		OTHER:		
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**ARDINAL  
LABORATORIES**

PHONE (915) 873-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 07/26/00  
Reporting Date: 07/27/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 07/26/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		07/26/00	07/26/00
H5032-1	S000726TZ14	<50	1430
Quality Control		956	1018
True Value QC		1000	1000
% Recovery		95.6	102
Relative Percent Difference		0.5	7.1

METHOD: SW-846 8015 M

*Burgess J. Cooke*  
Chemist

*7/27/00*  
Date

H5032.XLS  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 07/28/00  
Reporting Date: 07/28/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 07/28/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		07/28/00	07/28/00
H5040-1	S000728TZ15	<50	1490
Quality Control		956	1018
True Value QC		1000	1000
% Recovery		95.6	102
Relative Percent Difference		0.5	7.1

METHOD: SW-846 8015 M

*Bryson J. Cooke*  
Chemist

7/28/00  
Date

H5040.XLS

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



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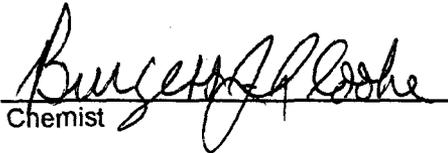
ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 07/28/00  
Reporting Date: 07/28/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 07/28/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		07/28/00	07/28/00
H5040-1	S000728TZ15	<50	
Quality Control		956	1018
True Value QC		1000	1000
% Recovery		95.6	102
Relative Percent Difference		0.5	7.1

METHOD: SW-846 8015 M

  
Chemist

7/28/00  
Date

H5040.XLS

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



# CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240  
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Company Name: <u>TEXACO E&amp;P INC</u>		BILLITO PO #:	
Project Manager: <u>Rodney Bailey</u>		Company:	
Address: <u>P.O. BOX 3109</u>		Attn:	
City: <u>MIDLAND</u> State: _____ Zip: _____		Address:	
Phone #: <u>305-631-9005</u>		City:	
Fax #:		State:	
Project #: _____		Phone #:	
Project Name: <u>Saunders</u>		Fax #:	
Project Location:		Zip:	
FOR LAB USE ONLY		Project Owner:	
LAB I.D. <u>Sample I.D.</u>		Project Name:	
<u>H5040-1500728TZ15</u>		Project Location:	
# CONTAINERS <u>1</u>		Project Manager:	
(G) RAB OR (C) OMP <u>✓</u>		Project Analyst:	
GROUNDWATER		Project Date:	
WASTEWATER		Project Time:	
SOIL <u>✓</u>		Project Location:	
OIL		Project Name:	
SLUDGE		Project Address:	
OTHER:		Project City:	
ACID:		Project State:	
ICE / COOL <u>✓</u>		Project Phone #:	
OTHER:		Project Fax #:	
PRES.		Project Matrix:	
SAMPLING		Project Date:	
DATE <u>7-28</u>		Project Time:	
TIME <u>8:10</u>		Project Location:	
<u>Boism</u>		Project Name:	

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analysis. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all cost of collections, including attorney's fees.

Phone Result  Yes  No Additional Fax #:

Fax Result:  Yes  No

REMARKS:

Received By: \_\_\_\_\_ Date: 7-28-2000 Time: \_\_\_\_\_

Relinquished By: Roger Boone Date: 7/28/00 Time: 8:50

Delivered By: (Circle One) \_\_\_\_\_

Sampler - UPS - Bus - Other: \_\_\_\_\_

Checked By: (Initials) AMB

Sample Condition:  Yes  No

Coil Intact:  Yes  No

† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.



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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 07/31/00  
Reporting Date: 08/01/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 07/31/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		07/31/00	07/31/00
H5044-1	S000731TZ16	<50	1660
Quality Control		754	764
True Value QC		800	800
% Recovery		94.3	95.5
Relative Percent Difference		3.9	2.9

METHOD: SW-846 8015 M

*Burgess J. Coche*  
Chemist

*8/1/00*  
Date

**H5044.XLS**  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.









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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 08/07/00  
Reporting Date: 08/08/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 08/07/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		08/07/00	08/07/00
H5066-1	S00087TZ19	<50	1710
H5066-2	S00087TZ20	78.1	2000
Quality Control		716	835
True Value QC		800	800
% Recovery		89.5	104
Relative Percent Difference		1.0	3.2

METHOD: SW-846 8015 M

Burgess R. Coche  
Chemist

8/8/00  
Date

H5066.XLS  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





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ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 08/09/00  
Reporting Date: 08/10/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 08/09/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		08/09/00	08/09/00
H5078-1	S00089TZ21	<50	1660
Quality Control		716	835
True Value QC		800	800
% Recovery		89.5	104
Relative Percent Difference		1.0	3.2

METHOD: SW-846 8015 M

Burgett A. Cooke  
Chemist

8/10/00  
Date

**H5078.XLS**  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.









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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 08/14/00  
Reporting Date: 08/15/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 08/14/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		08/14/00	08/14/00
H5090-1	S000814TZ23	<50	1360
Quality Control		999	951
True Value QC		1000	1000
% Recovery		99.9	95.1
Relative Percent Difference		3.2	0.9

METHOD: SW-846 8015 M

*Burges L. Roche*  
Chemist

8/15/00  
Date

**H5090 XLS**

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



# CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240  
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Company Name: <u>TEXACO ECP INC</u>		BILL TO PO #:		
Project Manager: <u>Rodney Hatley</u>		Company:		
Address:		Attn:		
City: <u>MIDLAND</u> State: _____ Zip: _____		Address:		
Phone #: <u>505-631-9005</u>		City:		
Fax #: _____		State:		
Project #: _____		Phone #:		
Project Name: <u>STANDERS</u>		Fax #:		
Project Location:		FOR LAB USE ONLY		
LAB I.D.	Sample I.D.	MATRIX	PRES.	SAMPLING
<u>H5090-1</u>	<u>5000814TZ23</u>	GROUNDWATER	ICE / COOL	DATE
		WASTEWATER	ACID:	TIME
		WASTEWATER	OTHER:	
		SLUDGE	OTHER:	
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		GROUNDWATER	OTHER:	
		WASTEWATER	OTHER:	
		SLUDGE	OTHER:	















# ARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

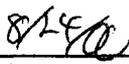
Receiving Date: 08/23/00  
Reporting Date: 08/24/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 08/23/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		08/23/00	08/23/00
H5119-1	S000823TZ27	<50	534
Quality Control		822	956
True Value QC		1000	1000
% Recovery		82.2	95.6
Relative Percent Difference		4.5	9.5

METHOD: SW-846 8015 M

  
Chemist

  
Date

H5119.XLS

PLEASE NOTE: **Liability and Damages.** Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





# ARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 08/24/00  
Reporting Date: 08/25/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 08/24/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		08/24/00	08/24/00
H5121-1	S000824TZ28	<50	815
Quality Control		822	956
True Value QC		1000	1000
% Recovery		82.2	95.6
Relative Percent Difference		4.5	9.5

METHOD: SW-846 8015 M

Bryan J. Coche  
Chemist

8/25/00  
Date

H5121.XLS

PLEASE NOTE: **Liability and Damages.** Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 08/25/00  
Reporting Date: 08/28/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 08/25/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		08/25/00	08/25/00
H5123-1	S000825TZ29	<50	605
Quality Control		822	956
True Value QC		1000	1000
% Recovery		82.2	95.6
Relative Percent Difference		4.5	9.5

METHOD: SW-846 8015 M

*Burgess A. Cooke*  
Chemist

8/28/00  
Date

H5123.XLS

PLEASE NOTE: **Liability and Damages.** Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





# ARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

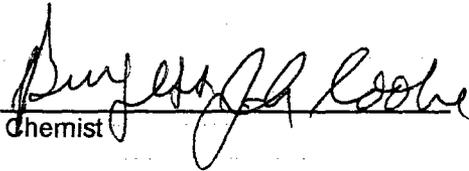
ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

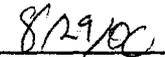
Receiving Date: 08/28/00  
Reporting Date: 08/29/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 08/28/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		08/28/00	08/28/00
H5125-1	S000828TZ30	<50	603
Quality Control		822	956
True Value QC		1000	1000
% Recovery		82.2	95.6
Relative Percent Difference		4.5	9.5

METHOD: SW-846 8015 M

  
Chemist

  
Date

H5125.XLS

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



# CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240  
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page      of     

Company Name: <u>TEXACO ESP INC</u>		P.O. #:		<b>ANALYSIS REQUEST</b>	
Project Manager: <u>Rodney Bailey</u>		Company:			
Address:		Attn:			
City:		Address:			
State:		City:			
Zip:		State:			
Phone #:		Phone #:			
Fax #:		Fax #:			
Project #:		Project Owner:			
Project Name:		Project Location: <u>STANDERS</u>			
Sampler Name:		Sampler Name:			

Lab I.D. <u>Sample I.D.</u>		PRESERV		SAMPLING	
FOR LAB USE ONLY		# CONTAINERS <u>1</u>		OTHER:	
		(G)RAB OR (C)OMP <u>1</u>		ACID/BASE:	
		GROUNDWATER		ICE / COOL <u>✓</u>	
		WASTEWATER		OTHER:	
SOIL <u>✓</u>		SLUDGE		DATE <u>8-28</u>	
CRUDE OIL		DATE <u>8-28</u>		TIME <u>8:20</u>	
8-28-2000		DATE <u>8-28</u>		TIME <u>8:20</u>	
50008287230		DATE <u>8-28</u>		TIME <u>8:20</u>	

PLEASE NOTE: Liability and Damages: Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analysis. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collection, including attorney's fees.

Sampler Relinquished: Roger Boone Date: 8-28-2000 Time: 9:30

Relinquished By: Roger Boone Received By: (Lab Staff) JMU HULL

Delivered By: (Circle One) UPS Sample Condition Cool  Intact  Yes  No  Yes  No

Checked By: (Initials) JMU HULL

Phone Result:  Yes  No Fax Result:  Yes  No Add'l Phone #: Add'l Fax #:

REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.



# ARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 08/30/00  
Reporting Date: 08/31/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 08/30/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		08/30/00	08/30/00
H5131-1	S000830TZ31	<50	660
Quality Control		789	818
True Value QC		800	800
% Recovery		98.6	102
Relative Percent Difference		4.7	2.2

METHOD: SW-846 8015 M

  
Chemist

  
Date

H5131.XLS

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.









# ARDINAL LABORATORIES

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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

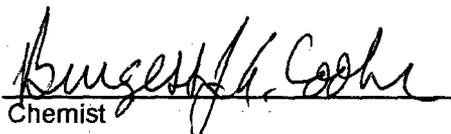
ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 09/01/00  
Reporting Date: 09/05/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 09/01/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: GP  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		09/01/00	09/01/00
H5141-1	S000901TZ33	<50	1380
Quality Control		789	818
True Value QC		800	800
% Recovery		98.6	102
Relative Percent Difference		4.7	2.2

METHOD: SW-846 8015 M

  
Chemist

9/5/00  
Date

H5141.XLS

PLEASE NOTE: **Liability and Damages.** Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.









# ARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 09/06/00  
Reporting Date: 09/07/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 09/06/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: AH  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		09/06/00	09/06/00
H5149-1	S000906TZ35	165	3610
Quality Control		789	818
True Value QC		800	800
% Recovery		98.6	102
Relative Percent Difference		4.7	2.2

METHOD: SW-846 8015 M

  
Chemist

09/07/2000  
Date

H5149.XLS

PLEASE NOTE: **Liability and Damages.** Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

## ARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240  
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

Page 1 of 1

Company Name: <u>TEXACO EXP INC</u>		P.O. #:		ANALYSIS REQUEST	
Project Manager: <u>Rodney Bailey</u>		Company: <u>TEXACO</u>			
Address:		Attn:			
City: <u>MIDLAND</u>		Address:			
Phone #: <u>505-631-9005</u>		City:			
Project #: _____		State: _____			
Project Name: _____		Phone #: _____			
Project Location: <u>Saunders</u>		Fax #: _____			
Sampler Name: _____		Project Owner: _____			
FOR LAB USE ONLY					
Lab I.D.	<u>Sample I.D.</u>	(G)RAB OR (OMP)	<input checked="" type="checkbox"/>	# CONTAINERS	<u>1</u>
		GROUNDWATER		WASTEWATER	
		SOIL	<input checked="" type="checkbox"/>	CRUDE OIL	
		SLUDGE		OTHER:	
		ACID/BASE	<input checked="" type="checkbox"/>	ICE/COOL	
		OTHER:		DATE	<u>9-6-00</u>
		PRESERV		TIME	<u>7:00</u>
					<u>Boism</u>

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's obligations remain for any claims arising whether based in contract or tort, shall be limited to the amount paid by the client for the analysis. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of analytical services by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Sampler Relinquished: Roger Boone Date: 9-6-00 Time: \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_ Date: 9-6-00 Time: 9:30  
 Received By: (Lab Staff) \_\_\_\_\_  
 Delivered By: (Circle One) Sampler - UPS - Bus - Other: \_\_\_\_\_  
 Sample Condition:  Intact  Damaged  
 Checked By: (Initials) Max Hill

Phone Result:  Yes  No Add'l Phone #: \_\_\_\_\_  
 Fax Result:  Yes  No Add'l Fax #: \_\_\_\_\_  
 REMARKS: \_\_\_\_\_

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.



**CHAIN-OF-CUSTODY AND ANALYSIS REQUEST**

**CARDINAL LABORATORIES, INC.**

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240  
 (915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

<b>ANALYSIS REQUEST</b>											
<b>BILL TO</b>											
Company Name: <u>TEXACO EIP INC</u>											
Project Manager: <u>Rodney Bailey</u>											
Address: _____											
City: <u>MIDLAND</u> State: _____ Zip: _____											
Phone #: <u>505-631-7005</u> Fax #: _____											
Project #: _____ Project Owner: _____											
Project Name: _____											
Project Location: <u>SAUNDERS</u>											
Sampler Name: _____											
FOR LAB USE ONLY											
<b>Sample I.D.</b>											
<u>15153-1 5000907TZ36</u>											
LABORATORY			PRESERV.			DATE			TIME		
# CONTAINERS			ACID/BASE			9-7			7:00		
(G)RAB OR (C)OMP.			ICE / COOL								
GROUNDWATER			OTHER:								
WASTEWATER			ACID/BASE								
SOIL			OTHER:								
CRUDE OIL			SLUDGE								
MATRIX			SAMPLING								

**PLEASE NOTE:** Utility and Temperature. Cardinal's liability and client's obligations remain for any data which is based in contrast or not, and is limited to the amount paid by the client for the analysis. All data including those for negligence and any other cause whatsoever shall be deemed subject unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Terms and Conditions: Invoiced will be charged on all accounts terms from 30 days past due at the rate of 20% per annum from the original date of invoice, and all costs of collection, including attorney's fees.

Received By: \_\_\_\_\_ Date: 9-7-2000 Time: \_\_\_\_\_  
 Received By: (Lab Staff) \_\_\_\_\_ Date: 09/07/2000 Time: 10:10A

Sampler Relinquished: Roger Boone Phone Result:  Yes  No Add'l Phone #: \_\_\_\_\_  
 Fax Result:  Yes  No Add'l Fax #: \_\_\_\_\_

Delivered By: (Circle One) UPS - UPS - Bus - Other: \_\_\_\_\_  
 Checked By: (Initials) \_\_\_\_\_

REMARKS: \_\_\_\_\_

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.



# ARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

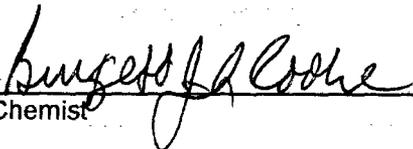
ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 09/11/00  
Reporting Date: 09/12/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 09/11/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE.ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		09/11/00	09/11/00
H5162-1	S000911TZ37	<50	2030
Quality Control		865	853
True Value QC		1000	1000
% Recovery		86.5	85.3
Relative Percent Difference		2.1	5.0

METHOD: SW-846 8015 M

  
Chemist

9/12/00  
Date

H5162.XLS

PLEASE NOTE: **Liability and Damages.** Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.









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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

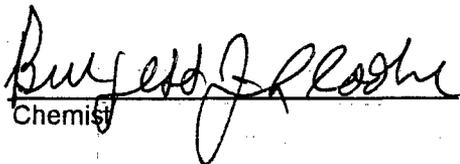
ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 09/15/00  
Reporting Date: 09/19/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 09/15/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		09/15/00	09/15/00
H5180-1	S000915TZ39	<50	1410
Quality Control		923	970
True Value QC		1000	1000
% Recovery		92.3	97.0
Relative Percent Difference		0.8	5.4

METHOD: SW-846 8015 M

  
Chemist

9/19/00  
Date

H5180.XLS

PLEASE NOTE: **Liability and Damages.** Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





# ARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

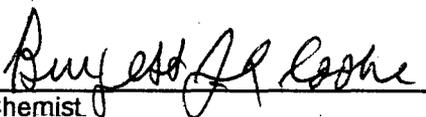
ANALYTICAL RESULTS FOR  
TEXACO E&P, INC.  
ATTN: RODNEY BAILEY  
P.O. BOX 3109  
MIDLAND, TX 79702  
FAX TO:

Receiving Date: 09/25/00  
Reporting Date: 09/26/00  
Project Number: NOT GIVEN  
Project Name: SAUNDERS  
Project Location: NOT GIVEN

Sampling Date: 09/25/00  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
ANALYSIS DATE:		09/25/00	09/25/00
H5200-1	S000925TZ40	<50	174
Quality Control		956	1040
True Value QC		1000	1000
% Recovery		95.6	104.0
Relative Percent Difference		3.7	2.2

METHOD: SW-846 8015 M

  
Chemist

9/26/00  
Date

H5200.XLS

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**CHAIN-OF-CUSTODY AND ANALYSIS REQUEST**

**CARDINAL LABORATORIES, INC.**

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240  
 (915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

<b>Company Name:</b> <i>Texasco ESP, Inc</i>		<b>BILL TO</b>		<b>ANALYSIS REQUEST</b>	
<b>Project Manager:</b> <i>Rodney Bailey</i>		<b>P.O. #:</b>			
<b>Address:</b>		<b>Company:</b>			
<b>City:</b> <i>Madland</i>	<b>State:</b>	<b>Zip:</b>			
<b>Phone #:</b> <i>505-631-9005</i>	<b>Fax #:</b>				
<b>Project #:</b>	<b>Project Owner:</b>				
<b>Project Name:</b>					
<b>Project Location:</b> <i>Saunders</i>					
<b>Sampler Name:</b>					
<b>FOR LAB USE ONLY</b>	<b>MATRIX</b>	<b>PRESERV</b>	<b>SAMPLING</b>	<b>DATE</b>	<b>TIME</b>
<b>Lab I.D.</b>	<b>(G)RAB OR (C)OMP:</b>	<b>ICE/COOL</b>	<b>ACID/BASE:</b>	<b>OTHER:</b>	
<i>H320-1</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<i>7-25</i>	<i>8:15</i>
<i>5000925TZ40</i>	<input type="checkbox"/>	<input type="checkbox"/>	<b>OTHER:</b>		
	<b>GROUNDWATER</b>	<b>SLUDGE</b>	<b>CRUDE OIL</b>		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	<b>WASTEWATER</b>	<b>SOIL</b>	<b>WASTEWATER</b>		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	<b># CONTAINERS</b>				
	<input type="checkbox"/>				

**PLEASE NOTE:** Liability and Damages. Cardinal's liability and damage's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the services. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated theories or otherwise.

**Sampler Relinquished:** *Roger Bone* Date: *7-25* Time: *11:35*

**Relinquished By:** \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

**Received By:** \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

**Delivered By: (Circle One)**  Bus  UPS  Other

**Sampler - UPS - Bus - Other:**

**Checked By:** *Burcett* (initials)

**REMARKS:**

Phone Result:  Yes  No Add'l Phone #: \_\_\_\_\_  
 Fax Result:  Yes  No Add'l Fax #: \_\_\_\_\_

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.



# TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298  
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944  
E-Mail: lab@traceanalysis.com

## Analytical and Quality Control Report

Mark Larson  
Larson & Associates, Inc.  
P.O. Box 50685  
Midland, Tx. 79710

Report Date: December 18, 2000

Order ID Number: A00120606

Project Number: 00-0110  
Project Name: C.J. Saunders  
Project Location: Lea County, New Mexico

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
160106	MW-13 10'	Soil	12/4/00	10:15	12/6/00
160107	MW-13 20'	Soil	12/4/00	10:25	12/6/00
160108	MW-13 30'	Soil	12/4/00	10:35	12/6/00
160109	MW-13 35'	Soil	12/4/00	10:42	12/6/00
160110	MW-13 40'	Soil	12/4/00	10:48	12/6/00
160112	MW-14 10'	Soil	12/4/00	13:10	12/6/00
160113	MW-14 20'	Soil	12/4/00	13:17	12/6/00
160114	MW-14 30'	Soil	12/4/00	13:28	12/6/00
160115	MW-14 35'	Soil	12/4/00	13:33	12/6/00

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 9 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.



Dr. Blair Leftwich, Director

### Analytical and Quality Control Report

**Sample: 160106 - MW-13 10'**

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC07141 Date Analyzed: 12/6/00  
Analyst: BP Preparation Method: 3550 B Prep Batch: PB06258 Date Prepared: 12/6/00

Param	Flag	Result	Units	Dilution	RDL
DRO		<50	mg/Kg	1	50

**Sample: 160106 - MW-13 10'**

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC07354 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: N/A Prep Batch: PB06409 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
GRO		<5	mg/Kg	1	0.10

**Sample: 160107 - MW-13 20'**

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC07141 Date Analyzed: 12/6/00  
Analyst: BP Preparation Method: 3550 B Prep Batch: PB06258 Date Prepared: 12/6/00

Param	Flag	Result	Units	Dilution	RDL
DRO		<50	mg/Kg	1	50

**Sample: 160107 - MW-13 20'**

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC07219 Date Analyzed: 12/7/00  
Analyst: RC Preparation Method: N/A Prep Batch: PB06310 Date Prepared: 12/7/00

Param	Flag	Result	Units	Dilution	RDL
GRO		<5	mg/Kg	1	0.10

**Sample: 160108 - MW-13 30'**

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC07141 Date Analyzed: 12/6/00  
Analyst: BP Preparation Method: 3550 B Prep Batch: PB06258 Date Prepared: 12/6/00

Param	Flag	Result	Units	Dilution	RDL
DRO		<50	mg/Kg	1	50

**Sample: 160108 - MW-13 30'**

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC07219 Date Analyzed: 12/7/00  
Analyst: RC Preparation Method: N/A Prep Batch: PB06310 Date Prepared: 12/7/00

Param	Flag	Result	Units	Dilution	RDL
GRO		<5	mg/Kg	1	0.10

**Sample: 160109 - MW-13 35'**

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC07141 Date Analyzed: 12/6/00  
Analyst: BP Preparation Method: 3550 B Prep Batch: PB06258 Date Prepared: 12/6/00

Param	Flag	Result	Units	Dilution	RDL
DRO		<50	mg/Kg	1	50

**Sample: 160109 - MW-13 35'**

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC07219 Date Analyzed: 12/7/00  
Analyst: RC Preparation Method: N/A Prep Batch: PB06310 Date Prepared: 12/7/00

Param	Flag	Result	Units	Dilution	RDL
GRO		<5	mg/Kg	1	0.10

**Sample: 160110 - MW-13 40'**

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC07141 Date Analyzed: 12/6/00  
Analyst: BP Preparation Method: 3550 B Prep Batch: PB06258 Date Prepared: 12/6/00

Param	Flag	Result	Units	Dilution	RDL
DRO		<50	mg/Kg	1	50

**Sample: 160110 - MW-13 40'**

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC07219 Date Analyzed: 12/7/00  
Analyst: RC Preparation Method: N/A Prep Batch: PB06310 Date Prepared: 12/7/00

Param	Flag	Result	Units	Dilution	RDL
GRO		<5	mg/Kg	1	0.10

**Sample: 160112 - MW-14 10'**

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC07141 Date Analyzed: 12/6/00  
Analyst: BP Preparation Method: 3550 B Prep Batch: PB06258 Date Prepared: 12/6/00

Param	Flag	Result	Units	Dilution	RDL
DRO		<50	mg/Kg	1	50

**Sample: 160112 - MW-14 10'**

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC07219 Date Analyzed: 12/7/00  
Analyst: RC Preparation Method: N/A Prep Batch: PB06310 Date Prepared: 12/7/00

Param	Flag	Result	Units	Dilution	RDL
GRO		<5	mg/Kg	1	0.10

**Sample: 160113 - MW-14 20'**

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC07141 Date Analyzed: 12/6/00  
Analyst: BP Preparation Method: 3550 B Prep Batch: PB06258 Date Prepared: 12/6/00

Param	Flag	Result	Units	Dilution	RDL
DRO		<50	mg/Kg	1	50

**Sample: 160113 - MW-14 20'**

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC07438 Date Analyzed: 12/14/00  
Analyst: RC Preparation Method: N/A Prep Batch: PB06487 Date Prepared: 12/14/00

Param	Flag	Result	Units	Dilution	RDL
GRO		<5	mg/Kg	1	0.10

**Sample: 160114 - MW-14 30'**

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC07141 Date Analyzed: 12/6/00  
Analyst: BP Preparation Method: 3550 B Prep Batch: PB06258 Date Prepared: 12/6/00

Param	Flag	Result	Units	Dilution	RDL
DRO		<50	mg/Kg	1	50

**Sample: 160114 - MW-14 30'**

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC07438 Date Analyzed: 12/14/00  
Analyst: RC Preparation Method: N/A Prep Batch: PB06487 Date Prepared: 12/14/00

Param	Flag	Result	Units	Dilution	RDL
GRO		<5	mg/Kg	1	0.10

**Sample: 160115 - MW-14 35'**

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC07141 Date Analyzed: 12/6/00  
Analyst: BP Preparation Method: 3550 B Prep Batch: PB06258 Date Prepared: 12/6/00

Param	Flag	Result	Units	Dilution	RDL
DRO		<50	mg/Kg	1	50

**Sample: 160115 - MW-14 35'**

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC07219 Date Analyzed: 12/7/00  
Analyst: RC Preparation Method: N/A Prep Batch: PB06310 Date Prepared: 12/7/00

Param	Flag	Result	Units	Dilution	RDL
GRO		<5	mg/Kg	1	0.10

### Quality Control Report Method Blank

Sample: Method Blank

QC Batch: QC07141

Param	Flag	Results	Units	Reporting Limit
DRO		<50	mg/Kg	50

Sample: Method Blank      QCBatch: QC07219

Param	Flag	Results	Units	Reporting Limit
GRO		<5	mg/Kg	0.10

Sample: Method Blank      QCBatch: QC07354

Param	Flag	Results	Units	Reporting Limit
GRO		<5	mg/Kg	0.10

Sample: Method Blank      QCBatch: QC07438

Param	Flag	Results	Units	Reporting Limit
GRO		<5	mg/Kg	0.10

### Quality Control Report Lab Control Spikes and Duplicate Spikes

Sample: LCS      QC Batch: QC07141

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
DRO		254.000	mg/Kg	1	250	<50	101		70 - 130	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
n-Octane		188	mg/Kg	1	250	75	70 - 130

Sample: LCSD      QC Batch: QC07141

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
DRO		242.000	mg/Kg	1	250	<50	96	5	70 - 130	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
n-Octane		198	mg/Kg	1	250	79	70 - 130

Sample: LCS                      QC Batch: QC07219

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
GRO		0.912	mg/Kg	1	1	<5	91		70 - 130	20

Sample: LCSD                      QC Batch: QC07219

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
GRO		0.877	mg/Kg	1	1	<5	87	4	70 - 130	20

Sample: LCS                      QC Batch: QC07354

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
GRO		0.963	mg/Kg	1	1	<5	96		70 - 130	20

Sample: LCSD                      QC Batch: QC07354

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
GRO		0.884	mg/Kg	1	1	<5	88	8	70 - 130	20

Sample: LCS                      QC Batch: QC07438

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
GRO		0.987	mg/Kg	1	1	<5	98		70 - 130	20

Sample: LCSD                      QC Batch: QC07438

Continued ...

... Continued

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
GRO		1.03	mg/Kg	1	1	<5	103	4	70 - 130	20

### Quality Control Report Matrix Spikes and Duplicate Spikes

Sample: MS                      QC Batch: QC07141

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
DRO		253.000	mg/Kg	1	250	<50	101		70 - 130	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
n-Octane		253	mg/Kg	1	250	101	70 - 130

Sample: MSD                      QC Batch: QC07141

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
DRO		232.000	mg/Kg	1	250	<50	92	9	70 - 130	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
n-Octane		232	mg/Kg	1	250	92	70 - 130

### Quality Control Report Continuing Calibration Verification Standards

Sample: CCV (1)                      QC Batch: QC07141

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	255.000	102	75 - 125	12/6/00
n-Octane		mg/Kg	250	203	81	75 - 125	12/6/00

Sample: CCV (2)                      QC Batch: QC07141

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	235.000	94	75 - 125	12/6/00
n-Octane		mg/Kg	250	194	77	75 - 125	12/6/00

Sample: ICV (1)                      QC Batch: QC07141

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	272.000	108	75 - 125	12/6/00
n-Octane		mg/Kg	250	190	76	75 - 125	12/6/00

Sample: CCV (1)                      QC Batch: QC07219

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1	0.801	80	75 - 125	12/7/00

Sample: CCV (2)                      QC Batch: QC07219

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1	0.854	85	75 - 125	12/7/00

Sample: ICV (1)                      QC Batch: QC07219

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1	0.937	93	75 - 125	12/7/00

Sample: CCV (1)                      QC Batch: QC07354

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1	1.05	105	75 - 125	12/12/00

Sample: CCV (2)                      QC Batch: QC07354

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1	1.07	107	75 - 125	12/12/00

Sample: ICV (1)                      QC Batch: QC07354

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1	0.962	96	75 - 125	12/12/00

Sample: CCV (1)                      QC Batch: QC07438

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1	0.988	98	75 - 125	12/14/00

Sample: ICV (1)                      QC Batch: QC07438

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1	1	100	75 - 125	12/14/00







# TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9    Lubbock, Texas 79424    800•378•1296    806•794•1296    FAX 806•794•1298  
4725 Ripley Avenue, Suite A    El Paso, Texas 79922    888•588•3443    915•585•3443    FAX 915•585•4944  
E-Mail: lab@traceanalysis.com

## Analytical and Quality Control Report

Mark Larson  
Larson & Associates, Inc.  
P.O. Box 50685  
Midland, Tx. 79710

Report Date:            December 21, 2000

Order ID Number:    A00120713

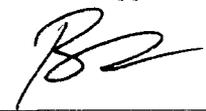
Project Number:    00-0110  
Project Name:        C.J. Saunders  
Project Location:    Lea County, New Mexico

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
160209	MW-9	Water	12/5/00	14:30	12/7/00

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 8 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

  
\_\_\_\_\_  
Dr. Blair Leftwich, Director

## Analytical and Quality Control Report

**Sample: 160209 - MW-9**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07523 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		488	mg/L as CaCo3	1	1
Total Alkalinity		488	mg/L as CaCo3	1	1

**Sample: 160209 - MW-9**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07328 Date Analyzed: 12/8/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06383 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.473	mg/L	1	0.10	94	72 - 128
4-BFB		0.419	mg/L	1	0.10	83	72 - 128

**Sample: 160209 - MW-9**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07223 Date Analyzed: 12/7/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06316 Date Prepared: 12/7/00

Param	Flag	Result	Units	Dilution	RDL
CL		29	mg/L	1	0.50
Fluoride		1.2	mg/L	1	0.20
Nitrate-N	<sup>1</sup>	1.6	mg/L	1	0.20
Sulfate		160	mg/L	1	0.50

**Sample: 160209 - MW-9**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07552 Date Analyzed: 12/12/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06596 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		226	mg/L	1	0.50
Dissolved Magnesium		24	mg/L	1	0.50
Dissolved Potassium		4.7	mg/L	1	0.50
Dissolved Sodium		20.4	mg/L	1	0.50

<sup>1</sup>Sample out of hold time for NO3.

**Sample: 160209 - MW-9**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07435 Date Analyzed: 12/12/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06484 Date Prepared: 12/11/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		870	mg/L	1	10

**Quality Control Report  
Method Blank**

Sample: Method Blank      QCBatch: QC07223

Param	Flag	Results	Units	Reporting Limit
CL		<0.5	mg/L	0.50
Fluoride		<0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<0.5	mg/L	0.50

Sample: Method Blank      QCBatch: QC07328

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.096	mg/L	0.10	96	72 - 128
4-BFB		0.087	mg/L	0.10	87	72 - 128

Sample: Method Blank      QCBatch: QC07435

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Sample: Method Blank      QCBatch: QC07523

Param	Flag	Results	Units	Reporting Limit
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.0	mg/L as CaCo3	1
Total Alkalinity		<4.0	mg/L as CaCo3	1

Sample: Method Blank      QCBatch: QC07552

Param	Flag	Results	Units	Reporting Limit
Dissolved Calcium		<0.05	mg/L	0.50
Dissolved Magnesium		<0.05	mg/L	0.50
Dissolved Potassium		<0.05	mg/L	0.50
Dissolved Sodium		<0.05	mg/L	0.50

### Quality Control Report Lab Control Spikes and Duplicate Spikes

Sample: LCS      QC Batch: QC07223

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		11.36	mg/L	1	12.50	<0.5	90		80 - 120	25
Fluoride		2.35	mg/L	1	2.50	<0.2	94		80 - 120	20
Nitrate-N		2.38	mg/L	1	2.50	<0.2	95		80 - 120	20
Sulfate		11.70	mg/L	1	12.50	<0.5	93		80 - 120	20

Sample: LCSD      QC Batch: QC07223

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		11.36	mg/L	1	12.50	<0.5	90	0	80 - 120	25
Fluoride		2.36	mg/L	1	2.50	<0.2	94	0	80 - 120	20
Nitrate-N		2.37	mg/L	1	2.50	<0.2	94	0	80 - 120	20
Sulfate		11.75	mg/L	1	12.50	<0.5	94	0	80 - 120	20

Sample: LCS      QC Batch: QC07328

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.085	mg/L	1	0.10	<0.001	85		80 - 120	20
Benzene		0.093	mg/L	1	0.10	<0.001	93		80 - 120	20

Continued ...

... Continued

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Toluene		0.086	mg/L	1	0.10	<0.001	86		80 - 120	20
Ethylbenzene		0.085	mg/L	1	0.10	<0.001	85		80 - 120	20
M,P,O-Xylene		0.244	mg/L	1	0.30	<0.001	81		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.096	mg/L	1	0.10	96	72 - 128
4-BFB		0.089	mg/L	1	0.10	89	72 - 128

Sample: LCSD                      QC Batch: QC07328

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.085	mg/L	1	0.10	<0.001	85	0	80 - 120	20
Benzene		0.092	mg/L	1	0.10	<0.001	92	1	80 - 120	20
Toluene		0.086	mg/L	1	0.10	<0.001	86	0	80 - 120	20
Ethylbenzene		0.085	mg/L	1	0.10	<0.001	85	0	80 - 120	20
M,P,O-Xylene		0.243	mg/L	1	0.30	<0.001	81	0	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.094	mg/L	1	0.10	94	72 - 128
4-BFB		0.087	mg/L	1	0.10	87	72 - 128

### Quality Control Report Matrix Spikes and Duplicate Spikes

Sample: MS                              QC Batch: QC07223

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		969.04	mg/L	1	625		83		82 - 100	25
CL		969.04	mg/L	1	625	450	83		82 - 100	25
Fluoride		124.97	mg/L	1	125		95		81 - 109	20
Fluoride		124.97	mg/L	1	125	5.2	95		81 - 109	20
Nitrate-N		133.68	mg/L	1	125		98		74 - 111	20
Nitrate-N		133.68	mg/L	1	125	11	98		74 - 111	20
Sulfate		1144.32	mg/L	1	625		95		81 - 106	20
Sulfate		1144.32	mg/L	1	625	550	95		81 - 106	20

Sample: MSD                              QC Batch: QC07223

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		967.19	mg/L	1	625		82	0	82 - 100	25
CL		967.19	mg/L	1	625	450	82	0	82 - 100	25
Fluoride		124.34	mg/L	1	125		95	0	81 - 109	20
Fluoride		124.34	mg/L	1	125	5.2	95	0	81 - 109	20
Nitrate-N		133.76	mg/L	1	125		98	0	74 - 111	20
Nitrate-N		133.76	mg/L	1	125	11	98	0	74 - 111	20
Sulfate		1137.14	mg/L	1	625		93	1	81 - 106	20
Sulfate		1137.14	mg/L	1	625	550	93	1	81 - 106	20

### Quality Control Report Duplicate Samples

Sample: Duplicate      QC Batch: QC07435

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		1998	2000	mg/L	1	0	11

Sample: Duplicate      QC Batch: QC07523

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	11
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	11
Bicarbonate Alkalinity		360	360	mg/L as CaCo3	1	0	11
Total Alkalinity		360	360	mg/L as CaCo3	1	0	11

### Quality Control Report Continuing Calibration Verification Standards

Sample: CCV (1)      QC Batch: QC07223

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.48	99	80 - 120	12/7/00
CL		mg/L	12.50	11.42	91	80 - 120	12/7/00
Fluoride		mg/L	2.50	2.37	94	80 - 120	12/7/00
Nitrate-N		mg/L	2.50	2.38	95	80 - 120	12/7/00
Sulfate		mg/L	12.50	11.76	94	80 - 120	12/7/00

Sample: ICV (1)      QC Batch: QC07223

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.53	101	80 - 120	12/7/00
CL		mg/L	12.50	11.79	94	80 - 120	12/7/00
Fluoride		mg/L	2.50	2.35	94	80 - 120	12/7/00
Nitrate-N		mg/L	2.50	2.39	95	80 - 120	12/7/00
Sulfate		mg/L	12.50	12.21	97	80 - 120	12/7/00

Sample: CCV (1)      QC Batch: QC07328

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.09	90	80 - 120	12/8/00
Benzene		mg/L	0.10	0.095	95	80 - 120	12/8/00
Toluene		mg/L	0.10	0.088	88	80 - 120	12/8/00
Ethylbenzene		mg/L	0.10	0.087	87	80 - 120	12/8/00
M,P,O-Xylene		mg/L	0.30	0.247	82	80 - 120	12/8/00

Sample: CCV (2)      QC Batch: QC07328

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.085	85	80 - 120	12/8/00
Benzene		mg/L	0.10	0.095	95	80 - 120	12/8/00
Toluene		mg/L	0.10	0.085	85	80 - 120	12/8/00
Ethylbenzene		mg/L	0.10	0.084	84	80 - 120	12/8/00
M,P,O-Xylene		mg/L	0.30	0.24	80	80 - 120	12/8/00

Sample: ICV (1)      QC Batch: QC07328

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.091	91	80 - 120	12/8/00
Benzene		mg/L	0.10	0.1	100	80 - 120	12/8/00
Toluene		mg/L	0.10	0.094	94	80 - 120	12/8/00
Ethylbenzene		mg/L	0.10	0.093	93	80 - 120	12/8/00
M,P,O-Xylene		mg/L	0.30	0.265	88	80 - 120	12/8/00

Sample: CCV (1)      QC Batch: QC07435

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	988	98	80 - 120	12/12/00

Sample: ICV (1) QC Batch: QC07435

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	975	97	80 - 120	12/12/00

Sample: CCV (1) QC Batch: QC07523

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	6	0	80 - 120	12/15/00
Carbonate Alkalinity		mg/L as CaCo3	0	248	0	80 - 120	12/15/00
Bicarbonate Alkalinity		mg/L as CaCo3	0	<1.0	0	80 - 120	12/15/00
Total Alkalinity		mg/L as CaCo3	250	254	101	80 - 120	12/15/00

Sample: ICV (1) QC Batch: QC07523

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	8	0	80 - 120	12/15/00
Carbonate Alkalinity		mg/L as CaCo3	0	256	0	80 - 120	12/15/00
Bicarbonate Alkalinity		mg/L as CaCo3	0	<1.0	0	80 - 120	12/15/00
Total Alkalinity		mg/L as CaCo3	250	264	105	80 - 120	12/15/00

Sample: CCV (1) QC Batch: QC07552

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.1	96	75 - 125	12/12/00
Dissolved Magnesium		mg/L	25	23.9	95	75 - 125	12/12/00
Dissolved Potassium		mg/L	25	24.3	97	75 - 125	12/12/00
Dissolved Sodium		mg/L	25	24.1	96	75 - 125	12/12/00

Sample: ICV (1) QC Batch: QC07552

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.5	98	75 - 125	12/12/00
Dissolved Magnesium		mg/L	25	24.3	97	75 - 125	12/12/00
Dissolved Potassium		mg/L	25	24.4	97	75 - 125	12/12/00
Dissolved Sodium		mg/L	25	23.9	95	75 - 125	12/12/00

6701 Aberdeen Avenue, Ste. 9  
Lubbock, Texas 79424  
Tel (806) 794-1296  
Fax (806) 794-1298  
1 (800) 378-1296

# Trace Analysis, Inc.

4725 Ripley Dr., Ste A  
El Paso, Texas 79922-1028  
Tel (915) 585-3443  
Fax (915) 585-4944  
1 (888) 588-3443

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # **AC0126713**

Company Name: **Larson and Associates, Inc.** Phone #: **(915) 687-0991**  
 Address: **(Street, City, Zip)** **2501 Leament Ln, Hudland, TX 79705 (915) 687-0456**  
 Contact Person: **Mark Larson**  
 Invoice to: **(if different from above)** **P.O. Box 50685 Hudland, TX 79710-0685**  
 Project #: **00-0110** Project Name: **Texas - C. J. Saunders**  
 Project Location: **Dea County, NM** Sampler Signature: *[Signature]*

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	PRESERVATIVE METHOD							SAMPLING			
				WATER	SOIL	AIR	SLUDGE	HCL	HNO3	NaHSO4	H2SO4	NaOH	ICE	NONE
160209	MW-9	3	✓	✓									12/14/00	1430

### ANALYSIS REQUEST

(Circle or Specify Method No.)

MTBE 8021B/602	✓
BTEX 8021B/602	✓
TPH 418.1/TX1005	
PAH 8270C	
Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	
TCLP Metals Ag As Ba Cd Cr Pb Se Hg	
TCLP Volatiles	
TCLP Semi Volatiles	
TCLP Pesticides	
RCI	
GC-MS Vol. 8260B/624	
GC/MS Semi. Vol. 8270C/625	
PCBs 8082/608	
Pesticides 8081A/608	
BOD, TSS, pH	
Antim	✓
TDS	✓
Hold	14

Turn Around Time if different from standard (Days) **(14)**

REMARKS: **12/22/00**

**LAB USE ONLY**

Intact  Y /  N  
 Headspace  Y /  N  
 Temp  2  
 Log-in Review  2

Relinquished by: *[Signature]* Date: **12/6/00** Time: **800**  
 Received by: **Nelson d'Arbenton** Date: **12/6/00** Time: **800**

Relinquished by: **Nelson d'Arbenton** Date: **12/6/00** Time: **1845**  
 Received at Laboratory by: **Mark Larson** Date: **12-7-200** Time: **10:00am**

Carrier # **They board**

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C. **3 samples ITS ORIGINAL COPY**

# TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298  
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944  
E-Mail: lab@traceanalysis.com

## Analytical and Quality Control Report

Mark Larson  
Larson & Associates, Inc.  
P.O. Box 50685  
Midland, Tx. 79710

Report Date: December 27, 2000

Order ID Number: A00120823

Project Number: 00-0110  
Project Name: C.J. Saunders  
Project Location: Lea County, New Mexico

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
160350	MW-1	Water	12/6/00	9:35	12/8/00
160351	MW-5	Water	12/6/00	10:10	12/8/00
160352	MW-6	Water	12/6/00	10:35	12/8/00
160353	MW-7	Water	12/6/00	11:18	12/8/00
160354	MW-8	Water	12/6/00	11:42	12/8/00
160355	MW-13	Water	12/6/00	12:35	12/8/00
160356	MW-14	Water	12/6/00	13:05	12/8/00
160357	MW-3	Water	12/6/00	13:35	12/8/00
160358	MW-2	Water	12/6/00	14:05	12/8/00
160359	MW-4	Water	12/6/00	14:32	12/8/00
160360	MW-11	Water	12/6/00	14:56	12/8/00
160361	MW-12	Water	12/6/00	15:20	12/8/00
160362	Duplicate	Water	12/6/00	:	12/8/00
160363	Trip Blank	Water	12/6/00	:	12/8/00

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

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Dr. Blair Leftwich, Director

**Sample: 160350 - MW-1**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07523 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		486	mg/L as CaCo3	1	1
Total Alkalinity		486	mg/L as CaCo3	1	1

**Sample: 160350 - MW-1**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07330 Date Analyzed: 12/11/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06382 Date Prepared: 12/11/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.461	mg/L	1	0.10	92	72 - 128
4-BFB		0.412	mg/L	1	0.10	82	72 - 128

**Sample: 160350 - MW-1**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07308 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL	1	65	mg/L	1	0.50
Fluoride		1.3	mg/L	1	0.20
Nitrate-N	2	<1.0	mg/L	1	0.20
Sulfate		140	mg/L	1	0.50

**Sample: 160350 - MW-1**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		300	mg/L	1.10	0.50
Dissolved Magnesium		35	mg/L	1.10	0.50
Dissolved Potassium		6.7	mg/L	1.10	0.50
Dissolved Sodium		76	mg/L	1.10	0.50

<sup>1</sup>Chloride re-ran on IC121300-1.sch (PB06467; QC07409). ICV %IA = 100; CCV %IA = 96; matrix spikes RPD = 0; matrix spikes %EA = 95.

<sup>2</sup>Sample ran out of hold time for NO3.

**Sample: 160350 - MW-1**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07435 Date Analyzed: 12/12/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06484 Date Prepared: 12/11/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1400	mg/L	1	10

**Sample: 160351 - MW-5**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07523 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		580	mg/L as CaCo3	1	1
Total Alkalinity		580	mg/L as CaCo3	1	1

**Sample: 160351 - MW-5**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.488	mg/L	1	0.10	97	72 - 128
4-BFB		0.425	mg/L	1	0.10	85	72 - 128

**Sample: 160351 - MW-5**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07308 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		160	mg/L	1	0.50
Fluoride		1.4	mg/L	1	0.20
Nitrate-N	3	3.5	mg/L	1	0.20
Sulfate	4	56	mg/L	1	0.50

<sup>3</sup>Sample ran out of hold time for NO3.

<sup>4</sup>Sulfate re-ran on IC121300-1.sch (PB06467; QC07409). ICV %IA = 100; CCV %IA = 97; blank spikes RPD = 0; blank spikes %EA = 97. Blank spikes used because the matrix spikes were outside the curve.

**Sample: 160351 - MW-5**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		314	mg/L	1.10	0.50
Dissolved Magnesium		36	mg/L	1.10	0.50
Dissolved Potassium		6.8	mg/L	1.10	0.50
Dissolved Sodium		73	mg/L	1.10	0.50

**Sample: 160351 - MW-5**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07435 Date Analyzed: 12/12/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06484 Date Prepared: 12/11/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1400	mg/L	1	10

**Sample: 160352 - MW-6**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07523 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		394	mg/L as CaCo3	1	1
Total Alkalinity		394	mg/L as CaCo3	1	1

**Sample: 160352 - MW-6**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.5	mg/L	1	0.10	100	72 - 128
4-BFB		0.434	mg/L	1	0.10	86	72 - 128

**Sample: 160352 - MW-6**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07308 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL	5	810	mg/L	1	0.50
Fluoride		1.6	mg/L	1	0.20
Nitrate-N	6	2.8	mg/L	1	0.20
Sulfate		74	mg/L	1	0.50

**Sample: 160352 - MW-6**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		448	mg/L	1.10	0.50
Dissolved Magnesium		52	mg/L	1.10	0.50
Dissolved Potassium		8.4	mg/L	1.10	0.50
Dissolved Sodium		112	mg/L	1.10	0.50

**Sample: 160352 - MW-6**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07435 Date Analyzed: 12/12/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06484 Date Prepared: 12/11/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1900	mg/L	1	10

**Sample: 160353 - MW-7**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07523 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		360	mg/L as CaCo3	1	1
Total Alkalinity		360	mg/L as CaCo3	1	1

**Sample: 160353 - MW-7**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

<sup>5</sup>Chloride re-ran on IC121300-1.sch (PB06467; QC07409). ICV %IA = 100; CCV %IA = 96; matrix spikes RPD = 0; matrix spikes %EA = 95.

<sup>6</sup>Sample ran out of hold time for NO3.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.48	mg/L	1	0.10	96	72 - 128
4-BFB		0.421	mg/L	1	0.10	84	72 - 128

**Sample: 160353 - MW-7**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07309 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		140	mg/L	1	0.50
Fluoride		1.6	mg/L	1	0.20
Nitrate-N	7	2.2	mg/L	1	0.20
Sulfate	8	850	mg/L	1	0.50

**Sample: 160353 - MW-7**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		324	mg/L	1.10	0.50
Dissolved Magnesium		33	mg/L	1.10	0.50
Dissolved Potassium		8.3	mg/L	1.10	0.50
Dissolved Sodium		216	mg/L	1.10	0.50

**Sample: 160353 - MW-7**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07435 Date Analyzed: 12/12/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06484 Date Prepared: 12/11/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1900	mg/L	1	10

**Sample: 160354 - MW-8**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07523 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		178	mg/L as CaCo3	1	1
Total Alkalinity		178	mg/L as CaCo3	1	1

**Sample: 160354 - MW-8**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

<sup>7</sup>Sample ran out of hold time for NO3.

<sup>8</sup>Sulfate re-ran on IC121300-1.sch (PB06467; QC07409). ICV %IA = 100; CCV %IA = 97; blank spikes RPD = 0; blank spikes %EA = 97. Blank spikes used because the matrix spikes were outside the curve.

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.474	mg/L	1	0.10	94	72 - 128
4-BFB		0.418	mg/L	1	0.10	83	72 - 128

**Sample: 160354 - MW-8**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07309 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		26	mg/L	1	0.50
Fluoride		2.0	mg/L	1	0.20
Nitrate-N	<sup>9</sup>	2.7	mg/L	1	0.20
Sulfate		51	mg/L	1	0.50

**Sample: 160354 - MW-8**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		72	mg/L	1.10	0.50
Dissolved Magnesium		6.6	mg/L	1.10	0.50
Dissolved Potassium		3.8	mg/L	1.10	0.50
Dissolved Sodium		30	mg/L	1.10	0.50

**Sample: 160354 - MW-8**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07435 Date Analyzed: 12/12/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06484 Date Prepared: 12/11/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		380	mg/L	1	10

**Sample: 160355 - MW-13**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07524 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1

Continued ...

<sup>9</sup>Sample ran out of hold time for NO3.

... Continued Sample: 160355 Analysis: Alkalinity

Param	Flag	Result	Units	Dilution	RDL
Bicarbonate Alkalinity		172	mg/L as CaCo3	1	1
Total Alkalinity		172	mg/L as CaCo3	1	1

**Sample: 160355 - MW-13**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.482	mg/L	1	0.10	96	72 - 128
4-BFB		0.419	mg/L	1	0.10	83	72 - 128

**Sample: 160355 - MW-13**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07309 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		25	mg/L	1	0.50
Fluoride		2.2	mg/L	1	0.20
Nitrate-N	<sup>10</sup>	2.7	mg/L	1	0.20
Sulfate		48	mg/L	1	0.50

**Sample: 160355 - MW-13**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		72	mg/L	1.10	0.50
Dissolved Magnesium		6.8	mg/L	1.10	0.50
Dissolved Potassium		3.9	mg/L	1.10	0.50
Dissolved Sodium		25	mg/L	1.10	0.50

**Sample: 160355 - MW-13**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07435 Date Analyzed: 12/12/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06484 Date Prepared: 12/11/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		350	mg/L	1	10

<sup>10</sup>Sample ran out of hold time for NO3.

**Sample: 160356 - MW-14**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07524 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		166	mg/L as CaCo3	1	1
Total Alkalinity		166	mg/L as CaCo3	1	1

**Sample: 160356 - MW-14**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.508	mg/L	1	0.10	101	72 - 128
4-BFB		0.434	mg/L	1	0.10	86	72 - 128

**Sample: 160356 - MW-14**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07307 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		25	mg/L	1	0.50
Fluoride		2.1	mg/L	1	0.20
Nitrate-N		2.6	mg/L	1	0.20
Sulfate	<sup>11</sup>	50	mg/L	1	0.50

**Sample: 160356 - MW-14**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		71	mg/L	1.10	0.50
Dissolved Magnesium		7.6	mg/L	1.10	0.50
Dissolved Potassium		4.1	mg/L	1.10	0.50
Dissolved Sodium		26	mg/L	1.10	0.50

<sup>11</sup>Sulfate re-ran on IC120800-2.sch (PB06367; QC07308). ICV %IA = 93; CCV %IA = 93; matrix spikes RPD = 0; matrix spikes %EA = 93.

**Sample: 160356 - MW-14**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07435 Date Analyzed: 12/12/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06484 Date Prepared: 12/11/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		360	mg/L	1	10

**Sample: 160357 - MW-3**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07524 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		204	mg/L as CaCo3	1	1
Total Alkalinity		204	mg/L as CaCo3	1	1

**Sample: 160357 - MW-3**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.47	mg/L	1	0.10	94	72 - 128
4-BFB		0.407	mg/L	1	0.10	81	72 - 128

**Sample: 160357 - MW-3**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07307 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		26	mg/L	1	0.50
Fluoride		2.0	mg/L	1	0.20
Nitrate-N		2.6	mg/L	1	0.20
Sulfate	12	64	mg/L	1	0.50

**Sample: 160357 - MW-3**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

<sup>12</sup>Sulfate re-ran on IC120800-2.sch (PB06367; QC07308). ICV %IA = 93; CCV %IA = 93; matrix spikes RPD = 0; matrix spikes %EA = 93.

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		87	mg/L	1.10	0.50
Dissolved Magnesium		8.0	mg/L	1.10	0.50
Dissolved Potassium		4.1	mg/L	1.10	0.50
Dissolved Sodium		29	mg/L	1.10	0.50

**Sample: 160357 - MW-3**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07436 Date Analyzed: 12/13/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06485 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		410	mg/L	1	10

**Sample: 160358 - MW-2**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07524 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		190	mg/L as CaCo3	1	1
Total Alkalinity		190	mg/L as CaCo3	1	1

**Sample: 160358 - MW-2**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.476	mg/L	1	0.10	95	72 - 128
4-BFB		0.414	mg/L	1	0.10	82	72 - 128

**Sample: 160358 - MW-2**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07307 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		57	mg/L	1	0.50
Fluoride		1.9	mg/L	1	0.20
Nitrate-N		2.4	mg/L	1	0.20

Continued ...

... Continued Sample: 160358 Analysis: Ion Chromatography (IC)

Param	Flag	Result	Units	Dilution	RDL
Sulfate	13	69	mg/L	1	0.50

**Sample: 160358 - MW-2**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		96	mg/L	1.10	0.50
Dissolved Magnesium		10	mg/L	1.10	0.50
Dissolved Potassium		4.3	mg/L	1.10	0.50
Dissolved Sodium		32	mg/L	1.10	0.50

**Sample: 160358 - MW-2**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07436 Date Analyzed: 12/13/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06485 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		460	mg/L	1	10

**Sample: 160359 - MW-4**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07524 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		150	mg/L as CaCo3	1	1
Total Alkalinity		150	mg/L as CaCo3	1	1

**Sample: 160359 - MW-4**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.467	mg/L	1	0.10	93	72 - 128
4-BFB		0.411	mg/L	1	0.10	82	72 - 128

<sup>13</sup>Sulfate re-ran on IC120800-2.sch (PB06367; QC07308). ICV %IA = 93; CCV %IA = 93; matrix spikes RPD = 0; matrix spikes %EA = 93.

**Sample: 160359 - MW-4**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07307 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		11	mg/L	1	0.50
Fluoride		3.3	mg/L	1	0.20
Nitrate-N		<1.0	mg/L	1	0.20
Sulfate	14	35	mg/L	1	0.50

**Sample: 160359 - MW-4**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07678 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		59	mg/L	1.10	0.50
Dissolved Magnesium		5.6	mg/L	1.10	0.50
Dissolved Potassium		3.1	mg/L	1.10	0.50
Dissolved Sodium		13	mg/L	1.10	0.50

**Sample: 160359 - MW-4**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07436 Date Analyzed: 12/13/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06485 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		260	mg/L	1	10

**Sample: 160360 - MW-11**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07524 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		326	mg/L as CaCo3	1	1
Total Alkalinity		326	mg/L as CaCo3	1	1

**Sample: 160360 - MW-11**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

<sup>14</sup>Sulfate re-ran on IC120800-2.sch (PB06367; QC07308). ICV %IA = 93; CCV %IA = 93; matrix spikes RPD = 0; matrix spikes %EA = 93.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.47	mg/L	1	0.10	94	72 - 128
4-BFB		0.422	mg/L	1	0.10	84	72 - 128

**Sample: 160360 - MW-11**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07307 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		120	mg/L	1	0.50
Fluoride		3.2	mg/L	1	0.20
Nitrate-N		<1.0	mg/L	1	0.20
Sulfate	<sup>15</sup>	59	mg/L	1	0.50

**Sample: 160360 - MW-11**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07679 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		104	mg/L	1.10	0.50
Dissolved Magnesium		22	mg/L	1.10	0.50
Dissolved Potassium		4.9	mg/L	1.10	0.50
Dissolved Sodium		94	mg/L	1.10	0.50

**Sample: 160360 - MW-11**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07436 Date Analyzed: 12/13/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06485 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		720	mg/L	1	10

**Sample: 160361 - MW-12**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07524 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		288	mg/L as CaCo3	1	1
Total Alkalinity		288	mg/L as CaCo3	1	1

**Sample: 160361 - MW-12**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

<sup>15</sup>Sulfate re-ran on IC120800-2.sch (PB06367; QC07308). ICV %IA = 93; CCV %IA = 93; matrix spikes RPD = 0; matrix spikes %EA = 93.

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.482	mg/L	1	0.10	96	72 - 128
4-BFB		0.424	mg/L	1	0.10	84	72 - 128

**Sample: 160361 - MW-12**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07307 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		36	mg/L	1	0.50
Fluoride		2.9	mg/L	1	0.20
Nitrate-N		<1.0	mg/L	1	0.20
Sulfate	<sup>16</sup>	90	mg/L	1	0.50

**Sample: 160361 - MW-12**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07679 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		83	mg/L	1.10	0.50
Dissolved Magnesium		31	mg/L	1.10	0.50
Dissolved Potassium		3.3	mg/L	1.10	0.50
Dissolved Sodium		52	mg/L	1.10	0.50

**Sample: 160361 - MW-12**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07436 Date Analyzed: 12/13/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06485 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		570	mg/L	1	10

**Sample: 160362 - Duplicate**

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC07524 Date Analyzed: 12/15/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06575 Date Prepared: 12/15/00

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1

Continued ...

<sup>16</sup>Sulfate re-ran on IC120800-2.sch (PB06367; QC07308). ICV %IA = 93; CCV %IA = 93; matrix spikes RPD = 0; matrix spikes %EA = 93.

... Continued Sample: 160362 Analysis: Alkalinity

Param	Flag	Result	Units	Dilution	RDL
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		280	mg/L as CaCo3	1	1
Total Alkalinity		280	mg/L as CaCo3	1	1

**Sample: 160362 - Duplicate**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.472	mg/L	1	0.10	94	72 - 128
4-BFB		0.414	mg/L	1	0.10	82	72 - 128

**Sample: 160362 - Duplicate**

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC07308 Date Analyzed: 12/8/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06367 Date Prepared: 12/8/00

Param	Flag	Result	Units	Dilution	RDL
CL		34	mg/L	1	0.50
Fluoride		2.6	mg/L	1	0.20
Nitrate-N		<1.0	mg/L	1	0.20
Sulfate		91	mg/L	1	0.50

**Sample: 160362 - Duplicate**

Analysis: Salts Analytical Method: S 6010B QC Batch: QC07679 Date Analyzed: 12/26/00  
Analyst: RR Preparation Method: E 3005 A Prep Batch: PB06717 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		85	mg/L	1.10	0.50
Dissolved Magnesium		31	mg/L	1.10	0.50
Dissolved Potassium		3.3	mg/L	1.10	0.50
Dissolved Sodium		57	mg/L	1.10	0.50

**Sample: 160362 - Duplicate**

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC07436 Date Analyzed: 12/13/00  
Analyst: JS Preparation Method: N/A Prep Batch: PB06485 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		560	mg/L	1	10

**Sample: 160363 - Trip Blank**

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC07360 Date Analyzed: 12/12/00  
Analyst: RC Preparation Method: 5035 Prep Batch: PB06416 Date Prepared: 12/12/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.093	mg/L	1	0.10	93	72 - 128
4-BFB		0.08	mg/L	1	0.10	80	72 - 128

**Sample: Method Blank**      QCBatch: QC07307

Param	Flag	Results	Units	Reporting Limit
CL		<0.5	mg/L	0.50
Fluoride		<0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		0.51	mg/L	0.50

**Sample: Method Blank**      QCBatch: QC07308

Param	Flag	Results	Units	Reporting Limit
CL		<0.5	mg/L	0.50
Fluoride		<0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<0.5	mg/L	0.50

**Sample: Method Blank**      QCBatch: QC07309

Param	Flag	Results	Units	Reporting Limit
CL		<0.5	mg/L	0.50
Fluoride		<0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<0.5	mg/L	0.50

**Sample: Method Blank**      QCBatch: QC07330

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Param	Flag	Results	Units	Reporting Limit
Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.101	mg/L	0.10	101	72 - 128
4-BFB		0.088	mg/L	0.10	88	72 - 128

Sample: Method Blank      QCBatch:    QC07360

Param	Flag	Results	Units	Reporting Limit
Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.1	mg/L	0.10	100	72 - 128
4-BFB		0.088	mg/L	0.10	88	72 - 128

Sample: Method Blank      QCBatch:    QC07435

Param	Flag	Results	Units	Reporting Limit
Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Sample: Method Blank      QCBatch:    QC07436

Param	Flag	Results	Units	Reporting Limit
Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Sample: Method Blank      QCBatch:    QC07523

Param	Flag	Results	Units	Reporting Limit
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.0	mg/L as CaCo3	1
Total Alkalinity		<4.0	mg/L as CaCo3	1

Sample: Method Blank      QCBatch:    QC07524

Param	Flag	Results	Units	Reporting Limit
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.0	mg/L as CaCo3	1
Total Alkalinity		<4.0	mg/L as CaCo3	1

Sample: Method Blank      QCBatch:    QC07678

Param	Flag	Results	Units	Reporting Limit
Dissolved Calcium		<0.05	mg/L	0.50
Dissolved Magnesium		<0.05	mg/L	0.50
Dissolved Potassium		<0.05	mg/L	0.50
Dissolved Sodium		<0.05	mg/L	0.50

Sample: Method Blank      QCBatch:    QC07679

Param	Flag	Results	Units	Reporting Limit
Dissolved Calcium		<0.05	mg/L	0.50
Dissolved Magnesium		<0.05	mg/L	0.50
Dissolved Potassium		<0.05	mg/L	0.50
Dissolved Sodium		<0.05	mg/L	0.50

Sample: LCS                  QC Batch: QC07307

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		11.30	mg/L	1	12.50	<0.5	90		80 - 120	25
Fluoride		2.37	mg/L	1	2.50	<0.2	94		80 - 120	20
Nitrate-N		2.32	mg/L	1	2.50	<0.2	92		80 - 120	20

Sample: LCSD                QC Batch: QC07307

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		11.32	mg/L	1	12.50	<0.5	90	0	80 - 120	25
Fluoride		2.38	mg/L	1	2.50	<0.2	95	0	80 - 120	20
Nitrate-N		2.32	mg/L	1	2.50	<0.2	92	0	80 - 120	20

Sample: LCS            QC Batch: QC07308

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL	<sup>17</sup>	11.27	mg/L	1	12.50	<0.5	90		80 - 120	25
Fluoride		2.38	mg/L	1	2.50	<0.2	95		80 - 120	20
Nitrate-N		2.30	mg/L	1	2.50	<0.2	92		80 - 120	20
Sulfate		11.66	mg/L	1	12.50	<0.5	93		80 - 120	20

Sample: LCSD            QC Batch: QC07308

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL	<sup>18</sup>	11.26	mg/L	1	12.50	<0.5	90	0	80 - 120	25
Fluoride		2.40	mg/L	1	2.50	<0.2	96	1	80 - 120	20
Nitrate-N		2.30	mg/L	1	2.50	<0.2	92	0	80 - 120	20
Sulfate		11.75	mg/L	1	12.50	<0.5	94	1	80 - 120	20

Sample: LCS            QC Batch: QC07309

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		11.20	mg/L	1	12.50	<0.5	89		80 - 120	25
Fluoride		2.37	mg/L	1	2.50	<0.2	94		80 - 120	20
Nitrate-N		2.33	mg/L	1	2.50	<0.2	93		80 - 120	20
Sulfate		11.62	mg/L	1	12.50	<0.5	92		80 - 120	20

Sample: LCSD            QC Batch: QC07309

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		11.17	mg/L	1	62.50	<0.5	89	0	80 - 120	25
Fluoride		2.38	mg/L	1	12.50	<0.2	95	0	80 - 120	20
Nitrate-N		2.31	mg/L	1	2.50	<0.2	92	1	80 - 120	20
Sulfate		11.58	mg/L	1	12.50	<0.5	92	0	80 - 120	20

<sup>17</sup>Chloride blank spikes used because I'm re-running the chloride on the sample that I spiked.

<sup>18</sup>Chloride blank spikes used because I'm re-running the chloride on the sample that I spiked.

Sample: LCS      QC Batch: QC07330

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.095	mg/L	1	0.10	<0.001	95	0	80 - 120	20
Benzene		0.094	mg/L	1	0.10	<0.001	94	1	80 - 120	20
Toluene		0.087	mg/L	1	0.10	<0.001	87	0	80 - 120	20
Ethylbenzene		0.087	mg/L	1	0.10	<0.001	87	0	80 - 120	20
M,P,O-Xylene		0.246	mg/L	1	0.30	<0.001	82	0	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.098	mg/L	1	0.10	98	72 - 128
4-BFB		0.089	mg/L	1	0.10	89	72 - 128

Sample: LCSD      QC Batch: QC07330

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.086	mg/L	1	0.10	<0.001	86	5	80 - 120	20
Benzene		0.092	mg/L	1	0.10	<0.001	92	2	80 - 120	20
Toluene		0.085	mg/L	1	0.10	<0.001	85	2	80 - 120	20
Ethylbenzene		0.084	mg/L	1	0.10	<0.001	84	1	80 - 120	20
M,P,O-Xylene		0.24	mg/L	1	0.30	<0.001	80	2	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.098	mg/L	1	0.10	98	72 - 128
4-BFB		0.089	mg/L	1	0.10	89	72 - 128

Sample: LCS      QC Batch: QC07360

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.098	mg/L	1	0.10	<0.001	98	3	80 - 120	20
Benzene		0.096	mg/L	1	0.10	<0.001	96	6	80 - 120	20
Toluene		0.092	mg/L	1	0.10	<0.001	92	9	80 - 120	20
Ethylbenzene		0.091	mg/L	1	0.10	<0.001	91	4	80 - 120	20
M,P,O-Xylene		0.255	mg/L	1	0.30	<0.001	85	8	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.099	mg/L	1	0.10	99	72 - 128
4-BFB		0.09	mg/L	1	0.10	90	72 - 128

Sample: LCSD QC Batch: QC07360

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.098	mg/L	1	0.10	<0.001	98	3	80 - 120	20
Benzene		0.097	mg/L	1	0.10	<0.001	97	6	80 - 120	20
Toluene		0.093	mg/L	1	0.10	<0.001	93	9	80 - 120	20
Ethylbenzene		0.092	mg/L	1	0.10	<0.001	92	4	80 - 120	20
M,P,O-Xylene		0.259	mg/L	1	0.30	<0.001	86	8	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.102	mg/L	1	0.10	102	72 - 128
4-BFB		0.093	mg/L	1	0.10	93	72 - 128

Sample: MS QC Batch: QC07307

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		90.39	mg/L	1	62.50	36	87		82 - 100	25
Fluoride		14.07	mg/L	1	12.50	2.9	89		81 - 109	20
Nitrate-N		11.88	mg/L	1	12.50	<1.0	95		74 - 111	20

Sample: MSD QC Batch: QC07307

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		90.38	mg/L	1	62.50	36	87	0	82 - 100	25
Fluoride		13.93	mg/L	1	12.50	2.9	88	1	81 - 109	20
Nitrate-N		12.02	mg/L	1	12.50	<1.0	96	1	74 - 111	20

Sample: MS QC Batch: QC07308

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Fluoride		13.01	mg/L	1	12.50	1.6	91		81 - 109	20
Nitrate-N		14.16	mg/L	1	12.50	2.8	90		74 - 111	20
Sulfate		132.00	mg/L	1	62.50	74	92		81 - 106	20

Sample: MSD QC Batch: QC07308

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Fluoride		12.83	mg/L	1	12.50	1.6	89	2	81 - 109	20
Nitrate-N		14.19	mg/L	1	12.50	2.8	91	0	74 - 111	20
Sulfate		131.71	mg/L	1	62.50	74	92	0	81 - 106	20

Sample: MS            QC Batch: QC07309

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		79.91	mg/L	1	62.50	25	87		82 - 100	25
Fluoride		13.76	mg/L	1	12.50	2.2	92		81 - 109	20
Nitrate-N		14.08	mg/L	1	12.50	2.7	91		74 - 111	20
Sulfate		105.16	mg/L	1	62.50	48	91		81 - 106	20

Sample: MSD            QC Batch: QC07309

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		80.14	mg/L	1	62.50	25	88	0	82 - 100	25
Fluoride		14.26	mg/L	1	12.50	2.2	96	4	81 - 109	20
Nitrate-N		13.91	mg/L	1	12.50	2.7	89	2	74 - 111	20
Sulfate		105.55	mg/L	1	62.50	48	92	1	81 - 106	20

Sample: Duplicate            QC Batch: QC07435

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		1998	2000	mg/L	1	0	11

Sample: Duplicate            QC Batch: QC07436

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		1710	1700	mg/L	1	0	11

Sample: Duplicate            QC Batch: QC07523

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	11
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	11
Bicarbonate Alkalinity		360	360	mg/L as CaCo3	1	0	11

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Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Alkalinity		360	360	mg/L as CaCo3	1	0	11

Sample: Duplicate      QC Batch: QC07524

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	11
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	11
Bicarbonate Alkalinity		200	204	mg/L as CaCo3	1	2	11
Total Alkalinity		200	204	mg/L as CaCo3	1	2	11

Sample: CCV (1)      QC Batch: QC07307

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.48	99	80 - 120	12/8/00
CL		mg/L	12.50	11.64	93	80 - 120	12/8/00
Fluoride		mg/L	2.50	2.38	95	80 - 120	12/8/00
Nitrate-N		mg/L	2.50	2.33	93	80 - 120	12/8/00
Sulfate		mg/L	12.50	11.64	93	80 - 120	12/8/00

Sample: ICV (1)      QC Batch: QC07307

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.47	98	80 - 120	12/8/00
CL		mg/L	12.50	11.31	90	80 - 120	12/8/00
Fluoride		mg/L	2.50	2.39	95	80 - 120	12/8/00
Nitrate-N		mg/L	2.50	2.33	93	80 - 120	12/8/00
Sulfate		mg/L	12.50	11.66	93	80 - 120	12/8/00

Sample: CCV (1)      QC Batch: QC07308

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.44	97	80 - 120	12/8/00
CL		mg/L	12.50	11.30	90	80 - 120	12/8/00
Fluoride		mg/L	2.50	2.40	96	80 - 120	12/8/00
Nitrate-N		mg/L	2.50	2.31	92	80 - 120	12/8/00
Sulfate		mg/L	12.50	11.63	93	80 - 120	12/8/00

Sample: ICV (1)      QC Batch: QC07308

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.48	99	80 - 120	12/8/00
CL		mg/L	12.50	11.64	93	80 - 120	12/8/00
Fluoride		mg/L	2.50	2.38	95	80 - 120	12/8/00
Nitrate-N		mg/L	2.50	2.33	93	80 - 120	12/8/00
Sulfate		mg/L	12.50	11.64	93	80 - 120	12/8/00

Sample: CCV (1)      QC Batch: QC07309

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.41	96	80 - 120	12/8/00
CL		mg/L	12.50	11.22	89	80 - 120	12/8/00
Fluoride		mg/L	2.50	2.39	95	80 - 120	12/8/00
Nitrate-N		mg/L	2.50	2.33	93	80 - 120	12/8/00
Sulfate		mg/L	12.50	11.56	92	80 - 120	12/8/00

Sample: ICV (1)      QC Batch: QC07309

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.44	97	80 - 120	12/8/00
CL		mg/L	12.50	11.30	90	80 - 120	12/8/00
Fluoride		mg/L	2.50	2.40	96	80 - 120	12/8/00
Nitrate-N		mg/L	2.50	2.31	92	80 - 120	12/8/00
Sulfate		mg/L	12.50	11.63	93	80 - 120	12/8/00

Sample: CCV (1)      QC Batch: QC07330

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.094	94	80 - 120	12/11/00
Benzene		mg/L	0.10	0.092	92	80 - 120	12/11/00
Toluene		mg/L	0.10	0.085	85	80 - 120	12/11/00
Ethylbenzene		mg/L	0.10	0.085	85	80 - 120	12/11/00
M,P,O-Xylene		mg/L	0.30	0.24	80	80 - 120	12/11/00

Sample: CCV (2)      QC Batch: QC07330

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	80 - 120	12/11/00
Benzene		mg/L	0.10	0.089	89	80 - 120	12/11/00
Toluene		mg/L	0.10	0.081	81	80 - 120	12/11/00
Ethylbenzene		mg/L	0.10	0.083	83	80 - 120	12/11/00
M,P,O-Xylene		mg/L	0.30	0.242	80	80 - 120	12/11/00

Sample: ICV (1)      QC Batch: QC07330

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	80 - 120	12/11/00
Benzene		mg/L	0.10	0.091	91	80 - 120	12/11/00
Toluene		mg/L	0.10	0.087	87	80 - 120	12/11/00
Ethylbenzene		mg/L	0.10	0.092	92	80 - 120	12/11/00
M,P,O-Xylene		mg/L	0.30	0.258	86	80 - 120	12/11/00

Sample: CCV (1)      QC Batch: QC07360

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.1	100	80 - 120	12/12/00
Benzene		mg/L	0.10	0.096	96	80 - 120	12/12/00
Toluene		mg/L	0.10	0.091	91	80 - 120	12/12/00
Ethylbenzene		mg/L	0.10	0.091	91	80 - 120	12/12/00
M,P,O-Xylene		mg/L	0.30	0.255	85	80 - 120	12/12/00

Sample: CCV (2)      QC Batch: QC07360

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.086	86	80 - 120	12/12/00
Benzene		mg/L	0.10	0.094	94	80 - 120	12/12/00
Toluene		mg/L	0.10	0.089	89	80 - 120	12/12/00
Ethylbenzene		mg/L	0.10	0.089	89	80 - 120	12/12/00
M,P,O-Xylene		mg/L	0.30	0.25	83	80 - 120	12/12/00

Sample: ICV (1)      QC Batch: QC07360

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.1	100	80 - 120	12/12/00

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.091	91	80 - 120	12/12/00
Toluene		mg/L	0.10	0.088	88	80 - 120	12/12/00
Ethylbenzene		mg/L	0.10	0.087	87	80 - 120	12/12/00
M,P,O-Xylene		mg/L	0.30	0.245	81	80 - 120	12/12/00

Sample: CCV (1)            QC Batch: QC07435

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	988	98	80 - 120	12/12/00

Sample: ICV (1)            QC Batch: QC07435

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	975	97	80 - 120	12/12/00

Sample: CCV (1)            QC Batch: QC07436

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	963	96	80 - 120	12/13/00

Sample: ICV (1)            QC Batch: QC07436

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	957	95	80 - 120	12/13/00

Sample: CCV (1)            QC Batch: QC07523

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	6	0	80 - 120	12/15/00
Carbonate Alkalinity		mg/L as CaCo3	0	248	0	80 - 120	12/15/00
Bicarbonate Alkalinity		mg/L as CaCo3	0	<1.0	0	80 - 120	12/15/00
Total Alkalinity		mg/L as CaCo3	250	254	101	80 - 120	12/15/00

Sample: ICV (1)            QC Batch: QC07523

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	8	0	80 - 120	12/15/00
Carbonate Alkalinity		mg/L as CaCo3	0	256	0	80 - 120	12/15/00
Bicarbonate Alkalinity		mg/L as CaCo3	0	<1.0	0	80 - 120	12/15/00
Total Alkalinity		mg/L as CaCo3	250	264	105	80 - 120	12/15/00

Sample: CCV (1)            QC Batch: QC07524

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	18	0	80 - 120	12/15/00
Carbonate Alkalinity		mg/L as CaCo3	0	224	0	80 - 120	12/15/00
Bicarbonate Alkalinity		mg/L as CaCo3	0	<1.0	0	80 - 120	12/15/00
Total Alkalinity		mg/L as CaCo3	250	242	96	80 - 120	12/15/00

Sample: ICV (1)            QC Batch: QC07524

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	6	0	80 - 120	12/15/00
Carbonate Alkalinity		mg/L as CaCo3	0	248	0	80 - 120	12/15/00
Bicarbonate Alkalinity		mg/L as CaCo3	0	<1.0	0	80 - 120	12/15/00
Total Alkalinity		mg/L as CaCo3	250	254	101	80 - 120	12/15/00

Sample: CCV (1)            QC Batch: QC07678

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.9	99	75 - 125	12/26/00
Dissolved Magnesium		mg/L	25	24.9	99	75 - 125	12/26/00
Dissolved Potassium		mg/L	25	24.8	99	75 - 125	12/26/00
Dissolved Sodium		mg/L	25	24.8	99	75 - 125	12/26/00

Sample: ICV (1)            QC Batch: QC07678

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.7	98	75 - 125	12/26/00
Dissolved Magnesium		mg/L	25	25.0	100	75 - 125	12/26/00
Dissolved Potassium		mg/L	25	25.2	100	75 - 125	12/26/00

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	25	25.6	102	75 - 125	12/26/00

Sample: CCV (1)

QC Batch: QC07679

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.7	98	75 - 125	12/26/00
Dissolved Magnesium		mg/L	25	25.0	100	75 - 125	12/26/00
Dissolved Potassium		mg/L	25	25.0	100	75 - 125	12/26/00
Dissolved Sodium		mg/L	25	24.5	98	75 - 125	12/26/00

Sample: ICV (1)

QC Batch: QC07679

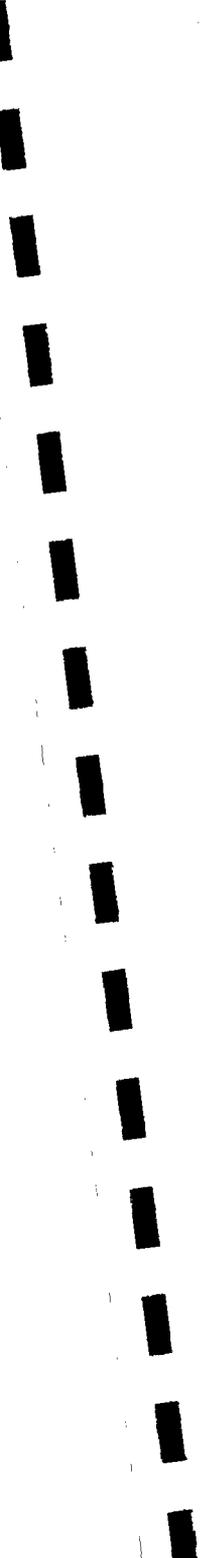
Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.9	99	75 - 125	12/26/00
Dissolved Magnesium		mg/L	25	24.9	99	75 - 125	12/26/00
Dissolved Potassium		mg/L	25	24.8	99	75 - 125	12/26/00
Dissolved Sodium		mg/L	25	24.8	99	75 - 125	12/26/00





**APPENDIX D**

**Correspondence to NMOCD**





## Highlander Environmental Corp.

Midland, Texas

June 12, 2000

**Via: Facsimile (505) 827-8177**

Mr. William C. Olson  
Environmental Bureau  
New Mexico Oil Conservation Division  
2040 S. Pacheco  
Santa Fe, New Mexico 87505

**Re: Nutrient Additive for Blended Soil, Saunders Excavation Site, Unit Letter "J", Section 18, Township 19 South, Range 37 East, Lea County, New Mexico**

Dear Mr. Olson:

This letter serves as a confirmation and clarification to our telephone call on Thursday, June 8, 2000, regarding the addition of nutrient to blended soil at the above-referenced location. Based on our telephone call, nutrient will be added to blended soil with total petroleum hydrocarbon (TPH) concentrations over 2,000 milligrams per kilogram (mg/kg). The nutrient (Micro-Blaze) was added to the first lift of blended soil, which reported a TPH concentration of 553 mg/kg (GRO and DRO), to provide an additional level of protection above the buffer of clean soil (2 to 3 feet) placed in the bottom of the excavation. Micro-Blaze will be added to subsequent lifts reporting TPH concentrations 2,000 mg/kg or greater.

Please call Rodney Bailey at (915) 688-2971, or myself at (915) 682-4559, if you have questions.

Sincerely,

*Highlander Environmental Corp.*

Mark J. Larson, CPG, CGWP  
Senior Project Manager

cc: Mr. Rodney Bailey - Texaco  
Mr. Robert Patterson - Texaco  
Mr. Glen Waldrop - EOTT  
Mr. Chris Williams - NMOCD Hobbs District

**APPENDIX E**

**MicroBlaze Product Information**

09/08/00 10:09 FAX 5053942601

ENVIRON PLUS

02



ENVIRONMENTAL PLUS, INC.  
STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES

*MicroBlaze*

*MicroBlaze Out™*

September 8, 2000

Larson & Associates

Subject: MicroBlaze Spill Control and Budkicker (Bio-Catalyst)

Mark,

The typical application for hydrocarbon contamination in soil is 1 gallon of 6% MicroBlaze Spill Control (MBSC) per cubic yard of soil. This inoculates the soil with petrophilic facultative bacteria and the phosphate based detergent promotes emulsification. Adequate moisture optimizes attenuation, but saturation should be avoided. Ten to 30 days after the initial application of MBSC, a similar application of 6% BudKicker (BK) should be made. The BK is a urea based nutrient that replaces depleted nutrients and accelerates the attenuation.

A 6% solution is obtained by mixing 16 gallons of clean fresh water with 1 gallon of concentrate and applied. Chloride inhibits the process.

Likewise, to calculate the amount of concentrate required for the bio-cell, divide the total yardage by 16 to get the number of gallons of concentrate required.

Sand is typically very low in nutrients and bacteria, the converse is true of loamy soils.

MBSC and BK accelerate the natural bio-attenuation process.

By-products of the attenuation process are bio-mass, N<sub>2</sub>, H<sub>2</sub>O, and CO<sub>2</sub>.

Attenuation occurs much more rapidly aerobically than the anaerobically, therefore, spreading the contaminated soil into a 12"-18" lift and tilling/turning weekly will optimize the process.

Call if you have any questions.

Pat

ENVIRONMENTAL PLUS, INC.

## Soil Remediation

### "Micro-Blaze" Emergency Liquid Spill Control

As a general rule, the following instructions apply:

#### Moderate to Concentrated Hydrocarbon Spills:

Maximum of one (1) gallon of concentrate per cubic yard saturated at an applied rate of 4% to 6% with water.

There are many variables in soil bioremediation. The factors to consider are the porosity, the depth of contamination, available moisture, the oxygen supply, surface compaction, temperature and the type of contaminants. These determine the amount of applications and the time frame. It is recommended to treat the area and test monthly for the amount of reductions. This will indicate the need to add or delete the product.

#### Liquid Remediation:

Gasoline storage tanks (to inert) – 6% of concentrate per 1,000 gallon capacity. The factors to consider in this type of remediation is the amount of contaminant in the tank and aeration. Product may be applied with a high pressure hose for aeration. A test for volatiles may be taken two (2) hours later. A TPH test 24 hours later.

#### Sludge Remediation:

These sites contain both sludge and liquids. Tests are necessary to determine the amounts of both, plus the amount of water and contaminants. These sites normally require on-going treatments of product applied in conjunction with CDU units and possibly other equipment. There are no set formulas or standards for these and require stability studies in the United States.

**Rule of Thumb:** "Micro-Blaze" Emergency Liquid Spill Control required is usually estimated at 10% of the amount of hydrocarbon spilled (i.e. 100 gals. of hydrocarbon – 10 gals. of "Micro-Blaze" Spill Control). This can vary due to surface area and is normally applied at a 3% to 6% ratio with water.

Follow-up treatments of *Bio-Catalyst* are normally applied 7 to 10 days following the initial treatment of "Micro-Blaze" Emergency Liquid Spill Control and is applied at a 3% to 10% ratio with water. These treatments can be alternated until there is no further contamination.



*Bud Kicker 2 of 2*

<b>Section V—Reactivity Data</b>						
Stability	Unstable		Conditions to Avoid	N/A		
	Stable	XXXX		N/A		
Incompatibility (Materials to Avoid)						
Hazardous Decomposition or Byproducts						
Hazardous Polymerization	May Occur		Conditions to Avoid	N/A		
	Will Not Occur	XXXX		N/A		
<b>Section VI—Health Hazard Data</b>						
Route(s) of Entry	N/A	Inhalation?	N/A	Skin?	N/A	
Health Hazards (Acute and Chronic)	N/A					
Carcinogenicity	N/A	NTP?	N/A	IARC Monographs?	N/A	
				OSHA Regulated?	N/A	
Signs and Symptoms of Exposure	N/A					
Medical Conditions						
Generally Aggravated by Exposure	N/A					
Emergency and First Aid Procedures	N/A					
<b>Section VII—Precautions for Safe Handling and Use</b>						
Steps to Be Taken in Case Material Is Released or spilled: None. Environmentally compatible to living organisms, soil or water.						
Waste Disposal	N/A					
Precautions to Be Taken in Handling and Storing	N/A					
Other Precautions	N/A					
<b>Section VIII—Control Measures</b>						
Respiratory Protection (Specify Type) None required with adequate ventilation.						
Ventilation	Local Exhaust	N/A			Special	N/A
	Mechanical (General)	N/A			Other	N/A
Protective Gloves	N/A			Eye Protection	N/A	
Other Protective Clothing or Equipment	N/A					
Work/Hygienic Practices	N/A					

We believe the statements, technical information and recommendations herein are reliable, but they are given without warranty or guarantee of any kind, express or implied, and we assume no responsibility for any loss, damage, or expense, direct or consequential, arising out of their use.



*Bud Kicker 2 of 2*

**Section V—Reactivity Data**

Stability	Unstable		Conditions to Avoid	N/A
	Stable	XXXX		N/A
Compatibility (Materials to Avoid)				
Hazardous Decomposition or Byproducts				
Hazardous Polymerization	May Occur		Conditions to Avoid	N/A
	Will Not Occur	XXXX		N/A

**Section VI—Health Hazard Data**

Route(s) of Entry	N/A	Inhalation?	N/A	Skin?	N/A	Ingestion?	N/A
Health Hazards (Acute and Chronic)		N/A					
Mutagenicity	N/A	NTP?	N/A	IARC Monographs?	N/A	OSHA Regulated?	N/A
Signs and Symptoms of Exposure		N/A					
Medical Conditions							
Generally Aggravated by Exposure		N/A					
Emergency and First Aid Procedures		N/A					

**Section VII—Precautions for Safe Handling and Use**

Steps to Be Taken in Case Material Is Released or Spilled:		None. Environmentally compatible to living organisms, soil or water.					
Waste Disposal		N/A					
Precautions to Be Taken in Handling and Storing		N/A					
Other Precautions		N/A					

**Section VIII—Control Measures**

Respiratory Protection (Specify Type) None required with adequate ventilation.					
Ventilation	Local Exhaust	N/A	Special	N/A	
	Mechanical (General)	N/A	Other	N/A	
Protective Gloves		N/A	Eye Protection		N/A
Other Protective Clothing or Equipment		N/A			
Work/Hygienic Practices		N/A			

We believe the statements, technical information and recommendations herein are reliable, but they are given without warranty or guarantee of any kind, express or implied, and we assume no responsibility for any loss, damage, or expense, direct or consequential, arising out of their use.

**APPENDIX F**

**Soil Compaction Analyses**

1-24-201 10:03AM

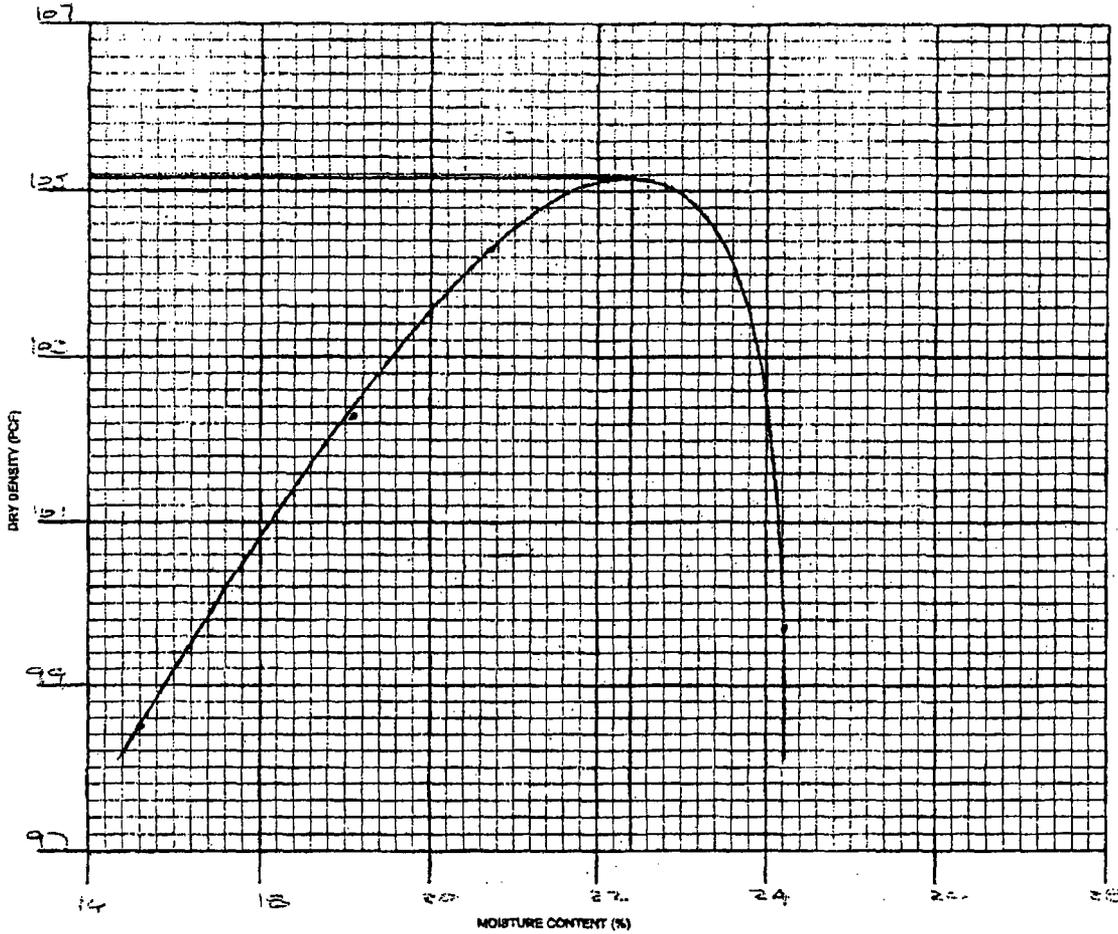
FROM JOHN WEST SURVEYING 15053933450

9-28-200 8:19AM

FROM PETTIGREW AND ASSOC. 505 393+1543



**PETTIGREW and ASSOCIATES  
CONSULTING ENGINEERS**



CLIENT: J. WEST PROJECT: LEIF JANDERS LEASE

SAMPLE LOCATION: STOCKPILE

SOIL DESCRIPTION: RED CLAY

SOIL CLASSIFICATION: \_\_\_\_\_ TEST METHOD: DEL 9/25/00

ATTERBERG: LL \_\_\_\_\_ PI \_\_\_\_\_ AOTM D 698

DATE: 9/27/00 LAB NO. \_\_\_\_\_

DRY WEIGHT LB/CU. FT. 105.2 MOISTURE CONTENT % 22.4

SIEVE ANALYSIS - % PASSING							

**PETTIGREW and ASSOCIATES**

COPIES:

BY: \_\_\_\_\_ S.E.T.

LABORATORY TEST RESULTS

JOHN WEST ENGINEERING COMPANY

412 N. DAL PASO  
HOBBS, NM 88240  
(505)393-3117

SCOTT BUSSELL P.E.  
MERCED SANCHEZ., E.I.T.

TO: Larson & Associates, Inc.  
P.O. Box 50685  
Midland, TX 79710-0685

MATERIAL: Red Clay

PROJECT: J.C. Saunders Site

TEST METHOD: ASTM D-2922

DEPTH: 12"

DATE OF TEST: September 28, 2000

TEST NO.	LOCATION	DRY DENSITY %MAXIMUM	MOISTURE CONTENT %	DEPTH
1	Flag #3, Lift #1	98.98	12.32	12"
2	Flag #6, Lift #1	97.96	12.85	12"
3	Flag #8, Lift #1	98.30	15.48	12"
4	Flag #10, Lift #1	96.37	15.03	12"
5	Flag #9, Lift #1	95.79	14.25	12"
6	Flag #7, Lift #1	96.76	13.08	12"
7	Flag #5, Lift #1	100.50	14.32	12"
8	Flag #2, NW Corner, Lift #1	97.37	14.65	12"
9	Flag#4, Lift #1	95.27	14.32	12"
10	Flag #1, NE Corner, Lift #1	95.60	11.11	12"

CONTROL DENSITY: 105.2 LBS. ASTM D698

OPTIMUM MOISTURE: 22.4%

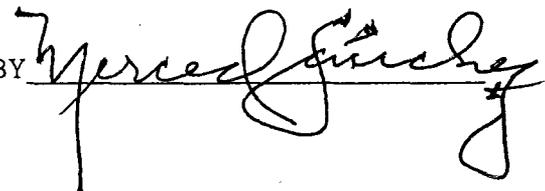
REQUIRED COMPACTION: 95%

MOISTURE CONTENT

COPIES TO:

JOHN WEST ENGINEERING COMPANY

BY



**APPENDIX G**

**Soil Boring Logs and Well Construction Records**

Client: Texaco Exploration and Production Inc. and EOTT ENERGY Pipeline L.P.

Log: **MW-13**

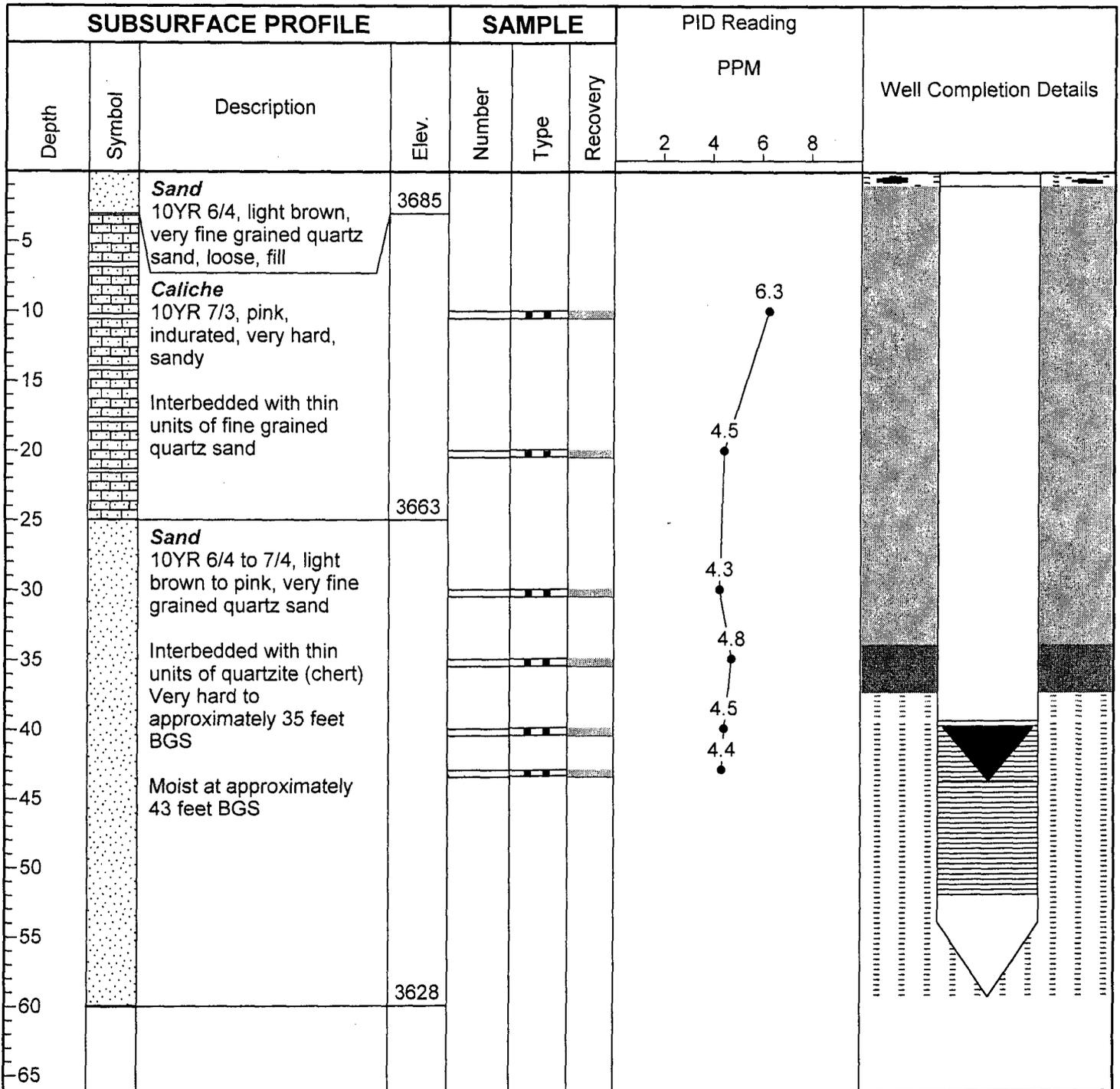
Project: C. J. Saunders

Geologist: M. J. Larson

Project No: 00-0110

Page: 1 of 1

Location: Lea County, New Mexico



Drilling Method: Rotary (Air)

Larson and Associates, Inc.  
2501 Learmont Drive  
Midland, Texas 79705  
(915) 687-0901

Datum: MSL

Drill Date: 04-Dec-00

Checked by: MJL

Hole Diameter: 5"

Drilled by: Scarborough Drilling

Client: Texaco Exploration and Production Inc. and EOTT ENERGY Pipeline L.P.

Log: MW-14

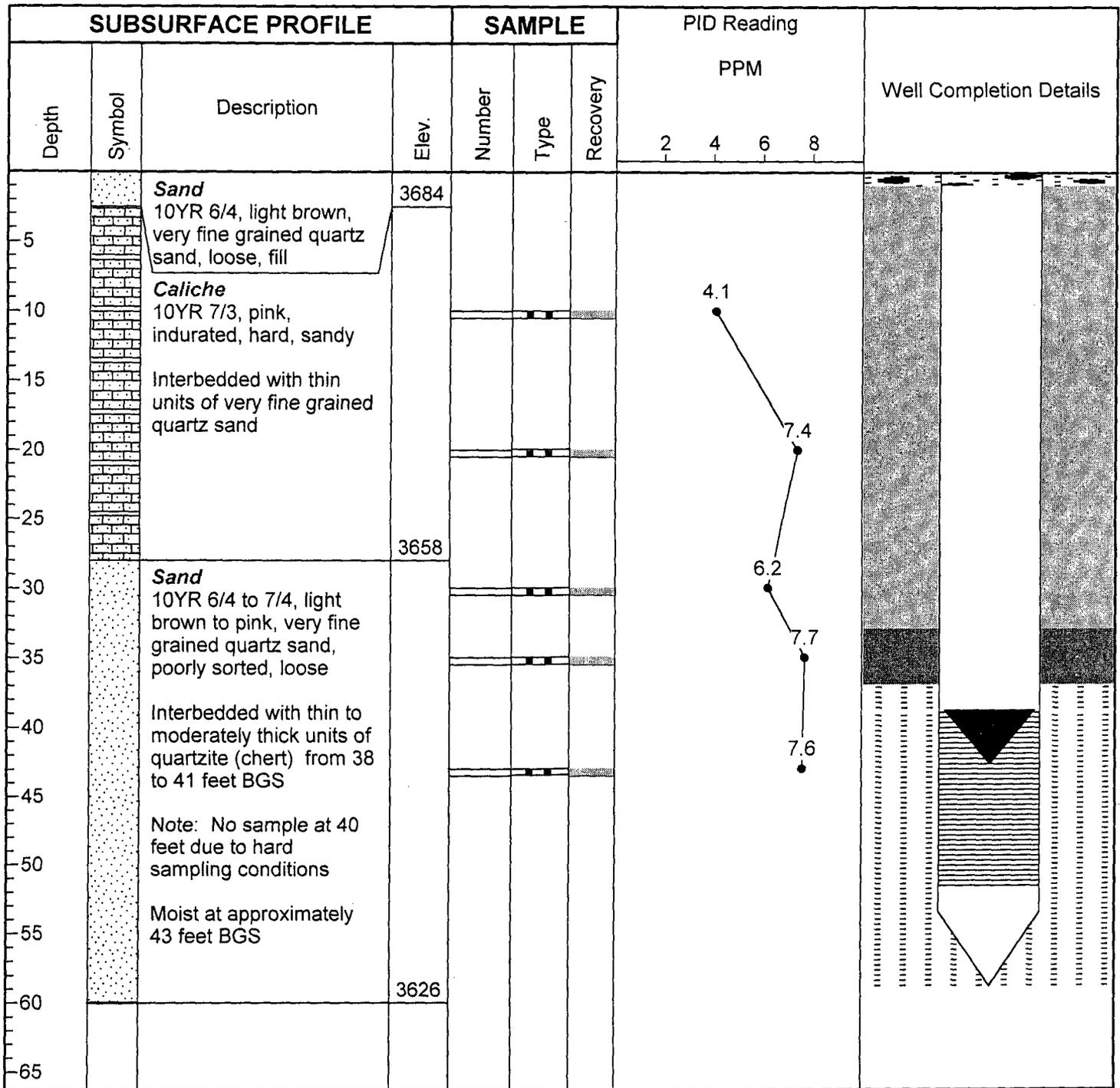
Project: C. J. Saunders

Geologist: M. J. Larson

Project No: 00-0110

Location: Lea County, New Mexico

Page: 1 of 1



Drilling Method: Rotary (Air)

Larson and Associates, Inc.  
2501 Learmont Drive  
Midland, Texas 79705  
(915) 687-0901

Datum: MSL

Drill Date: 04-Dec-00

Checked by: MJL

Hole Diameter: 5"

Drilled by: Scarborough Drilling

**APPENDIX H**

**ETGI Field and Laboratory Data**

TABLE  
SUMMARY OF GROUNDWATER CHEMISTRY  
TNM 95-10  
LEA COUNTY, NM  
ETGI PROJECT# EOT2046C

SAMPLE LOCATION	SAMPLE DATE	Methods: EPA SW 846-8021B, 5030					Methods: EPA 418.1	Methods: EPA SW 846-8015M	
		BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	m,p-XYLENE (mg/L)	o-XYLENE (mg/L)	TPH (mg/L)	GRO C6-C10 (mg/L)	DRO >C10-C25 (mg/L)
MW-1	03/22/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1.1	<0.5	0.6
	06/28/00	0.001	0.002	<0.001	<0.001	<0.001	<1		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/08/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3
MW-2	03/22/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	06/28/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/08/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3
MW-3	03/22/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	06/28/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/08/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3
MW-4	03/22/00	0.010	<0.001	0.004	0.003	0.002	<1.6	<0.5	1.1
	06/28/00	0.008	0.003	0.005	0.002	0.002	<1		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/08/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3
MW-5	03/22/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	06/28/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/08/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3
MW-6	03/22/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	06/28/00	<0.001	<0.001	<0.001	0.002	<0.001	<1		
MW-7	03/22/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	06/28/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/08/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3
MW-8	03/22/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	06/28/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/28/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3
MW-9	03/22/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	06/28/00	0.002	0.001	<0.001	0.001	<0.001	<1		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/08/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3

TABLE  
SUMMARY OF GROUNDWATER CHEMISTRY  
TNM 95-10  
LEA COUNTY, NM  
ETGI PROJECT# EOT2046C

MW-11	03/22/00	0.007	<0.001	0.008	<0.001	<0.001	43.3	1.8	41.5
	06/28/00	0.006	0.006	0.007	0.005	<0.001	36		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/08/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3
MW-12	03/22/00	0.002	<0.001	0.003	<0.001	<0.001	10.6	0.6	10
	06/28/00	0.004	0.003	0.002	0.003	0.002	3		
	09/25/00	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.5	<0.5
	12/08/00	<0.001	<0.001	<0.001	<0.001	<0.001	<6	<3	<3

TNM 95-10 (SAUNDERS)  
GROUNDWATER ELEVATION TABLE  
PROJECT # EOT2046C  
ANNUAL REPORT

Well Number	DATE MEASURED	Casing Well Elevation	Depth to Product	Depth to Water	PSH Thickness	Corrected Groundwater Elevation
MW - 1	3/12/2000	3,689.93	-	45.61	0.00	3,644.32
	6/28/2000	3,689.93	-	45.64	0.00	3,644.29
	9/25/2000	3,689.93	-	45.58	0.00	3,644.35
	12/7/2000	3,689.93	-	45.99	0.00	3,643.94
MW - 2	3/12/2000	3,687.71	-	44.11	0.00	3,643.60
	6/28/2000	3,687.71	-	44.25	0.00	3,643.46
	9/25/2000	3,687.71	-	44.12	0.00	3,643.59
	12/7/2000	3,687.71	-	44.36	0.00	3,643.35
MW - 3	3/12/2000	3,687.50	-	43.63	0.00	3,643.87
	6/28/2000	3,687.50	-	43.79	0.00	3,643.71
	9/25/2000	3,687.50	-	43.72	0.00	3,643.78
	12/7/2000	3,687.50	-	43.98	0.00	3,643.52
MW - 4	3/12/2000	3,687.57	-	43.63	0.00	3,643.94
	6/28/2000	3,687.57	-	43.75	0.00	3,643.82
	9/25/2000	3,687.57	-	43.60	0.00	3,643.97
	12/7/2000	3,687.57	-	43.90	0.00	3,643.67
MW - 5	3/12/2000	3,690.79	-	46.41	0.00	3,644.38
	6/28/2000	3,690.79	-	46.45	0.00	3,644.34
	9/25/2000	3,690.79	-	46.40	0.00	3,644.39
	12/7/2000	3,690.79	-	46.81	0.00	3,643.98
MW - 6	3/12/2000	3,691.32	-	46.91	0.00	3,644.41
	6/28/2000	3,691.32	-	47.02	0.00	3,644.30
	9/25/2000	3,691.32	-	46.90	0.00	3,644.42
MW - 7	3/12/2000	3,690.99	-	46.56	0.00	3,644.43
	6/28/2000	3,690.99	-	46.73	0.00	3,644.26
	9/25/2000	3,690.99	-	46.71	0.00	3,644.28
	12/7/2000	3,690.99	-	47.08	0.00	3,643.91
MW - 8	3/12/2000	3,691.56	-	47.05	0.00	3,644.51
	6/28/2000	3,691.56	-	47.28	0.00	3,644.28
	9/25/2000	3,691.56	-	47.31	0.00	3,644.25
	12/7/2000	3,691.56	-	47.65	0.00	3,643.91
MW - 9	3/12/2000	3,689.81	-	45.58	0.00	3,644.23
	6/28/2000	3,689.81	-	45.61	0.00	3,644.20
	9/25/2000	3,689.81	-	45.59	0.00	3,644.22
	12/7/2000	3,689.81	-	45.89	0.00	3,643.92

MW - 11	3/12/2000	3,688.62	-	44.70	0.00	3,643.92
	6/28/2000	3,688.62	-	44.75	0.00	3,643.87
	9/25/2000	3,688.62	-	44.62	0.00	3,644.00
	12/7/2000	3,688.62	-	44.93	0.00	3,643.69
MW - 12	3/12/2000	3,688.67	-	44.72	0.00	3,643.95
	6/28/2000	3,688.67	-	44.75	0.00	3,643.92
	9/25/2000	3,688.67	-	44.65	0.00	3,644.02
	12/7/2000	3,688.67	-	44.95	0.00	3,643.72

# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.  
ATTN: MR. JESSE TAYLOR  
P.O. BOX 4845  
MIDLAND, TEXAS 79704  
FAX: 915-520-4310  
FAX: 505-392-3760

SampleType: Water  
Sample Condition: Intact/ Iced/HCl  
Project #: EOT 1015C  
Project Name: TNM 95-10  
Project Location: Lea County , N.M.

Sampling Date: 03/22/00  
Receiving Date: 03/25/00  
Analysis Date: 3/27 & 3/28/00

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
24280	MW1	<0.001	<0.001	<0.001	<0.001	<0.001
24281	MW2	<0.001	<0.001	<0.001	<0.001	<0.001
24282	MW3	<0.001	<0.001	<0.001	<0.001	<0.001
24283	MW4	0.010	<0.001	0.004	0.003	0.002
24284	MW5	<0.001	<0.001	<0.001	<0.001	<0.001
24285	MW6	<0.001	<0.001	<0.001	<0.001	<0.001
24286	MW7	<0.001	<0.001	<0.001	<0.001	<0.001
24287	MW8	<0.001	<0.001	<0.001	<0.001	<0.001
24288	MW9	<0.001	<0.001	<0.001	<0.001	<0.001
24289	MW11	0.007	<0.001	0.008	<0.001	<0.001
24290	MW12	0.002	<0.001	0.003	<0.001	<0.001

% IA	99	91	90	98	86
% EA	98	90	89	98	85
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8021B,5030

  
Raland K. Tuttle

3-29-00  
Date

# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.  
ATTN: MR. JESSE TAYLOR  
P.O. BOX 4845  
MIDLAND, TEXAS 79704  
FAX: 915-520-4310  
FAX: 505-392-3760

Sample Type: Water  
Sample Condition: Intact/Iced/HCl  
Project #: EOT1015C  
Project Name: TNM 95-10  
Project Location: Lea County, N.M.

Sampling Date: 03/22/00  
Receiving Date: 03/25/00  
Analysis Date: 03/27/00

ELT#	FIELD CODE	GRO	DRO
		C6-C10 mg/L	>C10-C28 mg/L
24280	MW1	<0.5	0.6
24281	MW2	<0.5	<0.5
24282	MW3	<0.5	<0.5
24283	MW4	<0.5	1.1
24284	MW5	<0.5	<0.5
24285	MW6	<0.5	<0.5
24286	MW7	<0.5	<0.5
24287	MW8	<0.5	<0.5
24288	MW9	<0.5	<0.5
24289	MW11	1.8	41.5
24290	MW12	0.6	10

%INSTRUMENT ACCURACY	111	115
% EXTRACTION ACCURACY	86	106
BLANK	<0.5	<0.5

Methods: EPA SW 846-8015M GRO/DRO

  
Raland K. Tuttle

3-29-00  
Date



# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.  
ATTN: MR. JESSE TAYLOR  
2540 W. MARLAND  
HOBBS, N.M. 88242  
FAX: 915-520-4310  
FAX: 505-397-4701

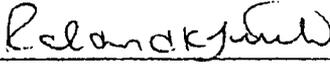
SampleType: Water  
Sample Condition: Intact/ Iced/HCl/ 28 deg. F  
Project #: EOT 2015C  
Project Name: TNM 95-10  
Project Location: Lea County, N.M.

Sampling Date: 06/28/00  
Receiving Date: 06/29/00  
Analysis Date: BTEX 07/02/00  
Analysis Date: TPH 07/10/00

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L	TPH mg/L
27564	MW 1	0.001	0.002	<0.001	<0.001	<0.001	<1
27565	MW 2	<0.001	<0.001	<0.001	<0.001	<0.001	<1
27566	MW 3	<0.001	<0.001	<0.001	<0.001	<0.001	<1
27567	MW 4	0.008	0.003	0.005	0.002	0.002	<1
27568	MW 5	<0.001	<0.001	<0.001	<0.001	<0.001	<1
27569	MW 6	<0.001	<0.001	<0.001	0.002	<0.001	<1
27570	MW 7	<0.001	<0.001	<0.001	<0.001	<0.001	<1
27571	MW 8	<0.001	<0.001	<0.001	<0.001	<0.001	<1
27572	MW 9	0.002	0.001	<0.001	0.001	<0.001	<1
27573	MW 11	0.006	0.006	0.007	0.005	<0.001	36
27574	MW 12	0.004	0.003	0.002	0.003	0.002	3

% IA	91	82	82	88	83	100
% EA	89	88	88	96	89	-
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<1

METHODS: SW 846-8021B,5030, EPA 418.1

  
Raland K. Tuttle

7-10-00  
Date



# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

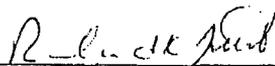
ENVIRONMENTAL TECHNOLOGY GROUP, INC.  
ATTN: BETH ALDRICH  
P.O. BOX 4845  
MIDLAND, TEXAS 79704  
FAX: 915-520-4310  
FAX: 505-397-4701

Sample Type: Water  
Sample Condition: Intact/ Iced/ HCl/ -4deg. C  
Project #: EOT 2046C  
Project Name: TNM 95-10  
Project Location: Lea Co., N.M.

Sampling Date: 09/25/00  
Receiving Date: 09/27/00  
Analysis Date: 10/03/00

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p XYLENE mg/L	o-XYLENE mg/L
31338	MW-1	<0.001	<0.001	<0.001	<0.001	<0.001
31339	MW-2	<0.001	<0.001	<0.001	<0.001	<0.001
31340	MW-3	<0.001	<0.001	<0.001	<0.001	<0.001
31341	MW-4	<0.001	<0.001	<0.001	<0.001	<0.001
31342	MW-5	<0.001	<0.001	<0.001	<0.001	<0.001
31343	MW-7	<0.001	<0.001	<0.001	<0.001	<0.001
31344	MW-8	<0.001	<0.001	<0.001	<0.001	<0.001
31345	MW-9	<0.001	<0.001	<0.001	<0.001	<0.001
31346	MW-11	<0.001	<0.001	<0.001	<0.001	<0.001
31347	MW-12	<0.001	<0.001	<0.001	<0.001	<0.001
31348	EB-1	<0.001	<0.001	<0.001	<0.001	<0.001
	%IA	95	101	96	102	101
	%EA	104	110	109	114	114
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8021B ,5030

  
\_\_\_\_\_  
Roland K. Tuttle

10-6-00  
Date

# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

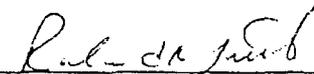
ENVIRONMENTAL TECHNOLOGY GROUP, INC.  
ATTN: BETH ALDRICH  
P.O. BOX 4845  
MIDLAND, TEXAS 797004  
FAX: 915-520-4310  
FAX: 505-397-4701

SampleType: Water  
Sample Condition: Intact/ Iced/ HCl/ -4 deg. C  
Project #: EOT 2046C  
Project Name: TNM 95-10  
Project Location: Lea County, N.M.

Sampling Date: 09/25/00  
Receiving Date: 09/27/00  
Analysis Date: 09/29/00

ELT#	FIELD CODE	GRO C6 C10 mg/L	DRO >C10 C28 mg/L
31338	MW-1	<0.5	<0.5
31339	MW-2	<0.5	<0.5
31340	MW-3	<0.5	<0.5
31341	MW-4	<0.5	<0.5
31342	MW-5	<0.5	<0.5
31343	MW-7	<0.5	<0.5
31344	MW-8	<0.5	<0.5
31345	MW-9	<0.5	<0.5
31346	MW-11	<0.5	<0.5
31347	MW-12	<0.5	<0.5
31348	EB-1	<0.5	<0.5
% IA		77	66
% EA		77	74
BLANK		<0.5	<0.5

METHODS: SW 846-8015M GRO/DRO

  
Raland K. Tuttle

10-6-00  
Date

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

ANALYSIS REQUEST  
(Circle or Specify Method No.)

For Use On **EOTT ENERGY CORP.** Projects Only  
 EOTT ENERGY CORP.  
 5905 East Business 20  
 Midland, TX 79702  
 Tel: (915) 687-3400  
 Fax: (915) 682-2781

2540 West Marland  
 Hobbs, NM 88242  
 Tel: (505) 357-4862  
 Fax: (505) 397-4701

4500 West Wall  
 Midland, TX 79703  
 Tel: (915) 522-1139  
 Fax: (915) 526-4310

Project Manager: **BETH SAUNDERS**  
 Project Name: **TNM 95-10 (SAUNDERS)**  
 Project Location: **MONUMENT NM**  
 Project Number: **EOT 2046C**  
 Sampler Signature: *[Signature]*

LAB # (Lab Use Only)	FIELD CODE	# CONTAINERS	Volume/Amount	WATER	SOIL	AIR	SLUDGE	PRESERVATION METHOD				SAMPLING	
								HCL	HNO3	NAHSO4	ICE	NONE	DATE
35173	MW 1	2	V5X					Y				12-8	11:25
35174	MW 2											10:40	
35175	MW 3											10:30	
35176	MW 4											10:49	
35177	MW 5											11:40	
35178	MW 7											11:52	
35179	MW 8											10:15	
35180	MW 9											11:08	
35181	MW 11											12:05	
35182	MW 12											12:15	
35183	EB 1											12:30	

REMARKS: REC - 2.0°C  
 FAX RESULTS: HOBBS  
 MAIL RESULTS: EOTT  
 INVOICE: EOTT

Received by: *[Signature]* Date: 12-5-00 Time: 15:00  
 Received at Lab by: *[Signature]* Date: 12-5-00 Time: 12:30  
 Relinquished by: *[Signature]* Date: 12-5-00 Time: 17:30  
 Relinquished by: *[Signature]* Date: 12-5-00 Time: 12:30

TPH 418, 17X 1005  
 TPH 8015M GROUND  
 PAH 0270C (8100 New Mexico only)  
 Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/7470  
 TCLP Metals Ag As Ba Cd Cr Pb Se Hg  
 TCLP Volatiles  
 TCLP Semi Volatiles  
 Volatiles 8260B  
 Semi Volatiles 8270C  
 TDS 160.1  
 Coliforms/Bacteria 375.4/225.3

NO FIELD SAMPLES

USE OF EOTT SYSTEM - 10/18/01. HOBBS, NM. 9. AS PER Beth Saunders

# ENVIRONMENTAL LAB OF , INC.

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ATTN: BETH ALDRICH  
P.O. BOX 4845  
MIDLAND, TEXAS 79704  
FAX: 915-520-4310

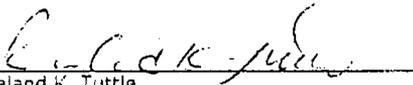
Sample Type: Water  
Sample Condition: Intact/ Iced/ HCl/ -2.0 deg. C  
Project #: EOT 2046C  
Project Name: TNM 95-10 (Sanders)  
Project Location: Monument, N.M.

Sampling Date: 12/08/00  
Receiving Date: 12/09/00  
Analysis Date: 12/10/00

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
35173	MW 1	<0.001	<0.001	<0.001	<0.001	<0.001
35174	MW 2	<0.001	<0.001	<0.001	<0.001	<0.001
35175	MW 3	<0.001	<0.001	<0.001	<0.001	<0.001
35176	MW 4	<0.001	<0.001	<0.001	<0.001	<0.001

%IA	99	104	102	106	100
%EA	88	91	93	99	96
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8021B ,5030

  
Roland K. Tuttle

12-18-00  
Date

# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.  
ATTN: BETH ALDRICH  
P.O. BOX 4845  
MIDLAND, TEXAS 79704  
FAX: 915-520-4310

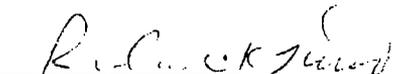
Sample Type: Water  
Sample Condition: Intact/ Iced/ HCl/ -2.0 deg. C  
Project #: EOT 2046C  
Project Name: TNM 95-10 (Sanders)  
Project Location: Monument, N.M.

Sampling Date: 12/08/00  
Receiving Date: 12/09/00  
Analysis Date: 12/11/00

ELT#	FIELD CODE	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	m,p-XYLENE mg/L	o-XYLENE mg/L
35177	MW 5	<0.001	<0.001	<0.001	<0.001	<0.001
35178	MW 7	<0.001	<0.001	<0.001	<0.001	<0.001
35179	MW 8	<0.001	<0.001	<0.001	<0.001	<0.001
35180	MW 9	<0.001	<0.001	<0.001	<0.001	<0.001
35181	MW 11	<0.001	<0.001	<0.001	<0.001	<0.001
35182	MW 12	<0.001	<0.001	<0.001	<0.001	<0.001
35183	EB 1	<0.001	<0.001	<0.001	<0.001	<0.001

%IA	92	97	94	96	92
%EA	89	96	94	97	92
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8021B ,5030

  
Raland K. Tuttle

12-13-00  
Date

# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

ENVIRONMENTAL TECHNOLOGY GROUP, INC.  
ATTN: BETH ALDRICH  
P.O. BOX 4845  
MIDLAND, TEXAS 79704  
FAX: 915-520-4310

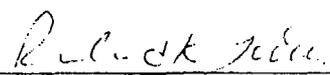
SampleType: Water  
Sample Condition: Intact/ Iced/ HCl/ -2.0 deg. C  
Project #: EOT 2046C  
Project Name: TNM 95-10 (Sanders)  
Project Location: Monument, N.M.

Sampling Date: 12/08/00  
Receiving Date: 12/09/00  
Analysis Date: 12/13/00

ELT#	FIELD CODE	GRO C6-C10 mg/L	DRO >C10-C28 mg/L
35173	MW 1	<3	<3
35174	MW 2	<3	<3
35175	MW 3	<3	<3
35176	MW 4	<3	<3
35177	MW 5	<3	<3
35178	MW 7	<3	<3
35179	MW 8	<3	<3
35180	MW 9	<3	<3
35181	MW 11	<3	<3
35182	MW 12	<3	<3

% IA	85	91
% EA	91	101
BLANK	<3	<3

METHODS: SW 846-8015M GRO/DRO

  
Raland K. Tuttle

12-18-00  
Date

Environmental Lab of Texas, Inc. 12600 West 1-20 East Odessa, Texas 79763  
 (915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST  
 CAC # 237

Project Manager: **BETH ALDRICH**  
 Company Name & Address: **ETGZ**  
 2540 W MARLAND HOBBS NM  
 Project #: **EOT 2041C**  
 Project Location: **LEN COUNTY NM**  
 Project Name: **TNM 95-10**  
 Supplier Signature: *[Signature]*

ANALYSIS REQUEST

TPH	8015 DRG GAS
TCLP Metals Ag As Ba Cd Cr Pb Hg Se	
TCLP Volatiles	
TCLP Semi Volatiles	
TDS	
RCI	

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX								PRESERVATIVE METHOD			SAMPLING		
				WATER	SOIL	AIR	SUDGE	OTHER	HCL	HNO3	ICE	NONE	OTHER	DATE	TIME		
31338	mw 1	2	V.S.Y.													7-25	1054 YX
31339	mw 2																1010
31340	mw 3																1030
31341	mw 4																1153
31342	mw 5																1245
31343	mw 7																1249
31344	mw 8																1325
31345	mw 9																1038
31346	mw 11																1135
31347	mw 12	2															1110
31348	EB1	2	V.V.														1335

REMARKS

INVOICE: EOTT  
 FAX RESULTS: HOBBS OFFICE  
 MAIL RESULTS: EOTT  
 Rec-4°C

Received by:

*[Signature]*

Received by:

Received by Laboratory:

Date:

9-27-99

Date:

Date:

Relinquished by:

*[Signature]*

Relinquished by:

Relinquished by: