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Monitoring Well Installation and Testing at the North Flare Pit Area of Blanco Plant

December 10, 1992

Prepared for:

El Paso Natural Gas Company
El Paso, Texas

Project 224857

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MONITORING WELL INSTALLATION AND TESTING
AT THE NORTH FLARE PIT AREA
OF BLANCO PLANT

1 INTRODUCTION

Burlington Environmental Inc. (Burlington) investigated the extent of subsurface hydrocarbon contamination downgradient of the North Flare Pit at the Blanco Plant in San Juan County, New Mexico. The purpose of this investigation was to assess the extent of hydrocarbon contamination and collect data for the design of a hydrocarbon-recovery system. This work was performed in response to the detection of liquid-phase hydrocarbons in a groundwater monitoring well near the North Flare Pit.

Burlington performed this investigation in response to the request for proposal from El Paso Natural Gas Company (EPNG) dated August 20, 1992, which included EPNG's work plan for the project that was transmitted to the New Mexico Oil Conservation Division (NMOCD) on August 12, 1992. The work plan was developed by EPNG with NMOCD guidance. Any deviations from the written work plan were approved by NMOCD prior to the investigation activity being performed. Burlington's scope of work, based on EPNG's work plan, is described in the Proposal for Monitoring Well Installation and Testing at the Blanco North Flare Pit (Burlington, 1992). Burlington's field investigation activities at the plant were performed during the period of September 14 to October 19, 1992.

Burlington's investigation included well installation, soil borehole drilling, sample collection, groundwater and liquid-phase hydrocarbon pump tests, soil and groundwater sample analyses, and data evaluation.

2 BACKGROUND

The North Flare Pit Area is part of the Blanco Plant, which is currently owned and operated by EPNG. In January 1990, monitoring well MW-19 was installed about 500 feet southeast of the North Flare Pit by K.W. Brown & Associates, Inc, (K.W. Brown). At the time this well was installed, high photoionization detector (PID) readings, strong hydrocarbon odors, and an oily sheen on the water level probe were reported. Groundwater sampling in the North Flare Pit Area in monitoring wells MW-19 and MW-2 was performed by K.W. Brown in 1989 and 1990 (K.W. Brown 1989 and 1990) and by EPNG in 1991. Over time, hydrocarbon product has continued to accumulate to the present (October 13, 1992) thickness of approximately 3.6 feet in monitoring well MW-19.

Releases from the North Flare Pit were suspected to be the source of this subsurface contamination. A lined evaporation pond that was previously an unlined pit near the North Flare Pit may also have been a source for hydrocarbons in monitoring well MW-19. Figure 1 illustrates the relative locations of the evaporation pond, the North Flare Pit, and the location of the two existing monitoring wells prior to Burlington's September/October 1992 investigation.

In February 1992, EPNG excavated hydrocarbon-impacted soil to the practical extent possible from the North Flare Pit. Figure 1 delineates the areas where soil contamination remains. NMOCD requested that EPNG prepare and implement a work plan for evaluation of the extent of the floating hydrocarbons detected at monitoring well MW-19 and removal of those hydrocarbons. This evaluation was performed by Burlington following the remediation of hydrocarbon contaminated soils at the North Flare Pit because the pit was suspected to be a source of contamination.

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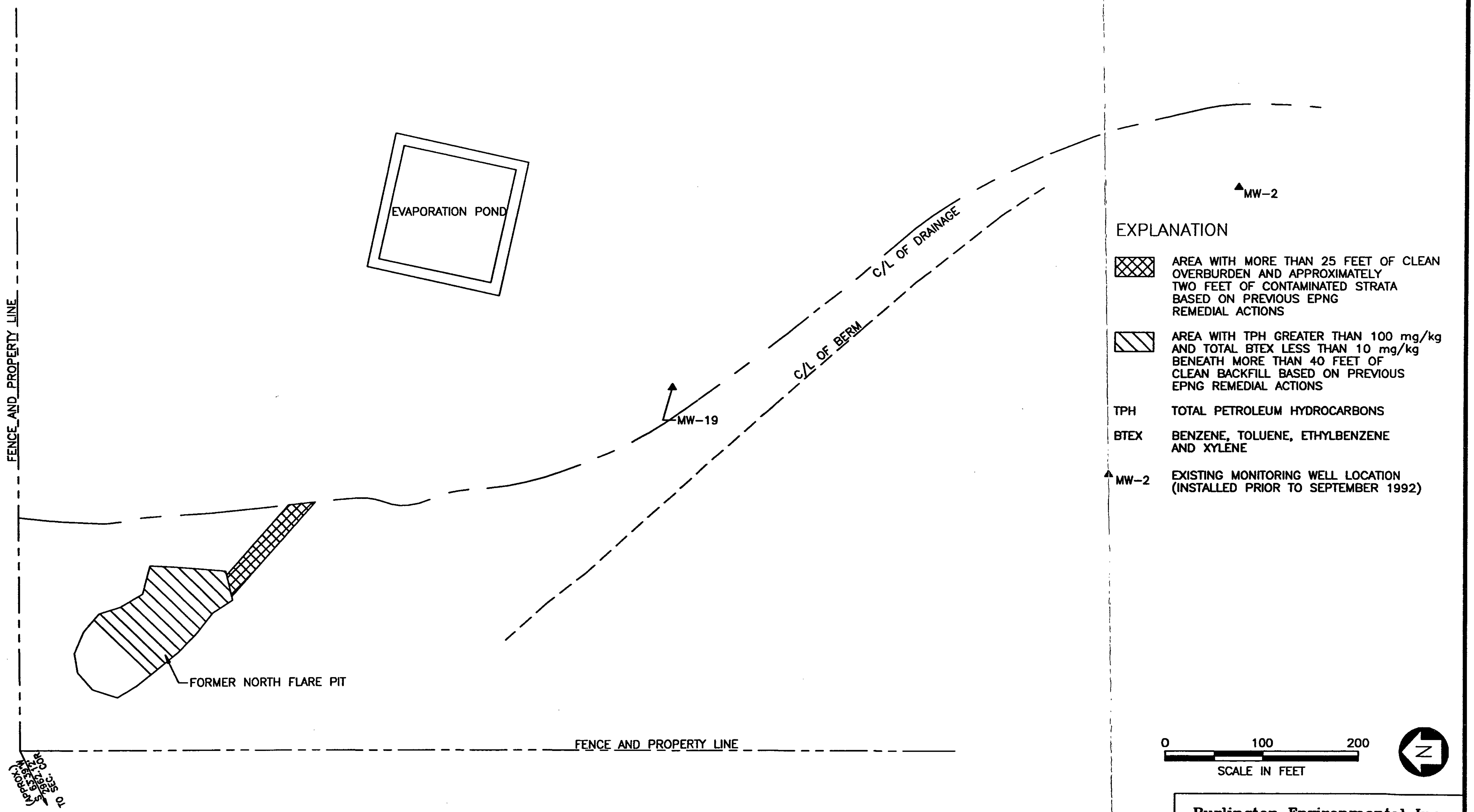

EXPLANATION

▩	AREA WITH MORE THAN 25 FEET OF CLEAN OVERBURDEN AND APPROXIMATELY TWO FEET OF CONTAMINATED STRATA BASED ON PREVIOUS EPNG REMEDIAL ACTIONS
▧	AREA WITH TPH GREATER THAN 100 mg/kg AND TOTAL BTEX LESS THAN 10 mg/kg BENEATH MORE THAN 40 FEET OF CLEAN BACKFILL BASED ON PREVIOUS EPNG REMEDIAL ACTIONS
TPH	TOTAL PETROLEUM HYDROCARBONS
BTEX	BENZENE, TOLUENE, ETHYLBENZENE AND XYLENE
▲ MW-2	EXISTING MONITORING WELL LOCATION (INSTALLED PRIOR TO SEPTEMBER 1992)

Burlington Environmental Inc.

NORTH FLARE PIT
EXISTING MONITORING
WELL LOCATIONS
PRIOR TO SEPTEMBER 1992

BLANCO
SAN JUAN COUNTY, NM
224857

FIGURE 1

3 SCOPE OF WORK

As described in EPNG's Work Plan (EPNG, 1992), the proposed scope of work was to install one upgradient monitoring well (in a noncontaminated area north of the North Flare Pit) and three plume-definition monitoring wells that could potentially be used during remediation of the subsurface hydrocarbons. In addition, three boreholes were to be drilled to assist in determining the source of the release. As agreed to with NMOCD, any borehole encountering water was to be completed as a monitoring well.

Slight modifications to EPNG's work plan occurred during field operations in order to achieve the project objectives. The NMOCD was notified of pending changes prior to the work being performed.

The North Flare Pit Area investigation consisted of soil testing; borehole drilling; well installation; soil, groundwater, and hydrocarbon product sample collection and analyses; groundwater and liquid-phase hydrocarbon pump tests; data evaluation; and report preparation. The drilling program consisted of eight boreholes each drilled to a depth of approximately 65 feet. Five of the boreholes were completed as monitoring wells. The remaining three boreholes were grouted to surface. The boreholes were sampled every five feet with a split-spoon sampler after a depth of 40 feet was reached. Borehole and monitoring well locations are shown in Figure 2. Soil samples with the highest PID readings were collected from boreholes for laboratory analysis for total petroleum hydrocarbons (TPH) and for benzene, toluene, ethylbenzene, and xylene (BTEX).

Upon completion of well installation, all new monitoring wells that did not contain a floating layer of hydrocarbon product were developed. Groundwater samples were collected from these monitoring wells for laboratory analysis for TPH, BTEX, and total dissolved solids (TDS). Monitoring wells that contained floating hydrocarbons were not sampled. Once all sampling was completed, product and groundwater pumping and recharge tests were performed in monitoring wells MW-19, MW-26, and MW-27.

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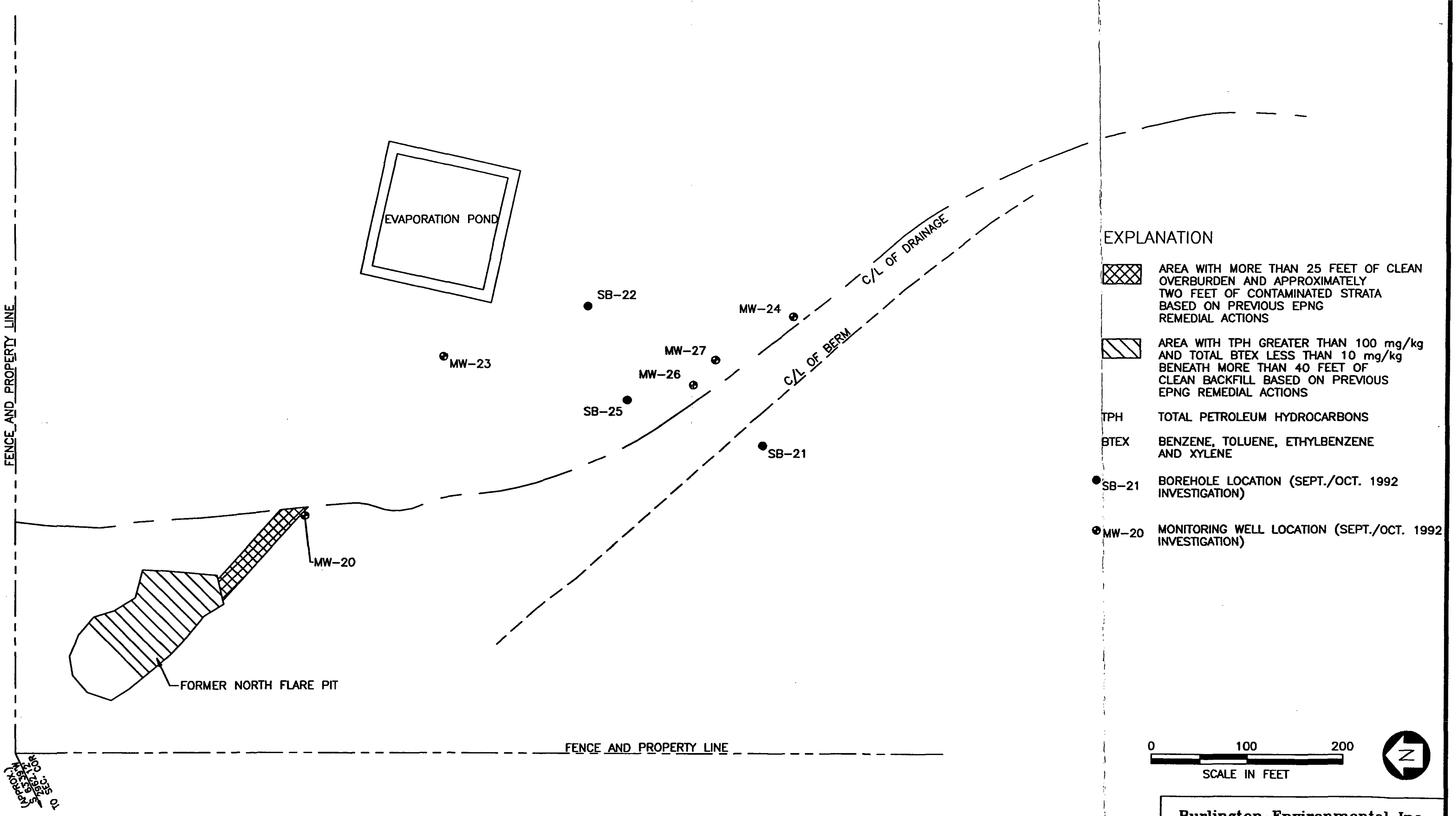

Burlington Environmental Inc.

NORTH FLARE PIT
NEW BOREHOLE AND MONITORING
WELL LOCATIONS

BLANCO
SAN JUAN COUNTY, NM
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FIGURE 2

This report documents field activities and laboratory testing, and presents Burlington's conclusions and recommendations on the extent of contamination and potential remediation methods to address site conditions. Photographs taken during field operations are in Appendix A.

4 RATIONALE FOR DRILLING LOCATIONS AND METHODOLOGY

The rationale for borehole and monitoring well locations and methods of borehole drilling, sample collection, and analysis are described in this chapter. Project tasks were performed in accordance with the procedures described in Burlington's proposal and in the following sections.

4.1 Rationale for Drilling Locations

The locations of all wells and boreholes in the investigated area are illustrated in Figure 3. The new boreholes were drilled in the numbered sequence. Boreholes completed as wells have the prefix "MW".

Monitoring well MW-20 was drilled downgradient of the North Flare Pit, a suspected source of hydrocarbon contamination. Drill cuttings did not contain significant amounts of hydrocarbons; therefore, this location was selected for installation of the background well rather than a location north of the North Flare Pit as had been initially planned.

Borehole SB-21 was drilled southwest of existing monitoring well MW-19 to evaluate whether impacted groundwater was present. Since water was not encountered, a well was not installed. Soil samples did not contain hydrocarbons.

Borehole SB-22 and monitoring well MW-23 were drilled on two sides of the evaporation pond to evaluate if the previously unlined pond was a source of hydrocarbons contamination. A soil sample from Borehole SB-22 contained barely detectable levels of hydrocarbons in soil beginning at 38 feet, but was dry; therefore, it was not completed as a well. Monitoring well MW-23 contained dissolved-phase hydrocarbons, but no floating product.

Monitoring wells MW-24, MW-26, and MW-27 were drilled along the drainageway between existing monitoring wells MW-19 and MW-2 to evaluate the radius of the cone of drawdown that could be produced

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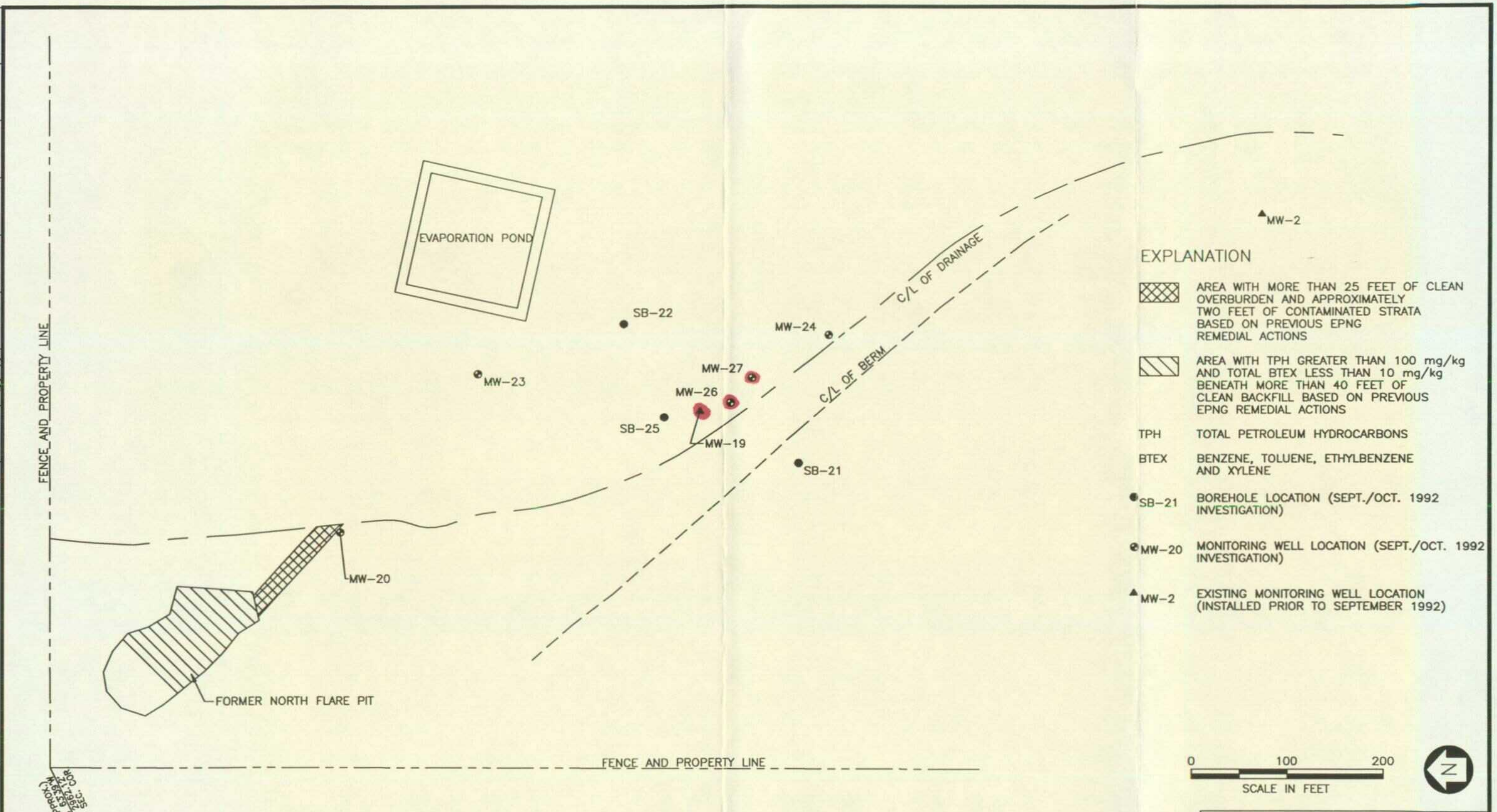

EXPLANATION

▩	AREA WITH MORE THAN 25 FEET OF CLEAN OVERBURDEN AND APPROXIMATELY TWO FEET OF CONTAMINATED STRATA BASED ON PREVIOUS EPNG REMEDIAL ACTIONS
▧	AREA WITH TPH GREATER THAN 100 mg/kg AND TOTAL BTEX LESS THAN 10 mg/kg BENEATH MORE THAN 40 FEET OF CLEAN BACKFILL BASED ON PREVIOUS EPNG REMEDIAL ACTIONS
TPH	TOTAL PETROLEUM HYDROCARBONS
BTEX	BENZENE, TOLUENE, ETHYLBENZENE AND XYLENE
● SB-21	BOREHOLE LOCATION (SEPT./OCT. 1992 INVESTIGATION)
⊗ MW-20	MONITORING WELL LOCATION (SEPT./OCT. 1992 INVESTIGATION)
▲ MW-2	EXISTING MONITORING WELL LOCATION (INSTALLED PRIOR TO SEPTEMBER 1992)

Burlington Environmental Inc.

NORTH FLARE PIT
BOREHOLE AND MONITORING
WELL LOCATIONS–OCTOBER 1992

BLANCO
SAN JUAN COUNTY, NM
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FIGURE 3

by pumping from MW-19 and for future use as recovery wells if floating hydrocarbon product was present. A floating product layer was detected in monitoring wells MW-26 and MW-27. The southernmost new well, MW-24, contained no floating hydrocarbons, but did contain dissolved-phase hydrocarbons.

Borehole SB-25 was drilled between monitoring wells MW-23 and existing monitoring well MW-19 to evaluate if impacted groundwater was present between these two wells. Water was not encountered and soil samples did not contain hydrocarbons at this location.

4.2 Borehole Drilling and Sample Collection

Burlington subcontracted the drilling to Sergent, Hauskins, and Beckwith Consulting (SHB). SHB used a truck-mounted rotary drill rig with hollow-stem augers to drill and sample all boreholes except MW-20. Borehole MW-20 was drilled with 10-inch O.D. augers until auger refusal; the borehole was then completed through the augers with air rotary methods using a six-inch tricone bit.

Soil samples were collected using a split-spoon sampler by pushing the samples through the hollow-stem augers. During drilling activities, monitoring of the borehole, breathing zone, and soil sampling was performed using a 10.2-electron-volt PID. Daily calibration of the PID was performed. A combustible gas detector was used at borehole locations where hydrocarbons were encountered to monitor for explosive environments. Soil samples collected for laboratory analysis were selected based on the highest PID headspace readings encountered. Headspace readings were taken by putting the soil sample in a Zip-Lok bag, allowing time for volatilization to occur, inserting the PID probe into the bag, and recording the initial response on the PID meter.

Appendix B contains the borehole geologic logs for the drilling performed by Burlington and our subcontractor, SHB, and geologic logs for the two previously installed wells (MW-19 and MW-2) in the

North Flare Pit Area. Geologic logs prepared by Burlington are based on primarily drill cuttings and limited split-spoon sampling.

4.3 Well Installation and Well Development

Monitoring wells were installed at a depth of approximately 65 feet below ground surface. Each well consisted of 15 feet of 0.010-inch machine-slotted Schedule 40 PVC screen, and Schedule 40 PVC riser to approximately 2.5 feet above ground surface. The gravel pack of each well consisted of 10-20 silica sand extending a minimum of two feet above the well screen. The gravel pack was sealed with a minimum of two feet of bentonite pellets and the remaining annular space was grouted to surface using a cement bentonite grout. All wells were finished with locking well protectors set in a three-foot by three-foot concrete pad, surrounded on three sides by bumper posts.

Upgradient monitoring well MW-20 was installed open-hole as a two-inch-diameter well, as proposed in the work plan. Monitoring wells MW-23 and MW-24 were also installed by open-hole method and were constructed as four-inch-diameter wells. Monitoring wells MW-26 and MW-27 were installed through the augers. Monitoring well MW-26 was installed as a four-inch-diameter well. Monitoring well MW-27 was installed as a two-inch-diameter well because it was not possible to ream the hole to install a four-inch-diameter well due to difficult drilling conditions.

Different well installation procedures were used based on the well size proposed in the work plan and on the difficulty in drilling. Open-hole installations were performed by removing the augers from the borehole and installing the monitoring well through the open borehole. At wells installed through the augers, well materials and annular materials were installed while the augers were removed from the borehole. Appendix C contains well construction diagrams for the wells installed by Burlington and our subcontractor, SHB.

Monitoring wells MW-20, MW-23, and MW-24 were developed prior to sampling by removing three annular well volumes or by bailing the well dry three times. Water quality readings such as pH, conductivity, and temperature were recorded during development to evaluate when groundwater samples could be collected. Appendix D contains field data sheets for well development and groundwater sampling activities.

4.4 Decontamination Procedures

Drilling and sampling equipment were decontaminated between each borehole to prevent cross contamination. Drilling augers and well materials were steam cleaned with potable water prior to use. Drilling personnel were required to wear clean Tyvek coveralls and surgical gloves to prevent possible cross contamination from handling well materials. Decontamination fluids generated from steam cleaning were collected and pumped into EPNG's lined evaporation pond on site.

Sampling equipment such as split-spoon samplers and bailers were washed with a non-phosphorous detergent solution, rinsed with potable water, followed by a final rinse with distilled water.

4.5 Quality Assurance/Quality Control (QA/QC)

QA/QC of the groundwater samples was performed by collecting and analyzing one duplicate sample. The results of the duplicate groundwater sample collected from monitoring well MW-23 (labeled MW-73) compared closely to the results of the sample labeled MW-23.

Analytical testing was performed by American Technical & Analytical Services, Inc., (ATAS) using the following analytical methods:

- TPH using USEPA Method 418.1;

- BTEX using USEPA Method 8020;
- TDS using USEPA Method 160.1;
- nitrogen using Standard Method 420A;
- nitrate using USEPA Method 353.2;
- nitrate using Standard Method 419; and
- total phosphorus using USEPA Method 365.2.

4.6 Data Collection During Aquifer Testing

Field measurements of water levels during aquifer testing were obtained by using an electrical water level indicator and an oil/water interface probe. The measured fluid depths, floating product layer thickness (if present), and time of measurement were recorded on individual data sheets for each well. These data sheets are included in Appendices G and H.

Evaluation of the fluid level drawdowns recorded on the data sheets were plotted and analyzed by the Theis Method (1935) and the Cooper-Jacob Method (1946) using software that incorporates these methods of analysis. The software used is Geraghty & Miller's AQTESOLV^{TM} Aquifer Test Solver (Version 1.00).

5 RESULTS OF ASSESSMENT

The following chapter presents a description of the regional and site geology and hydrogeology and the results of the groundwater and soil investigation. The geologic interpretations presented in this chapter are based on evaluations of the site by EPNG, Burlington, and previous studies of the region by Stone and others (1983) and Williamson and Lucas (1992).

5.1 Regional Geology and Hydrogeology

Alluvial deposits in the San Juan Basin consist of gravel, sand, silt, clay, and various mixtures thereof. Texture and composition vary widely depending on age and source. Alluvial deposits have a maximum thickness of 80 feet in the San Juan River Valley at Farmington and range between 40 and 100 feet in the Animas River Valley near Aztec. Drilling characteristics and cuttings of poorly consolidated bedrock are difficult to distinguish from those of alluvium. Alluvial deposits are present at the surface in places at the Blanco Plant.

Terrace deposits consist of boulder gravel resting on benches cut into the Tertiary bedrock units. These deposits can be traced upstream to glacial moraines in the mountains of Colorado and are properly termed outwash terraces. The thickness of these terrace deposits generally does not exceed 30 feet.

The Tertiary Nacimiento Formation also outcrops at the Blanco Plant. These outcrops include mudstone with swelling clay, and trough cross-bedded sandstone units. The Nacimiento Formation resulted from stream deposition in broad alluvial aprons.

Locally, orientation of channel-sandstone bodies in the Nacimiento Formation may control the direction of groundwater flow. Channel sandstone bodies are elongate or shoestring in geometry. Zones of relatively higher hydraulic conductivity may serve as conduits for greater flow. The orientation of such zones with respect to hydraulic gradient may exert a supplementary influence on flow direction.

5.2 Site Geology and Hydrogeology

Figure 4 is a geologic cross section through the North Flare Pit Area. From groundsurface to approximately 19 feet the new boreholes encountered silty to clayey sand (with traces of gravel and cobbles in MW-24, SB-25, and MW-26). A silty clay was encountered in the drill cuttings at approximately 19 feet. Cores of this material indicated it to be shale/mudstone. In one well (MW-20), the core contained finely interlaminated silty sandy clay and clayey sand lenses with stiff laminated mudstone/clay at 46 feet. The last 12 feet of this unit is a dark gray-to-black, friable, shale/mudstone that extends to a depth of 58 feet. Drilling was difficult in this lithology and the drillers called it a "very tight clay."

A similar lithology was encountered in borehole SB-21. At 23 feet a silty clay to sandy clay was encountered, which gradually changed to a dark silty clay with some shale fragments at a depth of approximately 35 feet. The last five feet of this unit (at a depth of approximately 40 to 45 feet) contained laminated siltstones/mudstones with leaf impressions in the partings. The drillers noticed tightness increasing with depth at this borehole (SB-21).

A six- to ten-foot sand with a trace of gravel was also reported in some boreholes (as shown in Figure 4), but it appears to pinch out laterally.

At approximately 58 to 60 feet below the surface sandstone was encountered. In some places the upper portion of this sandstone appeared to be cemented with gypsum, and in other places it was very friable. The cemented sandstone appeared in samples from all boreholes, but was not always at the same depth.

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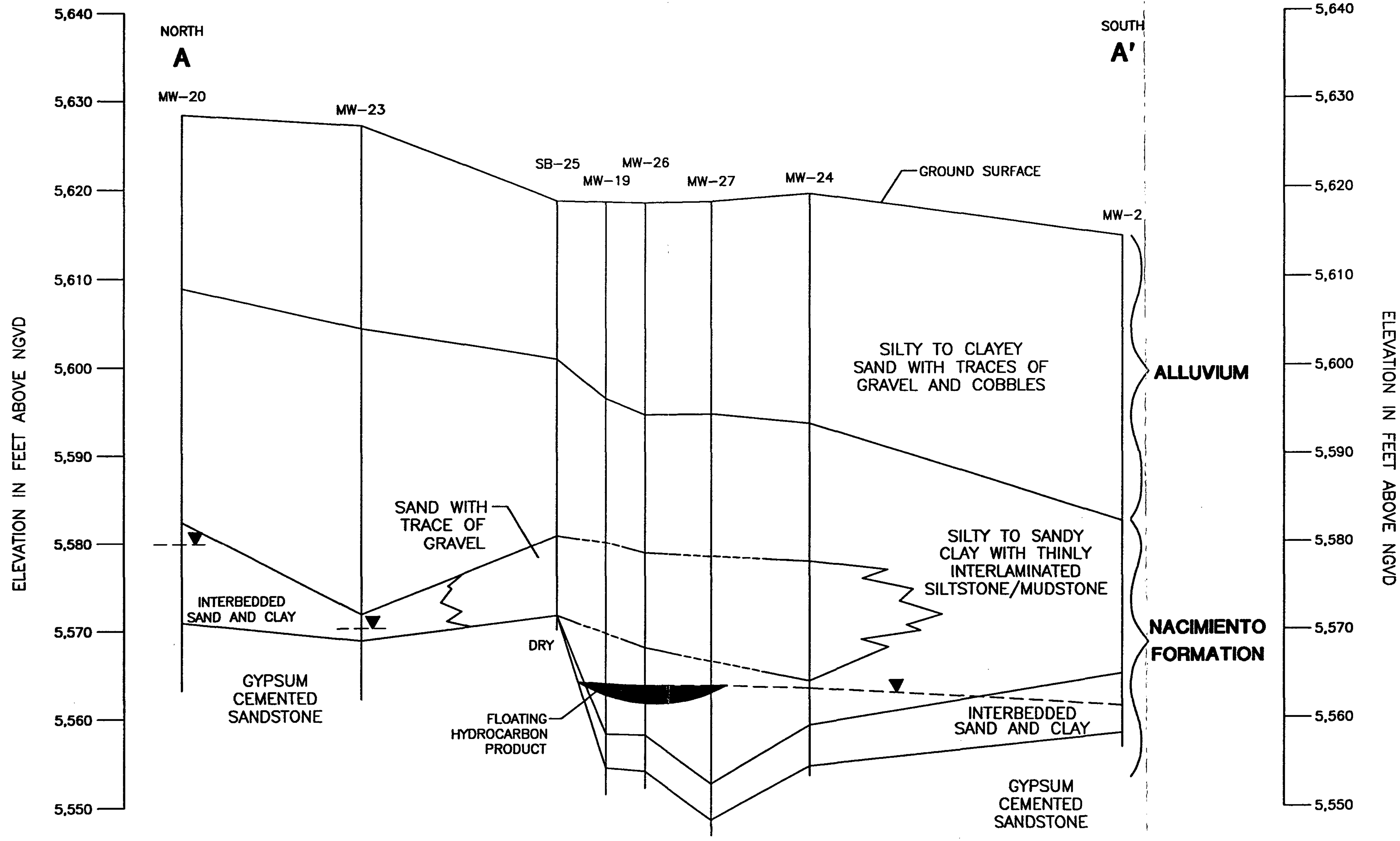

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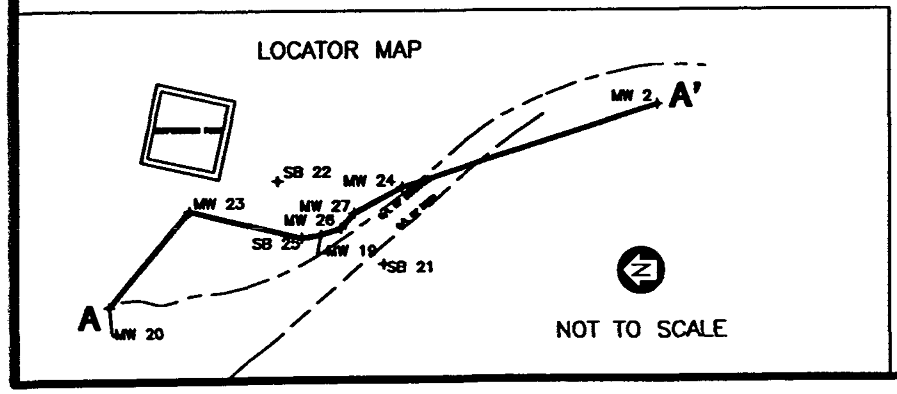

EXPLANATION

▼ APPROXIMATE GROUNDWATER OR HYDROCARBON PRODUCT SURFACE ON OCTOBER 13, 1992

General Note:

This cross section is based on interpolation between widely spaced monitoring wells or boreholes and only at the monitoring well or borehole location is the depth of the noted feature actually known.

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GEOLOGIC CROSS SECTION
IN THE NORTH FLARE PIT AREA

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FIGURE 4

The water table appears to be within this sandstone. Where the gypsum cement is encountered at shallower depths in the borehole, the borehole is dry. These boreholes were drilled at least five feet beyond where water was anticipated from the local gradient in order to verify that the boreholes were indeed dry. In all cases, a gypsum (or possibly silica) cemented sandstone layer appears to serve as an aquitard. It was not possible in this investigation to determine any lateral pattern to the distribution of this cemented bedrock layer.

Where groundwater was encountered in the boreholes, the water table appeared to be related to the elevation of the gypsum cemented sandstone. It was not possible to predict which boreholes would be dry, or which would contain water. In one well (MW-20), the water table may be under confining conditions. Groundwater was encountered below a dry mudstone at a depth of 54 feet in this well during drilling. The static level measured after installation was 50.9 feet deep.

5.3 Fluid Level Data and Groundwater Flow Direction

The groundwater level and product thickness measurements recorded in October 13, 1992, are presented in Table 1. Similar levels were measured on successive days during the field work. The groundwater level contours interpreted from these measurements are illustrated in Figure 5. The direction of groundwater flow is to the south southeast, which agrees with the previous investigations by K.W. Brown & Associates Inc. (K.W. Brown, 1989 and 1990). The hydraulic gradient from MW-19 to MW-2 was 0.006 ft/ft.

In some borehole locations, groundwater was not encountered (SB-21, SB-22, and SB-25). The thickness of saturated aquifer encountered in the monitoring wells ranged from eight to 16 feet. At three locations (MW-19, MW-26, and MW-27) a liquid-phase hydrocarbon product accumulated. Product thicknesses of

Table 1

SUMMARY OF MONITORING WELL COMPLETION DATA
OCTOBER 1992 GROUNDWATER AND PRODUCT LEVELS

NORTH FLARE PIT AREA
BLANCO PLANT
EL PASO NATURAL GAS COMPANY

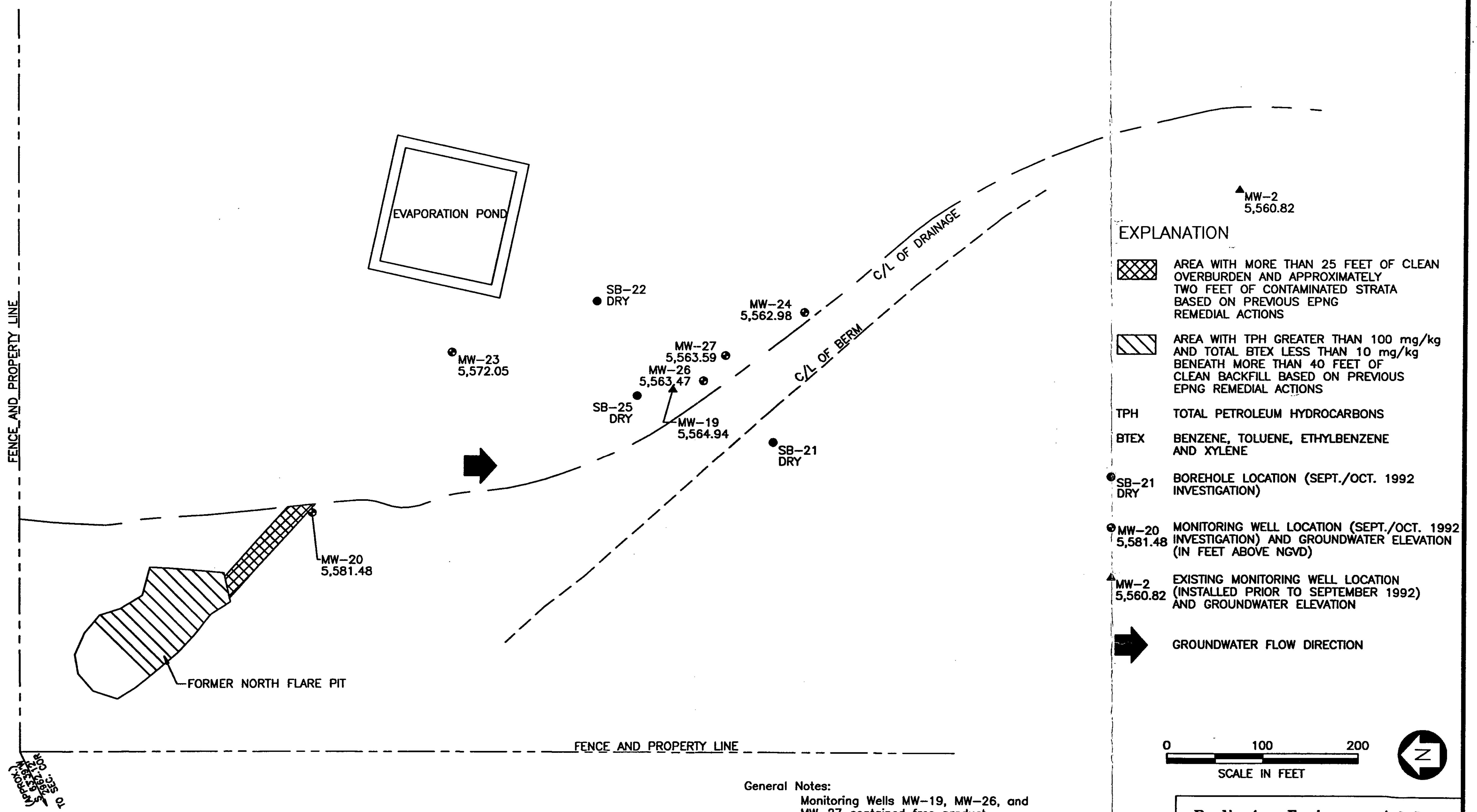
OCTOBER 13, 1992

Monitoring Well	Ground Surface Elevation	Top of Riser Elevation	Well Screen Interval Depth (Feet)	Depth of Groundwater	Groundwater** Elevation	Product Thickness (Feet)
MW-2	5,614.00	5,616.30	43.3 - 56.3	55.48	5560.82	0
MW-19*	5,619.70	5,623.36	55.2 - 65.2	60.95	5,562.41 (5,564.94)	3.62
MW-20*	5,628.21	5,630.31	50.0 - 65.0	48.83	5,581.48	0
MW-23	5,628.31	5,631.02	49.0 - 64.0	58.97	5,572.05	0
MW-24	5,619.49	5,621.97	49.5 - 64.5	58.99	5,562.98	0
MW-26	5,618.75	5,621.31	50.0 - 65.0	60.42	5,560.89 (5,563.47)	3.68
MW-27*	5,618.83	5,621.31	50.25 - 66.0	58.10	5,563.21 (5,563.59)	0.54

Elevations in feet above National Geologic Vertical Datum of 1929.

* Two-inch-diameter well. All other wells are four-inch diameter.

** Water level elevation corrected for presence of product in well, in parentheses. Calculated by groundwater elevation plus 0.70 times product thickness. Estimated specific gravity of hydrocarbon product is 0.70.



EXPLANATION

▩	AREA WITH MORE THAN 25 FEET OF CLEAN OVERBURDEN AND APPROXIMATELY TWO FEET OF CONTAMINATED STRATA BASED ON PREVIOUS EPNG REMEDIAL ACTIONS
▧	AREA WITH TPH GREATER THAN 100 mg/kg AND TOTAL BTEX LESS THAN 10 mg/kg BENEATH MORE THAN 40 FEET OF CLEAN BACKFILL BASED ON PREVIOUS EPNG REMEDIAL ACTIONS
TPH	TOTAL PETROLEUM HYDROCARBONS
BTEX	BENZENE, TOLUENE, ETHYLBENZENE AND XYLENE
● SB-21 DRY	BOREHOLE LOCATION (SEPT./OCT. 1992 INVESTIGATION)
⊗ MW-20 5,581.48	MONITORING WELL LOCATION (SEPT./OCT. 1992 INVESTIGATION) AND GROUNDWATER ELEVATION (IN FEET ABOVE NGVD)
▲ MW-2 5,560.82	EXISTING MONITORING WELL LOCATION (INSTALLED PRIOR TO SEPTEMBER 1992) AND GROUNDWATER ELEVATION
➡	GROUNDWATER FLOW DIRECTION

General Notes:

Monitoring Wells MW-19, MW-26, and MW-27 contained free product. Corrected groundwater elevations for these wells were used to estimate groundwater flow directions.

This contour map is based on interpolation between widely spaced monitoring wells or boreholes and only at the monitoring well or borehole location is the elevation actually known.

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GROUNDWATER ELEVATIONS IN THE NORTH FLARE PIT AREA ON OCTOBER 13, 1992

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FIGURE 5

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approximately 3.6 feet were measured at MW-19 and MW-26. At MW-27 the product thickness was 0.54 feet.

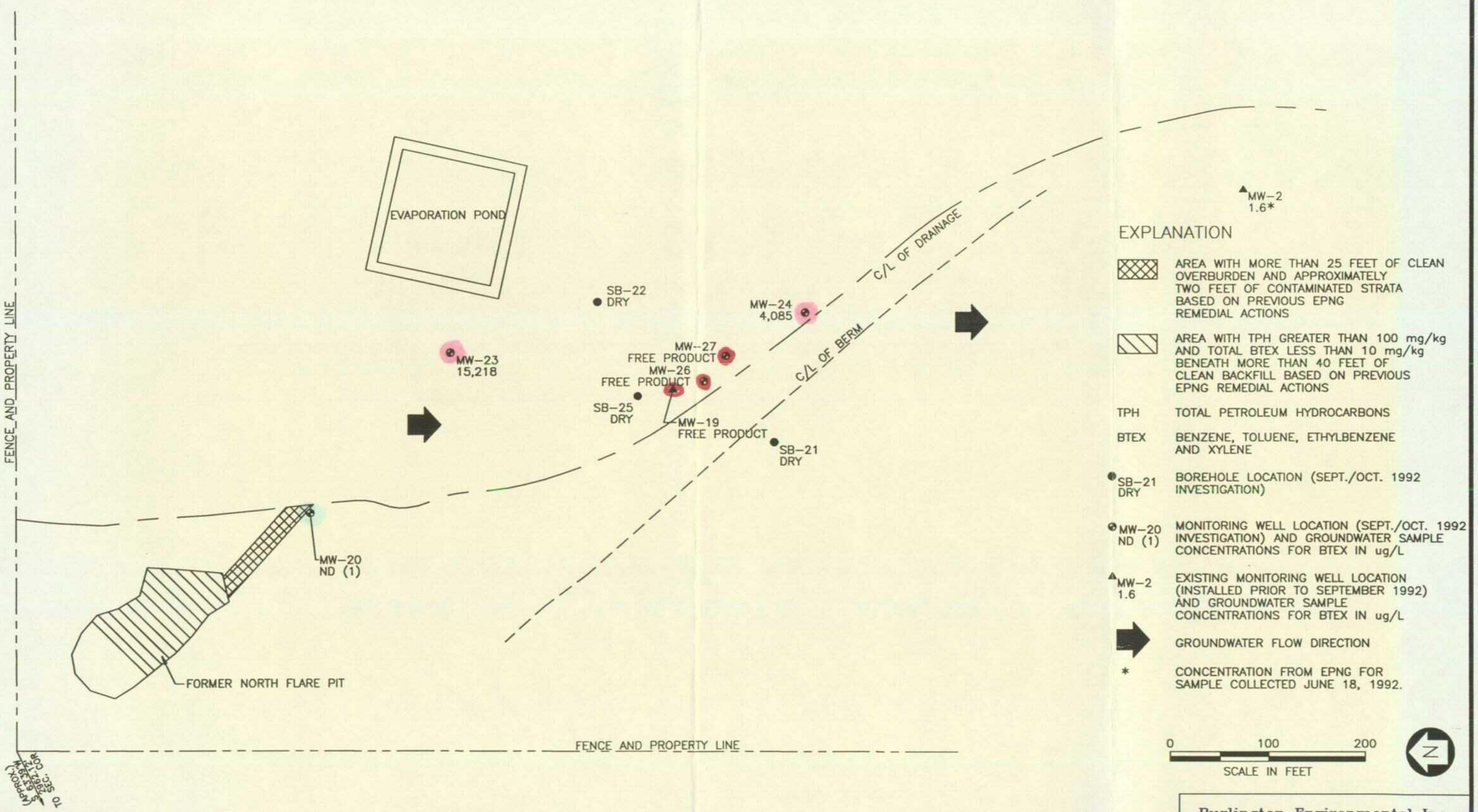
5.4 Analytical Results and Extent of Contamination

The main objective of this investigation was to evaluate the extent and source of the floating hydrocarbon product layer detected in monitoring well MW-19. The analytical results and field observations collected from this investigation and from previous studies by K.W. Brown were used to map the extent of floating hydrocarbon product as illustrated in Figure 6.

Based on these investigations free product was found only in monitoring wells MW-19, MW-26, and MW-27. Boreholes to the east (SB-22), north (SB-25), and west (SB-21) did not encounter water or free product. The lateral extent of the free product is approximated by these three boreholes and monitoring well MW-24, which did not contain free product. Monitoring well MW-24 is located south of the free product plume.

Table 2 is a list of the analytical results for groundwater samples from monitoring wells MW-20, MW-23, and MW-24. Dissolved-phase BTEX concentrations in samples from monitoring wells MW-23 and MW-24 were greater than New Mexico Water Quality Control Commission (WQCC) standards. In addition, TDS concentrations exceeded domestic water quality standards. Groundwater samples were not collected from monitoring wells MW-19, MW-26, and MW-27 because these wells contained a floating layer of hydrocarbon product.

The soil samples with the highest PID readings were collected for laboratory analytical testing. The analytical results from boreholes not completed as monitoring wells (SB-21, SB-22, and SB-25) were also useful in evaluating the source of hydrocarbon contamination. Table 3 is a list of the soil sample analytical results. Of these three boreholes only the soil samples from SB-22 contained BTEX concentrations above 5 μg/kg. The soil sample



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GROUNDWATER CONCENTRATIONS FOR TOTAL BTEX AND LOCATIONS OF FREE PRODUCT

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FIGURE 6

Table 2

GROUNDWATER BTEX, TPH, and TDS CONCENTRATIONS

NORTH FLARE PIT AREA
BLANCO PLANT
EL PASO NATURAL GAS COMPANY

OCTOBER 1992

Monitoring Well Number	Sample I.D.	Concentrations (µg/L)					Total Petroleum Hydrocarbons (mg/L)	Total Dissolved Solids (mg/L)
		Benzene	Toluene	Ethylbenzene	Xylenes	Total BTEX		
MW-20	MW-20	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.5)	11,500
MW-23	MW-23	2,600	7,090	198	5,330	15,218	2	28,700
MW-23 (Duplicate)	MW-73	2,770	7,690	221	6,090	16,771	2	30,000
MW-24	MW-24	2,650	ND(50)	94.8	1,340	4,084.8	1	5,630
WQCC Standard		10	750	750	620	NA	NA	1,000(a)

Note:	Monitoring wells MW-19, MW-26, and MW-27 contained a floating layer of free product; therefore, no groundwater sample was collected.
BTEX	Benzene, toluene, ethylbenzene, and total xylenes.
mg/L	Milligrams per liter.
ND(50)	Not detected at detection limit in parentheses.
TDS	Total Dissolved Solids.
TPH	Total petroleum hydrocarbons.
µg/L	Micrograms per liter.
(a)	WQCC Standard for TDS in domestic water supplies. For other uses the TDS standard is 10,000 mg/L.

Table 3

SOIL BTEX AND TPH CONCENTRATIONS

NORTH FLARE PIT AREA
BLANCO PLANT
EL PASO NATURAL GAS COMPANY

OCTOBER 1992

Borehole Number	Sample Depth (Feet)	Sample I.D.	Concentration (µg/kg)					Total Petroleum Hydrocarbons (mg/kg)
			Benzene	Toluene	Ethylbenzene	Xylenes	Total BTEX	
SB-20	45.5	MW-20-45.5	ND(1.0)	3.8	ND(1.0)	2.7	6.5	16
SB-21	45	SB-21-45	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	N/A
SB-22	38	SB-22-38	ND(1.0)	1.5	ND(1.0)	3.3	4.8	26
SB-23	58	SB-23-58	ND(5.0)	87.8	18.6	283	389.4	24
SB-23	63	SB-23-63	ND(125.0)	5,550	988	22,800	29,338	N/A
SB-24	50	SB-24-50	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	8.0
SB-25	47	SB-25-47	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	N/A
SB-26	60.5	SB-26-60.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	9

BTEX	Benzene, toluene, ethylbenzene, and total xylenes.
mg/kg	Milligrams per kilogram.
µg/kg	Micrograms per kilogram.
N/A	Not analyzed.
ND(0.001)	Not detected at the detection limit in parentheses.
TPH	Total petroleum hydrocarbons.

analyzed from borehole SB-22 was collected from the depth of 38 feet, the depth of the first elevated PID readings in this borehole.

Groundwater from the background well location (MW-20) did not contain BTEX or TPH. However, a soil sample from a depth of 45.5 feet, above the water table, contained low concentrations of toluene, xylenes, and TPH.

The most recent groundwater sample results for monitoring well MW-2, south of the plume, were collected by EPNG on January 6, 1992. The sample results were below the detection limit of 5 μg/L.

In the boreholes drilled where free product was detected (monitoring wells MW-24, MW-26, and MW-27) the soil samples from above the water table did not contain hydrocarbon contamination. Therefore, the detected hydrocarbons apparently have moved laterally into this area by migrating on top of the water table.

No volatile organic compounds were identified by HNU readings, odor, or stain in any of the wells in the mudstone unit of the Nacimiento Formation. In monitoring wells MW-23 and MW-27, stains or odors were detected in the sandstone unit of the Nacimiento Formation just above the cemented sandstone zone. Only a slight odor was detected in borehole SB-22 and monitoring well MW-24 in this unit.

A sample of the product from monitoring well MW-26 was collected by Burlington and analyzed by EPNG's laboratory in Farmington, New Mexico, to evaluate the type of hydrocarbon product. The analyses indicated that a perfect match was not achieved when compared to other gas chromatograms for hydrocarbon product types, but that an 81 percent correlation was made that the product is pipeline drip. According to EPNG, this type of hydrocarbon was formerly discharged into an unlined pit at the present location of the lined evaporation pond and also at the North Flare Pit.

Appendix E contains the groundwater and soil analytical results. Appendix F contains the EPNG analytical results for the product sample.

6 AQUIFER TESTING

Aquifer testing was performed by Burlington at the Blanco Plant between September 29 and October 19, 1992. The following chapter describes the testing and the evaluation of the testing data. The objective of the testing was to evaluate the groundwater and product production rates, types of pumping systems (single versus dual pump systems for total fluids and product only), and aquifer characteristics for transmissivity, storage coefficient, and radius of influence. Short-duration testing of product skimming and groundwater pumping was performed on September 29, October 13, and October 14 on monitoring wells MW-19 and MW-26. A longer duration test on monitoring well MW-19 was performed on October 19 to evaluate the radius of influence of pumping.

6.1 Product Skimming and Short-Duration Testing on MW-19 and MW-26

The product skimming test was performed by skimming the product from monitoring well MW-26 with a bailer and monitoring the recovery of product thickness. The results of the tests indicated very slow product thickness recovery. The initial product thickness was 3.68 feet. After one hour of recovery measurement, the product thickness was only 0.49 foot, indicating that product flow into the well is very slow and that the actual product thickness in the formation is much less than the exaggerated thickness measured in the monitoring well. The method of performing the test and evaluating the results generally followed the procedure specified in Testa and Paczkowski (1989). A graph of the product recovery test is presented in Appendix G.

The short-duration total fluids pumping of monitoring wells MW-19 and MW-26 was performed to evaluate the total fluids pumping rate that could be achieved. The maximum duration of pumping during this testing was 3.5 hours per well. Each well had a similar response to pumping and would allow only very low flow rates (less than 0.25 gallons per minute). Appendix G contains the field data for these tests.

6.2 Radius of Influence Test

To evaluate the radius of influence of pumping, monitoring well MW-19 was pumped for approximately 10.5 hours while fluid levels were monitored at nearby wells. Prior to these pumping activities, static water level and product level measurements were recorded at all monitoring wells on October 19, 1992. A 1.8-inch-diameter submersible pump was placed in monitoring well MW-19 such that approximately five feet of water was above the pump prior to initiation of pumping. Pumping from this well began at an initial pumping rate of approximately 0.33 gallons per minute (gal/min). Water level and product level measurements were recorded in the pumping well and five observation wells (MW-20, MW-23, MW-24, MW-26, and MW-27) at approximately 30-minute intervals during pumping. The pumping rate was steadily reduced from an initial pumping rate of 0.33 gal/min to approximately 0.11 gal/min during the pump test to prevent the pumping well from being pumped dry. During the 10.5-hour test, approximately 115 gallons of water were pumped from the well. The average pumping rate during the pump test was approximately 0.18 gal/min.

After cessation of pumping, water level and product level measurements were recorded at five-minute intervals for one hour on October 19, 1992, immediately following the test, and again at 9:20 a.m. on October 20, 1992. Measurements were obtained from the pumping well (MW-19) and five observation wells (MW-20, MW-23, MW-24, MW-26, and MW-27). Appendix H contains the field data from this test.

6.3 Evaluation of Data

Due to site conditions, pumping influences were observed in only a single monitoring well (MW-26). This well is approximately 30 feet from the pumping well used during the aquifer testing. A water level rise of up to approximately 0.07 foot was observed in the remaining monitoring wells (MW-20, MW-23, MW-24, and MW-27). This is anticipated to be the result of atmospheric pressure changes due to a weather change during the test. A rise in water levels occurs with a decrease in atmospheric pressure. The maximum water level drawdown observed in monitoring well MW-26 was 0.42 foot just prior to cessation of pumping. Prior to pumping, the product thickness on top of the groundwater was approximately 3.23 feet. The product thickness increased to approximately 3.48 feet during pumping. The water level drawdown observed during pumping was corrected for product thickness by adjusting the water level depth upward based on the measured product thickness and an assumed specific gravity of 0.70 for the hydrocarbon product.

Appendix I summarizes the water level and product level measurements obtained from monitoring well MW-26, the only observation well affected by pumping. Corrected water levels and drawdowns for monitoring well MW-26 are also summarized in Appendix I.

The water level within monitoring well MW-26 had not recovered to pretest levels 875 minutes after cessation of pumping. The lack of recharge to the well indicates that only a small amount of fluid is present in storage in the formation in the vicinity of monitoring well MW-19.

Water level drawdowns were used to calculate the transmissivity and storage coefficient for the aquifer. In these calculations, Burlington used both the actual depths to groundwater and the corrected depth to groundwater (adjusted for layer of floating hydrocarbon product which will depress the water level). Water level drawdowns and corrected water level drawdowns were evaluated using the Theis Method (1935) and the Cooper-Jacob Method (1946) of analysis for aquifer parameters. Water drawdown levels and corrected drawdown levels were plotted versus duration of pumping on logarithmic and semi-logarithmic plots for analysis. Copies of the time versus drawdown plots are in Appendix I. Based upon the evaluation of the water level drawdowns using the Theis and Cooper-Jacob methods of analysis and the water level drawdowns observed in monitoring well MW-26, the transmissivity for the aquifer is very low, in the range of 9.7×10^{-3} to 1.8×10^{-2} square feet per minute (ft^2/min). The storage coefficient was calculated to be between 5.8×10^{-4} and 9.5×10^{-4} (unitless).

Because pumping influences were observed in only one observation well (MW-26), an evaluation of the aquifer parameters by means of distance versus drawdown analysis is not possible. Additionally, evaluation of the radius of influence of the pumping well is limited because only monitoring well MW-26, located 30 feet from MW-19, was observed to be influenced by pumping. The next closest observation well to pumping well MW-19 is MW-27, which is approximately 65 feet away. Well MW-27 did not measure any drawdown from the pump test. Therefore, the radius of influence of pumping from monitoring well MW-19, following approximately 631 minutes of pumping, is between 30 and 65 feet.

Because recovery was so limited in monitoring well MW-26 following cessation of pumping, it is not possible to evaluate the aquifer parameters using recovery data.

The transmissivity of the aquifer and its ability to produce fluid are expected to vary with location because the saturated thickness of the aquifer is not consistent and the Nacimiento Formation is heterogeneous and contains preferential flow pathways.

7 CONCLUSIONS

The hydrogeology of the North Flare Pit Area has been evaluated based on data from five new monitoring wells, three new boreholes not completed as wells, and two existing wells. Based upon the results of the investigations performed during this study, the following conclusions are made.

1. The area of floating hydrocarbon product in the North Flare Pit Area has been delineated by the investigation.
2. The direction of groundwater flow, which may be influenced locally by sandstone channels within the Nacimiento Formation, is to the south southeast.
3. A layer of liquid-phase hydrocarbon product was measured at approximately 3.6 feet in two wells.
4. The depth to groundwater or floating hydrocarbon product is approximately 48 to 59 feet.
5. The total saturated layer (groundwater and floating hydrocarbons) is only eight to 16 feet thick.
6. Recovery of hydrocarbon-contaminated groundwater and product from the alluvial sediments will be very slow because of the thin saturated zone and relatively low transmissivity and storage coefficient of the formation.
7. The rate of total fluid pumping will be less than 0.25 gallon per minute in the monitoring wells (MW-19, MW-26, and MW-27) where free product is present.

8 PROPOSED HYDROCARBON RECOVERY SYSTEM

Based on this assessment of the extent of groundwater contamination and the observed aquifer characteristics, Burlington recommends the following approach to groundwater remediation at this location.

Recovery of product and groundwater should be performed by total fluids pumping from either monitoring well MW-19 or MW-26. A pump should be placed in one well and operated over a period of months. The liquids can be discharged to an aboveground tank installed adjacent to the well. The performance of the system should be evaluated based on the rate of fluid recovery and the reduction of product thicknesses in monitoring wells MW-19, MW-26, and MW-27. The product and groundwater collected in the aboveground tank will be pumped into a vacuum truck provided by EPNG on an as-needed basis. The vacuum truck will transport the liquids to a drip storage tank located west of the Blanco Plant. The collected product will be recycled.

After a period of several months of pumping, the effectiveness of the system will be evaluated and the results reported to the NMOCD. The evaluation of system performance will be based on the volumes of product and groundwater recovered and changes in product thickness.

Upon approval from NMOCD, EPNG will design a system for total fluids pumping based upon the above recommendations.

9 LIMITATIONS OF STUDY

Burlington Environmental Inc. places the following limitations on the information presented in this report.

Limited Warranty and Report Usage

This report has been prepared for El Paso Natural Gas Company to use for evaluating the extent of subsurface hydrocarbon contamination and potential methods for remediating these hydrocarbons at the Blanco Plant in San Juan County, New Mexico, as described herein. This report has been prepared in accordance with generally accepted environmental, hydrogeological, and related practices. No other warranty, expressed or implied, is made to the professional advice and recommendations included herein. This report is not for use by parties other than those named or for purposes other than those stated herein. It may not contain sufficient information for the use of other parties or for other purposes.

Lapse of Time

If there is a substantial lapse of time between the submission of this report and the start of work at the site, or if conditions have changed due to natural causes, construction operations at or adjacent to the site, or additional waste disposal at the site, this report should be reviewed by Burlington to determine the applicability of the analyses and to determine the applicability of the analyses and recommendations considering the changed conditions and time lapse. The report should also be reviewed by Burlington if changes occur in the project concepts.

Variations Between Sampling Locations

These analyses and recommendations are based upon data obtained from site reconnaissance, previous work by K.W. Brown, EPNG, and other pertinent information presented herein. This report does not reflect any variations between or below the explorations. Should such variations become evident, they should be immediately brought to the attention of Burlington. It may be necessary to modify the conclusions and recommendations of this report after performance of on-site observations during the construction/remediation activities and noting the characteristics of any such variation.

Stratigraphy

The stratigraphy encountered at each borehole location is shown on the appropriate Geologic Log. The lines designating the interface between soil materials on the Geologic Logs represent approximate boundaries. The transition between materials may be gradual or may occur between recovered samples.

Groundwater Levels

Groundwater information reported at each borehole and monitoring well location is reported on the appropriate field data sheets and geologic logs. It should be noted that fluctuations in the groundwater level may occur due to seasonal variations and other considerations that may not be evident at the times the measurements were made.

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Brown K.W. & Associates, Inc. 1990. *Site Investigation of the Blanco Plant, San Juan County, New Mexico*. Prepared for El Paso Natural Gas Company. February.

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Testa, Stephan M. and M.T. Paczkowski. 1989. *Volume Determination and Recoverability of Free Hydrocarbon*. Published in Groundwater Monitoring Review. Winter pp 120-128.

Williamson, J.E., and S.G. Lucas. 1992. *Stratigraphy and Mammalian Biostatigraphy of the Paleocene Nacimiento Formation, Southern San Juan Basin, New Mexico*. Presented in New Mexico Geological Society Guidebook, 43rd Conference San Juan Basin IV.

APPENDIX A

Site Photographs

BURLINGTON ENVIRONMENTAL INC.
210 West Sand Bank Road
Post Office Box 330
Columbia, Illinois 62236
(618) 281-7173 FAX (618) 281-5120

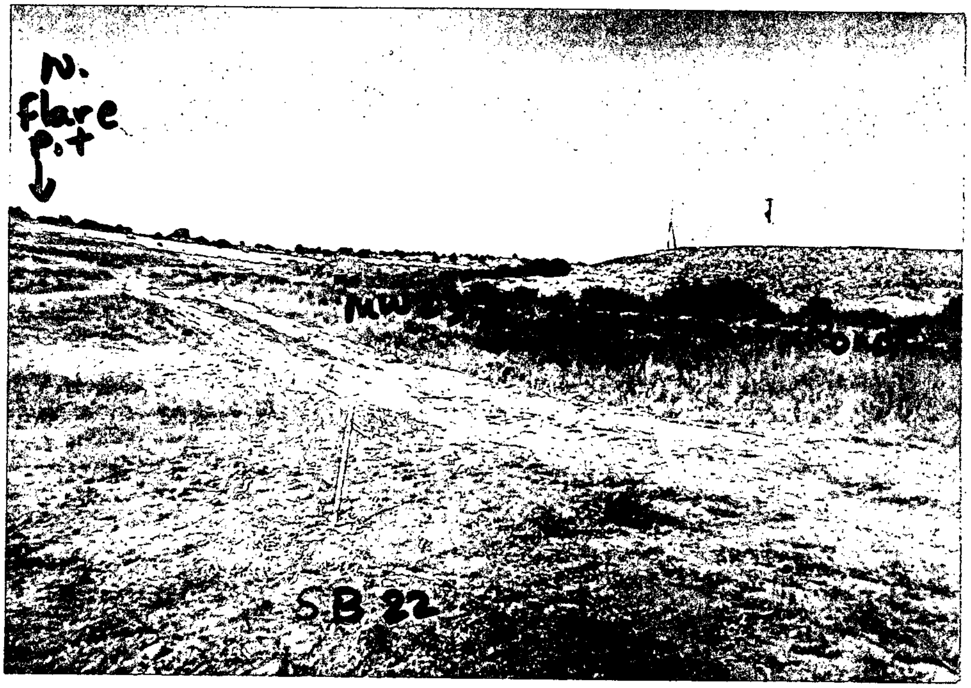
Project Name North Flare Pit
Project No. 224857 Phase
Location EPNG Blanco Plant

PHOTOGRAPHS

Time: Oct 1992
Direction: north
Photographer: N. Prince
Description:
well locations

Roll No.
Date
Negative No.
Control No.

⇒



Time: Oct 1992
Direction: North
Photographer: N. Prince
Description:
well locations

Roll No.
Date
Negative No.
Control No.

⇒

FORM EE-701 *(Style 1)* (REV. 1/92)

BURLINGTON ENVIRONMENTAL INC.
210 West Sand Bank Road
Post Office Box 330
Columbia, Illinois 62236
(618) 281-7173 FAX (618) 281-5120

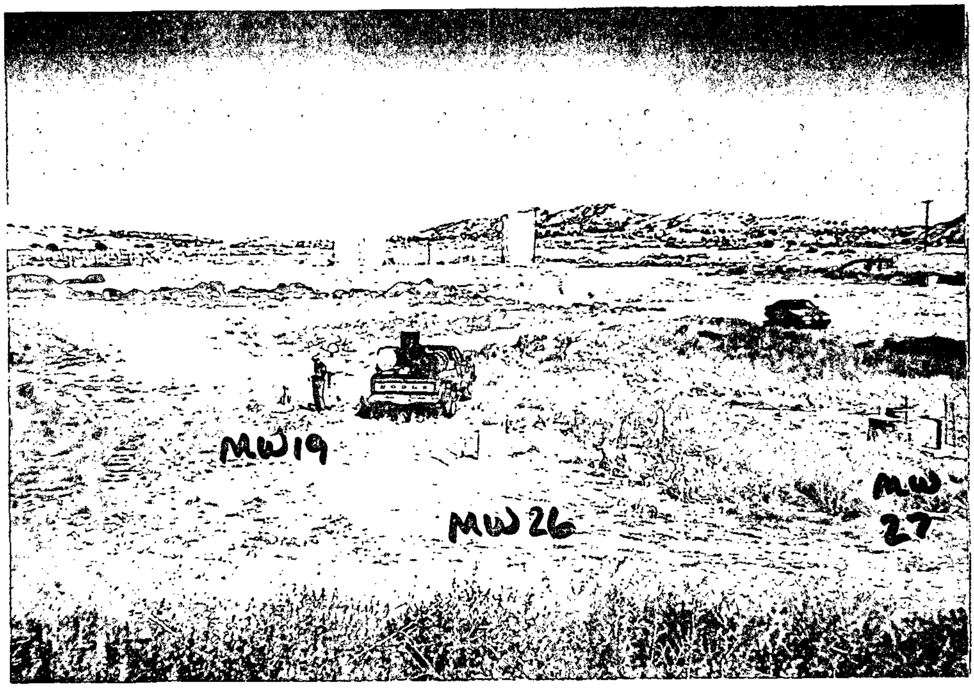
Project Name North Flare Pit
Project No. 224857 Phase
Location EPNG Blanco Plant

PHOTOGRAPHS

Time: Oct. 1992
Direction: north
Photographer: N. Prince
Description:
well locations - looking north

Roll No.
Date
Negative No.
Control No.

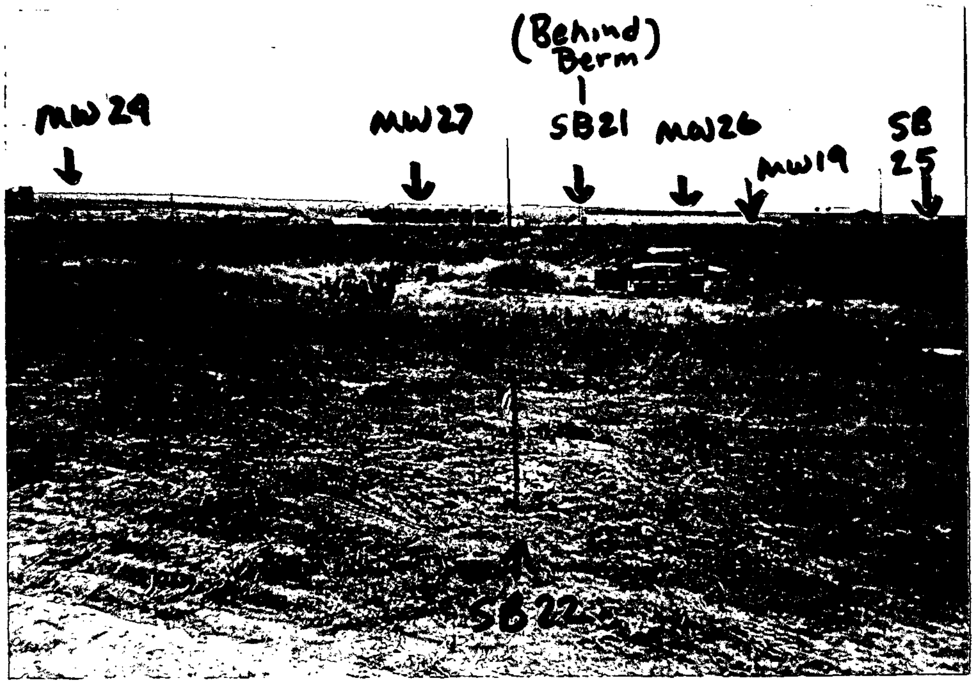
⇒



Time: Oct. 1992
Direction: South
Photographer: N. Prince
Description:
well Locations

Roll No.
Date
Negative No.
Control No.

⇒



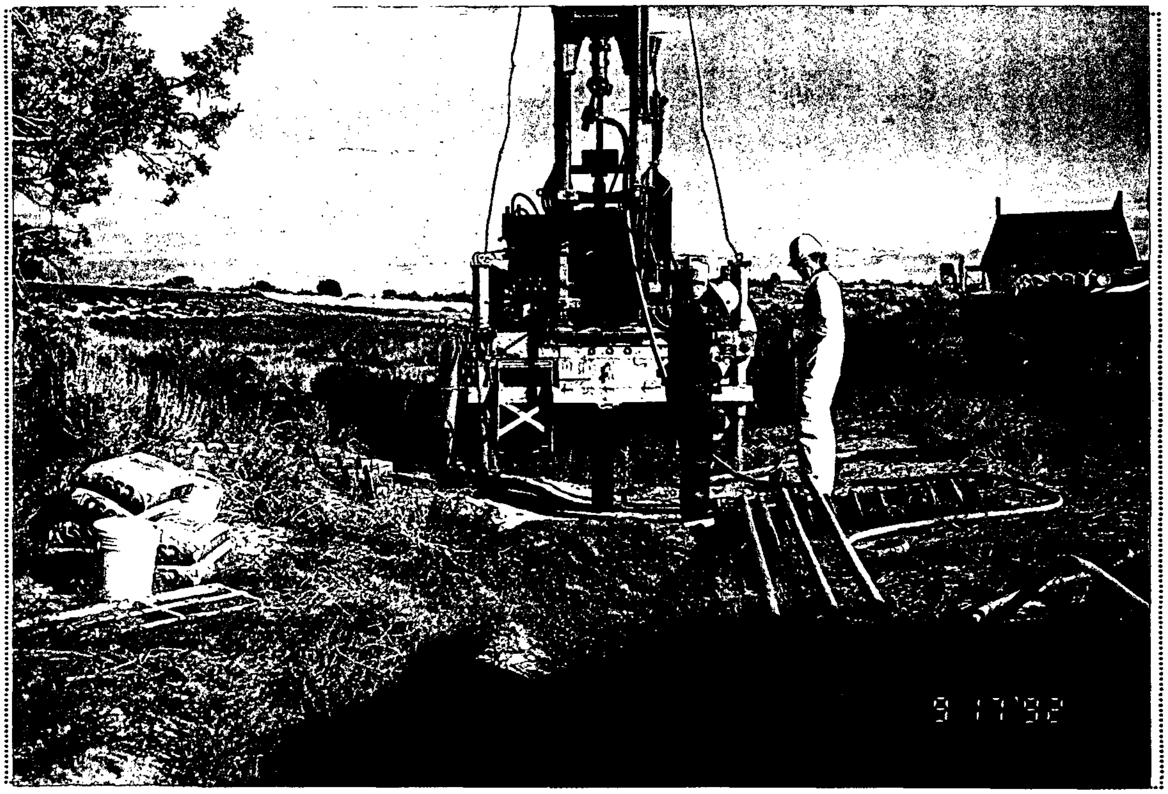
BURLINGTON ENVIRONMENTAL INC.
210 West Sand Bank Road
Post Office Box 330
Columbia, Illinois 62236
(618) 281-7173 FAX (618) 281-5120

Project Name North Flare Pit
Project No. 224857 Phase
Location EPNG Blanco Plant

PHOTOGRAPHS

Time: Oct. 1992
Direction:
Photographer: S.POPE
Description:
SHB drill rig

Roll No.
Date
Negative No.
Control No.

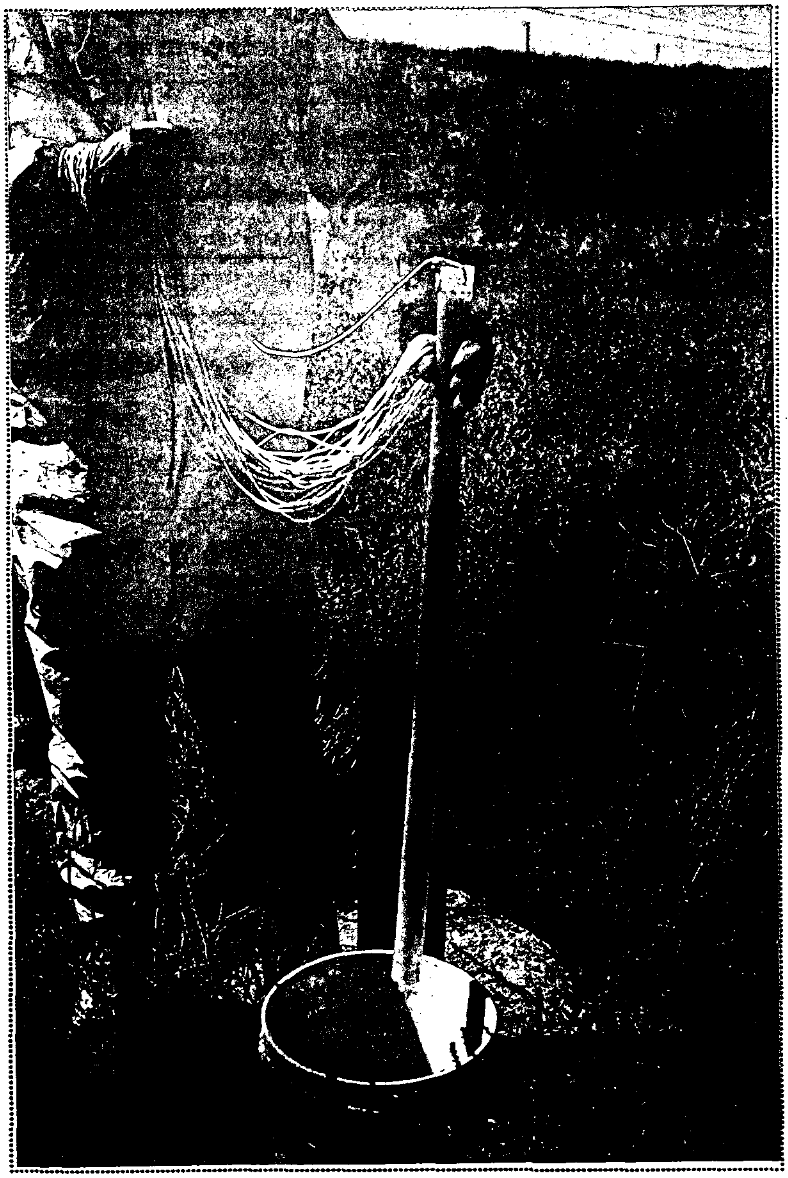


BURLINGTON ENVIRONMENTAL INC.
210 West Sand Bank Road
Post Office Box 330
Columbia, Illinois 62236
(618) 281-7173 FAX (618) 281-5120

Project Name North Flare Pit
Project No. 224857 Phase
Location EPNG Blanco Plant

PHOTOGRAPHS

Time: Oct. 1992
Direction:
Photographer: S. Pope
Description: Product measurement in well mw-19



Roll No.
Date
Negative No.
Control No.

FORM EE-701 *(Style 6)* (REV. 6/92)

APPENDIX B

Borehole Logs

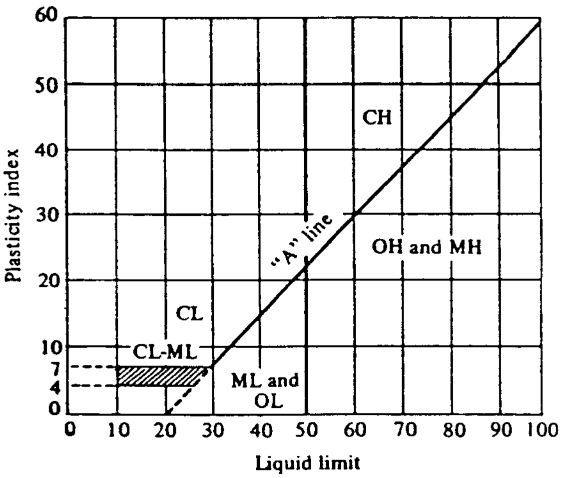
B-1 Burlington Environmental Geologic Logs
B-2 K.W. Brown Geologic Logs

APPENDIX B-1

Burlington Environmental Geologic Logs

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions			*Group Symbols*	*Typical Names*	*Laboratory Classification Criteria*		
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 per cent GW, GP, SW, SP More than 12 per cent GM, GC, SM, SC 5 to 12 per cent *Borderline* cases requiring dual symbols	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits below "A" line with P.I. greater than 7	
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures		Atterberg limits above "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils (More than half material is smaller than No. 200 sieve)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity			
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		PT	Peat and other highly organic soils			



RECORD OF SUBSURFACE EXPLORATION

Borehole # 20
Well # MW-20
Page 1 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/14/92 1530
Date/Time Completed 9/17/92 0830

Drilling Method HSA 6 1/4 ID
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU			Drilling Conditions & Blow Counts
							BZ	BH	S	
				Brown-tan silty SAND; fine grained; moist; loose.			0	0	0	No visible impact.
5										
				trace gravel.						Driller noted change in drilling (6" gravel layer)
							0	0	0	
					SM					No visible impact.
10										
							0	0	0	
15										
							0	0	0	Driller noted 6" of gravel at 19'.
20										
				Brown-dark brown sandy, silty CLAY; fine-medium sand grains; moist; medium stiff clay.		20				
							0	0	0	Driller noted change in drilling at 23'.
25					CL					
							0	0	0	
30										
							0	0	0	Driller noted continued tight drilling.
35										
							0	0	0	
40										

Comments: Borehole logged from drill cuttings except where noted.

RECORD OF SUBSURFACE EXPLORATION

Borehole # 20
Well # MW-20
Page 2 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/14/92 1530
Date/Time Completed 9/17/92 0830

Drilling Method HSA 6 1/4 ID
Air Monitoring Meth HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU BZ	BH	S	Drilling Conditions & Blow Counts
40										
	1	40.5 41.0	SS 18	Brown-Gray CLAY; trace sand; moist; very stiff; laminated; mudstone like appearance.	CL		0	0	30	Headspace reading - 50 NDU
45										
	2*	45.5 47.0	SS 10	Brown-tan silty SAND w/trace clay; dry.	SM	46	0	0	30	Odor from 3-inch sandstone layer from 46-foot depth. Lamination & interbedded silts & sandy clay noted. Slight odor noted at contact.
50	3	48.5 50.0	SS 6	Dark gray black friable SHALE; dry. Auger refusal @ 49.0 feet.		48.5	0	0	0	
										Headspace reading @ 45.5'-47.0' - 80 NDU
55							0	0	0	Headspace reading @ 49.0' - 0 - 1 NDU Water in cuttings @ 54'.
60				Light gray SANDSTONE; medium grained; slightly crumbly; moist. Noted dry, very hard GYPSUM stringers in some cuttings.		58	0	0	0	Noted sandy gypsum getting drier with depth.
							0	0	0	Cuttings appeared dry past 60'.
65										
				TOB - 66'						

Comments: Stopped drilling with HSA at 12:00 on 9/14/92, resumed drilling with air rotary on 9/16/92.
Water came up to 49' in borehole on 9/17/92.
* Sample collected for TPH & BTEX analysis.

RECORD OF SUBSURFACE EXPLORATION

Borehole # 21
Well # MW-21
Page 1 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/15/92 1600
Date/Time Completed 10/01/92 1230

Drilling Method HSA 4 1/4 ID
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU BZ	BH	S	Drilling Conditions & Blow Counts
				Brown-tan silty SAND; fine grained, trace moisture, loose.			0	0	0	No odor.
5										
				Trace gravel.			0	0	0	
					SM					
10										
							0	0	0	
15										No noted change in drilling.
							0	0	0	
20										
							0	0	0	
25				Brown silty SAND w/clay; fine-med SAND, loose, trace gravel; moist.		23.5				Driller noted tighter drilling @ 23-24'.
					SC		0	0	0	
30										
						32.0				- Driller noted increasing tightness w/depth. - No odors.
35				Dark gray, silty sandy CLAY; fine-med SAND, trace sandstone gravel moist, dense.	CL-SC		0	0	0	
				Noted some shale fragments in cuttings.			0	0	0	
40						40.0				

Comments:

RECORD OF SUBSURFACE EXPLORATION

Borehole # 21
Well # MW-21
Page 2 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/15/92 1600
Date/Time Completed 10/01/92 1230

Drilling Method HSA 4 1/4 ID
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU			Drilling Conditions & Blow Counts
							BZ	BH	S	
40										
	1	40 41.5	SS 18	Brown-tan SILTSTONE/MUDSTONE; trace fine sand and organics; dense, moist.			0	0	0	No odor on sample. Noted lamination throughout sample. Noted wood and leaf print.
45						45.0				Auger refusal @ 45.5'. Drove spoon 3" - 4" before refusal. No odor or staining.
	2*	45 46.5	SS 4"	Tan-reddish, medium grain SAND; trace silt and clay, moist, med-dense.	SP		0	0	0	Headspace reading - 0 NDU
50						50.0				
	3	50 51.5	SS 6	White-lt. gray SANDSTONE w/gypsum stringers; fine-medium grained; dry, dense.			0	0	0	- Sand grains appeared to be suspended in gypsum stringers. Possible calcite cementation. Extremely tight drilling from 50' - 55'.
55										
	4	55 56.5	SS 6	SAA Damp in fresh breaks.			0	0	0	Tight drilling from 55' - 60'.
60										
	5	60 61.5	SS 6	SAA			0	0	0	
				TOB - 61.5						

Comments: SAA = same as above

Allowed borehole to remain open to see if water enters hole. Water noted at 1100 on 9/16/92.

* Sample collect for BTEX analysis only.

RECORD OF SUBSURFACE EXPLORATION

Borehole # 22
Well #
Page 1 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/18/92 900
Date/Time Completed 9/18/92 1400

Drilling Method HSA 8" OD
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU BZ	BH	S	Drilling Conditions & Blow Counts
				Loose brown-tan sandy SILT to fine SAND; trace moisture.			0	0	0	
5					ML					
							0	0	0	
10										
				Brown silty CLAY w/med-fine sand; trace moisture; medium soft.		11.5	0	0	0	
15				Noted trace gravel.	CL					
20						20.0	0	0	0	Drilling started getting tighter. No evidence of impact.
				Loose brown silty SAND; medium-coarse grained; trace gravel; moist.	SM					
25				Noted: brown silty clay balls from 23' to 28'.			0	0	0	No odors.
30						30				Driller noted change in drilling at 30'. Tight drilling.
				Brown silty sandy CLAY; fine to medium sand grains. Clay medium stiff; moist.	CL		0	0	0	
						33				
35				Brown silty SAND w/clay; fine to medium sand grains; clay med. stiff; trace moisture.	SM					Tight drilling
						38	0	0	6	Begin sampling @ 38'. Slight organic odor. Headspace reading - 8 NDU.
40	1*	38 39.5	SS 18	Brown-tan SILT w/sand; trace clay; moist med. dense.	ML					

Comments: * Sample collected for BTEX and TPH analysis.

RECORD OF SUBSURFACE EXPLORATION

Burlington Environmental Inc.
210 West Sand Bank Road
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Borehole # 22
Well #
Page 2 of 2

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/18/92 900
Date/Time Completed 9/18/92 1400

Drilling Method HSA 8" OD
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU BZ	BH	S	Drilling Conditions & Blow Counts
40										Drilling tight.
						43				
45	2	43 44.5	SS 18	Brown-tan, med-coarse grained SAND w/silt; trace gravel; loose; trace moisture.	SM		0	0	2	Headspace reading - 1 NDU.
50	3	48 49.5	SS 18	Dk. brown silty CLAY w/sand; very dense; trace moisture; intermittent sand stringers; trace gravel.	CL	49	0	0	3	Drilling much easier. Headspace reading - 3 NDU.
55	4	53 54.5	SS 0	No recovery.						Refusal after 1.5". Trace sample on outside of shoe possibly a lt. gray SANDSTONE.
60	5	58.0 59.5	SS 4"	Lt. gray-white SANDSTONE, fine-med. sand grains; white calcium or gypsum cementation; trace dampness; crumbly.			0	2	0	Very tight drilling Headspace reading - 0 NDU Refusal @ 4".
65	6	63 64.5	SS 3"	SAA			0	0	0	Refusal @ 3". Headspace reading - 0 NDU.
				TOB - 64.5						

Comments: Abandon borehole due to lack of water.

RECORD OF SUBSURFACE EXPLORATION

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Borehole # 23
Well # MW-23
Page 1 of 2

Project Name: Blanco Plant
North Flare Pit
Project Number: 224857
Project Location: Blanco, New Mexico

Logged By: Scott Pope
Drilled By: SHB
Date/Time Started: 9/19/92 730
Date/Time Completed: 9/20/92 1430

Drilling Method: HSA 8" OD
Air Monitoring Method: HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU BZ	BH	S	Drilling Conditions & Blow Counts
				Brown sandy SILT to fine SAND; dry, loose.			0	0	0	
5					ML					
										No odors.
10	1	8 9.5	SS 12"	Brown sandy SILT to fine SAND; trace moisture; loose.			0	0	0	Headspace reading - 1 NDU. Easy drilling.
						13				
15	2	13 14.5	SS 18	Brown silty SAND; fine-med. grained; trace moisture; loose.			0	0	0	Headspace reading - 2 NDU.
					SM					
20	3	18 19.5	SS 18	SAA			0	0	0	Headspace reading - 2 NDU.
25	4	23 24.5	SS 18	Brown silty CLAY; trace sand; moist; stiff.		23.5	0	0	5	Headspace reading - 2 NDU. Moisture affecting HNU readings. Driller noted tight drilling @ 26.0
					CL					
						28.0				
30	5	28 29.5	SS 12	Brown silty SAND w/trace clay; dense, trace moisture.			0	0	0	Headspace reading - 2 NDU. Extremely tight drill string, stuck in hole.
	6A	33 34.5		No sample.						
35					SM					
	6B	35 36.5	SS 8	Brown silty SAND; med.-grained; trace gravel and moisture; loose.			0	0	0	No odor or visible contamination.
40						40				

Comments: SAA = same as above.
Drilling problems; drill string stuck in borehole at 35 feet. Delay for repairs from 09:30 to 14:30. on 9/19/92. EPNG stated to stop sampling past 40 feet. Drill cutting sample collected; headspace reading - 150 NDU. Discontinued use of center plug.

RECORD OF SUBSURFACE EXPLORATION

Borehole # 23
Well # MW-23
Page 2 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name: Blanco Plant
North Flare Pit
Project Number: 224857
Project Location: Blanco, New Mexico

Logged By: Scott Pope
Drilled By: SHB
Date/Time Started: 9/19/92 730
Date/Time Completed: 9/20/92 1430

Drilling Method: HSA 8" OD
Air Monitoring Method: HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU			Drilling Conditions & Blow Counts
							BZ	BH	S	
40										
	7	40 41.5	SS 10	Brown silty CLAY; trace fine sand; gypsum stringers; trace moisture; very stiff.			0	0	1	
45							0	0	0	
					CL					
50										
							0	0	1	
55										Driller noted change @ 56'.
						56				Noted 200 NDU on HNU cuttings.
				Dk gray, sandy CLAY; fine-med sand grains; trace gravel; moist; stiff.	SM		0	130	200	Strange organic odor on cuttings.
60	8*	58 59.5	SS 4"	Lt brown-tan SANDSTONE w/large amounts of gypsum. Med. grained sand, trace moisture, crumbly. Noted some staining at sandstone interface.			0	100	30	Noted strong odor on sample. Headspace reading - 200 NDU.
							0	100	200	200 NDU on cuttings.
65	9*	63 64.5	SS 4"	Lt gray SANDSTONE w/gypsum stringers; medium grains; dry; dense.			0	100	50	Refusal after 4". Noted 3" black impacted zone just above gypsum in sample tube. Possibly material that was stuck in augers. *Zone of impact could not be defined.*
	2			TOB - 64.5						

Comments: Cuttings from 56' to 65' were wet with steam and may have affected HNU readings.
Center plug installed to allow water to accumulate.
* Samples collected for lab analysis.

RECORD OF SUBSURFACE EXPLORATION

Borehole # 24
Well # MW-24
Page 1 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/21/92 1445
Date/Time Completed 9/22/92 940

Drilling Method HSA 8" OD
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU			Drilling Conditions & Blow Counts
							BZ	BH	S	
				Brown-tan silty SAND; fine to medium grained; dry; loose.			0	0	0	No odors. Easy drilling noted.
5										
							0	0	0	
10					SM					
				Trace clay; moisture.			0	0	0	
15										
							0	0	0	
20										
						22				Slight change in drilling.
				Brown-tan clayey SAND; fine to medium grained; moist; loose.	SC		0	0	0	
25										
						26	0	0	0	Driller noted drilling change @ 26'.
				Brown sandy CLAY, fine-med. grained; moist; medium stiff.						
30										
	1	30 31.5	SS 18	Dk-brown CLAY w/sand and silt; moist; very stiff.	CL		0	0	0	
35							0	0	0	
40						40				

Comments: Center plug stuck in augers at 32 feet; time 1600 - 1800.

RECORD OF SUBSURFACE EXPLORATION

Borehole # 24
Well # MW-24
Page 2 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/21/92 1445
Date/Time Completed 9/22/92 940

Drilling Method HSA 8" OD
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU			Drilling Conditions & Blow Counts
							BZ	BH	S	
	2	40 41.5	SS 18"	Brown SAND; fine to medium grained; trace silt; moist; loose.			0	0	2	No visible impact or odors. Headspace reading - 3 NDU.
45					SP					
	3	45 46.5	SS 18"	SAA			0	0	1	
50						50				
	4*	50 51.5	SS 18"	Brown clayey SAND; medium grained; trace silt; moist; medium dense.	SC		0	0	5	Headspace reading - 30. Slight organic odor. Tight drilling, no cuttings coming up, had go w/out center plug.
55						55				
	5	55 56.5	SS 18"	Brown sandy CLAY; fine-medium grained; wet; medium stiff.	CL		0	15	4	Cuttings reading - 300 NDU.
60						60	0	3	0	Headspace reading - 4 NDU.
	6	60 61.5	SS 18"	Brown, clayey SAND, fine-medium grains; saturated; medium dense.	SC					
65						65				Refusal @ 6".
	7	65 66.5	SS 6"	Tan-buff SANDSTONE w/gypsum; damp, medium-coarse grained; hard.			0	3	3	Noted some staining in material in spoon. Impacted zone not known. 20 NDU reading on staining. No odor on gypsum sand.
				TOB - 65.5						

Comments: SAA = same as above
Noted approximately 6 feet of water on rods from last sample.
* Sample collected for lab analysis.

RECORD OF SUBSURFACE EXPLORATION

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
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(618) 281-7173 FAX (618) 281-5120

Borehole # 25
Well # MW-25
Page 1 of 2

Project Name Blanco Plant North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/28/92 1315
Date/Time Completed 9/28/92 1830

Drilling Method HSA 10" OD
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU			Drilling Conditions & Blow Counts
							BZ	BH	S	
				Brown silty SAND; fine grained; trace moisture; loose.	SM		0	0	0	
						3.5				
5				Brown CLAY w/silt; trace fine sand; moist; medium stiff.	CL		0	0	0	
						8.0				
10				Brown silty SAND w/clay; fine to medium grains trace gravel, moisture; med. dense.			0	0	0	
					SM					Driller noted hard then easy drilling from 13' - 18'.
15							0	0	0	
						18				
20				Brown-dark brown sandy CLAY; fine to medium grains; trace moisture; medium stiff.			0	0	0	
					CL					Driller noted very tight drilling.
25				Very stiff clay.			0	0	0	
30				Brown-dark brown sandy CLAY, fine to medium grains; trace moisture; medium stiff.			0	0	0	Drilling very slowly - add 5 gallons water to help bring cuttings up. - still tight drilling.
35										
						38				Tight drilling.
40	1	38 39.5	SS 12"	Brown-tan SAND; medium-coarse grained; trace silt; trace gravel; moist, dense.	SP		0	0	0	Headspace reading - 0 NDU. Noted gravel in cuttings.

Comments:

RECORD OF SUBSURFACE EXPLORATION

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Borehole # 25
Well # MW-25
Page 2 of 2

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/28/92 1315
Date/Time Completed 9/28/92 1830

Drilling Method HSA 10" OD
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU BZ	BH	S	Drilling Conditions & Blow Counts
40										
45	2	43 44.5	SS 4"	SAA Note 3" clay @ bottom of spoon.	SP		0	0	0	Headspace reading - 0 NDU. Noted trace gravel in cuttings.
						47	0	0	0	Headspace reading - 0 NDU. - Noted gypsum and sandstone chips in cuttings. Auger refusal @ 47'. Sample refusal @ 5".
	3*	47 48.5	SS 6"	Lt. gray - white SANDSTONE, and GYPSUM interbedded; med-grained; dry; very dense.						
50				TOB - 48.5'						

Comments: * Sample collected for BTEX analysis.

RECORD OF SUBSURFACE EXPLORATION

Borehole # 26
Well # MW-26
Page 1 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/29/92 1030
Date/Time Completed 9/30/92 1430

Drilling Method HSA 10" OD
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU BZ	BH	S	Drilling Conditions & Blow Counts
				Brown silty CLAY w/sand; moist; medium stiff.			0	0	0	
5				Brown, silty, sandy CLAY, fine-medium grains; medium dense; moist.	SC					
							0	0	0	
10										Driller noted tight drilling at 10' - 15'.
							0	0	0	
15						15				
				Brown SAND, medium coarse grains; trace gravel; moist; loose.	SP					Driller noted change at 15'.
						18	0	0	0	Tough drilling through cobble zone.
				Noted cobbles in cuttings at 18'.						
20					SW					Easy drilling in sands.
						24	0	0	0	Drilling slows in clay.
25				Brown sandy CLAY; fine to medium grains; moist; stiff; trace cobbles and gravel.						
							0	0	0	
30				Brown silty CLAY with fine-medium sand; stiff; moist.						
							0	0	0	
					CL					
35										Tight drilling through clay.
40										

Comments:

RECORD OF SUBSURFACE EXPLORATION

Borehole # 26
Well # MW-26
Page 2 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 9/29/92 1030
Date/Time Completed 9/30/92 1430

Drilling Method HSA 10" OD
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU BZ	BH	S	Drilling Conditions & Blow Counts
	1	40.5 42.0	SS 14	Brown-tan SAND; medium to coarse grains; trace gravel, silt, and gypsum precipitate; moist; medium dense.			0	0	0	Driller noted tight drilling; had to add 4 gallons water to help bring cuttings up. Very tight drilling. Stop at 44' for sample.
45	2	44 45.5	SS 14	SAA with silts and clay at bottom of tube.	SC		0	0	0	Problem drilling, tight. Had to add 5 gallons of water.
50										
	3	50.5 52	SS 16	Brown silty CLAY with sand; fine to medium grains; medium stiff; moist.			0	0	0	
55					SC					Tight drilling to 55'.
	4	55.5 57.0	SS 18	Brown silty, sandy CLAY, fine-medium grains; medium stiff; moist; some gypsum stringers within clay.			0	0	0	
60										Headspace reading - 10 NDU.
	5*	60.5 62.0	SS 8	Brown SAND with clay, med. coarse grains; trace gravel; saturated; medium dense.	SC		0	0	3	No odor, refusal after 6" on split spoon. Driller noted hard drilling at 62'. Very hard at 64.5', not drilling, trip out for sample.
65						64.5				
	6	64.5 66	SS 2"	Gray SANDSTONE w/gypsum; some pyrite around grains; med-coarse grains; damp.			0	3	1	Refusal after 2". Not enough sample to get a good idea of formation.
				65.5' - 67': Gray SANDSTONE with trace gypsum; some clay zones; medium grains; damp to wet. Some hard, very consolidated pieces and some very soft claylike sections. TOB - 65.5'			0	3	1	Headspace reading - 1 NDU. Drilled to 65.5', auger refusal. Trip in hole with sample tube.

Comments: * Sample collected for analysis.
SAA = same as above.
Drilling problems at 16:00 on 9/29/92. Stop drilling at 19:00 on 9/29/92. Continued drilling at 08:30 on 9/30/92.

RECORD OF SUBSURFACE EXPLORATION

Borehole # 27
Well # MW-27
Page 1 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name: Blanco Plant North Flare Pit
Project Number: 224857
Project Location: Blanco, New Mexico

Logged By: Scott Pope
Drilled By: SHB
Date/Time Started: 10/01/92 900
Date/Time Completed: 10/01/92 1230

Drilling Method: HSA 8" OD
Air Monitoring Method: HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU			Drilling Conditions & Blow Counts
							BZ	BH	S	
				Brown silty CLAY; trace fine sand; moist; medium stiff.			0	0	0	
					CL					
5										
						7.5	0	0	0	Driller noted change at 7.5'.
				Brown SAND; medium grains; trace clay; moist; loose.						
10										
				Clay content increasing.			0	0	0	
					SP					
15										
							0	0	0	
20										
				Driller noted trace gravel in cutting.						
						24.0				Driller noted change at 24'.
25				Brown sandy CLAY; trace silty; medium stiff; moist.						
							0	1	0	
30										
					CL					
							0	1	0	
35										
				Brown silty CLAY with fine to medium grained sand; trace moisture; medium stiff.						
							0	1	0	Driller noted tight zone at 38'.
40										Driling very easy 40' - 45'.

Comments:

RECORD OF SUBSURFACE EXPLORATION

Borehole # 27
Well # MW-27
Page 2 of 2

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name Blanco Plant
North Flare Pit
Project Number 224857
Project Location Blanco, New Mexico

Logged By Scott Pope
Drilled By SHB
Date/Time Started 10/01/92 900
Date/Time Completed 10/01/92 1230

Drilling Method HSA 8" OD
Air Monitoring Method HNU

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System - USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units - NDU			Drilling Conditions & Blow Counts
							BZ	BH	S	
							0	1	0	
45										
							0	1	0	
50										
					CL		0	200	200	Noted 200 NDU on cuttings. Cuttings hot and steaming. Start drumming soil.
55										
							0	200	200	
60										
				Brown silty CLAY with fine-medium sand; moist; soft.			1	150	200	Some hydrocarbon odor coming from hole.
65						65				Stop drilling at 65'. Trip in with split spoon to check for sandstone.
	1	65 66.5	SS 18	Brown silty, sandy CLAY, fine to medium grains; saturated; soft. 4" gravely sand at bottom.			1	150	3	Delay from 1100 to 1130; ran out of gas in rig. No gypsum sand. Drilled 5 more feet to take another sample.
						69.0				
70	2	69 71.0	SS 18	Brown SAND with clay in middle of spoon. Clay had large gypsum crystal in it. Medium-coarse sand with gravel had some gypsum at bottom of spoon.	SC		1	150	10	Refusal with split spoon at 71'. Noted
				TOB - 71'						

Comments:

APPENDIX B-2

K.W. Brown Geologic Logs

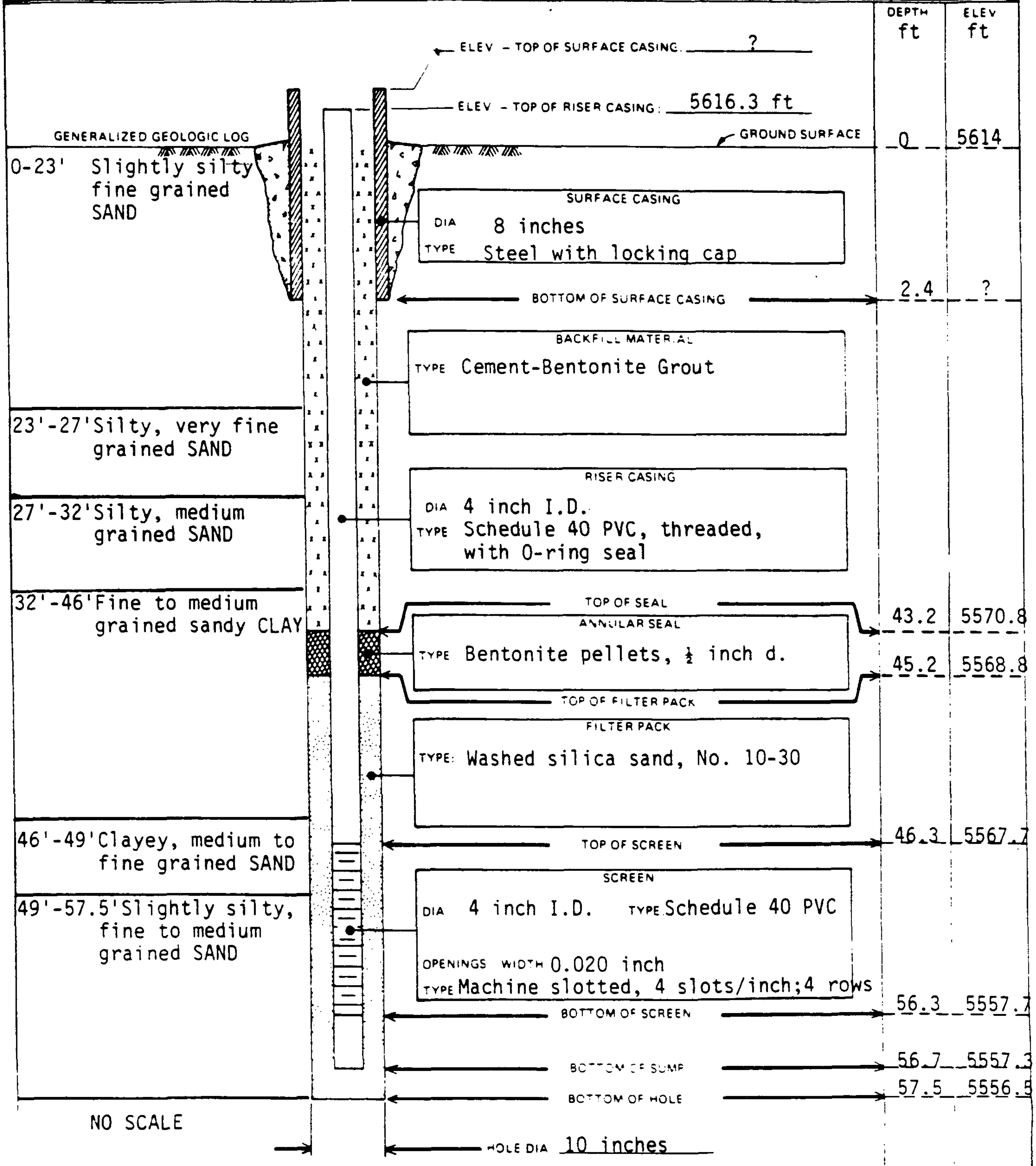
(mw-2)

OBSERVATION WELL

PROJECT	WELL NO
EL PASO NATURAL GAS CO.	W-2

JOB NO	SITE	COORDINATES
19782	Blanco Plant	

BEGUN	COMPLETED	PREPARED BY	REFERENCE POINT FOR MEASUREMENTS
9/20/88	9/21/88	E. Berglund	Top of Riser Casing



ELEV - TOP OF SURFACE CASING: ?

ELEV - TOP OF RISER CASING: 5616.3 ft

GENERALIZED GEOLOGIC LOG

0-23'	Slightly silty fine grained SAND
23'-27'	Silty, very fine grained SAND
27'-32'	Silty, medium grained SAND
32'-46'	Fine to medium grained sandy CLAY
46'-49'	Clayey, medium to fine grained SAND
49'-57.5'	Slightly silty, fine to medium grained SAND

SURFACE CASING
DIA 8 inches
TYPE Steel with locking cap

BACKFILL MATERIAL
TYPE Cement-Bentonite Grout

RISER CASING
DIA 4 inch I.D.
TYPE Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL
TYPE Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN
DIA 4 inch I.D. TYPE Schedule 40 PVC
OPENINGS WIDTH 0.020 inch
TYPE Machine slotted, 4 slots/inch;4 rows

	DEPTH ft	ELEV ft
GROUND SURFACE	0	5614
BOTTOM OF SURFACE CASING	2.4	?
TOP OF SEAL	43.2	5570.8
TOP OF FILTER PACK	45.2	5568.8
TOP OF SCREEN	46.3	5567.7
BOTTOM OF SCREEN	56.3	5557.7
BOTTOM OF SUMP	56.7	5557.3
BOTTOM OF HOLE	57.5	5556.5

NO SCALE

HOLE DIA 10 inches

Geologic Description

Logged from cuttings

Depth (MSL)	Depth (Feet)
	5
5610	10
	15
5600	20
	25
5590	30
	35
5580	40
	45
5570	50
	55
5560	60
	65
5550	70
	75
	80
	85
	90
	95
	100
	105
	110
	115
	120
	125

0-22' SAND, tan, fine to coarse-grained, moist, quartzose, increasing grain size with depth, some pebbles from 18-22', maximum pebble size approx. 1.0 cm.

22-27' CLAY, dark brown, moist, sandy, fine-grained sand.

27-46' SAND, tan, fine to coarse-grained, quartzose, some pebbles.

46-60' SAND with gravel, tan, fine to coarse-grained, quartzose, interbedded dark brown clay seams, maximum gravel size approx. 2.0 cm.

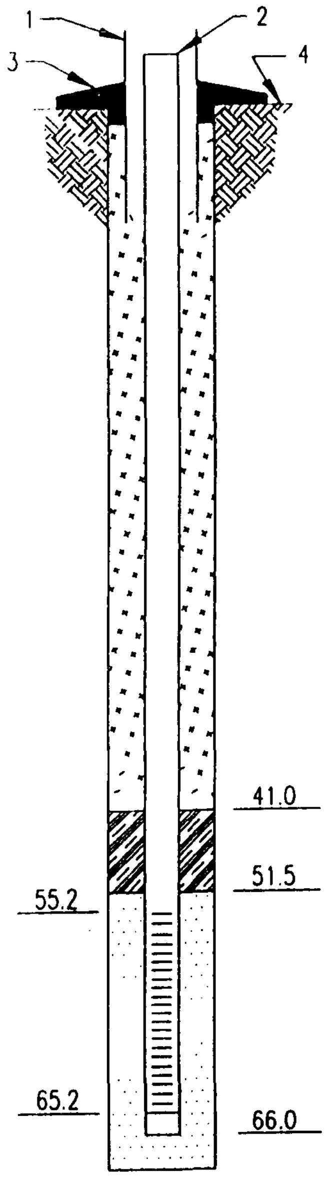
60-64' GRAVEL, some coarse sand, maximum size approx. 2.0 cm.

64-66' SANDSTONE, tan, moist.

TD 66.0'

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monitoring Well ☒
Piezometer
Protective Casing ☒



Depths in Feet
from Ground Surface
(Not to Scale)

Design Specifications

Elevations: 1 5622.38 2 5622.02
3 5619.85 4 5619.70
Coordinates: X ______ Y ______
Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐
Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐
Type of Screen: ☐ 0.008 ☒ 0.010 ☐
Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐
Sand Pack: #30 Colorado Silica Sand
Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐
Grout Type: Ideal 1 and 2 Weight:
Bore Hole Diameter: 5 5/8"
Drill Rig: ☐ Hollow Stem ☒ Rotary ☒ Rotary Air
Drilled By: MO-TE, Inc.
Logged By: WCZ
Completion Date: 01/11/90

Date	D-T-W	MSL	Date	Field pH	Field EC
01/12/90	55.81		01/12/90	7.1	9,750
01/15/90	55.68		01/15/90	7.2	12,500

Comments: Cored with air

El Paso Natural Gas Company

W-19 (mw-19)

Project: EPNG 63716 (EPNGW-19)
Location: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC.

APPENDIX C

Monitoring Well Construction Diagrams

MONITORING WELL INSTALLATION RECORD

Well # MW-20

Page 1 of 1

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name EPNG - Blanco North Flare
Project Number 224857 Phase 6614
Project Location Blanco, New Mexico

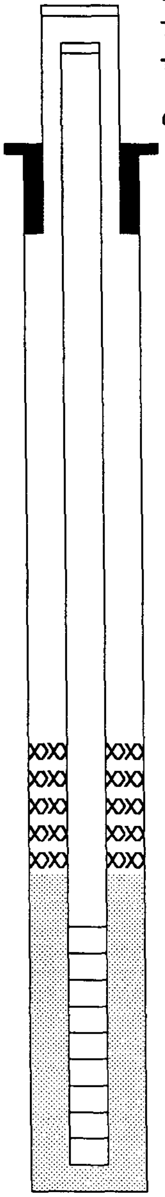
Surface Elevation 5628.21 feet
GWL Depth 54 feet
Installed By SHB

On-Site Geologist Scott Pope
Contractors On-Site SHB

Date/Time Started 9/17/92
Date/Time Completed 9/17/92 1400 hours

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing		+2.3
Bottom of Protective Casing		-1.0
Top of Permanent Borehole Casing		- -
Bottom of Permanent Borehole Casing		- -
Top of Concrete		+0.18
Bottom of Concrete		0.0
Top of Grout		0.0
Bottom of Grout		-48
Top of Well Riser	2-inch PVC; Schedule 40	+2.1
Bottom of Well Riser		-50
Top of Well Screen	2-inch PVC 0.010 slot size	-50
Bottom of Well Screen		-65
Top of Seal	Bentonite Chips	-46
Bottom of Seal		-48
Top of Gravel Pack	10-20 Silica Sand	-48
Bottom of Gravel Pack		-66
Top of Natural Cave-In		- -
Bottom of Natural Cave-In		- -
Top of Groundwater		-54
Total Depth of Borehole		-66



Elevations (feet)

Top of Protective Casing	5630.51
Top of Riser	5630.31
Ground Surface	5628.21

Depth Below Ground Surface (feet)

Top of Seal	-46
Top of Gravel Pack	-48
Top of Screen	-50
Bottom of Screen	-65
Bottom of Borehole	-66

Comments: Half of pellets would not drop below bottom of auger. Borehole is 6-inches from 48-66 feet.
One-half bucket of pellets used.

224857\mw-20.wk1\

MONITORING WELL INSTALLATION RECORD

Well # MW-23

Page 1 of 1

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

Project Name EPNG - Blanco North Flare
Project Number 224857 Phase 6614
Project Location Blanco, New Mexico

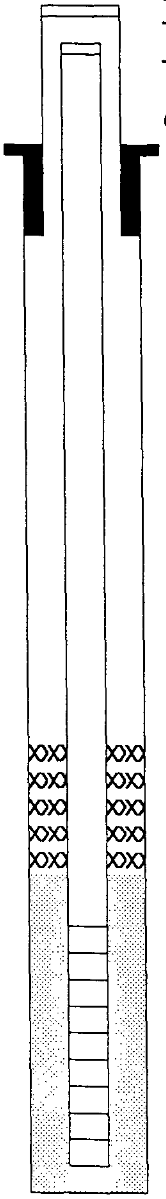
Surface Elevation 5628.31 feet
GWL Depth 61 feet
Installed By SHB

On-Site Geologist Scott Pope
Contractors On-Site SHB

Date/Time Started 9/21/92 1015 hours
Date/Time Completed 9/21/92 1100 hours

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing		+2.6
Bottom of Protective Casing		-1.4
Top of Permanent Borehole Casing		- -
Bottom of Permanent Borehole Casing		- -
Top of Concrete		+0.53
Bottom of Concrete		0.0
Top of Grout		0.0
Bottom of Grout		-44.5
Top of Well Riser	4-inch PVC Schedule 40	+2.71
Bottom of Well Riser		-49
Top of Well Screen	4-inch PVC; 0.010 slot size	-49
Bottom of Well Screen		-64
Top of Seal	Bentonite Pellets	-44.5
Bottom of Seal		-47
Top of Gravel Pack	10-20 Silica Sand	-47
Bottom of Gravel Pack		-64
Top of Natural Cave-In		- -
Bottom of Natural Cave-In		- -
Top of Groundwater		-61
Total Depth of Borehole		-64



Elevation (feet)
Top of Protective Casing* 5630.91
Top of Riser 5631.02
Ground Surface 5628.31

Depth Below Ground Surface (feet)
Top of Seal -44.5
Top of Gravel Pack -47
Top of Screen -49
Bottom of Screen -64
Bottom of Borehole -64

Comments: Open hole installation 8-inch diameter. 3 bags of 10-20 sand & 1 bucket of pellets.
* Elevation not surveyed, estimated based upon field measurements during installation.

MONITORING WELL INSTALLATION RECORD

Well # MW-24

Page 1 of 1

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

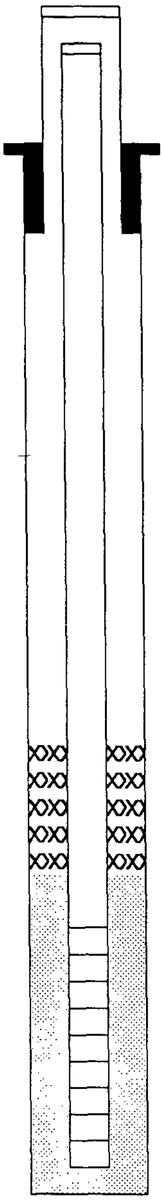
Project Name EPNG - Blanco North Flare
Project Number 224857 Phase 6614
Project Location Blanco, New Mexico

Surface Elevation 5619.49 feet
GWL Depth 57 feet
Installed By SHB
Date/Time Started 9/22/92 1045 hours
Date/Time Completed 9/22/92 1200 hours

On-Site Geologist Scott Pope
Contractors On-Site SHB

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing		+2.7
Bottom of Protective Casing		-1.3
Top of Permanent Borehole Casing		- -
Bottom of Permanent Borehole Casing		- -
Top of Concrete		+0.34
Bottom of Concrete		0.0
Top of Grout		0.0
Bottom of Grout		-44.5
Top of Well Riser	4-inch PVC; Schedule 40	+2.48
Bottom of Well Riser		-49.5
Top of Well Screen	4-inch PVC 0.010 slot size	-49.5
Bottom of Well Screen		-64.5
Top of Seal	Bentonite Chips	-44.5
Bottom of Seal		-46.5
Top of Gravel Pack	10-20 Silica Sand	-46.5
Bottom of Gravel Pack		-64.5
Top of Natural Cave-In		- -
Bottom of Natural Cave-In		- -
Top of Groundwater		-57
Total Depth of Borehole		-64.5



Elevation (feet)

Top of Protective Casing 5622.19
Top of Riser 5621.97
Ground Surface 5619.49

Depth Below Ground Surface (feet)

Top of Seal -44.5
Top of Gravel Pack -46.5
Top of Screen -49.5
Bottom of Screen -64.5
Bottom of Borehole -64.5

Comments: 3-1/4 bags of 10-20 sand, 1-1/4 buckets of pellets.

224857\mw-24.wk1\

MONITORING WELL INSTALLATION RECORD

Well # MW-26

Page 1 of 1

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

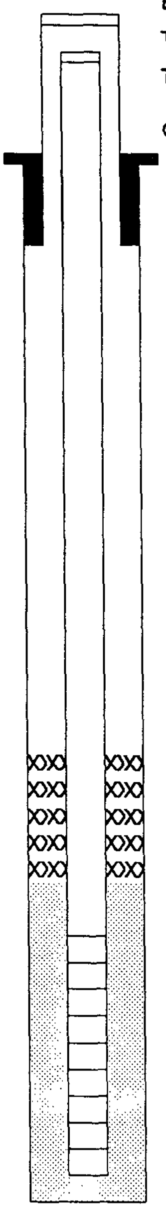
Project Name EPNG - Blanco North Flare
Project Number 224857 Phase 6614
Project Location Blanco, New Mexico

Surface Elevation 5618.75 feet
GWL Depth 65 feet
Installed By SHB
Date/Time Started 9/30/92 1215 hours
Date/Time Completed 9/30/92 1700 hours

On-Site Geologist Scott Pope
Contractors On-Site SHB

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing		--
Bottom of Protective Casing		--
Top of Permanent Borehole Casing		--
Bottom of Permanent Borehole Casing		--
Top of Concrete		--
Bottom of Concrete		--
Top of Grout		0.0
Bottom of Grout		-44.5
Top of Well Riser	4-inch PVC	+2.56
Bottom of Well Riser		-50
Top of Well Screen	4-inch PVC; 0.010 slot size	-50
Bottom of Well Screen		-65
Top of Seal	Bentonite Pellets	-44.5
Bottom of Seal		-47
Top of Gravel Pack	10-20 Silica Sand	-47
Bottom of Gravel Pack		-65
Top of Natural Cave-In		--
Bottom of Natural Cave-In		--
Top of Groundwater		-65
Total Depth of Borehole		-65.5



Elevation (feet)

Top of Protective Casing --
Top of Riser 5621.31
Ground Surface 5618.75

Depth Below Ground Surface (feet)

Top of Seal -44.5
Top of Gravel Pack -47
Top of Screen -50
Bottom of Screen -65
Bottom of Borehole -65.5

Comments: 10-inch borehole; 4-inch well.
Used 20 bags of 10-20 sand & 2 buckets of pellets.

224857\mw-26.wk1\

MONITORING WELL INSTALLATION RECORD

Well # MW-27

Page 1 of 1

Burlington Environmental Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, Illinois 62236-0330
(618) 281-7173 FAX (618) 281-5120

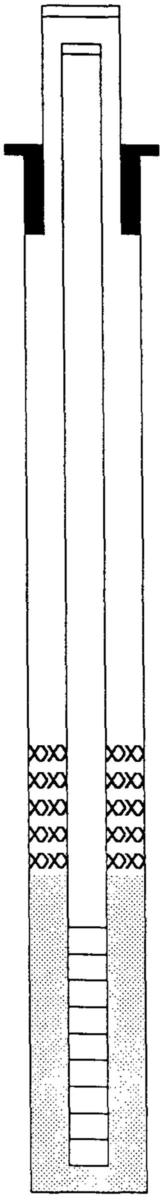
Project Name EPNG - Blanco North Flare
Project Number 224857 Phase 6614
Project Location Blanco, New Mexico

Surface Elevation 5618.83 feet
GWL Depth 56 feet
Installed By SHB
Date/Time Started 10/1/92 1345 hours
Date/Time Completed 10/1/92

On-Site Geologist Scott Pope
Contractors On-Site SHB

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing		2.7
Bottom of Protective Casing		-1.3
Top of Permanent Borehole Casing		- -
Bottom of Permanent Borehole Casing		- -
Top of Concrete		+0.38
Bottom of Concrete		0.0
Top of Grout		0.0
Bottom of Grout		-45.5
Top of Well Riser	2-inch PVC Schedule 40	+2.48
Bottom of Well Riser		-50.5
Top of Well Screen	2-inch PVC; 0.010 slot size	-50.5
Bottom of Well Screen		-66
Top of Seal	Bentonite Pellets	-45.5
Bottom of Seal		-48
Top of Gravel Pack	10-20 Silica Sand	-48
Bottom of Gravel Pack		-70
Top of Natural Cave-In		- -
Bottom of Natural Cave-In		- -
Top of Groundwater		-56
Total Depth of Borehole		-70



Elevation (feet)
Top of Protective Casing 5621.53
Top of Riser 5621.31
Ground Surface 5618.83

Depth Below Ground Surface (feet)
Top of Seal -45.5
Top of Gravel Pack -48
Top of Screen -50.5
Bottom of Screen -66
Bottom of Borehole -70

Comments: Hole was drilled to 70 feet, due to lack of augers it was pulled up 5 feet and collapsed to 66 feet. At 66 feet, very loose well wanted to sink in. Used 5 bags 10-20 sand & 1 bucket of pellets.

APPENDIX D

Field Data Sheets for Well Development and Sampling

WELL DEVELOPMENT & PURGING
GENERAL DATA

SERIAL NO. WD ____
PAGE ____ OF ____

PROJECT NAME Blanco N. Flare WELL NO. MW-20
PROJECT NO. 224857 MAJOR TASK 6618 SUB TASK 77
DATE 9 24 92 FORM COMPLETED BY S. Pope

WELL CONSTRUCTION

TOTAL DEPTH (FT) 68.26 BOREHOLE DIAMETER (IN) 6"
GRAVEL PACK INTERVAL (FT) 17 WELL DIAMETER INSIDE (IN) 4"
WELL PROTECTOR: ✓ YES ____ NO PADLOCK NO. 2532
QUANTITY OF FLUID INJECTED DURING DRILLING (GALLONS) None

WATER VOLUME CALCULATION

DATE OF MEASUREMENT 2/24/92
MEASURING POINT TOR ELEV. ____
WATER LEVEL INSTRUMENT USED EWLI
INITIAL WATER LEVEL (FT) 50.69
LINEAR FEET OF WATER 17.57
LINEAR FEET SATURATED GRAVEL PACK 17.0

ITEM	WATER VOLUME	
	FT^3	GAL
WELL CASING		11.47
GRAVEL PACK		5.46
DRILLING FLUIDS		
TOTAL		16.93

NOTE: QUANTITIES ARE TO BE CALCULATED PRIOR TO DEVELOPMENT.

DEVELOPMENT CRITERIA

METHOD OF DEVELOPMENT Bailer
WATER QUALITY MEASUREMENTS X YES ____ NO
WELL VOLUME (ANNULUS) (GAL) 5.46 WELL CASING VOLUME (PIPE) (GAL) 11.47
WATER VOLUME TO BE REMOVED (GAL) MINIMUM 50.79 MAXIMUM ____

NOTE: DEVELOPMENT IS TO BE PERFORMED IN ACCORDANCE WITH PROJECT-SPECIFIC WELL DEVELOPMENT PLAN.

WATER QUALITY INSTRUMENTS

DATE	INSTRUMENT	SERIAL NO.	CALIBRATION PERFORMED (✓)	TECH	COMMENTS
9/24/92	HyDAC Combo		✓	S.P.	

1:4688-
COMMENTS .8262 x .50 = .3213 x 17^{00} = 5.46

DATE 5/24/92

WELL NO. MW-20

DEVELOPMENT TECHNIQUES

DATE	DEVELOPMENT METHOD	MATERIAL OR SERIAL NO.	DEVELOPMENT TECHNICIAN	VOLUMES REMOVED/TYPE
9/24/92	Bailer	PVC	S.P.	

WATER QUALITY/WATER REMOVAL

WATER QUALITY READINGS

WATER REMOVAL DATA

DATE	TIME	TOTAL INCREMENT GALLONS REMOVED	TOTAL WELL INCREMENT VOLUMES REMOVED	TEMP (°C)	pH	CONDUCTIVITY (u mhos/cm)	APPEARANCE/ COMMENTS	DEVELOPMENT START TIME	DEVELOPMENT STOP TIME	REMOVAL RATE (GPM)	PUMP INTAKE LEVEL	WATER LEVEL BEFORE DEVELOPMENT	WATER LEVEL AFTER DEVELOPMENT
9/24/92	1150	5		75.1	7.55	17.48 x1000	Gray Cloudy	1120					
↓	1218	5		73.1	7.53	17.13 x1000	Gray Cloudy						
	1248	5		74.7	7.63	17.30 x1000	Gray Cloudy						
*	1300	1		74.7	7.72	17.96 x1000	Silt		1300				
**	1648	3		74.8	7.78	17.14 x1000	Gray Cloudy	1615	1648			63.46	
*** 9/25/92	830	5		59.3	7.66	15.66 x1000	Gray Slightly Cloudy	800				60.9	
	905	2		62.0	7.77	15.38 x1000	Gray Cloudy		905				

COMMENTS * Bailed Dry after removing 16 gallons. This well was bailed dry on 9/18/92 for recovery test. ** Noted Clear water for 1st Gallon then clouded up. Bailed dry after 3 gallons. *** 1st 2 gallon clear. Bailed Dry after 7 gallons

NOTES:

1. COMMENTS SHOULD DELINEATE FINAL SAMPLE AND REPLICATE MEASUREMENTS.
2. ANY INSTRUMENTATION CALIBRATION OR USE ANOMALIES SHOULD BE NOTED.
3. APPEARANCE SHOULD BE NOTED BEFORE, DURING, AND AFTER DEVELOPMENT.

WELL DEVELOPMENT & PURGING
GENERAL DATA

mathes

SERIAL NO. WD ______
PAGE ____ OF ____

PROJECT NAME BLANCO N. FLARE WELL NO. MW-23
PROJECT NO. 224857 MAJOR TASK 6618 SUB TASK 77
DATE 9 24 92 FORM COMPLETED BY WILL SMITH

WELL CONSTRUCTION

TOTAL DEPTH (FT) 67.02 BOREHOLE DIAMETER (IN) 8"
GRAVEL PACK INTERVAL (FT) 17 WELL DIAMETER INSIDE (IN) 4"
WELL PROTECTOR: ✓ YES ____ NO PADLOCK NO. 2532
QUANTITY OF FLUID INJECTED DURING DRILLING (GALLONS) NONE

WATER VOLUME CALCULATION

DATE OF MEASUREMENT 9-24-92
MEASURING POINT TOR ELEV. ______
WATER LEVEL INSTRUMENT USED EWLI
INITIAL WATER LEVEL (FT) 57.11
LINEAR FEET OF WATER 6.89
LINEAR FEET SATURATED GRAVEL PACK 6.89

ITEM	WATER VOLUME	
	FT³	GAL
WELL CASING		4.5
GRAVEL PACK		6.3
DRILLING FLUIDS		
TOTAL		10.8

NOTE: QUANTITIES ARE TO BE CALCULATED PRIOR TO DEVELOPMENT.

DEVELOPMENT CRITERIA

METHOD OF DEVELOPMENT BAILER
WATER QUALITY MEASUREMENTS ✓ YES ____ NO
WELL VOLUME (ANNULUS) (GAL) 6.3 WELL CASING VOLUME (PIPE) (GAL) 4.5
WATER VOLUME TO BE REMOVED (GAL) MINIMUM 32.4 MAXIMUM ______

NOTE: DEVELOPMENT IS TO BE PERFORMED IN ACCORDANCE WITH PROJECT-SPECIFIC WELL DEVELOPMENT PLAN.

WATER QUALITY INSTRUMENTS

DATE	INSTRUMENT	SERIAL NO.	CALIBRATION PERFORMED (✓)	TECH	COMMENTS
9/24/92	HYDAC COMBO		✓	S.P.	

COMMENTS 2.6112 - ~~[illegible]~~ .8262 = 1.83 x .5 = ~~[illegible]~~ .915 ~~[illegible]~~ .915 x 6.89 = 6.3

DATE 9 24, 92

WELL NO. MW-23

DEVELOPMENT TECHNIQUES

DATE	DEVELOPMENT METHOD	MATERIAL OR SERIAL NO.	DEVELOPMENT TECHNICIAN	VOLUMES REMOVED/TYPE
9/24/92	BAILER	PVC	S.P.	

WATER QUALITY/WATER REMOVAL

WATER QUALITY READINGS

WATER REMOVAL DATA

DATE	TIME	TOTAL INCREMENT GALLONS REMOVED	TOTAL WELL INCREMENT VOLUMES REMOVED	TEMP (°C)	pH	CONDUCTIVITY (umhos/cm)	APPEARANCE/ COMMENTS	DEVELOPMENT START TIME	DEVELOPMENT STOP TIME	REMOVAL RATE (GPM)	PUMP INTAKE LEVEL	WATER LEVEL BEFORE DEVELOPMENT	WATER LEVEL AFTER DEVELOPMENT
9/24/92	10:55	5		78.7	7.07	+20×1000	GREY; CLOUDED	10:30					
9/24/92	11:45	5		78.2	7.45	+20x1,000	GREY; CLOUDED						
9/24/92	12:30	2		81.5	7.41	+20x1,000	BROWN; CLOUDED		12:30				
9/24/92	5:15	3		76.6	7.39	+20x1,000	BEGINING TO CLEARUP	1600	5:15			63.41	
9/25/92	8:05	5		59.5	6.95	+20x1000	LIGHTLY CLOUDED	7:35				59.8	
9/25/92	9:05	2		63	7.25	+20x1,000	LIGHTLY CLOUDED		9:05				

COMMENTS CHECKED FOR FREE PHASE W/PRODUCT THICKNESS BAILER. NONE ENCOUNTER WELL BAILED DRY AFTER 12 GALLONS. ON 9/24/92. VISUAL INSPECTION OF WATER REVEALS A VERY HIGH SALT CONTENT. WELL BAILED DRY AFTER 3 GALLONS WERE REMOVED ON 9/24/92. BAILED DRY AFTER 2 GALLONS WERE REMOVED ON 9/25/92.

NOTES:

1. COMMENTS SHOULD DELINEATE FINAL SAMPLE AND REPLICATE MEASUREMENTS.
2. ANY INSTRUMENTATION CALIBRATION OR USE ANOMALIES SHOULD BE NOTED.
3. APPEARANCE SHOULD BE NOTED BEFORE, DURING, AND AFTER DEVELOPMENT.

WELL DEVELOPMENT & PURGING
GENERAL DATA

mathes

SERIAL NO. WD ____
PAGE ____ OF ____

PROJECT NAME Blanco N. Flare WELL NO. MW-24
PROJECT NO. 224857 MAJOR TASK 6618 SUB TASK 77
DATE 9/24/92 FORM COMPLETED BY S. Pope

WELL CONSTRUCTION

TOTAL DEPTH (FT) 67.4
BOREHOLE DIAMETER (IN) 8"
GRAVEL PACK INTERVAL (FT) 18
WELL DIAMETER INSIDE (IN) 4"
WELL PROTECTOR: X YES ____ NO
PADLOCK NO. 2532
QUANTITY OF FLUID INJECTED DURING DRILLING (GALLONS) None

WATER VOLUME CALCULATION

DATE OF MEASUREMENT 9/24/92
MEASURING POINT TOR ELEV. ____
WATER LEVEL INSTRUMENT USED EWLI
INITIAL WATER LEVEL (FT) 59.6
LINEAR FEET OF WATER 7.8
LINEAR FEET SATURATED GRAVEL PACK 7.8

ITEM	WATER VOLUME	
	FT^3	GAL
WELL CASING		5.1
GRAVEL PACK		7.0
DRILLING FLUIDS		
TOTAL		12.1

NOTE: QUANTITIES ARE TO BE CALCULATED PRIOR TO DEVELOPMENT.

DEVELOPMENT CRITERIA

METHOD OF DEVELOPMENT Bailer
WATER QUALITY MEASUREMENTS X YES ____ NO
WELL VOLUME (ANNULUS) (GAL) ~~6~~ 7.0 WELL CASING VOLUME (PIPE) (GAL) 5.1
WATER VOLUME TO BE REMOVED (GAL) MINIMUM 36.3 MAXIMUM ____

NOTE: DEVELOPMENT IS TO BE PERFORMED IN ACCORDANCE WITH PROJECT-SPECIFIC WELL DEVELOPMENT PLAN.

WATER QUALITY INSTRUMENTS

DATE	INSTRUMENT	SERIAL NO.	CALIBRATION PERFORMED (✓)	TECH	COMMENTS
9/24/92	Hydac Combo		✓	SP	

COMMENTS ____

DATE 9 24 92

WELL NO. MW-24

DEVELOPMENT TECHNIQUES

DATE	DEVELOPMENT METHOD	MATERIAL OR SERIAL NO.	DEVELOPMENT TECHNICIAN	VOLUMES REMOVED/TYPE
9/24/92	2" Grunfos	SS	SP	3
9/24/92	Bailer	Teflon	SP	

WATER QUALITY/WATER REMOVAL

WATER QUALITY READINGS | WATER REMOVAL DATA

	DATE	TIME	TOTAL INCREMENT GALLONS REMOVED	TOTAL WELL INCREMENT VOLUMES REMOVED	TEMP (°C)	pH	CONDUCTIVITY (umhos/cm)	APPEARANCE/ COMMENTS	DEVELOPMENT START TIME	DEVELOPMENT STOP TIME	REMOVAL RATE (GPM)	PUMP INTAKE LEVEL	WATER LEVEL BEFORE DEVELOPMENT	WATER LEVEL AFTER DEVELOPMENT
*	9/24/92	1515	8					Brown Silty	1420	155				
**	9/24/92	1538	2		71.6	6.71	5.82x1000	Brown Silty	1515	1551				Dry
***	9/24/92	1729	5		70.4	6.85	5.4 x1,000	Gray Slightly Cloudy	1700	1730			62.3	Dry
	9/25/92	935	5		61.9	6.80	5.19 x1000	Gray Cloudy	905				50.72	~~Dry~~
****	9/25/92	1000	2.5		62.	6.99	5.05 x1000	Gray Cloudy		1000				Dry

COMMENTS * Would not pump more than 8 gallon before losing head ** Bailed dry after 2.5 additional gal. 10.5 total. *** Noted 1st 2gal Clear. Bailed Dry after 5gals. Removed. **** 1st Gallon Clear. Bailed Dry after 2.5 gallons Removed

NOTES:

1. COMMENTS SHOULD DELINEATE FINAL SAMPLE AND REPLICATE MEASUREMENTS.
2. ANY INSTRUMENTATION CALIBRATION OR USE ANOMALIES SHOULD BE NOTED.
3. APPEARANCE SHOULD BE NOTED BEFORE, DURING, AND AFTER DEVELOPMENT.

WATER SAMPLING DATA

mathes

SERIAL NO. WS MW-20
PAGE ____ OF ____

PROJECT NAME Blanco N. Flare
SAMPLE LOCATION NO. OR BORING/WELL NO. MW-20
PROJECT NO. 224857
MAJOR TASK 6618
SUB TASK 77
TECHNICAL CREW S. Pope, W. Smith
DATE 9/25/92
FORM COMPLETED BY S. Pope
WEATHER Sunny Warm
LEVEL OF PROTECTION A B C [✓ D]
SAMPLING METHOD Bailer
SPECIAL SAMPLING METHODS None
INITIAL WATER LEVEL 66.38
TIME ELAPSED FROM FINAL DEVELOPMENT/PURGING ____
TECH ____
SAMPLING DEPTH INTERVAL TOP 3'
PUMPING RATE/SAMPLING ____
SAMPLE COLLECTION PERIOD: START 1600
FINISH 1620

WATER QUALITY INSTRUMENTS

DATE	INSTRUMENT	SERIAL NO.	CALIBRATION PERFORMED (✓)	TECH	COMMENTS
9/25/92	Hydac Combo		✓	STP	

FINAL WATER QUALITY INSTRUMENT READINGS

TEMP (°C) 67.3
CONDUCTIVITY (umhos/cm) 15.93 x1000
pH 7.78
EH ____
D.O. (mg/L) ____
OTHER ____

TIME: START 1616
FINISH 1618
TECH WAS
COMMENTS Gray Cloudy

DUPLICATE WATER SAMPLING DATA INSTRUMENT READINGS

TEMP (°C) ____
CONDUCTIVITY (umhos/cm) ____
pH ____
EH ____
D.O. (mg/L) ____
OTHER ____

TIME: START ____
FINISH ____
TECH ____
COMMENTS ____

DATE 9 25 92

SAMPLE LOCATION NO.
OR BORING/WELL NO. MW-20

TOTAL VOLUME OF WATER COLLECTED 2.58L TOTAL NO. OF CONTAINERS 6

FIELD FILTERED: ____ YES ____ NO TIME ________ TECH ________ FILTER TYPE ________

SAMPLES COOLED DURING COLLECTION PERIOD: X YES ____ NO

SAMPLE CONTAINERS

QUANTITY	CONTAINER MATERIAL	SAMPLE LABEL SERIAL NO.	PRESERVATIVES	COMMENTS
1	Qt Glass		H_2SO_4	TPH
2	40ml Glass		HCL	BTEX
1	250ml Plastic		—	Cation / Anion
1	250ml Plastic		—	TDS
1	Qt Plastic		H_2SO_4	NO_2, NO_3 & TKN

DOCUMENTATION

PACKING AND SHIPPING TECH S. Pope

SAMPLE CONTAINER SEALED: ____ YES X NO TIME ________ DATE / /

SHIPPING CONTAINER SEALED: ____ YES X NO TIME ________ DATE / /

L.A.R. FORM: SERIAL NO. ________ ____ YES X NO TIME ________ DATE / /

C.O.C. FORM: SERIAL NO. ________ X YES ____ NO TIME 1620 DATE 9 25 92

COMMENTS ________________________________

WATER SAMPLING DATA

SERIAL NO. WS MW-23
PAGE ____ OF MW-73 DUPLICATE

PROJECT NAME Blanco N. Flare
SAMPLE LOCATION NO. OR BORING/WELL NO. MW-23
PROJECT NO. 224857
MAJOR TASK 6618
SUB TASK 77
TECHNICAL CREW S. Pope, W. Smith
DATE 9/25/92
FORM COMPLETED BY S. Pope
WEATHER Sunny Warm
LEVEL OF PROTECTION A B C [✓ D]
SAMPLING METHOD Bailer
SPECIAL SAMPLING METHODS None
INITIAL WATER LEVEL
TIME ELAPSED FROM FINAL DEVELOPMENT/PURGING
TECH
SAMPLING DEPTH INTERVAL TOP 3'
PUMPING RATE/SAMPLING
SAMPLE COLLECTION PERIOD: START 1500 FINISH 1553

WATER QUALITY INSTRUMENTS

DATE	INSTRUMENT	SERIAL NO.	CALIBRATION PERFORMED (✓)	TECH	COMMENTS
9/25/92	HydacCombo		✓	STP	

FINAL WATER QUALITY INSTRUMENT READINGS

TEMP (°C) 71.4
CONDUCTIVITY (umhos/cm) +20 x 1,000
pH 7.05
EH
D.O. (mg/L)
OTHER

TIME: START 1546 FINISH 1548
TECH
COMMENTS Gray Cloudy

DUPLICATE WATER SAMPLING DATA INSTRUMENT READINGS

TEMP (°C)
CONDUCTIVITY (umhos/cm)
pH
EH
D.O. (mg/L)
OTHER

TIME: START FINISH
TECH
COMMENTS

DATE 9 25 92

SAMPLE LOCATION NO. OR BORING/WELL NO. MW-23

TOTAL VOLUME OF WATER COLLECTED 2.58 L

TOTAL NO. OF CONTAINERS 6

FIELD FILTERED: ___ YES X NO TIME ___ TECH ___ FILTER TYPE ___

SAMPLES COOLED DURING COLLECTION PERIOD: X YES ___ NO

SAMPLE CONTAINERS

QUANTITY	CONTAINER MATERIAL	SAMPLE LABEL SERIAL NO.	PRESERVATIVES	COMMENTS
1	Qt Glass		H_2SO_4	TPH
2	40ml Glass		HCL	BTEX
1	250 ml Plastic		—	Cation/Anion
1	250 ml Plastic		—	TDS
1	Qt Plastic		H_2SO_4	NO_2 NO_3 & TKN

DOCUMENTATION

PACKING AND SHIPPING TECH S. Pope

SAMPLE CONTAINER SEALED: ___ YES X NO TIME ___ DATE / /

SHIPPING CONTAINER SEALED: ___ YES X NO TIME ___ DATE / /

L.A.R. FORM: SERIAL NO. ___ ___ YES X NO TIME ___ DATE / /

C.O.C. FORM: SERIAL NO. 4746 X YES ___ NO TIME 1620 DATE 9 25 92

COMMENTS Noted extreme effervescing when filling bottles w/ preservatives in them

WATER SAMPLING DATA

mathes

SERIAL NO. WS MW-24
PAGE ____ OF ____

PROJECT NAME Blano N. Flare
SAMPLE LOCATION NO. OR BORING/WELL NO. MW-24
PROJECT NO. 224857
MAJOR TASK 6618
SUB TASK 77
TECHNICAL CREW S. Pope, W. Smith
DATE 9,25,92
FORM COMPLETED BY S. Pope
WEATHER Sunny Warm Breezy
LEVEL OF PROTECTION A B C [✓ D]
SAMPLING METHOD Bailer
SPECIAL SAMPLING METHODS None
INITIAL WATER LEVEL 59.62
TIME ELAPSED FROM FINAL DEVELOPMENT/PURGING ____
TECH ____
SAMPLING DEPTH INTERVAL TOP 3'
PUMPING RATE/SAMPLING ____
SAMPLE COLLECTION PERIOD: START 1413 FINISH 1442

WATER QUALITY INSTRUMENTS

DATE	INSTRUMENT	SERIAL NO.	CALIBRATION PERFORMED (✓)	TECH	COMMENTS
9/25/92	Hydac Combo		✓	STP	

FINAL WATER QUALITY INSTRUMENT READINGS

TEMP (°C) 72.1
CONDUCTIVITY (umhos/cm) 5.53 x 1000
pH 6.81
EH .... ____
D.O. (mg/L) .... ____
OTHER .... ____

TIME: START 1440 FINISH 1442
TECH STP/W.S.
COMMENTS LIGHT GREY CLOUDED

DUPLICATE WATER SAMPLING DATA INSTRUMENT READINGS

TEMP (°C) .... ____
CONDUCTIVITY (umhos/cm) ____
pH .... ____
EH .... ____
D.O. (mg/L) .... ____
OTHER .... ____

TIME: START ____ FINISH ____
TECH ____
COMMENTS ____

DATE 9 25 92

SAMPLE LOCATION NO. OR BORING/WELL NO. MW-24

TOTAL VOLUME OF WATER COLLECTED 2.58 L

TOTAL NO. OF CONTAINERS 6

FIELD FILTERED: YES [✓ NO] TIME ______ TECH ______ FILTER TYPE ______

SAMPLES COOLED DURING COLLECTION PERIOD: [✓ YES] NO

SAMPLE CONTAINERS

QUANTITY	CONTAINER MATERIAL	SAMPLE LABEL SERIAL NO.	PRESERVATIVES	COMMENTS
1	Qt Glass		H_2SO_4	TPH
2	40ml Glass		HCl	BTEX
1	250ml Plastic		—	Cation/Anion
1	250ml Plastic		—	TDS
1	Qt Plastic		H_2SO_4	NO_2 NO_3 & TKN

DOCUMENTATION

PACKING AND SHIPPING TECH S. Poye

SAMPLE CONTAINER SEALED: YES [✓ NO] TIME ______ DATE / /

SHIPPING CONTAINER SEALED: YES [✓ NO] TIME ______ DATE / /

L.A.R. FORM: SERIAL NO. ______ YES [✓ NO] TIME ______ DATE / /

C.O.C. FORM: SERIAL NO. 4746 [✓ YES] NO TIME 1620 DATE 9 25 92

COMMENTS

APPENDIX E

ATAS Laboratory Analytical Reports

APPENDIX E-1

Analytical Data, Chain-of-Custody Laboratory QA/QC Data

PROJECT MEMORANDUM

DATE: October 20, 1992

TO: Dale Markley

FROM: Pat McAllister

PROJECT: 224857
El Paso Natural Gas - Blanco Plant

SUBJECT: ANALYTICAL DATA REVIEW

I have completed a review of the analytical data for the samples collected from September 15, and September 25, 1992. Based on the information supplied by the laboratory, the data appears to be valid. This review includes the ATAS episode numbers of 5243, 5316, and 5273.

If you have any questions please feel free to contact me.

PDM/pdm/QA102092.MEM

AMERICAN TECHNICAL & ANALYTICAL SERVICES, INC.
875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 • FAX (314) 434-0080

September 28, 1992

Kathy Blaine
Burlington Environmental, Inc.
210 West Sand Bank Road P.O. Box 330
Columbia, IL 62236-0330

RE: ATAS #5243.01-#5243.06
#224857/6614 Blanco N. Flare

Dear Ms. Blaine:

Enclosed are the analytical reports for the samples received in our laboratory on September 22, 1992.

If, in your review, you should have any questions or require additional information, please call.

Thank you for choosing ATAS for your analytical needs.

Sincerely,

Richard H Mannz

Richard H. Mannz
Vice President

Enclosures

ATAS
"Professional Commitment"

AMERICAN TECHNICAL & ANALYTICAL SERVICES, INC.
875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 • FAX (314) 434-0080

October 9, 1992

Kathy Blaine
Burlington Environmental, Inc.
210 West Sand Bank Road P.O. Box 330
Columbia, IL 62236-0330

RE: ATAS #5316.01-#5316.02
#224857/6614 Blanco N. Flare

Dear Ms. Blaine:

Enclosed are the analytical reports for the samples received in our laboratory on October 3, 1992.

If, in your review, you should have any questions or require additional information, please call.

Thank you for choosing ATAS for your analytical needs.

Sincerely,

Richard H. Mannz

Richard H. Mannz
Vice President

TW

Enclosures

ATAS
"Professional Commitment"

AMERICAN TECHNICAL & ANALYTICAL SERVICES, INC.
875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 • FAX (314) 434-0080

October 19, 1992

Kathy Blaine
Burlington Environmental, Inc.
210 West Sand Bank Road P.O. Box 330
Columbia, IL 62236-0330

RE: ATAS #5273.01-#5273.05
#224857/6615 Blanco N. Flora

Dear Ms. Blaine:

Enclosed are the analytical reports for the samples received in our laboratory on September 26, 1992.

If, in your review, you should have any questions or require additional information, please call.

Thank you for choosing ATAS for your analytical needs.

Sincerely,

Richard H. Mannz

Richard H. Mannz
Vice President

Enclosures

"Professional Commitment"

Mathes & Associates, Inc.
10 West Sand Bank Road
Columbia, Illinois 62236

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 4746

PROJECT NAME Blanco N. Flor
PROJECT NUMBER 224857
MAJOR TASK 6615
SAMPLERS STP/LWAS
LAB DESTINATION

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS TPH-418.1	BTEX	Cation & Anion	TDS	NO2, NO3, TKN			PRESERVATIVES ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE) WD 9-28-92 2A3-1K3 BA 1K1
MW-24	9/25/92	1420		X	MW-24	6	1	2	1	1	1			X	*	* TPH - H2SO4 5273.01
MW-23	9/25/92	1505		X	MW-23	6	1	2	1	1	1					BTEX - HCL 02
MW-73	9/25/92	1515		X	MW-23	6	1	2	1	1	1					NO2 NO3 • TKN - H2SO4 03
MW-20	9/25/92	1605		X	MW-20	6	1	2	1	1	1					04
																cation
																Phos. per Pat
SB-24-50	9/22/92	800		X	SB-24-50-51.5	2	1	1								anion 527305
																B.White 9-28-92

RELINQUISHED BY / RECEIVED BY

SIGNATURE	DATE	TIME	SIGNATURE	DATE	TIME
Scott T. P	1620	9/25/92	Lawton Massenburg	9/26/92	10:15

SHIPPING NOTES

LAB NOTES Noted Effervesing when MW-23, 73 water was added to bottles w/Preserva

JM-34 (8/89)

J[illegible] Mathes & Associates, Inc.
[illegible] West Sand Bank Road
Columbia, Illinois 62236

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 4748

PROJECT NAME Blanco N. Flare
PROJECT NUMBER 224857 MAJOR TASK 6614
SAMPLERS S. Pope
LAB DESTINATION ATAS

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS							PRESERVATIVES		REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
							BTEX	TPH (418.1)						ICED	CHEMICALS ADDED	wD 10-5-92 1K1-2A4
B-25-47	9/28/92	1830		X	SB-25-47'	1	1	[illegible]						X	None	5316.01
B-26-60.5	9/30/92	1000		X	SB-26-60.5-62	2	1	1						X	None	5316.02

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
Scott T. Pope	10/2/92	15:30	Newton Massenberg	10/3/92	08:30

SHIPPING NOTES Please Return Cooler to: Burlington Env.
500 Electric Ave
Farmington, NM 87401

LAB NOTES Please Return Results Attn: Kathy Blaine

JM-34 (8/89)

Mathes & Associates, Inc.
0 West Sand Bank Road
Columbia, Illinois 62236

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 36[illegible]

PROJECT NAME Blanco N. Flare
PROJECT NUMBER 224857 MAJOR TASK 6614
SAMPLERS STP
LAB DESTINATION ATAS

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS BTEX	TPH						ICED	PRESERVATIVES CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE) WD 9-22-92 2135-1JS 1K1
23-63.0	9/20/92	1400		X	SB-23-63.0-64.5	1	1							X		5243.01
20-45.5	9/15/92	1100		X	SMW-20-45.5	2	1	1								02
22-38	9/18/92	1130		X	SB-22-38-39.5	2	1	1								03
21-45	9/15/92	1800		X	SB-21-45-45.5	1	1									04
23-58	9/20/92	1215		X	SB-23-58-58.5	2	1	1								↓ 05
WB-01	9/18/92	1800		X	WB-01 WaterTank	3	2	1						↓	*	H_2O: * H_2SO_4 TPH, HCL BTEX 06

RELINQUISHED BY

SIGNATURE	DATE	TIME
[illegible] T. Pope	9/21/92	1215

RECEIVED BY

SIGNATURE	DATE	TIME
Lawton [illegible]	9/22/92	09:30

SHIPPING NOTES Please Return Cooler To: Burlington
500 Electric Ave
Farmington NM 87401
(505) 326-2262

LAB NOTES Send Results Attn: Kathy Blaine
Address Above.
(Columbia, ILL)

JM-34 (8/89)

LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 418.1

LABORATORY BLANK

MATRIX : WATER
SAMPLE ID : BLANK
SAMPLE AMOUNT : 1000 ml
ANALYSIS DATE : 09-22-92

DILUTION FACTOR: 1.00

COMPOUND	DETECTION LIMIT (PPM)	AMOUNT FOUND (PPM)
TOTAL PETROLEUM HYDROCARBON	0.09	ND

SPIKE BLANK/SPIKE BLANK DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPM)	SAMPLE CONC. (PPM)	SPIKE BLANK CONC. (PPM)	PERCENT RECOVERY
TOTAL PETROLEUM HYDROCARBON	4.00	ND	3.78	94.0 %

	SPIKE BLANK DUP. CONC. (PPM)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
TOTAL PETROLEUM HYDROCARBON	3.68	92.0%	2 %

LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 418.1

LABORATORY BLANK

MATRIX : SOIL
SAMPLE ID : BLANK
SAMPLE AMOUNT : 30 g
ANALYSIS DATE : 09-23-92

DILUTION FACTOR: 1.00

COMPOUND	DETECTION LIMIT (PPM)	AMOUNT FOUND (PPM)
TOTAL PETROLEUM HYDROCARBON	3.1	ND

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPM)	5236.01 SAMPLE CONC. (PPM)	5236.01 MS MATRIX SPIKE CONC.	PERCENT RECOVERY
TOTAL PETROLEUM HYDROCARBON	133	26.0	146.7	91.0 %

	5236.01 MSD MATRIX SPIKE DUP. CONC. (PPM)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
TOTAL PETROLEUM HYDROCARBON	135.1	82.0 %	10 %

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LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 8020
INSTRUMENT ID : 1B

LABORATORY BLANK

MATRIX : W
SAMPLE ID : BLANK
SAMPLE AMOUNT : 5.0 G
ANALYSIS DATE : 09-28-92
ANALYSIS TIME : 08:26

ATAS NO. : B1

DILUTION FACTOR : 1.00

COMPOUND	QUANTITATION LIMIT (PPB)	AMOUNT FOUND (PPB)
BENZENE	1.0	ND
TOLUENE	1.0	ND
ETHYLBENZENE	1.0	ND
TOTAL XYLENES	1.0	ND

ROGATE RECOVERY (BROMOFLUOROBENZENE): 110.00 %

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

NO MS/MSD RESULTS

LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 8020
INSTRUMENT ID : 2B
QA SEQUENCE NO: 2B433

LABORATORY BLANK

MATRIX : W
SAMPLE ID : BLANK
SAMPLE AMOUNT : 5.0 G
ANALYSIS DATE : 09-25-92
ANALYSIS TIME : 08:26
ATAS NO. : B1
DILUTION FACTOR : 1.00

COMPOUND	QUANTITATION LIMIT (PPB)	AMOUNT FOUND (PPB)
BENZENE	1.0	ND
TOLUENE	1.0	ND
ETHYLBENZENE	1.0	ND
TOTAL XYLENES	1.0	ND

[illegible]ROGATE RECOVERY (BROMOFLUOROBENZENE): 89.00 %

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPB)	5243.06 SAMPLE CONC. (PPB)	5243.06 MS MATRIX SPIKE CONC. (PPB)	PERCENT RECOVERY
BENZENE	20.0	ND	21.5	107.3 %
TOLUENE	20.0	ND	19.3	96.4 %
ETHYLBENZENE	20.0	ND	20.0	100.1 %
TOTAL XYLENES	40.0	ND	41.9	104.8 %

	5243.06 MSD MATRIX SPIKE DUP. CONC. (PPB)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
BENZENE	19.2	96.1 %	11.11 %
TOLUENE	18.5	92.7 %	3.91 %
ETHYLBENZENE	19.5	97.7 %	2.48 %
TOTAL XYLENES	39.5	98.7 %	6.04 %

LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 8020 QA SEQUENCE NO: 2B432
INSTRUMENT ID : 2B

LABORATORY BLANK

MATRIX : W
SAMPLE ID : BLANK
SAMPLE AMOUNT : 5.0 G
ANALYSIS DATE : 09-24-92
ANALYSIS TIME : 23:28

ATAS NO. : B1
DILUTION FACTOR : 1.00

COMPOUND	QUANTITATION LIMIT (PPB)	AMOUNT FOUND (PPB)
BENZENE	1.0	ND
TOLUENE	1.0	ND
ETHYLBENZENE	1.0	ND
TOTAL XYLENES	1.0	ND

[illegible]RROGATE RECOVERY (BROMOFLUOROBENZENE): 82.00 %

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPB)	5237.12 SAMPLE CONC. (PPB)	5237.12 MS MATRIX SPIKE CONC. (PPB)	PERCENT RECOVERY
BENZENE	20.0	ND	18.1	90.6 %
TOLUENE	20.0	ND	19.2	95.8 %
ETHYLBENZENE	20.0	ND	18.9	94.3 %
TOTAL XYLENES	40.0	ND	38.8	97.0 %

	5237.12 MSD MATRIX SPIKE DUP. CONC. (PPB)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
BENZENE	18.7	93.3 %	2.88 %
TOLUENE	19.4	96.9 %	1.14 %
ETHYLBENZENE	18.9	94.7 %	0.48 %
TOTAL XYLENES	39.1	97.7 %	0.72 %

LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 418.1

LABORATORY BLANK

MATRIX : SOIL
SAMPLE ID : BLANK
SAMPLE AMOUNT : 30 g
ANALYSIS DATE : 10-06-92

DILUTION FACTOR: 1.00

COMPOUND	DETECTION LIMIT (PPM)	AMOUNT FOUND (PPM)
TOTAL PETROLEUM HYDROCARBON	3.1	ND

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPM)	5313.01 SAMPLE CONC. (PPM)	5313.01 MS MATRIX SPIKE CONC.	PERCENT RECOVERY
TOTAL PETROLEUM HYDROCARBON	133	11.0	100.6	67.0 %

	5313.01 MSD MATRIX SPIKE DUP. CONC.(PPM)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
TOTAL PETROLEUM HYDROCARBON	93.4	62.0 %	8 %

LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 8020
INSTRUMENT ID : 2B
QA SEQUENCE NO: 2B442

LABORATORY BLANK

MATRIX : W
SAMPLE ID : BLANK
SAMPLE AMOUNT : 5.0 G
ANALYSIS DATE : 10-08-92
ANALYSIS TIME : 14:30
ATAS NO. : B1
DILUTION FACTOR : 1.00

COMPOUND	QUANTITATION LIMIT (PPB)	AMOUNT FOUND (PPB)
BENZENE	1.0	ND
TOLUENE	1.0	ND
ETHYLBENZENE	1.0	ND
TOTAL XYLENES	1.0	ND

[illegible]ROGATE RECOVERY (BROMOFLUOROBENZENE): 94.00 %

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPB)	5320.03 SAMPLE CONC. (PPB)	5320.03 MS MATRIX SPIKE CONC. (PPB)	PERCENT RECOVERY
BENZENE	20.0	ND	14.4	71.8 %
TOLUENE	20.0	ND	16.3	81.5 %
ETHYLBENZENE	20.0	ND	16.8	83.9 %
TOTAL XYLENES	40.0	ND	34.3	85.8 %

	5320.03 MSD MATRIX SPIKE DUP. CONC. (PPB)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
BENZENE	13.6	67.8 %	5.66 %
TOLUENE	15.3	76.5 %	6.34 %
ETHYLBENZENE	15.8	78.8 %	6.27 %
TOTAL XYLENES	32.3	80.8 %	6.00 %

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: QC1003IN(135)

DATE : 10-19-92

QA/QC

DESCRIPTION		PARAMETER	RESULTS	
METHOD BLANK	10-03-92	NITRATE	<0.10	mg/L
METHOD BLANK	10-03-92	NITRATE/NITRITE	<0.10	mg/L
METHOD BLANK	10-05-92	TOTAL PHOSPHORUS	<0.10	mg/L
BLANK SPIKE	10-03-92	NITRATE	101 %	RECOVERY
BLANK SPIKE	10-03-92	NITRATE/NITRITE	101 %	RECOVERY
BLANK SPIKE	10-05-92	TOTAL PHOSPHORUS	100 %	RECOVERY

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LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 418.1

LABORATORY BLANK

MATRIX : SOIL DILUTION FACTOR: 1.00
SAMPLE ID : BLANK
SAMPLE AMOUNT : 30 g
ANALYSIS DATE : 09-29-92

COMPOUND	DETECTION LIMIT (PPM)	AMOUNT FOUND (PPM)
TOTAL PETROLEUM HYDROCARBON	3.1	ND

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPM)	5263.01 SAMPLE CONC. (PPM)	5263.01 MS MATRIX SPIKE CONC.	PERCENT RECOVERY
TOTAL PETROLEUM HYDROCARBON	133	8.1	131.5	93.0 %

	5263.01 MSD MATRIX SPIKE DUP. CONC.(PPM)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
TOTAL PETROLEUM HYDROCARBON	150.8	107.0 %	14 %

LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 418.1

LABORATORY BLANK

MATRIX : WATER
SAMPLE ID : BLANK
SAMPLE AMOUNT : 1000 ml
ANALYSIS DATE : 09-30-92

DILUTION FACTOR: 1.00

COMPOUND	DETECTION LIMIT (PPM)	AMOUNT FOUND (PPM)
TOTAL PETROLEUM HYDROCARBON	0.09	ND

SPIKE BLANK/SPIKE BLANK DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPM)	SAMPLE CONC. (PPM)	SPIKE BLANK CONC. (PPM)	PERCENT RECOVERY
TOTAL PETROLEUM HYDROCARBON	4.00	0.10	3.23	81.0 %

	SPIKE BLANK DUP. CONC. (PPM)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
TOTAL PETROLEUM HYDROCARBON	3.58	90.0%	10 %

LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 8020
INSTRUMENT ID : 1B
QA SEQUENCE NO: 1B411

LABORATORY BLANK

MATRIX : W
SAMPLE ID : BLANK
SAMPLE AMOUNT : 5.0 G
ANALYSIS DATE : 10-01-92
ANALYSIS TIME : 09:31
ATAS NO. : B3
DILUTION FACTOR : 1.00

COMPOUND	QUANTITATION LIMIT (PPB)	AMOUNT FOUND (PPB)
BENZENE	1.0	ND
TOLUENE	1.0	ND
ETHYLBENZENE	1.0	ND
TOTAL XYLENES	1.0	ND

[illegible]RROGATE RECOVERY (BROMOFLUOROBENZENE): 84.00 %

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPB)	5269.04 SAMPLE CONC. (PPB)	5269.04 MS MATRIX SPIKE CONC.(PPB)	PERCENT RECOVERY
BENZENE	20.0	ND	13.2	66.0 %
TOLUENE	20.0	1.5	14.3	64.0 %
ETHYLBENZENE	20.0	ND	14.5	72.3 %
TOTAL XYLENES	40.0	1.4	28.5	67.7 %

	5269.04 MSD MATRIX SPIKE DUP. CONC.(PPB)	PERCENT RECOVERY	RECOVERY PERCENT DIFFERENCE
BENZENE	14.9	74.5 %	12.03 %
TOLUENE	16.2	73.5 %	13.75 %
ETHYLBENZENE	15.6	77.9 %	7.46 %
TOTAL XYLENES	31.3	74.5 %	9.60 %

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LABORATORY QUALITY CONTROL SEQUENCE

METHOD : EPA 8020
QA SEQUENCE NO: 2B437
INSTRUMENT ID : 2B

LABORATORY BLANK

MATRIX : W
ATAS NO. : B1
SAMPLE ID : BLANK
SAMPLE AMOUNT : 5.0 G
DILUTION FACTOR : 1.00
ANALYSIS DATE : 10-01-92
ANALYSIS TIME : 10:21

COMPOUND	QUANTITATION LIMIT (PPB)	AMOUNT FOUND (PPB)
BENZENE	1.0	ND
TOLUENE	1.0	ND
ETHYLBENZENE	1.0	ND
TOTAL XYLENES	1.0	ND

ROGATE RECOVERY (BROMOFLUOROBENZENE): 94.00 %

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (PPB)	5273.04 SAMPLE CONC. (PPB)	5273.04 MS MATRIX SPIKE CONC.(PPB)	PERCENT RECOVERY
BENZENE	20.0	ND	20.4	102.0 %
TOLUENE	20.0	ND	21.4	106.8 %
ETHYLBENZENE	20.0	ND	21.4	107.0 %
TOTAL XYLENES	40.0	ND	45.4	114.0 %

	5273.04 MSD MATRIX SPIKE DUP. CONC.(PPB)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
BENZENE	19.1	96.0 %	6.06 %
TOLUENE	19.5	97.7 %	8.90 %
ETHYLBENZENE	20.3	101.7 %	5.13 %
TOTAL XYLENES	43.4	108.0 %	5.40 %

APPENDIX E-2

Water Analytical Results

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 527304BX(135)

DATE : 10-19-92

SAMPLE MATRIX : WATER
ATAS # : 5273.04
DATE SUBMITTED: 09-26-92
PROJECT : #224857/6615 BLANCO N. FLORA
SAMPLE ID : MW-20

PARAMETER	REPORTING LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
<u>GAS CHROMATOGRAPHY</u>					
BENZENE	1.0	ug/L	ND	10-01-92	SW 8020
TOLUENE	1.0	ug/L	ND	10-01-92	SW 8020
ETHYLBENZENE	1.0	ug/L	ND	10-01-92	SW 8020
[illegible]LENES	1.0	ug/L	ND	10-01-92	SW 8020
TOTAL BTEX		ug/L	ND		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%)	100 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
[illegible]D = NOT DETECTED ABOVE REPORTING LIMIT
ug/L = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 527303BX(135)

DATE : 10-19-92

SAMPLE MATRIX : WATER
ATAS # : 5273.03
DATE SUBMITTED: 09-26-92
PROJECT : #224857/6615 BLANCO N. FLORA
SAMPLE ID : MW-73

PARAMETER	REPORTING LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
<u>GAS CHROMATOGRAPHY</u>					
BENZENE	100.0	ug/L	2770	10-01-92	SW 8020
TOLUENE	200.0	ug/L	7690	10-01-92	SW 8020
ETHYLBENZENE	100.0	ug/L	221	10-01-92	SW 8020
[illegible]ENES	100.0	ug/L	6090	10-01-92	SW 8020
TOTAL BTEX		ug/L	16771		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 111 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
[illegible] = NOT DETECTED ABOVE REPORTING LIMIT
ug/L = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 527302BX(135)

DATE : 10-19-92

SAMPLE MATRIX : WATER
ATAS # : 5273.02
DATE SUBMITTED: 09-26-92
PROJECT : #224857/6615 BLANCO N. FLORA
SAMPLE ID : MW-23

PARAMETER	REPORTING LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
<u>GAS CHROMATOGRAPHY</u>					
BENZENE	100.0	ug/L	2600	10-01-92	SW 8020
TOLUENE	200.0	ug/L	7090	10-01-92	SW 8020
ETHYLBENZENE	100.0	ug/L	198	10-01-92	SW 8020
[illegible]LENES	100.0	ug/L	5330	10-01-92	SW 8020
TOTAL BTEX		ug/L	15218		

<u>QA/QC SURROGATE RECOVERY</u>

BROMOFLUOROBENZENE (65-135%)	107 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
[illegible]D = NOT DETECTED ABOVE REPORTING LIMIT
ug/L = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 527301BX(135)

DATE : 10-19-92

SAMPLE MATRIX : WATER
ATAS # : 5273.01
DATE SUBMITTED: 09-26-92
PROJECT : #224857/6615 BLANCO N. FLORA
SAMPLE ID : MW-24

PARAMETER	REPORTING LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
<u>GAS CHROMATOGRAPHY</u>					
BENZENE	50.0	ug/L	2650.0	10-01-92	SW 8020
TOLUENE	50.0	ug/L	ND	10-01-92	SW 8020
ETHYLBENZENE	50.0	ug/L	94.8	10-01-92	SW 8020
[illegible]ENES	50.0	ug/L	1340.0	10-01-92	SW 8020
TOTAL BTEX		ug/L	4084.8		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 97 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
[illegible] = NOT DETECTED ABOVE REPORTING LIMIT
ug/L = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 524306BX(131)
DATE : 09-28-92

SAMPLE MATRIX : WATER
ATAS # : 5243.06
DATE SUBMITTED: 09-22-92
PROJECT : #224857/6614 BLANCO N. FLARE
SAMPLE ID : WB-01 Sample of water from SHB water tank DEM

PARAMETER	REPORTING LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
GAS CHROMATOGRAPHY					
BENZENE	1.0	ug/L	ND	09-25-92	SW 8020
TOLUENE	1.0	ug/L	ND	09-25-92	SW 8020
ETHYLBENZENE	1.0	ug/L	ND	09-25-92	SW 8020
[illegible]ENES	1.0	ug/L	ND	09-25-92	SW 8020
TOTAL BTEX		ug/L	ND		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 80 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
[illegible] = NOT DETECTED ABOVE REPORTING LIMIT
ug/L = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 5273TPHW(135)
DATE : 10-19-92

SAMPLE MATRIX : WATER
ATAS EPISODE : #5273
DATE SUBMITTED: 09-26-92
DATE ANALYZED : 09-30-92
PROJECT : #224857/6615 BLANCO N. FLORA
METHOD REF. : 418.1

RESULTS REPORTED IN mg/L OR PARTS PER MILLION(PPM)

TOTAL PETROLEUM HYDROCARBONS

CLIENT ID	ATAS ID	REPORTING LIMIT	RESULTS
MW-24	5273.01	0.5	1.0
MW-23	5273.02	0.5	2.0
MW-73	5273.03	0.5	2.0
MW-20	5273.04	0.5	ND

ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 5243TPHW(131)

DATE : 09-28-92

SAMPLE MATRIX : WATER
ATAS EPISODE : #5243
DATE SUBMITTED: 09-22-92
DATE ANALYZED : 09-22-92
PROJECT : #224857/6614 BLANCO N. FLARE
METHOD REF. : 418.1

RESULTS REPORTED IN mg/L OR PARTS PER MILLION(PPM)

TOTAL PETROLEUM HYDROCARBONS

CLIENT ID	ATAS ID	REPORTING LIMIT	RESULTS
WB-01	5243.06	0.5	5.5

water sample from
SHB water tank

ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 527304IN(135)

DATE : 10-19-92

SAMPLE MATRIX : WATER
ATAS # : 5273.04
DATE SUBMITTED: 09-26-92
PROJECT : #224857/6615 BLANCO N. FLORA
SAMPLE ID : MW-20

PARAMETER	**DET LIMIT**	**UNITS**	**RESULTS**	**DATE ANALYZED**	**METHOD REFERENCE**
			INORGANICS		
TDS	1	mg/L	11500	09-30-92	EPA 160.1
NITROGEN (TKN)	1	mg/L	ND	10-02-92	SM 420A
NITRATE	0.10	mg/L	ND	10-03-92	EPA 353.2
NITRITE	0.10	mg/L	ND	10-03-92	SM 419
TOTAL PHOSPHORUS	0.10	mg/L	0.29	10-05-92	EPA 365.2

mg/L = PARTS PER MILLION(PPM)
ND = NOT DETECTED ABOVE QUANTITATION LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 527302IN(135)
DATE : 10-19-92

SAMPLE MATRIX : WATER
ATAS # : 5273.02
DATE SUBMITTED: 09-26-92
PROJECT : #224857/6615 BLANCO N. FLORA
SAMPLE ID : MW-23

PARAMETER	DET LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			INORGANICS		
TDS	1	mg/L	28700	09-30-92	EPA 160.1
NITROGEN (TKN)	1	mg/L	3.4	10-02-92	SM 420A
NITRATE	0.10	mg/L	0.60	10-03-92	EPA 353.2
NITRITE	0.10	mg/L	ND	10-03-92	SM 419
TOTAL PHOSPHORUS	0.10	mg/L	0.21	10-05-92	EPA 365.2

mg/L = PARTS PER MILLION(PPM)
ND = NOT DETECTED ABOVE QUANTITATION LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 527303IN(135)
DATE : 10-19-92

SAMPLE MATRIX : WATER
ATAS # : 5273.03
DATE SUBMITTED: 09-26-92
PROJECT : #224857/6615 BLANCO N. FLORA
SAMPLE ID : MW-73

PARAMETER	DET LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			INORGANICS		
TDS	1	mg/L	30100	09-30-92	EPA 160.1
NITROGEN (TKN)	1	mg/L	3.9	10-02-92	SM 420A
NITRATE	0.10	mg/L	0.62	10-03-92	EPA 353.2
NITRITE	0.10	mg/L	ND	10-03-92	SM 419
TOTAL PHOSPHORUS	0.10	mg/L	0.23	10-05-92	EPA 365.2

mg/L = PARTS PER MILLION(PPM)
ND = NOT DETECTED ABOVE QUANTITATION LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 527301IN(135)

DATE : 10-19-92

SAMPLE MATRIX : WATER
ATAS # : 5273.01
DATE SUBMITTED: 09-26-92
PROJECT : #224857/6615 BLANCO N. FLORA
SAMPLE ID : MW-24

PARAMETER	DET LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			INORGANICS		
TDS	1	mg/L	5630	09-30-92	EPA 160.1
NITROGEN (TKN)	1	mg/L	ND	10-02-92	SM 420A
NITRATE	0.10	mg/L	1.42	10-03-92	EPA 353.2
NITRITE	0.10	mg/L	ND	10-03-92	SM 419
TOTAL PHOSPHORUS	0.10	mg/L	ND	10-05-92	EPA 365.2

mg/L = PARTS PER MILLION(PPM)
ND = NOT DETECTED ABOVE QUANTITATION LIMIT

APPENDIX E-3

Soil Analytical Results

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 524302BX(131)

DATE : 09-28-92

SAMPLE MATRIX : SOIL
ATAS # : 5243.02
DATE SUBMITTED: 09-22-92
PROJECT : #224857/6614 BLANCO N. FLARE
SAMPLE ID : MW-20-45.5

PARAMETER	REPORTING LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
GAS CHROMATOGRAPHY					
BENZENE	1.0	ug/Kg	ND	09-25-92	SW 8020
TOLUENE	1.0	ug/Kg	3.8	09-25-92	SW 8020
ETHYLBENZENE	1.0	ug/Kg	ND	09-25-92	SW 8020
[illegible]LENES	1.0	ug/Kg	2.7	09-25-92	SW 8020
TOTAL BTEX		ug/Kg	6.5		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 38 % *

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
ug/Kg = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 524304BX(131)
DATE : 09-28-92

SAMPLE MATRIX : SOIL
ATAS # : 5243.04
DATE SUBMITTED: 09-22-92
PROJECT : #224857/6614 BLANCO N. FLARE
SAMPLE ID : SB-21-45

PARAMETER	**REPORTING LIMIT**	**UNIT**	**RESULTS**	**DATE ANALYZED**	**METHOD REFERENCE**
GAS CHROMATOGRAPHY					
BENZENE	1.0	ug/Kg	ND	09-25-92	SW 8020
TOLUENE	1.0	ug/Kg	ND	09-25-92	SW 8020
ETHYLBENZENE	1.0	ug/Kg	ND	09-25-92	SW 8020
[illegible]LENES	1.0	ug/Kg	ND	09-25-92	SW 8020
TOTAL BTEX		ug/Kg	ND		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 67 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
ug/Kg = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 524303BX(131)

DATE : 09-28-92

SAMPLE MATRIX : SOIL
ATAS # : 5243.03
DATE SUBMITTED: 09-22-92
PROJECT : #224857/6614 BLANCO N. FLARE
SAMPLE ID : SB-22-38

PARAMETER	**REPORTING LIMIT**	**UNIT**	**RESULTS**	**DATE ANALYZED**	**METHOD REFERENCE**
GAS CHROMATOGRAPHY					
BENZENE	1.0	ug/Kg	ND	09-25-92	SW 8020
TOLUENE	1.0	ug/Kg	1.5	09-25-92	SW 8020
ETHYLBENZENE	1.0	ug/Kg	ND	09-25-92	SW 8020
XYLENES	1.0	ug/Kg	3.3	09-25-92	SW 8020
TOTAL BTEX		ug/Kg	4.8		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 37 % *

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
ug/Kg = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 524305BX(131)
DATE : 09-28-92

SAMPLE MATRIX : SOIL
ATAS # : 5243.05
DATE SUBMITTED: 09-22-92
PROJECT : #224857/6614 BLANCO N. FLARE
SAMPLE ID : SB-23-58

PARAMETER	**REPORTING LIMIT**	**UNIT**	**RESULTS**	**DATE ANALYZED**	**METHOD REFERENCE**
GAS CHROMATOGRAPHY					
BENZENE	5.0	ug/Kg	ND	09-25-92	SW 8020
TOLUENE	5.0	ug/Kg	87.8	09-25-92	SW 8020
ETHYLBENZENE	5.0	ug/Kg	18.6	09-25-92	SW 8020
LENES	5.0	ug/Kg	283.0	09-25-92	SW 8020
TOTAL BTEX		ug/Kg	389.4		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 83 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
D = NOT DETECTED ABOVE REPORTING LIMIT
ug/Kg = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 524301BX(131)
DATE : 09-28-92

SAMPLE MATRIX : SOIL
ATAS # : 5243.01
DATE SUBMITTED: 09-22-92
PROJECT : #224857/6614 BLANCO N. FLARE
SAMPLE ID : SB-23-63.0

PARAMETER	**REPORTING LIMIT**	**UNIT**	**RESULTS**	**DATE ANALYZED**	**METHOD REFERENCE**
GAS CHROMATOGRAPHY					
BENZENE	125.0	ug/Kg	ND	09-25-92	SW 8020
TOLUENE	125.0	ug/Kg	5550	09-25-92	SW 8020
ETHYLBENZENE	125.0	ug/Kg	988	09-25-92	SW 8020
[illegible]LENES	1250.0	ug/Kg	22800	09-28-92	SW 8020
TOTAL BTEX		ug/Kg	29338		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 99 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
[illegible]D = NOT DETECTED ABOVE REPORTING LIMIT
ug/Kg = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 527305BX(135)
DATE : 10-19-92

SAMPLE MATRIX : SOIL
ATAS # : 5273.05
DATE SUBMITTED: 09-26-92
PROJECT : #224857/6615 BLANCO N. FLORA
SAMPLE ID : SB-24-50

PARAMETER	REPORTING LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
GAS CHROMATOGRAPHY					
BENZENE	5.0	ug/Kg	ND	10-01-92	SW 8020
TOLUENE	5.0	ug/Kg	ND	10-01-92	SW 8020
ETHYLBENZENE	5.0	ug/Kg	ND	10-01-92	SW 8020
[illegible]ENES	5.0	ug/Kg	ND	10-01-92	SW 8020
TOTAL BTEX		ug/Kg	ND		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 69 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
[illegible]D = NOT DETECTED ABOVE REPORTING LIMIT
ug/Kg = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 531601BX(133)
DATE : 10-09-92

SAMPLE MATRIX : SOIL
ATAS # : 5316.01
DATE SUBMITTED: 10-03-92
PROJECT : #224857/6614 BLANCO N. FLARE
SAMPLE ID : SB-25-47

PARAMETER	REPORTING LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
GAS CHROMATOGRAPHY					
BENZENE	1.0	ug/Kg	ND	10-08-92	SW 8020
TOLUENE	1.0	ug/Kg	ND	10-08-92	SW 8020
ETHYLBENZENE	1.0	ug/Kg	ND	10-08-92	SW 8020
[illegible]LENES	1.0	ug/Kg	ND	10-08-92	SW 8020
TOTAL BTEX		ug/Kg	ND		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%) 71 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
ug/Kg = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 531602BX(133)
DATE : 10-09-92

SAMPLE MATRIX : SOIL
ATAS # : 5316.02
DATE SUBMITTED: 10-03-92
PROJECT : #224857/6614 BLANCO N. FLARE
SAMPLE ID : SB-26-60.5

PARAMETER	REPORTING LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
<u>GAS CHROMATOGRAPHY</u>					
BENZENE	5.0	ug/Kg	ND	10-08-92	SW 8020
TOLUENE	5.0	ug/Kg	ND	10-08-92	SW 8020
ETHYLBENZENE	5.0	ug/Kg	ND	10-08-92	SW 8020
XYLENES	5.0	ug/Kg	ND	10-08-92	SW 8020
TOTAL BTEX		ug/Kg	ND		

QA/QC SURROGATE RECOVERY

BROMOFLUOROBENZENE (65-135%)	76 %

* = OUTSIDE QC LIMIT ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
ug/Kg = PARTS PER BILLION(PPB)

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 5243TPHA(131)
DATE : 09-28-92

SAMPLE MATRIX : SOIL
ATAS EPISODE : #5243
DATE SUBMITTED: 09-22-92
DATE ANALYZED : 09-23-92
PROJECT : #224857/6614 BLANCO N. FLARE
METHOD REF. : 418.1 (MISSOURI MODIFIED)

RESULTS REPORTED IN mg/Kg OR PARTS PER MILLION(PPM)

TOTAL PETROLEUM HYDROCARBONS

CLIENT ID	ATAS ID	REPORTING LIMIT	RESULTS
MW-20-45.5	5243.02	5	16
SB-22-38	5243.03	5	26
SB-23-58	5243.05	5	24

ND = NOT DETECTED ABOVE REPORTING LIMIT

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 5273TPH(135)
DATE : 10-19-92

SAMPLE MATRIX : SOIL
ATAS EPISODE : #5273
DATE SUBMITTED: 09-26-92
DATE ANALYZED : 09-29-92
PROJECT : #224857/6615 BLANCO N. FLORA
METHOD REF. : 418.1 (MISSOURI MODIFIED)

RESULTS REPORTED IN mg/Kg OR PARTS PER MILLION(PPM)

TOTAL PETROLEUM HYDROCARBONS

CLIENT ID	ATAS ID	REPORTING LIMIT	RESULTS
SB-24-50	5273.05	5	8

ND = NOT DETECTED ABOVE REPORTING LIMIT

CLIENT: BURLINGTON ENVIRONMENTAL, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 5316TPH(133)
DATE : 10-09-92

SAMPLE MATRIX : SOIL
ATAS EPISODE : #5316
DATE SUBMITTED: 10-03-92
DATE ANALYZED : 10-06-92
PROJECT : #224857/6614 BLANCO N. FLARE
METHOD REF. : 418.1 (MISSOURI MODIFIED)

RESULTS REPORTED IN mg/Kg OR PARTS PER MILLION(PPM)

TOTAL PETROLEUM HYDROCARBONS

CLIENT ID	ATAS ID	REPORTING LIMIT	RESULTS
SB-26-60.5	5316.02	5	9

ND = NOT DETECTED ABOVE REPORTING LIMIT

APPENDIX F

EPNG Laboratory Analytical Reports

EL PASO
NATURAL GAS COMPANY **MEMORANDUM**

RECEIVED
OCT 23 1992

TO: Anu Pundari **DATE:** 10/19/92

FROM: John A. Lambdin **PLACE:** Field Services
Farmington Lab

Project: Blanco Plant Monitor Well #26 Product Layer

On October 19, 1992, the Farmington Field Services Engineering Laboratory received one hydrocarbon and water mixed phase sample. The sample was assigned the EPNG lab number N22400. The hydrocarbon layer was subjected to GC, FT-IR and EPA Method 8020 (BETX) analyses in order to get the hydrocarbon "fingerprint" ID on this material.

Sample ID Information:

Location: Blanco Plant
Sample Point: Monitor Well #26 Product Layer
Date Of Sample: 10-13-92
Sampled By: Scott T. Pope, BEI

Results and Conclusions: Hydrocarbon Layer

The hydrocarbon layer of the sample was characterized utilizing simple gas chromatography (GC) followed by infrared (IR) spectroscopic identification. The BETX analytical report is attached. Also attached is a copy of all IR spectra run. Any other results are shown below.

Gas Chromatograph Results

Component Name	Liquid Volume Percent
Propane	0.01
Iso-Butane	0.06
N-Butane	0.33
Iso-Pentane	1.98
N-Pentane	2.86
C6+	24.70
C7+	70.06

The sample was primarily hydrocarbons containing six carbons and greater.

Infrared Results

Component Name	Correlation (1.0 = Perfect Match)
EPNG Pipeline Drip (N20383)	0.8110

No perfect match was achieved. However, the results are consistent with what would be expected for unrefined hydrocarbons associated with oil and gas production - commonly called pipeline drip. The sample is a complex mixture of petroleum hydrocarbons consisting of substituted and non-substituted aliphatic and aromatic hydrocarbons. This analysis is consistent with what is usually seen for pipeline drip samples. The sample has weathered by some process into the slightly heavier C6 to C18 hydrocarbons. This would be similar to a very low grade of unleaded gasoline.

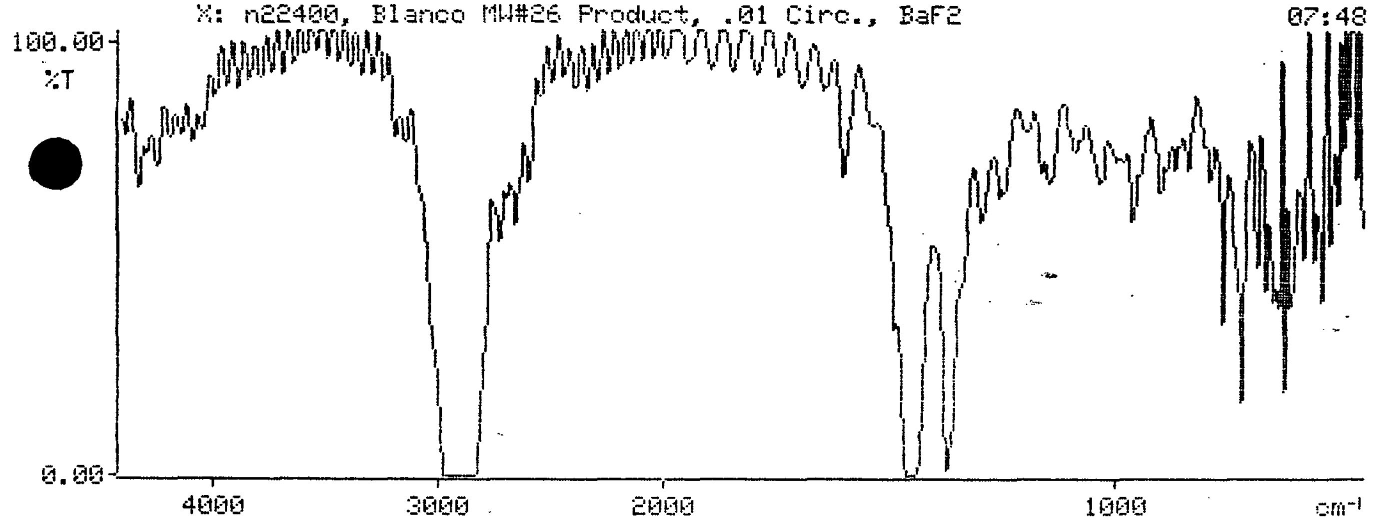
Please don't hesitate to call, if you have any questions.

John Lambdin
John Lambdin

cc: David Hall
Nancy Prince
Scott Pope, BEI
Results Log Book
File

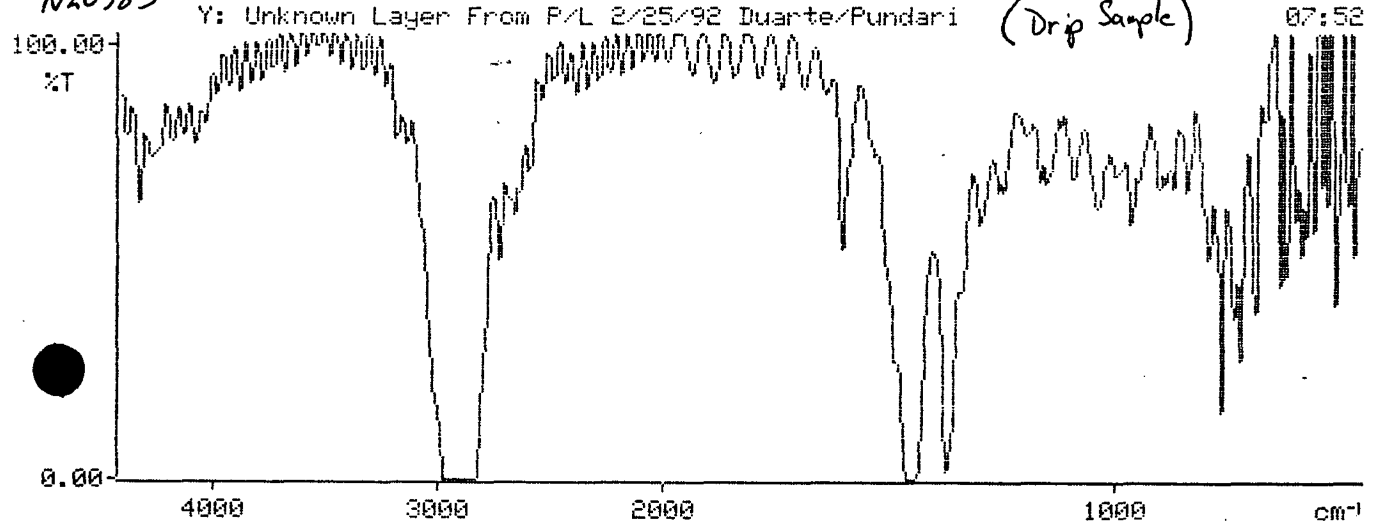
Enclosures:

X: n22400, Blanco MW#26 Product, .01 Circ., BaF2



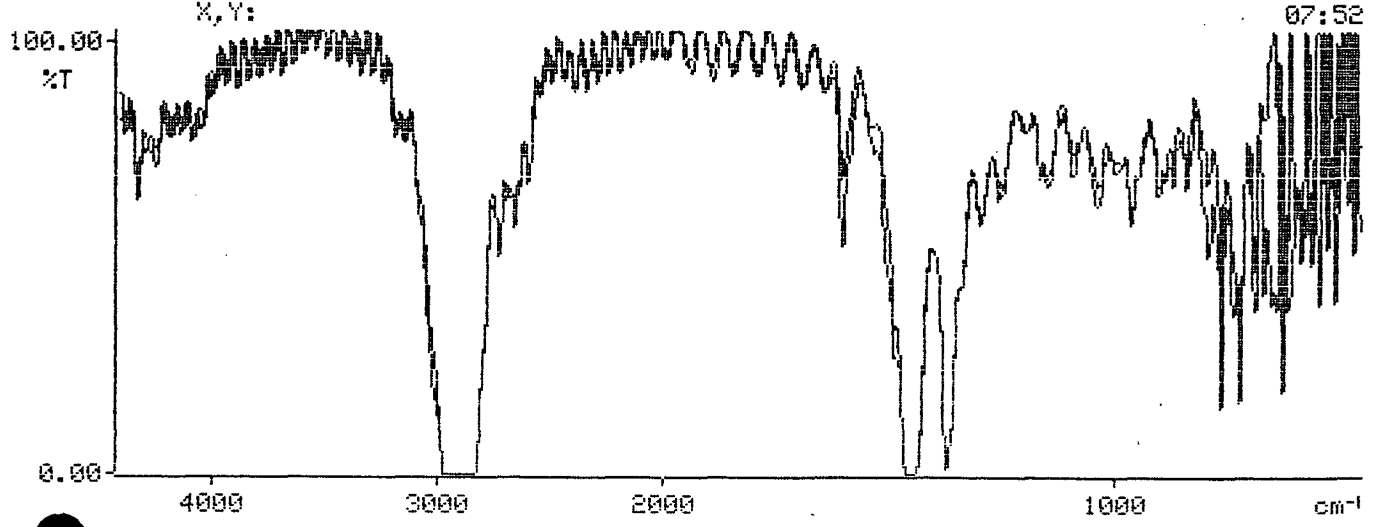
N20383

Y: Unknown Layer From P/L 2/25/92 Duarte/Pundari (Drip Sample)



correlation: 0.854371; factor: 0.8110

X,Y:



FT-IR Comparison Spectra

10/9/92

EL PASO NATURAL GAS COMPANY
FIELD SERVICES LABORATORY
ANALYTICAL REPORT
EPA METHOD 8020 – BETX

SAMPLE IDENTIFICATION

SAMPLE NUMBER: N22400

SAMPLE DATE: 10–13–92
SAMPLE TIME (Hrs.): 1430
SAMPLED BY: Scott T. Pope
LOCATION: Blanco Plant
SAMPLE SITE: Monitor Well #26
SAMPLE POINT: Monitor Well Product Layer
DATE OF ANALYSIS: 10–19–92

REMARKS: The sample had to be diluted by a factor or 20,000.

RESULTS

PARAMETER	PPM (mg/L)	QUALIFIER	COMMENTS
BENZENE	15,199		
ETHYLBENZENE	41,300	D	This exceeded the calibration curve.
TOLUENE	296,000	D	This exceeded the calibration curve.
TOTAL XYLENES	348,000	D	This exceeded the calibration curve.

Approved By: John [illegible] 10/19/92
Date

hn Mathes & Associates, Inc.
210 West Sand Bank Road
Columbia, Illinois 62236

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 4745

PROJECT NAME Blanco N. Flare
PROJECT NUMBER 22485-7 MAJOR TASK 6615
SAMPLERS SP/WS
LAB DESTINATION EPNG Farmington Lab

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Fuel TYPING							PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
mw-26-Prd	10/13/92	1430		X	MW-26 Product	2	2							X	HCL	EPNG # N22400

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
Scott T. Pope	10/15/92	1415	Teresa White	10/15/92	1430

SHIPPING NOTES

LAB NOTES We are trying to ID this product to track down the source. Please compare w/ Similar fuels @ the Blanco Plant or pipe lines.
Thanks

JM-34 (8/89)

APPENDIX G

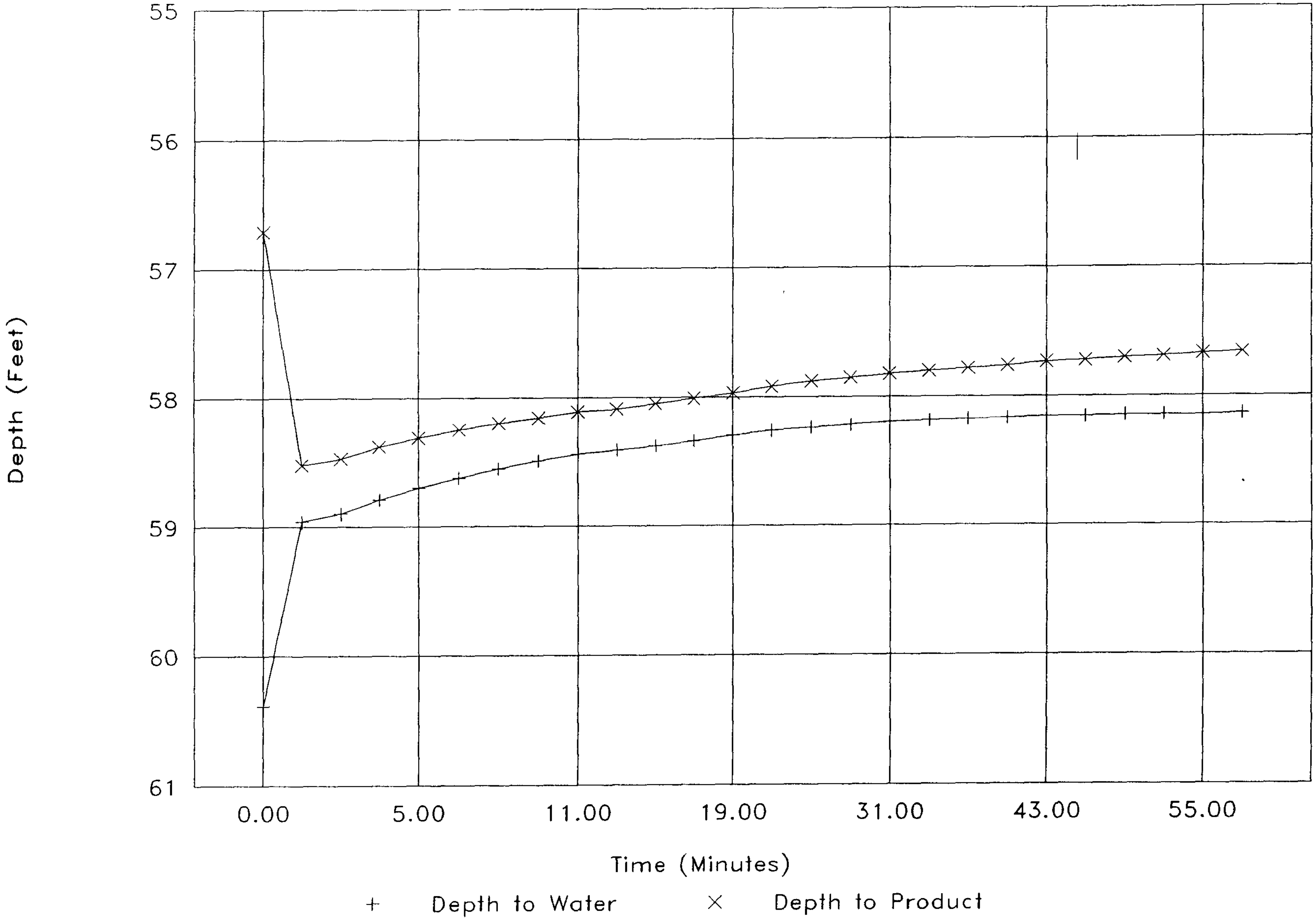
Field Data for Product Skimming and Short-Duration Groundwater Pumping Tests

Water Level & Product Recovery Data - Well MW-26
EPNG - Blanco
October 13, 1992

Time	Elapsed Time	Depth to Water	Depth to Product	Product Thickness
14:00	0.00	60.39	56.71	3.68
15:00	1.00	58.96	58.52	0.44
16:00	2.00	58.90	58.47	0.43
17:30	3.50	58.79	58.38	0.41
19:00	5.00	58.70	58.31	0.39
20:30	6.50	58.62	58.25	0.37
22:00	8.00	58.55	58.20	0.35
23:30	9.50	58.49	58.16	0.33
25:00	11.00	58.44	58.11	0.33
26:30	12.50	58.41	58.09	0.32
28:00	14.00	58.38	58.05	0.33
30:00	16.00	58.34	58.01	0.33
33:00	19.00	58.30	57.97	0.33
36:00	21.00	58.26	57.92	0.34
39:00	25.00	58.24	57.88	0.36
42:00	28.00	58.22	57.85	0.37
45:00	31.00	58.20	57.82	0.38
48:00	34.00	58.19	57.80	0.39
51:00	37.00	58.18	57.78	0.40
54:00	40.00	58.17	57.76	0.41
57:00	43.00	58.16	57.73	0.43
60:00	46.00	58.16	57.72	0.44
63:00	49.00	58.15	57.70	0.45
66:00	52.00	58.15	57.69	0.46
69:00	55.00	58.15	57.67	0.48
72:00	58.00	58.14	57.66	0.48

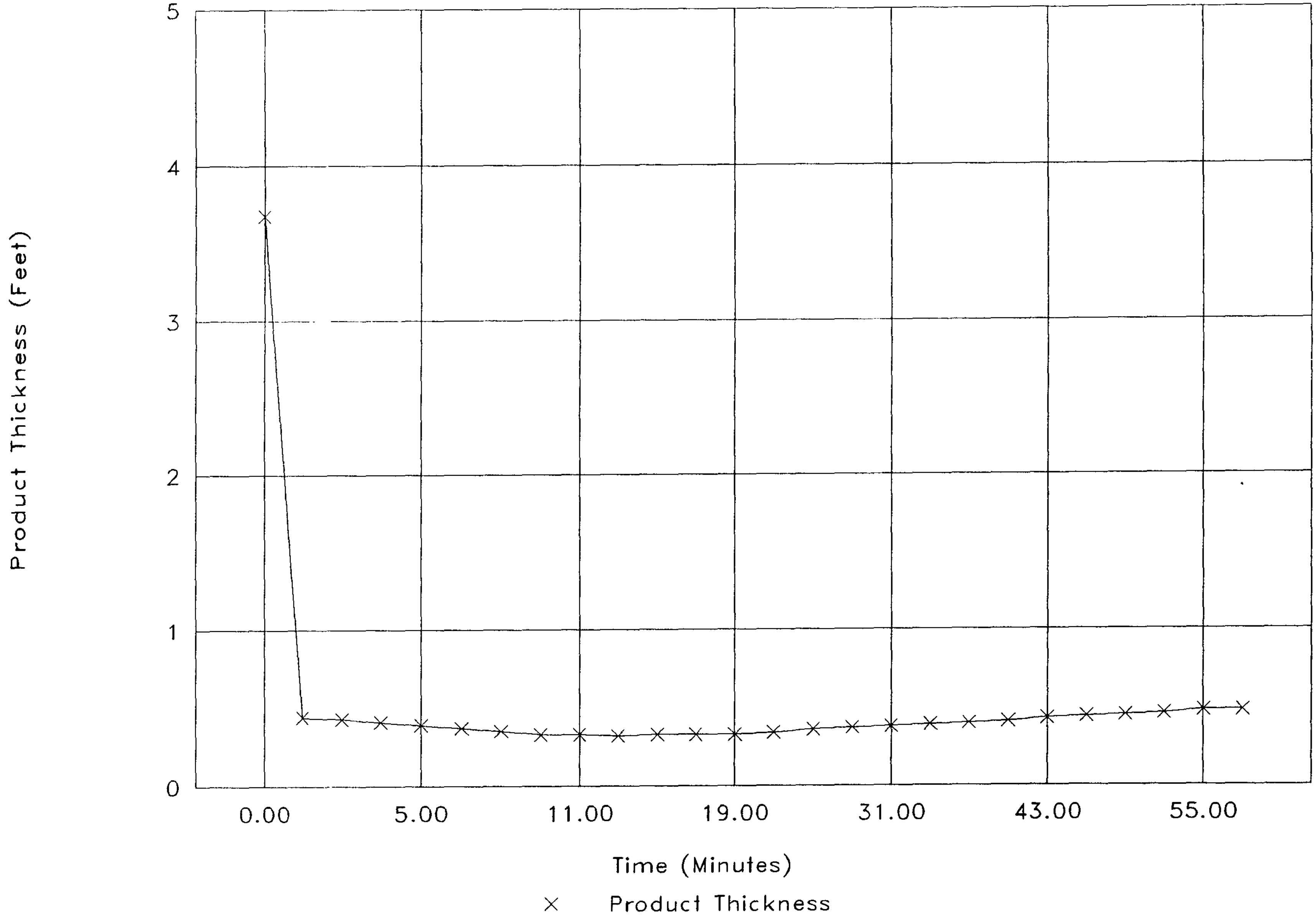
EPNG - Blanco

Recovery Data - Well MW-26



EPNG - Blanco

Recovery Data - Well MW-26



Product Recovery Data

1

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-26
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 63.6 (TOR)
Depth to Static Water Level: 60.54 Obtain just prior to initiation of pumping.
Depth to Product Level: 56.71
Date & Time of Static Water Level Measurement: 10/13/92 1400

Date	Time 15:14:30	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/13/92	15 14 :30	58.55	+ 1.84	58.02	.47	
	:15 :00	58.96	1.43	58.52	.44	
	15 :30	58.93	1.46	58.50	.43	
	16 :00	58.90	1.49	58.47	.43	
	16 :30	58.86	1.53	58.44	42	
	:17 :00	58.83	1.56	58.41	.42	
	:17 :30	58.79	1.60	58.38	.41	
	:18 :00	58.76	1.63	58.35	.41	
	:18 :30	58.73	1.66	58.33	.40	
	:19 :00	58.70	1.69	58.31	.39	
	:19 :30	58.67	1.72	58.29	.38	
	:20 :00	58.64	1.75	58.27	.37	
	:20 :30	58.62	1.77	58.25	.37	
	21 :00	58.59	1.80	58.23	.36	
	21 :30	58.57	1.82	58.22	.35	
	22:00	58.55	1.84	58.20	.35	
	22:30	58.53	1.86	58.19	.34	
	23 :00	58.51	1.88	58.17	.34	
	23 :30	58.49	1.90	58.16	.33	
	24 :00	58.47	1.92	58.15	.32	
	24 :30	58.46	1.93	58.13	.33	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 1 of 4 for Well # 26

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Product Recovery Data

2

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-26
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5 (TOC)
Depth to Static Water Level: 60.39 Obtain just prior to initiation of pumping.
Depth to Product Level: 56.71
Date & Time of Static Water Level Measurement: 10/13/92 1400

End → 30 sec Reading
Begin 1 min

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/13/92	15:25:00	58.44		58.11	.33	
	:25:30	58.43		58.10	.33	
	:26:00	58.42		58.10	.32	
	:26:30	58.41		58.09	.32	
	:27:00	58.40		58.08	32	
	:27:30	58.38		58.06	.32	
	:28:00	58.38		58.05	.33	
	28:30	58.37		58.04	33	
	29:00	58.36		58.03	.33	
	:30:00	58.34		58.01	.33	
	:31:00	58.32		58.00	.32	
	:32:00	58.31		57.98	.33	
	:33:00	58.30		57.97	.33	
	:34:00	58.28		57.95	.33	
	:35:00	58.27		57.93	.34	
	36:00	58.26		57.92	.34	
	:37:00	58.26		57.91	.35	
	:38:00	58.25		57.90	.35	
	:39:00	58.24		57.88	.36	
	:40:00	58.24		57.88	.36	
	:41:00	58.23		57.86	.37	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 2 of 4 for Well # ____

ptform1.wk1\

Product Recovery Data 3

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N Flare
Project Number: 224847

Well Number: MW-26
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5 (TOR)
Depth to Static Water Level: 60.39 Obtain just prior to initiation of pumping.
Depth to Product Level: 56.71
Date & Time of Static Water Level Measurement: 10/13/92 1400

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/13/92	15:42:00	58.22		57.85	.37	
	:43:00	58.22		57.84	.38	
	:44:00	58.21		57.83	.38	
	:45:00	58.20		57.82	.38	
	:46:00	58.20		57.82	.38	
	:47:00	58.19		57.81	.38	
	:48:00	58.19		57.80	.39	
	:49:00	58.18		57.79	.39	
	50 00	58.18		57.79	.39	
	51:00	58.18		57.78	.40	
	52:00	58.18		57.77	.41	
	53:00	58.17		57.77	.4	
	54:00	58.17		57.76	.41	
	55:00	58.17		57.75	.42	
	56:00	58.17		57.74	.43	
	57:00	58.16		57.73	.43	
	58:00	58.16		57.73	.43	
	59:00	58.16		57.72	.44	
	16:00:00	58.16		57.72	.44	
	01:00	58.16		57.71	.45	
	02:00	58.16		57.71	.45	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 3 of 4 for Well # 26

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4

Product Recovery Data

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N Flare
Project Number: 224857

Well Number: MW-26
Pumping Well or Observation Well (circle one)

Total Well Depth: 67.5 (TOR)
Depth to Static Water Level: 60.39 Obtain just prior to initiation of pumping.
Depth to Product Level: 56.71
Date & Time of Static Water Level Measurement: 10/13/92 1400

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/13/92	16:03:00	58.15		57.70	.45	
	:04:00	58.15		57.70	.45	
	:05:00	58.15		57.69	.46	
	:06:00	58.15		57.69	.46	
	:07:00	58.15		57.68	.47	
	:08:00	58.15		57.68	.47	
	:09:00	58.15		57.67	.48	
	:10:00	58.15		57.67	.48	
	:11:00	58.14		57.67	.47	
	:12:00	58.14		57.66	.48	
	:13:00	58.14		57.66	.48	
	:14:00	58.14		57.65	.49	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 4 of 4 for Well # 26

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Recovery Data

Burlington Environmental, Inc.
~~Water Level Drawdown Data Sheet~~

Project Name: 224857
Project Number: Blaw N. Flare

Well Number: MW-19
Pumping Well or Observation Well (circle one)

Total Well Depth: 68
Depth to Static Water Level: 61.00
Depth to Product Level: 57.2
Date & Time of Static Water Level Measurement: 1300 9/25/92

Obtain just prior to initiation of pumping.

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
9/25/92	1:12:30	60.02	.98			
9/25/92	1:13:00	60.13				
9/25/92	1:13:30	60.06				
	1:14:00	60.01				
	1:14:30	59.98				
	1:15:00	59.95				
	1:15:30	59.91				
	1:16:00	59.87				
	1:16:30	59.81				
	1:17:00	59.82				
	1:17:30	59.79				
	1:18:00	59.76				
	1:18:30	59.74				
	1:19:00	59.72				
	1:19:30	59.72				
	1:20:00	59.70				
	1:20:30	59.68				
	1:21:00	59.67				
	1:21:30	59.66				
	1:22:00	59.64				
	1:22:30	59.63				

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 1 of 3 for Well # 19

Recove Data

Burlington E vironmental, Inc.
Water Level Drawdown Data Sheet

Project Name: 224857

Project Number: Bianci N. Flare

Well Number: MW-19

Pumping Well or [✓ Observation Well] (circle one)

Total Well Depth: 68.0

Depth to Static Water Level: 61.00 Obtain just prior to initiation of pumping.

Depth to Product Level: 57.2

Date & Time of Static Water Level Measurement: 1300 9/25/92

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
9/25/92	1:23:30	59.60				
	1.24:30	59.59				
	1:25:30	59.58				
	1:26:30	59.58				
	1:27:30	59.58		58.94	.64	
	1:28:30	59.56		58.91	.65	
	1:29:30	5957		58.89	.68	
	1:30:30	59.58		58.86	.72	
	1:31:30	59.58		58.81	.77	
	1.32:30	59.58		58.79	.79	
	1:33.30	59.58		58.75	.83	
	1:34:30	59.58		58.72	.86	
	1:35:30	59.58		58.69	.89	
	1:36:30	59.58		58.68	.9	
	1:37:30	59.59		58.66	.93	
	1:38:30	59.59		58.63	.96	
	1:39:30	59.60		58.62	.98	
	1:40:30	59.60		58.59	1.01	
	1:41:30	59.60		58.58	1.02	
	1:42:30	59.61		58.56	1.05	
	1:43:30	59.61		58.54	1.07	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 2 of 3 for Well # ____

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Recovery Data

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Bianca N. Flare

Project Number: 224857

Well Number: MW-19

Pumping Well or Observation Well (circle one)

Total Well Depth: 68.0

Depth to Static Water Level: 61.0 Obtain just prior to initiation of pumping.

Depth to Product Level: 57.2

Date & Time of Static Water Level Measurement: 1300 9/25/92

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
5/25/92	1:44:30	59.61		58.53	1.08	
9/25/92	1:45:30	59.62		58.52	1.1	
9/25/92	1:46:30	59.62		58.50	1.12	
9/25/92	1:47:30	59.62		58.49	1.13	
9/25/92	1:48:30	59.62		58.47	1.15	
9/25/92	1:49:30	59.62		58.45	1.17	
9/25/92	1:50:30	59.62		58.44	1.18	
5/25/92	1:51:30	59.62		58.43	1.19	
9/25/92	1:52:30	59.62		58.42	1.2	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 3 of 3 for Well # 19

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-26
[✓ Pumping Well] or Observation Well (circle one)

Begin Pumping 9:58 Am. 10/14/92
End Pumping 12:37 PM 10/14/92

Pump Test Duration: 2 hrs, 39 min

Total Well Depth: 67.5
Depth to Static Water Level: 58.82
Depth to Product Level: 57.34
Date & Time of Static Water Level Measurement: 10/14/92, 1000

Obtain just prior to initiation of pumping.

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet) water	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/14/92	10:03:	62.0	3.18	2.5	59.54	Loose head, Stop Pumping
	10:08:					Resume Pump less than 1/4 gpm
	10:17:					Stop Pump, loss of head
	10:22					Resume Pump 1/2-1/4 gpm
	10:36:	64.2	5.38	3.0	61.2	
	10:37:	64.[illegible]	5.28			1/4 gpm
	10:39:	64.07	5.25			
	10:40:					1/4 gpm
	10:43:	64.35	5.53			
	10:45:	64.45	5.63			
	10:47	64:48	5.66	3.58	60.9	
	10:49	64.45	5.63			
	10:51:	64.35	5.53			
	10:58:	63.12	4.3			
	11:00	63.	4.18			
	11:17	64.3	5.48	4.1	60.2	
	11:24					Begin Pumping Product
	11:31	63.3	4.48	4.0	59.3	Product & Water
	11:44	64.75	5.93	4.61	60.4	
	12:10	65.95	7.13	5.35	60.6	
	12:33	66.9	8.08	5.85	61.05	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 1 of 1 for Well # 26

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Recovery Data

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blaine N. Flare
Project Number: 224857

Well Number: MW-26
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 58.26 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.34
Date & Time of Static Water Level Measurement: 10/14/92, 1000

	Date	Time 12:30	Depth to Water (0.01 Feet)	Water Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
1	10/14/92	12:37:00	65.95	7.13	65.86	.09	Pump Rate during
2		37:30	65.60	6.78	65.60	.00	Pump Test Ave 1/2-3/4 gpm
3		38:00	65.30	6.48	65.10	.20	
4		38:30	64.95	6.13	64.80	.15	
5		39:00	64.75	5.93	64.53	.22	
6		39:30	64.43	5.61	64.20	.23	
7		40:00	64.10	5.28	63.90	.29	
8		40:30	63.84	5.02	63.55	.29	
9		41:00	63.60	4.78	63.25	.35	
10		41:30	63.34	4.52	63.0	.34	
11		42:00	63.0	4.18	62.66	.34	
12		42:30	62.77	3.95	62.42	.35	
13		43:00	62.48	3.66	62.12	.36	
14		43:30	62.31	3.49	61.92	.39	
15		44:00	62.08	3.26	61.70	.38	
16		44:30	61.99	3.17	61.50	.49	
17		45:00	61.74	2.92	61.30	.44	
18		45:30	61.51	2.69	61.09	.41	
19		46:00	61.33	2.51	60.93	.40	
20		46:30	61.23	2.41	60.75	.48	
21		47:00	61.05	2.23	60.60	.45	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

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Recovery Data

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Bianca N. Flare
Project Number: 224857

Well Number: MW 26
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 58.82 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.34
Date & Time of Static Water Level Measurement: 10/14/92, 1020

	Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
22	10/14/92	12:47:30	60.92	2.1	60.44	.48	
23		48 00	60.83	2.01	60.32	.51	
24		48 30	60.73	1.91	60.22	.51	
25		49 00	60.64	1.82	60.17	.52	
26		49 30	60.55	1.73	60.03	.52	
27		50:00	60.48	1.66	59.95	.53	
28		50 30	60.40	1.58	59.88	.52	
29		51 00	60.30	1.48	59.78	.52	
30		51 30	60.26	1.44	59.72	.54	
[redacted]		[redacted]					
1		12:52:30	60.10	1.28	59.57	.53	
2		53:30	60.02	1.20	59.47	.55	
3		54 30	59.90	1.08	59.36	.54	
4		55 30	59.81	.99	59.27	.54	
5		36:30	59.72	.90	59.18	.54	
6		57:30	59.65	.83	59.11	.54	
7		58:30	59.58	.76	59.05	.53	
8		59:30	59.52	.70	58.98	.53	
9		13:00:30	59.46	.64	58.94	.52	
10		13:01:30	59.42	.60	58.90	.52	
11		13:02:30	59.37	.55	58.84	.53	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

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Recovery Data

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blaine N. Flav
Project Number: 224857

Well Number: MW-26
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 58.82 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.34
Date & Time of Static Water Level Measurement: 10/14/92, 1000

	Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
12	10/14/92	13:03:30	59.33	.51	58.75	.58	
13		13:04:30	59.29	.47	58.70	.59	
14		05:30	59.27	.45	58.65	.62	
15		06:30	59.25	.43	58.62	.63	
16		07:30	59.22	.40	58.57	.65	
17		08:30	59.20	.38	58.55	.65	
18		09:30	59.19	.37	58.51	.68	
19		10:30	59.17	.35	58.46	.71	
20		11:30	59.15	.33	58.42	.73	
21		12:30	59.14	.32	58.39	.75	
22		13:30	59.12	.30	58.37	.75	
23		14:30	59.11	.29	58.33	.78	
24		15:30	59.10	.28	58.32	.78	
25		16:30	59.10	.28	58.30	.80	
26		17:30	59.09	.27	58.28	.81	
27		18:30	59.09	.27	58.27	.82	
28		19:30	59.08	.26	58.25	.83	
29		20:30	59.07	.25	58.23	.84	
30		21:30	59.06	.24	58.22	.84	
31		22:30	59.06	.24	58.20	.86	
32		23:30	59.05	.23	58.19	.86	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

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Recovery Rate

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare

Project Number: 224857

Well Number: MW-26

[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5

Depth to Static Water Level: 58.82 Obtain just prior to initiation of pumping.

Depth to Product Level: 57.34

Date & Time of Static Water Level Measurement: 10/14/92, 1000

	Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
33	10/14/92	13:24:30	59.04	.22	58.17	.87	
34		:25:30	59.03	.21	58.16	.87	
35		:26:30	59.03	.20	58.15	.88	
36		:27:30	59.02	.20	58.13	.89	
37		:28:30	59.02	.20	58.12	.90	
38		:29:30	59.01	.19	58.11	.90	
39		:30:30	59.01	.19	58.10	.91	
40		:31:30	59.02	.20	58.10	.92	
41		:32:30	59.02	.20	58.08	.94	
42		:33:30	59.01	.19	58.07	.94	
43		34 30	59.01	.19	58.06	.95	
44		35 30	59.00	.18	58.05	.95	
45		:36:30	58.99	.17	58.04	.95	
1824		18:24:00	58.98	.16	57.53	1.45	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

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Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-19
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 61.20 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.44
Date & Time of Static Water Level Measurement: 10/14/92

Begin Pumping 15:08 10/14/92
End Pumping 17:12 10/14/92
Pump Test Duration: 2 hours, 12 mins.
Total Fluids Removed: 27 gallons

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/14/92	15:08	61.20	3.2	57.44	–	Begin Pumping
1/14/92	15:20					Could maintain a pump rate
						of ≈ .125 gpm. Tried increasing
10/14/92	15:48	64.4	3.2	58.9	5.5	Flow rate
10/14/92	17:12					Shut Pump down
						- Was able to sustain
						a continuous pumping rate of
						.125-.5 gpm for 30 min @
						end of Test. Water finally
						drew down to the point we
						kept losing hydraulic head required
						to keep pumping.
						Noted periods of
						product pumping as well
						as a mixed phase pumping.

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

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Recovery D

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW 19
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 61.20 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.44
Date & Time of Static Water Level Measurement: 10/14/92 1520

	Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
1	10/14/92	[illegible]	62.23	1.03	6187	.36	Pump was shut
2		:17:30	61.95	.75	61.82	.13	down @ ≃ 17:12:00
3		:18:00	61.69	.49	61.56	.13	
4		:18:30	61.35	.15	61.21	.14	- Pump rate was approx
5		:19:00	61.08	+.12	60.95	.13	1/4 - 1/2 gpm
6		:19:30	60.85	+.35	60.70	.15	
7		:20:00	60.65	+.55	60.50	.15	
8		:20:30	60.52	+.68	60.33	.19	
9		21:00	60.38	+.82	60.18	.20	
10		:21:30	60.29	.91	60.07	.22	
11		:22:00	60.22	.98	59.70	.52	
12		:22:30	60.16	1.04	59.90	.26	
13		23:00	60.12	1.08	59.83	.29	
14		23:30	60.07	1.13	59.76	.31	
15		24:00	60.05	1.15	59.72	.33	
16		24:30	60.02	1.18	59.68	34	
17		25:00	60.02	1.18	59.63	39	
18		:25:30	60.00	1.20	59.59	41	
19		:26:00	59.99	1.21	59.56	43	
20		:26:30	59.97	1.23	59.53	44	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

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Pump Test Duration: 2 hours, 12 min.
Total Fluids Removed: 27 gallons

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Recovery Data

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanc N. Flore
Project Number: 224857

Well Number: MW 19
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 61.20 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.44
Date & Time of Static Water Level Measurement: 10/14/92 1500

	Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
1	10/14/92	17:27:30	59.94	+ 1.26	59.48	46	
2		28 30	59.91	+ 1.29	59.46	45	
3		29 30	59.87	+ 1.33	59.43	44	
4		30 30	59.82	+ 1.38	59.41	41	
5		31 30	59.78	+ 1.42	59.39	39	
6		32 30	59.74	+ 1.46	59.36	38	
7		33 30	59.71	+ 1.49	59.35	36	
8		34 30	59.66	+ 1.52	59.32	36	
9		35 30	59.64	+ 1.56	59.30	34	
10		36 30	59.61	+ 1.59	59.28	.33	
11		37 30	59.59	+ 1.61	59.25	34	
5:38 12		38 30	59.55	+ 1.65	59.22	.33	
13		39 30	59.54	+ 1.66	59.21	33	
14		40 30	59.52	+ 1.68	59.18	34	
15		41 30	59.51	+ 1.69	59.17	34	
16		42 30	59.50	+ 1.70	59.14	36	
17		43 30	59.49	+ 1.71	59.12	37	
18		44 30	59.47	+ 1.73	59.10	37	
19		45 30	59.47	+ 1.73	59.09	38	
20		46 30	59.46	+ 1.74	59.07	39	
21		47 30	59.45	+ 1.75	59.05	40	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

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Recovery ta

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: [redacted] 224857

Well Number: MW-19
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 61.20 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.44
Date & Time of Static Water Level Measurement: 10/14/92 1500

	Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
22	10/14/92	17:48:30	59.44	+ 1.76	59.03	.41	
23		49:30	59.44	+ 1.76	59.01	.43	
24		50:30	59.43	+ 1.77	59.00	.43	
25		51:30	59.43	+ 1.77	58.98	.45	
26		52 30	59.43	+ 1.77	58.96	.47	
27		53:30	59.43	+ 1.77	58.94	.49	
28		54:30	59.43	+ 1.77	58.92	.51	
29		55:30	59.43	+ 1.77	58.90	.53	
30		56:30	59.43	+ 1.77	58.88	.55	
1822		18:22:00	59.49	+ 1.31	58.61	.88	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

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APPENDIX H

Field Data for Radius of Influence Test

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-26
Pumping Well or Observation Well (circle one): [✓ Observation Well]

Total Well Depth: 67.5
Depth to Static Water Level: 60.15
Depth to Product Level: 56.92
Date & Time of Static Water Level Measurement: 741 10/19/92

Obtain just prior to initiation of pumping.

Begin Test : 800 10/19/92
End Test : 1840 10/19/92
Removed Aprox. 115 gallon of water/Prod (5gal) during the test

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/19/92	7:41	60.15		56.92	3.23	.33gpm @800 prd/water
	8:32	60.21	.06	56.95	3.26	.28gpm Prd/water
	9:01	60.26	.11	56.99	3.27	.20gpm Clouding & windy
	9:31	60.34	.19	57.03	3.31	.20gpm prd/water
	1000	60.37	.22	57.04	3.33	.20gpm prd/water
	1030	60.39	.24	57.06	3.33	.15gpm water only
	1101	60.41	.26	57.07	3.34	.25gpm water/Prd Clearing, less wind
	11.30	60.43	.28	57.08	3.35	.25gpm water/Prd
	1201	60.47	.32	57.10	3.37	.20gpm water only
	12.31	60.51	.36	57.11	3.40	.20gpm water/prd
	1301	60.53	.38	57.12	3.41	.16gpm water/Prd
	1331	60.53	.38	57.11	3.42	.15gpm water/Prd
	1402	60.52	.37	57.10	3.42	.15gpm water/Prd
	1432	60.51	.36	57.10	3.41	.10gpm water/Prd
	1502	60.48	.33	57.06	3.42	.10gpm Water/Prd
	1530	60.45	.30	57.04	3.41	Increase Rate to .28 gpm 1415
	1601	60.48	.33	57.05	3.43	.28gpm water/Prd
	163[illegible]	60.52	.37	57.08	3.44	.22gpm water/Prd
	1702	60.55	.40	57.09	3.46	.15gpm water only
	1731	60.56	.41	57.08	3.48	.11gpm
	1800	60.56	.41	57.09	3.47	.11gpm
	1831	60.57	.42	57.09	3.48	.11gpm

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

- Stoped Pumping 1245 - 1249
- Stoped Pumping 1319 - 1326. Lower pump 3-4" to bottom of well
- Stoped Pumping 1340 - 1355
- Stoped Pumping 1400 - 1405
- Stoped Pumping 1440 - 1450
- Stoped pumping 1707 - 1709
- Stoped pumping 1715 - 1718
- Stoped pumping 1724 - 1726

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Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-27
Pumping Well or [✓ Observation Well] (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 58.35
Depth to Product Level: 57.59
Date & Time of Static Water Level Measurement: 744 10/19/92

Obtain just prior to initiation of pumping.

Begin Test: 800 10/15/92
End Test: 1840 10/19/92
Remove Aprox. 115 gallon water/Prd (5gal) during the test.

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/19/92	7:44	58.35		57.59	.76	.33 gpm 800 prd/water
	8:35	58.37	.02	57.60	.77	.28gpm Prd/Water
	9:04	58.36	.01	57.60	.76	Noted Cloudingup and Wind picking up) .28gpm
	9.304	58.35	.00	57.60	.76	.20 gpm prd/water
	1000	58.35	.00	57.59	.76	.20 gpm prd/water
	1033	58.35	.00	57.59	.76	.15 gpm Water only
	1103	58.34	+.01	57.58	.76	.25 gpm prd/water
	1133	58.33	+.02	57.58	.75	.25 gpm prd/water
	1203	58.32	+.03	57.58	.74	.20 gpm water only
	1233	58.31	+.04	57.57	.74	.20 gpm
	1304	58.30	+.05	57.56	.74	.16 gpm
	1334	58.28	+.07	57.57	.71	.15 gpm
	1404	58.25	+.10	57.55	.70	.16 gpm
	1434	58.28	+.07	57.56	.69	.10 gpm
	1504	58.26	+.09	57.55	.71	.10 gpm
	1533	58.25	+.10	57.55	.70	Increase to .28 @ 1515
	1603	58.27	+.08	57.56	.71	.28 gpm
	1633	58.28	+.07	57.56	.72	.22 gpm
	1703	58.28	+.07	57.56	.72	.15 gpm
	1733	58.28	+.07	57.56	.72	.11 gpm
	1802	58.28	+.07	57.56	.72	.11 gpm

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

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10/19/92	1833	58.32	+.03	57.57	.75	.11 gpm

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Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blaine N. Flare
Project Number: 224857

Well Number: MW-24
Pumping Well or [✓ Observation Well] (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 59.05 Obtain just prior to initiation of pumping.
Depth to Product Level: —
Date & Time of Static Water Level Measurement: 7:29 10/19/92

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/19/92	7:29	59.05				
	9:01	59.07	.02			No rain Cloudy and Windy
	10:01	59.06	.01			
	11:01	59.04	+.01			
	12:01	59.04	+.01			
	13:03	59.02	+.03			
	14:03	59.00	+.05			
	1505	59.02	+.03			
	16:02	59.00	+.05			
	1701	59.02	+.03			
	1800	59.02	+.03			

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 1 of 1 for Well # 24

ptform1.wk1\

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-23
Pumping Well or [✓ Observation Well] (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 56.92 Obtain just prior to initiation of pumping.
Depth to Product Level: —
Date & Time of Static Water Level Measurement: 736 10/19/92

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/19/92	7:36	56.92				
	9:07	56.95	.03			Noted: Cloudy and Windy
	10:05	56.96	.04			
	11:06	56.95	.03			
	12:03	56.95	.03			
	13.08	56.93	.01			
	14:07	56.90	+.02			
	15:10	56.90	+.02			
	16:06	56.89	+.03			
	17:06	56.89	+.03			
	18:04	56.88	+.04			

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 1 of 1 for Well # 23

ptform1.wk1\

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-20
Pumping Well or [✓ Observation Well] (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 7:43 Obtain just prior to initiation of pumping.
Depth to Product Level: —
Date & Time of Static Water Level Measurement: 7:43 10/19/92

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/19/92	7.43	48.12				
	9:12	48.11	+.01			Noted Cloudy and Windy
	10:09	48.14	-.02			
	11:11	48.11	+.01			
	12:09	48.11	+.01			
	13:11	48.10	+.02			
	14:11	48.07	+.05			
	15:13	48.07	+.05			
	16:10	48.06	+.06			
	17:09	48.05	+.07			
	1807	48.05	+.07			

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 1 of 1 for Well # 20

ptform1.wk1\

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Recovery

STOPPED PUMPING AT 1840

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-19
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 6056 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.61
Date & Time of Static Water Level Measurement: 7:38AM 10/19/92

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/19/92	18:42	60.09	+ .47	59.76	.33	
	1846	59.78	.78	59.55	.23	
	1851	59.55	1.01	59.45	.10	
	1857	59.41	1.1	59.35	.06	
	1901	59.39	1.17	59.27	.12	
	1906	59.42	1.14	59.18	.24	
	1912	5943	1.13	59.13	.30	
	1917	59.45	1.11	59.08	.37	
	1922	59.43	1.13	59.04	.39	
	1927	59.43	1.13	59.09	.34	
	1632	59.44	1.12	59.06	.38	
	1937	59.44	1.12	59.03	.41	
	1940	59.45	1.11	58.92	.53	
	1946	59.43	1.13	58.89	.54	
	2018	59.43	1.13	58.78	.65	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page ___ of ___ for Well # 19

* Note: There was no check valve in line on pumping system. when the pump was shut down all water in the lines was released in to the well. The check valve was not-installed to aid in continious pumping during the pump test.

ptform1.wk1\

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Recovery

Project Name: Blaine N. Elare
Project Number: 224857

Well Number: MW-26
Pumping Well or [✓ Observation Well] (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 60.15 Obtain just prior to initiation of pumping.
Depth to Product Level: 56.92
Date & Time of Static Water Level Measurement: 741 10/19/92

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/19/92	1843	60.56		57.10	3.46	
	1848	60.58	-.02	57.10	3.48	
	1854	60.58	-.02	57.10	3.48	
	1858	60.58	-.02	57.10	3.48	
	1903	60.59	-.03	57.00	3.49	
	1908	60.59	-.03	57.10	3.49	
	1913	6057	-.01	57.11	3.46	
	1919	60.58	-.02	57.11	3.47	
	1923	60.58	-.02	57.11	3.47	
	1928	6058	-.02	57.11	3.47	
	1933	60.58	-.02	57.11	3.47	
	1938	60.58	-.02	57.11	3.47	
	1942	60.58	-.02	57.11	3.47	
	1947	60.58	-.02	57.11	3.47	
	2021	60.56	0.00	57.10	3.46	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 1 of 1 for Well # 26

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Recovery

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-27
Pumping Well or [✓ Observation Well] (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 58.35 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.59
Date & Time of Static Water Level Measurement: 744/10/19/92

Date	Time	Depth to Water (0.01 Feet)	~~Drawdown~~ Recovery (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/19/92	1845	58.33	+ .02	57.58	.75	
	1850	58.33	1 .02	57.58	.75	
	1855	58.32	+ .03	57.58	.74	
	1900	58.33	+ .02	57.58	.75	
	1904	58.34	+ .01	57.59	.75	
	1910	58.34	+ .01	57.59	.75	
	1915	58.34	+ .01	57.59	.75	
	1920	58.34	+ .01	57.59	.75	
	1925	58.34	+ .01	57.59	.75	
	1930	58.35	.00	57.59	.76	
	1935	58.35	.00	57.60	.75	
	1939	58.35	.00	57.60	.75	
	1945	58.34	+ .01	57.60	.74	
	1949	58.35	.00	57.60	.75	
	2023	58.35	.00	57.60	.75	

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 1 of 1 for Well # 27

ptform1.wk1\

Burlington Environmental, Inc.
Water Level Drawdown Data Sheet

Project Name: Blanco N. Flare
Project Number: 224857

Well Number: MW-19
[✓ Pumping Well] or Observation Well (circle one)

Total Well Depth: 67.5
Depth to Static Water Level: 60.56 Obtain just prior to initiation of pumping.
Depth to Product Level: 57.61
Date & Time of Static Water Level Measurement: 7:38AM 10/19/92

Date	Time	Depth to Water (0.01 Feet)	Drawdown (0.01 Feet)	Depth to Product (0.01 Feet)	Product Thickness (0.01 Feet)	Additional Comments*
10/19/92	7:38	60.56		57.61	2.95	No readings during test
						due to limited space in well

* - Note changes in pumping rates, cessation of pumping, occurence of rainfall, or any conditions which might have an effect of water levels.

Page 1 of 1 for Well # 19

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APPENDIX I

Tables and Graphs of Aquifer Test Evaluations

Pump Test Data - Monitoring Well MW-26
Blanco North Flare Pit

El Paso Natural Gas Company
October 19-20, 1992

Acutal Time	Elapsed Time	Depth to Groundwater	Groundwater Drawdown	Depth to Product	Product Thickness	Product Drawdown	Corrected Groundwater Depth	Corrected Groundwater Drawdown
Drawdown Data								
07:41	0	60.15	0	56.92	3.23	0	62.41	0
08:32	32	60.21	0.06	56.95	3.26	0.03	62.49	0.08
09:01	61	60.26	0.11	56.99	3.27	0.07	62.55	0.14
09:31	91	60.34	0.19	57.03	3.31	0.11	62.66	0.25
10:00	120	60.37	0.22	57.04	3.33	0.12	62.70	0.29
10:30	150	60.39	0.24	57.06	3.33	0.14	62.72	0.31
11:01	181	60.41	0.26	57.07	3.34	0.15	62.75	0.34
11:30	210	60.43	0.28	57.08	3.35	0.16	62.78	0.37
12:01	241	60.47	0.32	57.10	3.37	0.18	62.83	0.42
12:31	271	60.51	0.36	57.11	3.40	0.19	62.89	0.48
13:01	301	60.53	0.38	57.12	3.41	0.20	62.92	0.51
13:31	331	60.53	0.38	57.11	3.42	0.19	62.92	0.51
14:02	362	60.52	0.37	57.10	3.42	0.18	62.91	0.50
14:32	392	60.51	0.36	57.10	3.41	0.18	62.90	0.49
15:02	422	60.48	0.33	57.06	3.42	0.14	62.87	0.46
15:30	450	60.45	0.30	57.04	3.41	0.12	62.84	0.43
16:01	481	60.48	0.33	57.05	3.43	0.13	62.88	0.47
16:32	512	60.52	0.37	57.08	3.44	0.16	62.93	0.52
17:02	542	60.55	0.40	57.09	3.46	0.17	62.97	0.56
17:31	571	60.56	0.41	57.08	3.48	0.16	63.00	0.59
18:00	600	60.56	0.41	57.09	3.47	0.17	62.99	0.58
18:31	631	60.57	0.42	57.09	3.48	0.17	63.01	0.60

Pump Test Data - Monitoring Well MW-26
Blanco North Flare Pit

El Paso Natural Gas Company
October 19-20, 1992

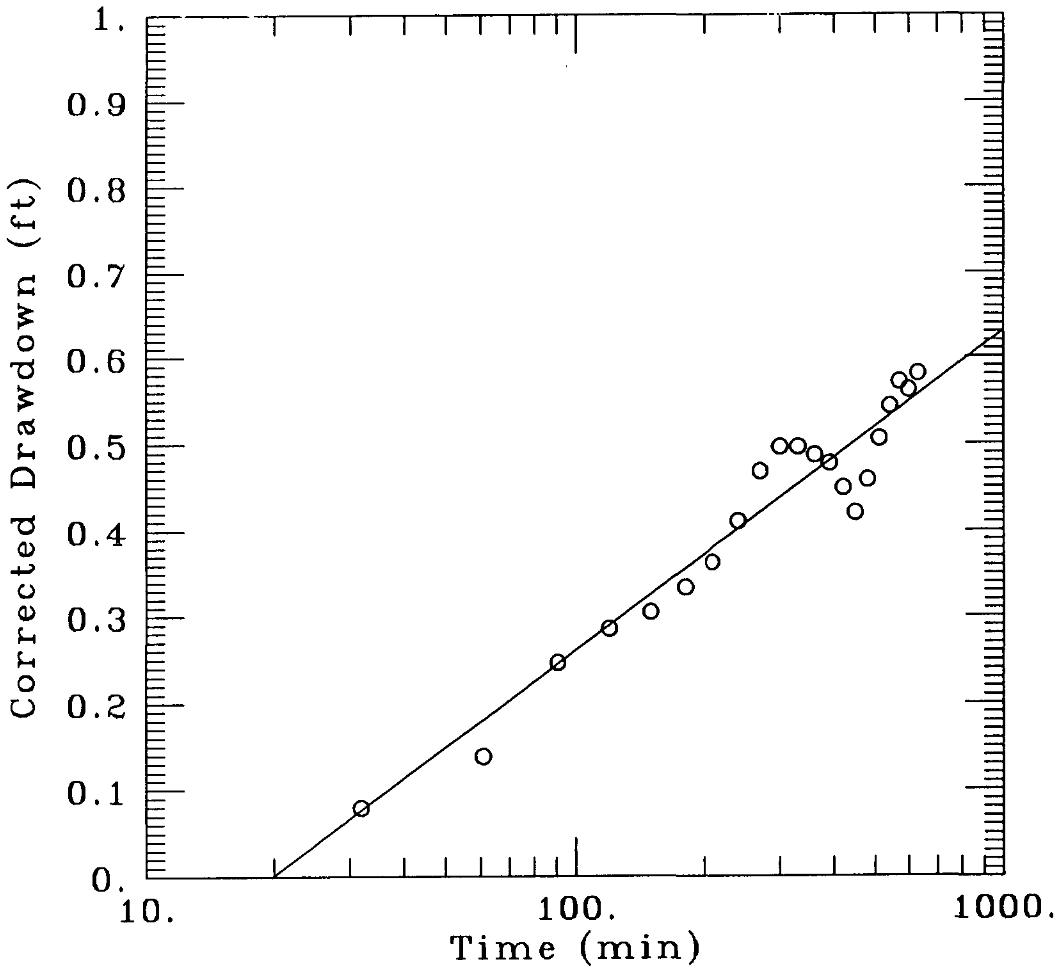
Acutal Time	Elapsed Time	Depth to Groundwater	Groundwater Drawdown	Depth to Product	Product Thickness	Product Drawdown	Corrected Groundwater Depth	Corrected Groundwater Drawdown
<u>Recovery Data</u>								
18:40	0	60.56	0.41	57.10	3.46	0.18	62.98	0.57
18:43	3	60.56	0.41	57.10	3.46	0.18	62.98	0.57
18:48	8	60.58	0.43	57.10	3.48	0.18	63.02	0.61
18:53	13	60.58	0.43	57.10	3.48	0.18	63.02	0.61
18:58	18	60.58	0.43	57.10	3.48	0.18	63.02	0.61
19:03	23	60.59	0.44	57.10	3.49	0.18	63.03	0.62
19:08	28	60.59	0.44	57.10	3.49	0.18	63.03	0.62
19:13	33	60.57	0.42	57.11	3.46	0.19	62.99	0.58
19:19	39	60.58	0.43	57.11	3.47	0.19	63.01	0.60
19:23	43	60.58	0.43	57.11	3.47	0.19	63.01	0.60
19:29	49	60.58	0.43	57.11	3.47	0.19	63.01	0.60
19:33	53	60.58	0.43	57.11	3.47	0.19	63.01	0.60
19:38	58	60.58	0.43	57.11	3.47	0.19	63.01	0.60
19:42	62	60.58	0.43	57.11	3.47	0.19	63.01	0.60
19:47	67	60.58	0.43	57.11	3.47	0.19	63.01	0.60
20:21	101	60.56	0.41	57.10	3.46	0.18	62.98	0.57
09:15	875	60.48	0.33	57.01	3.47	0.09	62.91	0.50

Note: Pumping began at 8:00 on October 19, 1992. Pump ceased at 18:40 on October 19, 1992.
Final recovery reading is 9:15 on October 20, 1992.

224857\ptblanco.wk1\

Burlington Environmental Inc.	Client: El Paso Natural Gas
Project No.: 224857	Location: Blanco - North Flare

Blanco Pump Test - Corrected Water Level



DATA SET:
blanco-c.dat
10/26/92

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Cooper-Jacob
TEST DATE:
10/19/92
TEST WELL:
MW-19
OBS. WELL:
MW-26

ESTIMATED PARAMETERS:
T = 0.01187 ft^2/min
S = 0.0005871

TEST DATA:
Q = 0.024 ft^3/min
r = 30. ft
b = 9.61 ft

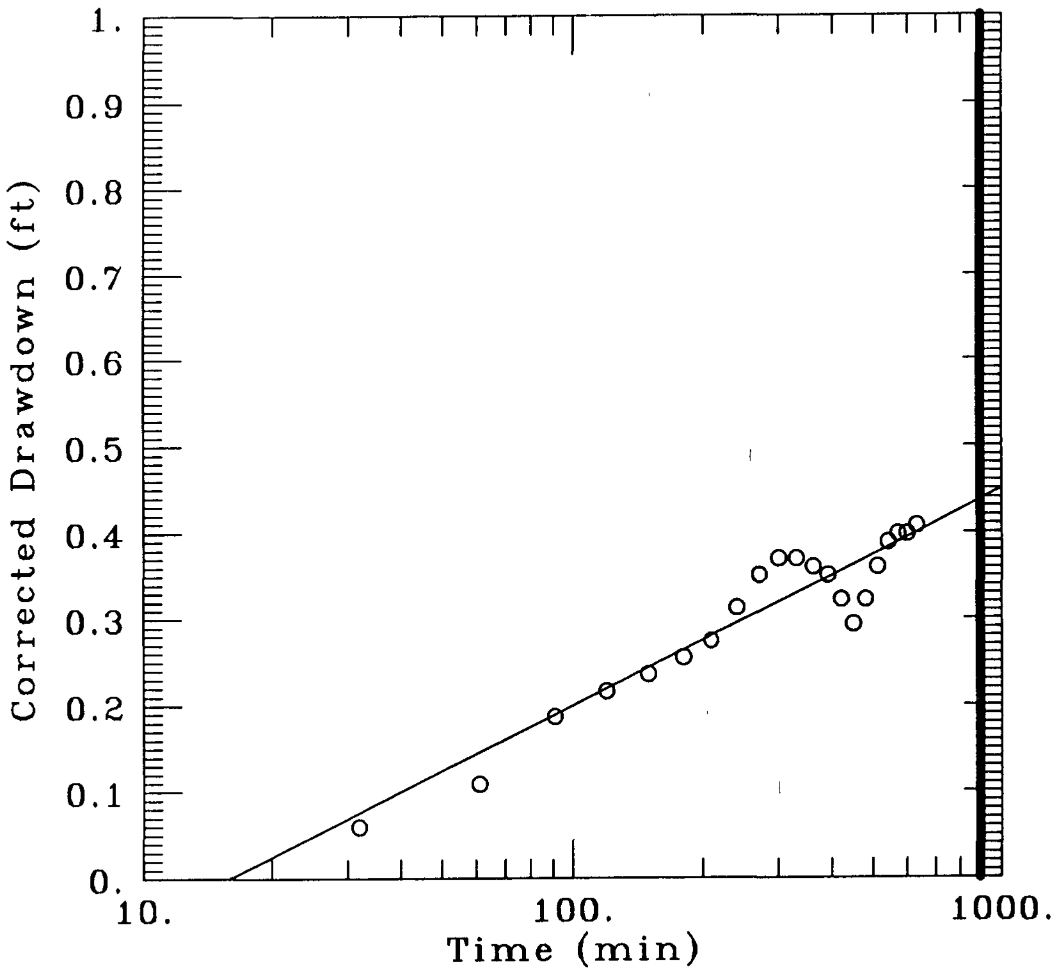
Burlington Environmental Inc.

Client: El Paso Natural Gas

Project No.: 224857

Location: Blanco - North Flare

Blanco Pump Test - Water Level



DATA SET:
blanco-w.dat
10/26/92

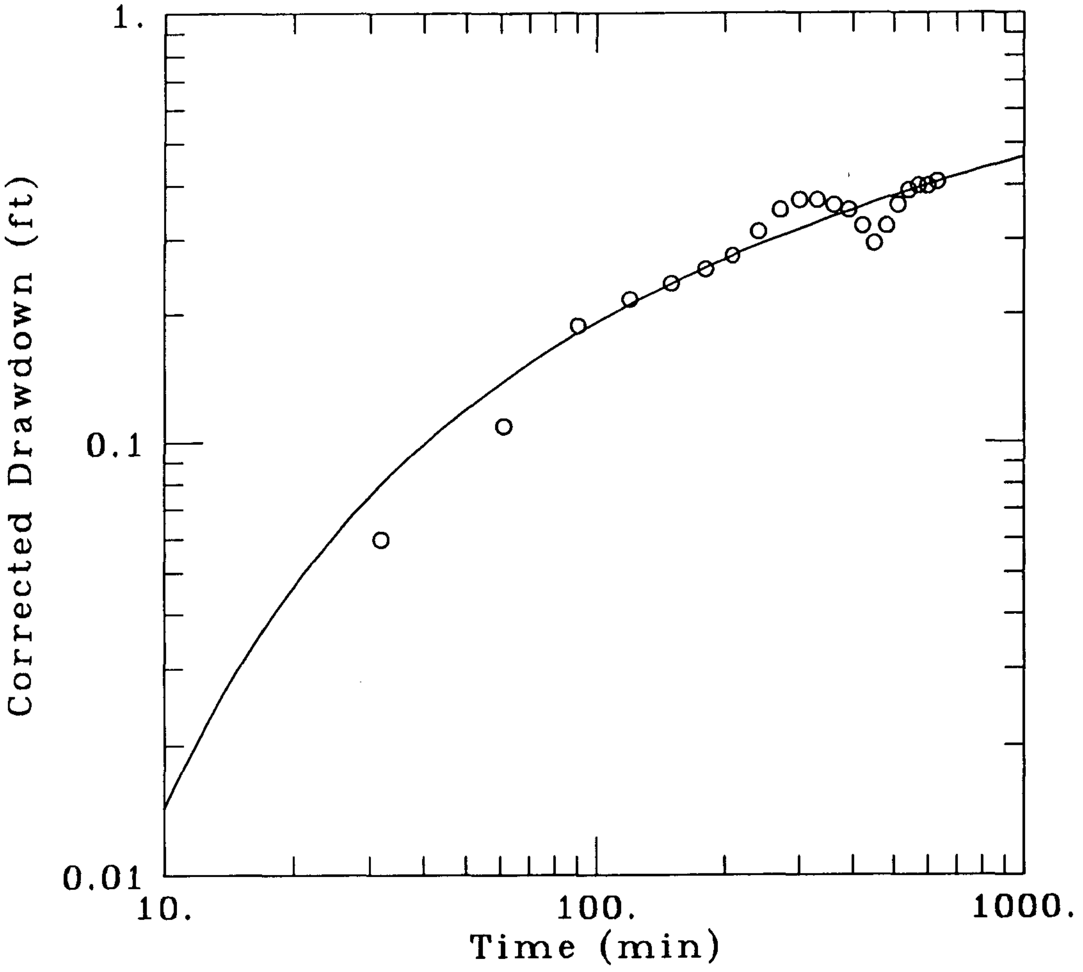
AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Cooper-Jacob
TEST DATE:
10/19/92
TEST WELL:
MW-19
OBS. WELL:
MW-26

ESTIMATED PARAMETERS:
T = 0.01762 ft^2/min
S = 0.0006971

TEST DATA:
Q = 0.024 ft^3/min
r = 30. ft
b = 7.35 ft

Burlington Environmental Inc.	Client: El Paso Natural Gas
Project No.: 224857	Location: Blanco - North Flare

Blanco Pump Test - Water Level



DATA SET:
blanco-w.dat
10/26/92

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Theis
TEST DATE:
10/19/92
TEST WELL:
MW-19
OBS. WELL:
MW-26

ESTIMATED PARAMETERS:
T = 0.01523 ft^2/min
S = 0.0009558

TEST DATA:
Q = 0.024 ft^3/min
r = 30. ft
b = 7.35 ft

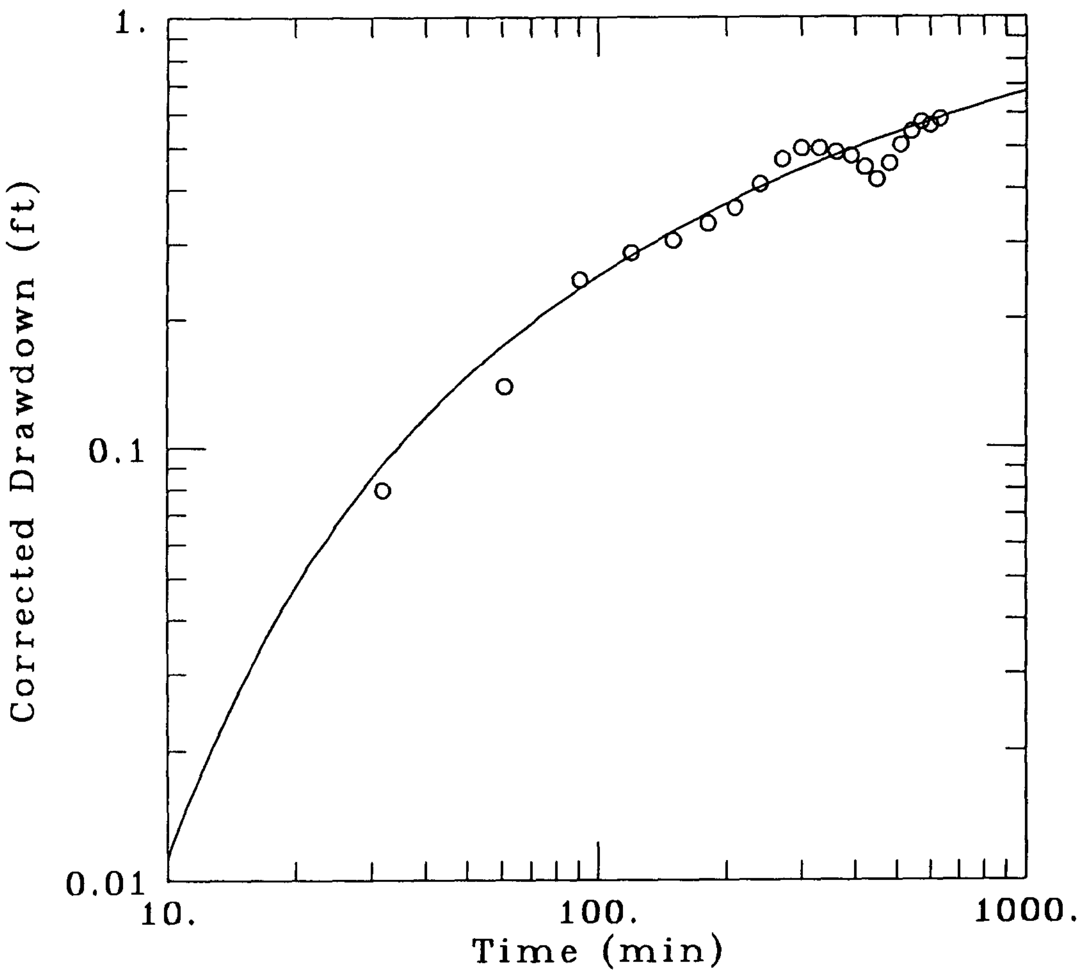
Burlington Environmental Inc.

Client: El Paso Natural Gas

Project No.: 224857

Location: Blanco - North Flare

Blanco Pump Test - Corrected Water Level



DATA SET:
blanco-c.dat
10/26/92

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Theis
TEST DATE:
10/19/92
TEST WELL:
MW-19
OBS. WELL:
MW-26

ESTIMATED PARAMETERS:
$T = 0.009685\ ft^2/min$
$S = 0.0008111$

TEST DATA:
$Q = 0.024\ ft^3/min$
$r = 30.\ ft$
$b = 9.61\ ft$

File Copy

SITE INVESTIGATION
OF THE BLANCO PLANT
SAN JUAN COUNTY, NEW MEXICO

RECEIVED

FEB 04 1991

OIL CONSERVATION DIV.
SANTA FE

El Paso Natural Gas Company
El Paso, Texas

November, 1990

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EXECUTIVE SUMMARY

K. W. Brown & Associates was hired by El Paso Natural Gas Company to conduct a site investigation at its Blanco Plant from January 8 through January 15, 1990. The objectives of the investigation involved assessing the extent of contamination from a removed underground storage tank (UST) near D Plant, evaluating the effectiveness of the existing collector well, and addressing the high nitrate levels in the existing background well. The investigation entailed the installation of monitoring wells and the collection and analysis of both soil and groundwater samples.

Based on documentation that soil contamination decreases with depth and that only trace levels of contamination occur in the groundwater, it seems reasonable to assume that the contamination in the D Plant area is limited both laterally and vertically in the soil profile. The concentrations of benzene, toluene, ethylbenzene, and total xylenes (BTEX) in the groundwater samples were all below the standards set by the New Mexico Water Quality Control Commission (NMWQCC). No further investigation seems necessary in the vicinity of the D Plant.

There is some uncertainty whether the collector well is intercepting additional contamination. Localized shallow liquids intercepted by the collector well suggest that the source of the water is not part of the aquifer system. The collector well needs to be drained, cleaned, and more closely monitored as to the amounts of liquids collected and pumped, to determine its effectiveness.

High nitrate concentrations are not restricted to a certain depth or strata and appear to be widespread throughout the plant area and in varying concentrations. The source of the high nitrate concentration is still unknown and an investigation upgradient of the plant showed that sources from agricultural activities and septic systems are not present in the area.

A distinct hydrocarbon odor and oily sheen was discovered on the depth-to-water probe after taking measurements in W-19. With the excessively high concentrations of total petroleum hydrocarbons (TPH) reported in W-19, it is apparent that this area of the plant warrants further investigation. Monitoring well installation and soil and groundwater sampling seems necessary in the vicinity of W-19.

1.0 BACKGROUND

El Paso Natural Gas Company (EPNG) discovered a leaking underground storage tank (UST) in 1987 while constructing "D" Plant. This UST was immediately removed. In 1988, the New Mexico Oil Conservation Division (NMOCD) requested the preparation of a discharge plan application and as part of the discharge plan a groundwater quality study was conducted to assess the impact of plant operations on the groundwater.

2.0 INTRODUCTION

Seepage from an UST was detected during the excavation for the foundation of "D" Plant. The UST, installed in 1979, contained kerosene-like laboratory wastes, primary leftover absorption oil samples. The UST was removed in December 1987, and the soil surrounding the tank was replaced with clean fill. To assess the impact of the leaking UST, K. W. Brown & Associates, Inc. (KWB&A) was hired to conduct an investigation that consisted of installing monitoring wells and collecting soil and groundwater samples near "D" Plant. The intent of the investigation was to identify the lateral and vertical extent of soil contamination in the vicinity of the removed UST, as well as to determine if the contamination had migrated to the uppermost aquifer. The investigation also involved assessing the effectiveness of the existing collector well located by "D" Plant and addressing the high nitrate levels in the existing background well installed during the groundwater quality study conducted during 1988. The existing collector well has a dual purpose: to collect groundwater recharge affecting the "D" Plant building foundation and any possible leachate originating from the UST site.

3.0 SITE DESCRIPTION

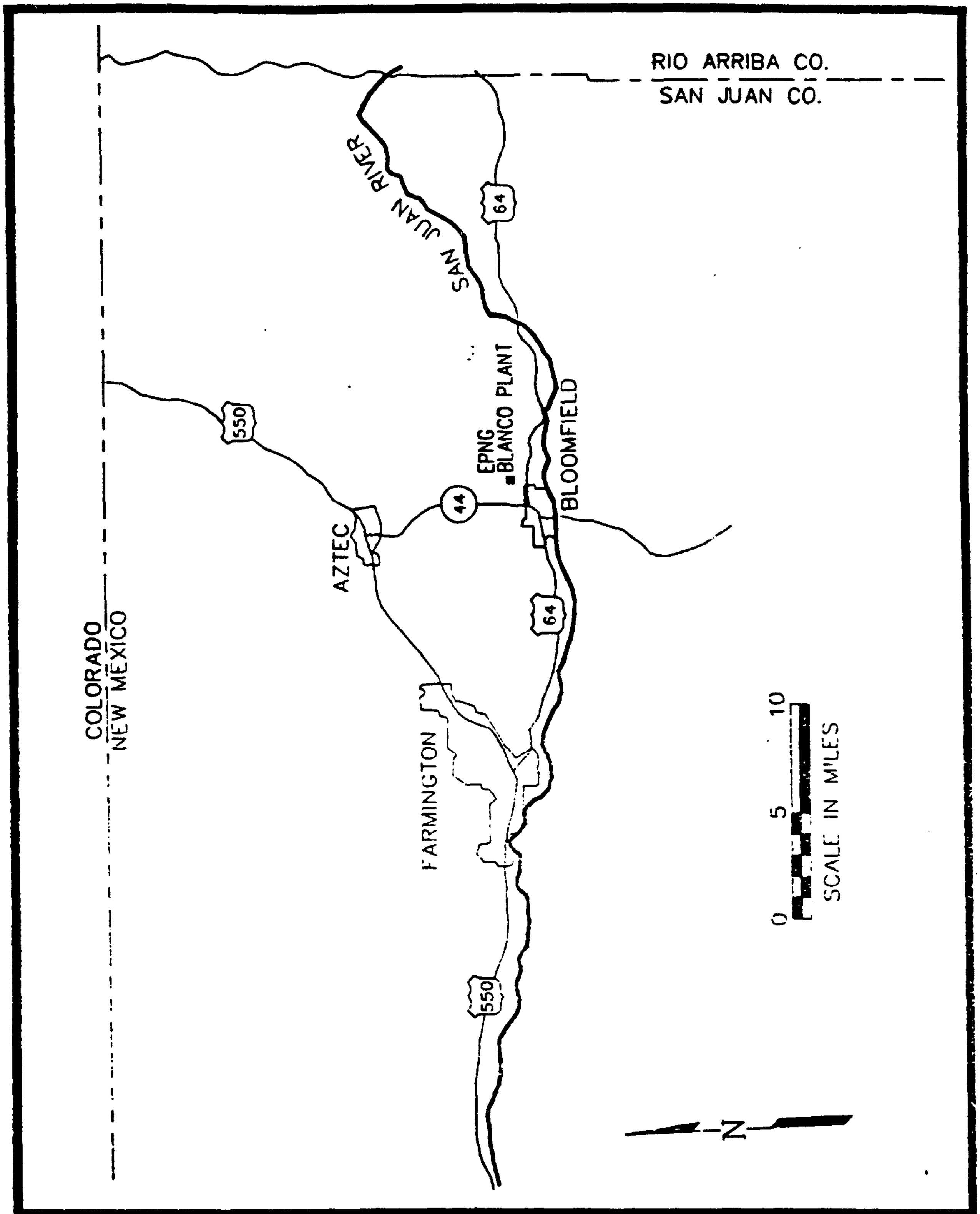
The following sections detail the site characteristics, in particular, the location and topography, geology, hydrology, and subsurface waters encountered in the Blanco Plant area.

3.1 SITE LOCATION AND TOPOGRAPHY

The EPNG Blanco Plant occupies approximately 230 acres located northeast of Bloomfield, New Mexico (Figure 3.1). The plant is located in a primarily uninhabited area with some agricultural and residential areas to the southwest. The topography surrounding the plant is dominated by a relatively flat surface that gently slopes toward the south. The elevations in the plant area range from 5,670 to 5,560 feet above sea level. These elevations represent an average slope toward the Citizens Ditch, located at the southern boundary of the plant.

3.2 SITE GEOLOGY

The plant is located on Quaternary alluvium, which fills a canyon cut into the Nacimiento Formation (Paleocene). The alluvium consists of interbedded fine to coarse sands, gravels, and clays deposited in fluvial and alluvial environments (EPNG, 1988). The thickness of the alluvium at the plant ranges from less than 5 feet to greater than 60 feet. Based on boring logs, the thickness of the alluvium in the field plant area increases to the north and east with only a thin veneer of alluvium in the "D" Plant area. Cores recovered from the "D" Plant area indicate that fractures exist in the shallow bedrock. The underlying Nacimiento Formation, deemed bedrock, consists of interbedded coarse- to medium-grained arkosic sandstone, siltstone, and shale which represent both channel fill and flood plain



El Paso
Natural Gas Company

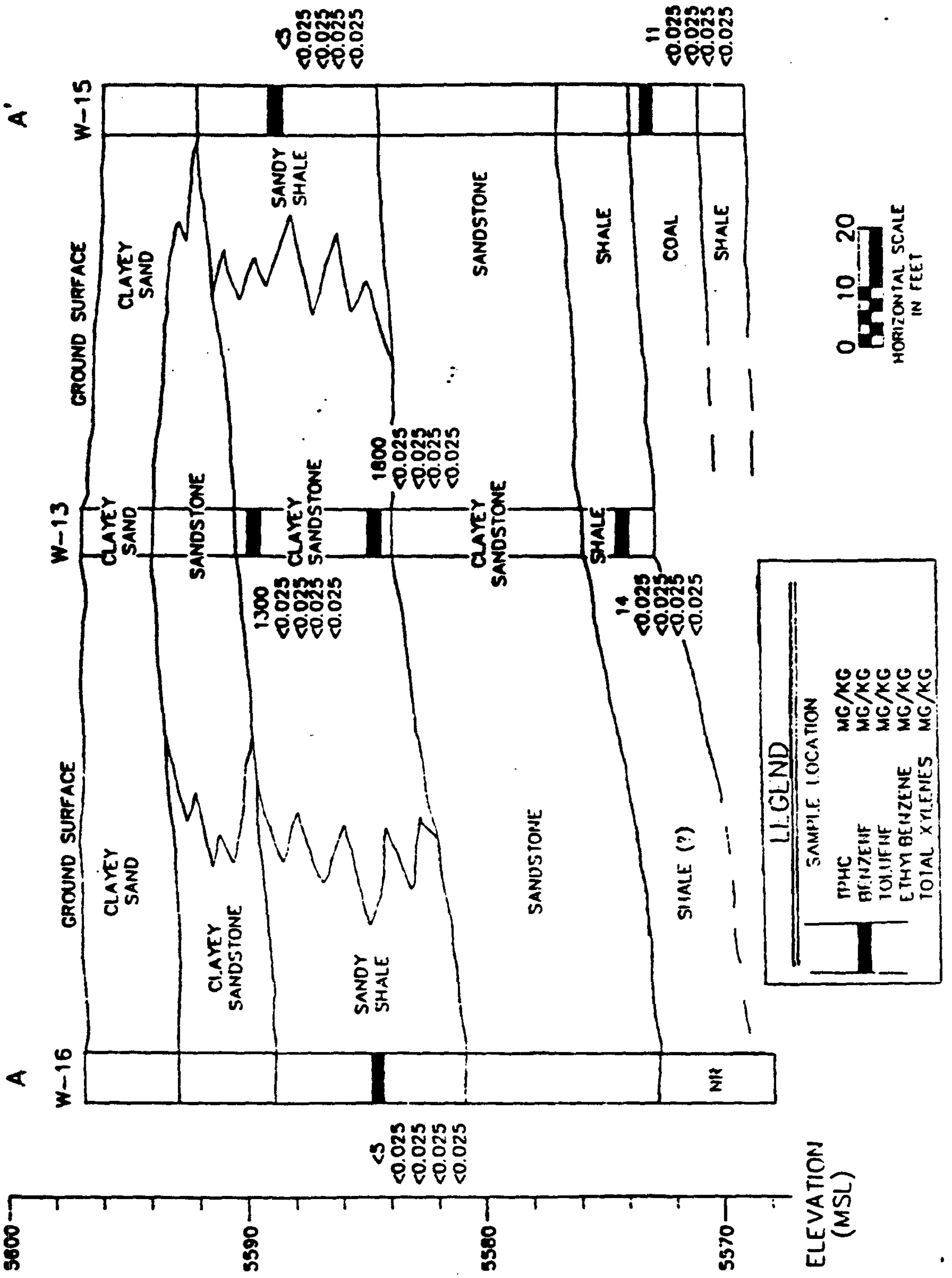
LOCATION OF THE EPNG
BLANCO PLANT

PROJECT: EPNG 63716 (EPNGBLMP) | LOCATION: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC. | DATE: 2-6-90

APPR: | DRAWN BY: RSW | SCALE: AS SHOWN

DATE: | DATE: 2-6-90 | FIGURE: 3.1



El Paso
Natural Gas Company

STRATIGRAPHIC CROSS SECTION
SHOWING SAMPLE LOCATIONS

PROJECT: EPNG 63716 (EPNGXSEC)			LOCATION: BLANCO PLANT		
K.W. BROWN & ASSOCIATES, INC.				DATE:	2-6-90
APPR:			DRAWN BY:	RSW	SCALE: AS SHOWN
DATE:			DATE:	2-6-90	FIGURE: 3.2

deposits (EPNG, 1988). Figure 3.2 illustrates the stratigraphy of the subsurface in the "D" Plant area (the location of this cross-section is in Section 5.0, shown on Figure 5.1).

3.3 SITE HYDROLOGY

Two distinct water tables exist in the Blanco Plant area. The deep water table is contained in the alluvium underlying the plant and occurs at a depth of approximately 52 to 56 feet below ground surface. The alluvium is an unconfined aquifer limited laterally by the edges of the canyon. The direction of groundwater flow, controlled by the buried canyon, trends from north-northeast to south-southwest. The main source of recharge of the alluvium is from rainfall. The average hydraulic gradient within the alluvial aquifer is approximately 0.006 ft/ft across the plant. Based on previous bail test, hydraulic conductivity values for the alluvium range from 6.4 x 10^4 to 1.4 x 10^5 cm/sec (Bechtel Environmental, Inc., 1989). The groundwater flow velocity, using an average hydraulic conductivity of 2.1 x 10^4 cm/sec and an effective porosity of 30%, equals approximately 4.4 ft/yr.

The shallow water table is contained in the Nacimiento Formation near the "D" Plant. This water table occurs at a depth of approximately 10 to 22 feet below ground surface. The direction of groundwater flow in the shallow water table could not be discerned from the available data. More wells are needed to better define the flow in this formation. Based on recent bail tests conducted on W-12, W-13, and W-15, hydraulic conductivity values for this shallow water-bearing strata range from 3.6 x 10^3 to 6.8 x 10^4 cm/sec. The lateral extent of this aquifer is unknown.

The presence of a perched water table occurring at the depth that corresponds with the seepage zone intercepted by the collector well was not confirmed during drilling activities conducted by KWB&A. To verify the presence or absence of this saturated zone, two monitoring wells were completed at the same mean sea level (MSL) elevation as the seepage zone; neither well produced water. Furthermore, core samples from surrounding monitoring wells were examined for saturation at the seepage depth and none was noted. Therefore, it is concluded a third aquifer system does not exist in the "D" Plant area, and that this zone of saturation is highly localized.

3.4 SURFACE WATER

The plant is situated at the mouth of a canyon that is oriented approximately north-south, and does not support permanent surface water. Rather, the surface water that is present is ephemeral in nature and occurs in response to precipitation events. Limited surface water is produced in the area, with an average precipitation of approximately 8.5 inches per year (EPNG, 1988). Drainage is toward the south, through the plant area, and into the Citizens Ditch. Storm runoff, when it occurs, is intercepted north of the plant and channeled into drainage ditches on each side of the plant. The major hydrologic feature in the area is the San Juan River, located approximately 1.5 miles south of the plant.

4.0 CHARACTERIZATION OF EXISTING WELLS

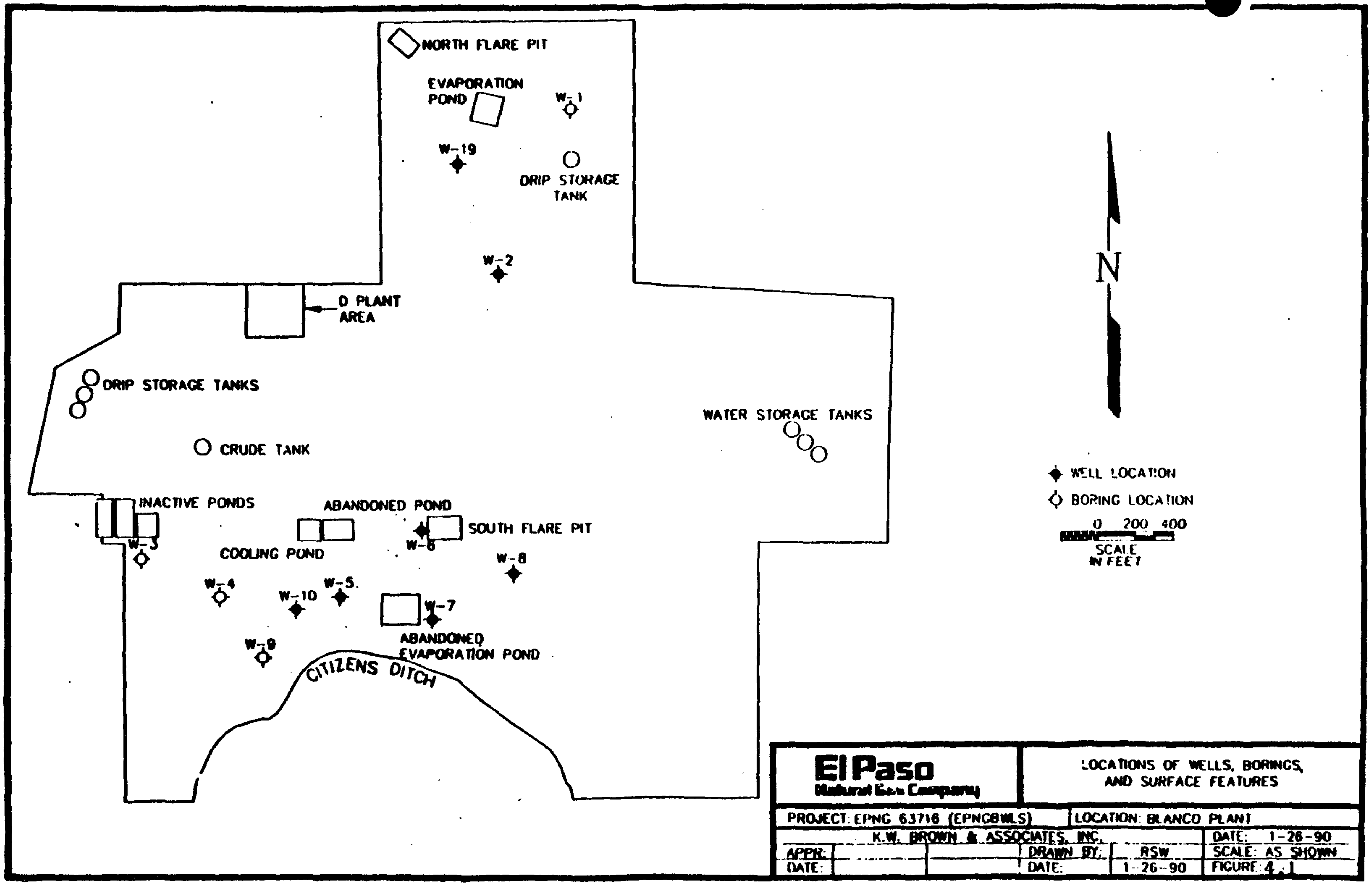
The locations of six monitoring wells that were previously installed at the Blanco Plant are shown on Figure 4.1. These wells were constructed as part of a preliminary groundwater investigation of the plant (Bechtel Environmental, Inc., 1989). Completion depths for these wells vary, but they appear to tap the water-bearing strata within the alluvium. Depth-to-water (D-T-W) measurements were taken in each well by KWB&A on January 8, 1990. The total well depth, D-T-W measurements, and MSL elevations for these wells are presented in Table 4.1.

Table 4.1 D-T-W Information on the Preexisting Monitoring Wells.

Well No.	Total Depth	D-T-W* (feet)	D-T-W (MSL)
W-2	57.5	51.87	5564.1
W-5	20.0	14.05	5552.5
W-6	31.0	21.22	5555.8
W-7	21.0	17.65	5551.4
W-8	35.0	26.47	5553.8
W-10	15.0	12.59	5551.6

* Measurements taken on January 8, 1990.

During the 1988 groundwater study six monitoring wells and four borings were drilled in the plant area. These borings were intended to be monitoring wells, but did not penetrate a water-bearing strata, and thus, were not completed as wells. The borings were drilled in a thin veneer of alluvium and reached the underlying Nacimiento Formation before penetrating the alluvial water table.



El Paso Natural Gas Company

LOCATIONS OF WELLS, BORINGS, AND SURFACE FEATURES

PROJECT: EPNG 63716 (EPNGBWLS)
LOCATION: BLANCO PLANT
K.W. BROWN & ASSOCIATES, INC.
APPR:
DATE:
DRAWN BY: RSW
DATE: 1-26-90
DATE: 1-26-90
SCALE: AS SHOWN
FIGURE: 4.1

5.0 MONITORING WELLS INSTALLED BY KWB&A

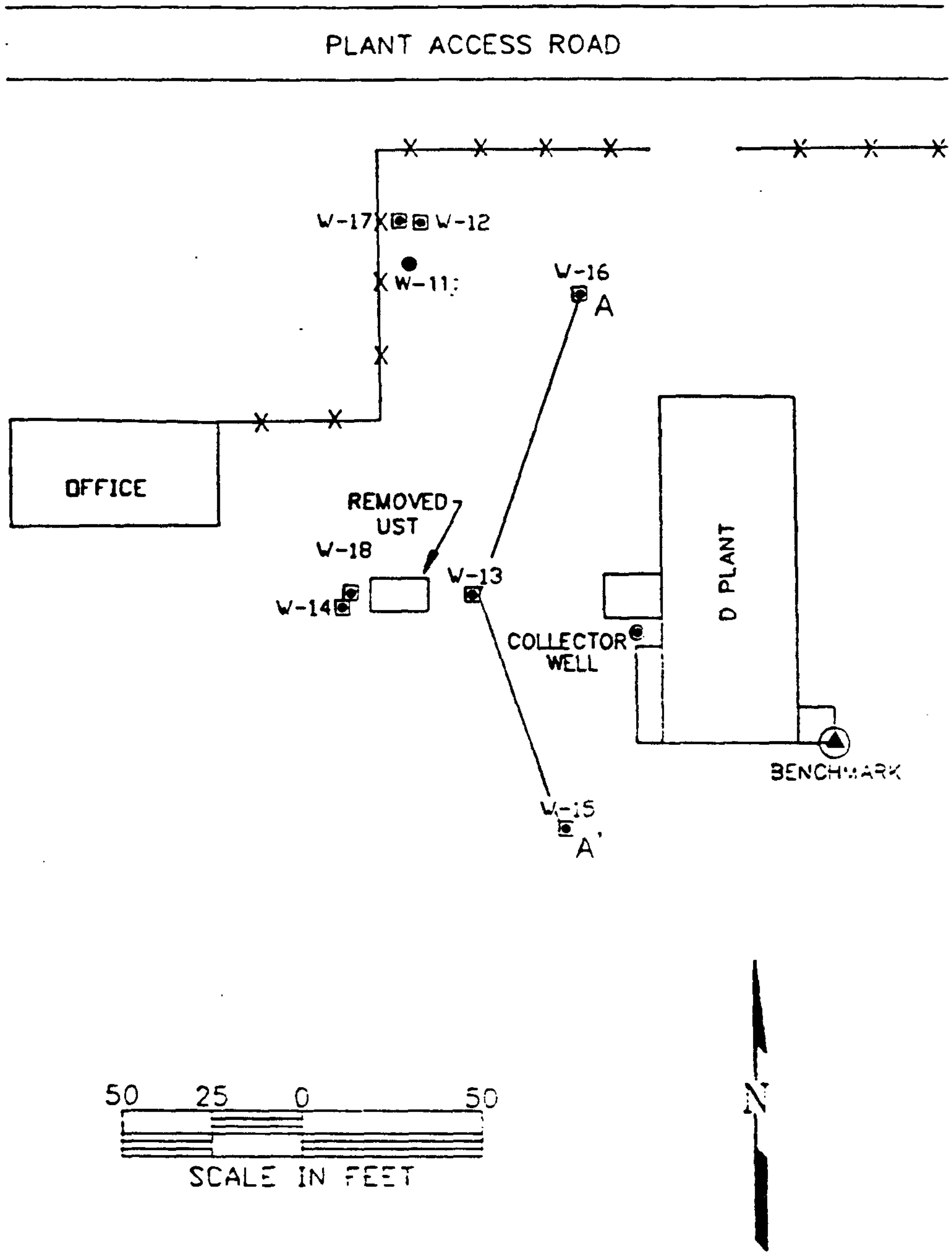
Eight additional monitoring wells were installed by KWB&A within the plant area after an initial 70-foot boring (W-11) was drilled near "D" Plant to obtain information on the underlying strata. These eight wells included: one well downgradient of the North Flare Pit, five wells near "D" Plant to depths of approximately 25 feet, and two wells near "D" Plant to depths of approximately 12 feet (Figures 4.1 and 5.1).

The well downgradient of the North Flare Pit (W-19) was installed in an effort to identify a potential source of nitrate. The five wells (W-12, -13, -14, -15, and -16) near the "D" Plant, which are approximately 25 feet in depth, were installed to assess the impact of the leaking UST. Finally, the other two wells (W-17 and W-18) near "D" Plant, 12 feet in depth, were completed at the same MSL elevation as the seepage zone as an attempt to determine the water source.

5.1 WELL INSTALLATION AND DEVELOPMENT

All the drilling in the plant was completed with a rotary-air drilling rig operated by MO-TE Drilling, Inc. (Farmington, New Mexico). Continuous samples were taken in the majority of the wells with a 5-foot core barrel and logged in the field notebook. The initial boring (W-11) and W-19 were logged from cuttings.

Each well was constructed using 2-inch I.D., schedule 40 flush-threaded PVC casing with screens 3-, 5-, or 10-feet long with 0.010-inch machine slots. A silica sand pack was installed



El Paso
Natural Gas Company

LOCATIONS OF WELLS AND BORINGS
IN D PLANT AREA

PROJECT: EPNG 63716 (EPNGWLBO) | LOCATION: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC. | DATE: 02/07/90

APPR: | DRAWN BY: RMM | SCALE: AS SHOWN

DATE: | DATE: 02/07/90 | FIGURE 5.1

around the slotted interval and capped with a bentonite seal using 0.5-inch bentonite pellets. The remaining annular space was grouted with Type 1 & 2 Ideal cement using a tremie pipe. Each monitoring well was protected with a 3-foot square concrete pad with lockable well cover or lockable man-hole cover. Well completion details for each well and the boring log for W-11 are presented in Appendix A.

Each well was developed to remove fine-grained sediments that had accumulated within the casing. The procedure involved manually bailing the wells with disposable polypropylene bailers. Bailing continued until the turbidity of the water was negligible, the majority of the sediments had been removed, and the pH and electrical conductivity (EC) of the groundwater had stabilized. Groundwater samples were collected and field tests, including temperature, pH, and EC measurements, were recorded. The EC and pH measurements of groundwater samples ranged from 12,500 to 19,500 μmhos/cm and 4.4 to 7.3, respectively. The list of field results is presented in Table 5.1.

Table 5.1 Field Results for the New Monitoring Wells.

Well No.	Temp. (° C)*	pH*	EC*
W-12	16.3	7.3	13,500
W-13	16.6	7.2	14,000
W-14	15.5	4.5	19,500
W-15	15.1	4.4	14,200
W-16	14.7	6.1	14,000
W-19	14.5	7.2	12,500

* Measurements taken on January 15, 1990.

5.2 GROUNDWATER FLOW

Based on previous reports, the direction of groundwater flow in the alluvium trends from north-northeast to south-southwest. Using D-T-W measurements from each monitoring well and correcting the values to MSL elevations, it is possible to determine the prevailing groundwater flow direction. The total well depth, D-T-W measurements, and MSL elevations for the wells are listed in Tables 4.1 and 5.2.

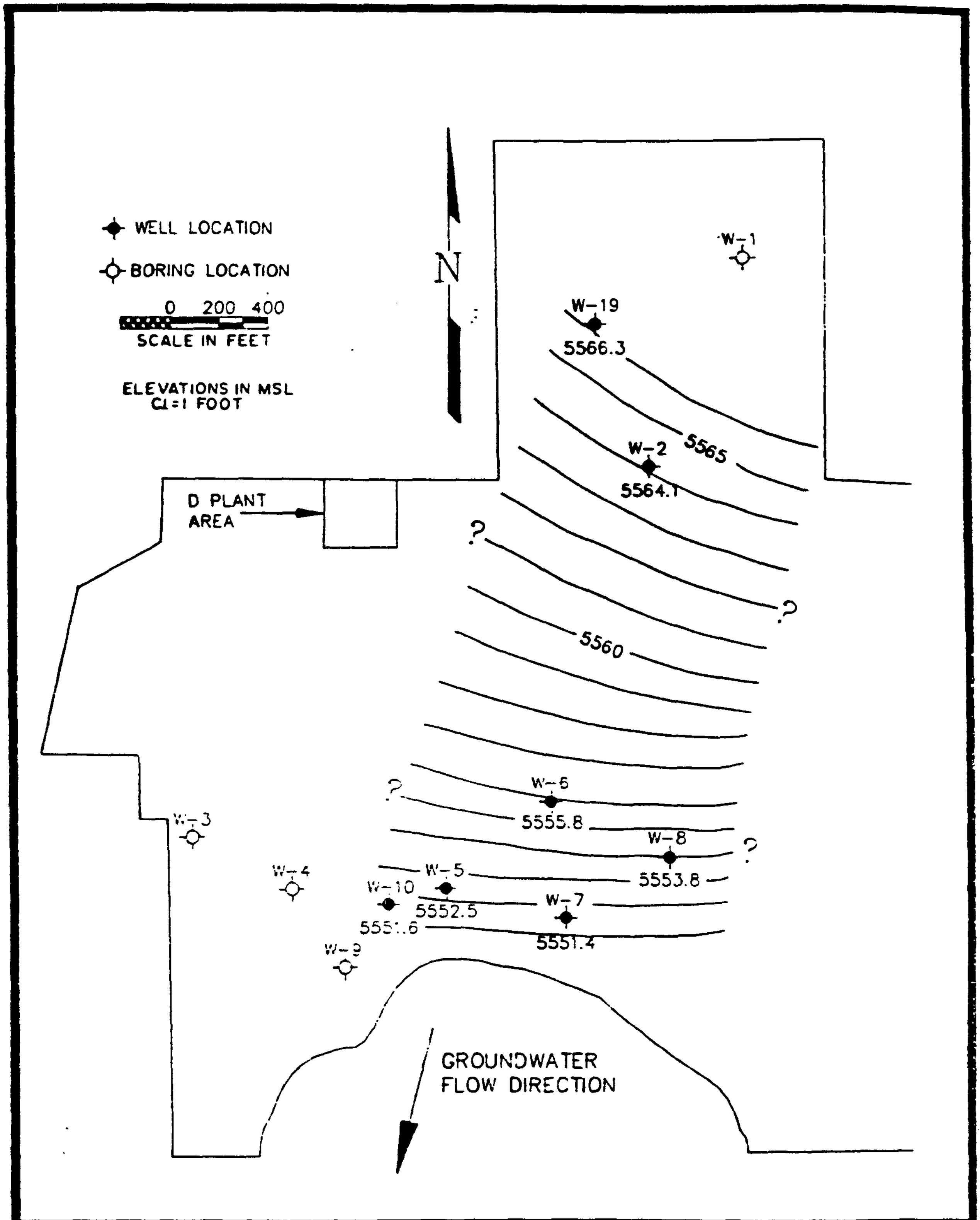
Table 5.2 D-T-W Information on the New Monitoring Wells.

Well No.	Total Depth	D-T-W* (feet)	D-T-W (MSL)
W-12	25.0	21.4	5580.0
W-13	23.8	17.7	5579.7
W-14	27.4	21.5	5576.6
W-15	26.9	20.0	5576.4
W-16	29.0	27.3	5570.2
W-17	12.0	dry	NA
W-18	11.0	dry	NA
W-19	66.0	55.7	5566.3

* Measurements taken on January 15, 1990.

As stated previously, D-T-W measurements and stratigraphic descriptions have identified two distinct water tables, a deep water table (approximately 52 to 56 feet below ground surface) in the alluvium and a shallow water table (approximately 18 to 22 feet below ground surface) in the Nacimiento Formation near "D" Plant. The water level information indicates the prevailing groundwater flow direction in the alluvium is toward the south-southwest (Figure 5.2). The prevailing groundwater flow direction in the Nacimiento system could not be discerned. The MSL elevations for the system are presented in Figure 5.3.

Based on the cores collected during the investigation, downward percolating waters appear to be controlled partially by fracture flow. Oxidation (rust staining) and contamination (gray staining) along fractures in cores collected near the removed UST provided evidence that flow had occurred by this mechanism.



El Paso
Natural Gas Company

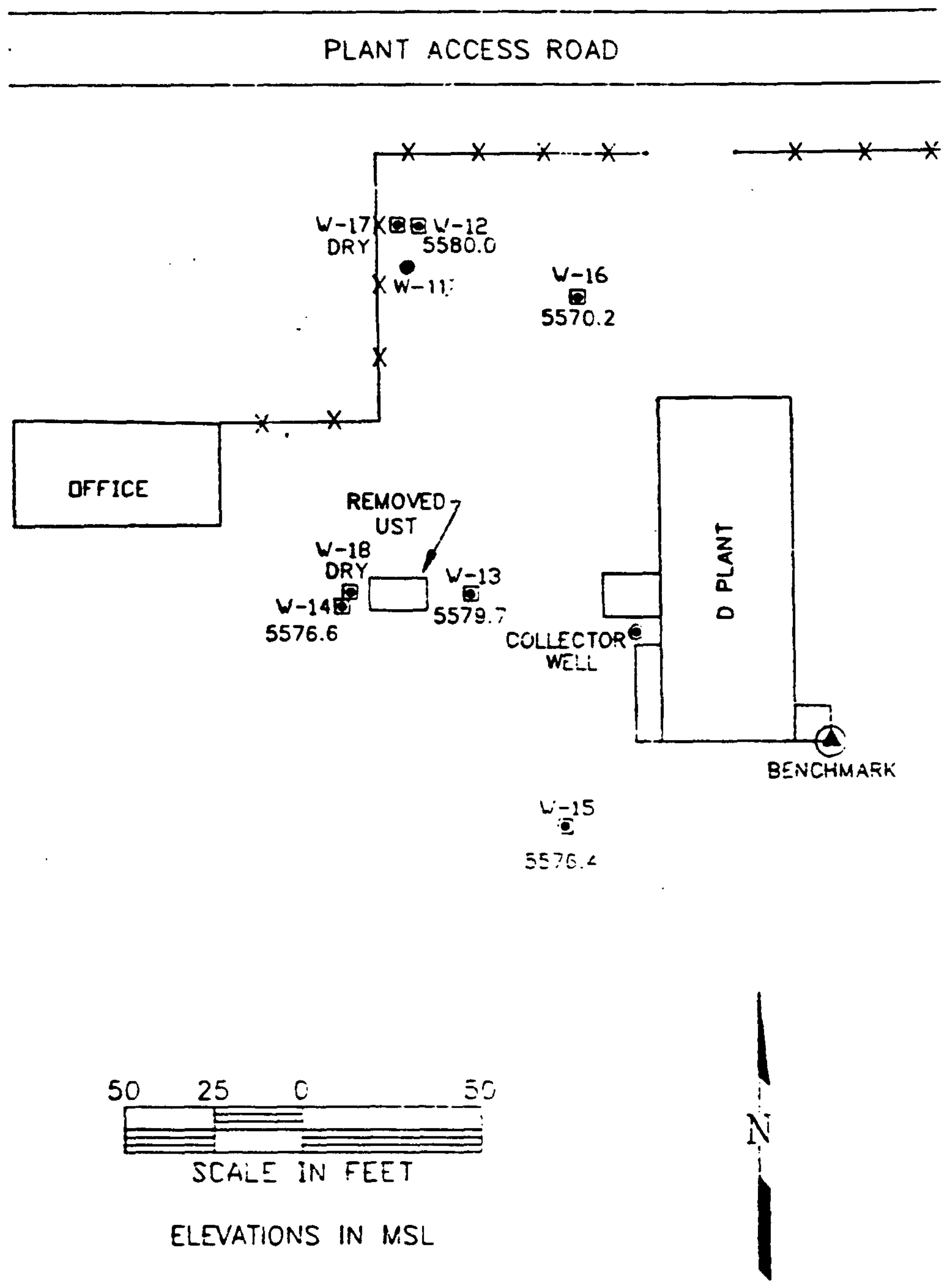
GROUNDWATER ELEVATIONS
IN THE ALLUVIUM AQUIFER

PROJECT: EPNG 63716 (EPNGDEPT) | LOCATION: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC. | DATE: 02/07/90

APPR: | DRAWN BY: RMM | SCALE: AS SHOWN

DATE: | DATE: 02/07/90 | FIGURE: 5.2



El Paso
Natural Gas Company

GROUNDWATER ELEVATIONS IN
THE NACIMIENTO AQUIFER

PROJECT: EPNG 63716 (EPNGWLBC)			LOCATION: BLANCO PLANT		
K.W. BROWN & ASSOCIATES, INC.					DATE: 02/07/90
APPR:			DRAWN BY:	RMM	SCALE: AS SHOWN
DATE:			DATE:	02/07/90	FIGURE: 5.3

NMOCD suspected that a groundwater mound existed in the area of the removed UST; therefore, shallow monitoring wells were installed east and west of the location of the removed UST.

Anomalously high water levels, relative to the surrounding water levels, would be expected in the case of groundwater mounding. These conditions do exist; however, the high water levels in the "D" Plant area (MSL elevation of approximately 5,576 to 5,580 feet) relative to the surrounding alluvium (MSL elevation of approximately 5,550 to 5,566 feet) are due to the fact that the water encountered near "D" Plant is an entirely different water table. As stated previously, two water tables exist in the Blanco Plant. The high water levels exhibited in the "D" Plant area are the result of the shallow aquifer in the Nacimiento Formation and not the result of groundwater mounding.

6.0 SAMPLE COLLECTION

To assess the impact of the leaking UST, both soil and groundwater samples were collected from the Blanco Plant. Collection of soil samples was limited because of the lack of soil and the overabundance of rock in the plant area. Trenching was initially attempted near "D" Plant in an effort to collect soil samples. But the numerous buried utility lines, and the presence of an extremely hard sandstone encountered approximately 3 feet below the ground surface, precluded further trenching.

6.1 SOIL SAMPLES AND ANALYSIS

All soil samples were collected using a 3-inch-diameter, 5-foot-long core barrel. Upon retrieval of the core barrel, the entire core was scanned with a photo-ionization detector (PID) to determine the presence of organic vapors. The PID readings for various cores are presented in Table 6.1. The PID was calibrated to 55 ppm prior to use with isobutylene (in air). Physical samples were collected from random depths (depending on the presence of loose soil), placed in labeled glass jars, logged onto a chain-of-custody form, packed on ice, and shipped to the contract laboratory. The remaining cores were placed in core boxes and stored at the plant and can be used for future reference. The core barrel was decontaminated between sampling events using distilled water and detergent.

The proposed soil analysis included BTEX and total petroleum hydrocarbons (TPH), including chlorinated hydrocarbons. The soil analytical data (Appendix B) are summarized in Table 6.2. A profile of the soil contaminated with depth is presented in Figure 3.2.

Table 6.1 PID Readings from Core Samples.

Well No.	Depth (feet)	PID Reading (ppm)
W-12	0.0 - 25.0	NA
W-13	10.0	1,100
W-13	11.0	50
W-13	12.0	200
W-13	14.0	500
W-13	15.0	580
W-13	16.0	160
W-13	18.0	25
W-13	18.5	380
W-13	19.0	100
W-13	20.0	NAB
W-13	21.0	170
W-13	22.0 - 23.8	NAB
W-14	5.0	1,050
W-14	8.5	550
W-14	9.0	1,700
W-14	10.0	1,700
W-14	11.0	1,700
W-14	12.0	1,600
W-14	13.0	1,700
W-14	16.0	40
W-14	16.5	400
W-14	18.0	200
W-14	20.5	210
W-14	24.0 - 27.0	NAB
W-15	4.0 - 26.9	NAB
W-16	4.0 - 29.0	NAB
W-17	4.0 - 12.0	NAB
W-18	0.0 - 11.0	NA
W-19	55.0 - 66.0	2,000*

NAB = not above background level (1.5 ppm)
NA = not available
* reading taken from inside PVC casing

Table 6.2 Soil Analytical Data.

	WELL & SAMPLE DEPTH (feet)										
ANALYSIS	W-13 7	W-13 12	W-13 22.5	W-14 8	W-14 10	W-14 24.5	W-15 7	W-15 22.5	W-16 12	W-17 10	Lab Blank
TPH *	1300	1800	14.0	670.0	< 5.0	16.0	< 5.0	11.0	< 5.0	< 5.0	< 5.0
Benzene #	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0
Toluene #	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0
Ethylbenzene #	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0
Total Xylenes #	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0

* **Concentration units in mg/kg**
# **Concentration units in ug/kg**

6.2 GROUNDWATER SAMPLES AND ANALYSIS

Three bore volumes were purged from each monitoring well prior to collecting the groundwater samples with disposable polypropylene bailers. The samples were placed in labeled bottles, logged onto a chain-of-custody form, packed on ice, and shipped to the contract laboratory.

The groundwater analysis included BTEX, TPH, nitrates (NO_3), and total dissolved solids (TDS). In addition, W-12, W-14, and the collector well were analyzed for soluble salts. The soluble salts analysis was performed to determine if a common groundwater source existed. The TPH and NO_3 analysis bottles were preserved with H_2SO_4 and the BTEX bottles were spiked with HCl. The groundwater analytical data (Appendix C) have been summarized in Table 6.3. These data are also presented in map view in Figures 6.1 and 6.2.

6.3 DISCUSSION

The following is a discussion of the results of the field investigation, in particular, the contamination of the soils and groundwater, the cation/anion concentrations, and other field observations.

6.3.1 Soils

Contaminated strata were encountered in W-13 and W-14, which are less than 10 feet from the location of the removed UST. The fractured, clayey sandstones in W-13 were stained gray from depths of 6 to 13 feet below ground surface. This interval exhibited faint hydrocarbon odors and PID readings ranged from 50 to 1,100 ppm. Samples taken from

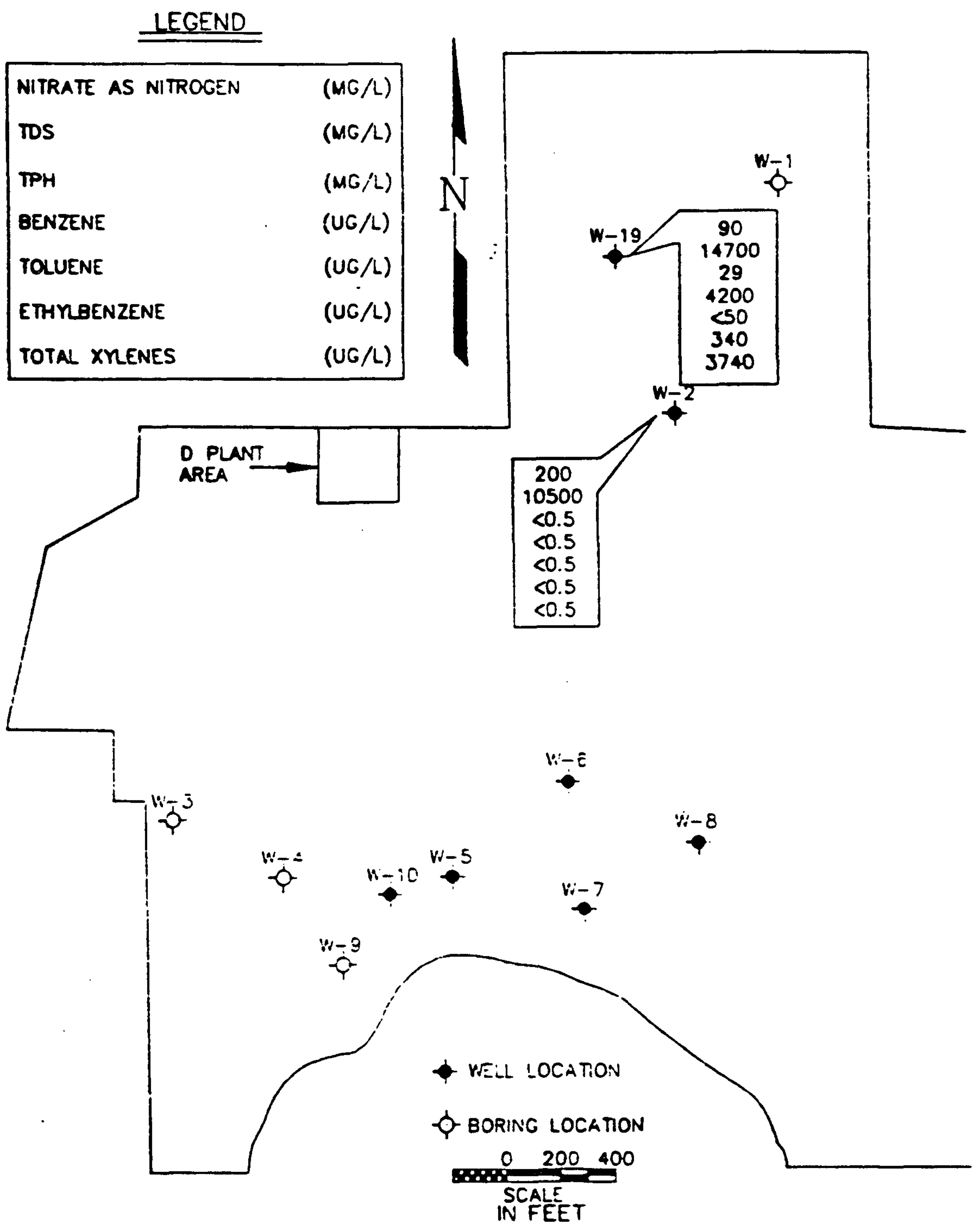
Table [illegible] Groundwater Analytical Data

	WELL										NMWQCC
ANALYSIS	Field Blank	W-2	W-12	W-13	W-13 Dup.	W-14	W-15	W-16	W-19	Collector	Standards
TPH *	< 0.5	< 0.5	< 0.5	< 0.5	1.0	< 0.5	< 0.5	NA	29.0	970.0	NA
Benzene #	< 0.5	< 0.5	< 0.5	4.4	5.8	1.5	< 0.5	1.0	4200	0.9	10.0
Toluene #	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 50.0	< 0.5	750.0
Ethylbenzene #	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	340.0	< 0.5	750.0
Total Xylenes #	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.8	3740	< 0.5	620.0
Carbonate *	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	< 1.0	NA
Bicarbonate *	NA	NA	627.0	NA	NA	11.0	NA	NA	NA	116.0	NA
Hydroxide *	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	< 1.0	NA
Total Alkalinity *	NA	NA	627.0	NA	NA	11.0	NA	NA	NA	116.0	NA
Chloride *	NA	NA	46.0	NA	NA	230.0	NA	NA	NA	78.0	NA
Nitrite *	NA	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate *	< 0.1	200.0	9.6	16.4	16.4	210.0	89.0	NA	90.0	< 0.1	10.0
Sulfate *	NA	NA	11,000	NA	NA	20,000	NA	NA	NA	2050	600.0
TDS *	< 10.0	10,500	16,700	18,900	18,600	34,400	24,100	NA	14,700	2600	10,000
Calcium *	NA	NA	375.0	NA	NA	431.0	NA	NA	NA	109.0	NA
Potassium *	NA	NA	17.1	NA	NA	26.8	NA	NA	NA	9.1	NA
Magnesium *	NA	NA	169.0	NA	NA	774.0	NA	NA	NA	54.6	NA
Sodium *	NA	NA	4710	NA	NA	8380	NA	NA	NA	543.0	NA
pH	NA	7.3	7.3	7.2	7.2	4.5	4.4	6.1	7.2	7.4	6.0 - 9.0
EC	NA	9700	13,500	14,000	14,000	19,500	14,200	14,000	12,500	2600	NA

* Concentration units in mg/l

\# Concentration units in ug/l

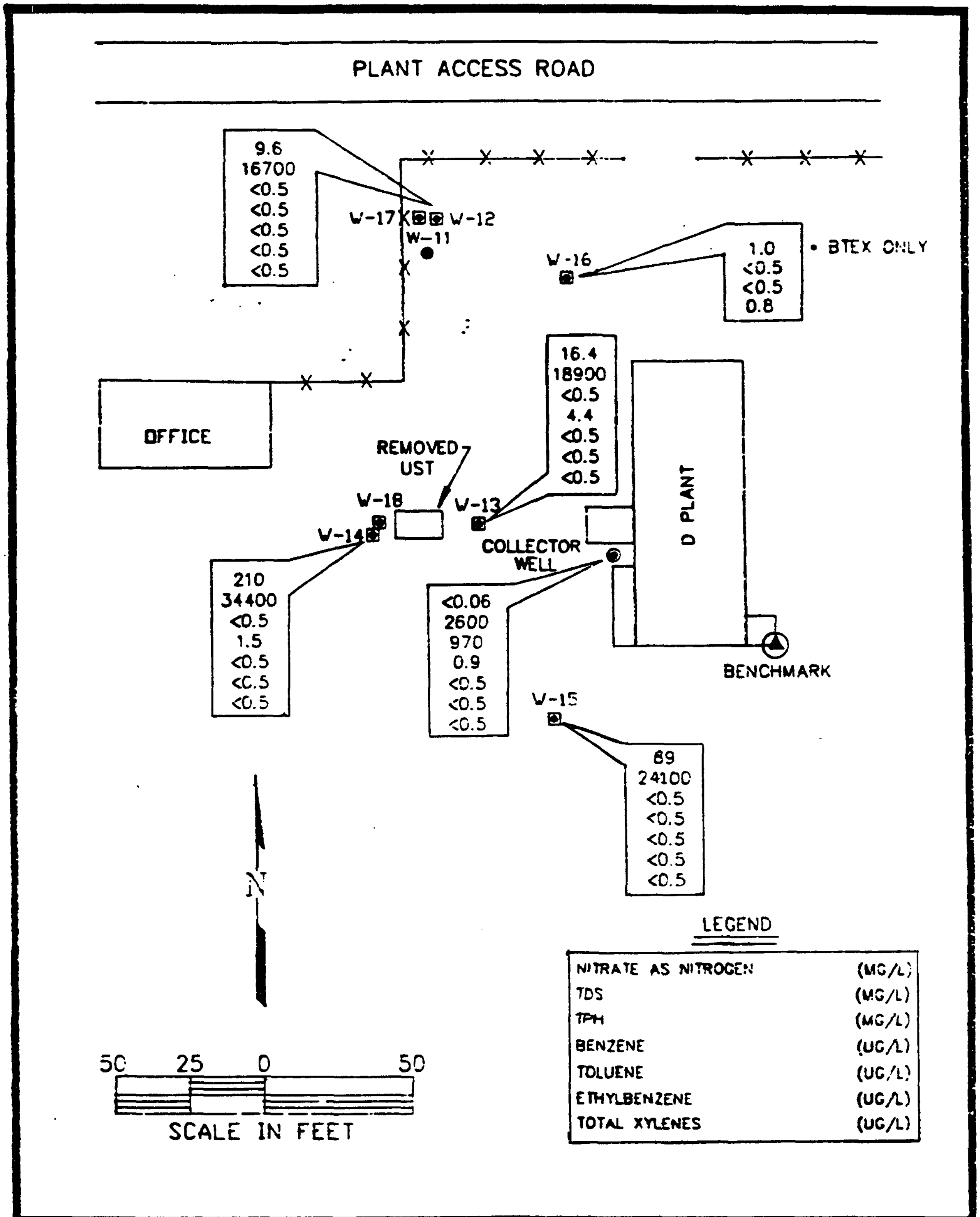
NA = not available



El Paso
Natural Gas Company

GROUNDWATER ANALYTICAL DATA FROM THE ALLUVIUM AQUIFER

PROJECT: EPNG 63716 (EPNGDEPT)		LOCATION: BLANCO PLANT		
K.W. BROWN & ASSOCIATES, INC.				DATE: 02/07/90
APPR:		DRAWN BY:	RMM	SCALE: AS SHOWN
DATE:		DATE:	02/07/90	FIGURE: 6.1



El Paso
Natural Gas Company

GROUNDWATER ANALYTICAL DATA FROM THE NACIMIENTO AQUIFER

PROJECT: EPNG 63716 (89432) | LOCATION: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC. | DATE: 02/06/90

APPR:			DRAWN BY:	RMM	SCALE: AS SHOWN
DATE:			DATE:	02/06/90	FIGURE: 6.2

depths of 7, 12, and 22.5 feet in W-13 exhibited TPH values of 1,300, 1,800, and 14 ppm, respectively, but BTEX values were less than 25 ppb. The fractured, clayey sandstones in W-14 were stained gray from depths of 7 to 19 feet below ground surface. This interval exhibited faint to strong hydrocarbon odors, and PID readings ranged from 40 to 1,700 ppm. Samples taken from depths of 8, 10, and 24.5 feet in W-14 exhibited TPH values of 670, <5, and 16 ppm, respectively, but BTEX values were less than 25 ppb.

Strata with no visual contamination, and PID readings not above background levels, were encountered throughout the entire cored interval in the surrounding wells (W-15, -16, and -17). Samples from 7 and 22.5 in W-16 and from 10 feet in W-17 exhibited TPH values <5 ppm. The BTEX values for all wells were less the 25 ppb.

6.3.2 Groundwater

The contamination in the groundwater is somewhat correlative with the soil contamination. Although the TPH values in the soil samples ranged from less than 5 to 1,800 ppm, the values for all the groundwater samples in the vicinity of d Plant were less than 0.5 ppm. The BTEX concentrations in all the groundwater samples were less than 0.5 ppb, with the exception of 4.4 ppb benzene in W-13, 1.5 ppb benzene in W-14, and 1.0 ppb benzene and 0.8 ppb total xylenes in W-16. These BTEX concentrations were discovered in the groundwater even though the soil samples exhibited concentrations less than 0.5 ppb.

Based on NMWQCC regulations (amended through December 24, 1987), the human health standards for groundwater of 10,000 ppm TDS or less are 10 ppb benzene, 750 ppb toluene, 750 ppb ethylbenzene, and 620 ppb total xylenes. No standard is available for TPH. The groundwater in the vicinity of "D" Plant, however, exhibited TDS concentrations ranging from 16,700 to 34,400 ppm. Even though the shallow water is exempt from the NMWQCC standards, based on the greater than 10,000 ppm TDS values, it is worth noting that the laboratory values for BTEX do not exceed the standards.

6.3.3 Cation/Anion Concentrations

As stated previously, a decision was made during the field investigation to have groundwater samples analyzed for major cations and anions. The logic behind this decision stems from the desire to support the stratigraphic data that indicate that two or more separate groundwater systems exist. Hence, the lab was requested to analyze for sodium, potassium, magnesium, calcium, chloride, sulfate, carbonate, and bicarbonate in selected monitoring wells, including W-12, W-14, and the collector well. Wells in the alluvial water table were not selected because cation/anion data already exist for a number of these wells.

The existence of notable differences in the cation/anion ratios was discovered upon receipt of the laboratory results for the groundwater samples and analyzing the data (inclusive of the existing data). First, water quality from the collector well (seepage zone) indicates its salinity, as measured by TDS, is an order of magnitude lower than water collected from monitoring wells installed in the Nacimiento water table. Second, groundwater from the Nacimiento shallow water table contains up to five times the concentration of sodium sulfate as measured for groundwater from the alluvial water table.

One notable similarity among virtually all groundwater samples from monitoring wells at the site, whether the wells are completed in the Nacimiento water table, the alluvial water table, or the seepage zone, is the presence of sodium sulfate (Thenardite). With the exception of W-5, all wells yielded groundwater samples where sodium is the dominant cation and sulfate is the dominant anion. In the case of W-5, calcium has replaced sodium as the dominant cation; however, sulfate remains the dominant anion. Finding sodium sulfate and calcium sulfate as the predominant constituents is consistent with the hydrogeochemistry of the San Juan Basin.

Table 6.4 illustrates the constituents of major cations and anions in groundwater samples used to formulate the preceding discussion. The analytical data presented in this table have been converted to milliequivalents per liter (meq/l) to aid the interpretation.

6.3.4 Field Observations

In addition to the aforementioned data and analyses, the following observations were noted at the Blanco Plant during sampling:

- Anomalously low pH readings of 4.5 and 4.4 were recorded for W-14 and W-15, respectively. Groundwater purged from W-14 had dark amber coloration and that from W-15 was slightly discolored. A possible source for the acidic condition may be contamination from the UST; however, the TPH values for both wells were less than 0.5 ppm and the BTEX concentrations were less than 0.5 ppb, with the exception of 1.5 ppb benzene in W-14. The

Table 6.4 Major Cations and Anions in Groundwater.

	W-12 Jan-90	W-12 Jan-90	W-14 Jan-90	W-14 Jan-90	Collector Well Jan-90	Collector Well Jan-90
CATIONS	*mg/l*	*meq/l*	*mg/l*	*meq/l*	*mg/l*	*meq/l*
Sodium	4,710.0	204.9	8,380.0	364.5	543.0	23.6
Potassium	1,701.0	43.5	26.8	0.7	9.1	0.2
Magnesium	169.0	13.9	774.0	63.7	54.6	4.5
Calcium	375.0	18.7	431.0	21.5	109.0	5.4
Sum	6,955.0	281.0	9,611.8	450.4	715.7	33.8
ANIONS	*mg/l*	*meq/l*	*mg/l*	*meq/l*	*mg/l*	*meq/l*
Chloride	46.0	1.3	230.0	6.5	78.0	2.2
Sulfate	11,000.0	229.0	20,000.0	416.4	2,050.0	42.7
Bicarbonate	627.0	10.3	11.0	0.2	116.0	1.9
Nitrate-N	9.6	0.2	210.0	3.4	0.0	0.0
Sum	11,682.6	240.8	20,451.0	426.5	2,244.0	46.8
+- Balance as % Relative Diff		15.4%		5.5%		-32.3%

	W-2 Sep-88	W-2 Sep-88	W-5 Sep-88	W-5 Sep-88	W-6 Sep-88	W-6 Sep-88
CATIONS	*mg/l*	*meq/l*	*mg/l*	*meq/l*	*mg/l*	*meq/l*
Sodium	1,680.0	73.1	59.1	2.6	796.0	34.6
Potassium	5.7	0.1	1.3	0.0	2.9	0.1
Magnesium	70.3	5.8	23.6	1.9	12.3	1.0
Calcium	473.0	23.6	689.0	34.4	532.0	26.5
Sum	2,229.0	102.6	773.0	38.9	1,343.2	62.3
ANIONS	*mg/l*	*meq/l*	*mg/l*	*meq/l*	*mg/l*	*meq/l*
Chloride	46.0	1.3	14.0	0.4	56.0	1.6
Sulfate	3,800.0	79.1	2,000.0	41.6	1,760.0	36.6
Bicarbonate	239.0	3.9	294.0	4.8	401.0	6.6
Nitrate-N	290.0	4.7	0.0	0.0	51.0	0.8
Sum	4,375.0	89.0	2,308.0	46.9	2,268.0	45.6
+- Balance as % Relative Diff		14.2%		-18.5%		30.8%

Table 6.4 Major Cations and Anions in Groundwater (cont.).

	W-7 Sep-88	W-7 Sep-88	W-8 Sep-88	W-8 Sep-88	W-10 Sep-88	W-10 Sep-88
CATIONS	*mg/l*	*meq/l*	*mg/l*	*meq/l*	*mg/l*	*meq/l*
Sodium	6.7	0.3	1,180.0	51.3	801.0	34.8
Potassium	3.3	0.1	4.2	0.1	5.2	0.1
Magnesium	26.3	2.2	56.9	4.7	97.5	8.0
Calcium	473.0	23.6	409.0	20.4	509.0	25.4
Sum	509.3	26.1	1,650.1	76.5	1,412.7	68.4
ANIONS	*mg/l*	*meq/l*	*mg/l*	*meq/l*	*mg/l*	*meq/l*
Chloride	45.0	1.3	17.0	0.5	73.0	2.1
Sulfate	1,990.0	41.4	1,610.0	33.5	2,370.0	49.3
Bicarbonate	378.0	6.2	229.0	3.8	248.0	4.1
Nitrate-N	0.3	0.0	0	0.0	1.0	0.0
Sum	2,413.3	48.9	1,856.0	37.8	2,692.0	55.5
+– Balance as % Relative Diff		-60.7%		67.9%		20.8%

acidic conditions and discoloration may be due to the nature of the strata in which the wells were completed. Both W-14 and W-15 were completed in a lignitic shale or coal-bearing strata. Acidic conditions have been reported in iron sulfide-rich coals. The iron sulfide oxidizes to ferrous sulfate, which is readily soluble and hydrolyzes to produce acidic and sulfate-rich conditions (Schaller and Sutton, 1978). High sulfate conditions (20,000 ppm) were reported in W-14. The NMWQCC standard for sulfate is 600 ppm.

- A distinct hydrocarbon odor was noticed at the time of drilling and during development of W-19, which was completed in the alluvium. A hydrocarbon odor and oily sheen were also discovered on the D-T-W probe after taking measurements in this well. The groundwater sample for W-19 exhibited high concentrations of TPH and BTEX (Table 6.3). A TPH value of 29 ppm and concentrations of 4,200 ppb benzene, < 50 ppb toluene, 340 ppb ethylbenzene, and 3,740 ppb total xylenes were reported in the well. The TDS concentration for the sample was 14,700 ppm.

7.0 NITRATE LEVELS

Abnormally high concentrations of nitrates had previously been reported in the background well, W-2 (Bechtel Environmental, Inc., 1989). The well was sampled on January 10, 1990, and analyzed for nitrates at Inter-Mountain Laboratories, Inc. A concentration of 214 ppm was reported from that analysis, so an additional background well (W-19) was installed upgradient of W-2 in an effort to identify a potential source. Both wells were sampled on January 15, 1990, and analyzed for BTEX, TPH, NO_3, and TDS. Groundwater analytical data are summarized in Table 6.3.

Results from the most recent sampling event indicate high nitrate concentrations in W-2 (200 ppm), W-19 (90 ppm), W-14 (210 ppm), and W-15 (89 ppm). High concentrations had also been reported in W-6 (51 ppm). The NMWQCC standard for nitrate is 10 ppm. Typical sources for nitrate contamination in groundwater include agricultural activities (fertilizer application) or septic systems (sewage). Inspection of the plant area, however, found neither of these sources present. Other potential sources include the presence of natural $NaNO_3$ salts in the subsurface, amines from sour gas treatment, and by-products from pigging pipelines. Regardless of the source, high nitrate concentrations are not restricted to a certain depth or strata. Also, based on the concentrations determined from both the recent and the previous sampling events (Bechtel Environmental, Inc., 1989), nitrates appear to be widespread throughout the plant area and in varying concentrations.

8.0 COLLECTOR WELL

After the discovery of a seepage zone containing a mixture of water and hydrocarbons during the excavation of the "D" Plant foundation, a collector well was installed in the area where the seepage was initially observed. The seepage occurred at a depth of approximately 9.3 feet below ground surface (McBride - Ratcliff & Associates, Inc., 1988). The collector well was screened from 10.1 to 8.6 feet below ground surface in an effort to intercept additional seepage.

Several monitoring wells were installed in the vicinity of the collector well to determine its effectiveness and aid in determining the lateral and vertical extent of the seepage. W-17 and W-18 were completed at the same MSL elevation as the seepage zone to determine the source of the water. Neither well produced water and no water was found at the seepage depth elsewhere in the plant. This implies that the shallow liquids intercepted by the collector well are localized and suggests that the source for the water is not part of an aquifer system. In addition, the flow of these shallow liquids appears to be controlled by the topography and/or structure of the underlying strata.

Water from the collector well was sampled and analyzed for BTEX, TPH, NO_3, TDS, and soluble salts. The analytical data are summarized in Table 6.3. The well exhibited an excessively high concentration of TPH (970 ppm); however, BTEX concentrations were less than 0.5 ppb with the exception of 0.9 ppb benzene. The TDS concentration for the sample was 2,600 ppm.

9.0 SURVEY DATA

The locations of the new monitoring wells surveyed on January 15, 1990, by Brewer Associates, Inc. (Farmington, New Mexico), are presented in Figure 5.1. The survey also included MSL elevations for the following: top of well cover, top of concrete, top of casing, and ground surface (Table 9.1). The elevations are relative to a benchmark on the southeast corner of "D" Plant.

Table 9.1 Survey Elevations. *

Well No.	Top of Well Cover	Top of Concrete	Top of Casing	Ground Surface
W-2	5616.26	5613.72	615.97	5613.63
W-12	5601.75	5599.17	601.44	5599.05
W-13	5597.57	5597.54	597.44	5597.38
W-14	5598.24	5598.25	598.07	5598.14
W-15	5596.58	5596.57	596.32	5596.50
W-16	5597.77	5597.75	597.43	5597.58
W-17	5601.81	5599.30	601.51	5599.16
W-18	5598.37	5598.34	598.21	5598.15
W-19	5622.38	5619.85	633.02	5619.70
Collector	5598.84			

* Elevations in MSL, relative to D Plant benchmark

10.0 CONCLUSIONS

Based on the review of the existing information and the data gathered during the site investigation, conclusions for the Blanco Plant have been formulated. The conclusions are targeted at three specific questions: 1) is the collector well effective?, 2) what is the source for elevated nitrate levels in W-2?, and 3) is there a groundwater mound in the "D" Plant area? To address these questions, the following summary of the preceding sections is offered.

1. The effectiveness of the collector well cannot be unquestionably determined. Past performance of this well clearly verifies that water and hydrocarbons are being collected. However, localized shallow liquids intercepted by the collector well suggest that the source of the water is not part of an aquifer system. This position is based on the absence of saturated conditions at an equal elevation in nearby borings and the discrepancies in water quality (anions/cations) between the collector well and local groundwater samples. Flow of these liquids appears to be controlled by topography and/or structure of the underlying strata, thereby making conventional hydrologic assessment impossible.

   Trace levels of hydrocarbons were found in the first continuous water table which underlies the area where the UST was located. Additionally, hydrocarbon staining was noted on soil cores recovered from borings from this same area. Hence, it is evident that some hydrocarbons have migrated to a depth which is inaccessible to the collector well. Using this criteria, it can be stated that the collector well is inadequate. In practical terms, the collector well will be drained, cleaned, and more closely monitored to determine the amount of water and hydrocarbon that is routinely being collected. This information will aid in determining the performance of the collector well.

2. High nitrate concentrations are not restricted to a certain depth or strata and appear to be widespread throughout the plant area and occur in varying concentrations. A point source for the high nitrate concentration was not identified since a visual investigation upgradient of the plant showed that sources from agricultural activities and septic systems are not present in the area. Additionally, plant personnel indicate that amines have not been used at the site. Therefore, virtually all man-made sources for contamination can be eliminated.

   Examination of the inorganic analytical data indicate the local groundwater is heavily-ladened with salts, predominantly sodium sulfate. Given the local climate setting and the environment of deposition for the San Juan Basin sediments, it is reasonable to assume that nitrates occur naturally.

   Additional wells will be installed and sampled in the vicinity of the North Flare Pit. The additional inorganic data should substantiate the conclusion of naturally occurring nitrates.

3. Two distinct water systems exist in the Blanco Plant area, a deep water system (approximately 52 to 56 feet below ground surface) in the alluvium and a shallow water system (approximately 10 to 22 feet below ground surface) in the Nacimiento Formation near "D" Plant. Concentrations of TDS and sodium sulfate in the groundwater samples, and the stratigraphic data clearly confirm two separate water systems. A third water system corresponding with the seepage zone does not exist in the "D" Plant area. This determination is based on unsaturated conditions encountered in all the monitoring wells in the "D" Plant area at an elevation which corresponds to the seep zone.

   The initial groundwater investigation for the Blanco Plant indicated that a groundwater mound was present in the "D" Plant area; this conclusion was in error. It appears that this initial assessment combined water level readings from the Nacimiento Formation and the alluvial water table, which is clearly a composition of levels for different aquifer systems, and this has given the impression of a groundwater mound where one does not exist.

4. Direction of groundwater flow for the alluvium trends from north-northeast to south-southwest. Hydraulic conductivity values for the alluvium range from 6.4 x 10^4 to 1.4 x 10^5 cm/sec. Groundwater flow velocities for the alluvium were estimated at 4.4 ft/yr.

Direction of groundwater flow for the Nacimiento aquifer could not be determined due to spurious groundwater elevations. Hydraulic conductivity values for the Nacimiento aquifer range from 3.6 x 10^3 to 6.8 x 10^4 cm/sec.

5. No visual contamination was noted at a depth greater than 19 feet below ground surface. Based on the documentation that soil contamination decreases with depth and that only trace levels of contamination occur in the groundwater samples, it seems reasonable to assume that the extent of the contamination is limited both laterally and vertically in the soil profile. Additional soil gas measurements will be taken next to each of the existing monitor wells in the South Flare Pit area (W-5, -6, -7, -8, and -10) and at several points between, and downgradient from the wells. These values will give a qualitative measurement of organic constituents present in the soil.

   Even though the groundwater is exempt from the New Mexico Water Quality Control Commission (NMWQCC) standards based on the greater than 10,000 ppm TDS values, the concentrations of contaminants discovered in the groundwater samples are below the human health standards. As the UST has been removed, and the excavation back-filled with clean soil, no further investigation seems necessary in the vicinity of the "D" Plant.

6. Anomalously low pH readings of 4.5 and 4.4 recorded for W-14 and W-15, respectively, may be the result of natural conditions in the subsurface. However,

additional research into the types of laboratory reagents (i.e., acids deposited into the UST) will be conducted to substantiate a natural source for the acidic conditions noted in these wells.

7. A hydrocarbon odor and oily sheen were noticed in W-19, which was completed in the alluvium. The installation and sampling of additional wells in this area of the plant will verify the magnitude and extent of the hydrocarbon contamination.

11.0 REMEDIAL STUDY

An unexpected hydrocarbon odor was detected in the area surrounding both the North and South Flare Pits. The following is the proposed remedial action.

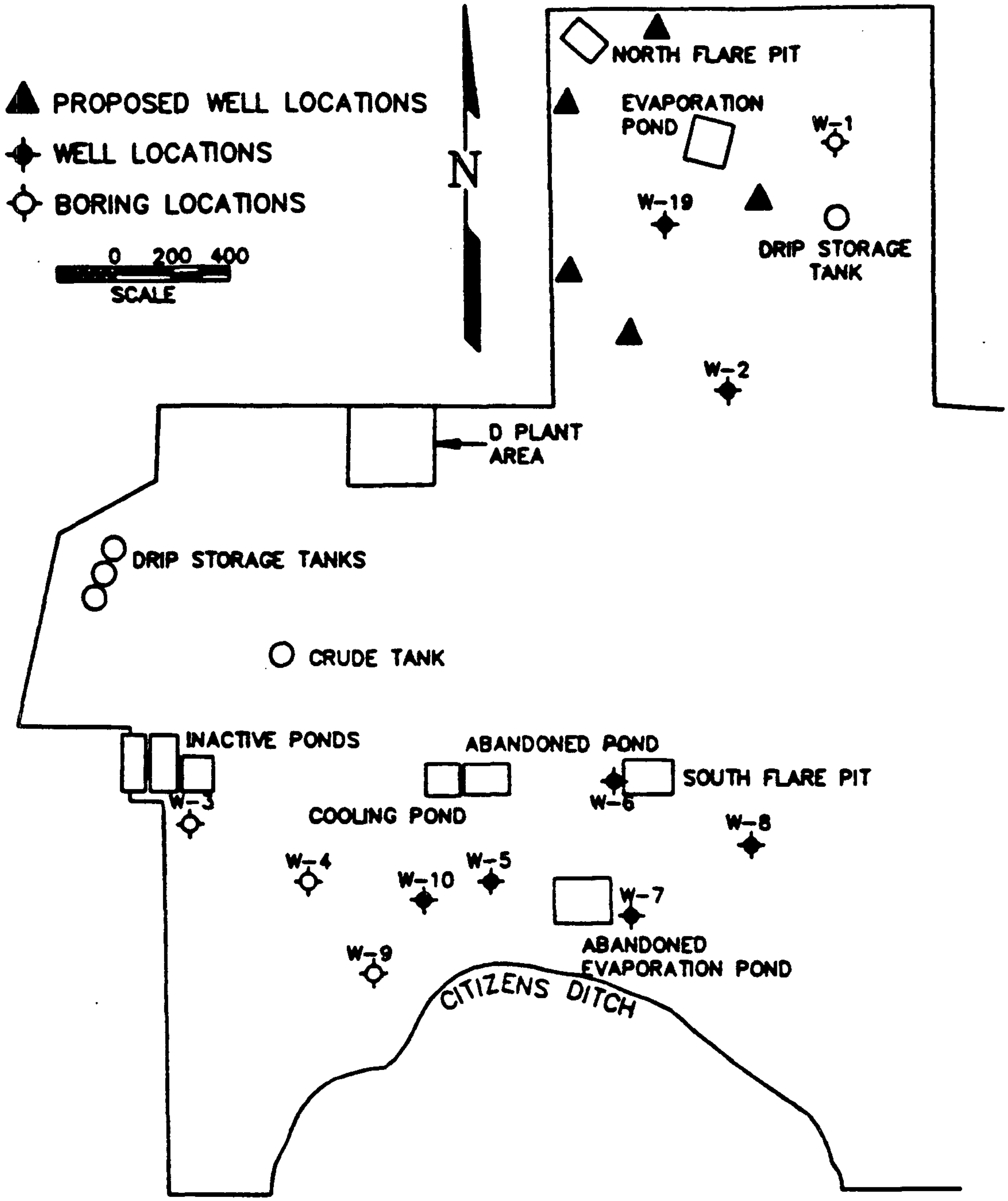
11.1 NORTH FLARE PIT AREA: MONITORING WELL INSTALLATION

To determine the extent and magnitude of groundwater contamination near well W-19, it is proposed that five monitor wells be installed and sampled in the vicinity of the well. The proposed monitoring wells include: one background well northeast of the North Flare Pit; one well southwest of the North Flare Pit to determine the potential of contamination from the pit in the downgradient direction; one background well northeast of W-19; and two wells southwest of W-19 to determine the potential of contamination in the downgradient direction. Locations of the proposed monitoring wells are presented in Figure 11.1.

Groundwater from the five installed wells, W-19 and W-2 will be sampled and analyzed for TPH and BTEX. Based on a recent analysis, the groundwater in W-19 and W-2 was reported as having concentrations of 14,700 and 10,500 ppm TDS, respectively. The groundwater in the vicinity of W-19 is exempt from NMWQCC standards based on the greater than 10,000 ppm TDS concentration.

11.2 SOUTH FLARE PIT AREA

To further investigate the condition of the groundwater near well W-6, it is proposed that groundwater sampling be conducted in wells near W-6. Located downgradient of W-6, wells W-5, W-7, and W-8 (Figure 11.1), should be sampled and analyzed for TPH and BTEX.



El Paso
Natural Gas Company

PROPOSED MONITORING WELL LOCATIONS

PROJECT: EPNG 63716 (EPNGPROW)			LOCATION: BLANCO PLANT	
K.W. BROWN & ASSOCIATES, INC.				DATE: 02/15/90
APPR:		DRAWN BY:	RMM	SCALE: AS SHOWN
DATE:		DATE:	02/15/90	FIGURE: 11.1

No drilling is proposed for the W-6 area at this time. However, it is proposed that a soil gas survey be performed in the area to evaluate the existence of a hydrocarbon plume. Information from the soil gas survey would augment the groundwater results.

11.2.1 Groundwater Sampling

Prior to extracting samples from the wells, depth-to-water measurements will be recorded from the top of the well casing. Purging and sampling of the wells will be effected through the use of dedicated polypropylene bailers to remove groundwater from the wells. Three well volumes will be removed from each well prior to sampling. Additionally, pH and electrical conductivity measurements will be made in the field.

The resultant TPH values will provide an indication of the total level of contamination and the BTEX values will provide a means for determining health-based risk. Moreover, comparing the data to previous data will indicate whether the level of contamination is increasing or decreasing.

Based on a previous analysis, the groundwater in W-6 was reported as having a concentration of 4,516 TDS. Thus, this well must conform to the NMWQCC standards for groundwater having less than 10,000 ppm TDS.

11.2.2 Soil Gas Survey

Depth to groundwater in the area of the South Flare Pit is approximately 20 feet; this depth is near the outer limit of the soil gas equipment. However, the alluvial sediments at the site should be amenable to advancing the soil gas probe to the depth provided cobbles are not encountered.

It is anticipated that soil gas measurements will be taken next to each of the existing monitoring wells in the South Flare Pit area (W-5,-6,-7,-8, and -10) and at several points between, and downgradient from the wells. Measurements will be taken using a PID (photoionization detector; e.g., H-nu). These values will give a qualitative measurement of the organic constituents present in the soil. If significant values are detected, an isopleth map will be constructed to illustrate the location of the organic vapor plume.

11.3 HIGH NITRATE

It was the conclusion in a previous study (February, 1990) that nitrates observed at the site are from naturally occurring sources. This conclusion was based on the occurrence of high nitrate levels throughout the plant and the absence of anthropogenic sources for the nitrate. It is suggested that a literature study be conducted to assemble the most useful information pertaining to unusually-high, naturally-occurring nitrate concentrations in groundwater systems.

12.0 REFERENCES

Bechtel Environmental, Inc. 1989. Groundwater Investigation Report, El Paso Natural Gas Company's Blanco Plant.

El Paso Natural Gas Company. 1988. Discharge Plan, El Paso Natural Gas Company's Blanco Plant.

K. W. Brown & Associates, Inc. 1990. Site Investigation of the Blanco Plant San Juan County, New Mexico.

McBride - Ratcliff & Association, Inc. 1988. Preliminary Assessment, Observed Subsurface Seepage and Contamination, EPNG Blanco D Compressor Station Foundation Excavation.

New Mexico Water Quality Control Commission Regulations, amended through December 24.

Schaller, F. W. and P. Sutton (eds.). 1978. Reclamation of Drastically Disturbed Lands. American Society of Agronomy, Madison, Wisconsin.

APPENDIX A

Well Completion Details and Boring Log

BORING LOG: W-11

PROJECT: 63716
CLIENT: EPNG
LOCATION: BLANCO PLANT
FIRST ENCOUNTERED WATER: 24', DRY BELOW 25'
DATE COMPLETED: 01/08/90

SHEET: 1 OF 1
DRILLED BY: MO-TE
LOGGED BY: SHJ
SURF. ELEV: 5598.1
TOTAL DEPTH: 70.0'

DESCRIPTION

0-5' CLAYEY SAND, tan, moist, slightly plastic, medium-grained.

5-9' SANDSTONE, olive tan, dry, clayey, poorly lithified, fine-grained, brown sandstone @ base (1' thick), fine-grained.

9-12' SANDY SHALE, olive gray, dry, medium-grained sand.

12-15' SANDSTONE, olive tan, dry, medium to fine-grained, micaceous, organic matter.

15-23' SHALE, olive gray, brittle, dry, significant fine-grained sand.

23-25' SANDSTONE, tan, wet, poorly lithified.

25-28' SHALE, gray to brown, dry, brittle, poorly lithified

28-32' COAL, lignitic, black, clayey, moist, gradational contact with underlying shale.

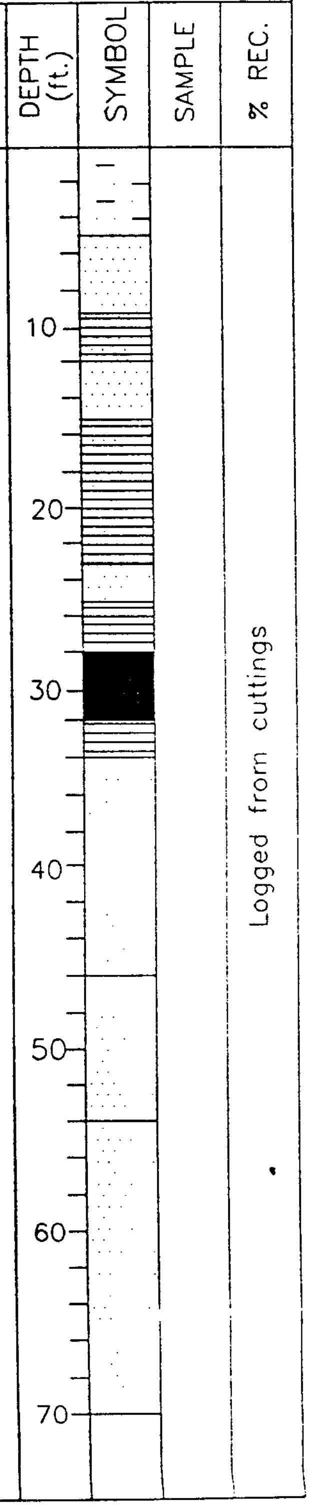
32-34' SHALE, gray, dry, brittle, some fine-grained sand

34-46' SANDSTONE, light gray, fine to coarse-grained dry, poorly sorted, poor to moderate cementation, rare pyrite.

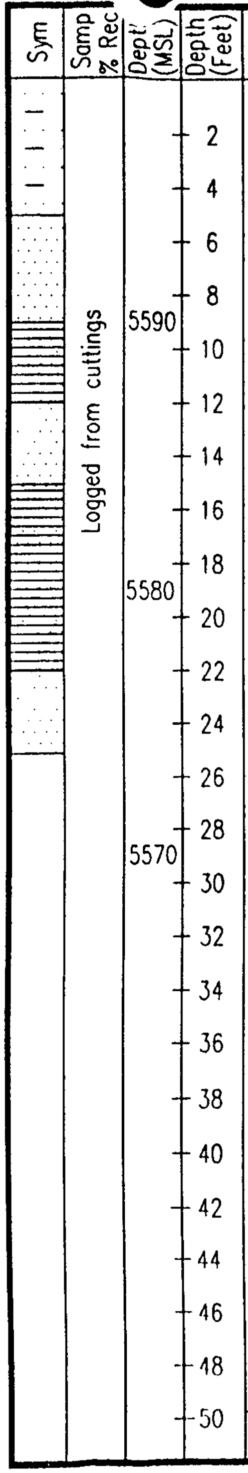
46-54' SANDSTONE, gray, dry, brittle, fine-grained, poor to moderated cementation, embedded lignitious material, rare iron staining.

54-70' SANDSTONE, gray to light gray, dry, medium to coarse-grained, poorly sorted, downward coarsening, gradational with above sandstone.

TD 70.0'



K. W. BROWN & ASSOCIATES, INC.



Geologic Description

0-5' CLAYEY SAND, tan, moist, slightly plastic, medium-grained.

5-9' SANDSTONE, olive tan, dry, clayey, poorly lithified, fine-grained, brown sandstone @ base (1' thick), fine-grained.

9-12' SANDY SHALE, olive gray, dry, medium-grained sand, some oxidation along fractures (rust staining), gypsum along fractures.

12-15' SANDSTONE, olive tan, dry, medium to fine-grained, micaceous, oxidation along fractures, increasing clay content with depth, embedded organic matter (carbonaceous leaf).

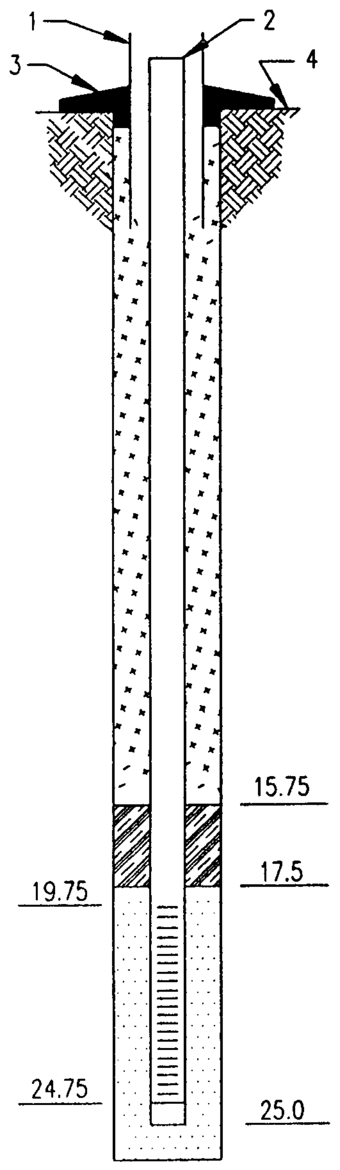
15-22' SHALE, olive gray, brittle, dry, significant fine-grained sand.

22-25' SANDSTONE, tan, wet, poorly lithified.

TD 25.0'

ST=Shelby Tube	SS=Split Spoon	C=Cuttings

Monitoring Well ☒
Piezometer ☐
Protective Casing ☒



Depths in Feet
from Ground Surface
(Not to Scale)

Design Specifications

Elevations: 1 5601.75 2 5601.44
3 5599.17 4 5599.05
Coordinates: X ______ Y ______
Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ______
Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ______
Type of Screen: ☐ 0.008 ☒ 0.010 ☐ ______
Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ______
Sand Pack: #30 Colorado Silica Sand
Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ ______
Grout Type: Ideal 1 and 2 Weight: ______
Bore Hole Diameter: 5 5/8"
Drill Rig: ☐ Hollow Stem ☒ Rotary ☒ Rotary Air
Drilled By: MO-TE Inc.
Logged By: SHJ/WCZ
Completion Date: 01/08/90

Date	D-T-W	MSL	Date	Field pH	Field EC
01/12/90	21.39		01/12/90	7.1	13,000
01/15/90	21.40		01/15/90	7.3	13,500

Comments: Cored with air. Core description from W-11 except sandstone @ 22-25'.

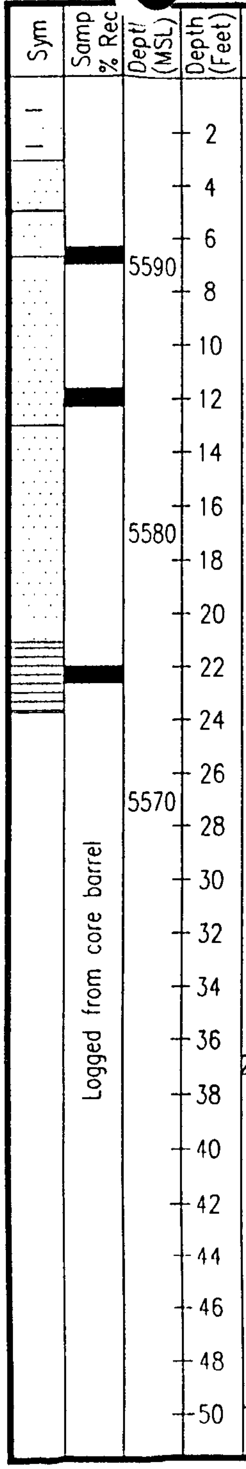
El Paso Natural Gas Company

W-12

Project: EPNG 63716 (EPNGW-12)
Location: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC.

Geologic Description



0–3' CLAYEY SAND, olive tan, moist, medium-grained.

3–4' SANDSTONE, olive gray, dry, friable, very fine-grained.

4–6' NO RECOVERY

6–6.5' SANDSTONE, tan, massive, medium to coarse-grained, fractured, fractures stained gray to black, no hydrocarbon odor, saturated (?).

6.5–13' SANDSTONE, olive gray, dry, clayey, fractured, fractures stained gray, faint hydrocarbon odor, gypsum along fractures.

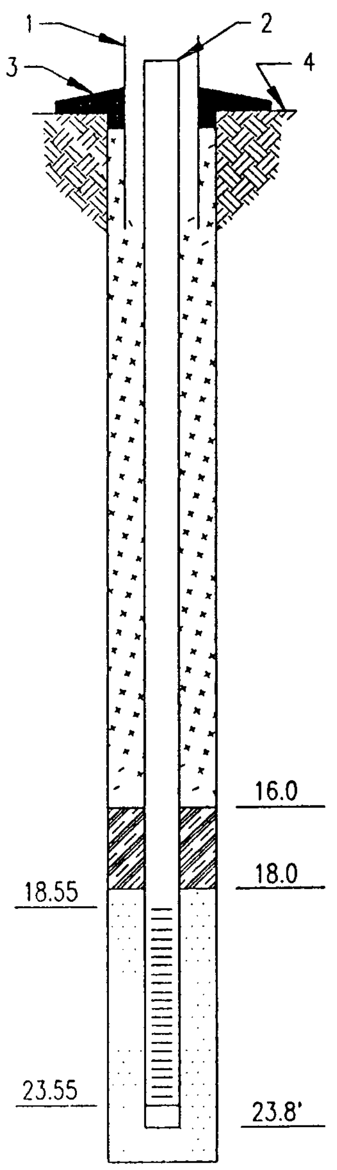
13–21' SANDSTONE, olive tan, massive, moist, clayey, fine-grained, fractured, faint hydrocarbon odor in fractures, micaceous, gypsum along fractures, fractures not stained as in 6.5–13', highly oxidized weathered zone @ 20' (4" thick), trace of coal @ 21', vertical fracture from 20.5 to 21' shows oxidation and weathering.

21–23.8' SHALE, dark brown to black, moist, oxidation along fractures, more massive with fewer fractures with depth, carbonized leaf in fracture.

TD 23.8'

ST=Shelby Tube	SS=Split Spoon	C=Cuttings

Monitoring Well	☒
Piezometer	
Protective Casing	☒



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: 1 5597.57 2 5597.44
3 5597.54 4 5597.38
Coordinates: X ______ Y ______
Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ______
Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ______
Type of Screen: ☐ 0.008 ☒ 0.010 ☐ ______
Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ______
Sand Pack: #30 Colorado Silica Sand
Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ ______
Grout Type: Ideal 1 and 2 Weight: ______
Bore Hole Diameter: 5 5/8"
Drill Rig: ☐ Hollow Stem ☒ Rotary ☒ Rotary Air
Drilled By: MO-TE, Inc.
Logged By: BCS
Completion Date: 01/09/90

Date	D-T-W	MSL	Date	Field pH	Field EC
01/12/90	17.68		01/12/90	7.1	14,000
01/15/90	17.74		01/15/90	7.2	14,000

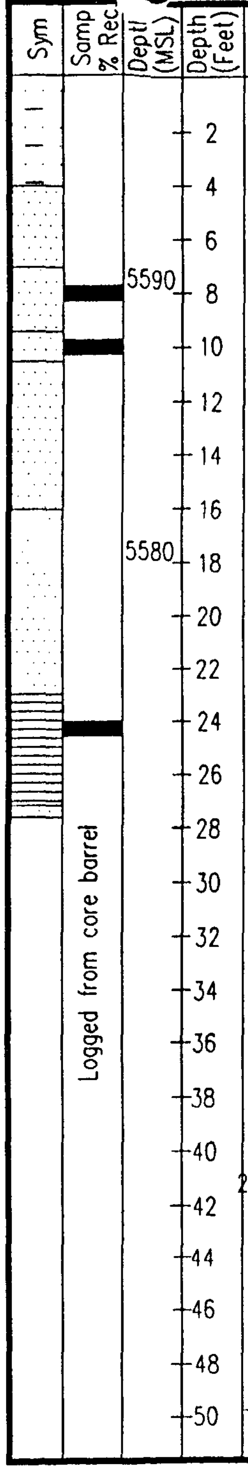
Comments: Cored with water. Capped with man-hole cover.

El Paso Natural Gas Company

W–13

Project: EPNG 63716 (EPNGW-13)
Location: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC.



Geologic Description

0-4' CLAYEY SAND, tan, moist, medium-grained.

4-7' SANDSTONE, olive tan, dry, clayey, oxidized, fine to medium-grained, massive, gradational contact with underlying sandstone, embedded organic matter.

7-9.5' SANDSTONE, olive gray, clayey, moist, poorly lithified, highly fractured, micaceous, friable, fractures stained gray, strong hydrocarbon odor.

9.5-10.5' SANDSTONE, tan, clayey, poorly lithified, micaceous, faint hydrocarbon odor

10.5-16' SANDSTONE, olive gray, clayey, moist, massive, fractures stained gray, gypsum along fractures, faint hydrocarbon odor, more friable starting @ 13', some oxidation starting @ 13'

16-21.5' SANDSTONE, olive tan, moist, massive, clayey, micaceous, occasional fractures, fine, to medium-grained, fracture @ 18.5' showed high degree of mineralization and gray staining, strong hydrocarbon odor.

21.5-24' NO RECOVERY

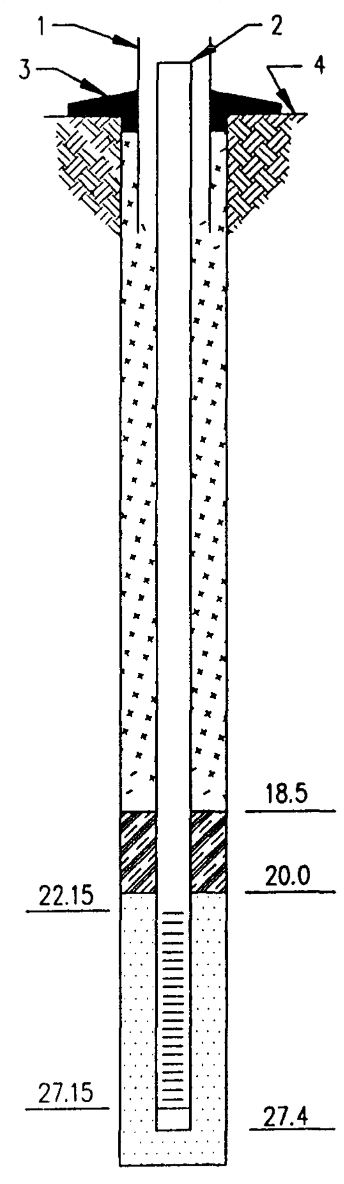
24-27.2' SHALE, dark brown to black, moist, highly weathered, friable, no apparent hydorcarbon odor, carbonaceous, some oxidation (rust staining), grades from sandy shale to lignitic shale @ 26.5'

27.2-27.4' SANDSTONE, olive tan, massive, micaceous, dry to moist, oxidation along fractures

TD 27.4'

ST=Shelby Tube	SS=Split Spoon	C=Cuttings

Monitoring Well	☒
Piezometer	☐
Protective Casing	☒



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: 1 5598.24 2 5598.07
3 5598.25 4 5598.14

Coordinates: X ______ Y ______

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ______

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ______

Type of Screen: ☐ 0.008 ☒ 0.010 ☐ ______

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ______

Sand Pack: #30 Colorado Silica Sand

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ ______

Grout Type: Ideal 1 and 2 Weight: ______

Bore Hole Diameter: 5 5/8"

Drill Rig: ☐ Hollow Stem ☒ Rotary ☒ Rotary Air

Drilled By: MO-TE, Inc.

Logged By: BCS

Completion Date: 01/10/90

Date	D-T-W	MSL	Date	Field pH	Field EC
01/12/90	22.34		01/12/90	4.4	19,500
01/15/90	21.49		01/15/90	4.5	19,500

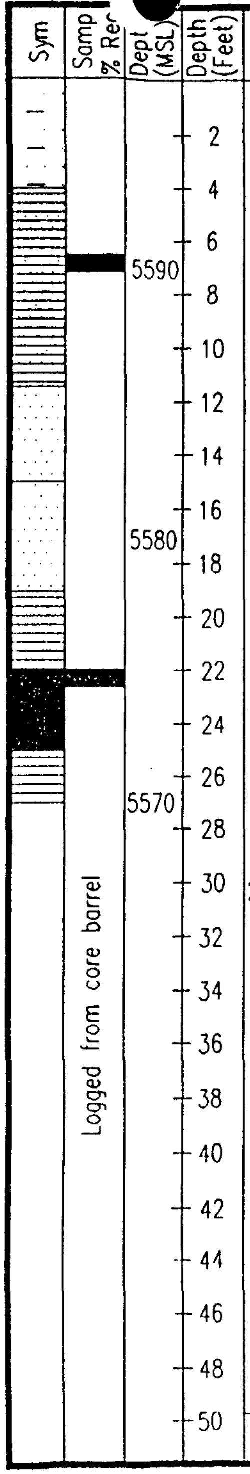
Comments: Cored with water from 25-28'. Capped with man-hole cover.

El Paso Natural Gas Company

W-14

Project: EPNG 63716 (EPNGW-14)
Location: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC.



Geologic Description

0-4' CLAYEY SAND, tan, moist, slightly plastic, medium-grained.

4-11.5' SANDY SHALE, olive gray, dry, slightly plastic, medium to fine-grained sand, oxidation along fractures (rust staining), gypsum along fractures starting @ 8'.

11.5-19' SANDSTONE, olive tan, dry, fine to medium-grained, moderately cemented, gypsum along fractures, embedded organic matter starting @ 15' (carbonaceous leaves), rust sandstone @ 15' (3" thick), very hard, well cemented.

19-22' SHALE, dark gray to black, silty, dry, oxidation along fractures (rust staining), gypsum along fractures.

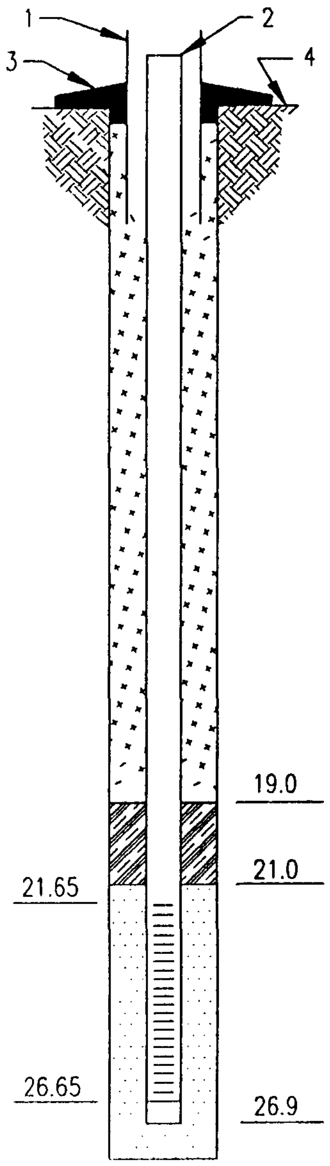
22-25' COAL, black, moist, friable, no recovery from 23-24'.

25-26.9' SHALE, dark gray to black, silty, topped with sandstone (3" thick), tan to gray, fine to medium-grained, sandstone at base of clay (3" thick), tan, coarse-grained.

TD 26.9'

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mon...ring Well ☒
Piezometer ☐
Protective Casing ☒



Depths in Feet
from Ground Surface
(Not to Scale)

Design Specifications

Elevations: 1 5596.58 2 5596.32
3 5596.57 4 5596.50

Coordinates: X ______ Y ______

Type of Casing: ☒ PVC Sched. 40 Flush Thread
☐ Stainless Steel ☐ ______

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ______

Type of Screen: ☐ 0.008 ☒ 0.010 ☐ ______

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ______

Sand Pack: #30 Colorado Silica Sand

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry
☐ 1/4" Pellets ☐ ______

Grout Type: Ideal 1 and 2 Weight: ______

Bore Hole Diameter: 5 5/8"

Drill Rig: ☐ Hollow Stem ☒ Rotary ☒ Rotary Air

Drilled By: MO-TE, Inc.

Logged By: WCZ

Completion Date: 01/10/90

Date	D-T-W	MSL	Date	Field pH	Field EC
01/12/90	22.22		01/12/90	4.5	15,000
01/15/90	19.96		01/15/90	4.4	14,200

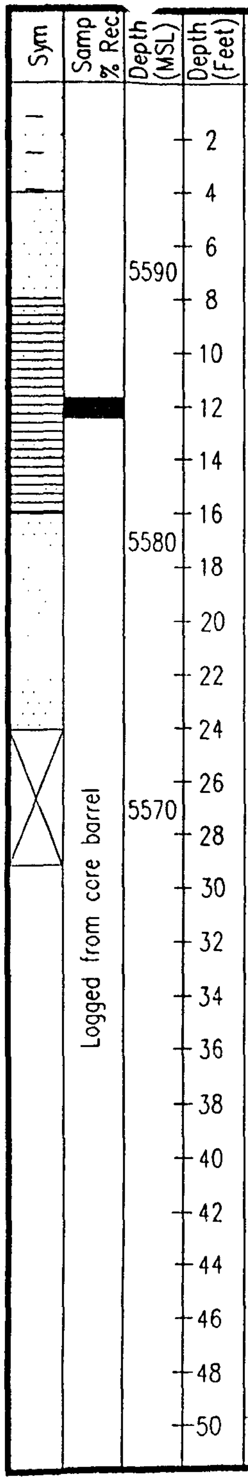
Comments: Cored with water from 24-27'. Capped with man-hole cover.

El Paso Natural Gas Company

W-15

Project: EPNG 63716 (EPNGW-15)
Location: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC.



Geologic Description

0-4' **CLAYEY SAND**, tan, moist, medium-grained, slightly plastic.

4-8' **SANDSTONE**, olive tan, clayey, dry, medium to fine-grained, increasing clay content with depth, gypsum along fractures, embedded organic matter.

8-16' **SANDY SHALE**, olive gray, dry, fine to very fine-grained sand, some oxidation along fractures (rust staining), some gypsum along fractures, dark brown shale @ 12-13'.

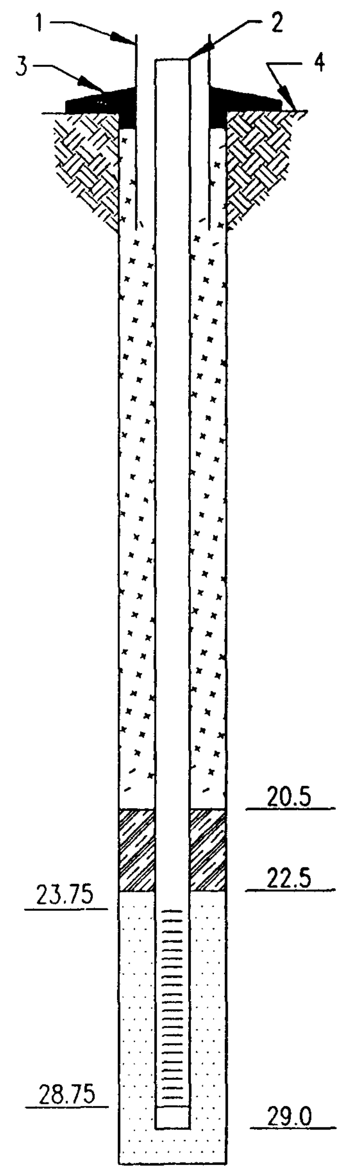
16-24' **SANDSTONE**, olive tan, dry, fine to medium-grained, increasing clay content with depth, some oxidation along fractures, some gypsum along fractures, small amounts of embedded organic matter, clayey @ 23', coal seam @ 19.5 and 23'.

24-29' NO RECOVERY

TD 29.0'

☐ ST=Shelby Tube	☐ SS=Split Spoon	☐ C=Cuttings

Monitoring Well	☒
Piezometer	☐
Protective Casing	☒



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: 1 5597.77 2 5597.43
3 5597.75 4 5597.58

Coordinates: X ______ Y ______

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ______

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ______

Type of Screen: ☐ 0.008 ☒ 0.010 ☐ ______

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ______

Sand Pack: #30 Colorado Silica Sand

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ ______

Grout Type: Ideal 1 and 2 Weight: ______

Bore Hole Diameter: 5 5/8"

Drill Rig: ☐ Hollow Stem ☒ Rotary ☒ Rotary Air

Drilled By: MO-TE, Inc.

Logged By: WCZ

Completion Date: 01/10/90

Date	D-T-W	MSL	Date	Field pH	Field EC
01/12/90	28.35				
01/15/90	27.25		01/15/90	6.1	14,000

Comments: Cored with air. Capped with man-hole cover.

El Paso Natural Gas Company

W-16

Project: EPNG 63716 (EPNGW-16)
Location: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC.

Sym | Samp % Rec | Dept (MSL) | Depth (Feet)

Logged from core barrel

5590

5580

2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50

Geologic Description

0-4' CLAYEY SAND, tan, moist, medium-grained.

4-5' NO RECOVERY

5-9' SANDSTONE, olive tan, clayey, dry, fine-grained, some oxidation along fractures (rust staining), some gypsum along fractures, dark brown sandstone @ 6' (6" thick), coarse to fine-grained, abundant gypsum along fractures.

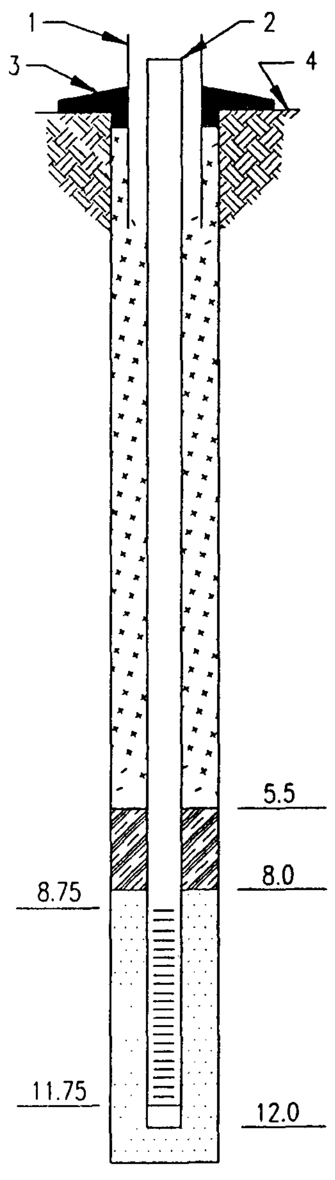
9-12' SANDY SHALE, olive gray, dry, medium-grained sand, some oxidation along fractures, gypsum along fractures.

12-14' SANDSTONE, olive tan, dry, medium to fine-grained, micaceous, oxidation along fractures, increasing clay content with depth, embedded organic matter (carbonaceous leaf).

TD 12.0'

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mon[illegible]ing Well ☒
Piezometer ☐
Protective Casing ☒



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: 1 5601.81 2 5601.51
3 5599.30 4 5599.16
Coordinates: X ______ Y ______
Type of Casing: ☒ PVC Sched. 40 Flush Thread
☐ Stainless Steel ☐ ______
Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ______
Type of Screen: ☐ 0.008 ☒ 0.010 ☐ ______
Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ______
Sand Pack: #30 Colorado Silica Sand
Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry
☐ 1/4" Pellets ☐ ______
Grout Type: Ideal 1 and 2 Weight: ______
Bore Hole Diameter: 5 5/8"
Drill Rig: ☐ Hollow Stem ☒ Rotary ☒ Rotary Air
Drilled By: MO-TE, Inc.
Logged By: WCZ
Completion Date: 01/11/90

Date	D-T-W	MSL	Date	Field pH	Field EC
01/12/90	dry				
01/15/90	dry				

Comments: Cored with air. Backfilled from 14' to 12' with #30 sand

El Paso Natural Gas Company

W-17

Project: EPNG 63716 (EPNGW-17)
Location: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC.

Sym	Samp % Re	Dep (MSL)	Depth (Feet)
	Logged from core barrel		2
			4
			6
		5590	8
			10
			12
			14
			16
		5580	18
			20
			22
			24
			26
			28
			30
			32
			34
			36
			38
			40
			42
			44
			46
			48
			50

Geologic Description

0-4' CLAYEY SAND, tan, moist, medium-grained.

4-7' SANDSTONE, olive tan, dry, clayey, highly oxidized, fine to medium-grained, massive, gradational contact with underlying sandstone, embedded organic matter.

7-9.5' SANDSTONE, olive gray, clayey, moist, poorly lithified, highly fractured, micaceous, friable, fractures stained gray, strong hydrocarbon odor.

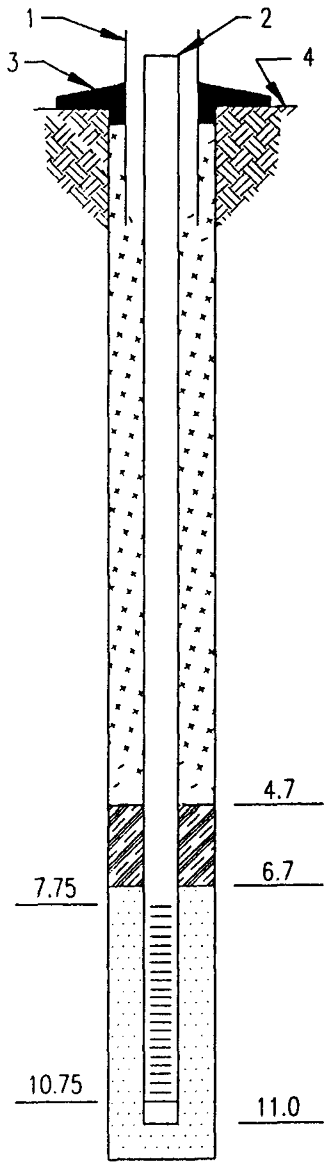
9.5-10.5' SANDSTONE, tan, clayey, poorly lithified, micaceous, faint hydrocarbon odor.

10.5-11' SANDSTONE, olive gray, clayey, moist, massive, fractures stained gray, gypsum along fractures, faint hydrocarbon odor.

TD 11.0'

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mo. ing Well ☒
Piezometer ☐
Protective Casing ☒



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: 1 5598.37 2 5598.21
3 5598.34 4 5598.15
Coordinates: X ______ Y ______
Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ______
Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ______
Type of Screen: ☐ 0.008 ☒ 0.010 ☐ ______
Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ______
Sand Pack: #30 Colorado Silica Sand
Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ ______
Grout Type: Ideal 1 and 2 Weight: ______
Bore Hole Diameter: 5 5/8"
Drill Rig: ☐ Hollow Stem ☒ Rotary ☒ Rotary Air
Drilled By: MO-TE, Inc.
Logged By: BCS
Completion Date: 01/11/90

Date	D-T-W	MSL	Date	Field pH	Field EC
01/12/90	dry				
01/15/90	dry				

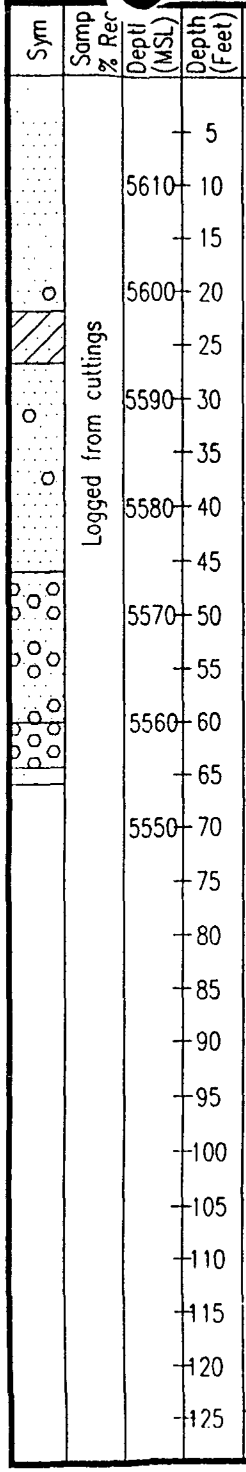
Comments: Core description from W-14. Capped with man-hole cover

El Paso Natural Gas Company

W-18

Project: EPNG 63716 (EPNGW-18)
Location: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC.



Geologic Description

0-22' SAND, tan, fine to coarse-grained, moist, quartzose, increasing grain size with depth, some pebbles from 18-22', maximum pebble size approx. 1.0 cm.

22-27' CLAY, dark brown, moist, sandy, fine-grained sand.

27-46' SAND, tan, fine to coarse-grained, quartzose, some pebbles.

46-60' SAND with gravel, tan, fine to coarse-grained, quartzose, interbedded dark brown clay seams, maximum gravel size approx. 2.0 cm.

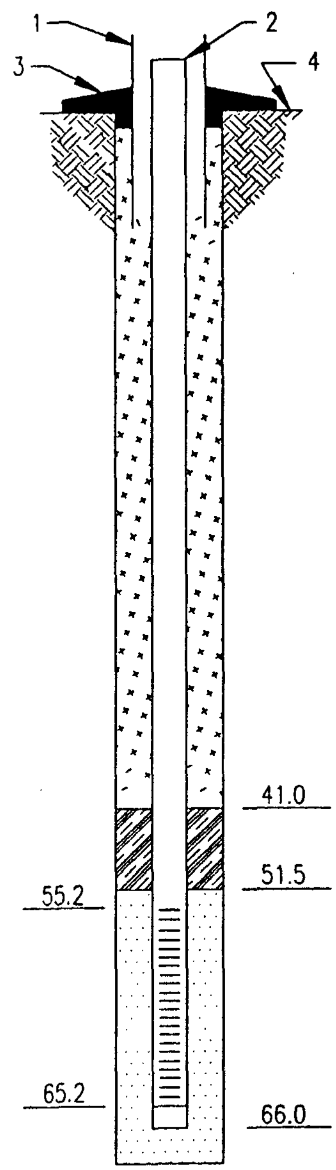
60-64' GRAVEL, some coarse sand, maximum size approx. 2.0 cm.

64-66' SANDSTONE, tan, moist.

TD 66.0'

☐ ST=Shelby Tube	☐ SS=Split Spoon	☐ C=Cuttings

Monitoring Well	☒
Piezometer	
Protective Casing	☒



Depths in Feet
from Ground Surface
(Not to Scale)

Design Specifications

Elevations: 1 5622.38 2 5622.02
3 5619.85 4 5619.70

Coordinates: X ______ Y ______

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ______

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ______

Type of Screen: ☐ 0.008 ☒ 0.010 ☐ ______

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ______

Sand Pack: #30 Colorado Silica Sand

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ ______

Grout Type: Ideal 1 and 2 Weight: ______

Bore Hole Diameter: 5 5/8"

Drill Rig: ☐ Hollow Stem ☒ Rotary ☒ Rotary Air

Drilled By: MO-TE, Inc.

Logged By: WCZ

Completion Date: 01/11/90

Date	D-T-W	MSL	Date	Field pH	Field EC
01/12/90	55.81		01/12/90	7.1	9,750
01/15/90	55.68		01/15/90	7.2	12,500

Comments: Cored with air

El Paso Natural Gas Company

W-19

Project: EPNG 63716 (EPNGW-19)
Location: BLANCO PLANT

K.W. BROWN & ASSOCIATES, INC.

APPENDIX B

Soil Analytical Data

Analytical Technologies, Inc.

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO

DATE RECEIVED : 01/12/90
REPORT DATE : 02/01/90

ATI I.D. : 001578

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	W13-7'	SOIL	01/09/90
02	W13-12'	SOIL	01/09/10
03	W13-22.5'	SOIL	01/09/10
04	W14-8'	SOIL	01/09/10
05	W14-10'	SOIL	01/09/10
06	W14-24.5'	SOIL	01/09/10
07	W15-7'	SOIL	01/10/90
08	W15-22.5	SOIL	01/10/90
09	W16-12'	SOIL	01/10/90
10	W17-10'	SOIL	01/11/90

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	10

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157801

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W13-7'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/19/90
UNITS : MG/KG
DILUTION FACTOR : 10

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	1300
HYDROCARBON RANGE	C10-C20
HYDROCARBONS QUANTITATED USING	DIESEL
SURROGATE PERCENT RECOVERIES	
DI-N-OCTYL-PHTHALATE (%)	105

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157802

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W13-12'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/19/90
UNITS : MG/KG
DILUTION FACTOR : 10

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	1800
HYDROCARBON RANGE	C10-C20
HYDROCARBONS QUANTITATED USING	DIESEL

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	129

AnalyticalTechnologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157803

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W13-22.5'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/18/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	14
HYDROCARBON RANGE	C12-C24
HYDROCARBONS QUANTITATED USING	DIESEL

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	98

Analytical **Technologies, Inc**

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157804

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W14-8'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/19/90
UNITS : MG/KG
DILUTION FACTOR : 10

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	670
HYDROCARBON RANGE	C10-C18
HYDROCARBONS QUANTITATED USING	DIESEL

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	135

Analytical Technologies, inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157805

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W14-10'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/27/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	106

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157806

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W14-24.5'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/18/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	16
HYDROCARBON RANGE	C12-C22
HYDROCARBONS QUANTITATED USING	DIESEL

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	108

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157807

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W15-7'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/10/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/18/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	99

Analytical **Technologies**, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157808

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W15-22.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/10/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/19/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	11
HYDROCARBON RANGE	C12-C24+
HYDROCARBONS QUANTITATED USING	DIESEL

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	105

AnalyticalTechnologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157809

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W16-12'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/10/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/19/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	102

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157810

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W17-10'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/11/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/19/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-
SURROGATE PERCENT RECOVERIES	
DI-N-OCTYL-PHTHALATE (%)	106

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

		ATI I.D.	: 001578
CLIENT	: K.W. BROWN & ASSOCIATES	DATE EXTRACTED	: 01/17/90
PROJECT #	: 63716	DATE ANALYZED	: 01/19/90
PROJECT NAME	: EPNG BLANCO	UNITS	: MG/KG
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	88

Analytical Technologies, Inc

QUALITY CONTROL DATA

ATI I.D. : 001578

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
REF I.D. : 00199922

DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/19/90
SAMPLE MATRIX : NON-AQUEOUS
UNITS : MG/KG

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
FUEL HYDROCARBONS	<5	40	33	83	NA	NA	NA

$$\text{\% Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

AnalyticalTechnologies, Inc

QUALITY CONTROL DATA

ATI I.D. : 001578

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
REF I.D. : 00157806

DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/19/90
SAMPLE MATRIX : SOIL
UNITS : MG/KG

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
FUEL HYDROCARBONS	16	40	35	63	37	66	10

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

AnalyticalTechnologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 001578

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
REF I.D. : 00157807

DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/19/90
SAMPLE MATRIX : SOIL
UNITS : MG/KG

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
FUEL HYDROCARBONS	<5	40	30	75	32	80	6

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \text{ X } 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \text{ X } 100$$

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157801

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W13-7'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	97

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157802

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W13-12'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	119

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GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157803

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W13-22.5'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/23/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	120

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157804

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W14-8'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	99

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157805

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W14-10'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	110

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157806

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W14-24.5'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/09/10
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	91

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157807

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W15-7'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/10/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	88

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157808

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W15-22.5
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/10/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	83

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GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157809

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W16-12'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/10/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	94

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GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : FUEL HYDROCARBONS (BTEX)

ATI I.D. : 001578
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : N/A

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : REAGENT BLANK

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	107

QUALITY CONTROL DATA

ATI I.D. : 001578

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
REF I.D. : 00199929

DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
SAMPLE MATRIX : NON-AQUEOUS
UNITS : MG/KG

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
BENZENE	ND	1.0	0.86	86	0.96	96	11
TOLUENE	ND	1.0	1.05	105	1.16	116	10
ETHYLBENZENE	ND	NA	NA	NA	NA	NA	NA
META-XYLENE	ND	1.0	1.03	103	1.16	116	12
ORTHO/PARA-XYLENE	ND	NA	NA	NA	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

Analytical Technologies, Inc

QUALITY CONTROL DATA

ATI I.D. : 001578

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
REF I.D. : 00199928

DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/23/90
SAMPLE MATRIX : NON-AQUEOUS
UNITS : MG/KG

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
BENZENE	ND	1.0	1.07	107	1.06	106	1
TOLUENE	ND	1.0	1.04	104	1.02	102	2
ETHYLBENZENE	ND	NA	NA	NA	NA	NA	NA
META-XYLENE	ND	1.0	0.97	97	0.94	94	3
ORTHO/PARA-XYLENE	ND	NA	NA	NA	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00157810

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W17-10'
SAMPLE MATRIX : SOIL

DATE SAMPLED : 01/11/90
DATE RECEIVED : 01/12/90
DATE EXTRACTED : 01/17/90
DATE ANALYZED : 01/22/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
TOLUENE	<0.025
ETHYLBENZENE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	96

APPENDIX C

Groundwater Analytical Data

iml
Inter-Mountain
Laboratories, Inc.

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

CLIENT: KW Brown

SITE: Well 2
LAB NO: 3751

DATE REPORTED: 01/11/90

DATE RECEIVED: 01/10/90
DATE COLLECTED: 01/10/90

Nitrate, mg/l...................... 214.00

C. Neal Schaeffer
Lab Director

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO

DATE RECEIVED : 01/16/90
REPORT DATE : 02/05/90

ATI I.D. : 001612

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	W 11B	AQUEOUS	01/15/90
02	W 12	AQUEOUS	01/15/90
03	W 13	AQUEOUS	01/15/90
04	W 14	AQUEOUS	01/15/90
05	W 15	AQUEOUS	01/15/90
06	W 16	AQUEOUS	01/15/90
07	W 19	AQUEOUS	01/15/90
08	W 11D	AQUEOUS	01/15/90
09	TRIP BLANK	AQUEOUS	01/15/90
10	COLLECTOR WELL	AQUEOUS	01/15/90
11	W 2	AQUEOUS	01/15/90

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	11

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 001612

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO

DATE RECEIVED : 01/16/90
REPORT DATE : 02/05/90

PARAMETER	UNITS	01	02	03	04	05
CARBONATE (CACO3)	MG/L	-	<1	-	<1	-
BICARBONATE (CACO3)	MG/L	-	627	-	11	-
HYDROXIDE (CACO3)	MG/L	-	<1	-	<1	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	627	-	11	-
CHLORIDE	MG/L	-	46	-	230	-
NITRATE AS NITROGEN	MG/L	<0.06	9.6	16.4	210	89
SULFATE	MG/L	-	11000	-	20000	-
TOTAL DISSOLVED SOLIDS	MG/L	<10	16700	18900	34400	24100

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 001612

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO

DATE RECEIVED : 01/16/90

REPORT DATE : 02/05/90

PARAMETER	UNITS	07	08	10	11
CARBONATE (CACO3)	MG/L	-	-	<1	-
BICARBONATE (CACO3)	MG/L	-	-	116	-
HYDROXIDE (CACO3)	MG/L	-	-	<1	-
TOTAL ALKALINITY (AS CACO3)	MG/L	-	-	116	-
CHLORIDE	MG/L	-	-	78	-
AMMONIA AS NITROGEN	MG/L	-	-	-	0.04
NITRITE AS NITROGEN	MG/L	-	-	-	0.09
NITRATE AS NITROGEN	MG/L	90	16.4	<0.06	200
SULFATE	MG/L	-	-	2050	-
TOTAL DISSOLVED SOLIDS	MG/L	14700	18600	2600	10500

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO

ATI I.D. : 001612

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	00164204	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		293	296	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		293	296	1	NA	NA	NA
CHLORIDE	MG/L	00164603	180	180	0	380	200	100
AMMONIA AS NITROGEN	MG/L	00171201	0.09	0.08	12	0.18	0.10	90
NITRITE AS NITROGEN	MG/L	00161211	0.09	0.09	0	2.13	2.00	102
NITRATE AS NITROGEN	MG/L	00161211	200	200	0	400	200	100
SULFATE	MG/L	00161202	11000	11000	0	22000	10000	110
TOTAL DISSOLVED SOLIDS	MG/L	00161208	18600	18600	0	NA	NA	NA
TOTAL DISSOLVED SOLIDS	MG/L	00161932	380	380	0	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 001612

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO

DATE RECEIVED : 01/16/9
REPORT DATE : 02/05/9

PARAMETER	UNITS	02	04	10
CALCIUM	MG/L	375	431	109
POTASSIUM	MG/L	17.1	26.8	9.1
MAGNESIUM	MG/L	169	774	54.6
SODIUM	MG/L	4710	8380	543

Analytical Technologies,

METALS - QUALITY CONTROL

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO

ATI I.D. : 001612

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CALCIUM	MG/L	00161202	375	376	0.3	896	500	104
POTASSIUM	MG/L	00161202	17.1	17.2	0.6	60.8	50.0	87
MAGNESIUM	MG/L	00161202	169	169	0	414	250	98
SODIUM	MG/L	00161202	4710	4670	1	8970	5000	85

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161201

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT	K.W. BROWN & ASSOCIATES	DATE SAMPLED	01/15/90
PROJECT #	63716	DATE RECEIVED	01/16/90
PROJECT NAME	EPNG BLANCO	DATE EXTRACTED	01/18/90
CLIENT I.D.	W 11B	DATE ANALYZED	01/19/90
SAMPLE MATRIX	AQUEOUS	UNITS	MG/L
		DILUTION FACTOR	1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<0.5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-
SURROGATE PERCENT RECOVERIES	
DI-N-OCTYL-PHTHALATE (%)	114

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161202

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 12
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/19/90
UNITS : MG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<0.5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-
SURROGATE PERCENT RECOVERIES	
DI-N-OCTYL-PHTHALATE (%)	110

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161203

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 13
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/19/90
UNITS : MG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<0.5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	102

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161204

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 14
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/19/90
UNITS : MG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<0.5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	99

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161205

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 15
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/19/90
UNITS : MG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<0.5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	106

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161207

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 19
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/19/90
UNITS : MG/L
DILUTION FACTOR : 10

COMPOUNDS	RESULTS	RESULTS
FUEL HYDROCARBONS	29	20
HYDROCARBON RANGE	C7-C12	C12-C22
HYDROCARBONS QUANTITATED USING	GASOLINE	DIESEL

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	142

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161208

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 11D
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/19/90
UNITS : MG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	0.99
HYDROCARBON RANGE	C10-C22
HYDROCARBONS QUANTITATED USING	DIESEL

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	103

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161210

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : COLLECTOR WELL
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/22/90
UNITS : MG/L
DILUTION FACTOR : 100

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	970
HYDROCARBON RANGE	C10-C18
HYDROCARBONS QUANTITATED USING	DIESEL

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	**

** Due to the necessary dilution of the sample, result was not attainable

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161211

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 2
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/19/90
UNITS : MG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<0.5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	112

Analytical Technologies,

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 001612
DATE EXTRACTED : 01/18/90
DATE ANALYZED : 01/19/90
UNITS : MG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
FUEL HYDROCARBONS	<0.5
HYDROCARBON RANGE	-
HYDROCARBONS QUANTITATED USING	-

SURROGATE PERCENT RECOVERIES

DI-N-OCTYL-PHTHALATE (%)	116

AnalyticalTechnologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 001612

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
REF I.D. : 00161202

DATE EXTRACTED :
DATE ANALYZED : 01/19/90
SAMPLE MATRIX : AQUEOUS
UNITS : MG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
FUEL HYDROCARBONS	<0.5	4.0	3.2	85	4.2	105	27

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 001612

TEST : FUEL HYDROCARBONS (MODIFIED EPA METHOD 8015)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
REF I.D. : 00199907

DATE EXTRACTED :
DATE ANALYZED : 01/19/90
SAMPLE MATRIX :
UNITS : MG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
FUEL HYDROCARBONS	<0.5	4.0	3.0	75	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161201

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 11B
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/25/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	89

Analytical Technologies,

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161202

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 12
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/25/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	86

Analytical **Technologies**, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161203

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 13
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/25/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	4.4
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	69

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161204

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 14
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/26/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	1.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	107

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161205

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 15
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/25/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	99

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161206

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 16
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/25/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	1.0
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	0.82
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	91

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161207

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 19
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/25/90
UNITS : UG/L
DILUTION FACTOR : 100

COMPOUNDS	RESULTS
BENZENE	4200 D
TOLUENE	<50
ETHYLBENZENE	340
META XYLENE	2800
ORTHO & PARA XYLENE	940

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	83

D INDICATES COMPOUND ANALYZED AT A DILUTION OF 500.

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161208

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT	: K.W. BROWN & ASSOCIATES
PROJECT #	: 63716
PROJECT NAME	: EPNG BLANCO
CLIENT I.D.	: W 11D
SAMPLE MATRIX	: AQUEOUS

DATE SAMPLED	: 01/15/90
DATE RECEIVED	: 01/16/90
DATE EXTRACTED	: N/A
DATE ANALYZED	: 01/25/90
UNITS	: UG/L
DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	5.8
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	95

Analytical Technologies,

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161209

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : TRIP BLANK
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/25/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	94

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161210

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : COLLECTOR WELL
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/25/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	0.87
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	92

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00161211

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : W 2
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 01/15/90
DATE RECEIVED : 01/16/90
DATE EXTRACTED : N/A
DATE ANALYZED : 01/25/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	96

Analytical Technologies,

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 001612
DATE EXTRACTED : 01/26/90
DATE ANALYZED : 01/29/90
UNITS : UG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

TRIFLUOROTOLUENE (%)	91

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 001612

TEST : FUEL HYDROCARBONS (BTEX)

CLIENT : K.W. BROWN & ASSOCIATES
PROJECT # : 63716
PROJECT NAME : EPNG BLANCO
REF I.D. : 00199907

DATE EXTRACTED :
DATE ANALYZED : 01/26/90
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
BENZENE	<0.5	10	8.8	88	9.0	90	2
TOLUENE	<0.5	10	9.0	90	8.8	88	2
ETHYLBENZENE	<0.5	10	8.0	80	8.0	80	0
META-XYLENE	<0.5	10	7.4	74	7.6	76	3
ORTHO/PARA-XYLENE	<0.5	20	18	90	18	90	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

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GROUNDWATER INVESTIGATION REPORT

EL PASO NATURAL GAS COMPANY'S

BLANCO PLANT

SAN JUAN COUNTY, NEW MEXICO

El Paso
Natural Gas Company

RECEIVED
JAN 27 1989
OIL CONSERVATION DIVISION
SANTA FE

JANUARY 1989

GROUNDWATER INVESTIGATION REPORT

APPENDIX D TO DISCHARGE PLAN

FOR

EL PASO NATURAL GAS COMPANY'S

BLANCO PLANT

SAN JUAN COUNTY

JANUARY 1989

EXECUTIVE SUMMARY

Bechtel Environmental, Inc. (BEI) was contracted to conduct a site investigation at El Paso Natural Gas Company's Blanco Plant in Bloomfield, New Mexico. The objective of the investigation was to determine if soil or groundwater contamination had resulted from past facility wastewater disposal practices.

Site Location

The El Paso Natural Gas Company (EPNG) Blanco Plant is located in San Juan County, New Mexico, approximately 0.6 miles north west of Bloomfield, New Mexico. The site occupies approximately 230 acres in a primarily uninhabited area. However, there is some residential and agricultural land use immediately south east of the site. Relief in the vicinity of the site slopes gently to the south.

Site History

The Blanco plant is a natural gas compressor facility compressing approximately 650 MMSCFD of gas. The extent of gas processing includes dehydration and removal of hydrocarbon by-products (C_3 to C_5 + liquids). In addition, the plant occasionally operates a fractionator which recovers lean oil from used oils brought to the plant from various sources. The lean oil fraction is reused by various EPNG facilities.

Prior to 1964, the Blanco plant also operated a natural gas liquids extraction ("gasoline") facility. The "gasoline" plant recovered propane, butane, pentanes and other heavier hydrocarbons and sold them as raw material to make gasoline. The wastewaters from the plant were discharged to several site evaporation ponds and a flare pit for evaporation. After 1964, facility wastewaters were comingled and sent to the Bloomfield municipal treatment facility for treatment/disposal.

Site Investigation

The site investigation was designed to determine if and to what extent chromium and organics may be present in site soil or groundwater due to past wastewater disposal practices. Information was also collected to better define site geology and groundwater hydrology.

Except for minor modifications, the investigation was conducted according to the procedures presented in the Work Plan for the Ground Water Quality Investigation of El Paso Natural Gas Company Blanco Plant (Bechtel Environmental Inc., August 1988.)

The site investigation consisted of the following activities:

- Collection and analysis of soil samples from two former site evaporation ponds and a flare pit
- Sampling and analysis of soil from the saturated zone of four borings completed as monitoring wells

- Installation and sampling of six groundwater monitoring wells
- Permeability testing

Geology and Hydrogeology

- The plant site is located on alluvium, which fills a canyon cut into the Nacimento Formation. At the plant site, thickness of the alluvium (above bedrock) ranges from less than 3 feet to more than 75 feet.

  The alluvium consists of sandy silts near the surface, very fine to medium-grained, silty to slightly silty sands, clayey, fine to medium-grained sands and a few beds of sandy clays.

- Direction of ground-water flow is to the south-southwest and then trends southward through the southern portion of the site. The average hydraulic conductivity is 2.1×10^{-4} cm/sec.

- Depth to the ground water table ranges from 49.7 feet (well W2) to 9.2 feet (well W10) below the ground surface, or 5564.3 to 5551.5 feet above sea level. The average hydraulic gradient is 0.0063 ft/ft.

Soil Contamination

- In samples collected from the evaporation ponds, the majority of metals for which analyses were conducted were detected at concentrations equivalent to the metal concentrations in soil collected from background locations. However, manganese, lead and chromium were present in some samples from the evaporation ponds at concentrations slightly in excess of background concentrations. These concentrations are probably within normal variations of metal concentrations in soil and do not appear to be affecting groundwater quality. Organic and volatile organic compounds for which the evaporation ponds samples were analyzed were not present at detectable concentrations.

- A sample obtained from a boring located immediately south of the flare pit, contained lead, zinc, copper and cadmium at concentrations slightly in excess of background concentrations. However, none of these metals were present in ground water at concentrations greater than the standards specified by the New Mexico Water Quality Control Commission for the protection of ground water of 10,000 mg/1 TDS concentration or less. This sample was also found to contain a variety of non-priority pollutant hydrocarbons with carbon chains ranging from C-9 to C-20. Concentrations of individual carbon chain hydrocarbons ranged from 0.1 to 3.5 ppm.

- Chromium, cadmium and copper were slightly higher than background levels in soil collected from the saturated zones of borings W5, W6 and W7. These metals were not detected at concentrations greater than an order of magnitude over background concentrations and are most likely within normal concentration variations for these metals in soil. In addition, these metals were not detected in groundwater at concentrations above the Ground Water Protection Standards established by the New Mexico Water Quality Control Commission.

Groundwater Quality

- Groundwater beneath the Blanco site was found to be of generally poor quality, characterized by high concentrations of total dissolved solids (TDS), sulfate and sodium. Nitrate concentrations were also high in two of the wells, the upgradient well W2 and the well next to the flare pit W6. The highest concentrations of TDS, sulfate, sodium and nitrate were found in the upgradient well W2.

- Several halogenated volatile organics and one volatile aromatic compound were detected in the groundwater samples. The volatile compounds detected are 1,1,1-trichlorethane, dibromochloromethane, chlorobenzene, trichloroethylene, trichlorofluoromethane and toluene. Concentrations of these compounds were low, ranging from 0.8 and 5 ppb, and were all well below available groundwater protection standards established by the New Mexico Water Quality Control Commission. Most of these compounds were detected in both upgradient and downgradient wells.

- The detection of both trichloroethylene and trichlorofluoreomethane in the travel blank suggests that these compounds may not actually be present in the groundwater but may be due to potential contamination from the sample containers, shipping container or the laboratory.

- With the exception of iron and manganese, the total concentrations of all of the metals for which the groundwater samples were analyzed were below the groundwater protection standard for the dissolved concentrations established by the New Mexico Water Quality Control Commission. Iron was present in groundwater from three of the six wells at total concentrations greater than the established standards for the dissolved iron concentration. Manganese was detected in all of the monitoring wells at total concentrations greater than the specified standard for the dissolved manganese concentration. The highest iron concentrations in the groundwater samples were found in water from both the upgradient and the downgradient wells. Information on plant operation indicates that neither iron or manganese were components of facility waste streams, therefore it is believed that iron and manganese concentrations detected in the site wells are characteristic of groundwater in the Blanco Area and not due to plant operations.

Conclusion

The results of the investigation suggest that the Blanco Facility's operations have not caused any significant contamination of soil or groundwater.

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DRAWINGS

ATTACHMENTS

1.0 INTRODUCTION

This report presents the results of the site investigation conducted in September 1988, at El Paso Natural Gas Company's (EPNG) Blanco Plant in Bloomfield, New Mexico. The purpose of the investigation was to determine if and to what extent groundwater or soil contamination by chromium and/or organics may have resulted from the disposal of facility wastewater to site evaporation ponds and the flare pit. The investigation also provided information to better define site geology and groundwater hydrology. Except for minor modifications, the investigation was conducted according to the procedures presented in the Work Plan for the Ground Water Quality Investigation of El Paso Natural Gas Company Blanco Plant (Bechtel Environmental Inc., August 1988.)

1.1 Background

The El Paso Natural Gas Company (EPNG) Blanco Plant is located in San Juan County, New Mexico, approximately 0.6 miles north west of Bloomfield, New Mexico. The site occupies approximately 230 acres in a primarily uninhabited area. However, there is some residential and agricultural land use immediately south east of the site. Relief in the vicinity of the site slopes gently to the south.

The Blanco plant is a natural gas compressor facility compressing approximately 650 MMSCFD of gas. The extent of gas processing includes dehydration and removal of hydrocarbon by-products (C_3 to C_5 + liquids).

In addition, the plant occasionally operates a fractionator which recovers lean oil from waste oils brought to the plant from various sources. The lean oil fraction is reused by various EPNG facilities.

Prior to 1964, the Blanco plant also operated a natural gas liquids ("gasoline") facility. The "gasoline" plant recovered propane, butane, pentanes and other heavier hydrocarbons and sold them as gasoline. The wastewaters from the plant were discharged to several site evaporation ponds and a flare pit for complete retention/evaporation. Wastewaters from the facility consisted of boiler blowdown, cooling tower blowdown, water treatment and domestic waste, contact wastewater from the dehydration and fractionation units and other wastestreams discharged during emergency upset conditions. The wastewaters contained chromium VI, which was used as a biocide in the cooling towers, and other petroleum wastes. Since 1964, facility wastewaters are comingled and sent to the Bloomfield municipal treatment facility for treatment/disposal.

The New Mexico Environmental Improvement Divison (NMEID) "Superfund" staff conducted a site inspection at the Blanco Plant on August 7, 1987. This inspection was conducted by NMEID as a preliminary part of the process necessary to obtain specific information required to ascertain whether the Blanco Plant qualifies for the Superfund National Priorities List. Based on this site inspection, NMEID requested that further investigation be undertaken at the Blanco Plant to assess the groundwater quality under the plant property. NMEID requested this investigation for the following reasons:

- Wastewaters containing chromium VI and petroleum compounds were deposited in wastewater ponds until approximately 1964. Site soils are very permeable and groundwater is encountered at shallow depths.

- The former disposal areas are up-gradient and in close proximity to the Citizens Ditch irrigation water canal.

NMEID requested that in conjunction with site investigation activities to be conducted in support of a Discharge Plan Application, EPNG should install monitoring wells at the Blanco Plant to ascertain whether contamination of groundwater exists as a result of past wastewater disposal practices. In August 1988, Bechtel Environmental Inc. prepared a work plan describing site investigation activities to be conducted in support of the Discharge Plan Application and in accordance with NMEID requests. The Work Plan titled Groundwater Quality Investigation of the Blanco Plant Site (BEI August 1988) outlined work to be performed to assess chemical contamination at the Blanco Plant site including a detailed sampling and analysis program. The Work Plan addressed well installation, drilling, sampling, analytical and decontamination procedures to be implemented during the site investigation.

1.2 Scope of Work

The objective of the site investigation was to determine if and to what extent chromium and organics may be present in site soil or groundwater due to past wastewater disposal practices. Information was also collected to better define site geology and groundwater hydrology.

The project began with a review of existing data related to potential site contamination. Based on the review, an investigation work plan was developed which specified soil sampling locations and depths, procedures for soil and groundwater sample collection, chemical analyses to be performed on selected samples, well installation and aquifer testing procedures, and procedures for field health and safety. EPNG submitted the investigation plan to the NMEID for review and comment. The investigation plan was amended following subsequent communication with the NMEID. After its modification and approval, the plan was used to retain the services of a drilling subcontractor and an analytical laboratory.

The site investigation consisted of the following activities:

- Collection and analysis of soil samples from two former site evaporation ponds and a flare pit
- Sampling and analysis of soil from the saturated zone of four borings completed as monitoring wells
- Installation and sampling of six groundwater monitoring wells
- Permeability testing

These activities are discussed in detail in the following sections of this report.

2.0 SITE GEOLOGY

The plant site is located on alluvium, which fills a canyon cut into the Nacimento Formation. The alluvium consists of sandy silts near the surface, very fine to medium-grained, silty to slightly silty sands, clayey, fine to medium-grained sands and a few beds of sandy clays (see geologic boring logs, Attachment 1). These were deposited by stream and wind action. The soils tend to be weak, compressible and have low hydraulic conductivity. At the plant site, thickness of the alluvium ranges from less than 3 feet to more than 75 feet (See Drawing 1 for contours drawn on top of bedrock). The alluvium is deposited on the Nacimiento Formation. Two geologic cross sections across the plant site are shown on Drawings 2 and 3.

The Nacimiento Formation (Paleocene) consists of interbedded mudstones and sandstones that were deposited as channel fill and stream flood plain deposits under humid conditions, as evidenced by the presence of lignite and carbonaceous plant debris.

The Nacimiento has a lower portion that is generally characterized by interbedded black, carbonaceous mudstones and white, coarse-grained, arkosic sandstones. The upper portion of the formation is generally characterized by lighter colored mudstones and arkosic sandstones. Outcrops of Nacimiento near the plant site consist of interbedded tan, carbonaceous claystone, siltstone and coarse to medium-grained, arkosic sandstone. Reported thickness of the Nacimiento within the Central Basin ranges from 418 feet to 2,232 feet (Stone and others, 1983).

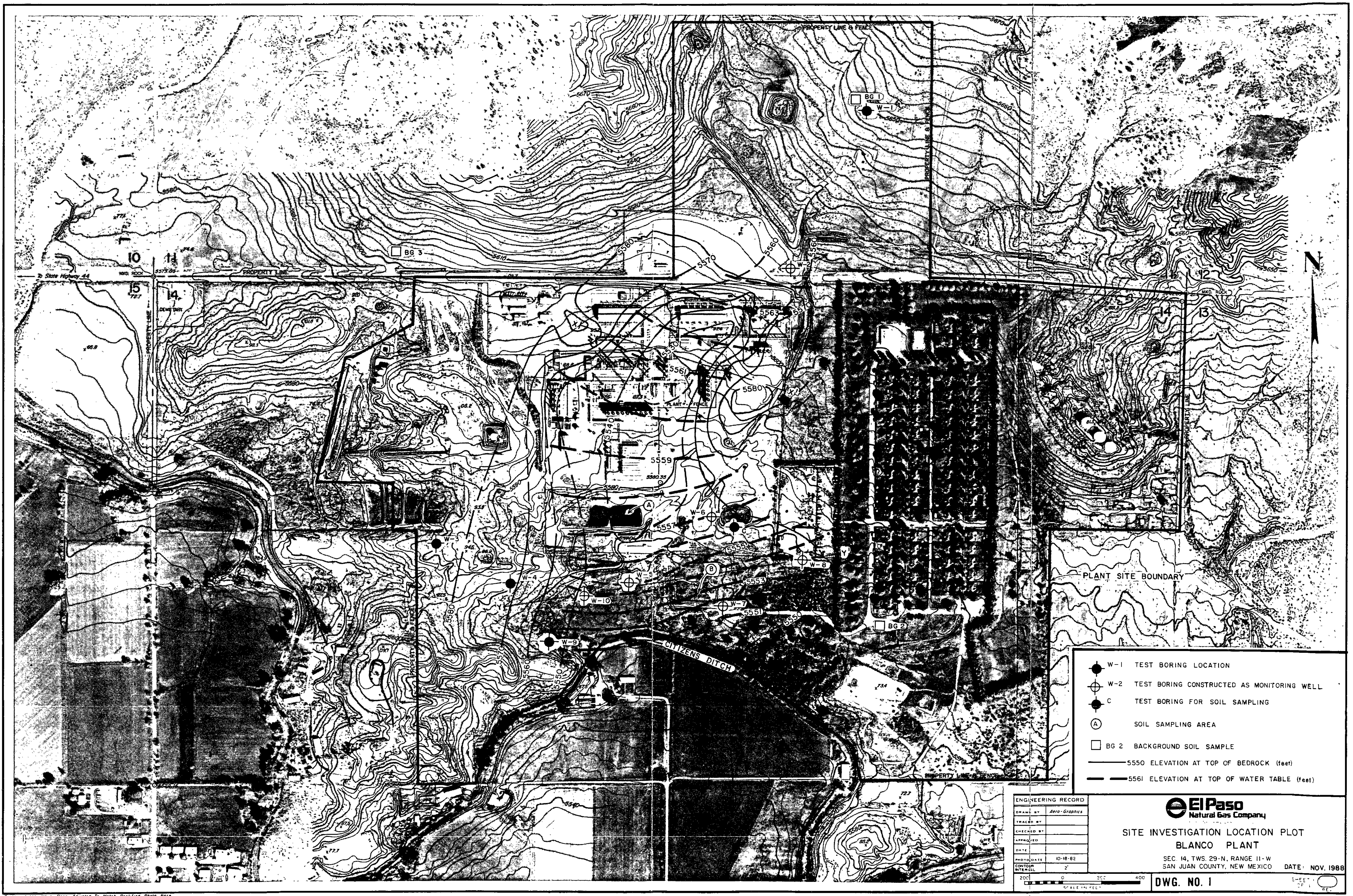
Thickness at the plant site is estimated to be approximately 450 feet. The Nacimiento conformably overlies the Oja Alamo Sandstone, and in some locations the two formations are shown to intertongue.

The Ojo Alamo Sandstone (Paleocene) consists of sandstone, conglomeratic sandstone and shale deposited in alluvial or fluvial environments. The nearest outcrop is found approximately 10 miles west of the plant site. The sandstone is a medium to very coarse-grained, often pebbly, immature, lithic arkose. The pebbly sections, occurring in beds up to 10 feet thick, give the sandstone its locally conglomeratic character. In the Central Basin the thickness of the Ojo Alamo ranges from 72 feet to 313 feet (Stone and others, 1983). Under the plant site, thickness is estimated to be 170 feet (Stone and others, 1983).

3.0 SITE GROUNDWATER HYDROLOGY AND GENERAL GROUNDWATER QUALITY

The alluvium of the plant site is an unconfined aquifer limited laterally by the edges of the canyon it fills (See Drawing 1 for top of bedrock contours). Depth to the top of the ground-water table ranges from 49.7 at Well W2 to 9.2 feet at Well W10. Elevation of the top of the groundwater table ranges from 5564.3 feet at Well 2 to 5551.5 feet at Well W7 (See Drawing 1 for contours at top of water table). Direction of groundwater flow, controlled by the buried canyon, starts from north-northeast to south-southwest and then trends southward through the southern portion of the site. The average hydraulic gradient is 0.0063 ft/ft. Average hydraulic conductivity (six tests) equals 2.1 x 10^{-4} cm/sec and an average transmissivity equals less

Monitor wells are W-2, 5, 6, 7, 8, 10



ENGINEERING RECORD	
DRAWN BY	Aero-Graphics
TRACED BY	
CHECKED BY	
APPROVED	
DATE	
PHOTO DATE	10-18-82
CONTOUR INTERVAL	2'

El Paso Natural Gas Company

SITE INVESTIGATION LOCATION PLOT
BLANCO PLANT

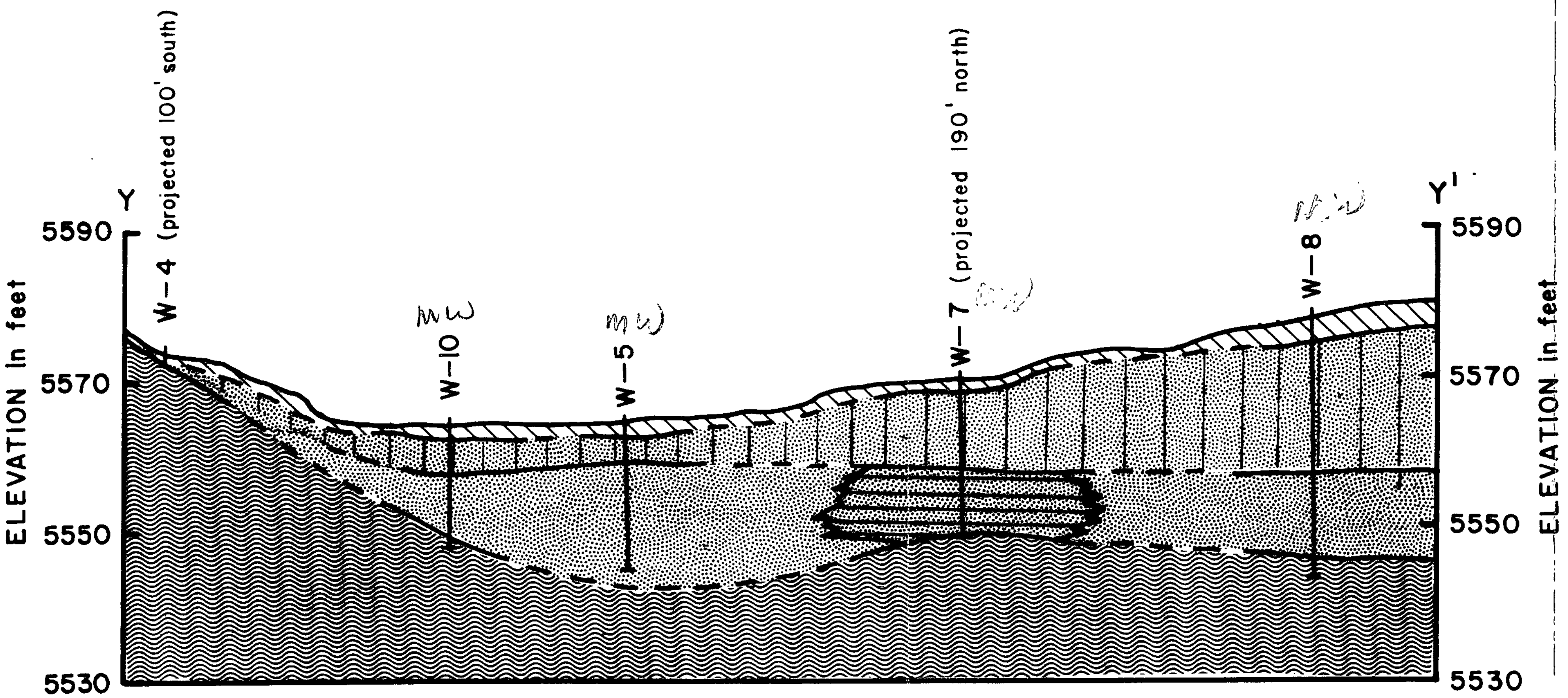
SEC. 14, TWS. 29-N, RANGE 11-W
SAN JUAN COUNTY, NEW MEXICO

DATE: NOV. 1988

DWG. NO. 1

SHEET 1 OF 1

Contour Lines Have Been Adjusted To Match Rectified Photo Base



CROSS SECTION Y—Y'

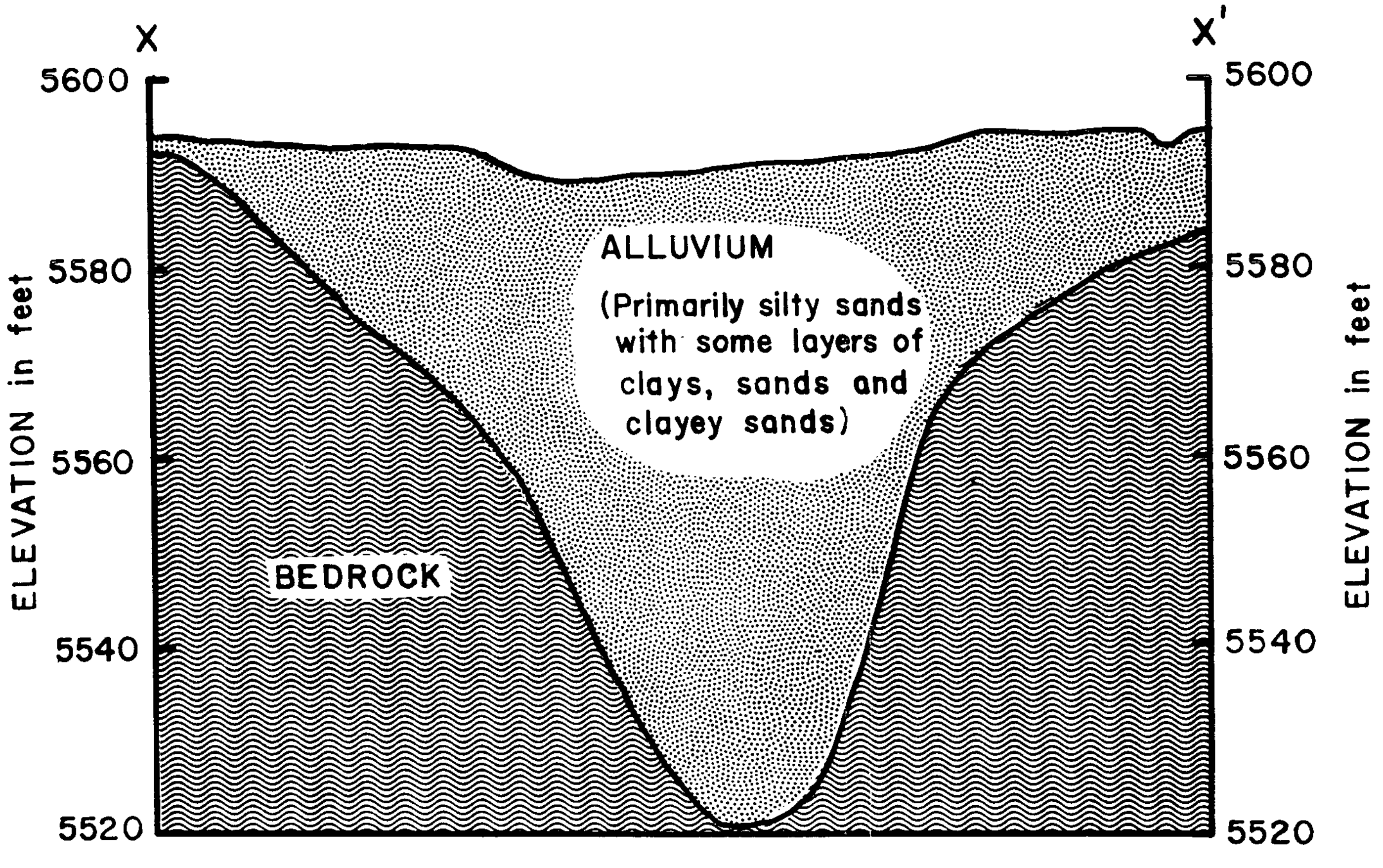
KEY

▧	Fine sandy SILT
▥	Silty, fine to medium SAND
░	SAND to slightly silty SAND
▤	Clayey SAND
▒	BEDROCK

NOTE: See DWG. NO. 1 for Section location.

Vertical Scale 1"= 20'
Horizontal Scale 1"= 200'

EL PASO NATURAL GAS CO.
BLANCO PLANT
CROSS SECTION Y—Y'
DWG. NO. 3 DATE: 11/88



CROSS SECTION X—X'

Vertical Scale 1"= 20'

Horizotal Scale 1"= 200'

NOTE: Constructed from borings by others.
Soil and rock descriptions brief.

See DWG. NO. 1 for Section location.

EL PASO NATURAL GAS CO.
BLANCO PLANT
CROSS SECTION X—X'
DWG. NO. 2 DATE: 11/88

than 200 GPD/ft (Table 1). The electrical conductivity and pH of groundwater samples was measured in the field; the values obtained are presented on Table 2. Electrical conductivity ranged from 2380 micromhos to 7200 micromhos and pH ranged from 7.0 to 7.5.

Groundwater samples were collected from the ground-water monitoring wells as described in Section 5.2. The samples were analyzed as described in Section 5.3 and the results are presented as Attachment 4. The following discussion includes a comparison of the basic water quality i.e., anions, cations, total dissolved solids (TDS) and pH of the shallow groundwater beneath the Blanco site with New Mexico Standards for the protection of groundwater of 10,000 mg/1 TDS concentration or less as specified in Section 3-103 of the New Mexico Water Quality Control Commission Regulations. These standards are not intended as maximum ranges and concentrations for use. Rather, they represent groundwater contaminant concentrations above which the groundwater cannot be degraded if the existing groundwater contaminant concentrations are below these specified concentrations. If the existing concentrations of water contaminants in groundwater are above these levels then no further degradation of the groundwater is allowed. It should be noted that the New Mexico groundwater quality standards, with the exception of mercury and organic compounds, apply to the dissolved portion of the contaminants. Metals, anion and cation concentrations for groundwater samples collected during the site investigation represent the total unfiltered concentrations. Therefore, a comparison of analytical data obtained during the investigation with groundwater protection standards is conservative. Actual dissolved metal, anion and cation concentrations would be lower than the total concentrations reported.

Published data indicates that, in general, groundwater-quality in the San Juan river basin is highly variable with TDS concentrations ranging from approximately 2500 to over 6000 mg/1 (ppm). The TDS in shallow ground water beneath the Blanco site was within this range (2900 to 7612 ppm). Generally, the groundwater is of poor quality, probably due to negligible recharge and/or low hydraulic conductivity. The groundwater does not appear to be suitable for either domestic or agricultural uses due to high TDS, sulfate and sodium concentrations. Groundwater from two of the wells (W2 and W6) also exhibited high nitrate concentrations.

The high concentration (290 ppm) of nitrate in the upgradient well (W2) could not have been due to plant operations. Elevated nitrate in W6 (51 ppm) may however be the result of the oxidation of nitrogen containing compounds from the flare pit area. Since all other wells show very low levels of nitrate, it is evident that this component is highly localized.

Standards for TDS, sulfate and nitrate specified in Section 3-103 of the New Mexico Water Quality Control Commission Regulations are 1000, 600 and 10 ppm respectively, there is no specified standard for sodium. TDS concentrations in all of the wells exceeded the specified TDS standards. TDS concentrations in the wells ranged from 2900 to 7612 mg/1 (ppm); sulfate concentrations ranged from 1610 to 3800 ppm.

Nitrate was detected in wells W2 and W5 at concentrations of 290 and 51 ppm respectively. Sodium concentrations ranged from 57.7 to 1680 ppm. The highest sodium concentrations were found in groundwater from wells W8, W10 and W2. The highest concentration of TDS, sulfate, sodium and nitrate was detected in well W2 the most upgradient well. Water quality may improve downgradient due to an increased area of potential recharge.

TABLE 1

HYDRAULIC CONDUCTIVITY AND TRANSMISSIVITY

WELL NUMBER	HYDRAULIC CONDUCTIVITY (CM/SEC)	TRANSMISSIVITY (GPD/FT)
W-2	6.6×10^{-5}	80
W-5	2.3×10^{-4}	102
W-6	1.5×10^{-4}	102
W-7	1.3×10^{-4}	57
W-8	1.4×10^{-5}	9
W-10	6.4×10^{-4}	190

TABLE 2

GROUNDWATER ELECTRICAL CONDUCTIVITY AND pH

WELL NUMBER	ELECTRICAL CONDUCTIVITY (micromhos/cm)	pH (field measurement)
W-2	7200	7.51
W-5	2380	7.30
W-6	4360	7.13
W-7	4250	7.02
W-8	>5000 (a)	7.41
W-10	4850	7.00

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a) Electrical conductivity (EC) value obtained using an EC meter scaled to a maximum scale of 5000 micromhos/cm.

4.0 SOIL CONTAMINATION INVESTIGATION

This section presents soil drilling, sampling and analytical procedures followed during the site soil investigation. Deviations from the sampling and analytical procedures as initially outlined in the Investigation Work Plan are also discussed.

4.1 Field Activities

Two test pits (A & B) were excavated in former site evaporation ponds and one soil boring (C) was drilled near the flare pit. Soil samples for chemical analysis were collected from these areas. In addition, soil samples were obtained from the saturated zone of four borings (W2, W5, W6 and W7) completed as monitoring wells. The location of the test pits, soil boring and monitoring wells are shown on Drawing 1. Sample depths are presented on the soil analytical data tables included as Attachment 3.

Geologic logs of all borings are included as Attachment 1.

Several modifications to the original sampling program were made due to field conditions encountered during the investigation. These modifications are as follows:

- Test pit C, initially planned to be located in the center of the flare pit, could not be excavated since the flare pit is active. This test pit was replaced by boring C located immediately south of the flare pit as shown on Drawing 1. Samples were obtained at depths of 14 and 18 feet.

- Three background samples were collected at locations shown on Drawing 1. The samples were collected at depths between 0.5 and 1.5 feet. These samples were collected to provide background metals concentrations in shallow soils for comparison with metals concentrations in shallow soil samples collected from the site.

Soil samples from borings W2, W5, W6, W7 and C were obtained by the "dry core" method using a drill rig and a Modified California Sampler. In this method, the soil core sampler is located just ahead of the hollow stem augers and is operated through the center of the auger string. No drilling fluids were used. New brass six-inch sectional liners were steam-cleaned and then were used inside the samplers to minimize the potential for cross-contamination between the soil and the sampler. The tube with the greatest recovery was selected for submission to the laboratory. Teflon lining was then applied to the ends of the tube and labels attached to identify the sampling number. The tube was then placed in an ice filled chest and shipped to the laboratory for analysis. Chain-of-custody procedures were followed for sample transfer. Soil samples in the remaining tubes were retained for pH measurement.

Samples collected from the borings located in the abandoned waste evaporation ponds were collected using a backhoe and drive sampler. The backhoe was used to advance the hole to the desired depth for sampling. The drive sampler was used to collect the sample. The sampler was used with brass liners to minimize the loss of volatile compounds that may have been present in the soil and to minimize the potential for cross-contamination between samples due to contact with the sampler. The brass liners were handled as described above.

Samples obtained from the background locations, BG1, BG2 and BG3 were collected using a hand auger and drive sampler. The hand auger was used to advance the hole to the desired depth for sampling. The drive sampler was used to collect the sample. The samples were collected in brass liners and further handled as described above.

During the drilling of boring W6, noticeably stained soil was encountered between depths of approximately 12 and 23 feet. The stained soil had a hydrocarbon odor. This contaminated soil was probably a result of seepage of hydrocarbon liquids that had once been discharged into the flare pit during emergency upset situations. Based on this observation, it was decided to drill a boring immediately south (downgradient) of the flare pit and collect samples from this stained soil for chemical analysis. This boring was also intended to replace test pit C, originally planned in the flare pit. While drilling the boring, noticeably stained soil was encountered at a depth of approximately 13 feet below the ground surface. Two soil samples were collected from the stained soil and were sent to the laboratory for analysis.

4.2 Laboratory Analysis

With the exception of several added analyses described below, laboratory analyses of soil samples were done in accordance with the analytical program described in the Work Plan. All soil samples were analyzed by the laboratory for analytical parameters listed on Table 3.

TABLE 3

SOIL ANALYTICAL PARAMETERS

Volatile Aromatics (EPA Method 8020)

- Benzene
- Chlorobenzene
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Ethyl benzene
- Toluene
- Xylenes

Volatile Halogenated Organics (EPA Method 8010)

- 1,1-Dichloroethylene
- 1,1-Dichloroethane
- trans-1,2-Dichloroethylene
- Chloroform
- 1,1,2-Trichloro-2,2,1-trifluoroethane
- 1,1,1-Trichloroethane
- Carbon Tetrachloride
- Bromodichloromethane
- 1,2-Dichloropropane
- cis-1,3-Dichloropropylene
- Trichloroethylene
- trans-1,3-Dichloropropylene
- 1,1,2-Trichloroethane
- Dibromochloromethane
- Bromoform
- Tetrachloroethylene
- 1,1,2,2-Tetrachloroethane
- Chlorobenzene

Metals

- Total Iron
- Total Manganese
- Total Chromium
- Total Arsenic
- Hexavalent Chromium
- Total Cadmium
- Total Lead
- Total Mercury
- Zinc

Total Extractable Hydrocarbons (EPA Method 8015)

Oxidation/reduction potential (ASTM Method D1498-76)

In addition, samples B-2 from test pit "B" and C-1 from test pit "C" were analyzed by the laboratory for volatile and semi-volatile priority pollutant organics by EPA GC/MS Methods 624 and 625.

The following additions were made to the proposed analytical plan:

- o Background samples BG1, BG2 and BG3, which were not described in the Work Plan, were collected at depths between .5 and 1.0 feet and were analyzed for total metals and hexavalent chromium. Total metals included those metals specified on Table 3, for which the other soil samples were analyzed.

- o Because noticeably stained soil was encountered in boring C, one of the samples from this boring, Sample C-1, in addition to being analyzed for the full suite of analyses specified for this sample in the analytical plan, was also analyzed for semi-volatile organics by EPA gas chromatograph/mass spectrometer (GC/MS) Method 625. This analysis was performed to identify any semi-volatile compounds that may be present in the sample that cannot be identified by the GC methods.

4.3 Analytical Results

The areas of the Blanco Plant facility that were sampled and analyzed in this study included the site evaporation ponds, flare pit and the saturated zone of four borings completed as monitoring wells. In addition, three shallow soil samples were collected from background locations and analyzed for metals for comparison with metals concentrations in soils collected from onsite locations. Soil samples from the evaporation ponds (B-1, B-2, A-1 and A-2) the flare pit (C-1 and C-2) and the saturated zone of borings W2, W5, W6 and W7 were collected as described in Section 4.1 and were analyzed for volatile organics, halogenated volatile organics, total metals, hexavalent chromium, total petroleum hydrocarbons and oxidation/reduction potential as described in Section 4.2. In addition, samples B-2 and C-1 were analyzed by the laboratory for volatile and semi-volatile priority pollutants by EPA methods 624 and 625. Analytical data obtained from these analyses is summarized below. Chemical data for soil samples have been tabulated and are presented as Attachment 3. Metals concentration ranges detected in the site soil samples are presented in Table 4.

Background Samples

Three shallow background samples were collected at depths between 0.5-1.5 feet from offsite locations (BG1, BG2 and BG3). These background samples were collected to determine background metals concentrations in shallow soil around the Blanco site for comparison with the metals concentration in shallow soil samples collected from on site locations. One additional background sample was collected at a depth of 56-57 feet from the saturated zone of the upgradient boring W2. This background sample was collected to determine the background metal concentration in the saturated zone for comparison with the metals concentration in soil obtained from the saturated zones of the other onsite borings. Metals concentrations in the background samples are presented in the soil analytical data tables (Attachment 3) and concentration ranges are presented on Table 4.

Table 4

ONSITE AND BACKGROUND METAL CONCENTRATION RANGES IN SOILS AT THE BLANCO SITE (a)

Metal	Concentration Ranges in Evaporation Ponds	Concentration Ranges in the Flare Pit and in the Saturated Zone of Borings W6, W7 and W8	Background Concentration Ranges in Background Samples BG1, BG2, BG3 (b)	Background Concentration Boring W2 (c)
Arsenic	<1 - 1.6	<1 - 1.7	<1 - 1.8	2.2
Cadmium	0.1 - 0.2	0.15 - 0.56	0.12 - 0.16	0.13
Chromium	1 - 31	2 - 19	2 - 11	4
Chromium VI	<0.1	<0.1	<0.1 - .23	<0.1
Copper	3 - 8	6 - 56	3 - 12	9
Iron	5710 - 5860	5850 - 5860	4240 - 5860	5850
Lead	<1 - 10.1	2.5 - 9.2	3.4 - 7.1	3
Manganese	71 - 287	158 - 269	131 - 260	263
Mercury	<0.04 - 0.05	<0.04 - 0.06	<0.04	<0.04
Zinc	20 - 30	20 - 50	<10 - 40	30

(a) Metals concentrations in mg/kg (ppm)

(b) Background samples were collected at depths of between 0.5-1.5 feet at the locations shown on the Site Investigation Location Plot (Drawing 1)

(c) Background sample W2 obtained at a depth of 56-57 feet.

Background metals concentration in sample W2 were found to be consistent with the metals concentrations in Samples BG1, BG2 and BG3. With the exception of arsenic, which was present at a slightly higher concentration in sample W2, all of the metals analyzed in sample W2 were present at concentrations within the range of metals concentrations present in the shallow background samples. Based on this data, it appears that there is no significant variation in the soil metals concentrations with depth.

Evaporation Ponds

In samples collected from the evaporation ponds, the majority of metals for which analyses were conducted were detected at concentrations equivalent to the metal concentrations in soil collected from background locations.

Manganese was detected in soil from the northern evaporation pond (Pond A) at concentrations of 284 and 287 mg/kg (ppm) which is slightly in excess of the background manganese concentrations which ranged from 131-260 ppm. Lead concentrations in soil from the south evaporation pond (Pond B) were 9.6 and 10.1 ppm. Background lead concentrations ranged from 3.4 to 7.1 ppm. The chromium concentration in soil sample B-1 was found to be elevated relative to the chromium concentrations in soils obtained from background locations. The chromium concentration in sample B-1 was 31 ppm while background chromium concentrations ranged from 2-11 ppm.

The concentrations of manganese, chromium and lead detected in the evaporation ponds are not significantly higher than background concentrations and may be within normal variations in metals concentration in soil. Concentrations of these metals in the soil do not appear to be adversely impacting ground water quality. The results of ground water analyses will be discussed in Section 5.4.

None of the organic and volatile organic compounds for which the evaporation pond samples were analyzed were present at detectable concentrations. The pH of the soil measured by the laboratory indicate that soil in evaporation pond B tends to be slightly acidic, ranging from 5.51 to 6.33. Soil pH in evaporation pond A is neutral to slightly basic ranging from 7.96 to 8.16.

The oxidation/reduction potential (ORP) of the evaporation pond samples indicate that the subsurface soil in the evaporation ponds is not a reducing system. Generally positive values indicate an oxidizing system. As recent reports have indicated (Rai, Dhanpat, Zachara, 1988), a reducing soil/ground water system tend to reduce and precipitate hexavalent chromium thus slowing or stopping its migration. If chromium had been detected at the site in significant concentrations then the soil ORP value would have been used as a general indicator of the potential for hexavalent chromium migration at the site.

Flare Pit

Sample C-1 collected from a depth of 14 feet in boring C located immediately south of the flare pit contained lead, zinc, copper and cadmium concentrations in excess of background concentrations. Lead was present in sample C-1 at a concentration of 9.2 ppm; zinc, copper and cadmium were present at 50, 56 and 0.33 ppm respectively. Background concentrations of zinc ranged from less than 10 to 40 ppm background lead concentrations from 3.4 to 7.1 ppm, copper concentrations in the background samples ranged from 3 to 12 ppm and cadmium concentrations in background samples ranged from 0.12 to 0.16 ppm. These metals were not detected at concentrations significantly higher than background concentrations and may be within normal variations of metals concentrations in soils.

Sample C-2 collected at a depth of 18-19 feet in Boring C showed metals concentrations at or near background levels with the exception of zinc at 40 ppm.

The majority of organic compounds for which samples C-1 and C-2 were analyzed were not present at detectable concentrations. However, sample C-1 was found to contain a variety of non-priority pollutant semi-volatile compounds. These compounds are hydrocarbons with carbon chains ranging from C-9 to C-20. Concentrations of individual hydrocarbons ranged from 0.1 to 3.5 ppm. The soil pH in samples C-1 and C-2 was 9.18 and 7.4 respectively.

Soil in Saturated Zone of Groundwater Well Borings

Analytical results of soil samples collected from the saturated zones of Borings W5, W6 and W7 indicate that the majority of metals analyzed were detected at concentrations equivalent to the metals concentrations in samples obtained from background locations BG1, BG2, BG3 and W2. However, chromium, cadmium and copper were slightly higher than the above background levels in soils from one or more well borings. Chromium was detected in soil from boring W6 at a concentration of 19 mg/kg. As discussed earlier, background soil samples contained chromium at concentrations ranging from 2 to 11 mg/kg. Cadmium was detected in borings W7 and W5 at concentrations of 0.52 and 0.56 ppm respectively. Background cadmium concentrations ranged from 0.12 to 0.16 ppm. Copper was detected in soil from boring W6 at a concentration of 19 ppm. Background copper concentrations ranged from 3 to 12 ppm.

In general, metals detected above background levels were not significantly higher than the background and are likely within normal concentration variations of these metals.in soil.

None of the organic compounds for which the samples were analyzed were present at detectable concentrations. The pH of soil from the saturated zones of wells W2, W6, W7 and W5 was neutral, ranging from 7.5 to 7.87.

5.0 GROUNDWATER QUALITY INVESTIGATION

5.1 Well Construction and Development

Six monitoring wells were constructed during the site investigation. Locations of these wells are shown on Drawing 1. A total of ten potential well locations was drilled, but at four locations groundwater was not encountered; consequently wells were not constructed at these locations. A geologic drill log of each drill hole is included in Attachment 1.

Drilling was performed with a CME-75 drilling machine using a ten-inch diameter hollow stem auger. Details of well construction including well depth are shown on the well construction records in Attachment 2.

The wells were developed by pumping with a 3 1/2 inch diameter submersible pump installed near the bottom of each well. A surging action was created by turning the pump off and on.

Development time for each well ranged from three to seven hours. The wells were pumped until the discharge water was clear and sand free.

After developing each well, permeability testing was performed by pumping the well down and using recovery rates to calculate hydraulic conductivity (Hvorslev, 1951; Bouwer and Rice, 1976). Results are shown on Table 1.

5.2 Well Sampling

Monitoring well sampling was conducted according to the procedures outlined in Appendix B of the Work Plan.

Wells W-7, W-8, W-5 and W-10 were sampled within 24 hours of well development. Wells W-6 and W-2 were not developed within 24 hours of sampling and, therefore, had to be purged of a minimum of three calculated well volumes using a positive displacement type hand pump. Temperature, pH, and electrical conductivity were monitored periodically during purging. After the required volume was removed and the temperature, pH and electrical conductivity had stabilized, the sample was collected using a stainless steel bailer fitted with both upper and lower teflon check valves. The sample was transferred directly to pre-cleaned, laboratory supplied containers using a teflon bottom-emptying device, to prevent sample aeration.

The sample containers, when full, were immediately capped, labeled, and sealed with tape. The samples were held in ice-filled coolers until transported to the laboratory under the appropriate chain-of-custody procedures. All pumps and downhole purging equipment, including drop pipe, were steam-cleaned between use in each well. The bailer was cleaned between each use according to the procedure outlined in the Work Plan.

5.3 Laboratory Analysis

Laboratory analysis of groundwater samples followed the analytical program described in the Work Plan. No modifications were made to this program. Samples from the six groundwater monitoring wells were analyzed for the analytical parameters listed on Table 5.

TABLE 5

GROUND WATER ANALYTICAL PARAMETERS

Volatile Aromatics (EPA Method 602)

- Benzene
- Chlorobenzene
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Ethyl benzene
- Toluene
- Xylenes

Volatile Halogenated Organics (EPA Method 601)

- 1,1-Dichloroethylene
- 1,1-Dichloroethane
- trans-1,2-Dichloroethylene
- Chloroform
- 1,1,2-Trichloro-2,2,1-trifluoroethane
- 1,1,1-Trichloroethane
- Carbon Tetrachloride
- Bromodichloromethane
- 1,2-Dichloropropane
- cis-1,3-Dichloropropylene
- Trichloroethylene
- 1,1,2-Trichloroethane
- 1,1,2-Trichloroethane
- Dibromochloromethane
- Bromoform
- Tetrachloroethylene
- 1,1,2,2-Tetrachloroethane
- Chlorobenzene

Metals

- Total Iron
- Total Manganese
- Total Chromium
- Total Arsenic
- Hexavalent Chromium
- Total Cadmium
- Total Lead
- Total Mercury
- Zinc
- Copper

Total Extractable Hydrocarbons (EPA Method 8015)

Major Cations and Anions

- Calcium EPA 200.7
- Magnesium EPA 200.7
- Potassium EPA 200.7
- Sodium EPA 200.7
- Sulfate EPA 375.4
- Alkalinity (Bicarbonate, Carbonate) EPA 310.1
- Chloride EPA 325.3
- Nitrate EPA 353.3

Basic Water Quality Parameters

- pH (EPA 150.1)
- Total Dissolved Solids (EPA 160.1)

Water from well W6 was also analyzed for volatile and semi-volatile priority pollutant organics by EPA, GC/MS Methods 624 and 625.

The Oxidation/Reduction Potential (ORP) of groundwater samples was not remeasured in the field as originally planned. It was decided that laboratory measurement of ORP in soil samples was sufficient for determination of this parameter in the subsurface environment.

5.4 Analytical Results

Groundwater samples were collected as described in Section 5.2 and were analyzed as described in Section 5.3. Detailed analytical results are presented as Attachment 4. Basic water quality parameters i.e, anions/cations, TDS and pH were discussed in Section 3.0.

This section discusses the results of analyses conducted to determine if and at what concentrations metals and organic compounds were present in groundwater beneath the Blanco Plant site.

Where appropriate, concentrations of metals and organic compounds detected in site groundwater are compared to the standards established by the New Mexico Water Quality Control Commission for the protection of groundwater with a TDS of 10,000 mg/1 or less. Concentrations of compounds detected in groundwater and the associated groundwater quality standards are presented on Table 6. It should be noted that the New Mexico groundwater quality standards, with the exception of mercury and organic compounds, apply to the dissolved portion of the contaminants.

Analytical data for metals, anion and cation concentrations for groundwater samples represent total unfiltered concentrations. Therefore, comparison of the analytical data with the groundwater protection standards is not conclusive. Actual dissolved metal, anion and cation concentrations would be lower than the total concentrations reported.

Chromium (as total chromium) was not detected in any of the groundwater samples. Hexavalent chrome (Chromium VI) was detected in very low concentrations in W5 and W8 (0.02 and 0.01 mg/l respectively). This may be attributed to the sensitivity difference between the methodologies for total chromium and hexavalent chromium.

With the exception of iron and manganese, all of the metals for which analyses were conducted were below the established standards. Iron was detected in three of the six wells at concentrations greater than the specified standard of 1.0 ppm. Iron was detected in wells, W2, W5, and W7 at concentrations of 4, 1.61 and 1.2 ppm respectively.

Manganese was detected in all of the monitoring wells at concentrations greater than the specified standard of 0.2 ppm. Manganese concentrations in the wells ranged from 1.28 to 4.59 ppm. The higher concentrations were detected in wells, W6, W8 and W10. Manganese concentrations in groundwater from wells W6, W8 and W10 were 4.03, 4.59 and 3.32 ppm respectively.

The highest iron concentrations in the groundwater samples were detected in water from both the upgradient well and the downgradient wells. Information on plant operation indicates that neither iron or manganese were components of facility wastestreams, therefore it is believed that the elevated iron and manganese concentrations detected in the site wells are probably characteristic of groundwater in the Blanco area and not due to the plant operations.

Trace concentrations (less than 2 ug/1) of halogenated volatile organics were detected in groundwater samples collected from the monitoring wells. The compounds detected were 1,1,1-Trichloroethane, chlorobenzene, dibromochloromethane, trichloroethylene and trichlorofluoromethane.

The volatile organic 1,1,1-trichloroethane was detected in groundwater from all of the wells. Concentrations were low, ranging from 0.3 to 1.4 ppb. The highest concentrations were detected in wells W2, W8 and W10. The concentration of 1,1,1-trichloroethane in these wells is 1.3, 1.4 and 1.3 ppm respectively. Chlorobenzene was detected only in well W5 at a concentration of 0.3 ppb. Dibromochloromethane was detected in wells W2, W8 and W10 at concentrations of 0.46, 0.31 and 0.2 respectively. Trichloroethylene was detected in all of the wells except well W6 and was also detected in the travel blank. Concentrations were low, ranging from 0.15 to 0.4 ppb. Trichlorofluoromethane was detected in well W10 and the travel blank at concentrations of 0.23 and 0.08 ppb. Only one volatile aromatic was detected in the ground water. Toluene was detected in well W8 at a concentration of 5 ppb.

A travel blank consisting of organic free water supplied by the laboratory was containerized and sealed in the same manner as the groundwater samples. The travel blank accompanied groundwater and soil samples to the laboratory and was analyzed for the same volatile compound for which the soil or water samples were analyzed. The purpose of the travel blank is to determine if there may be some source of outside contamination that may have affected soil and/or groundwater samples.

Outside sources of contamination may have included residue on sample containers, and/or contamination associated with the adhesive of tape or labels present on the bottles or in the shipping containers. The travel blank is prepared and analyzed in the same manner as groundwater samples and may also be affected by potential background contamination present in the laboratory. Trichloroethylene and trichlorofluoromethane which were detected in groundwater samples were also detected at low concentrations in the travel blanks. This suggests that these compounds may not actually be present in the groundwater but may be the result of contamination that may have occurred in the sample containers, the shipping containers or in the laboratory.

Some of the volatile compounds detected in site wells were detected in the upgradient well W2 where potential contamination associated with the Blanco plant operations was not expected to be present.

The concentrations of detected volatile compounds were all well below the groundwater quality standards established for these compounds by the New Mexico Water Quality Control Commission.

TABLE 6

METALS AND ORGANIC COMPOUNDS DETECTED IN GROUND WATER (a)

	Sample ID						New Mexico Standards for Ground Water of 10,000 mg/l TDS Concentrations or less (b) (c)
Volatile Halogenated Organics (601)	W2	W5	W6	W7	W8	W10	
1,1,1-Trichloroethane ug/l	1.3	0.5	0.3	0.6	1.4	1.3	60 ug/l
Chlorobenzene ug/l	<0.25	0.3	<0.25	<0.25	<0.25	<0.25	NA
Dibromochloromethane ug/l	0.46	<0.9	<0.9	<0.9	0.31	0.2	NA
Trichloroethylene ug/l	0.4	0.3	<0.12	0.15	0.4	0.3	100 ug/l
Trichlorofluoromethane ug/l	<0.4	<0.4	<0.4	<0.4	<0.4	0.23	NA
Volatile Aromatics (602)							
Toluene ug/l	<0.2	<0.2	<0.2	<0.2	5	<0.2	750 ug/l
Metals (mg/l)							
Total Iron	4	1.61	0.7	1.2	0.22	1.03	1.0 mg/l
Total Manganese	1.36	1.54	4.03	2.21	4.59	3.32	0.2 mg/l
Total Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05 mg/l
Hexavalent Chromium	<0.01	0.02	<0.01	<0.01	<0.01	0.01	0.05 mg/l
Total Arsenic	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1 mg/l
Total Cadmium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.01 mg/l
Total Lead	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05 mg/l
Total Mercury	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.002 mg/l
Zinc	0.03	0.03	<0.1	0.3	0.2	0.2	10.0 mg/l
Copper	0.03	0.02	<0.01	0.02	<0.01	<0.01	1.0 mg/l

a) Only those volatile compounds that were detected are presented in this table.

b) New Mexico Water Quality Control Commission Regulations, Subsection 3-103

c) Standards apply to the dissolved portion of the contaminants with the exception of mercury and organic compounds. Metals concentrations in ground water samples collected at the site represent metal concentrations for the total unfiltered sample.

6.0 REFERENCES

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ATTACHMENT 1

Geologic Boring Logs

GEOLOGIC DRILL LOG

PROJECT: EPNG BLANCO PLANT
JOB NO.: 19782
SHEET NO.: 1 of 1
HOLE NO.: W-1
SITE: Blanco Plant
COORDINATES:
ANGLE FROM HORIZ.: 90°
BEARING: -
BEGUN: 9/20/88
COMPLETED: 9/20/88
DRILLER: Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL: CME-75
HOLE SIZE: 10"d
OVERBURDEN (FT.): 51
ROCK (FT.): 1
TOTAL DEPTH: 52 ft
CORE RECOVERY (FT./%): NA
CORE BOXES: NA
SAMPLES: 1
EL. TOP OF CASING: NA
GROUND EL.: 5649 ft
DEPTH/EL. GROUND WATER: No Water
DEPTH/EL. TOP OF ROCK: 51 ft/5598 ft
SAMPLE HAMMER WEIGHT/FALL: 140 lbs/30"
CASING LEFT IN HOLE: DIA./LENGTH: None
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							5649				0 -1' Brown, silty, fine grained SAND (SM) - dry	
								5			1'-8' Brown, silty, fine to little medium grained SAND (SM) - dry	Drilled w/ 10" d hollow stem auger
								10			8'-10' Brown, little fine, medium grained SAND (SW) - dry	
								15			10'-51' Same as 1'-8', becoming moist with depth	NO WELL INSTALLED
								20				
								25				
								30				
								35				
								40				
								45				
								50				
Modified California, 2 1/2" d., 6" brass sleeves	12"	12"					5597				51'-52' Brown, decomposed, slightly sandy SILTSTONE	
								55			Bottom of boring 52' below ground surface	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: BLANCO PLANT
HOLE NO.: W-1

H&CF 19-1

BECHTEL

GEOLOGIC DRILL LOG

PROJECT EPNG BLANCO PLANT
JOB NO. 19782
SHEET NO. 1 OF 1
HOLE NO. W-2
SITE Blanco Plant
COORDINATES
ANGLE FROM HORIZ. 90°
BEARING -
BEGUN 9/20/88
COMPLETED 9/21/88
DRILLER Sergent, Houskins, & Beckwith
DRILL MAKE AND MODEL CME-75
HOLE SIZE 10"
OVERBURDEN (FT.) 57.5
ROCK (FT.) 0
TOTAL DEPTH 57.5 ft
CORE RECOVERY (FT./%) NA
CORE BOXES NA
SAMPLES 1
EL. TOP OF CASING *
GROUND EL. 5614 ft
DEPTH/EL. GROUND WATER 49.7 ft/5564.3 ft
DEPTH/EL. TOP OF ROCK 57.5'/5556.5 ft
SAMPLE HAMMER WEIGHT/FALL 140 lbs/30 in
CASING LEFT IN HOLE: DIA./LENGTH *
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS			ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
				LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES						
Modified California, 2 1/2" d., 6" brass sleeves							5614	5 10 15 20			0'-23' Brown, slightly silty, few medium, fine grained SAND (SW) slightly damp. Silt content increases with depth.	Drilled w/ 10"d. hollow-stem auger *See Well Construction Reports
								25			23'-27' Light brown, silty, very fine grained SAND (SM) - damp	
								30			27'-32' Brown, silty, medium grained SAND (SM) with little clay - damp	
								35 40			32'-46' Dark brown, fine to medium grained sandy CLAY (CL) - Moist - very little sand 41'-44'	
								45			46'-49' Dark brown, very clayed medium to fine grained SAND (SC) - moist	
								50 55		☒	49'-57 1/2' Light brown, slightly silty, fine to medium grained SAND (SP-SM) - saturated	
	18"	12"					5556.5				Bedrock @ 57 1/2' Bottom of boring @ 57 1/2'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE BLANCO PLANT
HOLE NO. W-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT: EPNG BLANCO PLANT

JOB NO.: 19782

SHEET NO.: 1 OF 1

HOLE NO.: W-3

SITE: Blanco Plant

COORDINATES:

ANGLE FROM HORIZ.: 90^{0}

BEARING: -

BEGUN: 9/23/88

COMPLETED: 9/23/88

DRILLER: Sergent, Houskins & Beckwith

DRILL MAKE AND MODEL: CME-75

HOLE SIZE: 10"d

OVERBURDEN (FT.): 6

ROCK (FT.): 2

TOTAL DEPTH: 8 ft

CORE RECOVERY (FT./%): NA

CORE BOXES: NA

SAMPLES: 0

EL. TOP OF CASING: NA

GROUND EL.: 5590 ft

DEPTH/EL. GROUND WATER: No Water

DEPTH/EL. TOP OF ROCK: 6 ft/5584 ft

SAMPLE HAMMER WEIGHT/FALL: NA

CASING LEFT IN HOLE: DIA./LENGTH: None

LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							5590				0 - 1/2' Brown, sandy, SILT (NL) - dry	Drilled w/10"d. Hollow-Stem Auger
								5			1/2 - 3' Light brown, silty fine grained SAND (SM) - dry	
							5582	10			3' - 6' Yellow brown, iron stained, very slightly clayey, slightly silty fine to medium grained SAND (SP-SM) - trace moisture	HOLE DRY NO WELL INSTALLED
											6' - 8' Very weathered, gray fine grained SANDSTONE	
											Refusal @ 8' Bottom of boring @ 8'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: BLANCO PLANT

HOLE NO.: W-3

BECHTEL

GEOLOGIC DRILL LOG

PROJECT EPNG BLANCO PLANT		JOB NO. 19782	SHEET NO. 1 of 1	HOLE NO. W-4
SITE Blanco Plant	COORDINATES		ANGLE FROM HORIZ. 90°	BEARING -
BEGUN 9/23/88	COMPLETED 9/23/88	DRILLER Sergent, Houskins & Beckwith	DRILL MAKE AND MODEL CME-75	HOLE SIZE 10" d
OVERBURDEN (FT.) 7	ROCK (FT.) 1	TOTAL DEPTH 8 ft		
CORE RECOVERY (FT./%) NA	CORE BOXES NA	SAMPLES 0	EL. TOP OF CASING NA	GROUND EL. 5582 ft
DEPTH/EL. GROUND WATER No Water	DEPTH/EL. TOP OF ROCK 7 ft/5575 ft			
SAMPLE HAMMER WEIGHT/FALL NA	CASING LEFT IN HOLE: DIA./LENGTH None	LOGGED BY: E. Berglund		

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS			ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
				LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES						
							5582				0-1' Light brown, fine sandy SILT (ML)-dry	Drilled w/10"d hollow stem auger
							5574	5 10			1'-7' Medium brown, slightly silty, fine to medium SAND (SP-SM)-dry Light brown 4'-7'	HOLE DRY
											7'-8' Light brown, decomposed medium grained SANDSTONE	NO WELL INSTALLED
											Refusal @ 8' Bottom of boring @ 8'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER	SITE BLANCO PLANT	HOLE NO. W-4

H&CF 19-1

GEOLOGIC DRILL LOG

PROJECT: EPNG BLANCO PLANT
JOB NO.: 19782
SHEET NO.: 1 OF 1
HOLE NO.: W-5
SITE: Blanco Plant
COORDINATES:
ANGLE FROM HORIZ.: 90°
BEARING: -
BEGUN: 9/23/88
COMPLETED: 9/23/88
DRILLER: Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL: CME-75
HOLE SIZE: 10" d
OVERBURDEN (FT.): 20
ROCK (FT.): -
TOTAL DEPTH: 20 ft
CORE RECOVERY (FT./%): NA
CORE BOXES: NA
SAMPLES: 1
EL. TOP OF CASING: *
GROUND EL.: 5565 ft
DEPTH/EL. GROUND WATER: 11.0 ft/5555 ft
DEPTH/EL. TOP OF ROCK: NA
SAMPLE HAMMER WEIGHT/FALL: 140 lbs/30 inches
CASING LEFT IN HOLE: DIA./LENGTH: *
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							5565				0-2' Brown, very silty fine to very fine grained SAND (SM) - dry	Drilled w/ 10"d. hollow stem auger
								5			2'-5' Brown, silty, fine to medium grained SAND (SM) - damp	
								10			5'-20' Brown, slightly silty, fine to medium grained SAND (SP-SM)-saturated below 11 feet	
Modified Calif. 2½" d., 6" brass sleeves	18"	12"						15		☒		
							5545	20			Bottom of boring @ 20' below ground surface	*See Well Construction Reports
								25				

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: BLANCO PLANT
HOLE NO.: W-5

H&CF 19-1

BECHTEL

GEOLOGIC DRILL LOG

PROJECT EPNG BLANCO PLANT	JOB NO. 19782	SHEET NO. 1 OF 1	HOLE NO. W-6
SITE Blanco Plant	COORDINATES	ANGLE FROM HORIZ. 90°	BEARING -

BEGUN 9/21/88	COMPLETED 9/21/88	DRILLER Sergent, Houskins & Beckwith	DRILL MAKE AND MODEL CME-75	HOLE SIZE 10" d	OVERBURDEN (FT.) 31	ROCK (FT.) 0	TOTAL DEPTH 31 ft

CORE RECOVERY (FT./%) NA	CORE BOXES NA	SAMPLES 1	EL. TOP OF CASING *	GROUND EL. 5576 ft	DEPTH/EL. GROUND WATER 19.2 ft/5556.8 ft	DEPTH/EL. TOP OF ROCK NA

SAMPLE HAMMER WEIGHT/FALL 140 lb/30 inches	CASING LEFT IN HOLE: DIA./LENGTH *	LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS LOSS IN G.P.M.			ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
						PRESSURE P.S.I.	TIME IN MINUTES						
Modified Calif. 2½" d. brass sleeves 6" long								5576				0-5' Light brown, fine sandy SILT (ML)-dry Sand content increases with depth	Drilled w/ 10"d hollow stem auger
									5			5'-7' Medium brown, silty very fine to fine grained SAND (SM)-dry	
									10			7'-12' Slightly yellow brown, slightly silty, fine to medium grained SAND - damp (SP-SM)	
									15 20			12'-23' Medium gray, silty fine sandy CLAY (CL) Moderate hydrocarbon odor. Light gray @ 20'.	*See Well Construction Reports
	18"	12"						5545	25 30		☒	25'-31' Slightly yellow brown, slightly clayey, silty fine to medium grained SAND (SM) - saturated	
									35			Bottom of boring @ 31'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER	SITE BLANCO PLANT	HOLE NO. W-6

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
EPNG BLANCO PLANT	19782	1 of 1	W-7

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
Blanco Plant		90^{0}	-

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
9/22/88	9/22/88	Sergent Houskins & Beckwith	CME-75	10"d	20.5	0.5	21 ft

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	1	*	5568 ft	16.5 ft/5551.5 ft	20.5 ft/5547.5 ft

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 lbs/30 inches	*	E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
Modified California, 2½" d. brass sleeves, 6" long							5568				0-1' Light brown, very fine sandy SILT (ML)-dry	Drilled w/ 10"d hollow stem auger
								5			1'-8' Light brown (yellow tint), silty to slightly silty, fine to very fine grained SAND (SM) trace moisture	
								10				
								15			8'-12' Medium brown, slightly silty, fine SAND (SW-SM) -damp	
	12"	12"					5547	20		☒	12'-20.5' Brown, clayey, fine grained SAND (SC)-damp	
								25			20.5'-21' Brown, medium grained slightly decomposed SANDSTONE	*See Well Construction Reports
											Bottom of boring @ 21'	

SS = SPLIT SPOON; ST = SHELBY TUBE;
D = DENNISON; P = PITCHER; O = OTHER

SITE	HOLE NO.
BLANCO PLANT	W-7

H&CF 19-1

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
EPNG BLANCO PLANT	19782	1 of 1	W-8

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
Blanco Plant		90°	-

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
9/23/88	9/23/88	Sergent, Houskins & Beckwith	CME-75	10" d	32	3	35 ft

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	0	*	5578 ft	24.6 ft/5553.4 ft	32 ft/5546 ft

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
NA	*	E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								5578				0-3½' Light brown, fine sandy SILT (ML) - dry	Drilled w/ 10"d. hollow stem auger
									5			3½'-10'Medium brown, silty, fine grained SAND (SM)-dry. Slightly damp below 6 ft.	
									10			10'-17'Gray-brown, very silty, fine grained SAND (SM)- damp	*See Well Construction Reports
									15				
									20			12'-21'Brown, silty, fine grained SAND (SM)-moist	
									25			21'-32'Dark brown, slightly silty, medium to fine grained SAND (SP-SM)- damp-saturated @ 25 ft	
									30			32'-35'Gray brown, decomposed medium grained SANDSTONE	
								5543	35			Refusal @ 35' Bottom of boring @ 35'	
									40				

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE	HOLE NO.
BLANCO PLANT	W-8

BECHTEL

GEOLOGIC DRILL LOG

PROJECT: EPNG BLANCO PLANT
JOB NO.: 19782
SHEET NO.: 1 OF 1
HOLE NO.: W-9

SITE: Blanco Plant
COORDINATES:
ANGLE FROM HORIZ.: 90°
BEARING: -

BEGUN: 9/24/88
COMPLETED: 9/24/88
DRILLER: Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL: CME-75
HOLE SIZE: 10"d
OVERBURDEN (FT.): 10
ROCK (FT.): 2.5
TOTAL DEPTH: 12.5

CORE RECOVERY (FT./%): NA
CORE BOXES: NA
SAMPLES: 0
EL. TOP OF CASING: NA
GROUND EL.: 5567 ft
DEPTH/EL. GROUND WATER: No Water
DEPTH/EL. TOP OF ROCK: 10 ft/5557 ft

SAMPLE HAMMER WEIGHT/FALL: NA
CASING LEFT IN HOLE: DIA./LENGTH: None
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								5567				0-3' Brown, silty, fine grained SAND (SM)-dry	Drilled w/ 10"d. hollow stem auger
									5			3'-6'Brown, silty, fine to medium grained SAND (SM) - trace moisture	
									10			6'-10'Dark brown, slightly clayey, silty, fine to medium grained SAND (SM)-damp	DRY HOLE
								5554.5	15			10'-12½'Gray, decomposed medium grained SANDSTONE-clayey	NO WELL INSTALLED
												Refusal @ 12½'	
												Bottom of boring @ 12½'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: BLANCO PLANT
HOLE NO.: W-9

H&CF 19-1

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
EPNG BLANCO PLANT	19782	1 OF 1	W-10

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
Blanco Plant		90^0	-

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
9/24/88	9/24/88	Sergent, Houskins & Beckwith	CME-75	10"d	14	1	15 ft

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	0	*	5563 ft	9.2 ft/5553.8 ft	14 ft/5549 ft

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
NA	*	E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS LOSS IN G.P.M.	WATER PRESSURE TESTS PRESSURE P.S.I.	WATER PRESSURE TESTS TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							5563				0-2' Light brown, fine sandy SILT (NL)-dry	Drilled w/10"d hollow stem auger
								5			2'-7' Dark brown, silty, fine medium grained SAND (SM)-trace moisture	
								10			7'-14' Gray-brown, slightly clayey, slightly silty fine to medium grained SAND (SP-SM)-wet	
							5548	15				
								20			14'-15' Grayish brown, decomposed SANDSTONE	
											Refusal @ 15' Bottom of boring @ 15'	*See Well Construction Reports

SS = SPLIT SPOON; ST = SHELBY TUBE;
D = DENNISON; P = PITCHER; O = OTHER

SITE	HOLE NO.
BLANCO PLANT	W-10

H&CF 19-1

GEOLOGIC DRILL LOG

PROJECT EPNG BLANCO PLANT
JOB NO. 19782
SHEET NO. 1 OF 1
HOLE NO. C
SITE Blanco Plant
COORDINATES
ANGLE FROM HORIZ. 90°
BEARING -
BEGUN 9/24/88
COMPLETED 9/24/88
DRILLER Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL CME-75
HOLE SIZE 6"d
OVERBURDEN (FT.) 19
ROCK (FT.) -
TOTAL DEPTH 19
CORE RECOVERY (FT./%) NA
CORE BOXES NA
SAMPLES 2
EL. TOP OF CASING NA
GROUND EL. 5580 ft
DEPTH/EL. GROUND WATER NA
DEPTH/EL. TOP OF ROCK NA
SAMPLE HAMMER WEIGHT/FALL 140 lbs/30 inches
CASING LEFT IN HOLE: DIA./LENGTH None
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
Modified Calif. 2½" d., 6" brass sleeves								5580				0-6' Brown, silty, fine grained SAND (SM)-dry	Drilled w/6"d. hollow-stem auger
									5			6'-13'Yellow-brown, slightly silty, fine to medium grained SAND (SP-SM) - damp	
									10				Drilled for sampling only
	18"	12"							15		☒	13'-19'Dark bluish-gray, sandy CLAY (CL) to clayey, fine to medium grained SAND (SC) - moist. Hydrocarbon odor.	
	18"	12"						5561	20		☒		
												Bottom of boring @19'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE BLANCO PLANT
HOLE NO. C

H&CF 19-1

ATTACHMENT 2

Well Construction Details

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.

WELL NO: W-2

JOB NO: 19782

SITE: Blanco Plant

COORDINATES:

BEGUN: 9/20/88

COMPLETED: 9/21/88

PREPARED BY: E. Berglund

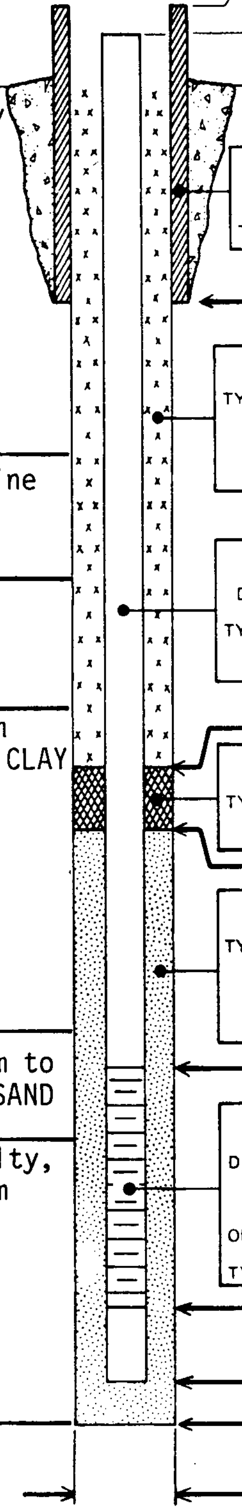
REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing

ELEV. – TOP OF SURFACE CASING: ?

ELEV. – TOP OF RISER CASING: 5616.3 ft

GENERALIZED GEOLOGIC LOG

0-23'	Slightly silty fine grained SAND
23'-27'	Silty, very fine grained SAND
27'-32'	Silty, medium grained SAND
32'-46'	Fine to medium grained sandy CLAY
46'-49'	Clayey, medium to fine grained SAND
49'-57.5'	Slightly silty, fine to medium grained SAND



SURFACE CASING

DIA: 8 inches

TYPE: Steel with locking cap

BACKFILL MATERIAL

TYPE: Cement-Bentonite Grout

RISER CASING

DIA: 4 inch I.D.

TYPE: Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL

TYPE: Bentonite pellets, ½ inch d.

FILTER PACK

TYPE: Washed silica sand, No. 10-30

SCREEN:

DIA: 4 inch I.D. TYPE: Schedule 40 PVC

OPENINGS: WIDTH 0.020 inch

TYPE Machine slotted, 4 slots/inch;4 rows

	DEPTH ft	ELEV. ft
GROUND SURFACE	0	5614
BOTTOM OF SURFACE CASING	2.4	?
TOP OF SEAL	43.2	5570.8
TOP OF FILTER PACK	45.2	5568.8
TOP OF SCREEN	46.3	5567.7
BOTTOM OF SCREEN	56.3	5557.7
BOTTOM OF SUMP	56.7	5557.3
BOTTOM OF HOLE	57.5	5556.5

NO SCALE

HOLE DIA: 10 inches

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.
WELL NO: W-5
JOB NO: 19782
SITE: Blanco Plant
COORDINATES:
BEGUN: 9/23/88
COMPLETED: 9/23/88
PREPARED BY: E. Berglund
REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing

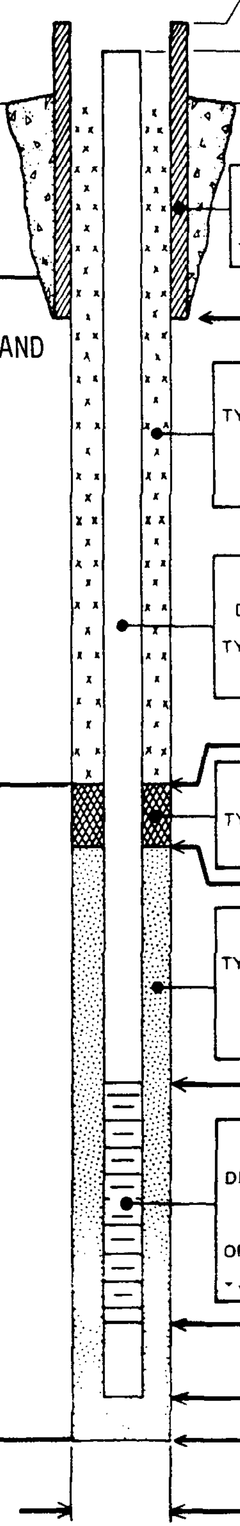
ELEV. – TOP OF SURFACE CASING: ?
ELEV. – TOP OF RISER CASING: 5566.5 ft

GENERALIZED GEOLOGIC LOG

0-2' Very silty, fine to very fine grained SAND

2'-5' Silty, fine to medium grained SAND

5'-15' Slightly silty, fine to medium grained SAND



SURFACE CASING
DIA: 8 inches
TYPE: Steel with locking cap

BACKFILL MATERIAL
TYPE: Cement-Bentonite Grout

RISER CASING
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL
TYPE: Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN:
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC
OPENINGS: WIDTH: 0.020 inch
TYPE: Machine slotted, 4 slots/inch;4 rows

	DEPTH ft	ELEV. ft
GROUND SURFACE	0	5565
BOTTOM OF SURFACE CASING	3.2	?
TOP OF SEAL	5.0	5560.0
TOP OF FILTER PACK	8.0	5557.0
TOP OF SCREEN	8.5	5556.5
BOTTOM OF SCREEN	18.5	5546.5
BOTTOM OF SUMP	19.9	5545.0
BOTTOM OF HOLE	20.0	5545.0

NO SCALE

HOLE DIA: 10 inches

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.

WELL NO. W-6

JOB NO 19782

SITE Blanco Plant

COORDINATES

BEGUN 9/21/88

COMPLETED 9/21/88

PREPARED BY E. Berglund

REFERENCE POINT FOR MEASUREMENTS Top of Riser Casing

ELEV. – TOP OF SURFACE CASING: ?

ELEV. – TOP OF RISER CASING: 5577.0 ft

GENERALIZED GEOLOGIC LOG

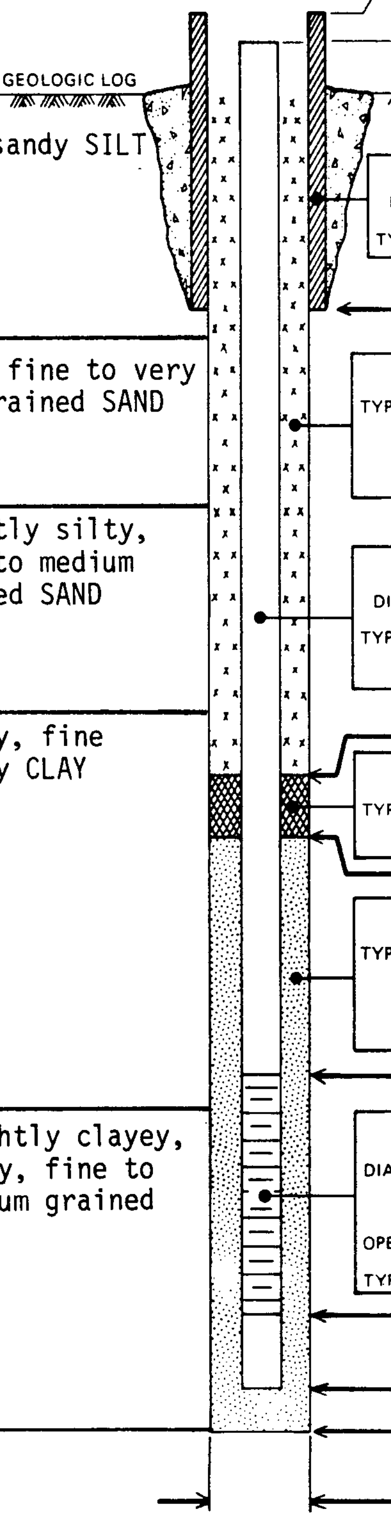
0'-5' Fine sandy SILT

5'-7' Silty, fine to very fine grained SAND

7'-12' Slightly silty, fine to medium grained SAND

12'-23' Silty, fine sandy CLAY

23'-31' Slightly clayey, silty, fine to medium grained SAND



SURFACE CASING
DIA: 8 inches
TYPE: Steel with locking cap

BACKFILL MATERIAL
TYPE: Cement-Bentonite Grout

RISER CASING
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC, threaded with O-ring seal

ANNULAR SEAL
TYPE: Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN:
DIA: 4 inch I.D. TYPE: Schedule 40 PVC
OPENINGS WIDTH: 0.020 inch
TYPE Machine slotted, 4 slots/inch;4 rows

	DEPTH ft	ELEV. ft
GROUND SURFACE	0	5576.0
BOTTOM OF SURFACE CASING	3.7	?
TOP OF SEAL	15.3	5560.7
TOP OF FILTER PACK	17.3	5558.7
TOP OF SCREEN	19.0	5557.0
BOTTOM OF SCREEN	29.0	5547.0
BOTTOM OF SUMP	30.4	5545.6
BOTTOM OF HOLE	31.0	5545.0

NO SCALE

HOLE DIA: 10 inches

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.

WELL NO: W-7

JOB NO.: 19782

SITE: Blanco Plant

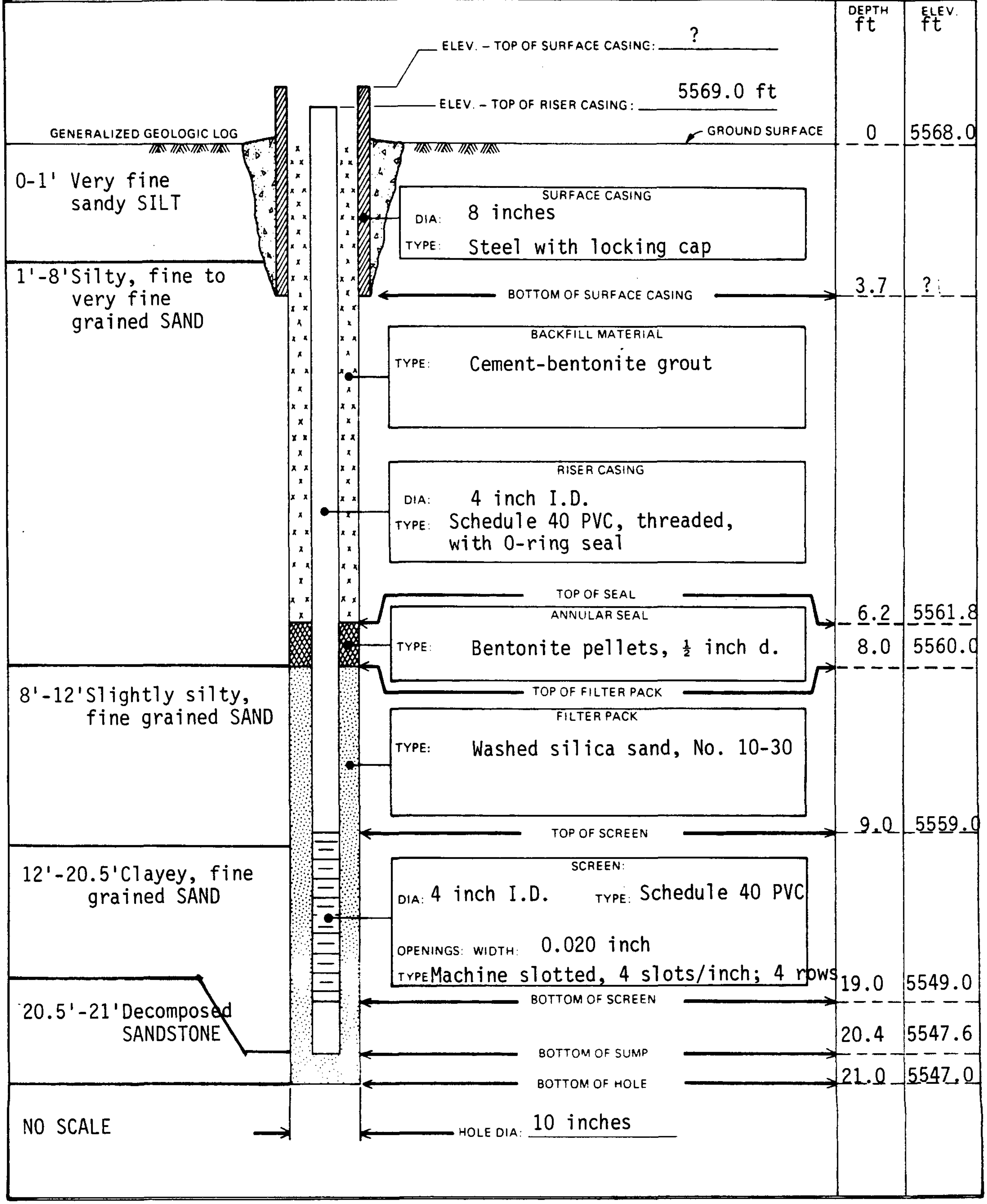
COORDINATES:

BEGUN: 9/22/88

COMPLETED: 9/22/88

PREPARED BY: E. Berglund

REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing



ELEV. – TOP OF SURFACE CASING: ?

ELEV. – TOP OF RISER CASING: 5569.0 ft

GENERALIZED GEOLOGIC LOG

0-1' Very fine sandy SILT

1'-8'Silty, fine to very fine grained SAND

8'-12'Slightly silty, fine grained SAND

12'-20.5'Clayey, fine grained SAND

20.5'-21'Decomposed SANDSTONE

SURFACE CASING
DIA: 8 inches
TYPE: Steel with locking cap

BACKFILL MATERIAL
TYPE: Cement-bentonite grout

RISER CASING
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL
TYPE: Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN:
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC
OPENINGS: WIDTH: 0.020 inch
TYPE: Machine slotted, 4 slots/inch; 4 rows

	DEPTH ft	ELEV. ft
GROUND SURFACE	0	5568.0
BOTTOM OF SURFACE CASING	3.7	?
TOP OF SEAL	6.2	5561.8
TOP OF FILTER PACK	8.0	5560.0
TOP OF SCREEN	9.0	5559.0
BOTTOM OF SCREEN	19.0	5549.0
BOTTOM OF SUMP	20.4	5547.6
BOTTOM OF HOLE	21.0	5547.0

NO SCALE

HOLE DIA: 10 inches

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.

WELL NO: W-8

JOB NO.: 19782

SITE: Blanco Plant

COORDINATES:

BEGUN: 9/23/88

COMPLETED: 9/23/88

PREPARED BY: E. Berglund

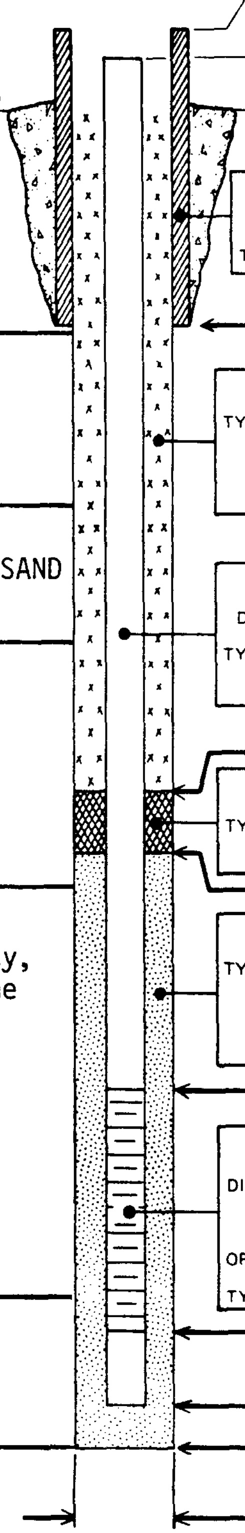
REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing

ELEV. – TOP OF SURFACE CASING: ?

ELEV. – TOP OF RISER CASING: 5580.3 ft

GENERALIZED GEOLOGIC LOG

- 0-3.5' Fine sandy SILT
- 3.5'-10' Silty, fine grained SAND
- 10'-12' Very silty, fine grained SAND
- 12'-21' Silty, fine grained SAND
- 21'-32' Slightly silty, medium to fine grained SAND
- 32'-35' Decomposed SANDSTONE



SURFACE CASING
DIA: 8 inches
TYPE: Steel with locking cap

BACKFILL MATERIAL
TYPE: Cement-bentonite Grout

RISER CASING
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL
TYPE: Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN:
DIA: 4 inch I.D. TYPE: Schedule 40 PVC
OPENINGS: WIDTH 0.020 inch
TYPE Machine slotted, 4 slots/inch; 4 rows

	DEPTH ft	ELEV. ft
GROUND SURFACE	0	5578.0
BOTTOM OF SURFACE CASING	2.4	?
TOP OF SEAL	17.9	5560.1
TOP OF FILTER PACK	19.3	5558.7
TOP OF SCREEN	23.3	5554.7
BOTTOM OF SCREEN	33.3	5544.7
BOTTOM OF SUMP	34.7	5543.3
BOTTOM OF HOLE	35.0	5543.0

NO SCALE

HOLE DIA: 10 inches

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.

WELL NO: W-10

JOB NO: 19782

SITE: Blanco Plant

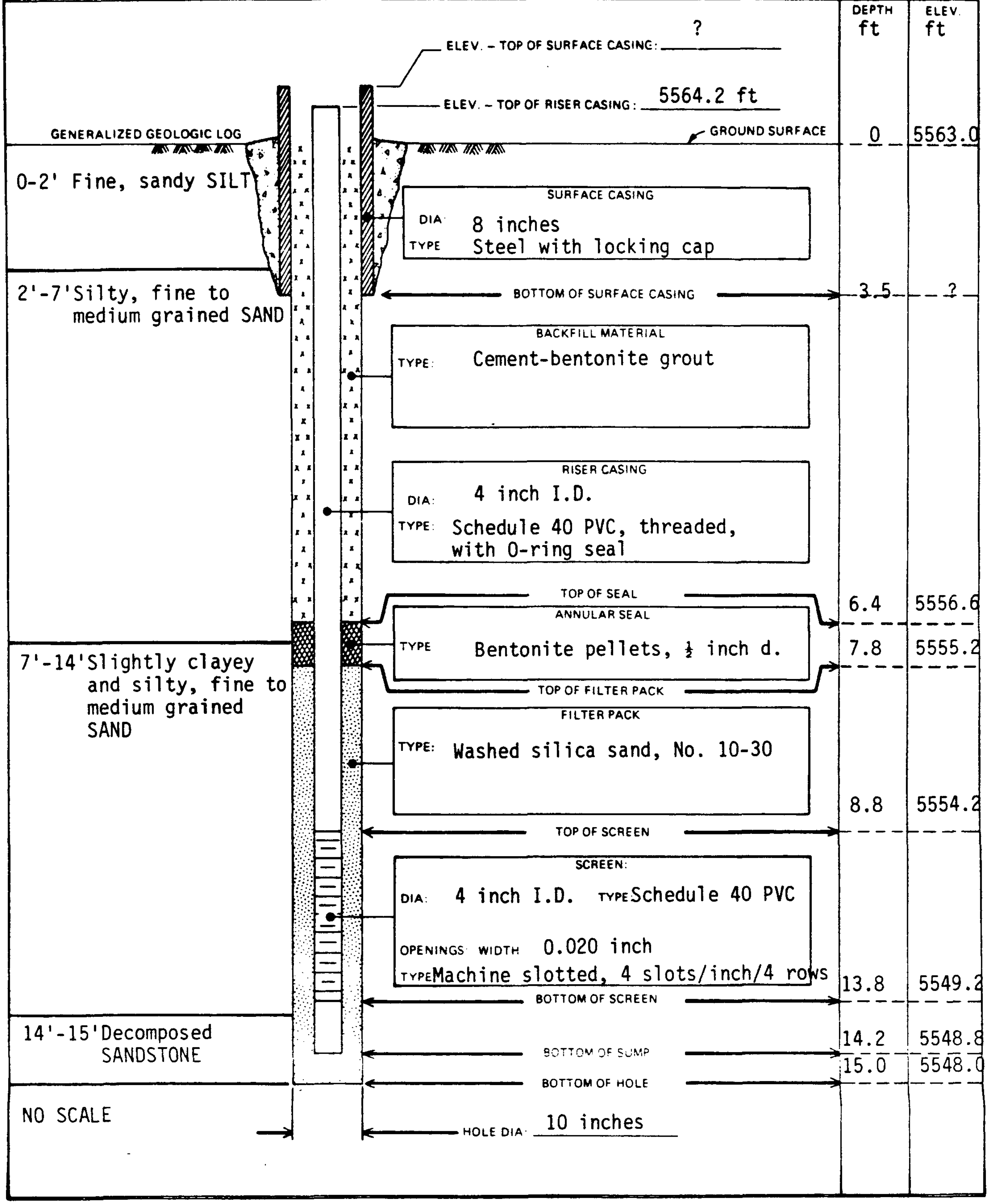
COORDINATES:

BEGUN: 9/24/88

COMPLETED: 9/24/88

PREPARED BY: E. Berglund

REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing



ELEV. – TOP OF SURFACE CASING: ?

ELEV. – TOP OF RISER CASING: 5564.2 ft

GENERALIZED GEOLOGIC LOG

0-2' Fine, sandy SILT

2'-7' Silty, fine to medium grained SAND

7'-14' Slightly clayey and silty, fine to medium grained SAND

14'-15' Decomposed SANDSTONE

NO SCALE

SURFACE CASING
DIA: 8 inches
TYPE: Steel with locking cap

BACKFILL MATERIAL
TYPE: Cement-bentonite grout

RISER CASING
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL
TYPE: Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN:
DIA: 4 inch I.D. TYPE Schedule 40 PVC
OPENINGS: WIDTH 0.020 inch
TYPE Machine slotted, 4 slots/inch/4 rows

HOLE DIA: 10 inches

	DEPTH ft	ELEV. ft
GROUND SURFACE	0	5563.0
BOTTOM OF SURFACE CASING	3.5	?
TOP OF SEAL	6.4	5556.6
TOP OF FILTER PACK	7.8	5555.2
TOP OF SCREEN	8.8	5554.2
BOTTOM OF SCREEN	13.8	5549.2
BOTTOM OF SUMP	14.2	5548.8
BOTTOM OF HOLE	15.0	5548.0

ATTACHMENT 3

Soil Analytical Data

EL PASO NATURAL GAS COMPANY
BLANCO PLANT SOIL DATA
(all results in ug/kg unless otherwise indicated)

Sample ID SAMPLE DEPTH (ft)	BG1 1-1.5	BG2 .5-1	BG3 .5-1	B-1 2-2.5	B-2 3.5-4.0	C-1 14-15	C-2 18-19	A-1 1.5-2.0	A-2 3.5-4.0
VOLATILE HALOGENATED ORGANICS (EPA 601)	NA(a)	NA	NA						
1,1,2,2-Tetrachloroethylene				<38	<38	<38	<38	<38	<38
1,1,2-Trichloroethane				<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene				<190	<190	<190	<190	<190	<190
1,2-Dichloropropane				<50	<50	<50	<50	<50	<50
1,3-Dichlorobenzene				<400	<400	<400	<400	<400	<400
1,4-Dichlorobenzene				<300	<300	<300	<300	<300	<300
1,1,1-Trichloroethane				<38	<38	<38	<38	<38	<38
1,1-Dichloroethane				<88	<88	<88	<88	<88	<88
1,2-Dichloroethane				<38	<38	<38	<38	<38	<38
2-Chlorotoluene				<1250	<1250	<1250	<1250	<1250	<1250
2-Chloroethyl vinyl ether				<160	<160	<160	<160	<160	<160
Bromodichloromethane				<125	<125	<125	<125	<125	<125
Benzyl Chloride				<1250	<1250	<1250	<1250	<1250	<1250
Bromomethane				<12500	<12500	<12500	<12500	<12500	<12500
Bromobenzene				<1250	<1250	<1250	<1250	<1250	<1250
Bis(2-chloroisopropyl)eth.				<12500	<12500	<12500	<12500	<12500	<12500
Bis(2-chloroethoxy)methane				<1250	<1250	<1250	<1250	<1250	<1250
Bromoform				<250	<250	<250	<250	<250	<250
Chloroform				<63	<63	<63	<63	<63	<63
Chlorobenzene				<310	<310	<310	<310	<310	<310
Chloroethane				<650	<650	<650	<650	<650	<650
Chloromethane				<100	<100	<100	<100	<100	<100
Carbon Tetrachloride				<150	<150	<150	<150	<150	<150
Dibromochloromethane				<110	<110	<110	<110	<110	<110
Dibromomethane				<2500	<2500	<2500	<2500	<2500	<2500
Trans-1,2-Dichloroethylene				<125	<125	<125	<125	<125	<125
Trans-1,3-Dicholoropropylene				<430	<430	<430	<430	<430	<430
Vinyal Chloride				<1250	<12500	<12500	<12500	<12500	<12500
1,1,1,2 Tetrachloroethane				<1250	<1250	<1250	<1250	<1250	<1250
1.1-Dichloroethylene				<160	<160	<160	<160	<160	<160
1,2,3-Trichloropropane				<1250	<1250	<1250	<1250	<1250	<1250
1-Chlorohexane				<1250	<1250	<1250	<1250	<1250	<1250
Chloroacetaldehyde				<12500	<12500	<12500	<12500	<12500	<12500
Chloromethyl methyl ether				<1250	<1250	<1250	<1250	<1250	<1250
Dichlorodifluoromethane				<1250	<1250	<1250	<1250	<1250	<1250
Dichloromethane				<125	<125	<125	<125	<125	<125
Trichloroethylene				<150	<150	<150	<150	<150	<150
Tetrachloroethylene				<38	<38	<38	<38	<38	<38
Trichlorofluoromethane				<500	<500	<500	<500	<500	<500

(a) NA - Not Analyzed

EL PASO NATURAL GAS COMPANY
BLANCO PLANT SOIL DATA
(all results in ug/kg unless otherwise indicated)

Sample ID SAMPLE DEPTH (ft)	BG1 1-1.5	BG2 .5-1	BG3 .5-1	B-1 2-2.5	B-2 3.5-4.0	C-1 14-15	C-2 18-19	A-1 1.5-2.0	A-2 3.5-4.0
VOLATILE AROMATICS (EPA 602)									
Benzene	NA(a)	NA	NA	<25	<25	<25	<25	<25	<25
Chlorobenzene	NA	NA	NA	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	NA	NA	NA	<50	<50	<50	<50	<50	<50
1,3-Dichlorobenzene	NA	NA	NA	<50	<50	<50	<50	<50	<50
1,4-Dichlorobenzene	NA	NA	NA	<38	<38	<38	<38	<38	<38
Ethyl Benzene	NA	NA	NA	<25	<25	<25	<25	<25	<25
Toluene	NA	NA	NA	<25	<25	<25	<25	<25	<25
Xylenes	NA	NA	NA	<75	<75	<75	<75	<75	<75
METALS									
Total Iron (mg/kg)	4240	5860	5860	5860	5860	5860	5860	5710	5860
Total Manganese (mg/kg)	131	260	190	71	156	158	169	284	287
Total Chromium (mg/kg)	2	11	2	31	5	3	4	1	1
Total Arsenic (mg/kg)	1.1	1.8	<1	<1	1.6	<1	1.4	<1	<1
Hexavalent Chromium (mg/kg)	<0.1	0.23	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Cadmium (mg/kg)	0.14	0.16	0.12	0.1	0.2	0.33	0.16	0.1	0.11
Total Lead (mg/kg)	3.5	3.4	7.1	9.6	10.1	9.2	2.5	<1	1
Total Mercury (mg/kg)	<0.04	0.04	<0.04	<.04	<.04	<0.04	<0.04	<.04	0.05
Zinc (mg/kg)	<10	40	20	30	30	50	40	20	20
Copper (mg/kg)	3	12	12	8	7	56	8	3	3
VOLATILE ORGANICS (EPA 624) (b)	NA	NA	NA	NA	ND	NA	NA	NA	NA
SEMI-VOLATILE ORGANICS (EPA 625) (b)	NA	NA	NA	NA	ND	ND (c)	NA	NA	NA
TOTAL EXTRACTABLE HYDROCARBONS (EPA 8015)									
Acrylamide (mg/kg)	NA	NA	NA	<125	<125	<125	<125	<125	<125
Diethyl Ether (mg/kg)	NA	NA	NA	<0.625	<0.625	<0.625	<0.625	<0.625	<0.625
Ethanol (mg/kg)	NA	NA	NA	<1.875	<1.875	<1.875	<1.875	<1.875	<1.875
Methylethylketone (mg/kg)	NA	NA	NA	<.625	<.625	<.625	<.625	<.625	<.625
Methyle Isobutyl Ketone (mg/kg)	NA	NA	NA	<.625	<.625	<.625	<.625	<.625	<.625
Paraldehyde (mg/kg)	NA	NA	NA	<25	<25	<25	<25	<25	<25
MISCELLANEOUS									
pH	NA	NA	NA	6.33	5.51	9.18	7.4	7.96	8.16
Oxidation/Reduction Potential (mV)	NA	NA	NA	269	242	310	330	263	278

(a) NA - Not Analyzed
(b) Only those priority pollutant compounds which were detected are presented in this table. (ND - None Detected)
(c) For semi-volatile non-priority pollutant compounds detected see attached analytical data sheet.

EL PASO NATURAL GAS COMPANY
BLANCO PLANT SOIL DATA
(all results in ug/kg unless otherwise indicated)

Sample ID SAMPLE DEPTH (ft)	W2 56-57	W6 28-29	W7 15-16	W5 14-15
VOLATILE HALOGENATED ORGANICS (EPA 601)				
1,1,2,2-Tetrachloroethylene	<38	<38	<38	<38
1,1,2-Trichloroethane	<25	<25	<25	<25
1,2-Dichlorobenzene	<190	<190	<190	<190
1,2-Dichloropropane	<50	<50	<50	<50
1,3-Dichlorobenzene	<400	<400	<400	<400
1,4-Dichlorobenzene	<300	<300	<300	<300
1,1,1-Trichloroethane	<38	<38	<38	<38
1,1-Dichloroethane	<88	<88	<88	<88
1,2-Dichloroethane	<38	<38	<38	<38
2-Chlorotoluene	<1250	<1250	<1250	<1250
2-Chloroethyl vinyl ether	<160	<160	<160	<160
Bromodichloromethane	<125	<125	<125	<125
Benzyl Chloride	<1250	<1250	<1250	<1250
Bromomethane	<12500	<12500	<12500	<12500
Bromobenzene	<1250	<1250	<1250	<1250
Bis(2-chloroisopropyl)eth.	<12500	<12500	<12500	<12500
Bis(2-chloroethoxy)methane	<1250	<1250	<1250	<1250
Bromoform	<250	<250	<250	<250
Chloroform	<63	<63	<63	<63
Chlorobenzene	<310	<310	<310	<310
Chloroethane	<6520	<650	<650	<650
Chloromethane	<100	<100	<100	<100
Carbon Tetrachloride	<150	<150	<150	<150
Dibromochloromethane	<110	<110	<110	<110
Dibromomethane	<2500	<2500	<2500	<2500
Trans-1,2-Dichloroethylene	<125	<125	<125	<125
Trans-1,3-Dicholoropropylene	<430	<430	<430	<430
Vinyal Chloride	<12500	<12500	<12500	<12500
1,1,1,2 Tetrachloroethane	<1250	<1250	<1250	<1250
1.1-Dichloroethylene	<160	<160	<160	<160
1,2,3-Trichloropropane	<1250	<1250	<1250	<1250
1-Chlorohexane	<1250	<1250	<1250	<1250
Chloroacetaldehyde	<12500	<12500	<12500	<12500
Chloromethyl methyl ether	<1250	<1250	<1250	<1250
Dichlorodifluoromethane	<1250	<1250	<1250	<1250
Dichloromethane	<125	<125	<125	<125
Trichloroethylene	<150	<150	<150	<150
Tetrachloroethylene	<38	<38	<38	<38
Trichlorofluoromethane	<500	<500	<500	<500

EL PASO NATURAL GAS COMPANY
BLANCO PLANT SOIL DATA

(all results in ug/kg unless otherwise indicated)

Sample ID	W2	W6	W7	W5
SAMPLE DEPTH (ft)	56-57	28-29	15-16	14-15
VOLATILE AROMATICS (EPA 602)				
Benzene	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25
1,2-Dichlorobenzene	<50	<50	<50	<50
1,3-Dichlorobenzene	<50	<50	<50	<50
1,4-Dichlorobenzene	<38	<38	<38	<38
Ethyl Benzene	<25	<25	<25	<25
Toluene	<25	<25	<25	<25
Xylenes	<75	<75	<75	<75
METALS				
Total Iron (mg/kg)	5850	5850	5860	5860
Total Manganese (mg/kg)	263	267	269	216
Total Chromium (mg/kg)	4	19	8	2
Total Arsenic (mg/kg)	2.2	1.7	1.3	1.5
Hexavalent Chromium (mg/kg)	<0.1	<0.1	<0.1	<0.1
Total Cadmium (mg/kg)	0.13	0.15	0.52	0.56
Total Lead (mg/kg)	3	6.2	4.9	3.8
Total Mercury (mg/kg)	<0.04	<0.04	<0.04	0.06
Zinc (mg/kg)	30	20	40	40
Copper (mg/kg)	9	7	19	6
VOLATILE ORGANICS (EPA 624)	NA(a)	NA	NA	NA
SEMI-VOLATILE ORGANICS (EPA 625)	NA	NA	NA	NA
TOTAL EXTRACTABLE HYDROCARBONS (EPA 8015)				
Acrylamide (mg/kg)	<125	<125	<125	<125
Diethyl Ether (mg/kg)	<0.625	<0.625	<0.625	<0.625
Ethanol (mg/kg)	<1.875	<1.875	<1.875	<1.875
Methylethylketone (mg/kg)	<.625	<.625	<.625	<.625
Methyle Isobutyl Ketone (mg/kg)	<.625	<.625	<.625	<.625
Paraldehyde (mg/kg)	<25	<25	<25	<25
MISCELLANEOUS				
pH	7.71	7.5	7.62	7.87
Oxidation/Reduction Potential (mV)	288	289	285	278

(a) NA - Not Analyzed

CUSTOMER Bechtel Environmental, Inc. - cc: Christine Nadeau
ADDRESS 3000 Post Oak Blvd.
CITY Houston, TX 77056
ATTENTION Dr. Monica Jacque
INVOICE NO.

REPORT OF ANALYSIS

SAMPLES RECEIVED 09/26/88

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Solid

Sample Identification	Date Collected	No. of Carbons	GC/MS Scan	Approx. Conc. (ug/gm) (PPM)
#C-1	09/29/88	13	3,8-Dimethyl Undecane	0.13
		9	4-Ethyl-2-Methyl Hexane	0.3
		11	6-Ethyl-2-Methyl Octane	0.16
		12	3-Methyl Undecane	0.2
		9	1-Ethyl-2-Methyl Cyclohexane	0.1
		13	2,6-Dimethyl Undecane	1.6
		13	3,7-Dimethyl Undecane	0.16
		13	3,8-Dimethyl Undecane	0.1
		12	Hexyl Cyclohexane	0.36
		13	6-Methyl Dodecane	0.26
		13	1-Tridecane	0.2
		13	4-Methyl Dodecane	0.26
		11	2,3,7-Trimethyl Octane	2.0
		12	5-Methyl-2-Undecane	0.03
		14	5-Tetradecane	0.1
		9	1-Ethyl-4-Methyl Cyclohexane	0.5
		11	1-Methyl Naphthalene	0.2
		14	2,5-Dimethyl Dodecane	0.76
		17	Undecane Cyclohexane	0.73
		14	5-Methyl Tridecane	0.2
		14	4-Methyl Tridecane	0.43
		48	1-Iodo Octatricontane	0.1
		19	7-Cyclohexyl Tridecane	0.13
		15	2,7,10-Trimethyl Dodecane	3.06
		13	2,3,5-Trimethyl Decane	0.7
		11	3,7-Dimethyl Nonane	0.3
		43	Tritetracontane	0.26
		12	2,3-Dimethyl Naphthalene	0.5
		12	1,2-Dimethyl Naphthalene	0.36
		14	Octyl Cyclohexane	0.8
		16	Hexadecane	3.5
		11	6-Ethyl-2-Methyl Octane	0.3
		12	1-Hexyl-3-Methyl Cyclopentane	0.1
		18	Octadecane	0.4
		9	1-Methyl Ethyl Cyclohexane	0.2
		20	Eicosane	0.26
		13	3,5-Dimethyl Undecane	0.73
		19	2,6,10,14-Tetramethyl Pentadecane	0.57

APPROVED BY
11/18/88 James J. Mueller, President

PAGE 1 OF 1 PAGE

cep
Controls for Environmental Pollution, Inc.
P.O. Box 5351 • 1925 Rosina • Santa Fe, New Mexico 87502
Telephone 505/982-9841

ATTACHMENT 4

Ground Water Analytical Data

EL PASO NATURAL GAS COMPANY
BLANCO PLANT GROUNDWATER DATA
(all results in ug/l unless otherwise indicated)

Sample ID Screened Interval (ft)	W2 46.3-56.3	W5 8.5-18.5	W5 Duplicate 8.5-18.5	W6 19.0-29.0	W7 9.0-19.0	W8 23.3-33.3	W10 8.8-13.8	TRAVEL BLANK
VOLATILE HALOGENATED ORGANICS (EPA 601)								
1,1,2,2-Tetrachloroethylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,1,2-Trichloroethane	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichlorobenzene	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
1,2-Dichloropropane	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,3-Dichlorobenzene	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
1,4-Dichlorobenzene	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
1,1,1-Trichloroethane	**1.3**	**0.5**	**0.5**	**0.3**	**0.6**	**1.4**	**1.3**	<0.03
1,1-Dichloroethane	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
1,2-Dichloroethane	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
2-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1
2-Chloroethyl vinyl ether	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Bromodichloromethane	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzyl Chloride	<1	<1	<1	<1	<1	<1	<1	<1
Bromomethane	<10	<10	<10	<10	<10	<10	<10	<10
Bromobenzene	<1	<1	<1	<1	<1	<1	<1	<1
Bis(2-chloroisopropyl)eth.	<10	<10	<10	<10	<10	<10	<10	<10
Bis(2-chloroethoxy)methane	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloroform	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	<0.25	**0.3**	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Chloroethane	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52
Chloromethane	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Carbon Tetrachloride	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Dibromochloromethane	**0.46**	<0.09	<0.09	<0.09	<0.09	**0.31**	**0.2**	<0.09
Dibromomethane	<2	<2	<2	<2	<2	<2	<2	<2
Trans-1,2-Dichloroethylene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trans-1,3-Dicholoropropylene	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
Vinyl Chloride	<10	<10	<10	<10	<10	<10	<10	<10
1,1,1,2 Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1
1.1-Dichloroethylene	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
1,2,3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	<1
1-Chlorohexane	<1	<1	<1	<1	<1	<1	<1	<1
Chloroacetaldehyde	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethyl methyl ether	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	<1
Dichloromethane	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trichloroethylene	**0.4**	**0.3**	**0.3**	<0.12	**0.15**	**0.4**	**0.3**	**0.2**
Tetrachloroethylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Trichlorofluoromethane	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	**0.23**	**0.08**

EL PASO NATURAL GAS COMPANY
BLANCO PLANT GROUNDWATER DATA
(all results in ug/l unless otherwise indicated)

Sample ID Screened Interval (ft)	W2 46.3-56.3	W5 8.5-18.5	W5 Duplicate 8.5-18.5	W6 19.0-29.0	W7 9.0-19.0	W8 23.3-33.3	W10 8.8-13.8	TRAVEL BLANK
VOLATILE AROMATICS (EPA 602)								
Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,3-Dichlorobenzene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Ethyl Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	<0.2	<0.2	<0.2	<0.2	<0.2	5	<0.2	<0.2
Xylenes	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
METALS								
Total Iron (mg/l)	4	1.61	1.54	0.7	1.2	0.22	1.03	NA(a)
Total Manganese (mg/l)	1.36	1.54	1.28	4.03	2.21	4.59	3.32	NA
Total Chromium (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Total Arsenic (mg/l)	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Hexavalent Chromium (mg/l)	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01	NA
Total Cadmium (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NA
Total Lead (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Total Mercury (mg/l)	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	NA
Zinc (mg/l)	0.3	0.3	0.2	<0.1	0.3	0.2	0.2	NA
Copper (mg/l)	0.03	0.02	<0.01	<0.01	0.02	<0.01	<0.01	NA
VOLATILE ORGANICS (EPA 624) (b)	NA	NA	NA	ND	NA	NA	NA	NA
SEMI-VOLATILE ORGANICS (EPA 625) (b)	NA	NA	NA	ND	ND	NA	NA	NA

(a) NA - Not Analyzed

(b) Only those priority pollutant compounds which were detected are presented in this table. (ND - None Detected)

EL PASO NATURAL GAS COMPANY
BLANCO PLANT GROUNDWATER DATA
(all results in ug/l unless otherwise indicated)

Sample ID Screened Interval (ft)	W2 46.3-56.3	W5 8.5-18.5	W5 Duplicate 8.5-18.5	W6 19.0-29.0	W7 9.0-19.0	W8 23.3-33.3	W10 8.8-13.8	TRAVEL BLANK
TOTAL EXTRACTABLE HYDROCARBONS (EPA 8015)								
Acrylamide	<1000	<1000	<1000	<1000	<1000	<1000	<1000	NA(a)
Diethyl Ether	<5	<5	<5	<5	<5	<5	<5	NA
Ethanol	<15	<15	<15	<15	<15	<15	<15	NA
Methylethylketone	<5	<5	<5	<5	<5	<5	<5	NA
Methyle Isobutyl Ketone	<5	<5	<5	<5	<5	<5	<5	NA
Paraldehyde	<200	<200	<200	<200	<200	<200	<200	NA
MAJOR CATIONS AND ANIONS								
Calcium (mg/l)	473	689	606	532	473	409	509	NA
Magnesium (mg/l)	70.3	23.6	20.8	12.3	26.3	56.9	97.5	NA
Potassium (mg/l)	5.7	1.3	1	2.9	3.3	4.2	5.2	NA
Sodium (mg/l)	1680	59.1	57.7	796	672	1180	801	NA
Sulfate (mg/l)	3800	2000	2255	1760	1990	1610	2370	NA
Carbonate (mg/l as CaCO3)	0	0	0	0	0	0	0	NA
Bicarbonate (mg/l as CaCO3)	239	294	295	401	378	229	248	NA
Chloride (mg/l)	46	14	16	56	45	17	73	NA
Nitrate (mg/l-N)	290	0.02	<0.1	51	0.3	<0.1	1	NA
BASIC WATER QUALITY PARAMETERS								
pH	7.87	7.91	7.37	7.32	7.62	7.84	7.5	NA
Total Dissolved Solids (mg/l)	7612	3112	2900	4516	4776	5680	5284	NA

(a) NA - Not Analyzed

El Paso
Natural Gas Company

P. O. BOX 1492
EL PASO, TEXAS 79978
PHONE: 915-541-2600

December 12, 1988

Ron Conrad, Ph.D., Environmental Supervisor
Superfund Section, Hazardous Waste Bureau
New Mexico Environmental Improvement Division
1190 St. Francis Drive
Santa Fe, NM 87503

Reference: **Blanco Plant Discharge Plan**
Groundwater Quality Assessment

Dear Dr. Conrad:

Enclosed, per your request, is the following information:

- Geologic Boring Logs (A Stratigraphy)
- Well Construction Details
- Site Investigation Location Plot Map with Groundwater Elevations
- Analytical Results

If you have questions regarding this information, please call me at 915/541-2832.

Very truly yours,

Henry Van, Ph.D., C.E.P.
Senior Environmental Engineer
Environmental and Safety Affairs Department

HV:cds

Enclosure

cc: David Boyer, NMOCD

RECEIVED
DEC 19 1988
OIL CONSERVATION DIVISION
SANTA FE

EL PASO NATURAL GAS CO.

BLANCO PLANT

STRATIGRAPHY

WELL CONSTRUCTION DETAILS

GROUNDWATER LEVEL MAP

ANALYTICAL RESULTS

DECEMBER 1988

ATTACHMENT 1

Geologic Boring Logs

BECHTEL

GEOLOGIC DRILL LOG

PROJECT: EPNG BLANCO PLANT
JOB NO.: 19782
SHEET NO.: 1 OF 1
HOLE NO.: W-1

SITE: Blanco Plant
COORDINATES:
ANGLE FROM HORIZ.: 90°
BEARING: -

BEGUN: 9/20/88
COMPLETED: 9/20/88
DRILLER: Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL: CME-75
HOLE SIZE: 10"d
OVERBURDEN (FT.): 51
ROCK (FT.): 1
TOTAL DEPTH: 52 ft

CORE RECOVERY (FT./%): NA
CORE BOXES: NA
SAMPLES: 1
EL. TOP OF CASING: NA
GROUND EL.: 5649 ft
DEPTH/EL. GROUND WATER: No Water
DEPTH/EL. TOP OF ROCK: 51 ft/5598 ft

SAMPLE HAMMER WEIGHT/FALL: 140 lbs/30"
CASING LEFT IN HOLE: DIA./LENGTH: None
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
Modified California, 2 1/2" d., 6" brass sleeves								5649				0 -1' Brown, silty, fine grained SAND (SM) - dry	
									5			1'-8' Brown, silty, fine to little medium grained SAND (SM) - dry	Drilled w/ 10" d hollow stem auger
									10			8'-10' Brown, little fine, medium grained SAND (SW) - dry	
									15			10'-51' Same as 1'-8', becoming moist with depth	NO WELL INSTALLED
									20				
									25				
									30				
									35				
									40				
									45				
									50				
	12"	12"						5597				51'-52' Brown, decomposed, slightly sandy SILTSTONE	
									55			Bottom of boring 52' below ground surface	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: BLANCO PLANT

HOLE NO.: W-1

H&CF 19-1

GEOLOGIC DRILL LOG

PROJECT EPNG BLANCO PLANT					JOB NO. 19782		SHEET NO. 1 OF 1		HOLE NO. W-2	
SITE Blanco Plant			COORDINATES				ANGLE FROM HORIZ. 90°		BEARING -	
BEGUN 9/20/88	COMPLETED 9/21/88	DRILLER Sergent, Houskins, & Beckwith		DRILL MAKE AND MODEL CME-75	HOLE SIZE 10"	OVERBURDEN (FT.) 57.5	ROCK (FT.) 0		TOTAL DEPTH 57.5 ft	
CORE RECOVERY (FT./%) NA	CORE BOXES NA	SAMPLES 1	EL. TOP OF CASING *	GROUND EL. 5614 ft	DEPTH/EL. GROUND WATER 49.7 ft/5564.3 ft		DEPTH/EL. TOP OF ROCK 57.5'/5556.5 ft			
SAMPLE HAMMER WEIGHT/FALL 140 lbs/30 in		CASING LEFT IN HOLE: DIA./LENGTH *		LOGGED BY: E. Berglund						

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS			ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
				LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES						
							5614	5 10 15 20			0'-23' Brown, slightly silty, few medium, fine grained SAND (SW) slightly damp. Silt content increases with depth.	Drilled w/ 10"d. hollow-stem auger *See Well Construction Reports
								25			23'-27' Light brown, silty, very fine grained SAND (SM) - damp	
								30			27'-32' Brown, silty, medium grained SAND (SM) with little clay - damp	
								35 40			32'-46' Dark brown, fine to medium grained sandy CLAY (CL) - Moist - very little sand 41'-44'	
								45			46'-49' Dark brown, very clayed medium to fine grained SAND (SC) - moist	
								50 55		☒	49'-57 1/2' Light brown, slightly silty, fine to medium grained SAND (SP-SM) - saturated	
Modified California, 2 1/2" d., 6" brass sleeves	18"	12"					5556.5				Bedrock @ 57 1/2' Bottom of boring @ 57 1/2'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE BLANCO PLANT

HOLE NO. W-2

H&CF 19-1

GEOLOGIC DRILL LOG

PROJECT EPNG BLANCO PLANT
JOB NO. 19782
SHEET NO. 1 OF 1
HOLE NO. W-3
SITE Blanco Plant
COORDINATES
ANGLE FROM HORIZ. 90°
BEARING -
BEGUN 9/23/88
COMPLETED 9/23/88
DRILLER Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL CME-75
HOLE SIZE 10"d
OVERBURDEN (FT.) 6
ROCK (FT.) 2
TOTAL DEPTH 8 ft
CORE RECOVERY (FT./%) NA
CORE BOXES NA
SAMPLES 0
EL. TOP OF CASING NA
GROUND EL. 5590 ft
DEPTH/EL. GROUND WATER No Water
DEPTH/EL. TOP OF ROCK 6 ft/5584 ft
SAMPLE HAMMER WEIGHT/FALL NA
CASING LEFT IN HOLE: DIA./LENGTH None
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANC LENGTH CORE RU	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS			ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
				LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ft	ft				
							5590				0 - 1/2' Brown, sandy, SILT (NL) - dry	Drilled w/10"d. Hollow-Stem Auger
								5			1/2 - 3' Light brown, silty fine grained SAND (SM) - dry	
							5582	10			3' - 6' Yellow brown, iron stained, very slightly clayey, slightly silty fine to medium grained SAND (SP-SM) - trace moisture	HOLE DRY NO WELL INSTALLED
											6' - 8' Very weathered, gray fine grained SANDSTONE	
											Refusal @ 8' Bottom of boring @ 8'	

SS = SPLIT SPOON; ST = SHELBY TUBE;
D = DENNISON; P = PITCHER; O = OTHER

SITE BLANCO PLANT
HOLE NO. W-3

GEOLOGIC DRILL LOG

PROJECT: EPNG BLANCO PLANT
JOB NO.: 19782
SHEET NO.: 1 of 1
HOLE NO.: W-4
SITE: Blanco Plant
COORDINATES:
ANGLE FROM HORIZ.: 90^0
BEARING: -
BEGUN: 9/23/88
COMPLETED: 9/23/88
DRILLER: Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL: CME-75
HOLE SIZE: 10" d
OVERBURDEN (FT.): 7
ROCK (FT.): 1
TOTAL DEPTH: 8 ft
CORE RECOVERY (FT./%): NA
CORE BOXES: NA
SAMPLES: 0
EL. TOP OF CASING: NA
GROUND EL.: 5582 ft
DEPTH/EL. GROUND WATER: No Water
DEPTH/EL. TOP OF ROCK: 7 ft/5575 ft
SAMPLE HAMMER WEIGHT/FALL: NA
CASING LEFT IN HOLE: DIA./LENGTH: None
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							5582				0-1' Light brown, fine sandy SILT (ML)-dry	Drilled w/10"d hollow stem auger
							5574	5			1'-7' Medium brown, slightly silty, fine to medium SAND (SP-SM)-dry Light brown 4'-7'	HOLE DRY
								10			7'-8' Light brown, decomposed medium grained SANDSTONE	NO WELL INSTALLED
											Refusal @ 8' Bottom of boring @ 8'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: BLANCO PLANT

HOLE NO.: W-4

H&CF 19-1

GEOLOGIC DRILL LOG

PROJECT: EPNG BLANCO PLANT
JOB NO.: 19782
SHEET NO.: 1 OF 1
HOLE NO.: W-5
SITE: Blanco Plant
COORDINATES:
ANGLE FROM HORIZ.: 90°
BEARING: -
BEGUN: 9/23/88
COMPLETED: 9/23/88
DRILLER: Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL: CME-75
HOLE SIZE: 10" d
OVERBURDEN (FT.): 20
ROCK (FT.): -
TOTAL DEPTH: 20 ft
CORE RECOVERY (FT./%): NA
CORE BOXES: NA
SAMPLES: 1
EL. TOP OF CASING: *
GROUND EL.: 5565 ft
DEPTH/EL. GROUND WATER: 11.0 ft/5555 ft
DEPTH/EL. TOP OF ROCK: NA
SAMPLE HAMMER WEIGHT/FALL: 140 lbs/30 inches
CASING LEFT IN HOLE: DIA./LENGTH: *
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS			ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
					LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ft	ft				
								5565				0-2' Brown, very silty fine to very fine grained SAND (SM) - dry	Drilled w/ 10"d. hollow stem auger
									5			2'-5' Brown, silty, fine to medium grained SAND (SM) - damp	
									10			5'-20' Brown, slightly silty, fine to medium grained SAND (SP-SM)-saturated below 11 feet	
Modified Calif. 2½" d., 6" brass sleeves	18"	12"							15		☒		
								5545	20			Bottom of boring @ 20' below ground surface	*See Well Construction Reports
									25				

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: BLANCO PLANT
HOLE NO.: W-5

H&CF 19-1

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
EPNG BLANCO PLANT	19782	1 of 1	W-6

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
Blanco Plant		90°	-

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
9/21/88	9/21/88	Sergent, Houskins & Beckwith	CME-75	10" d	31	0	31 ft

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	1	*	5576 ft	19.2 ft/5556.8 ft	NA

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 lb/30 inches	*	E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
Modified Calif. 2½" d. brass sleeves 6" long								5576				0-5' Light brown, fine sandy SILT (ML)-dry Sand content increases with depth	Drilled w/ 10"d hollow stem auger
									5			5'-7' Medium brown, silty very fine to fine grained SAND (SM)-dry	
									10			7'-12' Slightly yellow brown, slightly silty, fine to medium grained SAND - damp (SP-SM)	
									15				
									20			12'-23' Medium gray, silty fine sandy CLAY (CL) Moderate hydrocarbon odor. Light gray @ 20'.	*See Well Construction Reports
									25		☒	25'-31' Slightly yellow brown, slightly clayey, silty fine to medium grained SAND (SM) - saturated	
	18"	12"						5545	30				
									35			Bottom of boring @ 31'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE	HOLE NO.
BLANCO PLANT	W-6

H&CF 19-1

GEOLOGIC DRILL LOG

PROJECT EPNG BLANCO PLANT	JOB NO. 19782	SHEET NO. 1 OF 1	HOLE NO. W-7
SITE Blanco Plant	COORDINATES	ANGLE FROM HORIZ. 90°	BEARING -

BEGUN 9/22/88	COMPLETED 9/22/88	DRILLER Sergent Houskins & Beckwith	DRILL MAKE AND MODEL CME-75	HOLE SIZE 10"d	OVERBURDEN (FT.) 20.5	ROCK (FT.) 0.5	TOTAL DEPTH 21 ft
CORE RECOVERY (FT./%) NA	CORE BOXES NA	SAMPLES 1	EL. TOP OF CASING *	GROUND EL. 5568 ft	DEPTH/EL. GROUND WATER 16.5 ft/5551.5 ft	DEPTH/EL. TOP OF ROCK 20.5 ft/5547.5 ft	
SAMPLE HAMMER WEIGHT/FALL 140 lbs/30 inches	CASING LEFT IN HOLE: DIA./LENGTH *	LOGGED BY: E. Berglund					

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
Modified California, 2½" d. brass sleeves, 6" long							5568				0-1' Light brown, very fine sandy SILT (ML)-dry	Drilled w/ 10"d hollow stem auger
								5 10			1'-8' Light brown (yellow tint), silty to slightly silty, fine to very fine grained SAND (SM) trace moisture	
								15			8'-12' Medium brown, slightly silty, fine SAND (SW-SM) -damp	
	12"	12"					5547	20		☒	12'-20.5' Brown, clayey, fine grained SAND (SC)-damp	
								25			20.5'-21' Brown, medium grained slightly decomposed SANDSTONE	*See Well Construction Reports
											Bottom of boring @ 21'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER	SITE BLANCO PLANT	HOLE NO. W-7

H&CF 19-1

BECHTEL

GEOLOGIC DRILL LOG

PROJECT: EPNG BLANCO PLANT
JOB NO.: 19782
SHEET NO.: 1 of 1
HOLE NO.: W-8

SITE: Blanco Plant
COORDINATES:
ANGLE FROM HORIZ.: 90°
BEARING: -

BEGUN: 9/23/88
COMPLETED: 9/23/88
DRILLER: Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL: CME-75
HOLE SIZE: 10" d
OVERBURDEN (FT.): 32
ROCK (FT.): 3
TOTAL DEPTH: 35 ft

CORE RECOVERY (FT./%): NA
CORE BOXES: NA
SAMPLES: 0
EL. TOP OF CASING: *
GROUND EL.: 5578 ft
DEPTH/EL. GROUND WATER: 24.6 ft/5553.4 ft
DEPTH/EL. TOP OF ROCK: 32 ft/5546 ft

SAMPLE HAMMER WEIGHT/FALL: NA
CASING LEFT IN HOLE: DIA./LENGTH: *
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANC LENGTH CORE RU	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								5578				0-3½' Light brown, fine sandy SILT (ML) - dry	Drilled w/ 10"d. hollow stem auger
									5 10			3½'-10'Medium brown, silty, fine grained SAND (SM)- dry. Slightly damp below 6 ft.	*See Well Construction Reports
									15			10'-17'Gray-brown, very silty, fine grained SAND (SM)- damp	
									20			12'-21'Brown, silty, fine grained SAND (SM)-moist	
									25			21'-32'Dark brown, slightly silty, medium to fine grained SAND (SP-SM)- damp-saturated @ 25 ft	
									30			32'-35'Gray brown, decomposed medium grained SANDSTONE	
								5543	35			Refusal @ 35' Bottom of boring @ 35'	
									40				

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: BLANCO PLANT
HOLE NO.: W-8

H&CF 19-1

BECHTEL

GEOLOGIC DRILL LOG

PROJECT EPNG BLANCO PLANT
JOB NO. 19782
SHEET NO. 1 OF 1
HOLE NO. W-9
SITE Blanco Plant
COORDINATES
ANGLE FROM HORIZ. 90°
BEARING -
BEGUN 9/24/88
COMPLETED 9/24/88
DRILLER Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL CME-75
HOLE SIZE 10"d
OVERBURDEN (FT.) 10
ROCK (FT.) 2.5
TOTAL DEPTH 12.5
CORE RECOVERY (FT./%) NA
CORE BOXES NA
SAMPLES 0
EL. TOP OF CASING NA
GROUND EL. 5567 ft
DEPTH/EL. GROUND WATER No Water
DEPTH/EL. TOP OF ROCK 10 ft/5557 ft
SAMPLE HAMMER WEIGHT/FALL NA
CASING LEFT IN HOLE: DIA./LENGTH None
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANC LENGTH CORE RU	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS			ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
					LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES						
								5567				0-3' Brown, silty, fine grained SAND (SM)-dry	Drilled w/ 10"d. hollow stem auger
									5			3'-6' Brown, silty, fine to medium grained SAND (SM) - trace moisture	
									10			6'-10' Dark brown, slightly clayey, silty, fine to medium grained SAND (SM)-damp	DRY HOLE
								5554.5	15			10'-12½' Gray, decomposed medium grained SANDSTONE-clayey	NO WELL INSTALLED
												Refusal @ 12½' Bottom of boring @ 12½'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER
SITE BLANCO PLANT
HOLE NO. W-9

H&CF 19-1

GEOLOGIC DRILL LOG

PROJECT EPNG BLANCO PLANT
JOB NO. 19782
SHEET NO. 1 of 1
HOLE NO. W-10

SITE Blanco Plant
COORDINATES
ANGLE FROM HORIZ. 90°
BEARING -

BEGUN 9/24/88
COMPLETED 9/24/88
DRILLER Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL CME-75
HOLE SIZE 10"d
OVERBURDEN (FT.) 14
ROCK (FT.) 1
TOTAL DEPTH 15 ft

CORE RECOVERY (FT./%) NA
CORE BOXES NA
SAMPLES 0
EL. TOP OF CASING *
GROUND EL. 5563 ft
DEPTH/EL. GROUND WATER 9.2 ft/5553.8 ft
DEPTH/EL. TOP OF ROCK 14 ft/5549 ft

SAMPLE HAMMER WEIGHT/FALL NA
CASING LEFT IN HOLE: DIA./LENGTH *
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE	LENGTH CORE RUN	SAMPLE RECOVERY	CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS			ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES						
										5563				0-2' Light brown, fine sandy SILT (NL)-dry	Drilled w/10"d hollow stem auger
											5			2'-7' Dark brown, silty, fine medium grained SAND (SM)-trace moisture	
											10				
														7'-14' Gray-brown, slightly clayey, slightly silty fine to medium grained SAND (SP-SM)-wet	
										5548	15				
											20			14'-15' Grayish brown, decomposed SANDSTONE	
														Refusal @ 15' Bottom of boring @ 15'	*See Well Construction Reports

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER
SITE BLANCO PLANT
HOLE NO. W-10

H&CF 19-1

BECHTEL

GEOLOGIC DRILL LOG

PROJECT: EPNG BLANCO PLANT
JOB NO.: 19782
SHEET NO.: 1 OF 1
HOLE NO.: C
SITE: Blanco Plant
COORDINATES:
ANGLE FROM HORIZ.: 90°
BEARING: -
BEGUN: 9/24/88
COMPLETED: 9/24/88
DRILLER: Sergent, Houskins & Beckwith
DRILL MAKE AND MODEL: CME-75
HOLE SIZE: 6"d
OVERBURDEN (FT.): 19
ROCK (FT.): -
TOTAL DEPTH: 19
CORE RECOVERY (FT./%): NA
CORE BOXES: NA
SAMPLES: 2
EL. TOP OF CASING: NA
GROUND EL.: 5580 ft
DEPTH/EL. GROUND WATER: NA
DEPTH/EL. TOP OF ROCK: NA
SAMPLE HAMMER WEIGHT/FALL: 140 lbs/30 inches
CASING LEFT IN HOLE: DIA./LENGTH: None
LOGGED BY: E. Berglund

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N"	PERCENT CORE RECOVERY	WATER PRESSURE TESTS			ELEVATION ft	DEPTH ft	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
					LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES						
Modified Calif. 2½" d., 6" brass sleeves								5580				0-6' Brown, silty, fine grained SAND (SM)-dry	Drilled w/6"d. hollow-stem auger
									5				
									10			6'-13'Yellow-brown, slightly silty, fine to medium grained SAND (SP-SM) - damp	Drilled for sampling only
	18'	12"							15		☒	13'-19'Dark bluish-gray, sandy CLAY (CL) to clayey, fine to medium grained SAND (SC) - moist. Hydrocarbon odor.	
	18'	12"						5561	20		☒		
												Bottom of boring @19'	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: BLANCO PLANT
HOLE NO.: C

H&CF 19-1

ATTACHMENT 2

Well Construction Details

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.

WELL NO: W-2

JOB NO: 19782

SITE: Blanco Plant

COORDINATES:

BEGUN: 9/20/88

COMPLETED: 9/21/88

PREPARED BY: E. Berglund

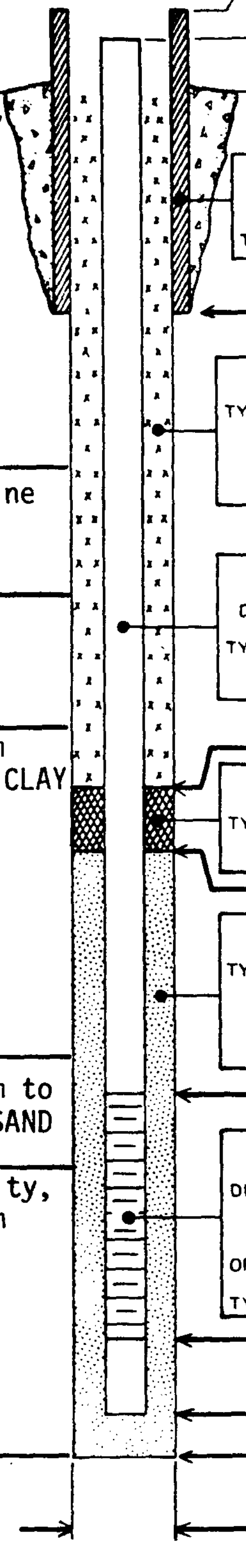
REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing

ELEV. – TOP OF SURFACE CASING: ?

ELEV. – TOP OF RISER CASING: 5616.3 ft

GENERALIZED GEOLOGIC LOG

0-23'	Slightly silty fine grained SAND
23'-27'	Silty, very fine grained SAND
27'-32'	Silty, medium grained SAND
32'-46'	Fine to medium grained sandy CLAY
46'-49'	Clayey, medium to fine grained SAND
49'-57.5'	Slightly silty, fine to medium grained SAND



SURFACE CASING
DIA 8 inches
TYPE Steel with locking cap

BACKFILL MATERIAL
TYPE Cement-Bentonite Grout

RISER CASING
DIA. 4 inch I.D.
TYPE Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL
TYPE Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN:
DIA 4 inch I.D. TYPE Schedule 40 PVC
OPENINGS WIDTH 0.020 inch
TYPE Machine slotted, 4 slots/inch;4 rows

	DEPTH ft	ELEV ft
GROUND SURFACE	0	5614
BOTTOM OF SURFACE CASING	2.4	?
TOP OF SEAL	43.2	5570.8
TOP OF FILTER PACK	45.2	5568.8
TOP OF SCREEN	46.3	5567.7
BOTTOM OF SCREEN	56.3	5557.7
BOTTOM OF SUMP	56.7	5557.3
BOTTOM OF HOLE	57.5	5556.5

NO SCALE

HOLE DIA 10 inches

OBSERVATION WELL

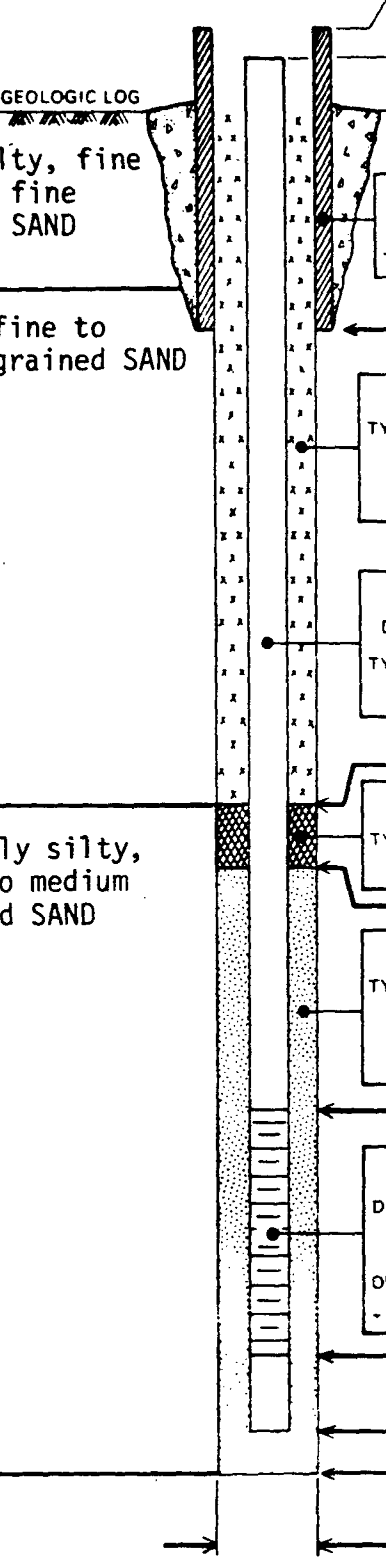
PROJECT: EL PASO NATURAL GAS CO.
WELL NO: W-5
JOB NO: 19782
SITE: Blanco Plant
COORDINATES:
BEGUN: 9/23/88
COMPLETED: 9/23/88
PREPARED BY: E. Berglund
REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing

GENERALIZED GEOLOGIC LOG

0-2' Very silty, fine to very fine grained SAND

2'-5' Silty, fine to medium grained SAND

5'-15' Slightly silty, fine to medium grained SAND



NO SCALE

ELEV. - TOP OF SURFACE CASING: ?
ELEV. - TOP OF RISER CASING: 5566.5 ft

SURFACE CASING
DIA 8 inches
TYPE Steel with locking cap

BACKFILL MATERIAL
TYPE Cement-Bentonite Grout

RISER CASING
DIA 4 inch I.D.
TYPE Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL
TYPE Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN:
DIA 4 inch I.D. TYPE: Schedule 40 PVC
OPENINGS WIDTH: 0.020 inch
TYPE: Machine slotted, 4 slots/inch;4 rows

HOLE DIA: 10 inches

	DEPTH ft	ELEV. ft
GROUND SURFACE	0	5565
BOTTOM OF SURFACE CASING	3.2	?
TOP OF SEAL	5.0	5560.0
TOP OF FILTER PACK	8.0	5557.0
TOP OF SCREEN	8.5	5556.5
BOTTOM OF SCREEN	18.5	5546.5
BOTTOM OF SUMP	19.9	5545.0
BOTTOM OF HOLE	20.0	5545.0

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.
WELL NO: W-6
JOB NO: 19782
SITE: Blanco Plant
COORDINATES:
BEGUN: 9/21/88
COMPLETED: 9/21/88
PREPARED BY: E. Berglund
REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing

GENERALIZED GEOLOGIC LOG

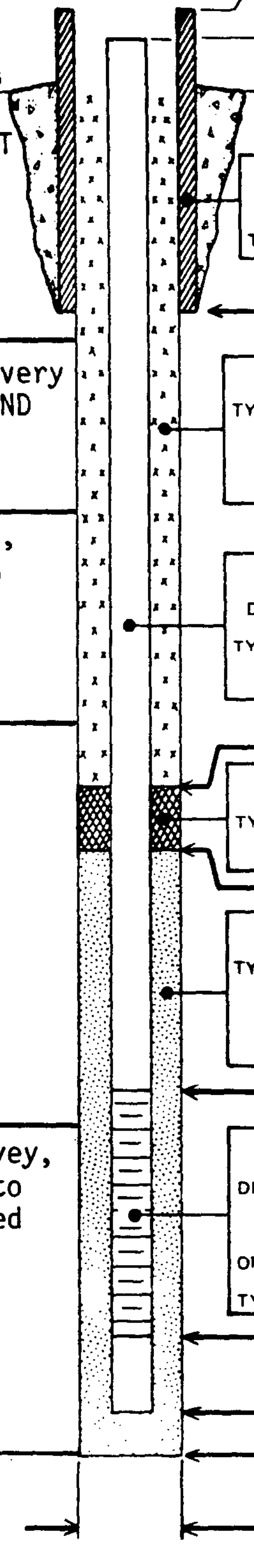
0'-5' Fine sandy SILT

5'-7' Silty, fine to very fine grained SAND

7'-12' Slightly silty, fine to medium grained SAND

12'-23' Silty, fine sandy CLAY

23'-31' Slightly clayey, silty, fine to medium grained SAND



SURFACE CASING
DIA 8 inches
TYPE Steel with locking cap

BACKFILL MATERIAL
TYPE: Cement-Bentonite Grout

RISER CASING
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC, threaded with O-ring seal

ANNULAR SEAL
TYPE Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN:
DIA 4 inch I.D. TYPE: Schedule 40 PVC
OPENINGS WIDTH: 0.020 inch
TYPE Machine slotted, 4 slots/inch;4 rows

	DEPTH ft	ELEV ft
ELEV. - TOP OF SURFACE CASING: ?		
ELEV. - TOP OF RISER CASING: 5577.0 ft		
GROUND SURFACE	0	5576.0
BOTTOM OF SURFACE CASING	3.7	?
TOP OF SEAL	15.3	5560.7
TOP OF FILTER PACK	17.3	5558.7
TOP OF SCREEN	19.0	5557.0
BOTTOM OF SCREEN	29.0	5547.0
BOTTOM OF SUMP	30.4	5545.6
BOTTOM OF HOLE	31.0	5545.0

NO SCALE

HOLE DIA 10 inches

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.

WELL NO: W-7

JOB NO: 19782

SITE: Blanco Plant

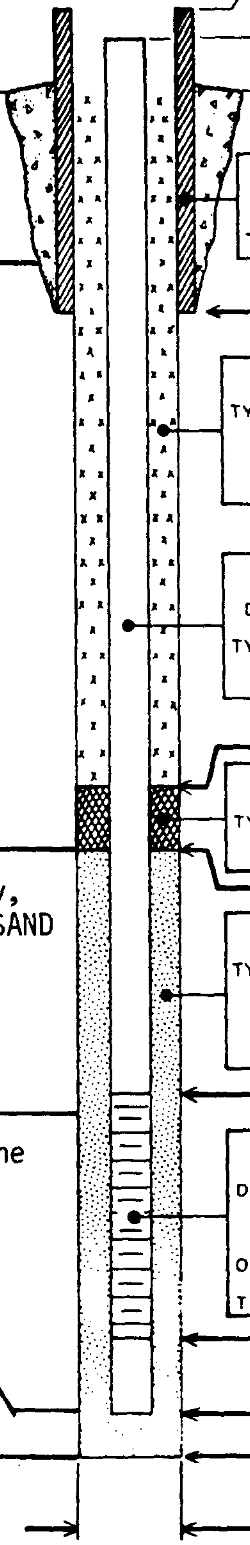
COORDINATES:

BEGUN: 9/22/88

COMPLETED: 9/22/88

PREPARED BY: E. Berglund

REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing



ELEV. – TOP OF SURFACE CASING: ?

ELEV. – TOP OF RISER CASING: 5569.0 ft

GENERALIZED GEOLOGIC LOG

0-1' Very fine sandy SILT

1'-8' Silty, fine to very fine grained SAND

8'-12' Slightly silty, fine grained SAND

12'-20.5' Clayey, fine grained SAND

20.5'-21' Decomposed SANDSTONE

SURFACE CASING

DIA: 8 inches

TYPE: Steel with locking cap

BACKFILL MATERIAL

TYPE: Cement-bentonite grout

RISER CASING

DIA: 4 inch I.D.

TYPE: Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL

TYPE: Bentonite pellets, ½ inch d.

FILTER PACK

TYPE: Washed silica sand, No. 10-30

SCREEN

DIA: 4 inch I.D.

TYPE: Schedule 40 PVC

OPENINGS: WIDTH 0.020 inch

TYPE: Machine slotted, 4 slots/inch; 4 rows

	DEPTH ft	ELEV. ft
GROUND SURFACE	0	5568.0
BOTTOM OF SURFACE CASING	3.7	?
TOP OF SEAL	6.2	5561.8
TOP OF FILTER PACK	8.0	5560.0
TOP OF SCREEN	9.0	5559.0
BOTTOM OF SCREEN	19.0	5549.0
BOTTOM OF SUMP	20.4	5547.6
BOTTOM OF HOLE	21.0	5547.0

NO SCALE

HOLE DIA: 10 inches

OBSERVATION WELL

PROJECT: EL PASO NATURAL GAS CO.

WELL NO: W-8

JOB NO: 19782

SITE: Blanco Plant

COORDINATES:

BEGUN: 9/23/88

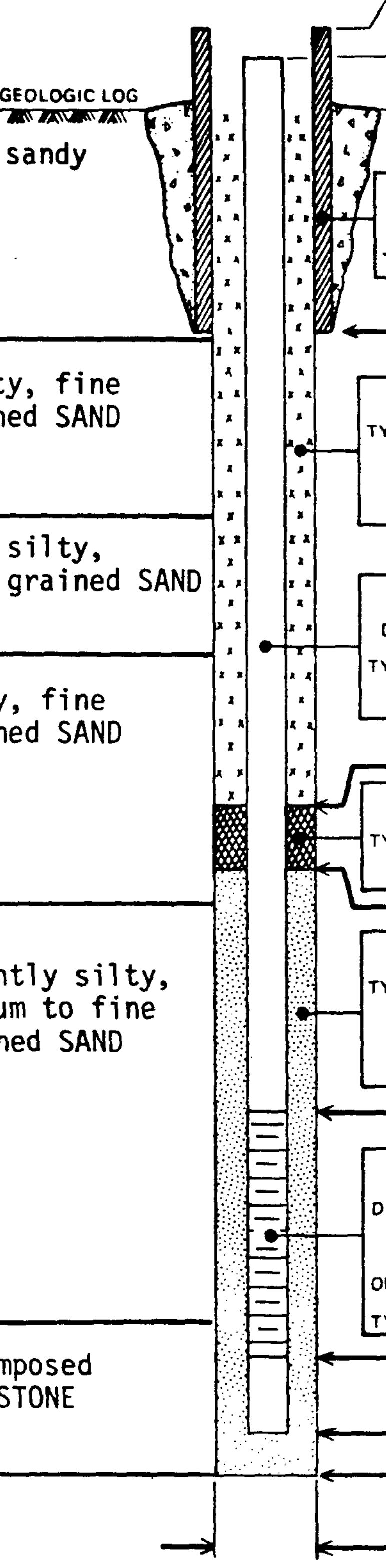
COMPLETED: 9/23/88

PREPARED BY: E. Berglund

REFERENCE POINT FOR MEASUREMENTS: Top of Riser Casing

ELEV. – TOP OF SURFACE CASING: ?

ELEV. – TOP OF RISER CASING: 5580.3 ft



GENERALIZED GEOLOGIC LOG

0-3.5' Fine sandy SILT

3.5'-10' Silty, fine grained SAND

10'-12' Very silty, fine grained SAND

12'-21' Silty, fine grained SAND

21'-32' Slightly silty, medium to fine grained SAND

32'-35' Decomposed SANDSTONE

SURFACE CASING
DIA: 8 inches
TYPE: Steel with locking cap

BACKFILL MATERIAL
TYPE: Cement-bentonite Grout

RISER CASING
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC, threaded, with O-ring seal

ANNULAR SEAL
TYPE: Bentonite pellets, ½ inch d.

FILTER PACK
TYPE: Washed silica sand, No. 10-30

SCREEN:
DIA: 4 inch I.D.
TYPE: Schedule 40 PVC
OPENINGS WIDTH: 0.020 inch
TYPE: Machine slotted, 4 slots/inch; 4 rows

	DEPTH ft	ELEV. ft
GROUND SURFACE	0	5578.0
BOTTOM OF SURFACE CASING	2.4	?
TOP OF SEAL	17.9	5560.1
TOP OF FILTER PACK	19.3	5558.7
TOP OF SCREEN	23.3	5554.7
BOTTOM OF SCREEN	33.3	5544.7
BOTTOM OF SUMP	34.7	5543.3
BOTTOM OF HOLE	35.0	5543.0

NO SCALE

HOLE DIA: 10 inches

BLANCO PLANT

SITE INVESTIGATION

ANALYTICAL RESULTS

DECEMBER 1988

DRAFT

EL PASO NATURAL GAS COMPANY
BLANCO PLANT SOIL DATA
(all results in ug/kg unless otherwise indicated)

Sample ID SAMPLE DEPTH (ft)	BG1 1-1.5	BG2 .5-1	BG3 .5-1	B-1 2-2.5	B-2 3.5-4.0	C-1 14-15	C-2 18-19	A-1 1.5-2.0	A-2 3.5-4.0
VOLATILE HALOGENATED ORGANICS (EPA 601)	NA(a)	NA	NA						
1,1,2,2-Tetrachloroethylene				<38	<38	<38	<38	<38	<38
1,1,2-Trichloroethane				<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene				<190	<190	<190	<190	<190	<190
1,2-Dichloropropane				<50	<50	<50	<50	<50	<50
1,3-Dichlorobenzene				<400	<400	<400	<400	<400	<400
1,4-Dichlorobenzene				<300	<300	<300	<300	<300	<300
1,1,1-Trichloroethane				<38	<38	<38	<38	<38	<38
1,1-Dichloroethane				<88	<88	<88	<88	<88	<88
1,2-Dichloroethane				<38	<38	<38	<38	<38	<38
2-Chlorotoluene				<1250	<1250	<1250	<1250	<1250	<1250
2-Chloroethyl vinyl ether				<160	<160	<160	<160	<160	<160
Bromodichloromethane				<125	<125	<125	<125	<125	<125
Benzyl Chloride				<1250	<1250	<1250	<1250	<1250	<1250
Bromomethane				<12500	<12500	<12500	<12500	<12500	<12500
Bromobenzene				<1250	<1250	<1250	<1250	<1250	<1250
Bis(2-chloroisopropyl)eth.				<12500	<12500	<12500	<12500	<12500	<12500
Bis(2-chloroethoxy)methane				<1250	<1250	<1250	<1250	<1250	<1250
Bromoform				<250	<250	<250	<250	<250	<250
Chloroform				<63	<63	<63	<63	<63	<63
Chlorobenzene				<310	<310	<310	<310	<310	<310
Chloroethane				<650	<650	<650	<650	<650	<650
Chloromethane				<100	<100	<100	<100	<100	<100
Carbon Tetrachloride				<150	<150	<150	<150	<150	<150
Dibromochloromethane				<110	<110	<110	<110	<110	<110
Dibromomethane				<2500	<2500	<2500	<2500	<2500	<2500
Trans-1,2-Dichloroethylene				<125	<125	<125	<125	<125	<125
Trans-1,3-Dicholoropropylene				<430	<430	<430	<430	<430	<430
Vinyal Chloride				<1250	<12500	<12500	<12500	<12500	<12500
1,1,1,2 Tetrachloroethane				<1250	<1250	<1250	<1250	<1250	<1250
1.1-Dichloroethylene				<160	<160	<160	<160	<160	<160
1,2,3-Trichloropropane				<1250	<1250	<1250	<1250	<1250	<1250
1-Chlorohexane				<1250	<1250	<1250	<1250	<1250	<1250
Chloroacetaldehyde				<12500	<12500	<12500	<12500	<12500	<12500
Chloromethyl methyl ether				<1250	<1250	<1250	<1250	<1250	<1250
Dichlorodifluoromethane				<1250	<1250	<1250	<1250	<1250	<1250
Dichloromethane				<125	<125	<125	<125	<125	<125
Trichloroethylene				<150	<150	<150	<150	<150	<150
Tetrachloroethylene				<38	<38	<38	<38	<38	<38
Trichlorofluoromethane				<500	<500	<500	<500	<500	<500

(a) NA - Not Analyzed

EL PASO NATURAL GAS COMPANY
BLANCO PLANT SOIL DATA
(all results in ug/kg unless otherwise indicated)

Sample ID	BG1	BG2	BG3	B-1	B-2	C-1	C-2	A-1	A-2
SAMPLE DEPTH (ft)	1-1.5	.5-1	.5-1	2-2.5	3.5-4.0	14-15	18-19	1.5-2.0	3.5-4.0
VOLATILE AROMATICS (EPA 602)									
Benzene	NA(a)	NA	NA	<25	<25	<25	<25	<25	<25
Chlorobenzene	NA	NA	NA	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	NA	NA	NA	<50	<50	<50	<50	<50	<50
1,3-Dichlorobenzene	NA	NA	NA	<50	<50	<50	<50	<50	<50
1,4-Dichlorobenzene	NA	NA	NA	<38	<38	<38	<38	<38	<38
Ethyl Benzene	NA	NA	NA	<25	<25	<25	<25	<25	<25
Toluene	NA	NA	NA	<25	<25	<25	<25	<25	<25
Xylenes	NA	NA	NA	<75	<75	<75	<75	<75	<75
METALS									
Total Iron (mg/kg)	4240	5860	5860	5860	5860	5860	5860	5710	5860
Total Manganese (mg/kg)	131	260	190	71	156	158	169	284	287
Total Chromium (mg/kg;	2	11	2	31	5	3	4	1	1
Total Arsenic (mg/kg)	1.1	1.8	<1	<1	1.6	<1	1.4	<1	<1
Hexavalent Chromium (mg/kg)	<0.1	0.23	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Cadmium (mg/kg)	0.14	0.16	0.12	0.1	0.2	0.33	0.16	0.1	0.11
Total Lead (mg/kg)	3.5	3.4	7.1	9.6	10.1	9.2	2.5	<1	1
Total Mercury (mg/kg)	<0.04	0.04	<0.04	<.04	<.04	<0.04	<0.04	<.04	0.05
Zinc (mg/kg)	<10	40	20	30	30	50	40	20	20
Copper (mg/kg)	3	12	12	8	7	56	8	3	3
VOLATILE ORGANICS (EPA 624) (b)	NA	NA	NA	NA	ND	NA	NA	NA	NA
SEMI-VOLATILE ORGANICS (EPA 625) (b)	NA	NA	NA	NA	ND	ND (c)	NA	NA	NA
TOTAL EXTRACTABLE HYDROCARBONS (EPA 8015)									
Acrylamide (mg/kg)	NA	NA	NA	<125	<125	<125	<125	<125	<125
Diethyl Ether (mg/kg)	NA	NA	NA	<0.625	<0.625	<0.625	<0.625	<0.625	<0.625
Ethanol (mg/kg)	NA	NA	NA	<1.875	<1.875	<1.875	<1.875	<1.875	<1.875
Methylethylketone (mg/kg)	NA	NA	NA	<.625	<.625	<.625	<.625	<.625	<.625
Methyle Isobutyl Ketone (mg/kg)	NA	NA	NA	<.625	<.625	<.625	<.625	<.625	<.625
Paraldehyde (mg/kg)	NA	NA	NA	<25	<25	<25	<25	<25	<25
MISCELLANEOUS									
pH	NA	NA	NA	6.33	5.51	9.18	7.4	7.96	8.16
Oxidation/Reduction Potential (mV)	NA	NA	NA	269	242	310	330	263	278

(a) NA - Not Analyzed
(b) Only those priority pollutant compounds which were detected are presented in this table. (ND - None Detected)
(c) For semi-volatile non-priority pollutant compounds detected see attached analytical data sheet.

EL PASO NATURAL GAS COMPANY
BLANCO PLANT SOIL DATA
(all results in ug/kg unless otherwise indicated)

Sample ID SAMPLE DEPTH (ft)	W2 56-57	W6 28-29	W7 15-16	W5 14-15
VOLATILE HALOGENATED ORGANICS (EPA 601)				
1,1,2,2-Tetrachloroethylene	<38	<38	<38	<38
1,1,2-Trichloroethane	<25	<25	<25	<25
1,2-Dichlorobenzene	<190	<190	<190	<190
1,2-Dichloropropane	<50	<50	<50	<50
1,3-Dichlorobenzene	<400	<400	<400	<400
1,4-Dichlorobenzene	<300	<300	<300	<300
1,1,1-Trichloroethane	<38	<38	<38	<38
1,1-Dichloroethane	<88	<88	<88	<88
1,2-Dichloroethane	<38	<38	<38	<38
2-Chlorotoluene	<1250	<1250	<1250	<1250
2-Chloroethyl vinyl ether	<160	<160	<160	<160
Bromodichloromethane	<125	<125	<125	<125
Benzyl Chloride	<1250	<1250	<1250	<1250
Bromomethane	<12500	<12500	<12500	<12500
Bromobenzene	<1250	<1250	<1250	<1250
Bis(2-chloroisopropyl)eth.	<12500	<12500	<12500	<12500
Bis(2-chloroethoxy)methane	<1250	<1250	<1250	<1250
Bromoform	<250	<250	<250	<250
Chloroform	<63	<63	<63	<63
Chlorobenzene	<310	<310	<310	<310
Chloroethane	<6520	<650	<650	<650
Chloromethane	<100	<100	<100	<100
Carbon Tetrachloride	<150	<150	<150	<150
Dibromochloromethane	<110	<110	<110	<110
Dibromomethane	<2500	<2500	<2500	<2500
Trans-1,2-Dichloroethylene	<125	<125	<125	<125
Trans-1,3-Dicholoropropylene	<430	<430	<430	<430
Vinyal Chloride	<12500	<12500	<12500	<12500
1,1,1,2 Tetrachloroethane	<1250	<1250	<1250	<1250
1.1-Dichloroethylene	<160	<160	<160	<160
1,2,3-Trichloropropane	<1250	<1250	<1250	<1250
1-Chlorohexane	<1250	<1250	<1250	<1250
Chloroacetaldehyde	<12500	<12500	<12500	<12500
Chloromethyl methyl ether	<1250	<1250	<1250	<1250
Dichlorodifluoromethane	<1250	<1250	<1250	<1250
Dichloromethane	<125	<125	<125	<125
Trichloroethylene	<150	<150	<150	<150
Tetrachloroethylene	<38	<38	<38	<38
Trichlorofluoromethane	<500	<500	<500	<500

EL PASO NATURAL GAS COMPANY
BLANCO PLANT SOIL DATA
(all results in ug/kg unless otherwise indicated)

Sample ID SAMPLE DEPTH (ft)	W2 *56-57*	W6 *28-29*	W7 *15-16*	W5 *14-15*
VOLATILE AROMATICS (EPA 602)				
Benzene	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25
1,2-Dichlorobenzene	<50	<50	<50	<50
1,3-Dichlorobenzene	<50	<50	<50	<50
1,4-Dichlorobenzene	<38	<38	<38	<38
Ethyl Benzene	<25	<25	<25	<25
Toluene	<25	<25	<25	<25
Xylenes	<75	<75	<75	<75
METALS				
Total Iron (mg/kg)	5850	5850	5860	5860
Total Manganese (mg/kg)	263	267	269	216
Total Chromium (mg/kg)	4	19	8	2
Total Arsenic (mg/kg)	2.2	1.7	1.3	1.5
Hexavalent Chromium (mg/kg)	<0.1	<0.1	<0.1	<0.1
Total Cadmium (mg/kg)	0.13	0.15	0.52	0.56
Total Lead (mg/kg)	3	6.2	4.9	3.8
Total Mercury (mg/kg)	<0.04	<0.04	<0.04	0.06
Zinc (mg/kg)	30	20	40	40
Copper (mg/kg)	9	7	19	6
VOLATILE ORGANICS (EPA 624)	NA(a)	NA	NA	NA
SEMI-VOLATILE ORGANICS (EPA 625)	NA	NA	NA	NA
TOTAL EXTRACTABLE HYDROCARBONS (EPA 8015)				
Acrylamide (mg/kg)	<125	<125	<125	<125
Diethyl Ether (mg/kg)	<0.625	<0.625	<0.625	<0.625
Ethanol (mg/kg)	<1.875	<1.875	<1.875	<1.875
Methylethylketone (mg/kg)	<.625	<.625	<.625	<.625
Methyle Isobutyl Ketone (mg/kg)	<.625	<.625	<.625	<.625
Paraldehyde (mg/kg)	<25	<25	<25	<25
MISCELLANEOUS				
pH	7.71	7.5	7.62	7.87
Oxidation/Reduction Potential (mV)	288	289	285	278

(a) NA - Not Analyzed

PRELIMINARY

EL PASO NATURAL GAS COMPANY
BLANCO PLANT GROUNDWATER DATA
(all results in ug/l unless otherwise indicated)

Sample ID Screened Interval (ft)	W2 46.3-56.3	W5 8.5-18.5	W5 Duplicate 8.5-18.5	W6 19.0-29.0	W7 9.0-19.0	W8 23.3-33.3	W10 8.8-13.8	TRAVEL BLANK
VOLATILE HALOGENATED ORGANICS (EPA 601)								
1,1,2,2-Tetrachloroethylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,1,2-Trichloroethane	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichlorobenzene	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
1,2-Dichloropropane	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,3-Dichlorobenzene	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
1,4-Dichlorobenzene	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
1,1,1-Trichloroethane 50µg/l	**1.3**	**0.5**	**0.5**	**0.3**	**0.6**	**1.4**	**1.3**	<0.03
1,1-Dichloroethane	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
1,2-Dichloroethane	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
2-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1
2-Chloroethyl vinyl ether	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Bromodichloromethane	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzyl Chloride	<1	<1	<1	<1	<1	<1	<1	<1
Bromomethane	<10	<10	<10	<10	<10	<10	<10	<10
Bromobenzene	<1	<1	<1	<1	<1	<1	<1	<1
Bis(2-chloroisopropyl)eth.	<10	<10	<10	<10	<10	<10	<10	<10
Bis(2-chloroethoxy)methane	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloroform	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	<0.25	**0.3**	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Chloroethane	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52
Chloromethane	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Carbon Tetrachloride	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Dibromochloromethane	**0.46**	<0.09	<0.09	<0.09	<0.09	**0.31**	**0.2**	<0.09
Dibromomethane	<2	<2	<2	<2	<2	<2	<2	<2
Trans-1,2-Dichloroethylene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trans-1,3-Dicholoropropylene	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
Vinyl Chloride	<10	<10	<10	<10	<10	<10	<10	<10
1,1,1,2 Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1
1.1-Dichloroethylene	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
1,2,3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	<1
1-Chlorohexane	<1	<1	<1	<1	<1	<1	<1	<1
Chloroacetaldehyde	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethyl methyl ether	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	<1
Dichloromethane	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trichloroethylene 100µg/l	**0.4**	**0.3**	**0.3**	<0.12	**0.15**	**0.4**	**0.3**	**0.2**
Tetrachloroethylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Trichlorofluoromethane	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	**0.23**	**0.08**

EL PASO NATURAL GAS COMPANY
BLANCO PLANT GROUNDWATER DATA
(all results in ug/l unless otherwise indicated)

Sample ID	W2	W5	W5 Duplicate	W6	W7	W8	W10	TRAVEL
Screened Interval (ft)	46.3-56.3	8.5-18.5	8.5-18.5	19.0-29.0	9.0-19.0	23.3-33.3	8.8-13.8	BLANK
VOLATILE AROMATICS (EPA 602)								
Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,3-Dichlorobenzene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Ethyl Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	<0.2	<0.2	<0.2	<0.2	<0.2	5	<0.2	<0.2
Xylenes	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
METALS								
Total Iron (mg/l)	4	1.61	1.54	0.7	1.2	0.22	1.03	NA(a)
Total Manganese (mg/l)	1.36	1.54	1.28	4.03	2.21	4.59	3.32	NA
Total Chromium (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Total Arsenic (mg/l)	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Hexavalent Chromium (mg/l)	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01	NA
Total Cadmium (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NA
Total Lead (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Total Mercury (mg/l)	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	NA
Zinc (mg/l)	0.3	0.3	0.2	<0.1	0.3	0.2	0.2	NA
Copper (mg/l)	0.03	0.02	<0.01	<0.01	0.02	<0.01	<0.01	NA
VOLATILE ORGANICS (EPA 624) (b)	NA	NA	NA	ND	NA	NA	NA	NA
SEMI-VOLATILE ORGANICS (EPA 625) (b)	NA	NA	NA	ND	ND	NA	NA	NA

(a) NA - Not Analyzed

(b) Only those priority pollutant compounds which were detected are presented in this table. (ND - None Detected)

EL PASO NATURAL GAS COMPANY
BLANCO PLANT GROUNDWATER DATA
(all results in ug/l unless otherwise indicated)

Sample ID	W2	W5	W5 Duplicate	W6	W7	W8	W10	TRAVEL
Screened Interval (ft)	46.3-56.3	8.5-18.5	8.5-18.5	19.0-29.0	9.0-19.0	23.3-33.3	8.8-13.8	BLANK
TOTAL EXTRACTABLE HYDROCARBONS (EPA 8015)								
Acrylamide	<1000	<1000	<1000	<1000	<1000	<1000	<1000	NA(a)
Diethyl Ether	<5	<5	<5	<5	<5	<5	<5	NA
Ethanol	<15	<15	<15	<15	<15	<15	<15	NA
Methylethylketone	<5	<5	<5	<5	<5	<5	<5	NA
Methyle Isobutyl Ketone	<5	<5	<5	<5	<5	<5	<5	NA
Paraldehyde	<200	<200	<200	<200	<200	<200	<200	NA
MAJOR CATIONS AND ANIONS								
Calcium (mg/l)	473	689	606	532	473	409	509	NA
Magnesium (mg/l)	70.3	23.6	20.8	12.3	26.3	56.9	97.5	NA
Potassium (mg/l)	5.7	1.3	1	2.9	3.3	4.2	5.2	NA
Sodium (mg/l)	1680	59.1	57.7	796	672	1180	801	NA
Sulfate (mg/l)	3800	2000	2255	1760	1990	1610	2370	NA
Carbonate (mg/l as CaCO3)	0	0	0	0	0	0	0	NA
Bicarbonate (mg/l as CaCO3)	239	294	295	401	378	229	248	NA
Chloride (mg/l)	46	14	16	56	45	17	73	NA
Nitrate (mg/l-N)	290	0.02	<0.1	51	0.3	<0.1	1	NA
BASIC WATER QUALITY PARAMETERS								
pH	7.87	7.91	7.37	7.32	7.62	7.84	7.5	NA
Total Dissolved Solids (mg/l)	7612	3112	2900	4516	4776	5680	5284	NA

(a) NA - Not Analyzed

Controls for Environmental Pollution, Inc.
P.O. BOX 5351 • Santa Fe, New Mexico 8[illegible]02
IN STATE 505/982-9841
OUT OF STATE 800/545-2188

PAGE 1 CEP, Inc. REPORT LAB # 88-09-402
RECEIVED: 09/22/88 11/09/88 16:03:00

REPORT TO Bechtel Environmental, Inc.
3000 Post Oak Blvd.
Houston, TX 77056

ATTEN Dr. Monica Jacque

CLIENT EL PASO BECH SAMPLES 10
COMPANY El Paso Natural Gas Company
FACILITY

WORK ID Water Quality
TAKEN
TRANS Federal Express & Bus
TYPE Water
P.O. # 37511 req. 0-1665
INV. # 430486

PREPARED BY Controls for Environmental
Pollution, Inc.
1925 Rosina Street
Santa Fe, NM 87502
ATTEN
PHONE (505) 982-9841

CERTIFIED BY

CONTACT GAIL

Remainder of sample(s) for routine analysis will be disposed of three weeks from final report date. Sample(s) for bacteria analysis only, will be disposed of one day after final report. This is not applicable if other arrangements have been made.

cc: Bechtel Corp.
P.O. Box 3965 Mail Code 50/18/C46
San Franciso, CA 94119
Attn: Christine Nadeau

"CORRECTED REPORT"

SAMPLE IDENTIFICATION

01 #W2
02 #BG1
03 #BG2
04 #BG3
05 #A-1
06 #A-2
07 #B-1
08 #B-2
09 #W6
10 TRIP BLANK 1

CEP, Inc. TEST CODES and NAMES used on this report

1112T1	1,1,1,2Tetrachloroethane	BRMTHA	Bromomethane
1122TA	1,1,2,2-Tetrachloroethane	BROMOB	Bromobenzene
112TCE	1,1,2-Trichloroethane	B ETH1	Bis(2-chloroisopropyl)eth.
11 DCL	1,1-Dichloroethylene	B METH	Bis(2-chloroethoxy)methane
123TCP	1,2,3-Trichloropropane	CBR4 1	Bromoform
12DCLB	1,2-Dichlorobenzene	CCL4 1	Chloroform
12DCLP	1,2-Dichloropropane	CD T S	Cadmium (total)
13DCLB	1,3-Dichlorobenzene	CLACET	Chloroacetaldehyde
14DCLB	1,4-Dichlorobenzene	CLBENZ	Chlorobenzene
1 1 1T	1,1,1-Trichloroethane	CLETHA	Chloroethane
1 1 DI	1,1-Dichloroethane	CLMTHA	Chloromethane
1 2 D1	1,2-Dichloroethane	CMME	Chlromethyl methyl ether
1 CLHX	1-Chlorohexane	CR 6 S	Chromium, Hexavalent
2 CTOL	2-Chlorotoluene	CR T S	Chromium (total)
2 CVE	2-Chloroethyl vinyl ether	CTET 1	Carbon Tetrachloride
ACRYLA	Acrylamide	CU T S	Copper (total)
AS T S	Arsenic (total)	DBCM 1	Dibromochloromethane
BDCM 1	Bromodichloromethane	DBMETH	Dibromomethane
BENZCL	Benzyl Chloride	DCLFLM	Dichlorodifluoromethane
BENZ 1	Benzene	DCLMET	Dichloromethane
BNFS	Base Neutrals EPA-625	DIETHE	Diethyl Ether

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CEP, Inc. REPORT
LAB # 88-09-402
11/09/88 16:03:00

CEP, Inc. TEST CODES and NAMES used on this report

ETBENZ	Ethul benzene
ETHANO	Ethanol
FE T S	Iron (total)
HG T S	Mercuru (total)
MEK 1	Methulethulketone
MIBK	Methul Isobutul Ketone
MN T S	Manganese (total)
PARALD	Paraldehude
PB T S	Lead (total)
PH S	pH
REDOX1	Redox Potential
T1 2DE	trans-1,2-Dichloroethulene
T1 3DE	trans-1,3Dichloropropulene
TCE	Trichloroethulene
TCLETY	Tetrachloroethulene
TCLFMA	Trichloroflouromethane
TOL 1	Toluene
VOA	Volatile Organics EPA-624
V CL	Vinul Chloride
XYLENE	Xulenes
ZN T S	Zinc (total)

Controls for Environmental Pollution, Inc.
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REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W2	09/20/88 16:20	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<170	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<88	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<12500	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<38	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W2 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	2.2	(mg/kg)
		Cadmium (total)	0.13	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	4.0	(mg/kg)
		Copper (total)	9.0	(mg/kg)
		Iron (total)	5850	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	263	(mg/kg)
		Lead (total)	3.0	(mg/kg)
		Zinc (total)	30.0	(mg/kg)
		pH	7.71	(units)
		Redox Potential	288	(mV)
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)

Controls for Environmental Pollution, Inc.
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REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#BG1	09/21/88	Arsenic (total)	1.1	(mg/kg)
		Cadmium (total)	0.14	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	2.0	(mg/kg)
		Copper (total)	3.0	(mg/kg)
		Iron (total)	4240	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	131.0	(mg/kg)
		Lead (total)	3.5	(mg/kg)
		Zinc (total)	<10	(mg/kg)

REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#BG2	09/21/88 11:30	Arsenic (total)	1.8	(mg/kg)
		Cadmium (total)	0.16	(mg/kg)
		Chromium Hexavalent	0.23	(mg/kg)
		Chromium (total)	11.0	(mg/kg)
		Copper (total)	12.0	(mg/kg)
		Iron (total)	5860	(mg/kg)
		Mercury (total)	0.04	(mg/kg)
		Manganese (total)	260.0	(mg/kg)
		Lead (total)	3.4	(mg/kg)
		Zinc (total)	40.0	(mg/kg)

REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#BG3	09/21/88 12:50	Arsenic (total)	<1.0	(mg/kg)
		Cadmium (total)	0.12	(mg/kg)
		Chromium Hexavalent	0.11	(mg/kg)
		Chromium (total)	2.0	(mg/kg)
		Copper (total)	12.0	(mg/kg)
		Iron (total)	5860	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	190.0	(mg/kg)
		Lead (total)	7.1	(mg/kg)
		Zinc (total)	20.0	(mg/kg)

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REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#A-1	09/21/88 14:15	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<190	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<88	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<12500	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<300	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#A-1 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	<1.0	(mg/kg)
		Cadmium (total)	0.10	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	1.0	(mg/kg)
		Copper (total)	3.0	(mg/kg)
		Iron (total)	5710	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	284.0	(mg/kg)
		Lead (total)	<1.0	(mg/kg)
		Zinc (total)	20.0	(mg/kg)
		pH	7.96	(units)
		Redox Potential	263	(mV)
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)

REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#A-2	09/21/88 14:20	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<190	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<88	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<12500	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<38	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#A-2 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	<1.0	(mg/kg)
		Cadmium (total)	0.11	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	1.0	(mg/kg)
		Copper (total)	3.0	(mg/kg)
		Iron (total)	5860	(mg/kg)
		Mercury (total)	0.05	(mg/kg)
		Manganese (total)	297.0	(mg/kg)
		Lead (total)	1.0	(mg/kg)
		Zinc (total)	20.0	(mg/kg)
		pH	8.16	(units)
		Redox Potential	278	(mV)
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)

REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#B-1	09/21/88 13:55	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<190	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<88	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<1250	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<38	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#B-1 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	<1.0	(mg/kg)
		Cadmium (total)	0.10	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	31.0	(mg/kg)
		Copper (total)	8.0	(mg/kg)
		Iron (total)	5860	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	71.0	(mg/kg)
		Lead (total)	9.6	(mg/kg)
		Zinc (total)	30.0	(mg/kg)
		pH	6.33	(units)
		Redox Potential	269	(mV)
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)

REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#B-2	09/21/88 14:05	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<190	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<88	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<12500	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<38	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#B-2 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	1.6	(mg/kg)
		Cadmium (total)	0.20	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	5.0	(mg/kg)
		Copper (total)	7.0	(mg/kg)
		Iron (total)	5860	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	156.0	(mg/kg)
		Lead (total)	10.1	(mg/kg)
		Zinc (total)	30.0	(mg/kg)
		pH	5.51	(units)
		Redox Potential	242	(mV)
		Base Neutrals		()
		Volatile Organics		()
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)

CUSTOMER Bechtel Environmental, Inc.
ADDRESS 3000 Post Oak Blvd.
CITY Houston, TX 77056
ATTENTION Dr. Monica Jacque
INVOICE NO.

REPORT OF ANALYSIS

SAMPLES RECEIVED 09/22/88

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Volatile Compounds in Water

Sample Identification: #B-2

Date Collected: 09/21/88 @ 14:05

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
74-87-3	Chloromethane	<10
74-83-9	Bromomethane	<10
75-01-4	Vinyl Chloride	<10
75-00-3	Chloroethane	<10
75-09-2	Methylene Chloride	<5
67-64-1	Acetone	<10
75-15-0	Carbon Disulfide	<5
75-35-4	1, 1-Dichloroethene	<5
75-34-3	1, 1-Dichloroethane	<5
156-60-5	Trans-1, 2-Dichloroethene	<5
67-66-3	Chloroform	<5
107-06-2	1, 2-Dichloroethane	<5
78-93-3	2-Butanone	<10
71-55-6	1, 1, 1-Trichloroethane	<5
56-23-5	Carbon Tetrachloride	<5
108-05-4	Vinyl Acetate	<10
75-27-4	Bromodichloromethane	<5

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
78-87-5	1, 2-Dichloropropane	<5
10061-02-6	Trans-1, 3-Dichloropropene	<5
79-01-6	Trichloroethene	<5
124-48-1	Dibromochloromethane	<5
79-00-5	1, 1, 2-Trichloroethane	<5
71-43-2	Benzene	<5
10061-01-5	cis-1, 3-Dichloropropene	<5
110-75-8	2-Chloroethylvinylether	<10
75-25-2	Bromoform	<5
108-10-1	4-Methyl-2-Pentanone	<10
591-78-6	2-Hexanone	<10
127-18-4	Tetrachloroethene	<5
79-34-5	1, 1, 2, 2-Tetrachloroethane	<5
108-88-3	Toluene	<5
108-90-7	Chlorobenzene	<5
100-41-4	Ethylbenzene	<5
100-42-5	Styrene	<5
	Total Xylenes	<5

APPROVED BY
11/03/88 James J. Mueller, President

cep®

Controls for Environmental Pollution, Inc.

P.O. Box 5351 • 1925 Rosina • Santa Fe, New Mexico 87502
Telephone 505/982-9841

CUSTOMER Bechtel Environmental, Inc.
ADDRESS 3000 Post Oak Blvd.
CITY Houston, TX 77056
ATTENTION Dr. Monica Jacque
INVOICE NO:

REPORT OF ANALYSIS

SAMPLES RECEIVED 09/22/88 CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Semivolatile Compounds in Water

Sample Identification: #B-2

Date Collected: 09/21/88 @ 14:05

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
108-95-2	Phenol	<330
111-44-4	bis(-2-Chloroethyl)Ether	<330
95-57-8	2-Chlorophenol	<330
541-73-1	1, 3-Dichlorobenzene	<330
106-46-7	1, 4-Dichlorobenzene	<330
100-51-6	Benzyl Alcohol	<330
95-50-1	1, 2-Dichlorobenzene	<330
95-48-7	2-Methylphenol	<330
39638-32-9	bis(2-chloroisopropyl)Ether	<330
106-44-5	4-Methylphenol	<330
621-64-7	N-Nitroso-Di-n-Propylamine	<330
67-72-1	Hexachloroethane	<330
98-95-3	Nitrobenzene	<330
78-59-1	Isophorone	<330
88-75-5	2-Nitrophenol	<330
105-67-9	2, 4-Dimethylphenol	<330
65-85-0	Benzoic Acid	<1600
111-91-1	bis(-2-Chloroethoxy)Methane	<330
120-83-2	2, 4-Dichlorophenol	<330
120-82-1	1, 2, 4-Trichlorobenzene	<330
91-20-3	Naphthalene	<330
106-47-8	4-Chloroaniline	<330
87-68-3	Hexachlorobutadiene	<330
59-50-7	4-Chloro-3-Methylphenol	<330
91-57-6	2-Methylnaphthalene	<330
77-47-4	Hexachlorocyclopentadiene	<330
88-06-2	2, 4, 6-Trichlorophenol	<1600
95-95-4	2, 4, 5-Trichlorophenol	<330
91-58-7	2-Chloronaphthalene	<330
88-74-4	2-Nitroaniline	<1600
131-11-3	Dimethyl Phthalate	<330
208-96-8	Acenaphthylene	<330
99-09-2	3-Nitroaniline	<1600

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
83-32-9	Acenaphthene	<330
51-28-5	2, 4-Dinitrophenol	<1600
100-02-7	4-Nitrophenol	<1600
132-64-9	Dibenzofuran	<330
121-14-2	2, 4-Dinitrotoluene	<330
606-20-2	2, 6-Dinitrotoluene	<330
84-66-2	Diethylphthalate	<330
7005-72-3	4-Chlorophenyl-phenylether	<330
86-73-7	Fluorene	<330
100-01-6	4-Nitroaniline	<1600
534-52-1	4, 6-Dinitro-2-Methylphenol	<1600
86-30-6	N-Nitrosodiphenylamine (1)	<330
101-55-3	4-Bromophenyl-phenylether	<330
118-74-1	Hexachlorobenzene	<330
87-86-5	Pentachlorophenol	<1600
85-01-8	Phenanthrene	<330
120-12-7	Anthracene	<330
84-74-2	Di-n-Butylphthalate	<330
206-44-0	Fluoranthene	<330
129-00-0	Pyrene	<330
85-68-7	Butylbenzylphthalate	<330
91-94-1	3, 3'-Dichlorobenzidine	<660
56-55-3	Benzo(a)Anthracene	<330
117-81-7	bis(2-Ethylhexyl)Phthalate	<330
218-01-9	Chrysene	<330
117-84-0	Di-n-Octyl Phthalate	<330
205-99-2	Benzo(b)Fluoranthene	<330
207-08-9	Benzo(k)Fluoranthene	<330
50-32-8	Benzo(a)Pyrene	<330
193-39-5	Indeno(1, 2, 3-cd)Pyrene	<330
53-70-3	Dibenz(a,h)Anthracene	<330
191-24-2	Benzo(g,h,i)Perylene	<330

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11/03/88 James J. Mueller, President

PAGE 2 OF 2 PAGE

Controls for Environmental Pollution, Inc.
P.O. Box 5351 • 1925 Rosina • Santa Fe, New Mexico 87502
Telephone 505/982-9841

REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W6	09/21/88 16:10	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<190	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<88	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<12500	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<38	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W6 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	1.7	(mg/kg)
		Cadmium (total)	0.15	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	19.0	(mg/kg)
		Copper (total)	7.0	(mg/kg)
		Iron (total)	5850	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	267	(mg/kg)
		Lead (total)	6.2	(mg/kg)
		Zinc (total)	20.0	(mg/kg)
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)
		pH	7.50	(units)
		Redox Potential	289	(mV)

REPORT OF ANALYSIS

LAB # 88-09-402

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
TRIP BLANK 1	not specified	1,1,2,2-Tetrachloroethane	<0.03	(ug/liter)
		1,1,2-Trichloroethane	<0.02	(ug/liter)
		1,2-Dichlorobenzene	<0.15	(ug/liter)
		1,2-Dichloropropane	<0.04	(ug/liter)
		1,3-Dichlorobenzene	<0.32	(ug/liter)
		1,4-Dichlorobenzene	<0.24	(ug/liter)
		1,1,1-Trichloroethane	<0.03	(ug/liter)
		1,1-Dichloroethane	<0.01	(ug/liter)
		1,2-Dichloroethane	<0.03	(ug/liter)
		2-Chlorotoluene	<1.0	(ug/liter)
		2-Chloroethyl vinyl ether	<0.13	(ug/liter)
		Bromodichloromethane	<0.10	(ug/liter)
		Benzyl Chloride	<1.0	(ug/liter)
		Bromomethane	<10.0	(ug/liter)
		Bromobenzene	<1.0	(ug/liter)
		Bis(2-chloroisopropyl)eth.	<10.0	(ug/liter)
		Bis(2-chloroethoxy)methane	<1.0	(ug/liter)
		Bromoform	<0.20	(ug/liter)
		Chloroform	<0.05	(ug/liter)
		Chlorobenzene	<0.25	(ug/liter)
		Chloroethane	<0.52	(ug/liter)
		Chloromethane	<0.08	(ug/liter)
		Carbon Tetrachloride	<0.12	(ug/liter)
		Dibromochloromethane	<0.09	(ug/liter)
		Dibromomethane	<2.0	(ug/liter)
		trans-1,2-Dichloroethylene	<0.10	(ug/liter)
		trans-1,3Dichloropropylene	<0.34	(ug/liter)
		Vinyl Chloride	<10.0	(ug/liter)
		1,1,1,2Tetrachloroethane	<1.0	(ug/liter)
		1,1-Dichloroethylene	<0.13	(ug/liter)
		1,2,3-Trichloropropane	<1.0	(ug/liter)
		1-Chlorohexane	<1.0	(ug/liter)
		Chloroacetaldehyde	<1.0	(ug/liter)
		Chlromethyl methyl ether	<1.0	(ug/liter)
		Dichlorodifluoromethane	<1.0	(ug/liter)
		Dichloromethane	<0.1	(ug/liter)
		Trichloroethylene	<0.12	(ug/liter)
		Tetrachloroethylene	<0.03	(ug/liter)
		Trichloroflouromethane	<0.4	(ug/liter)

REPORT OF ANALYSIS

LAB # 88-09-402

AMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
RIP BLANK 1 (Con't)		1,2-Dichlorobenzene	<0.4	
		1,3-Dichlorobenzene	<0.4	(ug/liter)
		1,4-Dichlorobenzene	<0.3	(ug/liter)
		Benzene	<0.2	(ug/liter)
		Chlorobenzene	<0.2	(ug/liter)
		Ethyl benzene	<0.2	(ug/liter)
		Toluene	<0.2	(ug/liter)
		Xylenes	<0.6	(ug/liter)

Controls for Environmental Pollution, Inc.
P.O. BOX 5351 • Santa Fe, New Mexico 02
IN STATE 505/982-9841
OUT OF STATE 800/545-2188

PAGE 1 CEP, Inc. REPORT LAB # 88-09-561
RECEIVED: 09/30/88 11/01/88 16:12:59

REPORT TO Bechtel Environmental, Inc.
3000 Post Oak Blvd.
Houston, TX 77056

ATTEN Dr. Monica Jacque

CLIENT EL PASO BECH SAMPLES 2
COMPANY El Paso Natural Gas Company
FACILITY Project: #19782 Blanco Plant

WORK ID Water Quality & Organics
TAKEN
TRANS Bus
TYPE Water
P.O. #
INVOICE under separate cover

PREPARED BY Controls for Environmental
Pollution, Inc.
1925 Rosina Street
Santa Fe, NM 87502
ATTEN
PHONE (505) 982-9841

CERTIFIED BY
CONTACT GAIL

Remainder of sample(s) for routine analysis will be disposed of three weeks from final report date. Sample(s) for bacteria analysis only, will be disposed of one day after final report. This is not applicable if other arrangements have been made.

cc: Bechtel Corp.
P.O. Box 3965 Mail Code 50/18/C46
San Francisco, CA 94119
Attn: Christine Nadeau

SAMPLE IDENTIFICATION

01 Duplicate
02 Trip Blank

CEP, Inc. TEST CODES and NAMES used on this report

1112T1	1,1,1,2Tetrachloroethane	BROMOB	Bromobenzene
1122TA	1,1,2,2-Tetrachloroethane	B ETH1	Bis(2-chloroisopropyl)eth.
112TCE	1,1,2-Trichloroethane	B METH	Bis(2-chloroethoxy)methane
11 DCL	1,1-Dichloroethylene	CA 1	Calcium
123TCP	1,2,3-Trichloropropane	CBR4 1	Bromoform
12DCLB	1,2-Dichlorobenzene	CCL4 1	Chloroform
12DCLP	1,2-Dichloropropane	CD T 1	Cadmium (total)
13DCLB	1,3-Dichlorobenzene	CLACET	Chloroacetaldehyde
14DCLB	1,4-Dichlorobenzene	CLBENZ	Chlorobenzene
1 1 1T	1,1,1-Trichloroethane	CLETHA	Chloroethane
1 1 DI	1,1-Dichloroethane	CLMTHA	Chloromethane
1 2 D1	1,2-Dichloroethane	CL 1	Chloride
1 CLHX	1-Chlorohexane	CMME	Chlromethyl methyl ether
2 CTOL	2-Chlorotoluene	CO3 W	Carbonate (as CaCO3)
2 CVE	2-Chloroethyl vinyl ether	CR 6 1	Chromium, Hexavalent (6+)
ACRYLA	Acrylamide	CR T 1	Chromium (total)
AS T 1	Arsenic (total)	CTET 1	Carbon Tetrachloride
BDCM 1	Bromodichloromethane	CU T 1	Copper (total)
BENZCL	Benzyl Chloride	DBCM 1	Dibromochloromethane
BENZ 1	Benzene	DBMETH	Dibromomethane
BRMTHA	Bromomethane	DCLFLM	Dichlorodifluoromethane

CEP, Inc. REPORT

LAB # 88-09-561

11/01/88 16:12:59

CEP, Inc. TEST CODES and NAMES used on this report

DCLMET	Dichloromethane
DIETHE	Diethyl Ether
ETBENZ	Ethyl benzene
ETHANO	Ethanol
FE T 1	Iron (total)
HCO3 W	Bicarbonate (as CaCO3)
HG T 1	Mercury (total)
K 1	Potassium
MEK 1	Methylethylketone
MG 1	Magnesium
MIBK	Methyl Isobutyl Ketone
MN T 1	Manganese (total)
NA 1	Sodium
NO3 1	Nitrate, Nitrogen (as N)
PARALD	Paraldehyde
PB T 1	Lead (total)
PH 1	pH
SO4 W	Sulfate
T1 2DE	trans-1,2-Dichloroethylene
T1 3DE	trans-1,3Dichloropropylene
TCE	Trichloroethylene
TCLETY	Tetrachloroethylene
TCLFMA	Trichloroflouromethane
TDS 1	Total Dissolved Solids
TOL 1	Toluene
V CL	Vinyl Chloride
XYLENE	Xylenes
ZN T 1	Zinc (total)

REPORT OF ANALYSIS

LAB # 88-09-561

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	ug/liter	
Duplicate	09/27/88	Chloride	16	(mg/liter)
		Carbonate (as CaCO3)	0	(mg/liter)
		Chromium, Hexavalent	<0.01	(mg/liter)
		Bicarbonate (as CaCO3)	295	(mg/liter)
		Nitrogen, Nitrate (as N)	<0.1 *	(mg/liter)
		pH	7.37	(units)
		Sulfate	2255	(mg/liter)
		Solids, Total Dissolved	2900	(mg/liter)
		Arsenic (total)	<0.01	(mg/liter)
		Calcium	606	(mg/liter)
		Cadmium (total)	<0.001	(mg/liter)
		Chromium (total)	<0.01	(mg/liter)
		Copper (total)	<0.01	(mg/liter)
		Iron (total)	1.54	(mg/liter)
		Mercury (total)	<0.0004	(mg/liter)
		Potassium	1.0	(mg/liter)
		Magnesium	20.8	(mg/liter)
		Manganese (total)	1.28	(mg/liter)
		Sodium	57.7	(mg/liter)
		Lead (total)	<0.01	(mg/liter)
		Zinc (total)	0.2	(mg/liter)
		Acrylamide	<1000.0	
		Diethyl Ether	<5.0	
		Ethanol	<15.0	
		Methylethylketone	<5.0	
		Methyl Isobutyl Ketone	<5.0	
		Paraldehyde	<200.0	
		1,1,2,2-Tetrachloroethane	<0.03	
		1,1,2-Trichloroethane	<0.02	
		1,2-Dichlorobenzene	<0.15	
		1,2-Dichloropropane	<0.04	
		1,3-Dichlorobenzene	<0.32	
		1,4-Dichlorobenzene	<0.24	
		1,1,1-Trichloroethane	0.5	
		1,1-Dichloroethane	<0.07	
		1,2-Dichloroethane	<0.03	
		2-Chlorotoluene	<1.0	
		2-Chloroethyl vinyl ether	<0.13	
		Bromodichloromethane	<0.10	

REPORT OF ANALYSIS

LAB # 88-09-561

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	ug/liter
Duplicate (Con't)		Benzyl Chloride	<1.0
		Bromomethane	<10.0
		Bromobenzene	<1.0
		Bis(2-chloroisopropyl)eth.	<10.0
		Bis(2-chloroethoxy)methane	<1.0
		Bromoform	<0.20
		Chloroform	<0.05
		Chlorobenzene	<0.25
		Chloroethane	<0.52
		Chloromethane	<0.08
		Carbon Tetrachloride	<0.12
		Dibromochloromethane	<0.09
		Dibromomethane	<2.0
		trans-1,2-Dichloroethylene	<0.10
		trans-1,3Dichloropropylene	<0.34
		Vinyl Chloride	<10.0
		1,1,1,2Tetrachloroethane	<1.0
		1,1-Dichloroethylene	<0.13
		1,2,3-Trichloropropane	<1.0
		1-Chlorohexane	<1.0
		Chloroacetaldehyde	<1.0
		Chlromethyl methyl ether	<1.0
		Dichlorodifluoromethane	<1.0
		Dichloromethane	<0.1
		Trichloroethylene	0.3
		Tetrachloroethylene	<0.03
		Trichloroflouromethane	<0.4
		1,2-Dichlorobenzene	<0.4
		1,3-Dichlorobenzene	<0.4
		1,4-Dichlorobenzene	<0.3
		Benzene	<0.2
		Chlorobenzene	<0.2
		Ethyl benzene	<0.2
		Toluene	<0.2
		Xylenes	<0.6

REPORT OF ANALYSIS

LAB # 88-09-561

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	ug/liter
Trip Blank	not specified	1,1,2,2-Tetrachloroethane	<0.03
		1,1,2-Trichloroethane	<0.02
		1,2-Dichlorobenzene	<0.15
		1,2-Dichloropropane	<0.04
		1,3-Dichlorobenzene	<0.32
		1,4-Dichlorobenzene	<0.24
		1,1,1-Trichloroethane	<0.03
		1,1-Dichloroethane	<0.07
		1,2-Dichloroethane	<0.03
		2-Chlorotoluene	<1.0
		2-Chloroethyl vinyl ether	<0.13
		Bromodichloromethane	<0.10
		Benzyl Chloride	<1.0
		Bromomethane	<10.0
		Bromobenzene	<1.0
		Bis(2-chloroisopropyl)eth.	<10.0
		Bis(2-chloroethoxy)methane	<1.0
		Bromoform	<0.20
		Chloroform	<0.05
		Chlorobenzene	<0.25
		Chloroethane	<0.52
		Chloromethane	<0.08
		Carbon Tetrachloride	<0.12
		Dibromochloromethane	<0.09
		Dibromomethane	<2.0
		trans-1,2-Dichloroethylene	<0.10
		trans-1,3Dichloropropylene	<0.34
		Vinyl Chloride	<10.0
		1,1,1,2Tetrachloroethane	<1.0
		1,1-Dichloroethylene	<0.13
		1,2,3-Trichloropropane	<1.0
		1-Chlorohexane	<1.0
		Chloroacetaldehyde	<1.0
		Chlromethyl methyl ether	<1.0
		Dichlorodifluoromethane	<1.0
		Dichloromethane	<0.1
		Trichloroethylene	0.2
		Tetrachloroethylene	<0.03
		Trichloroflouromethane	0.08

REPORT OF ANALYSIS

LAB # 88-09-561

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	ug/liter
Trip Blank (Con't)		1,2-Dichlorobenzene	<0.4
		1,3-Dichlorobenzene	<0.4
		1,4-Dichlorobenzene	<0.3
		Benzene	<0.2
		Chlorobenzene	<0.2
		Ethyl benzene	<0.2
		Toluene	<0.2
		Xylenes	<0.6

Controls for Environmental Pollution, Inc.
P.O. BOX 5351 • Santa Fe, New Mexico [illegible]32
IN STATE 505/982-9811
OUT OF STATE 800/545-2188

PAGE 1 CEP, Inc. REPORT LAB # 88-09-453
RECEIVED: 09/26/88 11/09/88 16:08:51

REPORT TO Bechtel Environmental, Inc.
3000 Post Oak Blvd.
Houston, TX 77056

ATTEN Dr. Monica Jacque

PREPARED BY Controls for Environmental
Pollution, Inc.
1925 Rosina Street
Santa Fe, NM 87502
ATTEN
PHONE (505) 982-9841

CERTIFIED BY

CONTACT GAIL

CLIENT EL PASO BECH SAMPLES 3
COMPANY El Paso Natural Gas Company
FACILITY Blanco Plant Site Invest.

Remainder of sample(s) for routine analysis will be disposed of three weeks from final report date. Sample(s) for bacteria analysis only, will be disposed of one day after final report. This is not applicable if other arrangements have been made.

WORK ID Water Quality & Organics
TAKEN
TRANS Federal Express
TYPE Soil
P.O. #
INV. # 430487

cc: Bechtel Corp. "CORRECTED REPORT"
P.O. Box 3965 Mail Code 50/18/C46
San Franciso, CA 94119
Attn: Christine Nadeau

SAMPLE IDENTIFICATION

01 C-1
02 C-2
03 W5

CEP, Inc. TEST CODES and NAMES used on this report

1112T1	1,1,1,2Tetrachloroethane	BRMTHA	Bromomethane
1122TA	1,1,2,2-Tetrachloroethane	BROMOB	Bromobenzene
112TCE	1,1,2-Trichloroethane	B ETH1	Bis(2-chloroisopropyl)eth.
11 DCL	1,1-Dichloroethylene	B METH	Bis(2-chloroethoxy)methane
123TCP	1,2,3-Trichloropropane	CBR4 1	Bromoform
12DCLB	1,2-Dichlorobenzene	CCL4 1	Chloroform
12DCLP	1,2-Dichloropropane	CD T S	Cadmium (total)
13DCLB	1,3-Dichlorobenzene	CLACET	Chloroacetaldehyde
14DCLB	1,4-Dichlorobenzene	CLBENZ	Chlorobenzene
1 1 1T	1,1,1-Trichloroethane	CLETHA	Chloroethane
1 1 DI	1,1-Dichloroethane	CLMTHA	Chloromethane
1 2 D1	1,2-Dichloroethane	CMME	Chlromethyl methyl ether
1 CLHX	1-Chlorohexane	CR 6 S	Chromium, Hexavalent
2 CTOL	2-Chlorotoluene	CR T S	Chromium (total)
2 CVE	2-Chloroethyl vinyl ether	CTET 1	Carbon Tetrachloride
ACRYLA	Acrylamide	CU T S	Copper (total)
AS T S	Arsenic (total)	DBCM 1	Dibromochloromethane
BDCM 1	Bromodichloromethane	DBMETH	Dibromomethane
BENZCL	Benzyl Chloride	DCLFLM	Dichlorodifluoromethane
BENZ 1	Benzene	DCLMET	Dichloromethane
BNFS	Base Neutrals EPA-625	DIETHE	Diethyl Ether

RECEIVED: 09/26/88

CEP, Inc. REPORT

11/09/88 16:08:51

LAB # 88-09-453

CEP, Inc. TEST CODES and NAMES used on this report

ETBENZ	Ethul benzene
ETHANO	Ethanol
FE T S	Iron (total)
HG T S	Mercuru (total)
MEK 5	Methulethulketone
MIBK	Methul Isobutul Ketone
MN T S	Manganese (total)
PARALD	Paraldehude
PB T S	Lead (total)
PH S	pH
REDOX1	Redox Potential
T1 2DE	trans-1,2-Dichloroethulene
T1 3DE	trans-1,3Dichloropropulene
TCE	Trichloroethulene
TCLETY	Tetrachloroethulene
TCLFMA	Trichloroflouromethane
TOL 1	Toluene
V CL	Vinul Chloride
XYLENE	Xulenes
ZN T S	Zinc (total)

REPORT OF ANALYSIS

LAB # 88-09-453

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
C-1	09/29/88	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<190	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<38	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<12500	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<38	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

LAB # 88-09-453

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
C-1 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	<1.0	(mg/kg)
		Cadmium (total)	0.33	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	3.0	(mg/kg)
		Copper (total)	56.0	(mg/kg)
		Iron (total)	5860	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	158.0	(mg/kg)
		Lead (total)	9.2	(mg/kg)
		Zinc (total)	50.0	(mg/kg)
		pH	9.18	(units)
		Redox Potential	310	(mV)
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)
		Base Neutrals		()

CUSTOMER Bechtel Environmental, Inc.
ADDRESS 3000 Post Oak Blvd.
CITY Houston, TX 77056
ATTENTION Dr. Monica Jacque
INVOICE NO

REPORT OF ANALYSIS

SAMPLES RECEIVED 09/26/88
CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Semivolatile Compounds in Soil

Sample Identification: C-1

Date Collected: 09/29/88

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
108-95-2	Phenol	<330
111-44-4	bis(-2-Chloroethyl)Ether	<330
95-57-8	2-Chlorophenol	<330
541-73-1	1, 3-Dichlorobenzene	<330
106-46-7	1, 4-Dichlorobenzene	<330
100-51-6	Benzyl Alcohol	<330
95-50-1	1, 2-Dichlorobenzene	<330
95-48-7	2-Methylphenol	<330
39638-32-9	bis(2-chloroisopropyl)Ether	<330
106-44-5	4-Methylphenol	<330
621-64-7	N-Nitroso-Di-n-Propylamine	<330
67-72-1	Hexachloroethane	<330
98-95-3	Nitrobenzene	<330
78-59-1	Isophorone	<330
88-75-5	2-Nitrophenol	<330
105-67-9	2, 4-Dimethylphenol	<330
65-85-0	Benzoic Acid	<1600
111-91-1	bis(-2-Chloroethoxy)Methane	<330
120-83-2	2, 4-Dichlorophenol	<330
120-82-1	1, 2, 4-Trichlorobenzene	<330
91-20-3	Naphthalene	<330
106-47-8	4-Chloroaniline	<330
87-68-3	Hexachlorobutadiene	<330
59-50-7	4-Chloro-3-Methylphenol	<330
91-57-6	2-Methylnaphthalene	<330
77-47-4	Hexachlorocyclopentadiene	<330
88-06-2	2, 4, 6-Trichlorophenol	<330
95-95-4	2, 4, 5-Trichlorophenol	<1600
91-58-7	2-Chloronaphthalene	<330
88-74-4	2-Nitroaniline	<1600
131-11-3	Dimethyl Phthalate	<330
208-96-8	Acenaphthylene	<330
99-09-2	3-Nitroaniline	<1600

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
83-32-9	Acenaphthene	<330
51-28-5	2, 4-Dinitrophenol	<1600
100-02-7	4-Nitrophenol	<330
132-64-9	Dibenzofuran	<330
121-14-2	2, 4-Dinitrotoluene	<330
606-20-2	2, 6-Dinitrotoluene	<330
84-66-2	Diethylphthalate	<330
7005-72-3	4-Chlorophenyl-phenylether	<330
86-73-7	Fluorene	<330
100-01-6	4-Nitroaniline	<1600
534-52-1	4, 6-Dinitro-2-Methylphenol	<1600
86-30-6	N-Nitrosodiphenylamine (1)	<330
101-55-3	4-Bromophenyl-phenylether	<330
118-74-1	Hexachlorobenzene	<330
87-86-5	Pentachlorophenol	<1600
85-01-8	Phenanthrene	<330
120-12-7	Anthracene	<330
84-74-2	Di-n-Butylphthalate	<330
206-44-0	Fluoranthene	<330
129-00-0	Pyrene	<330
85-68-7	Butylbenzylphthalate	<330
91-94-1	3, 3'-Dichlorobenzidine	<660
56-55-3	Benzo(a)Anthracene	<330
117-81-7	bis(2-Ethylhexyl)Phthalate	<330
218-01-9	Chrysene	<330
117-84-0	Di-n-Octyl Phthalate	<330
205-99-2	Benzo(b)Fluoranthene	<330
207-08-9	Benzo(k)Fluoranthene	<330
50-32-8	Benzo(a)Pyrene	<330
193-39-5	Indeno(1, 2, 3-cd)Pyrene	<330
53-70-3	Dibenz(a, h)Anthracene	<330
191-24-2	Benzo(g, h, i)Perylene	<330

APPROVED BY
11/03/88 James J. Mueller, President

PAGE 1 OF 1 PAGE

Controls for Environmental Pollution, Inc.
P.O. Box 5351 • 1925 Rosina • Santa Fe, New Mexico 87502
Telephone 505/982-9841

CUSTOMER Bechtel Environmental, Inc. - cc: Christine Nadeau
ADDRESS 3000 Post Oak Blvd.
CITY Houston, TX 77056
ATTENTION Dr. Monica Jacque
INVOICE NO.

REPORT OF ANALYSIS

MPLES RECEIVED 09/26/88
CUSTOMER ORDER NUMBER

OF ANALYSIS Solid

Sample Identification	Date Collected	No. of Carbons	GC/MS Scan	Approx. Conc. (ug/gm)
#C-1	09/29/88	13	3,8-Dimethyl Undecane	0.13
		9	4-Ethyl-2-Methyl Hexane	0.3
		11	6-Ethyl-2-Methyl Octane	0.16
		12	3-Methyl Undecane	0.2
		9	1-Ethyl-2-Methyl Cyclohexane	0.1
		13	2,6-Dimethyl Undecane	1.6
		13	3,7-Dimethyl Undecane	0.16
		13	3,8-Dimethyl Undecane	0.1
		12	Hexyl Cyclohexane	0.36
		13	6-Methyl Dodecane	0.26
		13	1-Tridecane	0.2
		13	4-Methyl Dodecane	0.26
		11	2,3,7-Trimethyl Octane	2.0
		12	5-Methyl-2-Undecane	0.03
		14	5-Tetradecane	0.1
		9	1-Ethyl-4-Methyl Cyclohexane	0.5
		11	1-Methyl Naphthalene	0.2
		14	2,5-Dimethyl Dodecane	0.76
		17	Undecane Cyclohexane	0.73
		14	5-Methyl Tridecane	0.2
		14	4-Methyl Tridecane	0.43
		48	1-Iodo Octatricontane	0.1
		19	7-Cyclohexyl Tridecane	0.13
		15	2,7,10-Trimethyl Dodecane	3.06
		13	2,3,5-Trimethyl Decane	0.7
		11	3,7-Dimethyl Nonane	0.3
		43	Tritetracontane	0.26
		12	2,3-Dimethyl Naphthalene	0.5
		12	1,2-Dimethyl Naphthalene	0.36
		14	Octyl Cyclohexane	0.8
		16	Hexadecane	3.5
		11	6-Ethyl-2-Methyl Octane	0.3
		12	1-Hexyl-3-Methyl Cyclopentane	0.1
		18	Octadecane	0.4
		9	1-Methyl Ethyl Cyclohexane	0.2
		20	Eicosane	0.26
		13	3,5-Dimethyl Undecane	0.73
		19	2,6,10,14-Tetramethyl Pentadecane	0.57

APPROVED BY
11/18/88 James J. Mueller, President
PAGE 1 OF 1 PAGE

Controls for Environmental Pollution, Inc.
P.O. Box 5351 • 1925 Rosina • Santa Fe, New Mexico 87502
Telephone 505/982-9841

REPORT OF ANALYSIS

LAB # 88-09-453

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
C-2	09/29/88	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<190	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<88	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<12500	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<38	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

LAB # 88-09-453

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
C-2 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	1.4	(mg/kg)
		Cadmium (total)	0.16	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	4.0	(mg/kg)
		Copper (total)	8.0	(mg/kg)
		Iron (total)	5860	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	169.0	(mg/kg)
		Lead (total)	2.5	(mg/kg)
		Zinc (total)	40.0	(mg/kg)
		pH	7.40	(units)
		Redox Potential	330	(mV)
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)

REPORT OF ANALYSIS

LAB # 88-09-453

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
W5	09/23/88 08:50	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<190	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<88	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63.0	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<12500	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<38	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

LAB # 88-09-453

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
W5 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	1.5	(mg/kg)
		Cadmium (total)	0.56	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	2.0	(mg/kg)
		Copper (total)	6.0	(mg/kg)
		Iron (total)	5860	(mg/kg)
		Mercury (total)	0.06	(mg/kg)
		Manganese (total)	216.0	(mg/kg)
		Lead (total)	3.8	(mg/kg)
		Zinc (total)	40.0	(mg/kg)
		pH	7.87	(units)
		Redox Potential	278	(mV)
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)

CEP Controls for Environmental Pollution, Inc.
P.O. BOX 5351 • Santa Fe, New Mexic 502
IN STATE 505/982-9841
OUT OF STATE 800/545-2188

PAGE 1 CEP, Inc. REPORT LAB # 88-09-408
RECEIVED: 09/23/88 11/09/88 00:25:24

REPORT TO Bechtel Environmental, Inc.
3000 Post Oak Blvd.
Houston, TX 77056

ATTEN Dr. Monica Jacque

CLIENT EL PASO BECH SAMPLES 1
COMPANY El Paso Natural Gas Company
FACILITY

WORK ID Water Quality & Organics
TAKEN 09/22/88
TRANS Federal Express
TYPE Water
P.O. #
INV. # 430464

PREPARED BY Controls for Environmental
Pollution, Inc.
1925 Rosina Street
Santa Fe, NM 87502
ATTEN
PHONE (505) 982-9841

CERTIFIED BY

CONTACT GAIL

Remainder of sample(s) for routine analysis will be disposed of three weeks from final report date. Sample(s) for bacteria analysis only, will be disposed of one day after final report. This is not applicable if other arrangements have been made.

cc: Bechtel Corp.
P.O. Box 3965 Mail Code 50/18/C46
San Fransico, CA 94119
Attn: Christine Nadeau

"CORRECTED REPORT"

SAMPLE IDENTIFICATION

01 #W7

CEP, Inc. TEST CODES and NAMES used on this report

1112T1	1,1,1,2Tetrachloroethane	BROMOB	Bromobenzene
1122TA	1,1,2,2-Tetrachloroethane	B ETH1	Bis(2-chloroisopropyl)eth.
112TCE	1,1,2-Trichloroethane	B METH	Bis(2-chloroethoxy)methane
11 DCL	1,1-Dichloroethylene	CBR4 1	Bromoform
123TCP	1,2,3-Trichloropropane	CCL4 1	Chloroform
12DCLB	1,2-Dichlorobenzene	CD T S	Cadmium (total)
12DCLP	1,2-Dichloropropane	CLACET	Chloroacetaldehyde
13DCLB	1,3-Dichlorobenzene	CLBENZ	Chlorobenzene
14DCLB	1,4-Dichlorobenzene	CLETHA	Chloroethane
1 1 1T	1,1,1-Trichloroethane	CLMTHA	Chloromethane
1 1 DI	1,1-Dichloroethane	CMME	Chlromethyl methyl ether
1 2 D1	1,2-Dichloroethane	CR 6 S	Chromium, Hexavalent
1 CLHX	1-Chlorohexane	CR T S	Chromium (total)
2 CTOL	2-Chlorotoluene	CTET 1	Carbon Tetrachloride
2 CVE	2-Chloroethyl vinyl ether	CU T S	Copper (total)
ACRYLA	Acrylamide	DBCM 1	Dibromochloromethane
AS T S	Arsenic (total)	DBMETH	Dibromomethane
BDCM 1	Bromodichloromethane	DCLFLM	Dichlorodifluoromethane
BENZCL	Benzyl Chloride	DCLMET	Dichloromethane
BENZ 1	Benzene	DIETHE	Diethyl Ether
BRMTHA	Bromomethane	ETBENZ	Ethyl benzene

Controls for Environmental Pollution, Inc.
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CEP, Inc. REPORT
11/09/88 00:25:24
LAB # 88-09-408

CEP, Inc. TEST CODES and NAMES used on this report

ETHANO	Ethanol
FE T S	Iron (total)
HG T S	Mercuru (total)
MEK 5	Methulethulketone
MIBK	Methul Isobutul Ketone
MN T S	Manganese (total)
PARALD	Paraldehude
PB T S	Lead (total)
PH S	pH
REDOX1	Redox Potential
T1 2DE	trans-1,2-Dichloroethulene
T1 3DE	trans-1,3Dichloropropulene
TCE	Trichloroethulene
TCLETY	Tetrachloroethulene
TCLFMA	Trichloroflouromethane
TOL 1	Toluene
V CL	Vinul Chloride
XYLENE	Xulenes
ZN T S	Zinc (total)

REPORT OF ANALYSIS

LAB # 88-09-408

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W7	09/22/88 11:05	1,1,2,2-Tetrachloroethane	<38	(ug/kg)
		1,1,2-Trichloroethane	<25	(ug/kg)
		1,2-Dichlorobenzene	<190	(ug/kg)
		1,2-Dichloropropane	<50	(ug/kg)
		1,3-Dichlorobenzene	<400	(ug/kg)
		1,4-Dichlorobenzene	<300	(ug/kg)
		1,1,1-Trichloroethane	<38	(ug/kg)
		1,1-Dichloroethane	<88	(ug/kg)
		1,2-Dichloroethane	<38	(ug/kg)
		2-Chlorotoluene	<1250	(ug/kg)
		2-Chloroethyl vinyl ether	<160	(ug/kg)
		Bromodichloromethane	<125	(ug/kg)
		Benzyl Chloride	<1250	(ug/kg)
		Bromomethane	<12500	(ug/kg)
		Bromobenzene	<1250	(ug/kg)
		Bis(2-chloroisopropyl)eth.	<12500	(ug/kg)
		Bis(2-chloroethoxy)methane	<1250	(ug/kg)
		Bromoform	<250	(ug/kg)
		Chloroform	<63	(ug/kg)
		Chlorobenzene	<310	(ug/kg)
		Chloroethane	<650	(ug/kg)
		Chloromethane	<100	(ug/kg)
		Carbon Tetrachloride	<150	(ug/kg)
		Dibromochloromethane	<110	(ug/kg)
		Dibromomethane	<2500	(ug/kg)
		trans-1,2-Dichloroethylene	<125	(ug/kg)
		trans-1,3Dichloropropylene	<430	(ug/kg)
		Vinyl Chloride	<12500	(ug/kg)
		1,1,1,2Tetrachloroethane	<1250	(ug/kg)
		1,1-Dichloroethylene	<160	(ug/kg)
		1,2,3-Trichloropropane	<1250	(ug/kg)
		1-Chlorohexane	<1250	(ug/kg)
		Chloroacetaldehyde	<12500	(ug/kg)
		Chlromethyl methyl ether	<1250	(ug/kg)
		Dichlorodifluoromethane	<1250	(ug/kg)
		Dichloromethane	<125	(ug/kg)
		Trichloroethylene	<150	(ug/kg)
		Tetrachloroethylene	<38	(ug/kg)
		Trichloroflouromethane	<500	(ug/kg)

REPORT OF ANALYSIS

LAB # 88-09-408

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W7 (Con't)		1,2-Dichlorobenzene	<0.050	
		1,3-Dichlorobenzene	<0.050	(mg/kg)
		1,4-Dichlorobenzene	<0.038	(mg/kg)
		Benzene	<0.025	(mg/kg)
		Chlorobenzene	<0.025	(mg/kg)
		Ethyl benzene	<0.025	(mg/kg)
		Toluene	<0.025	(mg/kg)
		Xylenes	<0.075	(mg/kg)
		Arsenic (total)	1.3	(mg/kg)
		Cadmium (total)	0.52	(mg/kg)
		Chromium Hexavalent	<0.10	(mg/kg)
		Chromium (total)	8.0	(mg/kg)
		Copper (total)	19.0	(mg/kg)
		Iron (total)	5860	(mg/kg)
		Mercury (total)	<0.04	(mg/kg)
		Manganese (total)	269.0	(mg/kg)
		Lead (total)	4.9	(mg/kg)
		Zinc (total)	40.0	(mg/kg)
		pH	7.62	(units)
		Redox Potential	285	(mV)
		Acrylamide	<125.0	(mg/kg)
		Diethyl Ether	<0.625	(mg/kg)
		Ethanol	<1.875	(mg/kg)
		Methylethylketone	<0.625	(mg/kg)
		Methyl Isobutyl Ketone	<0.625	(mg/kg)
		Paraldehyde	<25.0	(mg/kg)

Controls for Environmental Pollution, Inc.
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IN STATE 505/982 9841
OUT OF STATE 800/545-2188

CEP, Inc. REPORT LAB # 88-09-560

RECEIVED: 09/30/88 11/21/88 15:31:37

REPORT TO Bechtel Environmental, Inc.
3000 Post Oak Blvd.
Houston, TX 77056

ATTEN Dr. Monica Jacque

CLIENT EL PASO BECH SAMPLES 6
COMPANY El Paso Natural Gas Company
FACILITY Project: #19782 Blanco Plant

WORK ID Water Quality & Organics
TAKEN
TRANS Bus
TYPE Water
P.O. #
INV. # 430489

PREPARED BY Controls for Environmental
Pollution, Inc.
1925 Rosina Street
Santa Fe, NM 87502
ATTEN
PHONE (505) 982-9841

CERTIFIED BY
CONTACT GAIL

Remainder of sample(s) for routine analysis will be disposed of three weeks from final report date. Sample(s) for bacteria analysis only, will be disposed of one day after final report. This is not applicable if other arrangements have been made.

cc: Bechtel Corp.
P.O. Box 3965 Mail Code 50/18/C46
San Francisco, CA 94119
Attn: Christine Nadeau

"CORRECTED REPORT"

SAMPLE IDENTIFICATION

01 #W2
02 #W5
03 #W6
04 #W7
05 #W8
06 #W10

CEP, Inc. TEST CODES and NAMES used on this report

1112T1	1,1,1,2Tetrachloroethane	BRMTHA	Bromomethane
1122TA	1,1,2,2-Tetrachloroethane	BROMOB	Bromobenzene
112TCE	1,1,2-Trichloroethane	B ETH1	Bis(2-chloroisopropyl)eth.
11 DCL	1,1-Dichloroethylene	B METH	Bis(2-chloroethoxy)methane
123TCP	1,2,3-Trichloropropane	CA 1	Calcium
12DCLB	1,2-Dichlorobenzene	CBR4 1	Bromoform
12DCLP	1,2-Dichloropropane	CCL4 1	Chloroform
13DCLB	1,3-Dichlorobenzene	CD T 1	Cadmium (total)
14DCLB	1,4-Dichlorobenzene	CLACET	Chloroacetaldehyde
1 1 1T	1,1,1-Trichloroethane	CLBENZ	Chlorobenzene
1 1 DI	1,1-Dichloroethane	CLETHA	Chloroethane
1 2 D1	1,2-Dichloroethane	CLMTHA	Chloromethane
1 CLHX	1-Chlorohexane	CL 1	Chloride
2 CTOL	2-Chlorotoluene	CMME	Chlromethyl methyl ether
2 CVE	2-Chloroethyl vinyl ether	CO3 W	Carbonate (as CaCO3)
ACRYLA	Acrylamide	CR 6 1	Chromium, Hexavalent (6+)
AS T 1	Arsenic (total)	CR T 1	Chromium (total)
BDCM 1	Bromodichloromethane	CTET 1	Carbon Tetrachloride
BENZCL	Benzyl Chloride	CU T 1	Copper (total)
BENZ 1	Benzene	DBCM 1	Dibromochloromethane
BNFS	Base Neutrals EPA-625	DBMETH	Dibromomethane

Controls for Environmental Pollution, Inc.
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PAGE 2
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CEP, Inc. REPORT
11/21/88 15:31:37

LAB # 88-09-560

CEP, Inc. TEST CODES and NAMES used on this report

DCLFLM	Dichlorodifluoromethane
DCLMET	Dichloromethane
DIETHE	Diethyl Ether
ETBENZ	Ethyl benzene
ETHANO	Ethanol
FE T 1	Iron (total)
HCO3 W	Bicarbonate (as CaCO3)
HG T 1	Mercury (total)
K 1	Potassium
MEK 5	Methylethylketone
MG 1	Magnesium
MIBK	Methyl Isobutyl Ketone
MN T 1	Manganese (total)
NA 1	Sodium
NO3 1	Nitrate, Nitrogen (as N)
PARALD	Paraldehyde
PB T 1	Lead (total)
PH 1	pH
SO4 W	Sulfate
T1 2DE	trans-1,2-Dichloroethylene
T1 3DE	trans-1,3Dichloropropylene
TCE	Trichloroethylene
TCLETY	Tetrachloroethylene
TCLFMA	Trichloroflouromethane
TDS 1	Total Dissolved Solids
TOL 1	Toluene
VOA	Volatile Organics EPA-624
V CL	Vinyl Chloride
XYLENE	Xylenes
ZN T 1	Zinc (total)

Controls for Environmental Pollution, Inc.
P.O. BOX 5351 • Santa Fe, New Mexico 02
IN STATE 505/982 98·11
OUT OF STATE 800/545-2188

REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W2	09/28/88	Chloride	46	(mg/liter)
		Carbonate (as CaCO3)	0	(mg/liter)
		Chromium, Hexavalent	<0.01	(mg/liter)
		Bicarbonate (as CaCO3)	239	(mg/liter)
		Nitrogen, Nitrate (as N)	290.0	(mg/liter)
		pH	7.87	(units)
		Sulfate	3800	(mg/liter)
		Solids, Total Dissolved	7612	(mg/liter)
		Arsenic (total)	0.01	(mg/liter)
		Calcium	473	(mg/liter)
		Cadmium (total)	0.001	(mg/liter)
		Chromium (total)	<0.01	(mg/liter)
		Copper (total)	0.03	(mg/liter)
		Iron (total)	4.00	(mg/liter)
		Mercury (total)	<0.0004	(mg/liter)
		Potassium	5.7	(mg/liter)
		Magnesium	70.3	(mg/liter)
		Manganese (total)	1.36	(mg/liter)
		Sodium	1680	(mg/liter)
		Lead (total)	<0.01	(mg/liter)
		Zinc (total)	0.3	(mg/liter)
		Acrylamide	<1000.0	(ug/liter)
		Diethyl Ether	<5.0	(ug/liter)
		Ethanol	<15.0	(ug/liter)
		Methylethylketone	<5.0	(ug/liter)
		Methyl Isobutyl Ketone	<5.0	(ug/liter)
		Paraldehyde	<200.0	(ug/liter)
		1,1,2,2-Tetrachloroethane	<0.03	(ug/liter)
		1,1,2-Trichloroethane	<0.02	(ug/liter)
		1,2-Dichlorobenzene	<0.15	(ug/liter)
		1,2-Dichloropropane	<0.04	(ug/liter)
		1,3-Dichlorobenzene	<0.32	(ug/liter)
		1,4-Dichlorobenzene	<0.24	(ug/liter)
		1,1,1-Trichloroethane	1.3	(ug/liter)
		1,1-Dichloroethane	<0.07	(ug/liter)
		1,2-Dichloroethane	<0.03	(ug/liter)
		2-Chlorotoluene	<1.0	(ug/liter)
		2-Chloroethyl vinyl ether	<0.13	(ug/liter)
		Bromodichloromethane	<0.10	(ug/liter

REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W2 (Con't)		Benzyl Chloride	<1.0	(ug/liter)
		Bromomethane	<10.0	(ug/liter)
		Bromobenzene	<1.0	(ug/liter)
		Bis(2-chloroisopropyl)eth.	<10.0	(ug/liter)
		Bis(2-chloroethoxy)methane	<1.0	(ug/liter)
		Bromoform	<0.20	(ug/liter)
		Chloroform	<0.05	(ug/liter)
		Chlorobenzene	<0.25	(ug/liter)
		Chloroethane	<0.52	(ug/liter)
		Chloromethane	<0.08	(ug/liter)
		Carbon Tetrachloride	<0.12	(ug/liter)
		Dibromochloromethane	0.46	(ug/liter)
		Dibromomethane	<2.0	(ug/liter)
		trans-1,2-Dichloroethylene	<0.10	(ug/liter)
		trans-1,3Dichloropropylene	<0.34	(ug/liter)
		Vinyl Chloride	<10.0	(ug/liter)
		1,1,1,2Tetrachloroethane	<1.0	(ug/liter)
		1,1-Dichloroethylene	<0.13	(ug/liter)
		1,2,3-Trichloropropane	<1.0	(ug/liter)
		1-Chlorohexane	<1.0	(ug/liter)
		Chloroacetaldehyde	<1.0	(ug/liter)
		Chlromethyl methyl ether	<1.0	(ug/liter)
		Dichlorodifluoromethane	<1.0	(ug/liter)
		Dichloromethane	<0.1	(ug/liter)
		Trichloroethylene	0.4	(ug/liter)
		Tetrachloroethylene	<0.03	(ug/liter)
		Trichloroflouromethane	<0.4	(ug/liter)
		1,2-Dichlorobenzene	<0.4	(ug/liter)
		1,3-Dichlorobenzene	<0.4	(ug/liter)
		1,4-Dichlorobenzene	<0.3	(ug/liter)
		Benzene	<0.2	(ug/liter)
		Chlorobenzene	<0.2	(ug/liter)
		Ethyl benzene	<0.2	(ug/liter)
		Toluene	<0.2	(ug/liter)
		Xylenes	<0.6	(ug/liter)

REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W5	09/27/88 14:15	Chloride	14	(mg/liter)
		Carbonate (as CaCO3)	0	(mg/liter)
		Chromium, Hexavalent	0.02	(mg/liter)
		Bicarbonate (as CaCO3)	294	(mg/liter)
		Nitrogen, Nitrate (as N)	0.02	(mg/liter)
		pH	7.91	(units)
		Sulfate	2000	(mg/liter)
		Solids, Total Dissolved	3112	(mg/liter)
		Arsenic (total)	<0.01	(mg/liter)
		Calcium	689	(mg/liter)
		Cadmium (total)	<0.001	(mg/liter)
		Chromium (total)	<0.01	(mg/liter)
		Copper (total)	0.02	(mg/liter)
		Iron (total)	1.61	(mg/liter)
		Mercury (total)	<0.0004	(mg/liter)
		Potassium	1.3	(mg/liter)
		Magnesium	23.6	(mg/liter)
		Manganese (total)	1.54	(mg/liter)
		Sodium	59.1	(mg/liter)
		Lead (total)	<0.01	(mg/liter)
		Zinc (total)	0.2	(mg/liter)
		Acrylamide	<1000.0	(ug/liter)
		Diethyl Ether	<5.0	(ug/liter)
		Ethanol	<15.0	(ug/liter)
		Methylethylketone	<5.0	(ug/liter)
		Methyl Isobutyl Ketone	<5.0	(ug/liter)
		Paraldehyde	<200.0	(ug/liter)
		1,1,2,2-Tetrachloroethane	<0.03	(ug/liter)
		1,1,2-Trichloroethane	<0.02	(ug/liter)
		1,2-Dichlorobenzene	<0.15	(ug/liter)
		1,2-Dichloropropane	<0.04	(ug/liter)
		1,3-Dichlorobenzene	<0.32	(ug/liter)
		1,4-Dichlorobenzene	<0.24	(ug/liter)
		1,1,1-Trichloroethane	0.5	(ug/liter)
		1,1-Dichloroethane	<0.07	(ug/liter)
		1,2-Dichloroethane	<0.03	(ug/liter)
		2-Chlorotoluene	<1.0	(ug/liter)
		2-Chloroethyl vinyl ether	<0.13	(ug/liter)
		Bromodichloromethane	<0.10	(ug/liter)

REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W5 (Con't)		Benzyl Chloride	<1.0	(ug/liter)
		Bromomethane	<10.0	(ug/liter)
		Bromobenzene	<1.0	(ug/liter)
		Bis(2-chloroisopropyl)eth.	<10.0	(ug/liter)
		Bis(2-chloroethoxy)methane	<1.0	(ug/liter)
		Bromoform	<0.20	(ug/liter)
		Chloroform	<0.05	(ug/liter)
		Chlorobenzene	0.3	(ug/liter)
		Chloroethane	<0.52	(ug/liter)
		Chloromethane	<0.08	(ug/liter)
		Carbon Tetrachloride	<0.12	(ug/liter)
		Dibromochloromethane	<0.09	(ug/liter)
		Dibromomethane	<2.0	(ug/liter)
		trans-1,2-Dichloroethylene	<0.10	(ug/liter)
		trans-1,3Dichloropropylene	<0.34	(ug/liter)
		Vinyl Chloride	<10.0	(ug/liter)
		1,1,1,2Tetrachloroethane	<1.0	(ug/liter)
		1,1-Dichloroethylene	<0.13	(ug/liter)
		1,2,3-Trichloropropane	<1.0	(ug/liter)
		1-Chlorohexane	<1.0	(ug/liter)
		Chloroacetaldehyde	<1.0	(ug/liter)
		Chlromethyl methyl ether	<1.0	(ug/liter)
		Dichlorodifluoromethane	<1.0	(ug/liter)
		Dichloromethane	<0.1	(ug/liter)
		Trichloroethylene	0.3	(ug/liter)
		Tetrachloroethylene	<0.03	(ug/liter)
		Trichloroflouromethane	<0.4	(ug/liter)
		1,2-Dichlorobenzene	<0.4	(ug/liter)
		1,3-Dichlorobenzene	<0.4	(ug/liter)
		1,4-Dichlorobenzene	<0.3	(ug/liter)
		Benzene	<0.2	(ug/liter)
		Chlorobenzene	<0.2	(ug/liter)
		Ethyl benzene	<0.2	(ug/liter)
		Toluene	<0.2	(ug/liter)
		Xylenes	<0.6	(ug/liter)

REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W6	09/27/88 15:40	Chloride	56	(mg/liter)
		Carbonate (as CaCO3)	0	(mg/liter)
		Chromium, Hexavalent	<0.01	(mg/liter)
		Bicarbonate (as CaCO3)	401	(mg/liter)
		Nitrogen, Nitrate (as N)	51.0	(mg/liter)
		pH	7.32	(units)
		Sulfate	1760	(mg/liter)
		Solids, Total Dissolved	4516	(mg/liter)
		Arsenic (total)	<0.01	(mg/liter)
		Calcium	532	(mg/liter)
		Cadmium (total)	<0.001	(mg/liter)
		Chromium (total)	<0.01	(mg/liter)
		Copper (total)	<0.01	(mg/liter)
		Iron (total)	0.70	(mg/liter)
		Mercury (total)	<0.0004	(mg/liter)
		Potassium	2.9	(mg/liter)
		Magnesium	12.3	(mg/liter)
		Manganese (total)	4.03	(mg/liter)
		Sodium	796	(mg/liter)
		Lead (total)	<0.01	(mg/liter)
		Zinc (total)	<0.1	(mg/liter)
		Acrylamide	<1000.0	(ug/liter)
		Diethyl Ether	<5.0	(ug/liter)
		Ethanol	<15.0	(ug/liter)
		Methylethylketone	<5.0	(ug/liter)
		Methyl Isobutyl Ketone	<5.0	(ug/liter)
		Paraldehyde	<200.0	(ug/liter)
		1,1,2,2-Tetrachloroethane	<0.03	(ug/liter)
		1,1,2-Trichloroethane	<0.02	(ug/liter)
		1,2-Dichlorobenzene	<0.15	(ug/liter)
		1,2-Dichloropropane	<0.04	(ug/liter)
		1,3-Dichlorobenzene	<0.32	(ug/liter)
		1,4-Dichlorobenzene	<0.24	(ug/liter)
		1,1,1-Trichloroethane	0.3	(ug/liter)
		1,1-Dichloroethane	<0.07	(ug/liter)
		1,2-Dichloroethane	<0.03	(ug/liter)
		2-Chlorotoluene	<1.0	(ug/liter)
		2-Chloroethyl vinyl ether	<0.13	(ug/liter)
		Bromodichloromethane	<0.10	(ug/liter)

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W6 (Con't)		Benzyl Chloride	<1.0	(ug/liter)
		Bromomethane	<10.0	(ug/liter)
		Bromobenzene	<1.0	(ug/liter)
		Bis(2-chloroisopropyl)eth.	<10.0	(ug/liter)
		Bis(2-chloroethoxy)methane	<1.0	(ug/liter)
		Bromoform	<0.20	(ug/liter)
		Chloroform	<0.05	(ug/liter)
		Chlorobenzene	<0.25	(ug/liter)
		Chloroethane	<0.52	(ug/liter)
		Chloromethane	<0.08	(ug/liter)
		Carbon Tetrachloride	<0.12	(ug/liter)
		Dibromochloromethane	<0.09	(ug/liter)
		Dibromomethane	<2.0	(ug/liter)
		trans-1,2-Dichloroethylene	<0.10	(ug/liter)
		trans-1.3Dichloropropylene	<0.34	(ug/liter)
		Vinyl Chloride	<10.0	(ug/liter)
		1,1,1,2Tetrachloroethane	<1.0	(ug/liter)
		1,1-Dichloroethylene	<0.13	(ug/liter)
		1,2,3-Trichloropropane	<1.0	(ug/liter)
		1-Chlorohexane	<1.0	(ug/liter)
		Chloroacetaldehyde	<1.0	(ug/liter)
		Chlromethyl methyl ether	<1.0	(ug/liter)
		Dichlorodifluoromethane	<1.0	(ug/liter)
		Dichloromethane	<0.1	(ug/liter)
		Trichloroethylene	<0.12	(ug/liter)
		Tetrachloroethylene	<0.03	(ug/liter)
		Trichloroflouromethane	<0.4	(ug/liter)
		1,2-Dichlorobenzene	<0.4	(ug/liter)
		1,3-Dichlorobenzene	<0.4	(ug/liter)
		1,4-Dichlorobenzene	<0.3	(ug/liter)
		Benzene	<0.2	(ug/liter)
		Chlorobenzene	<0.2	(ug/liter)
		Ethyl benzene	<0.2	(ug/liter)
		Toluene	<0.2	(ug/liter)
		Xylenes	<0.6	(ug/liter)
		Volatile Organics		()
		Base Neutrals		()

CUSTOMER Bechtel Environmental, Inc.
ADDRESS 3000 Post Oak Blvd.
CITY Houston, TX 77056
ATTENTION Dr. Monica Jacque
INVOICE NO

REPORT OF ANALYSIS

SAMPLES RECEIVED 09/30/88 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Volatile Compounds in Water

Sample Identification: #W6 **Date Collected: 09/27/88 @ 15:40**

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	<10
74-83-9	Bromomethane	<10
75-01-4	Vinyl Chloride	<10
75-00-3	Chloroethane	<10
75-09-2	Methylene Chloride	<5
67-64-1	Acetone	<10
75-15-0	Carbon Disulfide	<5
75-35-4	1, 1-Dichloroethene	<5
75-34-3	1, 1-Dichloroethane	<5
156-60-5	Trans-1, 2-Dichloroethene	<5
67-66-3	Chloroform	<5
107-06-2	1, 2-Dichloroethane	<5
78-93-3	2-Butanone	<10
71-55-6	1, 1, 1-Trichloroethane	<5
56-23-5	Carbon Tetrachloride	<5
108-05-4	Vinyl Acetate	<10
75-27-4	Bromodichloromethane	<5

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
78-87-5	1, 2-Dichloropropane	<5
10061-02-6	Trans-1, 3-Dichloropropene	<5
79-01-6	Trichloroethene	<5
124-48-1	Dibromochloromethane	<5
79-00-5	1, 1, 2-Trichloroethane	<5
71-43-2	Benzene	<5
10061-01-5	cis-1, 3-Dichloropropene	<5
110-75-8	2-Chloroethylvinylether	<10
75-25-2	Bromoform	<5
108-10-1	4-Methyl-2-Pentanone	<10
591-78-6	2-Hexanone	<10
127-18-4	Tetrachloroethene	<5
79-34-5	1, 1, 2, 2-Tetrachloroethane	<5
108-88-3	Toluene	<5
108-90-7	Chlorobenzene	<5
100-41-4	Ethylbenzene	<5
100-42-5	Styrene	<5
	Total Xylenes	<5

APPROVED BY
11/03/88 James J. Mueller, President
PAGE 1 OF 3 PAGE

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REPORT OF ANALYSIS

SAMPLES RECEIVED 09/30/88
CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Semivolatile Compounds in Water

Sample Identification: #W6

Date Collected: 09/27/88 @15:40

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	<10
111-44-4	bis(-2-Chloroethyl)Ether	<10
95-57-8	2-Chlorophenol	<10
541-73-1	1, 3-Dichlorobenzene	<10
106-46-7	1, 4-Dichlorobenzene	<10
100-51-6	Benzyl Alcohol	<10
95-50-1	1, 2-Dichlorobenzene	<10
95-48-7	2-Methylphenol	<10
39638-32-9	bis(2-chloroisopropyl)Ether	<10
106-44-5	4-Methylphenol	<10
621-64-7	N-Nitroso-Di-n-Propylamine	<10
67-72-1	Hexachloroethane	<10
98-95-3	Nitrobenzene	<10
78-59-1	Isophorone	<10
88-75-5	2-Nitrophenol	<10
105-67-9	2, 4-Dimethylphenol	<10
65-85-0	Benzoic Acid	<10
111-91-1	bis(-2-Chloroethoxy)Methane	<10
120-83-2	2, 4-Dichlorophenol	<10
120-82-1	1, 2, 4-Trichlorobenzene	<10
91-20-3	Naphthalene	<10
106-47-8	4-Chloroaniline	<10
87-68-3	Hexachlorobutadiene	<10
59-50-7	4-Chloro-3-Methylphenol	<10
91-57-6	2-Methylnaphthalene	<10
77-47-4	Hexachlorocyclopentadiene	<10
88-06-2	2, 4, 6-Trichlorophenol	<10
95-95-4	2, 4, 5-Trichlorophenol	<50
91-58-7	2-Chloronaphthalene	<10
88-74-4	2-Nitroaniline	<10
131-11-3	Dimethyl Phthalate	<10
208-96-8	Acenaphthylene	<10
99-09-2	3-Nitroaniline	<50

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	<10
51-28-5	2, 4-Dinitrophenol	<50
100-02-7	4-Nitrophenol	<50
132-64-9	Dibenzofuran	<10
121-14-2	2, 4-Dinitrotoluene	<10
606-20-2	2, 6-Dinitrotoluene	<10
84-66-2	Diethylphthalate	<10
7005-72-3	4-Chlorophenyl-phenylether	<10
86-73-7	Fluorene	<10
100-01-6	4-Nitroaniline	<50
534-52-1	4, 6-Dinitro-2-Methylphenol	<50
86-30-6	N-Nitrosodiphenylamine (1)	<10
101-55-3	4-Bromophenyl-phenylether	<10
118-74-1	Hexachlorobenzene	<10
87-86-5	Pentachlorophenol	<50
85-01-8	Phenanthrene	<10
120-12-7	Anthracene	<10
84-74-2	Di-n-Butylphthalate	<10
206-44-0	Fluoranthene	<10
129-00-0	Pyrene	<10
85-68-7	Butylbenzylphthalate	<10
91-94-1	3, 3'-Dichlorobenzidine	<20
56-55-3	Benzo(a)Anthracene	<10
117-81-7	bis(2-Ethylhexyl)Phthalate	<10
218-01-9	Chrysene	<10
117-84-0	Di-n-Octyl Phthalate	<10
205-99-2	Benzo(b)Fluoranthene	<10
207-08-9	Benzo(k)Fluoranthene	<10
50-32-8	Benzo(a)Pyrene	<10
193-39-5	Indeno(1, 2, 3-cd)Pyrene	<10
53-70-3	Dibenz(a, h)Anthracene	<10
191-24-2	Benzo(g, h, i)Perylene	<10

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11/03/88 James J. Mueller, President

REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W7	09/27/88 10:45	Chloride	45	(mg/liter)
		Carbonate (as CaCO3)	0	(mg/liter)
		Chromium, Hexavalent	<0.01	(mg/liter)
		Bicarbonate (as CaCO3)	378	(mg/liter)
		Nitrogen, Nitrate (as N)	0.3	(mg/liter)
		pH	7.60	(units)
		Sulfate	1970	(mg/liter)
		Solids, Total Dissolved	4776	(mg/liter)
		Arsenic (total)	<0.01	(mg/liter)
		Calcium	473	(mg/liter)
		Cadmium (total)	<0.001	(mg/liter)
		Chromium (total)	<0.01	(mg/liter)
		Copper (total)	0.02	(mg/liter)
		Iron (total)	1.20	(mg/liter)
		Mercury (total)	<0.0004	(mg/liter)
		Potassium	3.3	(mg/liter)
		Magnesium	26.3	(mg/liter)
		Manganese (total)	2.21	(mg/liter)
		Sodium	672	(mg/liter)
		Lead (total)	<0.01	(mg/liter)
		Zinc (total)	0.3	(mg/liter)
		Acrylamide	<1000.0	(ug/liter)
		Base Neutrals		()
		Diethyl Ether	<5.0	(ug/liter)
		Ethanol	<15.0	(ug/liter)
		Methylethylketone	<5.0	(ug/liter)
		Methyl Isobutyl Ketone	<5.0	(ug/liter)
		Paraldehyde	<200.0	(ug/liter)
		1,1,2,2-Tetrachloroethane	<0.03	(ug/liter)
		1,1,2-Trichloroethane	<0.02	(ug/liter)
		1,2-Dichlorobenzene	<0.15	(ug/liter)
		1,2-Dichloropropane	<0.04	(ug/liter)
		1,3-Dichlorobenzene	<0.32	(ug/liter)
		1,4-Dichlorobenzene	<0.24	(ug/liter)
		1,1,1-Trichloroethane	0.6	(ug/liter)
		1,1-Dichloroethane	<0.07	(ug/liter)
		1,2-Dichloroethane	<0.03	(ug/liter)
		2-Chlorotoluene	<1.0	(ug/liter)
		2-Chloroethyl vinyl ether	<0.13	(ug/liter)

REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W7 (Con't)		Bromodichloromethane	<0.10	(ug/liter)
		Benzyl Chloride	<1.0	(ug/liter)
		Bromomethane	<10.0	(ug/liter)
		Bromobenzene	<1.0	(ug/liter)
		Bis(2-chloroisopropyl)eth.	<10.0	(ug/liter)
		Bis(2-chloroethoxy)methane	<1.0	(ug/liter)
		Bromoform	<0.20	(ug/liter)
		Chloroform	<0.05	(ug/liter)
		Chlorobenzene	<0.25	(ug/liter)
		Chloroethane	<0.52	(ug/liter)
		Chloromethane	<0.08	(ug/liter)
		Carbon Tetrachloride	<0.12	(ug/liter)
		Dibromochloromethane	<0.09	(ug/liter)
		Dibromomethane	<2.0	(ug/liter)
		trans-1,2-Dichloroethylene	<0.10	(ug/liter)
		trans-1,3Dichloropropylene	<0.34	(ug/liter)
		Vinyl Chloride	<10.0	(ug/liter)
		1,1,1,2Tetrachloroethane	<1.0	(ug/liter)
		1,1-Dichloroethylene	<0.13	(ug/liter)
		1,2,3-Trichloropropane	<1.0	(ug/liter)
		1-Chlorohexane	<1.0	(ug/liter)
		Chloroacetaldehyde	<1.0	(ug/liter)
		Chlromethyl methyl ether	<1.0	(ug/liter)
		Dichlorodifluoromethane	<1.0	(ug/liter)
		Dichloromethane	<0.1	(ug/liter)
		Trichloroethylene	0.15	(ug/liter)
		Tetrachloroethylene	<0.03	(ug/liter)
		Trichloroflouromethane	<0.4	(ug/liter)
		1,2-Dichlorobenzene	<0.4	(ug/liter)
		1,3-Dichlorobenzene	<0.4	(ug/liter)
		1,4-Dichlorobenzene	<0.3	(ug/liter)
		Benzene	<0.2	(ug/liter)
		Chlorobenzene	<0.2	(ug/liter)
		Ethyl benzene	<0.2	(ug/liter)
		Toluene	<0.2	(ug/liter)
		Xylenes	<0.6	(ug/liter)

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REPORT OF ANALYSIS

PLES RECEIVED 09/30/88 | CUSTOMER ORDER NUMBER

OF ANALYSIS Semivolatile Compounds in Water

Sample Identification: #W7

Date Collected: 09/27/88 @ 10:45

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	<10
111-44-4	bis(-2-Chloroethyl)Ether	<10
95-57-8	2-Chlorophenol	<10
541-73-1	1, 3-Dichlorobenzene	<10
106-46-7	1, 4-Dichlorobenzene	<10
100-51-6	Benzyl Alcohol	<10
95-50-1	1, 2-Dichlorobenzene	<10
95-48-7	2-Methylphenol	<10
39638-32-9	bis(2-chloroisopropyl)Ether	<10
106-44-5	4-Methylphenol	<10
621-64-7	N-Nitroso-Di-n-Propylamine	<10
67-72-1	Hexachloroethane	<10
98-95-3	Nitrobenzene	<10
78-59-1	Isophorone	<10
88-75-5	2-Nitrophenol	<10
105-67-9	2, 4-Dimethylphenol	<10
65-85-0	Benzoic Acid	<10
111-91-1	bis(-2-Chloroethoxy)Methane	<10
120-83-2	2, 4-Dichlorophenol	<10
120-82-1	1, 2, 4-Trichlorobenzene	<10
91-20-3	Naphthalene	<10
106-47-8	4-Chloroaniline	<10
87-68-3	Hexachlorobutadiene	<10
59-50-7	4-Chloro-3-Methylphenol	<10
91-57-6	2-Methylnaphthalene	<10
77-47-4	Hexachlorocyclopentadiene	<10
88-06-2	2, 4, 6-Trichlorophenol	<10
95-95-4	2, 4, 5-Trichlorophenol	<50
91-58-7	2-Chloronaphthalene	<10
88-74-4	2-Nitroaniline	<10
131-11-3	Dimethyl Phthalate	<10
208-96-8	Acenaphthylene	<10
99-09-2	3-Nitroaniline	<50

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	<10
51-28-5	2, 4-Dinitrophenol	<50
100-02-7	4-Nitrophenol	<50
132-64-9	Dibenzofuran	<10
121-14-2	2, 4-Dinitrotoluene	<10
606-20-2	2 6-Dinitrotoluene	<10
84-66-2	Diethylphthalate	<10
7005-72-3	4-Chlorophenyl-phenylether	<10
86-73-7	Fluorene	<10
100-01-6	4-Nitroaniline	<50
534-52-1	4, 6-Dinitro-2-Methylphenol	<10
86-30-6	N-Nitrosodiphenylamine (1)	<10
101-55-3	4-Bromophenyl-phenylether	<10
118-74-1	Hexachlorobenzene	<10
87-86-5	Pentachlorophenol	<50
85-01-8	Phenanthrene	<10
120-12-7	Anthracene	<10
84-74-2	Di-n-Butylphthalate	<10
206-44-0	Fluoranthene	<10
129-00-0	Pyrene	<10
85-68-7	Butylbenzylphthalate	<10
91-94-1	3, 3'-Dichlorobenzidine	<20
56-55-3	Benzo(a)Anthracene	<10
117-81-7	bis(2-Ethylhexyl)Phthalate	<10
218-01-9	Chrysene	<10
117-84-0	Di-n-Octyl Phthalate	<10
205-99-2	Benzo(b)Fluoranthene	<10
207-08-9	Benzo(k)Fluoranthene	<10
50-32-8	Benzo(a)Pyrene	<10
193-39-5	Indeno(1, 2, 3-cd)Pyrene	<10
53-70-3	Dibenz(a h)Anthracene	<10
191-24-2	Benzo(g h i)Perylene	<10

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11/03/88 James J. Mueller, President
PAGE 3 OF 3 PAGE

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REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W8	09/27/88 12:15	Chloride	17	(mg/liter)
		Carbonate (as CaCO3)	0	(mg/liter)
		Chromium, Hexavalent	<0.01	(mg/liter)
		Bicarbonate (as CaCO3)	229	(mg/liter)
		Nitrogen, Nitrate (as N)	<0.1	(mg/liter)
		pH	7.84	(units)
		Sulfate	1610	(mg/liter)
		Solids, Total Dissolved	5680	(mg/liter)
		Arsenic (total)	<0.01	(mg/liter)
		Calcium	409	(mg/liter)
		Cadmium (total)	<0.001	(mg/liter)
		Chromium (total)	<0.01	(mg/liter)
		Copper (total)	<0.01	(mg/liter)
		Iron (total)	0.22	(mg/liter)
		Mercury (total)	<0.0004	(mg/liter)
		Potassium	4.2	(mg/liter)
		Magnesium	56.9	(mg/liter)
		Manganese (total)	4.59	(mg/liter)
		Sodium	1180	(mg/liter)
		Lead (total)	<0.01	(mg/liter)
		Zinc (total)	0.2	(mg/liter)
		Acrylamide	<1000.0	(ug/liter)
		Diethyl Ether	<5.0	(ug/liter)
		Ethanol	<15.0	(ug/liter)
		Methylethylketone	<5.0	(ug/liter)
		Methyl Isobutyl Ketone	<5.0	(ug/liter)
		Paraldehyde	<200.0	(ug/liter)
		1,1,2,2-Tetrachloroethane	<0.03	(ug/liter)
		1,1,2-Trichloroethane	<0.02	(ug/liter)
		1,2-Dichlorobenzene	<0.15	(ug/liter)
		1,2-Dichloropropane	<0.04	(ug/liter)
		1,3-Dichlorobenzene	<0.32	(ug/liter)
		1,4-Dichlorobenzene	<0.24	(ug/liter)
		1,1,1-Trichloroethane	1.4	(ug/liter)
		1,1-Dichloroethane	<0.07	(ug/liter)
		1,2-Dichloroethane	<0.03	(ug/liter)
		2-Chlorotoluene	<1.0	(ug/liter)
		2-Chloroethyl vinyl ether	<0.13	(ug/liter)
		Bromodichloromethane	<0.10	(ug/liter)

REPORT OF ANALYSIS

LAB # 88-04-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W8 (Con't)		Benzyl Chloride	<1.0	(ug/liter)
		Bromomethane	<10.0	(ug/liter)
		Bromobenzene	<1.0	(ug/liter)
		Bis(2-chloroisopropyl)eth.	<10.0	(ug/liter)
		Bis(2-chloroethoxy)methane	<1.0	(ug/liter)
		Bromoform	<0.20	(ug/liter)
		Chloroform	<0.05	(ug/liter)
		Chlorobenzene	<0.25	(ug/liter)
		Chloroethane	<0.52	(ug/liter)
		Chloromethane	<0.08	(ug/liter)
		Carbon Tetrachloride	<0.12	(ug/liter)
		Dibromochloromethane	0.31	(ug/liter)
		Dibromomethane	<2.0	(ug/liter)
		trans-1,2-Dichloroethylene	<0.10	(ug/liter)
		trans-1,3Dichloropropylene	<0.34	(ug/liter)
		Vinyl Chloride	<10.0	(ug/liter)
		1,1,1,2Tetrachloroethane	<1.0	(ug/liter)
		1,1-Dichloroethylene	<0.13	(ug/liter)
		1,2,3-Trichloropropane	<1.0	(ug/liter)
		1-Chlorohexane	<1.0	(ug/liter)
		Chloroacetaldehyde	<1.0	(ug/liter)
		Chlromethyl methyl ether	<1.0	(ug/liter)
		Dichlorodifluoromethane	<1.0	(ug/liter)
		Dichloromethane	<0.1	(ug/liter)
		Trichloroethylene	0.4	(ug/liter)
		Tetrachloroethylene	<0.03	(ug/liter)
		Trichloroflouromethane	<0.4	(ug/liter)
		1,2-Dichlorobenzene	<0.4	(ug/liter)
		1,3-Dichlorobenzene	<0.4	(ug/liter)
		1,4-Dichlorobenzene	<0.3	(ug/liter)
		Benzene	<0.2	(ug/liter)
		Chlorobenzene	<0.2	(ug/liter)
		Ethyl benzene	<0.2	(ug/liter)
		Toluene	5.0	(ug/liter)
		Xylenes	<0.6	(ug/liter)

REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W10	09/27/88 13:15	Chloride	73	(mg/liter)
		Carbonate (as CaCO3)	0	(mg/liter)
		Chromium, Hexavalent	0.01	(mg/liter)
		Bicarbonate (as CaCO3)	248	(mg/liter)
		Nitrogen, Nitrate (as N)	1.0	(mg/liter)
		pH	7.50	(units)
		Sulfate	2370	(mg/liter)
		Solids, Total Dissolved	5284	(mg/liter)
		Arsenic (total)	<0.01	(mg/liter)
		Calcium	509	(mg/liter)
		Cadmium (total)	<0.001	(mg/liter)
		Chromium (total)	<0.01	(mg/liter)
		Copper (total)	<0.1	(mg/liter)
		Iron (total)	1.03	(mg/liter)
		Mercury (total)	<0.0004	(mg/liter)
		Potassium	5.2	(mg/liter)
		Magnesium	97.5	(mg/liter)
		Manganese (total)	3.32	(mg/liter)
		Sodium	801	(mg/liter)
		Lead (total)	<0.01	(mg/liter)
		Zinc (total)	0.2	(mg/liter)
		Acrylamide	<1000.0	(ug/liter)
		Diethyl Ether	<5.0	(ug/liter)
		Ethanol	<15.0	(ug/liter)
		Methylethylketone	<5.0	(ug/liter)
		Methyl Isobutyl Ketone	<5.0	(ug/liter)
		Paraldehyde	<200.0	(ug/liter)
		1,1,2,2-Tetrachloroethane	<0.03	(ug/liter)
		1,1,2-Trichloroethane	<0.02	(ug/liter)
		1,2-Dichlorobenzene	<0.15	(ug/liter)
		1,2-Dichloropropane	<0.04	(ug/liter)
		1,3-Dichlorobenzene	<0.32	(ug/liter)
		1,4-Dichlorobenzene	<0.24	(ug/liter)
		1,1,1-Trichloroethane	1.3	(ug/liter)
		1,1-Dichloroethane	<0.07	(ug/liter)
		1,2-Dichloroethane	<0.03	(ug/liter)
		2-Chlorotoluene	<1.0	(ug/liter)
		2-Chloroethyl vinyl ether	<0.13	(ug/liter)
		Bromodichloromethane	<0.10	(ug/liter)

REPORT OF ANALYSIS

LAB # 88-09-560

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	RESULTS	
#W10 (Con't)		Benzyl Chloride	<1.0	(ug/liter)
		Bromomethane	<10.0	(ug/liter)
		Bromobenzene	<1.0	(ug/liter)
		Bis(2-chloroisopropyl)eth.	<10.0	(ug/liter)
		Bis(2-chloroethoxy)methane	<1.0	(ug/liter)
		Bromoform	<0.20	(ug/liter)
		Chloroform	<0.05	(ug/liter)
		Chlorobenzene	<0.25	(ug/liter)
		Chloroethane	<0.52	(ug/liter)
		Chloromethane	<0.08	(ug/liter)
		Carbon Tetrachloride	<0.12	(ug/liter)
		Dibromochloromethane	0.2	(ug/liter)
		Dibromomethane	<2.0	(ug/liter)
		trans-1,2-Dichloroethylene	<0.10	(ug/liter)
		trans-1,3Dichloropropylene	<0.34	(ug/liter)
		Vinyl Chloride	<10.0	(ug/liter)
		1,1,1,2Tetrachloroethane	<1.0	(ug/liter)
		1,1-Dichloroethylene	<0.13	(ug/liter)
		1,2,3-Trichloropropane	<1.0	(ug/liter)
		1-Chlorohexane	<1.0	(ug/liter)
		Chloroacetaldehyde	<1.0	(ug/liter)
		Chlromethyl methyl ether	<1.0	(ug/liter)
		Dichlorodifluoromethane	<1.0	(ug/liter)
		Dichloromethane	<0.1	(ug/liter)
		Trichloroethylene	0.3	(ug/liter)
		Tetrachloroethylene	<0.03	(ug/liter)
		Trichloroflouromethane	0.23	(ug/liter)
		1,2-Dichlorobenzene	<0.4	(ug/liter)
		1,3-Dichlorobenzene	<0.4	(ug/liter)
		1,4-Dichlorobenzene	<0.3	(ug/liter)
		Benzene	<0.2	(ug/liter)
		Chlorobenzene	<0.2	(ug/liter)
		Ethyl benzene	<0.2	(ug/liter)
		Toluene	<0.2	(ug/liter)
		Xylenes	<0.6	(ug/liter)

ENGINEERING RECORD	
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APPROVED	
DATE	
PHOTO DATE	10-18-82
CONTOUR INTERVAL	2'

El Paso Natural Gas Company

SITE INVESTIGATION LOCATION PLOT
BLANCO PLANT

SEC. 14, TWS. 29-N, RANGE 11-W
SAN JUAN COUNTY, NEW MEXICO

DATE: NOV. 1988

DWG. NO. 1

SHEET 1 OF 1

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