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REMEDIAL INVESTIGATION REPORT FOR THE FORMER BRICKLAND REFINERY

Document No. REX89.DOC

Prepared for:

REXENE

Office of Environmental Affairs
5005 LBJ Freeway
Occidental Tower, 5th Floor
Dallas, Texas 75244

December 1, 1994

GCL
Environmental Science and Engineering
A BDM International Company

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1.0 Executive Summary

Geoscience Consultants, Ltd. (GCL) conducted a remedial investigation at the Brickland Refinery site in June and July 1994. The site is in Sunland Park, New Mexico and consists of 35 acres located along the Rio Grande. The former petroleum refinery operated from 1933 to 1958 and was subsequently dismantled. The primary objectives of the investigation included characterization of the nature and extent of hydrocarbons in the unsaturated zone and the physical, chemical, and biological properties of those soils. A secondary objective was to refine the understanding of geologic and hydrogeologic characteristics and their relation to groundwater flow and potential hydrocarbon migration. Quarterly groundwater monitoring samples and water level measurements were collected concurrent with the soils investigation.

The investigation included installation of 28 soil borings. 6 test trenches, and 4 additional groundwater monitoring wells. One hundred seventeen soil samples were collected for analysis to define soil properties considered critical for evaluating potential remedial action alternatives.

Results of the investigation indicate that refinery-related releases have occurred in the central to southern portions of the facility. Hydrocarbons in soil appear to correlate with concentrations observed in groundwater monitoring wells although the extent of free-phase hydrocarbons is very limited. Concentrations of total hydrocarbon constituents in soils ranged as high as 219 ppm and 290 ppm for the BTEX and PAH compounds respectively. Concentrations of these same compounds in groundwater ranged as high as 23 ppm for BTEX and 570 ppb for PAHs. A number of metals were detected at varying concentrations at locations across the site although the major metals of concern do not appear to have migrated into groundwater from the overlying soils.

Analytical results also indicate that significant quantities of clays and silts occur in heterogeneous and interbedded layers. These clays and their associated adsorptive properties serve to inhibit contaminant migration, slowing the process by which contaminants can leach into groundwater. From a remedial design perspective, site conditions limit soil remediation options the best of which may be in situ biotreatment.

Hydrogeologic analysis reveals that the groundwater flow direction beneath the site varies as a function of the river stage in the adjacent Rio Grande. In general,

groundwater flows in a southerly direction with local flow directions to the southeast and southwest. The groundwater flow direction will continue to be evaluated on a quarterly basis until sufficient data are available to determine how seasonal variations may impact any hydrocarbon migration and the effectiveness of any subsequent remedial action if required.

2.0 Introduction and Objectives

Previous investigations at the Brickland site (Eder, 1990) focused on determining the nature and extent of refinery-related releases to subsurface soils and groundwater underlying the facility. Samples were collected for analysis of typical hydrocarbon compounds and a number of metal constituents. Little information was provided regarding the chemical, physical, or biological properties of site soils and what influence these factors might have on natural degradation or attenuation of the compounds of concern, and what remedial alternatives might be appropriate considering site conditions.

The investigation conducted in June and July 1994 was designed to characterize the soil properties that would permit a determination of current site conditions and how they relate to constituent migration. It also provided the data necessary to allow a preliminary evaluation of potential remedial alternatives. Secondary goals of the investigation included a further evaluation of impacts to groundwater beneath the site and a thorough geologic/hydrogeologic characterization. Specific goals and objectives are as follows.

Soils Characterization

Soil samples were collected from 20 locations in the central to southern portions of the site (Plate A). Locations were selected based on historical data regarding facility operations and process areas, and the results of previous investigations. Four locations were also selected as sites for installation of additional groundwater monitoring wells to expand coverage of the existing monitor well network.

Analytical parameters were selected to further refine the understanding of the nature and areal distributions of hydrocarbon and metal constituents in subsurface soils. Selected samples were also analyzed for a number of physical and biological parameters to evaluate the influence of soil on constituent migration and attenuation, and determine whether natural soil properties are favorable or limiting for potential remedial alternatives. The investigation examined those properties which might have some applications in developing in situ remedial options that would result in containment or treatment of the various constituents. This included an evaluation of the biodegradation potential of the underlying soils and factors that might influence the physical movement of compounds in the subsurface (i.e., adsorption, porosity, permeability).

Groundwater Characterization

A quarterly groundwater monitoring program was established in December 1993 to evaluate impacts to the shallow aquifer beneath the site and to determine the extent of potential free-phase floating hydrocarbon. The program includes collection of samples from on- and off-site monitoring wells for analysis of volatile, semi-volatile and inorganic constituents, and measurement of water levels and free-phase hydrocarbon thickness. Four additional monitoring wells were installed during the June and July 1994 investigation to supplement the existing network and provide additional data on the presence and movement of hydrocarbons and metals in the subsurface. This information will help determine where recoverable hydrocarbons exist and the feasibility of potential remedial alternatives.

Geologic and Hydrogeologic Characterization

Regional and local geologic and hydrogeologic conditions will influence the fate and transport of compounds in the subsurface soils and underlying aquifer. Detailed lithologic descriptions were prepared for each borehole and trench. This, in conjunction with data provided by selected geotechnical analyses allowed the design of a conceptual model of subsurface conditions across the site. The surface geologic survey was conducted to further define the local geology and evaluate potential effects of subsurface fate and transport.

3.0 Sampling Methods and Techniques

Data to supplement that presented in previous investigations was obtained through the installation and sampling of soil borings, test trenches, monitoring wells, and well points, as well as a surface geologic survey. All sample locations, with the exception of those used in the geologic survey, are identified in Plate A. A detailed description of the methodologies used during the investigation is contained in the Sampling, Analysis and Quality Assurance Plan (SAP) for Remedial Investigation at the Former Brickland Refinery (GCL, 1994a).

3.1 Soil Borings and Test Trenches

Samples were collected from twenty-eight soil borings and six test trenches to characterize soil properties at the site and to evaluate potential remedial design alternatives. Four of the borings were completed as groundwater monitoring wells.

Soil samples were collected using a hollow-stem auger and split spoon samplers equipped with 2-foot Lexan tubes. All samples were collected, containerized, labeled, and shipped according to procedures outlined in the SAP. Total depth of the soil borings ranged from 8 to 12 feet, and cuttings were visually examined to allow preparation of detailed lithologic logs (Appendix A). Auger refusal conditions were not encountered during the investigation and all soil borings not completed as monitoring wells were plugged with bentonite and a non-shrinking grout. Soil cuttings were placed in labeled 55-gallon steel drums and field screened with a photoionization detector (PID) in order to segregate them into two sample groups that corresponded with highest and lowest PID measurements. One composite sample was taken from each group of the drummed cuttings for analysis by the Toxicity Characteristic Leaching Procedure (TCLP) for waste characterization and subsequent disposal, if necessary.

Six test trenches (Plate A) were excavated on June 22, 1994, to augment the samples collected from the soil borings and provide a better visual observation of the subsurface lithology. The trenches also proved useful in determining the distribution and movement of hydrocarbons beneath the site. The test trenches were excavated using a trackhoe and final dimensions were approximately 4 feet wide by 12 feet long by 8 feet deep. Spoils from the trenches were placed on plastic sheets and sampled for TCLP waste characterization.

3.2 Monitoring Well Installation and Development

Soil borings B-4, B-12, B-13, and B-14 (Plate A) were completed as monitoring wells to expand coverage of the existing groundwater monitoring network and to further evaluate the extent of floating free-phase hydrocarbons.

Each soil boring converted to a monitoring well was reamed to 12-inch diameter to accommodate the 4-inch monitoring well casing. The depth of the monitoring wells ranged from 24 feet at the central portion of the property to 31 feet at the south end. The monitoring wells were constructed using 4-inch diameter, flush joint, polyvinyl chloride (PVC) blank pipe; a 5-foot silt trap made of 4-inch diameter stainless steel; and 15 feet of 4-inch diameter, wire-wrapped stainless steel screen (0.01 to 0.02 inch slots). All casing was precleaned and prepackaged by the manufacturer.

The casing was lowered into the borehole through the hollow-stem auger, and auger flights were retrieved in 5-foot sections. A filter pack of precleaned and prepackaged 16-40 mesh silica sand was placed in the annulus around the screen as each auger flight was removed. The filter pack was installed to a level just above the top of the screen. Bentonite powder was then placed on top of the completed filter pack and hydrated with 5 gallons of distilled water to form an impervious barrier and prevent downward migration of fluids. The remainder of the annulus was grouted with a cement/bentonite slurry. Wells were completed with an above-grade protective steel pipe set in a 3-foot by 3-foot concrete well pad. Well locations and elevations were surveyed by a professional land surveyor. Monitoring well completion diagrams showing construction details, coordinates, and elevations are provided in Appendix B.

Monitoring wells were developed in one or two phases, depending on the amount of clay and silt that infiltrated the filter pack during completion. The first phase consisted of bailing water from the well to remove gross sediments. A jet pump with a 25-foot lift capacity was installed in the second phase. Water was pumped from several different screen intervals to facilitate well development. The wells were considered to be fully developed when indicator parameters of pH, temperature, and electrical conductance stabilized over three consecutive measurements. Parameters were allowed to vary ± 0.2 units for pH, ± 50 µmhos for conductivity, and ± 1°C for temperature.

3.3 Well Point Installation

Ten well points (Plate A) were installed to further evaluate the extent of free-phase floating hydrocarbons. The well points were constructed of 2-inch ID galvanized pipe with a 3-foot long screen (0.01 inch slots). The drilling rig was used to drive well points WP-28 and WP-29 into the soil. Well points WP-30 to WP-37 were installed in open boreholes. The screen intervals of 19 existing well points were adjusted to ensure contact with the desired aquifer interface. Well point completion diagrams are provided in Appendix C.

3.4 Geologic Survey

GCL personnel conducted a survey of the regional and local geology surrounding the Brickland site. This included reviews of existing geological publications, analysis and descriptions of local geologic units, and measurement of strikes and dips along local bedding planes and faults. Photographs of surficial geologic units were used for comparison with published geologic studies of the area. A full panoramic view of the geologic units bounding the western portion of the site is included in Appendix D.

4.0 Analytical Results

4.1 Soil Samples

During the investigation, 117 samples were collected to characterize the physical, chemical, and biologic properties of soil in the subsurface. Each borehole and trench was also visually logged to provide a full lithologic description. Results of the chemical, biological, and geotechnical analyses are provided in Appendix E.

4.1.1 Borehole/Trench Lithology

Three cross-sections (Plates B, C, and D) were constructed based on the presence and nature of the lithologic units encountered in the boring and trench investigations. These plates show the shallow lithology of the site in longitudinal and transverse views and incorporate data from earlier investigations. The cross-sections show interbedded units of clays, silts, and sands, and mixtures thereof, and are typical of the fluvial meandering stream environment of the Rio Grande. The underlying geology has influenced the movements of materials from the refinery and poses limitations on potential remedial alternatives due to their physical and chemical properties. Lithologic descriptions of all soil borings and test trenches are provided in Appendix A.

4.1.2 Chemical Samples

Seventy-seven samples were collected from the trenches and soil borings to further characterize the migration of materials from the surface to the subsurface. The number and location of soil samples collected for chemical analysis was based upon past refinery operations, previous investigations, and field observations and measurements. Hydrocarbon constituents are areally extensive in the central/southern portions of the facility and extend down to approximately 12 feet below ground surface making removal impractical.

Selected samples were analyzed for total petroleum hydrocarbons (TPH); benzene, toluene, ethylbenzene, and xylenes (BTEX); polynuclear aromatic hydrocarbons (PAHs); and RCRA metals. Sample locations and intervals are shown in Plates E through H. Analytical results are summarized in Tables 1 through 4 and the laboratory data are provided in Appendix E.

Table 1
Total Petroleum Hydrocarbon (EPA Method 418.1) Soil Sample Results
(Units mg/Kg)

Sample Location	B-01	B-02	B-03	B-04	B-05	B-06	B-07	B-08	B-09	B-10	B-11	B-12	B-13	B-14	TR-01	TR-02	TR-03	TR-04	TR-05	TR-06
Sample Depth (Ft)																				
0-2		1240	373				4670		404					44						
2-4	97		828				1230		48					46	2260	165	3310			
4-6			757		677	3760	1600		55					737						
6-8			871				1560	1790	34;108					596				452		642
8-10				254					50					369						
10-12									39	715	889	483	6150						414	
12-14												313								

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Table 2
BTEX (EPA Method 8020) Soil Sample Results
(units µg/Kg)

DTW = 6' 5.75' [illegible] [illegible] 4'6" [illegible] 4'6" [illegible] 4' 8-10' 6-8' 12' 8' 6-8 4.5' 3.9' 8' 10' 11' 7.5'

Sample Depth (Ft.)	Sample Location / BTEX	B-01	B-02	B-03	B-04	B-05	B-06	B-07	B-08	B-09	B-10	B-11	B-12	B-13	B-14	TR-01	TR-02	TR-03	TR-04	TR-05	TR-06
0 - 2	B																				
	T																				
	E																				
	X																				
	Total BTEX																				
2 - 4	B															13000	13000	24000			
	T															2700	3800	10000			
	E															23000	16000	65000			
	X															33000+	8900	120000+			
	Total BTEX															71700	41700	219000			
4 - 6	B	ND				12000			1100*												
	T	ND				2800															
	E	ND				6600															
	X	ND				16000															
	Total BTEX	ND				37400															
6 - 8	B		260*												1700, 190*				ND		
	T														ND				ND		
	E														2500				200		
	X														2700				920+		
	Total BTEX														6900				1120		
8 - 10	B												ND*								
	T																				
	E																				
	X																				
	Total BTEX																				
10 - 12	B										ND	ND								ND	
	T										340	ND								89	
	E										290	ND								240	
	X										1500	2800								440+	
	Total BTEX										2130	2800								769	

B-Benzene
T-Toluene
E-Ethyl Benzene
X-Xylenes
* TCLP (µg/L)
+ Compound also detected in blank

Table 3
Polynuclear Aromatic Hydrocarbon (EPA Method 8270) Soil Sample Results
(units µg/Kg)

Sample Location	Sample Depth (Ft.)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluroanthene	Benzo(ghi)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Napthene	Phenanthrene	Pyrene	Total PAH (µg/Kg)
B-01	0-2																		
	2-4																		
	4-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	6-8																		
	8-10																		
	10-12																		
B-02	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		
B-03	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		
B-04	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		
B-05	0-2																		
	2-4																		
	4-6	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	3700 8600	6000 13000	1800 5300	ND ND	ND ND	11500 26900
	6-8																		
	8-10																		
	10-12																		

Table 3 (cont'd)
Polynuclear Aromatic Hydrocarbon (EPA Method 8270) Soil Sample Results
(units µg/Kg)

Sample Location	Sample Depth (Ft.)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluroanthene	Benzo(ghi)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Napthene	Phenanthrene	Pyrene	Total PAH (µg/Kg)
B-06	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		
B-07	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		
B-08	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		
B-09	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		
B-10	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4700	3000	ND	2300	ND	10000

Table 3 (cont'd)
Polynuclear Aromatic Hydrocarbon (EPA Method 8270) Soil Sample Results
(units µg/Kg)

Sample Location	Sample Depth (Ft.)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluroanthene	Benzo(ghi)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Napthene	Phenanthrene	Pyrene	Total PAH (µg/Kg)
B-11	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	79000	160000	51000	ND	ND	290000
	10-12																		
B-12	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		
B-13	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		
B-14	0-2																		
	2-4																		
	4-6																		
	6-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2200	3800	2100	ND	ND	8100
	8-10																		
	10-12																		
TR-01	0-2																		
	2-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1800	3000	2400	ND	ND	7200
	4-6																		
	6-8																		
	8-10																		
	10-12																		

Table 3 (cont'd)
Polynuclear Aromatic Hydrocarbon (EPA Method 8270) Soil Sample Results
(units µg/Kg)

Sample Location	Sample Depth (Ft.)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(ghi)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Napthene	Phenanthrene	Pyrene	Total PAH (µg/Kg)
TR-02	0-2																		
	2-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12000	12000	ND	ND	ND	24000
	4-6																		
	6-8																		
	8-10																		
	10-12																		
TR-03	0-2																		
	2-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7700	110000	5600	ND	ND	123300
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7100	10000	4400	ND	ND	21500
	4-6																		
	6-8																		
	8-10																		
	10-12																		
TR-04	0-2																		
	2-4																		
	4-6																		
	6-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5300	ND	ND	ND	1700	7000
	8-10																		
	10-12																		
TR-05	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1600	1600
TR-06	0-2																		
	2-4																		
	4-6																		
	6-8																		
	8-10																		
	10-12																		

Table 4
Metals Soil Sample Results

Sample Location	Sample Depth (Ft)	RCRA Metals (Total, mg/Kg)								TCLP Metals (mg/L)							
		As	Ba	Cd	Cr	Pb	Hg	Se	Ag	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
B-01	0-2																
	2-4	18	137	<0.5	10	74	0.14	<10	<1								
	4-6	<5	179	<0.5	9	7	<0.10	<10	<1								
	6-8																
	8-10																
B-02	0-2																
	2-4																
	4-6																
	6-8									<0.05	2.1	<0.01	<0.01	<0.05	<0.003	<0.1	<0.01
	8-10																
B-03	0-2																
	2-4																
	4-6																
	6-8																
	8-10																
B-04	0-2																
	2-4	21	183	1.1	11	46	0.41	<10	<1								
	4-6																
	6-8	<5	204	<0.5	8	9	<0.10	<10	<1								
	8-10																

As-Arsenic
Ba-Barium
Cd-Cadmium
Cr-Chromium
Pb-Lead
Hg-Mercury
Se-Selenium
Ag-Silver

Table 4 (cont'd)
RCRA Metals Soil Sample Results

Sample Location	Sample Depth (Ft)	RCRA Metals (Total, mg/Kg)								TCLP Metals (mg/L)							
		As	Ba	Cd	Cr	Pb	Hg	Se	Ag	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
B-05	0-2																
	2-4																
	4-6																
	6-8																
	8-10																
B-06	0-2																
	2-4																
	4-6																
	6-8																
	8-10																
B-07	0-2																
	2-4																
	4-6																
	6-8																
	8-10																
B-08	0-2																
	2-4																
	4-6									0.11	0.8	0.12	<0.01	82	<0.003	<0.1	<0.01
	6-8																
	8-10																

As-Arsenic
Ba-Barium
Cd-Cadmium
Cr-Chromium
Pb-Lead
Hg-Mercury
Se-Selenium
Ag-Silver

Table 4 (cont'd)
Metals Soil Sample Results

Sample Location	Sample Depth (Ft)	RCRA Metals (Total, mg/Kg)								TCLP Metals (mg/L)							
		As	Ba	Cd	Cr	Pb	Hg	Se	Ag	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
B-09	0-2																
	2-4																
	4-6																
	6-8																
	8-10																
B-10	0-2																
	2-4																
	4-6																
	6-8																
	8-10	<5	136	<0.5	7	<5	<0.10	<10	<1								
B-11	0-2																
	2-4																
	4-6																
	6-8																
	8-10	<5,<5	132, 148	<0.5, <0.5	7,6	<0.10, <0.10	<10, <10	<1, <1									
B-12	0-2																
	2-4																
	4-6																
	6-8																
	8-10									<0.05	0.6	<0.01	<0.01	<0.05	<0.003	<0.1	0.02

As-Arsenic
Ba-Barium
Cd-Cadmium
Cr-Chromium
Pb-Lead
Hg-Mercury
Se-Selenium
Ag-Silver

Table 4 (cont'd)
RCRA Metals Soil Sample Results

Sample Location	Sample Depth (Ft)	RCRA Metals (Total, mg/Kg)								TCLP Metals (mg/L)							
		As	Ba	Cd	Cr	Pb	Hg	Se	Ag	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
B-13	0-2																
	2-4																
	4-6																
	6-8																
	8-10	5	57	<0.5	8	13	<0.10	<10	<1								
B-14	0-2																
	2-4																
	4-6																
	6-8									<0.05	3.0	<0.01	<0.01	0.07	<0.003	<0.1	0.08
	8-10																
TR-01	0-2	22	145	0.8	10	53	0.14	<10	<1								
	2-4	<5, <5	89, 100	<0.5, <0.5	6,7	9, 10	<0.10, 0.10	<10, <10	<1, <1								
	4-6																
	6-8																
	8-10																
TR-02	0-2																
	2-4	12	127	0.5	10	55	<0.10	<10	<1								
	4-6																
	6-8																
	8-10																

As-Arsenic
Ba-Barium
Cd-Cadmium
Cr-Chromium
Pb-Lead
Hg-Mercury
Se-Selenium
Ag-Silver

Table 4 (cont'd)
Metals Soil Sample Results

Sample Location	Sample Depth (Ft)	RCRA Metals (Total, mg/Kg)								TCLP Metals (mg/L)							
		As	Ba	Cd	Cr	Pb	Hg	Se	Ag	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
TR-03	0-2																
	2-4	5	136	<0.5	8	7	<0.10	<10	<1								
	4-6	<5	137	<0.5	7	6	<0.10	<10	<1								
	6-8																
	8-10																
TR-04	0-2																
	2-4	<5	53	<0.5	4	5	0.14	<10	<1								
	4-6	13	176	0.6	9	14	0.19	<10	<1								
	6-8																
	8-10																
TR-05	0-2																
	2-4	<5	59	<0.5	4	5	<0.10	<10	<1								
	4-6	<5	38	<0.5	4	5	<0.10	<10	<1								
	6-8																
	8-10																
TR-06	0-2																
	2-4																
	4-6																
	6-8																
	8-10																

As-Arsenic
Ba-Barium
Cd-Cadmium
Cr-Chromium
Pb-Lead
Hg-Mercury
Se-Selenium
Ag-Silver

Total Petroleum Hydrocarbons (TPH)

Thirty-six samples were collected from locations across the site and analyzed by Environmental Protection Agency (EPA) Method 418.1 to determine the aggregate concentrations of aromatic, paraffinic, and olefinic compounds in soils. This method provides an indication of overall hydrocarbon content without specific compound identification. The soil sample results are shown in Table 1.

The highest TPH results (>1,000 mg/kg) were observed in samples collected in the central portion of the site and appear to coincide with former process areas. Samples from the southern half of the site also exhibited the presence of hydrocarbon, with a number of results exceeding 100 mg/kg. TPH compounds were present in samples ranging in depth from six inches to 12 feet below grade.

Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)

Ten samples were collected and analyzed by EPA Method 8020 for BTEX constituents. The soil sample results for BTEX are shown in Table 2.

Total BTEX concentrations exceeding 10,000 µg/kg were detected in soils near the central portion of the site and coincide with former process areas. BTEX was also detected in soils at the southern half of the site with total concentrations ranging from 6,900 to 769 µg/kg.

Polynuclear Aromatic Hydrocarbons (PAHs)

Ten soil samples were collected from various locations across the site for analysis of PAHs by EPA Method 8270; results of the sampling are shown in Table 3. These polycyclic compounds represent many of the heavier molecular weight hydrocarbons, and are semi-volatile in nature. As with the other hydrocarbon constituents, the highest concentrations of these compounds (>10,000 µg/kg) were found in soils in the central to southern portion of the site.

RCRA Metals

Sixteen soil samples were collected for total RCRA metals analysis. Metal parameters include arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Analytical results of the soil sampling are presented in Table 4. These analyses were conducted to complement data from earlier investigations, and to evaluate the potential impact of past refinery operations to soil and groundwater.

The metals analyses indicate that all of the metals are within the limits of naturally-occurring metals in soil, although lead, arsenic, and mercury are above the mean for these elements in soils in the western United States. Lead concentrations may be associated with historic operations at the site, however, some lead and arsenic found in site soils may be related to airborne deposition from the nearby Asarco smelter. The low levels of mercury detected in site soils may also be due to Asarco operations.

TCLP metal results indicate that lead is present in soils at one location above the TCLP (5.0 mg/L) limit. This soil sample obtained from a boring near the east-central portion of the site contained 82 mg/L lead. All other samples had low lead concentrations ranging from below the detection limit to 0.07 mg/L.

4.1.3 Biological Samples

Four samples were collected to characterize the level of heterotrophic and hydrocarbon-utilizing bacteria in subsurface soils and determine the biodegradation potential for petroleum constituents found at the site. Thirty-five soil samples were collected for analysis of macro-nutrient, humic content, total organic carbon, soil pH, and soil moisture content. Samples were collected from areas suspected of having the most significant levels of hydrocarbon content. Laboratory data for the bacterial analyses are provided in Appendix E and the summarized results are shown in Table 5 and Plate I.

Bacterial Classification

Heterotrophic and hydrocarbon-utilizing bacterial counts were conducted on four samples collected across the site to determine the potential capacity of indigenous microorganisms to degrade petroleum hydrocarbons in soil. The analyses evaluated those bacteria capable of degrading gasoline (i.e., volatile hydrocarbons) and fuel oil (i.e., non-volatile hydrocarbons), as well as the total number of organic carbon utilizing bacteria (i.e., heterotrophs). The results indicate that large bacterial populations (> 30,000 colonies/gm of soil) occur in soils where hydrocarbon concentrations are minimal. Bacterial counts decline significantly in soils with greater hydrocarbon content.

Table 5

Sample Results for Characterizing Biodegradation Potential

Sample Location	Sample Depth	Sample ID	Bacteria Enumeration(1)			Macro Nutrients(4)			Humic Content (Organic) (%)	Total Organic Carbon (%)	pH	Moisture Content (%)
			Non-Volatile HC Utilizers(2) (col./gm soil)	Volatile HC Utilizers(3) (col./gm soil)	Total Bacteria (col./gm soil)	Ammonia (mg/L)	Phosphate (mg/L)	Nitrate (mg/L)				
B-01	4-6'	9406171043	31,000	37,000	260,000					0.32	8.13	32.2
	6-8'	9406171047										24.8
B-02	4-6'	9406171318							1.0			
	6-8'	9406171322										30.2
B-03	6-8'	9406171502	7,700	(820)	31,000					0.1	8.03	
B-04												
B-05	4-6'	9406171619										43.4
	6-8'	9406171625										27.5
B-06	4-6'	9406180631							1.3			34.0
B-07	6-8'	9406180749	< 100	< 100	(600)							
B-08	4-6'	9406180842								2.01	8.25	25.8
	6-8'	9406180845				3.0	5.0	ND				
B-09	6-8'	9406181050									9.05	28.8
B-10	6-8'	9406201410										34.8
B-11	4-6'	9406201616								0.57	7.75	
	8-10'	9406201625	400	6,100	8,700							
B-12	6-8'	9406210816							2.7			
B-13	0-2'	9406211453				1.7	1.6	2.0				
	8-10'	9406211510										13.7
B-14	2-4'	9406200831										4.8
TR-01												
TR-02												
TR-03												
TR-04	8-10'	9406221530				ND	ND	ND				
TR-05	10-12'	9406221625				2.2	1.3	ND				
TR-06												

( ) Estimated Values

(1) Methods of Soil Analysis, Part 2, Chemical and Microbiological Properties; Standard Methods for the Examination of Water and Wastes, 17th Edition.

(2) Based on Fuel-Oil degradation

(3) Based on Gasoline degradation

(4) Analysis by Hach Field Kit

G:\REXWORK\BIOSAMP.WQ1

Macro-Nutrients

Nitrogen (as nitrate or ammonia) and phosphorus (as ortho-phosphate) are essential compounds in bacterial nutrition and are often limiting factors for sustained bacterial growth and biodegradation. Four soil samples were collected and analyzed for these nutrients using a Hach field kit. Analytical results (Table 5) indicate that nitrogen and phosphorus are generally present in insufficient levels to promote widespread metabolism of indigenous bacteria. Optimal levels for nitrogen and phosphorus tend to average about 12.4% and 2.5% by weight respectively. However, preferred levels for both nutrients should be determined by a biotreatability study.

Humic Content

Three samples were collected for analysis of humic content by ASTM Method D-2974. This method determines biological debris that consists of dead bacteria and undigested substrate and is an indicator of potential metabolic activity. Humic content values varied from 1.0 percent to 2.7 percent and indicate that humic content in site soils is low and overall metabolic activity minimal.

Total Organic Carbon

Four samples were collected for analysis of total organic carbon by EPA Method 9060. Organic carbon serves as the primary energy source for bacterial metabolism. It also indicates the potential for bacterial survival in soil environments without additional carbon amendments. Organic carbon content in site soils ranged from 0.32 percent to 2.01 percent and indicates very little organic carbon in site soils. The optimal levels of organic carbon should be determined by a biotreatability study including its desired ratio to other nutrients.

pH

pH is an environmental factor that can limit and control the rate and magnitude of bacterial metabolism. A pH between 6 to 8 has been demonstrated to be optimal for bacterial growth rates. Five samples were collected for pH analysis by EPA Method 9045. Results ranged from pH 7.75 to 9.05 indicating a potential, although not optimal, environment for microbial growth.

Moisture Content

Soil moisture content can also limit bacterial growth. Soil moisture contents of 10 percent to 20 percent are preferable for optimum growth. Eleven samples were collected for soil moisture content determination by ASTM Method D-2216. Soil moisture contents range from 4.8 percent to 43.4 percent with a mean of 27.3 percent. The variance in soil moisture values is attributed to sampling depths. Most samples were collected from four to eight feet below the ground surface and had moisture contents on the order of 30 percent. Soil moisture content over most of the site is believed to be near optimum for microbial growth.

4.1.4 Geotechnical Samples

Geotechnical samples were collected for analysis of particle size, clay type, cation exchange capacity, bulk density, and hydraulic conductivity. These physical properties can reduce and/or attenuate compound migration in the underlying soils due to their absorptive properties. They can also often limit the application of many in situ remedial technologies due to these same properties. Analytical data for particle size distributions, clay type, and capillary moisture relationships are found in Appendix E.

Laser Particle Size Analysis (LPSA)

LPSA determines grain size distributions utilizing laser diffraction techniques. Dispersion patterns of a soil sample suspended in a liquid medium are recorded and analyzed by computer after being passed repeatedly through a laser beam. Particle size fractions are then reported as a percentage of the total sample volume.

Particle size distributions can be used to estimate soil permeability, which in conjunction with chemical vapor pressures, gives an indication of the feasibility of soil-vapor extraction (SVE). In general, SVE can be utilized when air permeabilities in soils are greater than 10 darcies, and chemical pressures are greater than 0.001 atmospheres (atm). Results from LPSA analyses and permeability estimates are shown in Table 6. As indicated by the permeability estimates for soils below the 0 to 4 foot interval (0.014 to 4.07 darcies) and listed vapor pressures for common hydrocarbon constituents (Table 7), SVE does not appear to be a favorable option, due to low soil permeability and the low vapor pressures of the majority of chemical compounds of concern. The interbedded

Table 6

Particle Size and Permeability Correlation

Borehole	Depth (ft)	Median Particle Size Diameter (mm)	Permeability Estimate (darcies)
B-04	0-2	0.8256	86.78
	2-4	0.0088	0.048
	4-6	0.0042	0.014
	6-8	0.0390	0.564
	8-10	0.1292	4.07
B-11	2-4	0.3261	18.74
	4-6	0.0474	0.778
	6-8	0.0463	0.748
	8-10	0.0593	1.125
	10-12	0.0777	1.758

Table 7

Vapor Pressure of Selected Soil Contaminants

Contaminant	Vapor Pressure (atm)
Benzene	0.100
Toluene	0.029
Ethyl Benzene	0.009
Xylenes	0.009
1-Methylnaphthalene	0.001
2-Methylnaphthalene	0.001
Naphthalene	0.001
Phenanthrene	2.763×10^{-7}
Pyrene	3.289×10^{-9}

nature of the fine-grained soils beneath the site are also not conducive to SVE technologies.

Clay Type

Clays in the natural environment can play an important role in constituent migration since they have the capacity to adsorb metal ions and some organic compounds. Adsorption of metal species can occur through replacement of metals in the clay matrix (Al, Si) by available metal ions of similar size. Hydrocarbon molecules can adsorb to negatively charged clay particles as a result of induced polarization and the formation of carbonium ions (C^+). The degree of metal replacement and hydrocarbon bonding is a function of clay type and corresponding cation exchange capacity and surface charge.

Samples for clay type analysis were cleaned, desegregated, and split into clay-size and sand-silt size fractions. The clay fraction was analyzed by X-ray diffraction for quantitative clay typing based on reflection geometry. Four primary clays were identified by the X-ray diffraction analysis. These include illite, kaolinite, chlorite, and smectite. Illite, smectite and illite/smectite clay mixtures predominate in the samples and comprise 33 percent to 84 percent of the total content of the four clay types found in the samples. Clay type analyses are presented in Appendix E.

As indicated in Table 8, illite and smectite typically exhibit relatively high surface areas and net surface charges, as well as high cation exchange capacity (CEC). These properties can serve to reduce the migration of constituents at the site due to absorption of hydrocarbons and metallic species.

Cation Exchange Capacity (CEC)

CEC analyses were conducted using an adsorbed water method that relies on an empirical relationship of the moisture content ratio (by weight) of samples dehydrated by different methods to determine cation exchange capacity. CEC is most commonly reported in milliequivalents (meq of cations per 100 grams of soil (meq/100 gm) and represents the mass of any ion that can combine with or replace hydrogen in chemical reactions. CECs range from near 0 in sands to 100 meq/100 gm or more in certain clays. CEC affects the movement and retention of ions in the soil, which can be critical in processes involving the transport of organic and inorganic contaminants.

Table 8

Properties Related to Adsorption Characteristics of Clay

	Smectite	Illite	Kaolinite	Chlorite
Surface Area (m^2/g)	800	80	15	80
Surface Charge (meq/m^2)	1400	2875	1975	~2800
CEC (meq/100 g)	96	34	3	25

The three samples collected for CEC analysis had the following results: 12.4, 13.6, and 53.0 meq/100g (Table 9). The results indicate that the site soils have a moderate to high ion retention capacity.

Hydraulic Conductivity

Two samples were collected from the saturated zone of soil borings (B-04 and B-13) for constant head, vertical, and horizontal conductivity analysis by ASTM Method D-2434. The results of the two analyses are summarized in Table 9 and indicate a wide variability in hydraulic conductivities in lithologic units encountered across the site.

The sample from borehole B-04, a well-graded sand, had a relatively high vertical (19.2 cm/day) and horizontal hydraulic conductivity (19.7 cm/day). The sample from B-13, a poorly-graded silt, had very low conductivities; 0.0032 cm/day for vertical conductivity and 0.00306 cm/day for horizontal conductivity.

Dry Bulk Density

Two samples were collected from shallow soils for analysis of dry bulk density using API Method RP-40. Results from the two samples were very similar with densities ranging from 89.1 to 92.4 lb/ft^3 (Table 9). The soils are of the OL group, which consists of organic silts and silt-clays having low plasticities.

Capillary Moisture Relationship

Three soil samples were analyzed for capillary moisture relationship by ASTM Method D-2325 to define the hydraulic response expected from the soil types found at the site. Samples were collected from a silt, silty-sand, and sandy zone representative of the soil types at the site. As expected, water retention capacities varied with silt/sand ratios and the capillary moisture curves shown in Appendix E can be used to estimate unsaturated hydraulic conductivities that can be useful in predicting infiltration from seasonal precipitation, modeling aquifer responses to transient conditions, and estimating maximum loading rates for infiltration gallery designs.

Table 9
Geotechnical Analyses Results
(Hydraulic Conductivity, Bulk Density, CEC)

Sample Location	Sample Depth (Ft.)	Hydraulic Conductivity (cm/day)		Bulk Density (g/cm^3)	CEC (meq/100g)
		Vertical	Horizontal		
B-01	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
B-02	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
B-03	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
B-04	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12	19.2	19.7		
B-05	0-2				
	2-4				
	4-6				
	6-8				13.6
	8-10				
	10-12				

Table 9
Geotechnical Analyses Results
(Hydraulic Conductivity, Bulk Density, CEC)

Sample Location	Sample Depth (Ft.)	Hydraulic Conductivity (cm/day)		Bulk Density (g/cm^3)	CEC (meq/100g)
		Vertical	Horizontal		
B-06	0-2				
	2-4				
	4-6				
	6-8				12.4
	8-10				
	10-12				
B-07	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
B-08	0-2			1.62	
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
B-09	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
B-10	0-2				
	2-4				
	4-6				
	6-8				53.0
	8-10				
	10-12				

Table 9
Geotechnical Analyses Results
(Hydraulic Conductivity, Bulk Density, CEC)

Sample Location	Sample Depth (Ft.)	Hydraulic Conductivity (cm/day)		Bulk Density (g/cm^3)	CEC (meq/100g)
		Vertical	Horizontal		
B-11	0-2				
	2-4			1.68	
	4-6				
	6-8				
	8-10				
	10-12				
B-12	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
B-13	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
	12-14	0.00320	0.00306		
B-14	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
TR-01	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				

Table 9
Geotechnical Analyses Results
(Hydraulic Conductivity, Bulk Density, CEC)

Sample Location	Sample Depth (Ft.)	Hydraulic Conductivity (cm/day)		Bulk Density (g/cm^3)	CEC (meq/100g)
		Vertical	Horizontal		
TR-02	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
TR-03	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
TR-04	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
TR-05	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				
TR-06	0-2				
	2-4				
	4-6				
	6-8				
	8-10				
	10-12				

4.1.5 Interpretation of Soil Sampling Results

Results from chemical analyses indicate that soils in the central to southern area of the site have been impacted by hydrocarbons and possibly metals (Plate N).

Lithologic descriptions and clay and particle size analysis results indicate that clays are present in sufficient quantities and in a heterogeneous and interbedded manner to effect the fate and transport of any of the constituents identified. These same site conditions also have the potential to limit the effectiveness of many remedial technologies that involve the use of mass transfer to remove constituents from the soil matrix to a carrier fluid such as air and water. If remedial action is determined to be necessary for soils, technologies involving biotreatment should be considered.

Other potential technologies include soil washing, solidification, and landfarming. These technologies are typically very intensive, however, and one potential difficulty is that significant dewatering might be required under high water table conditions.

Additional data collected indicates that biotreatment has potential, however, the existing environment would have to be modified to promote optimal metabolic growth.

4.2 Groundwater Samples

Water level measurements and samples for quarterly groundwater monitoring analyses were obtained during the remedial investigation. Interpretations of the hydraulic gradient and potentiometric surface based on the September 1994 water level measurements are presented in Section 4.3.1. The results of the chemical analysis follow below.

4.2.1 Chemical Samples

Seventeen existing and newly installed monitoring wells were sampled for the following parameters: WQCC metals, major cations and anions, polynuclear aromatic hydrocarbons (PAHs), phenols, and benzene/toluene/ethylbenzene/xylene (BTEX). Temperature, pH, and conductivity parameters were monitored during purging until measurements stabilized to ensure that representative groundwater

samples were obtained. A more detailed discussion of the quarterly sampling results will be presented in an annual sampling report.

Seventeen wells are included in the quarterly groundwater monitoring program at the Brickland site. These are:

• MW-1	• MW-2	• MW-3S and MW-3D
• MW-4	• MW-5	• MW-6S and MW-6D
• MW-7	• MW-8	• MW-9S
• MW-11	• MW-12	• MW-14
• MW-15	• MW-16	• MW-17

Three existing monitoring wells are excluded from the quarterly sampling and analysis program. Well MW-13 is not sampled since construction details of this well are unknown. However, this well is checked for water level and presence of product. Well MW-9D is no longer sampled due to casing failure; this well is filled with sediment. Well MW-10 is not included for sampling and analysis due to the presence of a thick layer of floating hydrocarbon; this well is checked for water level and product thickness.

Polynuclear Aromatic Hydrocarbons (PAHs)

PAHs were detected in four monitoring wells located in the central and southern portion of the site. Analytical results for PAHs are shown in Table 10. Well MW-5 had reported concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene at 78, 12, and 27 µg/L, respectively. The sample from well MW-8 had a reported value of naphthalene at 93 µg/L. The nearby well MW-14 exhibited concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene at 160, 180, and 230 µg/L, respectively; MW-14 contained the highest level of the detected PAHs at the site. Well MW-15, near the southern boundary of the site, had reported values of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene at 61, 41, and 15 µg/L, respectively. PAHs were not detected in any other well.

Phenols

Phenols were detected in two wells near the central portion of the site. Analytical results for phenols are shown in Table 11. Well MW-8 had 2,4-dimethylphenol

Table 10
Polynuclear Aromatic Hydrocarbon Analytical Results
3rd Quarter Monitor Well Sampling (June/July 1994)
(All results in ppb)

Parameter	WQCC Std.	MW-1	MW-2	MW-3D	MW-3S	MW-4	MW-5	MW-6D	MW-6S	MW-7	MW-8	MW-9S
Acenaphthene	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1-Methylnaphthalene	TP	ND	ND	ND	ND	ND	78	ND	ND	ND	ND	ND
2-Methylnaphthalene	TP	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND
Naphthalene	30 *	ND	ND	ND	ND	ND	27	ND	ND	ND	93	ND
Phenanthrene	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Parameter	WQCC Std.	MW 11	MW 12	MW 14	MW 15	MW 16	MW 17
Acenaphthene	None	ND	ND	ND	ND	ND,ND	ND
Acenaphthylene	None	ND	ND	ND	ND	ND,ND	ND
Anthracene	TP	ND	ND	ND	ND	ND,ND	ND
Benzo(a)anthracene	None	ND	ND	ND	ND	ND,ND	ND
Benzo(b)fluoranthene	None	ND	ND	ND	ND	ND,ND	ND
Benzo(k)fluoranthene	TP	ND	ND	ND	ND	ND,ND	ND
Benzo(g,h,i)perylene	None	ND	ND	ND	ND	ND,ND	ND
Benzo(a)pyrene	0.7	ND	ND	ND	ND	ND,ND	ND
Chrysene	None	ND	ND	ND	ND	ND,ND	ND
Dibenzo(a,h)anthracene	None	ND	ND	ND	ND	ND,ND	ND
Fluoranthene	TP	ND	ND	ND	ND	ND,ND	ND
Fluorene	TP	ND	ND	ND	ND	ND,ND	ND
Indeno(1,2,3-cd)pyrene	None	ND	ND	ND	ND	ND,ND	ND
1-Methylnaphthalene	TP	ND	ND	160	61	ND,ND	ND
2-Methylnaphthalene	TP	ND	ND	180	41	ND,ND	ND
Naphthalene	30 *	ND	ND	230	15	ND,ND	ND
Phenanthrene	TP	ND	ND	ND	ND	ND,ND	ND
Pyrene	TP	ND	ND	ND	ND	ND,ND	ND

* - Standard for naphthalene includes monomethylnapthalene
NS = Not sampled
ND = Not detected
NA = Not analyzed
TP = WQCC toxic pollutant

3031/RTPAH.WQ2

Table 11
Phenols Analytical Results
3rd Quarter Monitor Well Sampling (June/July 1994)
(All results in ppb)

Parameter	WQCC Std.	MW-1	MW-2	MW-3D	MW-3S	MW-4	MW-5	MW-6D	MW-6S	MW-7	MW-8	MW-9S
Phenols												
2,4,6-Trichlorophenol	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	56	ND
2,4-Dinitrophenol	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrophenol	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	TP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	110	ND

Parameter	WQCC Std.	MW-11	MW-12	MW-14	MW-15	MW-16	MW-17
Phenols							
2,4,6-Trichlorophenol	TP	ND	ND	ND	ND	ND,ND	ND
2,4-Dichlorophenol	TP	ND	ND	ND	ND	ND,ND	ND
2,4-Dimethylphenol	None	ND	ND	ND	ND	ND,ND	ND
2,4-Dinitrophenol	TP	ND	ND	ND	ND	ND,ND	ND
2-Chlorophenol	None	ND	ND	ND	ND	ND,ND	ND
2-Nitrophenol	None	ND	ND	ND	ND	ND,ND	ND
4,6-Dinitro-2-methylphenol	None	ND	ND	ND	ND	ND,ND	ND
4-Chloro-3-methylphenol	None	ND	ND	ND	ND	ND,ND	ND
4-Nitrophenol	None	ND	ND	ND	ND	ND,ND	ND
Pentachlorophenol	TP	ND	ND	ND	ND	ND,ND	ND
Phenol	5	ND	ND	300	ND	ND,ND	ND

NS = Not sampled
NA = Not analyzed
ND = Not detected
TP = WQCC toxic pollutant

and phenol values at 56 and 110 µg/L, respectively, and MW-14 had a phenol concentration of 300 µg/L.

WQCC Metals

Third quarter groundwater sampling results indicate that many WQCC metals are not present at levels above the detection limit or are present at insignificant levels. As shown in Table 12, the metals not found above the detection limit include: chromium, cobalt, lead, mercury, molybdenum, and selenium.

Cadmium and silver were present at very low levels near the southerly portion of the property. One well contained cadmium at 0.009 mg/L, and two wells contained silver at 0.01 mg/L. Neither appear to be a result of facility operations.

Copper and zinc were detected at low levels across the site in no discernable pattern. Copper was detected in four wells at 0.01 mg/L, and zinc was detected in five wells and ranged from 0.01 to 0.09 mg/L.

Arsenic was detected in four wells near the southern portion of the property; arsenic values ranged from 0.05 to 0.08 mg/L.

Aluminum was detected in 10 wells, located along the bank of the Rio Grande and in the southern portion of the site. Aluminum values in groundwater ranged from 0.05 to 2.32 mg/L.

Barium, manganese, and iron are ubiquitous in the groundwater wells at the site. Barium values range from 0.02 to 1.24 mg/L; manganese from 0.01 to 7.47 mg/L; and iron from 0.06 to 5.79 mg/L. The distribution of these metals in groundwater across the site do not present a distinctive pattern.

Major Anions and Cations

Summarized analytical results for bicarbonate (HCO^{3-}), chloride (Cl^{-}), nitrate (NO^{3-}), and sulfate (SO_4^{2-}), calcium, magnesium, potassium, and sodium are shown in Table 13.

Bicarbonate values at the site range from 473 to 2,670 mg/L, and generally increase from the Rio Grande toward the interior of the site. Chloride values range from 39.3 to 7,200 mg/L, but do not show a consistent spatial pattern across the site.

Table 12
WQCC Metals Analytical Results
3rd Quarter Monitor Well Sampling (June/July 1994)
(All results in ppb)

Parameter	WQCC Std.	MW-1	MW-2	MW-3D	MW-3S	MW-4	MW-5	MW-6D	MW-6S	MW-7	MW-8	MW-9S
Aluminum	5.0	1.20	ND	0.23	2.32	ND	ND	0.06	0.08	0.07	0.12	ND
Arsenic	0.1	ND	ND	ND	ND	ND	ND	ND	0.08	ND	0.08	ND
Barium	1.0	0.18	ND	0.04	0.13	0.20	0.25	0.03	1.16	0.35	0.70	0.04
Cadmium	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	1.0	0.01	ND	ND	0.01	ND	ND	ND	ND	ND	0.01	ND
Iron	1.0	1.96	1.83	2.41	3.91	1.78	0.06	1.30	4.78	1.92	5.79	4.80
Lead	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	0.2	1.42	7.47	3.25	1.12	3.21	0.01	4.20	1.08	0.80	0.23	3.20
Mercury	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.05	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND
Zinc	10.0	0.01	ND	ND	0.09	ND	ND	ND	ND	ND	0.02	ND

Parameter	WQCC Std.	MW-11	MW-12	MW-14	MW-15	MW-16	MW-17
Aluminum	5.0	0.10	ND	ND	0.32	ND	0.05
Arsenic	0.1	0.07	ND	0.05	ND	ND	ND
Barium	1.0	1.10	0.02	0.67	0.28	0.31	1.24
Cadmium	0.01	0.009	ND	ND	ND	ND	ND
Chromium	0.05	ND	ND	ND	ND	ND	ND
Cobalt	0.05	ND	ND	ND	ND	ND	ND
Copper	1.0	0.01	ND	ND	ND	ND	ND
Iron	1.0	4.68	3.89	4.78	0.52	ND	0.21
Lead	0.05	ND	ND	ND	ND	ND	ND
Manganese	0.2	0.67	5.90	4.13	1.06	2.77	3.16
Mercury	0.002	ND	ND	ND	ND	ND	ND
Molybdenum	1.0	ND	ND	ND	ND	ND	ND
Nickel	0.2	ND	ND	0.07	ND	ND	0.05
Selenium	0.05	ND	ND	ND	ND	ND	ND
Silver	0.05	0.01	ND	ND	ND	ND	ND
Zinc	10.0	0.01	0.01	ND	ND	ND	ND

ND = Not detected

Table 13

Major Anions/Cations Analytical Results
3rd Quarter Monitor well Sampling (June/July 1994)
(All results in ppb)

Parameter	WQCC Std.	MW-1	MW-2	MW-3D	MW-3S	MW-4	MW-5	MW-6D	MW-6S	MW-7	MW-8	MW-9S
Potassium	None	13.7	125	61	28	66	58	62	40	37	20.0	27
Sodium	None	105	3040	2760	1040	2050	2230	3100	1120	710	1150	1090
Bicarbonate	None	488	769	473	756	1350	1710	739	2020	1330	2670	820
Chloride	250	39.3	6770	6560	2630	4300	5450	3990	2090	1210	1380	1350
Nitrate (N)	10	0.3	0.3	0.1	0.4	2.8	0.3	10	0.4	0.3	0.5	1.4
Sulfate	600	150	2790	2550	1010	932	962	2420	84	575	60	2010

Parameter	WQCC Std.	MW-11	MW-12	MW-14	MW-15	MW-16	MW-17
Potassium	None	29	76	11.4	23	35,30	38
Sodium	None	820	3300	730	458	1500,149	610
Bicarbonate	None	1830	672	1490	723	1100,109	1100
Chloride	250	927	7200	910	436	1910,187	1350
Nitrate (N)	10	1.3	0.2	ND	ND	ND,ND	0.3
Sulfate	600	18	2350	200	294	1510,178	318

ND = Not detected

3031/RPTANC.WQ2

Nitrate was not detected in three site wells. Concentrations in all other wells ranged from 0.1 to 10 mg/L. The highest nitrate value, 10 mg/L, is from MW-6D, adjacent to the Rio Grande. The next highest nitrate value, 2.8 mg/L, is from MW-4, in the central portion of the site. There is no discernable or consistent spatial pattern of nitrate occurrence across the site.

Sulfate values range from 18 to 2,790 mg/L in groundwater at the site. While there is no distinctive pattern for this anion, wells along the Rio Grande appear to show the highest values of sulfate, particularly the deeper wells.

Calcium concentrations ranged from 57.7 to 1,080 mg/L across the site, and are generally highest in upgradient wells and those closest to the Rio Grande. Magnesium concentrations ranged from 15.4 to 500 mg/L and show the same general trend as calcium. Potassium and sodium concentrations ranged from 11.4 to 125 mg/L and 105 to 3,300 mg/L, respectively, and show trends similar to calcium and magnesium.

BTEX

Analytical results for BTEX compounds in groundwater are summarized in Table 14. Benzene was detected in groundwater samples from 11 of the 17 monitoring wells. Values ranged from 0.6 µg/L to 23,000 µg/L in groundwater. Very low to intermediate concentrations (0.6 to 110 µg/L) were detected in wells along the Rio Grande and near the southern portion of the facility. The highest values of benzene (1,800 to 23,000 µg/L) were located in the central portion of the property.

Toluene was only detected in one monitoring well near the central portion of the site; the reported value was 12 µg/L. Ethylbenzene was reported in four wells, two located near the Rio Grande and two within the central and southern portion of the property. Ethylbenzene values in these wells ranged from 13 to 50 µg/L. Xylene was detected in the wells in the central and southern portions of the property and in two wells along the Rio Grande. Concentrations ranged from 0.6 µg/L to 130 µg/L.

4.2.2 Interpretation of Groundwater Sampling Results

The results of the quarterly groundwater sampling conducted during the remedial investigation augment the results of the soil sampling investigation and provide

Table 14
BTEX Analytical Results
3rd Quarter Monitor Well Sampling (June/July 1994)
(All results in ppb)

Parameter	WQCC Std.	MW-1	MW-2	MW-3D	MW-3S	MW-4	MW-5	MW-6D	MW-6S	MW-7	MW-8	MW-9S
Benzene	10	1.3	ND	0.6	0.8	1800	5000,4200	ND	110	ND	2400	ND
Toluene	750	ND	ND	ND	ND	12	ND,ND	ND	ND	ND	ND	ND
Ethyl Benzene	750	ND	ND	ND	ND	50	ND,ND	ND	30	ND	ND	ND
Xylenes	620	ND	ND	ND	ND	ND	130,130	ND	88	3.2	ND	0.6
Total Vol. Petroleum Hydrocarbon	None	NA	NA	NA	NA	NA	NA,NA	NA	NA	NA	NA	NA

Parameter	WQCC Std.	MW-11	MW-12	MW-14	MW-15	MW-16	MW-17
Benzene	10	ND	1.9	23000	34	ND,ND	17
Toluene	750	ND	ND	ND	ND	ND,ND	ND
Ethyl Benzene	750	ND	ND	ND	13	ND,ND	19
Xylenes	620	ND	ND	ND	13	2,11	30
Total Vol. Petroleum Hydrocarbon	None	ND	ND	NA	NA	NA	NA

NA = Not Analyzed
ND = Not detected
NS = Not sampled

3031/RPTT

insight into the distribution of background levels of naturally occurring compounds vs. those indicated to be associated with the site activities.

The concentrations and distributions of WQCC metals and major anions/cations found in on- and off-site monitoring wells indicate that existing concentrations in soil have not been a source for the constituents detected in groundwater underlying the site. The levels of barium, iron, and manganese found in groundwater at the site are similar to those reported from shallow aquifers at other locations along the Rio Grande. Similarly, major cations and anions are highest in groundwater wells located upgradient and along the bank of the Rio Grande. The chemistry of the shallow groundwater at the Brickland site indicates that the water is saline and sulfate-rich, and not a potable groundwater source. The chemistry also indicates that the brackish water has a high scaling potential.

The presence and location of BTEX compounds, PAHs, and phenols in the groundwater coincide very well with areas of known hydrocarbon occurrences in soil, although it appears that there may be low-level sources of benzene upgradient of the site. Groundwater impacts associated with historic site operations are concentrated in the areas of the old refinery near the west-central portion of the facility and the pond area near the southern boundary of the site. Soils at these locations are continuing sources of hydrocarbon constituents. Monitoring wells within these areas show elevated concentrations of benzene, phenol, 1-methylnapthalene, and naphthalene. It is also apparent that benzene has migrated from the site at and near the location of MW-6S.

4.3 Geology and Hydrology

4.3.1 Regional Geology and Hydrology

The Brickland Refinery site is located within the southern part of the Mesilla Basin and Range Province and is situated on the western flood plain of the Rio Grande, between the southern tip of the Franklin Mountains and Cerro de la Cruz (Cerro de Muleros).

Geologic structures in the area are a result of deformations associated with the Tertiary andesitic and felsic Cristo Rey uplift. On the east side of the uplift, adjacent to the river, a series of southeast to northwest trending structural features are present. They have been identified from west to east as the Aqueduct anticline, the Power Line syncline, and the Brick Plant anticline (Lovejoy 1976).

The Brickland site is located at the approximate crest of the Brick Plant anticline. Several southeast to northwest trending normal faults (up to the east) are also present associated with the folding. The surface expression of these faults can be seen in the Cretaceous outcrop just beyond the southeastern edge of the Brickland property. At least one of the major faults is believed to extend across the southern end of the site.

The rocks exposed at the surface are relatively recent (Holocene) alluvial deposits of the Rio Grande. The alluvium extends along the river flood plain and covers much of the Cretaceous deformation and faulting at the site. Below the alluvium, to the north, east, and south of the site is the Quaternary/Tertiary Santa Fe Group (bolson deposits) also known as the Fort Hancock Formation. The bolson sediments rest unconformably above the Cretaceous rocks and are composed of alternating lenticular beds of sand, clay, and gravel. The bolson deposits are not present below the Brickland site where the Rio Grande Alluvium is underlain by erosionally breached, Lower Cretaceous rocks.

Groundwater in the region is supplied by three major sources: (1) the Hueco bolson deposits (Santa Fe Group - Lower El Paso Valley), (2) the Mesilla bolson deposits (Santa Fe Group - Upper El Paso Valley), and (3) the Rio Grande Alluvium. A portion of the water supply for the city of El Paso is also taken from the surfacewaters of the Rio Grande. The supply intake is located in the American Canal approximately 4 miles downstream of the Brickland site.

The Hueco bolson aquifer is located primarily on the east side of the Franklin Mountains and along the Rio Grande to the southeast. It is not present near the Brickland Refinery site, but is hydrologically connected to both the Mesilla bolson and the Rio Grande Alluvium (Alvarez & Buckner 1980).

The Mesilla bolson aquifer is present in several wells located across the river from the Brickland site. This aquifer is a thick section of older alluvium (up to 2,000 feet in thickness) that extends approximately two miles east of the river, up the slope of the Franklin Mountains. North from Cerro de Cristo Rey, the formation spreads to the west as valley fill for the Mesilla basin. Use of the Mesilla aquifer near the site is minimal.

The Rio Grande Alluvium aquifer is approximately 80 feet thick (Richardson, 1909) and is confined near the site to the present river flood plain. In most places, the recent alluvium has been deposited above the Mesilla and Hueco bolson. It is hydrologically connected with the underlying aquifers and the Rio Grande.

4.3.2 Local Geology and Hydrology

The shallow geology at the site is composed of Quaternary (Holocene) alluvium deposited by the Rio Grande. It consists of clay, silt, sand, and gravel that ranges from thin-bedded heterogeneous lenses to massive homogeneous units. The sediments encountered during the soil boring and trenching operations can best be described in two general categories: the shallow, thin-bedded heterogeneous clastics, and the deeper more homogeneous sands.

The base of the shallow unit has been identified by a somewhat consistent, pale brown, silty clay at approximately 7 to 9 feet below the surface (11 to 14 feet on the southern end of the site). The shallow unit consists of thin-bedded, fine-grained sand, silt, and silty clays that can rarely be correlated over a distance greater than 150 to 200 feet. The sediments were likely deposited by flood stage waters from the adjacent river. On the south end of the property, the upper portion of the shallow unit has apparently been removed either by erosion or the excavation of the former Brickland refinery waste ponds. The shallow soil in this area presently consists of a yellowish-brown, fine- to medium-grained sand believed to have been dredged from the river to back-fill the ponds. A remnant of the silty clay base of the shallow unit is present at approximately 8 to 11 feet in borings B-12 and B-13. The aquifer encountered in this shallow unit is partially confined to the sandier members, with the clay layers acting as aquitards.

Below the deepest silty clay is a massive, homogeneous, gray to yellow-brown, fine-grained sand characterized by well-sorted, subrounded sand grains that appear to coarsen with depth. Monitoring well drilling logs from previous investigations in some of the deeper wells. The aquifer in the deeper unit appears to be partially confined by the overlying silty clay, and appears hydraulically connected to the shallow aquifer at various locations across the property. Both the deep and shallow aquifers are strongly influenced by the hydrology of the Rio Grande.

Plate J was prepared with the water level obtained data from the site monitoring wells. The map indicates the hydraulic gradient under the assumption that both the shallow and deeper lithologic units are hydrologically connected.

5.0 Conclusions

The results of the investigation provide an estimate of the vertical and horizontal distribution of petroleum hydrocarbons at the former Brickland refinery site. Plates K, L, and M show the transverse and horizontal extent of subsurface petroleum constituents, based upon the results of this and previous investigations. Plate N shows the areal extent of petroleum contamination, based upon this information; soil TPH values within this area generally exceed 100 mg/kg.

The hydrocarbons contained in site soils have impacted underlying groundwater, and provide a continuing source via this pathway. The fluctuation of the shallow groundwater beneath the site has produced a "smear zone" in which the more mobile petroleum hydrocarbons have been transported vertically and horizontally through site soils.

Sampling results indicate that lead is the only site-related metal of concern in soil. At one location, lead values in soil exceed TCLP limits, however, lead has not been detected in any groundwater monitoring well to date. No other metals of concern have been noted in either soil or groundwater.

Biological and geotechnical parameters at the site indicate that naturally occurring biodegradation processes may be augmented within the site soils. Clay types and cation-exchange capacities suggest that contaminants are being adsorbed onto site soils, and are only slowly being released to groundwater.

Based on water levels collected by GCL, both the shallow and deep lithologic units are in direct communication with the Rio Grande. In July 1994, when monitoring wells were measured, the river was flowing at a capacity approaching flood stage. As a result, the potentiometric contour map reflects a condition where the river is losing, and therefore, recharging the aquifer as demonstrated by the decrease in potentiometric contours away from the river bank. Groundwater flow direction is primarily toward the south end of the site with a hydraulic gradient of about 0.0016 (ft./ft.).

On the basis of the local geologic and hydrologic data, the shallow flood plain aquifer at the Brickland site appears to be in communication with the river. The sandy sediments that make up the aquifer are bounded to the north and east by the recharging barrier of the Rio Grande and to the west and south by Cretaceous bedrock (Lovejoy, 1976).

Based on the September 1994 potentiometric contour map, the shallow aquifer beneath the site discharges to the south and southeast as throughflow. Additional discharge through fractured Cretaceous bedrock located below the flood plain sediments cannot be ruled out, but is expected to be small relative to throughflow. As noted earlier, the system of southeast to northwest trending normal faults, related to the Cristo Rey Uplift, were identified from surface geologic mapping and available literature (Lovejoy, 1976). Groundwater from the deeper homogeneous sediments may also be discharging into the fracture system, causing several localized areas of natural potentiometric surface depressions.

6.0 Recommendations

GCL recommends that groundwater beneath the site continue to be monitored for an additional two consecutive quarters prior to initiation or selection of any remedial action. This monitoring should consist of sampling the current network of 17 monitoring wells, and analyzing those samples on a quarterly basis for BTEX, TPH, PAH(s), phenolic compounds, and WQCC metals. In addition, groundwater monitoring should include collection of groundwater level data from all 20 monitoring wells and 37 well points associated with the site. This monitoring will verify and document suspected seasonal variations in contaminant trends and groundwater movement patterns. This information will also aid in the design of any remedial system that has to account for these seasonal variations.

At this point there does not appear to be a significant risk to potential receptors via a groundwater or surfacewater pathway. However, if after two consecutive quarters, it is verified that contaminated groundwater from the site impacts the only known potential receptor pathway (i.e., the Rio Grande) a Remedial Action Plan will be prepared and submitted to the New Mexico Oil Conservation Division. The plan will provide recommendations to mitigate any potential threats to human health or the environment from the Brickland site.

Although remedial actions are not anticipated, such actions might include containment of contaminated groundwater on site by a pump-and-treat system, and the cut-off and/or treatment of known and suspected source areas. The source areas are suspected to be localized areas of free-phase floating product and petroleum-contaminated soil zones that are hydraulically permeable and exhibit leaching characteristics. To date, metals in groundwater do not appear to pose any serious problems. Implementation of any remedial actions would take a phased approach to integrate the understanding of site characteristics with assessments of potential risks and provide a cost-effective remedy. The effectiveness of a phased approach can be assured by including provisions for ongoing monitoring at the Brickland site.

7.0 References

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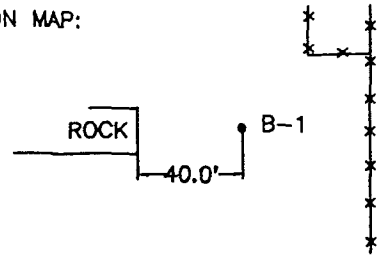
Appendix A

Lithologic Descriptions for Soil Borings,
Monitor Wells, and Test Trenches

LITHOLOGIC LOG (CORE)

LOCATION MAP:



___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

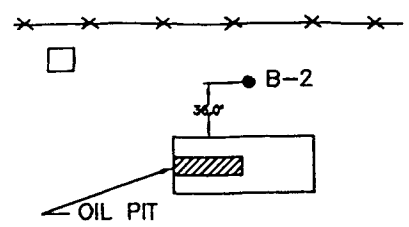
SITE ID: REXENE LOCATION ID: B-1
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM\LEXAN TUBE
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/17/94 DATE COMPLETED: 6/17/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: ONE FOOT AWAY FROM ATTEMPT MADE 6/16/94

LOCATION DESCRIPTION: _____

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
1			PUSH W/ DRILL-ING	0	2	30		SILT AND CLAY LT. BROWN, OR ANGULAR GRAVEL W/ ORGANIC MATERIAL.
2								
3			PUSH W/ DRILL-ING	2	4	60		CLAY REDDISH BRN TO DK BRN. W/O LITTLE < 5% UFN GR SAND, NO STRINGERS OF SAND. MOIST CLAY.
4								
5			PUSH W/ DRILL-ING	4	6	100		CLAY BROWN W/ SOME VERY SMALL SAND POCKETS, AND SOME APPARENT N.C. STAINS UFN. OR SD. (NOT CONTINUOUS LAYERS) MOIST
6								
7			PUSH W/ DRILL-ING	6	8	70		CLAY DK. BROWN, INCREASING SAD, UFN GR, W/S, SUB-ANGULAR, IN POORLY DEFINED LENSES WITHIN THE CLAY, WET
8								* SAMPLE WET BELOW ≈ 6.0' FL IN WELL 3.8' BELOW SURFACE BORING TO BE PLUGGED
9								
10								

LITHOLOGIC LOG

LOCATION MAP:



___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

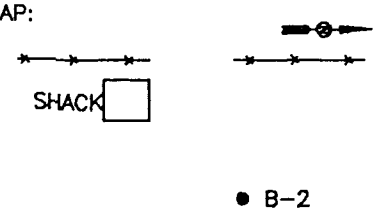
SITE ID: REXENE LOCATION ID: B-2
SITE COORDINATES (ft.):
N ___ E ___
GROUND ELEVATION (ft. MSL): ___
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM\LEXAN TUBE
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/17/94 DATE COMPLETED: 6/17/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: BORING TO BE PLUGGED

LOCATION DESCRIPTION: ___

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	FROM	TO	% REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
								GRAVEL FILL 6" SILT W/ ANGULAR FRAG OF GRAVEL LT BRN 10 YR 6/2
1			AUGER PUSH	6"	2'	60		CLAY W/ <5% FN GR SAND, BLK, HEAVY STAIN AND ODOR. N2
2								CLAY (AS ABOVE) LESS STAIN AND ODOR SLIGHTLY W/ DEPTH, NO SAND STRINGERS N2
3			AUGER PUSH	2'	4'	60		
4								SAND (AT 4-1/2 FT.) WITH CLAY ≈ 30% DK. BRN, (HC STAIN) FN GRAIN, W/S, SUB ROUNDED-ROUNDED, (WTR SAND) BTM OF SAND AT 5.75 (WET) SY 4/1
5			AUGER PUSH	4'	6'	100		
6								CLAY, BRN-DK BRN, < 5% SAND INC. W/ DEPTH (WET) TD LITH HOLE AT 8' 5YR 5/2
7			AUGER PUSH	6'	8'	70		
8								CLAY, 5YR 5/2, < 5% SAND, FN GR W/S , SUBANGULAR
9			AUGER PUSH	8'	10'	50		
10								FLUID LEVEL IN HOLE RECOVERED TO ≈

LITHOLOGIC LOG (CORE)

LOCATION MAP:



___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-3
SITE COORDINATES (ft.):
N 289061.96163 E 1551880.27191
GROUND ELEVATION (ft. MSL): 3131.71
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM\LEXAN TUBE
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/17/94 DATE COMPLETED: 6/17/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS:

LOCATION DESCRIPTION:

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	FROM	TO	% REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
1			PUSH WITH AUGER	6"	2'	40		GRAVEL, DEBRIS, FILL SANDY SILT V. FN GR ≈ 10% SD DRY, LT BRN 10YR 6/2, ANGULAR, W/G, ROUNDED TO ANGULAR GRAVEL, DEC. W/ DEPTH
2								SAND, FN GRAIN– V. FN GRAIN, ≈ 15% CLAY MOIST, PALE BRN. 5YR 5/2, SUB RND, W/S, RELATIVELY CLEAN. CLAY, NO GRAINS, < 5% SD, MOIST, BLACK, HEAVY STAIN, AND HEAVY ODOR, DENSE. STICKY.
3			PUSH WITH AUGER	2'	4'	40		
4								SILTY SAND, V. VN. GR, 10–20% SILT, WITH MINOR CLAY, WET, PALE BRN 5YR 5/2, SUB RND–SUB ANG., WELL SORTED, UNCONSOLID. H.C. ODOR. (SLIGHT)
5			PUSH WITH AUGER	4'	6'	100		
6								SILTY CLAY, V FN., 10% SILTY, WET PALE BROWN. 5YR 5/2, SAME HYDROC STAINING
7			PUSH WITH AUGER	6'	8'	90		SILTY SAND, V FN, GRN, 20–30% SILT, W/ MINOR CLAY, WET, PALE BRN 5YR 5/2, SUB RND–SUB ANG.
8								
9								
10								TD = 8' WATER LEVEL RECOVERED TO ≈ 2' BELOW SURF.

LITHOLOGIC LOG (CORE)

LOCATION MAP: SEE MAP

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-4 (MW-14)
SITE COORDINATES (ft.):
N 288993.83608 E 1551953.24319
GROUND ELEVATION (ft. MSL): 3730.40
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/19/94 DATE COMPLETED: 6/19/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: MUCH MOVE SAND IN THIS WELL, CONVERT TO MONITOR WELL #14

LOCATION DESCRIPTION:

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
								GRAVEL, FILL, DEBRIS
				6"	2'	20		SILT, V FN GR, < 10% SAND, 20% GRAVEL DRY, PALE YELLOW BRN (10YR 6/2), ANG, POOR SORT, CONSOLID.
2								
				2' WET AT BASE	4'	70		SILTY CLAY, 20% SILT, <10% SAND, DRY (10YR 5/2) HC STAIN, ANG, CONSOLID.
4								
				4' WET, SANDY SILT PROD	6'	80		SILTY SAND, 40% SILT, V FN GR., WET, DK YELLOWISH BRN, (10YR 4/20) ANG TO SUB-RNDED, W/S, MOD. CONSOLID, NO STAIN/ODOR
								CLAY, WET, PALE BRN (5YR 5/2) CONSOLID.
6								SILTY SAND (AS 3.5-5) NO STAIN OR ODOR
				6' WET SAND/CLAY	8'	100		SILTY SAND, V FN GR, 20% SILT, WET (5YR 5/2) RND, W/S UNCONSOLID.
8								SILTY CLAY (SEE 2')
				8' WET SAND	10'	90		SAND, FN GRN. TO MED GR, WET DK, YELLOWISH BRN, (10YR 4/2) SUB RND, W/S, UNCONSOLID (FLOW SAND)
10								GREAT DIFFICULTY CATCHING SPLIT SPOON SAMPLE.
				10' WET SAND	12'	50		
12								
				SAND TOO WET TO SAMPLE				
14								
16								SAND, MED GR, WET, DK YELLOWISH BRN, (10YR 4/2), RND-SUB RND, WELL SORTED, UNCONSOLID, 80% QTZ. (FLOW SAND)
				MED GR SAND				
18								
20								

LITHOLOGIC LOG (CORE)
(Continued)

LOCATION ID: B-4 (MW-14)

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE NUMBER OR PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
22								SAND AS ABOVE
24								TD = 23'
26								
28								
30								
32								
34								
36								
38								
40								
42								
44								
46								

LITHOLOGIC LOG (CORE)

LOCATION MAP: SEE SITE MAP

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-5
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM\LEXAN TUBE
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/17/94 DATE COMPLETED: 6/17/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: _____

LOCATION DESCRIPTION: _____

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	FROM	TO	% REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
1			AUGER PUSH	6"	2'	30		GRAVEL, FILL AND DEBRIS SANDY SILT, V. FN FRN, < 10% SAND, WITH ≈ 10% CLAY, DRY. LT BRN, (10YR 6/2), ANGULAR, M/5, SAME SMALL GRAVEL
2								
3			AUGER PUSH	2'	4'	40		SILTY CLAY, V. FN GRN, ≈ 20–30% SILT, DRY, PALE BRN. (5YR 5/2), SUBRND. W/S, DENSE, STICKY. STAINED (HC) AT TOP OF UNIT, AND AT BASE, REL. CLEAN
4								
5			AUGER PUSH	4'	6'	90		CLAYEY SILT, V FN GRN, ≈ 50% CLAY, MOIST, DK BRN (HC STAINED), ROUNDED, W/S, STRONG HC ODOR. SILTY SAND, V FN GRN, ≈ 40% SILT, WET, GRAYISH BRN (5YR 3/2), SUB-RND TO ANG, WELL SORTED, UNCONSOL. HC ODOR.
6								SANDY SILT, V FN GRN, ≈ 30% SAND WET, PALE BRN (5YR 5/2) ANGULAR W/S, UNCONSOLID. TO REL CONSOLID, NO HC STAIN, SLIGHT HC ODOR
7			AUGER PUSH	6'	8'			TD = 8'
8								
9								
10								

LITHOLOGIC LOG (CORE)

LOCATION MAP: SEE MAP

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-6
SITE COORDINATES (ft.):
N 289167.85159 E 1552005.02334
GROUND ELEVATION (ft. MSL): 3731.37
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/18/94 DATE COMPLETED: 6/18/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: ADJACENT TO WP # 29

LOCATION DESCRIPTION:

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
0	WELL POINT 29 SCREEN							GRAVEL, DEBRIS AND FILL
1								SANDY SILT, V FN GRAIN, ≈ 20% SILT, DRY, LT BRN (10YR 6/2) ANGULAR, M/S, CONSOLID. ANGULAR GRAVEL, SALT.
				6"	2'	30		SILTY CLAY, V. FN GRAIN, < 10% SILT, MOIST NEAR BOTTOM, GRAYISH BRN, (5YR 3/2) SUB-RND, W/S, HS ODOR NO SIGNIF. STAINING.
2								
3				2'	4'	100		SILTY SAND, V. FN. GR. 20-30% SILT, WET, PALE BRN (3YR 5/2) SUB-ANG, W/S, (HC ODOR) UNCONSOLID, NO SIGNIF. STAIN.
4								
5				4'	6'	80		SILTY CLAY V FN. GR. ≈ 20% SILT, WET PALE BRN (5YR 5/2) SUB-RND, W/S.
								SILTY SAND (AS ABOVE 3-5')
6								SILTY CLAY (AS 5-5.5')
7				6'	8'	100		SAND, FN GRAIN, < 10% SILT, WET, PALE BRN (5YR 5/2) RND, W/S, HC ODOR, NO STAIN.
8								TD = 8'
								• LEL TO 1% DURING DRILLING
9								FLUID LEVEL AFTER DRIL ≈ 1.0" B.S.
10								

LITHOLOGIC LOG (CORE)

LOCATION MAP: SEE MAP

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-7
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/18/94 DATE COMPLETED: 6/18/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: _____

LOCATION DESCRIPTION: SAGE BRUSH AND DEBRIS, APPARENT SALT AT SURF.

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	FROM	TO	% REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
								GRAVEL, FILL MATERIAL
1			PUSH WITH AUGER	6"	2'	15		SANDY SILT, FN GRAIN, 20% SAND, DRY, YELLOWISH BRN (10YR 5/4), ANGULAR, MED SORT (M/S), MOD. CONSOLID. SAND INC W/DEPTH. HC STAIN AT BASE OF UNIT.
2								SILTY CLAY, V FN GRN, <10% SILT, DRY, GRAYISH BRN (5YR 3/2), RND, W/S, MOD. CONSOLID. MOTTLED HC STAINING
3			PUSH WITH AUGER	2'	4'	70		
4								SILTY SAND, FN GRN, 10% SILT, WET, YELLOWISH BRN (10YR 4/2), RND-TO WELL ROUDN, W/S, UNCONSOLID., THIN ZONE, WATER SAND.
5			PUSH WITH AUGER	4'	6'	90		SILTY CLAY, V. FN. GRN, <10% SILT, WET, GRAYISH BRN (5YR 3/2), RND-SUB RND, W/S, SLIGHT HC ODOR, NO SIGNIF STAIN.
6								COULD NOT CATCH WET SAMPLE. APPEARED SANDIER THAN ABOVE UNIT, (CUTTINGS) WET.
7			PUSH WITH AUGER	6'	8'	10		
8								FL ≈ 1.0 FT B.S. TD = 8'
9								
10								

LITHOLOGIC LOG (CORE)

LOCATION MAP: SEE MAP

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-8
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/18/94 DATE COMPLETED: 6/18/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: NEAR DUMPSITE

LOCATION DESCRIPTION: _____

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
0								GRAVEL, DEBRIS, SANDY FILL, BROWN, NO STAIN OR ODOR.
1				6"	2'	50		SANDY SILT, FINE GRAIN SD, ≈ 10% SAND, DRY, YELLOW BRN, (10YR 5/4) ANGULAR, M/S, CONSOLID. W/ ANGULAR, PEBBLE GRAVEL
2								SILTY CLAY, V FN GRAIN, 20–30% SILT, MINOR SAND, DRY, DUSKY YELLOWISH BRN (10YR 2/2) (HC STAINED), ANGULAR GRNS, W/S, CONSOLID, STRON HC ODOR AND STAIN.
3				2'	4'	25		
4								SILT, V FN GRAN, (W/ INTERBEDD– 6" SILTY CLAY BEDS) WET, BLACK (HC STAIN) ANG–SUB RND, W/S, GRAINS, MOD. CONSOLID, STRONG HC ODOR AND STAIN.
5				4'	6'	80		
6								SILTY SAND, V FN GR, 10–20% SILT. MINOR CLAY, WET, GRAYISH BRN, (5YR 3/2) RND–SUB RND, W/S, GRN, UNCONSOLID. HC STAIN AND ODOR IN UPPER UNIT, NO STAIN IN LOWER FOOT. TD = 8'
7				6'	8'	90		
8					WET SAND			
9								
10								

LITHOLOGIC LOG (CORE)

LOCATION MAP: SEE MAP

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-9
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/18/94 DATE COMPLETED: 6/18/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: HEAVY BRUSH, NO GRAVEL, LESS DEBRIS

LOCATION DESCRIPTION: _____

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
1				6"	2'	30		SILTY FILL, ORGANIC MATERIAL AND DEBRIS SANDY SILT, V. FN GR, 20% SAND, CLAY DK YELLOWISH BRN (10YR 5/4) ANGULAR, MED/SORT, CONSOLID.. NO STAIN, OR ODOR.
2								
3				2'	4'	30		SILTY SAND, FN GRAIN, 30% SILT, DRY, GRAYISH BRN (5YR 5/2), RND-SUB RIND, W/S, MOD. CONSOLID, NO ODOR OR STAIN. WET AT BTM. OF UNIT.
4								
5				4'	6'	100		SILTY CLAY, V,V, FN GR, 30-40% SILT, WET, GRAY (N4)(HC STAIN), WELL SORT, MOD. CONSOLID., LENSES OF LIGHT GRAY CLAY.
6								SILTY SAND, V. FN GR, 20% SILT, WET GRAYISH BRN (5YR 5/2) RND-SUB RND, W/S, MOD CONSOLID, NOT STAIN OR ODOR.
7				6'	8'	90		SILTY CLAY, V FN GR, 10% SILT WET, GRAYISH BRN (5YR 5/2), W/S. NO STAIN OR ODOR. SILTY INCREASE SLIGHTY W/ DEPTH. TO TD OF 12'.
8								
9				8'	10'	90		
10								

LITHOLOGIC LOG (CORE)
(Continued)

LOCATION ID: B-9

DEPTH	WELL CONST.	LITH.	SAMPLE					LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
			USCS	FROM	TO	% REC	NUMBER OR PID READING	
11				10	12	90		
12								TD = 12' (SAME LITH)
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								

LITHOLOGIC LOG (CORE)

LOCATION MAP:

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-10
SITE COORDINATES (ft.):
N 288429.59539 E 1552201.23136
GROUND ELEVATION (ft. MSL): 3733.52
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/20/94 DATE COMPLETED: 6/20/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: BORING IN SAND AREA, USED TRACK HOE TO MOBILIZE RIG (NEAR WP 30)

LOCATION DESCRIPTION: SAND DUNED W/ SOME SPARSE VEG.

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	FROM	TO	% REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
1			AUGER PUSH	0	2	40		SAND, MED GR., <10% CLAY, DRY, PALE YELLOWISH BRN. (10YR 6/2), ANGULAR–SUB ANG, MED SORT, UNCOSOLID. (DUNES)
3				2	4	40		SAND, MD–FN GRN, ~ 20% SILT, DRY, MOD. YELLOWISH BRN (10YR 5/4), SUB ANG–SUB RND, MOD. SORTED, UNCONSOLID.
4								SILTY CLAY, V FN GRN. 40% SILT, MOIST, PALE YELLOWISH BR. (10YR 6/2), CONSOLID. NO HC STAIN OR ODOR.
5				4	6	30		
6								SILTY CLAY, V. FN GR, <10%, SILT, DRY , GRAYISH BRN (5YR 7/2), CONSOLID. NO HC ODOR, STAIN AT BASE.
7				6	8	30		
9				8	10	70		SILTY SAND, V. FN GR, ~ 20% WILT, WET, BROWNISH GRAY (5YR 4/1), ANG–SUB ANG, W/S, MOD CONSOLID, STRONG HC ODOR, POSS. HC STAIN.
10								SANDY SILT, V FN GR, <10% SAD, WET PROD PRESENT CONSOLIDDATED (5YR 3/2)

LITHOLOGIC LOG (CORE)
(Continued)

LOCATION ID: B-10

DEPTH	WELL CONST.	LITH.	SAMPLE					LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
			USCS	FROM	TO	% REC	NUMBER OR PID READING	
11				10	12	60		
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								

LITHLOGIC LOG (CORE)

LOCATION MAP: SEE MAP

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-11
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/20/94 DATE COMPLETED: 6/20/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: _____

LOCATION DESCRIPTION: SAND DUNES

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
				0	2	30		NO SAMPLE, SPUD IN SAND (AS BELOW)
2								SAND, MED GRAIN, <5% SILT, DRY, PALE BROWN (5YR 5/2) RNDED – SUB RND, WELL SORTED, UNCOSOLIDATED, NO ODOR OR STAIN.
				2	4	80		
4								
				4	6	40		SILT. V. FN GRN, <10% CLAY, MOIST, BLACK, HC STAINED, W/S, MOD. CONSOLIDATION, STR HC ODOR.
6								
				6	8	30		SILTY SAND, F FN GRN, 30% SILT, MINOR CLAY, WET, HEAVY HC STAIN AND ODOR (BLACK), SUB RND, W/S, MOD CONSOLIDATION.
8								
				8	10	90		SAND, VN GR, <10% SILT, WET, PROD. SATURATED, DK GRAY – BLK (HC STAIN) RND – SUB RND, W/S, MOD. CONSOLID TO UNCONSOLID. (STRONG HC ODOR/FREE PRODUCT.
10								
				10	12	100		SILTY CLAY, 10% SILT, DK BRN, MOTTLED WITH HC STAINING (BLK). MOD CONSOLID. STRONG HC ODOR.
12								TD = 12'
14								
16								
18								
20								

LITHOLOGIC LOG (CORE)

LOCATION MAP:

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-12(MW-16)
SITE COORDINATES (ft.):
N 288172.59247 E 1552284.09469
GROUND ELEVATION (ft. MSL): 3737.07
STATE: NEW COUNTY: DONA ANAN
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: DALE LITTLEJOHN
DATE STARTED: 6/21/94 DATE COMPLETED: 6/21/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: CONNECTED TO MONITOR WELL # 16

LOCATION DESCRIPTION:

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
0								SAND, MED GR., DRY, PALE YELLOWISH BRN (10YR 6/2), SUB-ANGULAR, MOD. SORTED, UNCONSOLID, NO STAIN OR ODOR.
2								
4								
6								SAND. FN GR, MOD. YELLOW BRN, (10YR 6/2), ANGULAR, WELL SORTED, UNCONSOLID. NO ODOR /OR STAIN.
8								CLAY, (V. FN SR. SILT) <10% SILT, DK. YELLOW BRN (10YR 4/2) CONSOLID. HC STAIN AT BASE OF UNIT ONLY. HC ODOR AT BASE OF UNIT.
10							NOTE : 8' TO 16' LOGGED FROM ___ HOLE, OTHER SAMP. DESC DETERM, FROM MON. WELL.	SILT, V FN GR, 30% CLAY, MOIST, GRAY, HC STAIN AND ODOR, W/S CONSOLID.
12								SILTY SAND, FN GR, 50% SILT, WET, GRAY, HC STAIN AND ODOR, MOD. CONSOLID, SUB RND, MED SORT.
14								* [THIS INTERVAL WAS NOT STAINED BUT SATURATED WITH PROD. SOME INTERVAL IN MON. WELL (10's) DID NOT!]
16								SILTY SAND. V FN GR., WET, 30% SILT, PALE BRN, (5YR 5/2), ANG-SUB ANG, WELL SORTED, CONSOLID. NO HC STAIN OR ODOR.
18								SAND. FN GRAIN, <55 SILT, WET, GRAYISH BROWN (5YR 3/2), SUB RND, W/S, MOD. CONSOLID. NO STAIN, OR HC ODOR.
20								

LITHOLOGIC LOG (CORE)
(Continued)

LOCATION ID: B-12 (MW-16)

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE NUMBER OR PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
22								NO SAMPLES BELOW 22' (FLOW SAND)
24								
26								
28								* AQUIFER APPEARS TO BE CONFINED BY CLAY AT 8-11 FT. B.S.
30								
32								
34								
36								
38								
40								
42								
44								
46								

LITHOLOGIC LOG (CORE)

LOCATION MAP:

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-13A (MW15)
SITE COORDINATES (ft.):
N 288099.5991 E 1552403.44909
GROUND ELEVATION (ft. MSL): 3738.62
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/21/94 DATE COMPLETED: 6/21/94
FIELD REP.: DALE LITTLEJOHN
COMMENTS: INSTALLED ON HIGH SANDY AREA AT SOUTH END OF PROPERTY, B-13 (ORIGINAL LOCATION) IMPACTED AT BEDROCK AT = 10'

LOCATION DESCRIPTION:

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
2								SAND, FN GRN, <10% SILT, DRY, PALE YELLOWISH BRN (10YR 6/2), SUB ANGULAR, W/S, UNCONSOLID., NO STAINING OR ODOR.
4								SAND FROM RIVER DREDGING, FORMED DUNES.
8								
10								SILT V. FN GRAIN, ≈ 20-30% CLAY, WET, BLACK (HC STAIN). W/S, MOD. CONSOLID. V. STRONG HC ODOR.
12								SAND. FN GRAIN, ≈10% SILT, WET, DK GRAY BLACK (HC STAIN). ANGULAR, MOD. SORTED, MOD. CONSOLID. V. STRONG HC ODOR. (FROM PROD)
14								
16								SAND, FN GRAIN, ≈ 10% SILT, WET, GRAYISH BRN (5YR 3/2), ANGULAR, MED SORTED, UNCONSOLIDATED STRONG HC ODOR, (SATURATED W/ PRODUCT AND WTR)
18								
20								* NO SPOON SAMPLES BELOW 20' (FLOWING SAND)

LITHOLOGIC LOG (CORE)
(Continued)

LOCATION ID: B-13A

DEPTH	WELL CONST.	LITH.	SAMPLE					LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
			USCS	FROM	TO	% REC	NUMBER OR PID READING	
22								SAND. FN-MED GRAIN, BLACK (HC STAINED) FREE PRODUCT PRESENT TO TD. RND-SUB-RND, W/S. UNCONSOLIDATED, "FLOWING" - NO SPOON SAMP. DESCRIPTION FROM CUTTINGS.
24								
26								
28								
30								
32								TD = 32'
34								* AQUIFER APPEARS TO BE UNCONFIRMED IN THIS AREA
36								
38								
40								
42								
44								
46								

LITHOLOGIC LOG (CORE)

LOCATION MAP: SEE MAP

___1/4 ___1/4 ___1/4 ___1/4 S___ T___ R___

SITE ID: REXENE LOCATION ID: B-14 (MW17)
SITE COORDINATES (ft.):
N 288730.82473 E 1552304.16481
GROUND ELEVATION (ft. MSL): 3732.04
STATE: NEW MEXICO COUNTY: DONA ANA
DRILLING METHOD: HOLLOW STEM AUGER
DRILLING CONTR.: GEO PROJECTS
DATE STARTED: 6/20/94 DATE COMPLETED:
FIELD REP.: DALE LITTLEJOHN
COMMENTS:

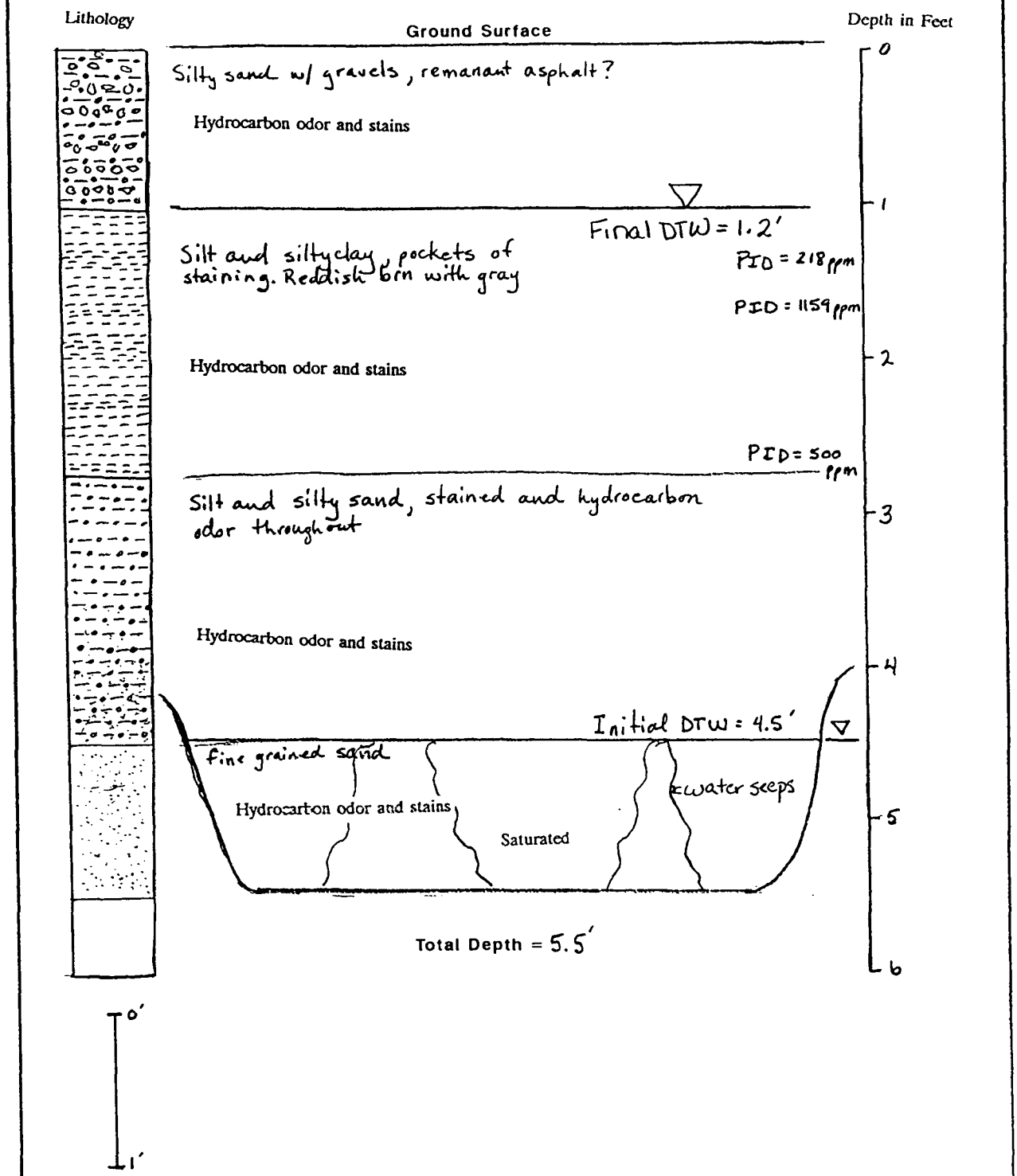
LOCATION DESCRIPTION: SITE LOCATED ON SAND AND GRAVEL HILL ≈ 1FT. ABOVE SURROUNDING AREA

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	FROM	TO	% REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
0			PUSH W/ AUGER	0	2'	60		SILTY SAND, V FN GR, ≈ 20% SILT, DRY PALE YELLOWISH BRN (10YR 6/2), ANGULAR, W/S, UNCONSOLID, BLOW SAND.
2				2	4'	30		SILT, SAND. V FN GR ≈ 30–40% SILT, DRY, PALE BRN (5YR 5/2), SUB ROUND, W/S, UNCONSOLID. W/SM GRAVEL.
4				4'	6	100		MISSING, BELIEVE TO BE SANDY SILT, PALE YELLOWISH BRN (10YR 6/2), CONSOLID.
6				6	8	10		SILTY CLAY, 20% SILT, V. FN GR, DRY, GRAYISH BRN, (5YR 3/2), CONSOLID, ANG. W/S CLAYEY SILT, V. FN GR, 30–40% CLAY, <5% SAND, WET, DK YELLOWISH BRN, (10YR 4.2), SUB RND, W/S, HC STAIN.
8				8	10	100		SILTY SAND, V FN GRAIN, 20% SILT, WET DK YELLOW BRN (10YR 4/2), SUB RND, W/S, NO STAINING
10				FLOWING SAND, NO CATCH SAMP.				SILTY CLAY, 40% SILTY, WET. (10YR 4/2)
12				SAMPLE DESCRIP BASED ON SPLIT SPOON ATTEMPTS (SAND FLOWING OUT OF AUGER) AND, SOIL ON BOTTOM FLIGHT OF AUGER.				SILTY SAND, 30% SILT (DEC W/ DEPTH) WET DK YELLOWISH BRN (10YR 4/2), RND TO SUB-ROUNDED, W/S. UNCONSOLID. NO STAIN OR ODOR.
14								V FN GRAIN SAND TO 16' INCREASING TO FN GR AT TD. SILT CONTENT DEC. TO ≈ 10% AT TD.
16								
18								SAND SEE NOTE.
20								

LITHLOGIC LOG (CORE)
(Continued)

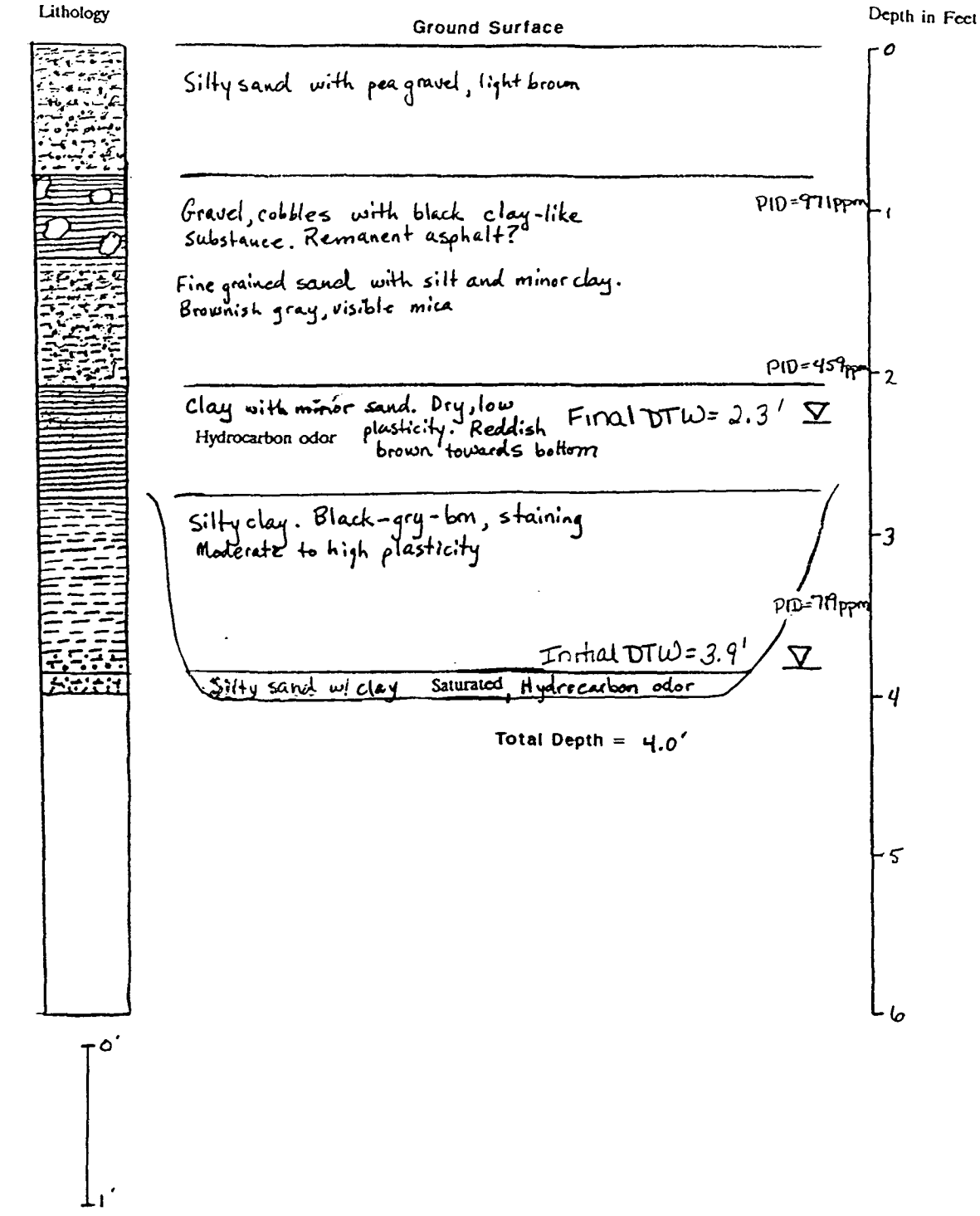
LOCATION ID: B-14 (MW-17)

DEPTH	WELL CONST.	LITH.	SAMPLE					LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
			USCS	FROM	TO	% REC	NUMBER OR PID READING	
22								SAND AS ABOVE.
24								TD = 24'
26								
28								
30								
32								
34								
36								
38								
40								
42								
44								
46								



GCL

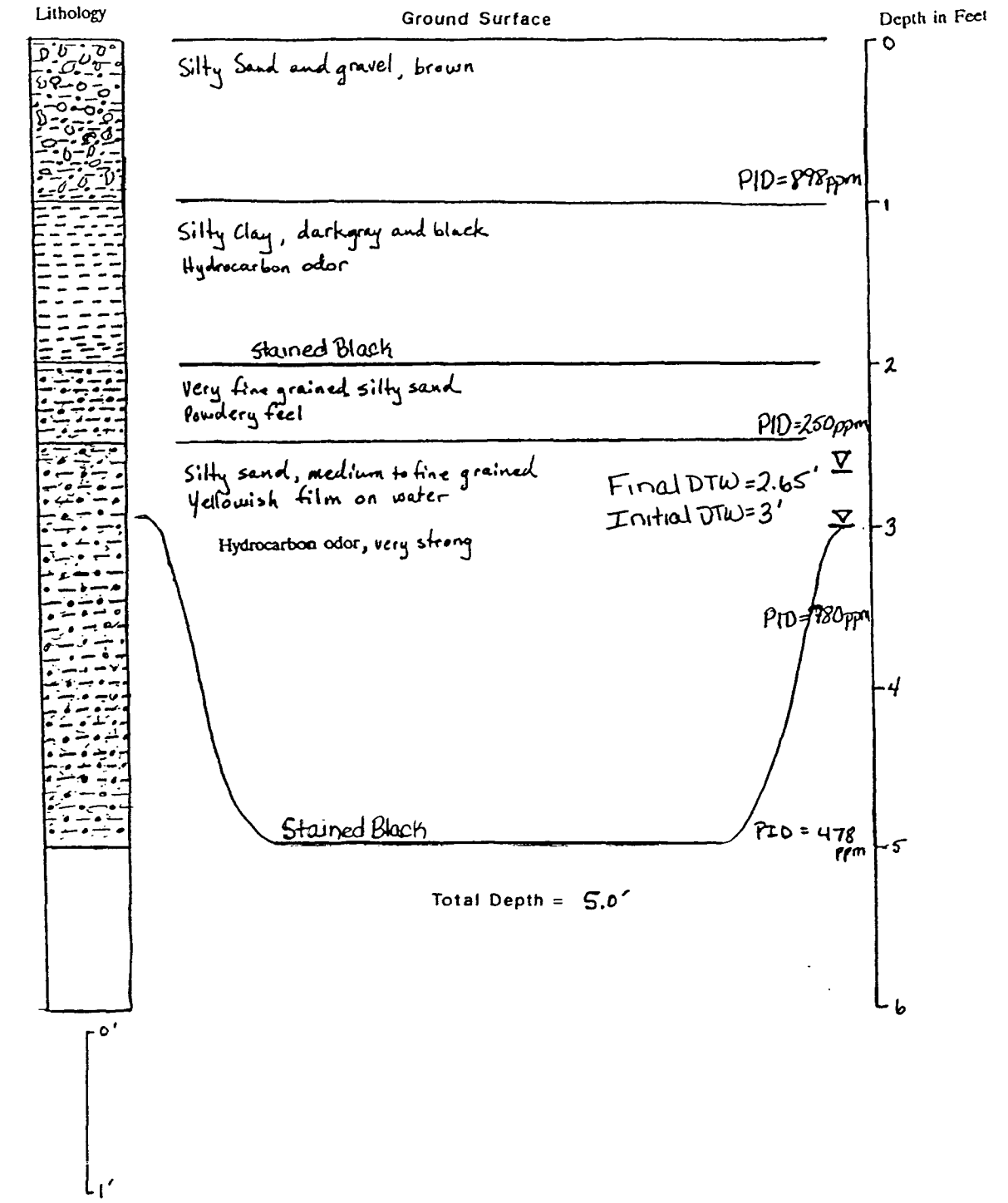
TRENCH TR-01



Vertical Scale: 1" = 1'
Horizontal Distance Not to Scale

GCL

TRENCH TR-02

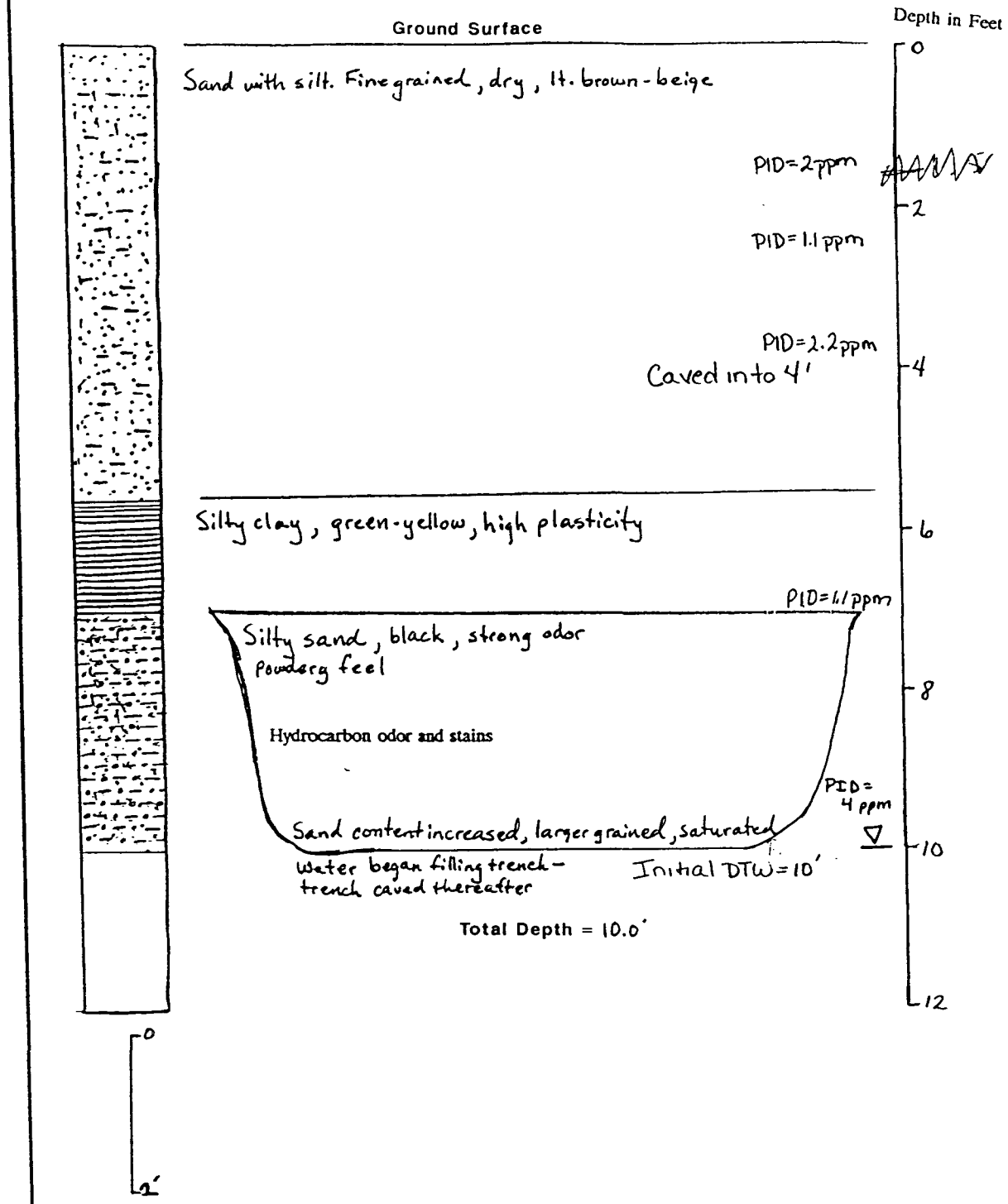


Vertical Scale: 1" = 1'

Horizontal Distance Not to Scale

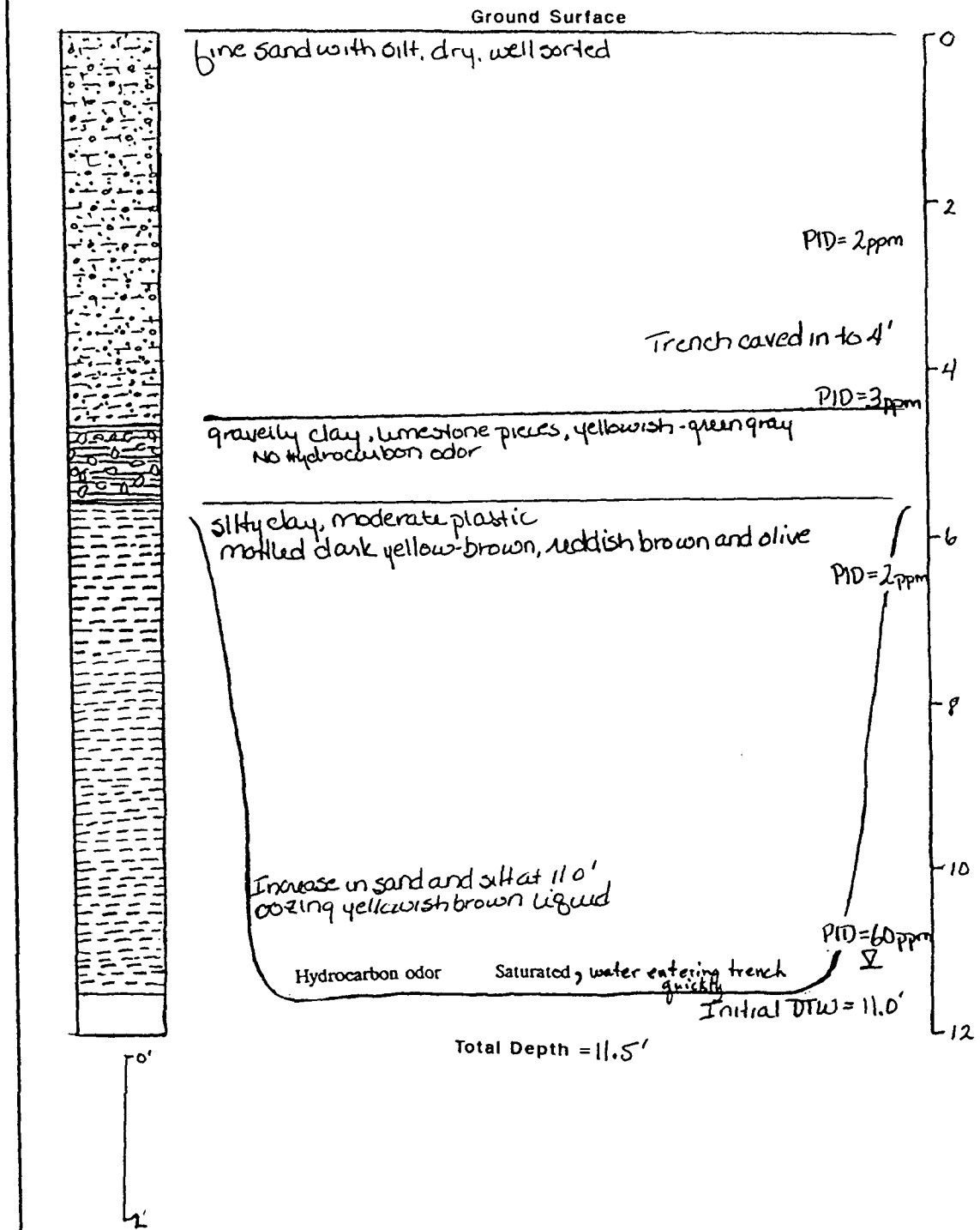
GCL

TRENCH TR-03



GCL

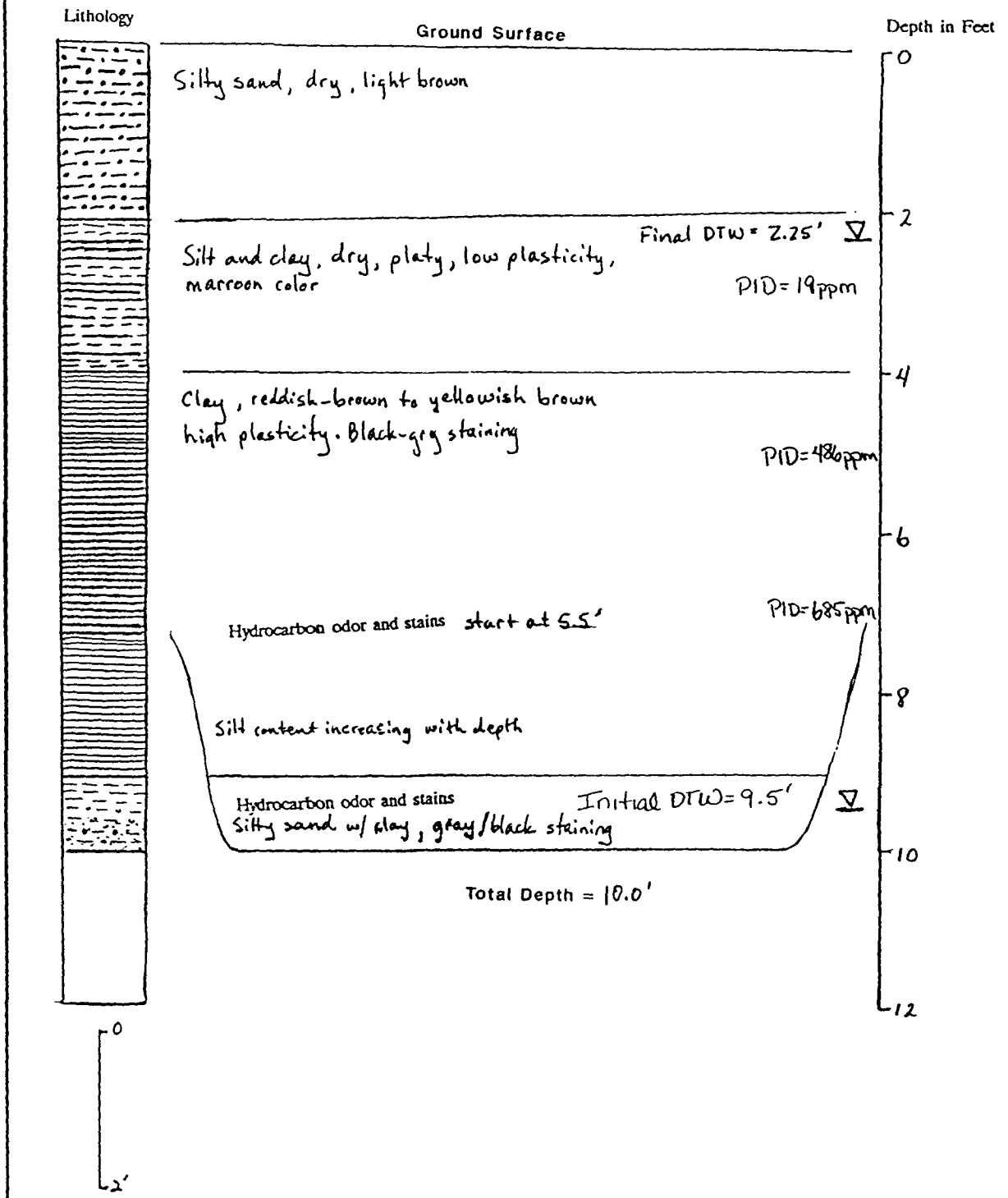
TRENCH TR-04



Vertical Scale: 1" = 1'
Horizontal Distance Not to Scale

GCL

TRENCH TR-05



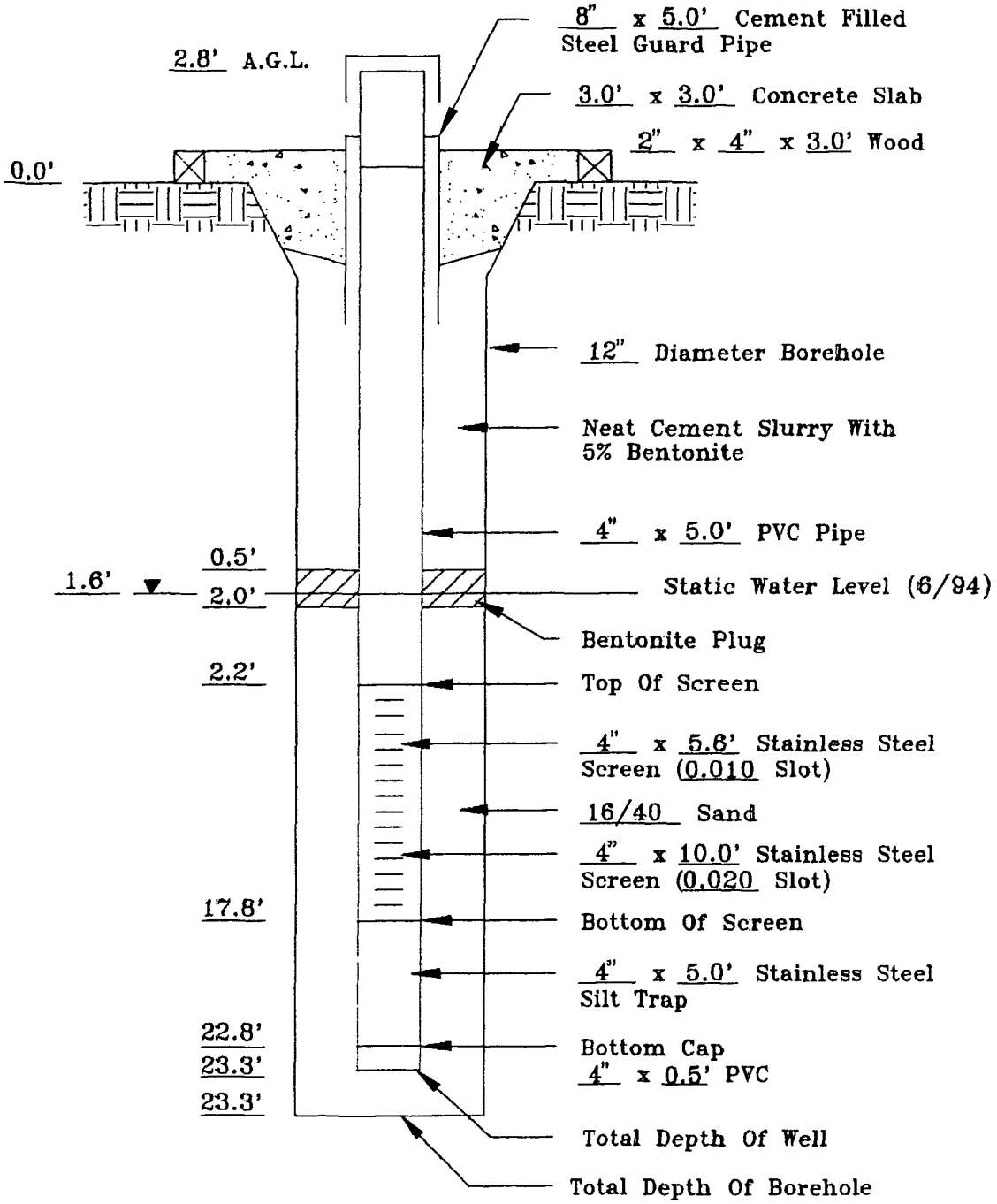
Vertical Scale: 1" = 2'
Horizontal Distance Not to Scale

GCL

TRENCH TR-06

Appendix B

Monitoring Well Completion Diagrams

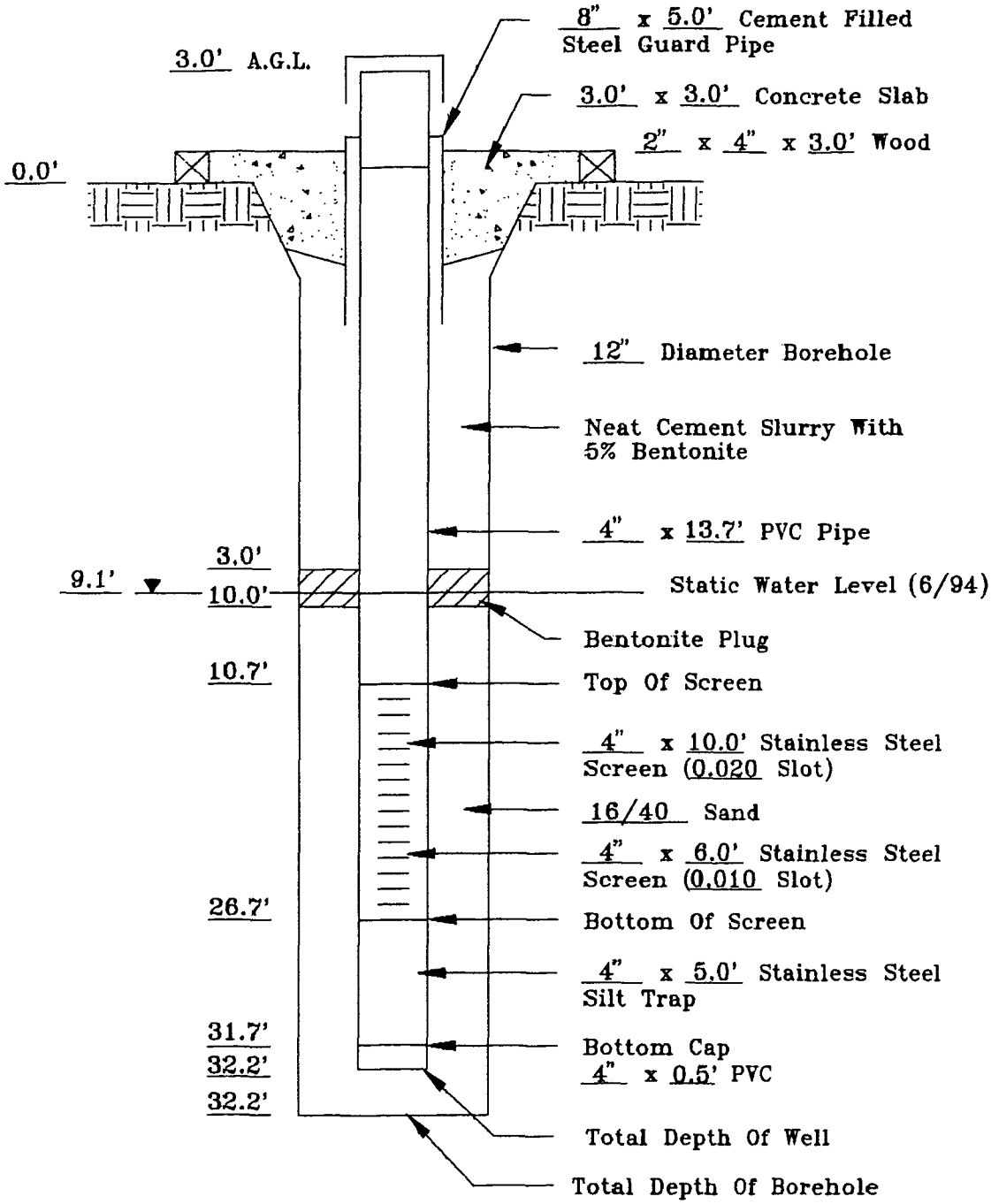


Northing : 288993.84
Easting : 1551953.24
Top of Casing : 3730.40

GCL

CLIENT: EXXENE CORPORATION	
DATE: 8/16/94	REV. NO.: 2
AUTHOR: G.J.V.	DRAWN BY: M.P.
CK'D BY: D.L./B.L.	FILE: MW-14CD

FORMER BRICKLAND REFINERY MONITOR WELL MW-14 COMPLETION DIAGRAM

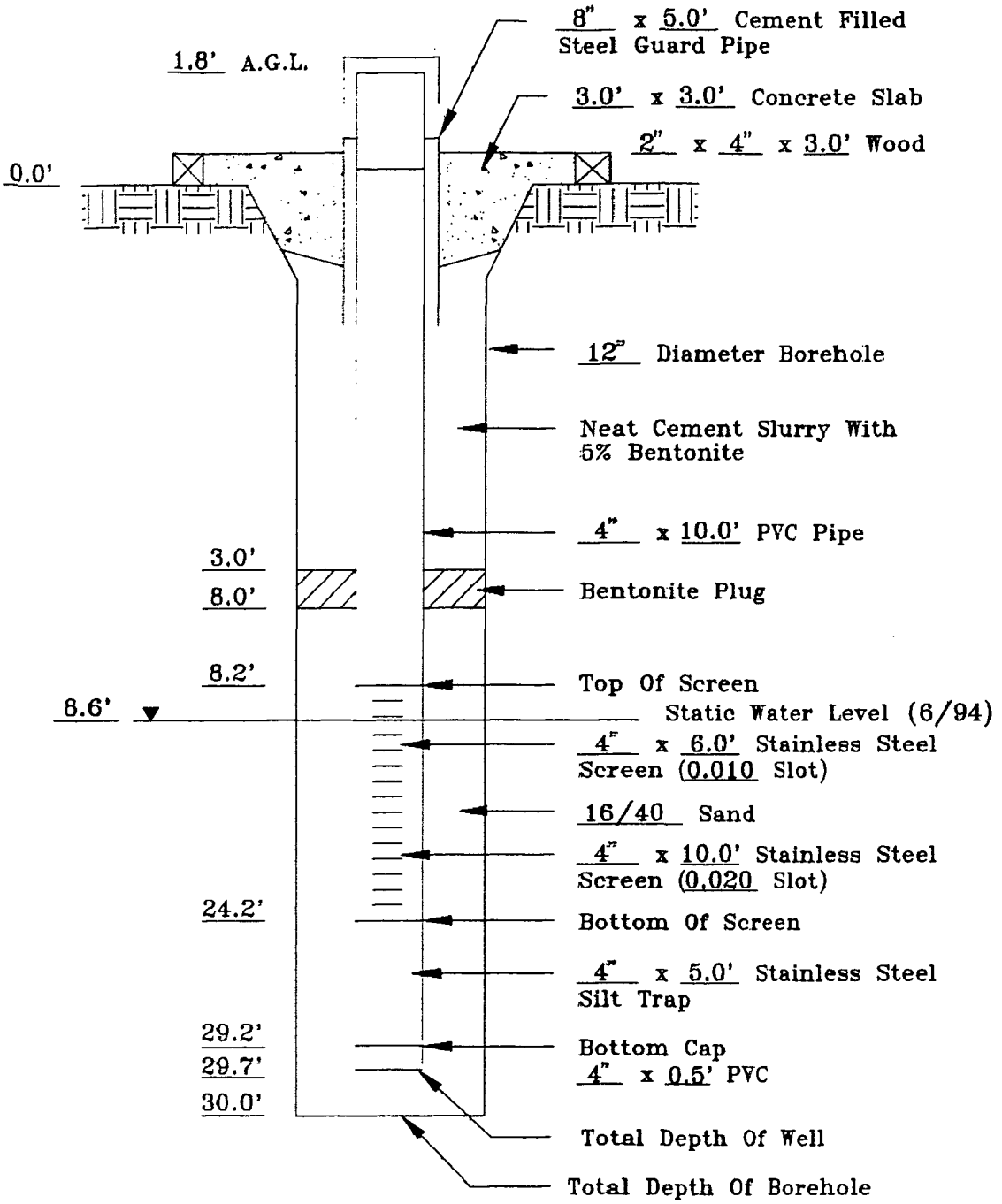


Northing : 288099.60
Easting : 1552403.45
Top of Casing : 3738.62

GCL

CLIENT: REXENE CORPORATION	
DATE: 8/16/94	REV. NO.: 2
AUTHOR: G.J.V.	DRAWN BY: M.P.
CK'D BY: D.L./B.L.	FILE: MW-15CD

FORMER BRICKLAND REFINERY
MONITOR WELL MW-15
COMPLETION DIAGRAM

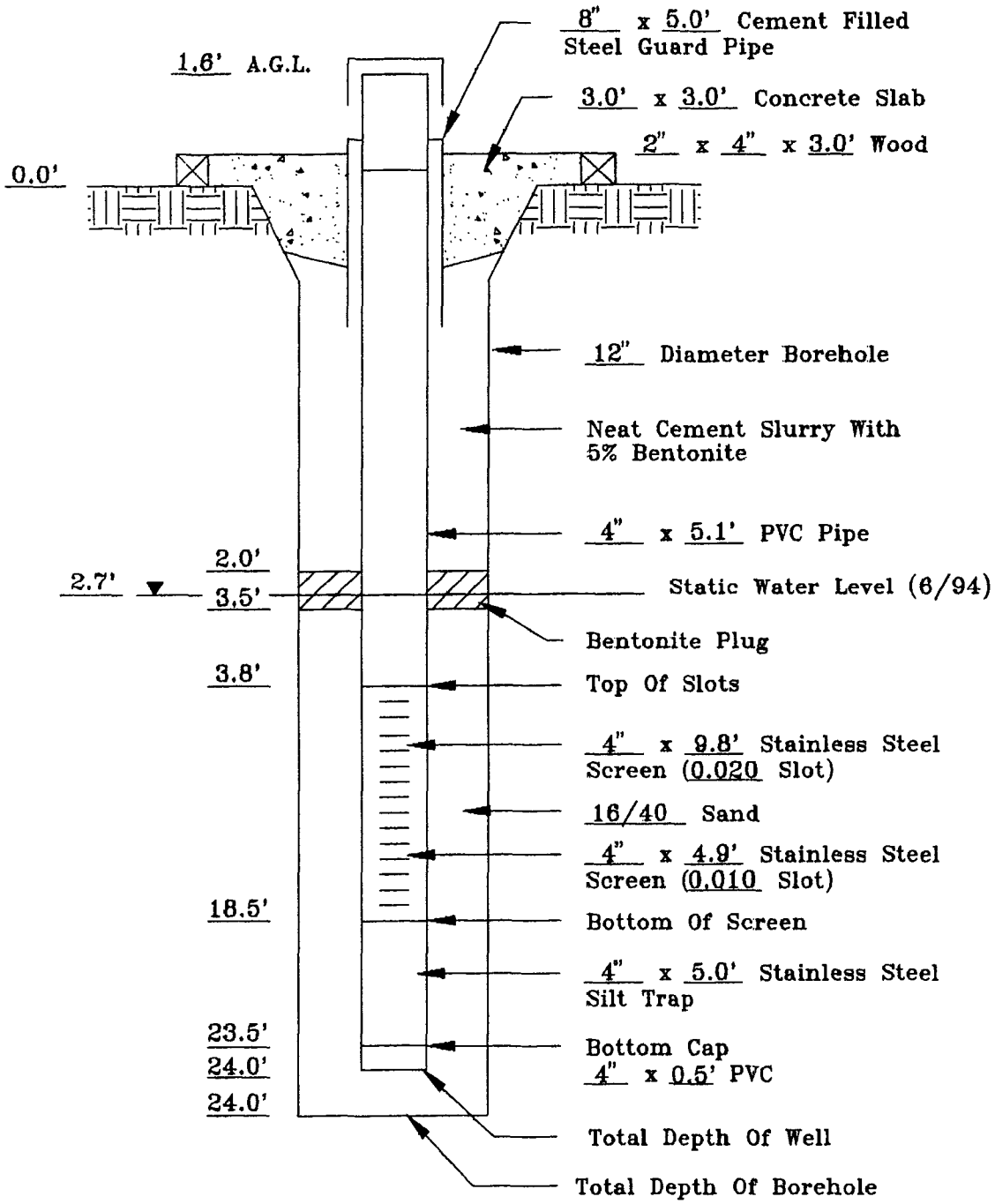


Northing : 288172.59
Easting : 1552284.09
Top of Casing : 3737.07

GCL

CLIENT: REXENE CORPORATION	
DATE: 5/16/94	REV. NO.: 2
AUTHOR: G.J.V.	DRAWN BY: M.P.
CK'D BY: D.L./B.L.	FILE: MW-16CD

FORMER BRICKLAND REFINERY
MONITOR WELL MW-16
COMPLETION DIAGRAM



Northing : 288730.82
Easting : 1552304.16
Top of Casing : 3732.04

GCL

CLIENT: REXENE CORPORATION	
DATE: 6/16/94	REV. NO.: 2
AUTHOR: G.J.V.	DRAWN BY: M.P.
CK'D BY: D.L./B.L.	FILE: MW-17CD

FORMER BRICKLAND REFINERY
MONITOR WELL MW-17
COMPLETION DIAGRAM

Appendix C

Well Point Completion Diagrams

Well Point Construction Information

Well Point ID : WP-01

Site Location/Client : Rexene

Northing : 288338.79

Easting : 1552367.00

Ground Level Elevation : N/A

Top of Casing Elevation : 3733.54

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon Steel

Casing Length : 8.3'

Casing Dia. : 2"

Screen Type : Stainless Steel

Slotted Length : 5.6'

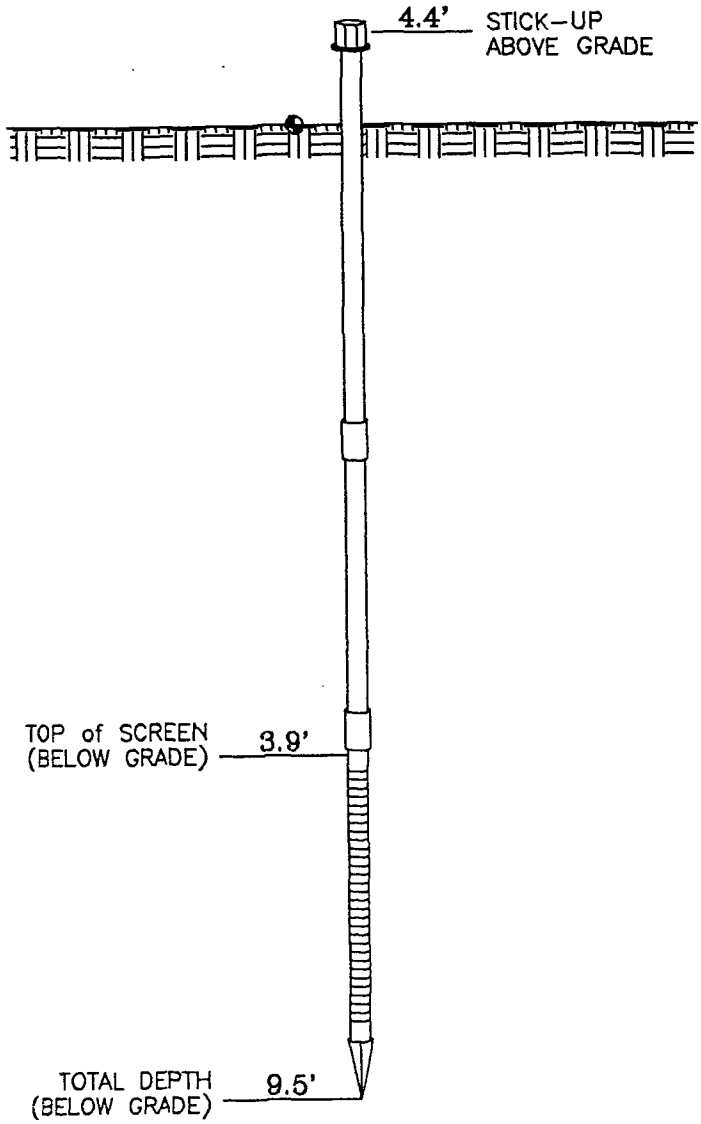
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 5.6 feet up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-02

Site Location/Client : Rexene

Northing : 288416.06

Easting : 1552377.58

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.81

Installation/Adjustment Date : 9/29/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : 5.6'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 13.0'

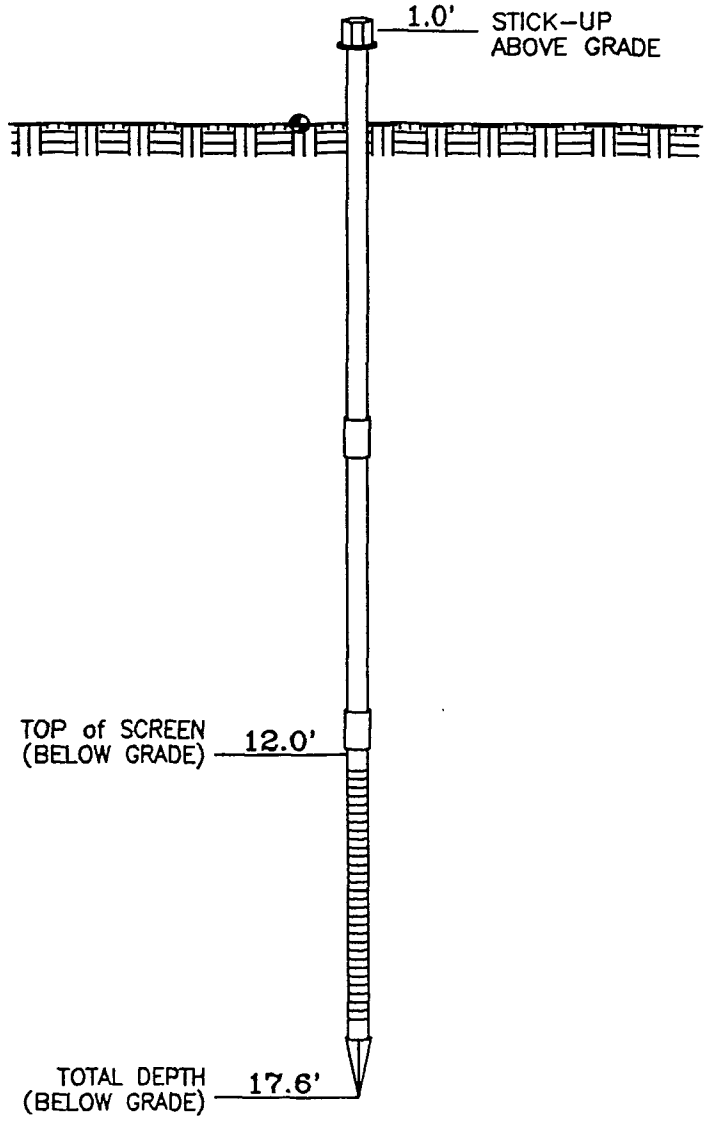
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-03

Site Location/Client : Rexene

Northing : 288539.77

Easting : 1552354.53

Ground Level Elevation : N/A

Top of Casing Elevation : 3729.76

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 6.2'

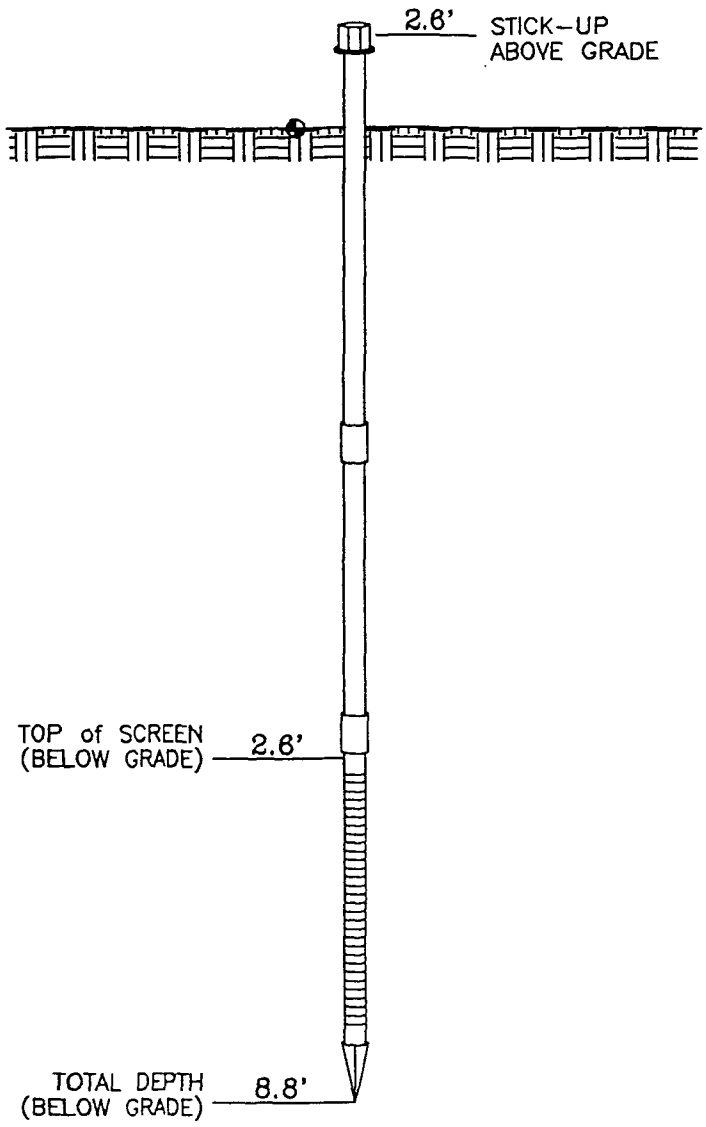
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 6.5' up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-04

Site Location/Client : Rexene

Northing : 288547.84

Easting : 1552218.37

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.98

Installation/Adjustment Date : 6/16/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.7'

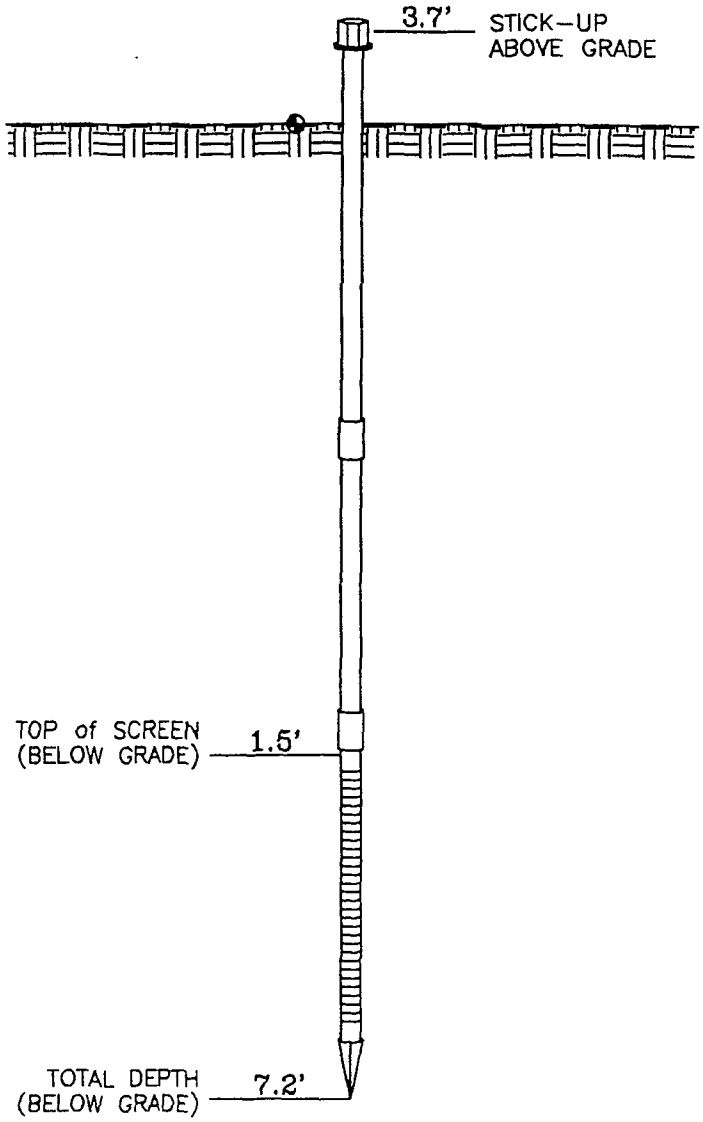
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Point is bent, raised 11.0 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-05

Site Location/Client : Rexene

Northing : 288476.81

Easting : 1552065.89

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.99

Installation/Adjustment Date : 6/16/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.1'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.7'

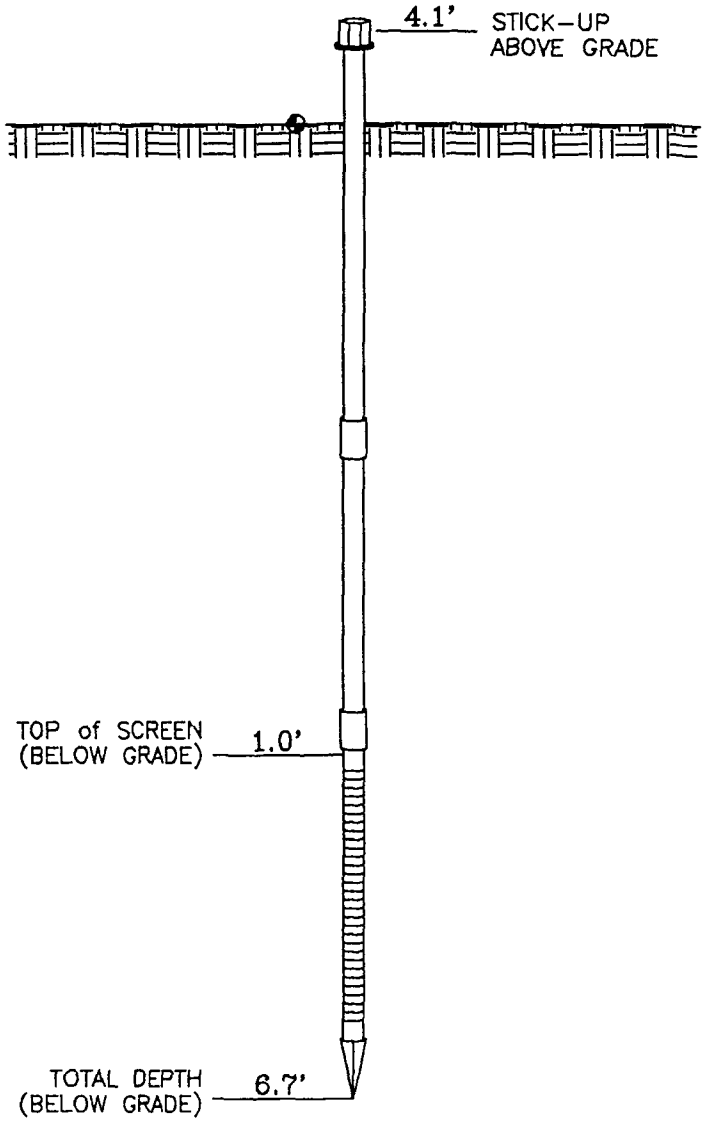
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 8.0 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-06

Site Location/Client : Rexene

Northing : 288621.20

Easting : 1551994.76

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.79

Installation/Adjustment Date : 6/16/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.7'

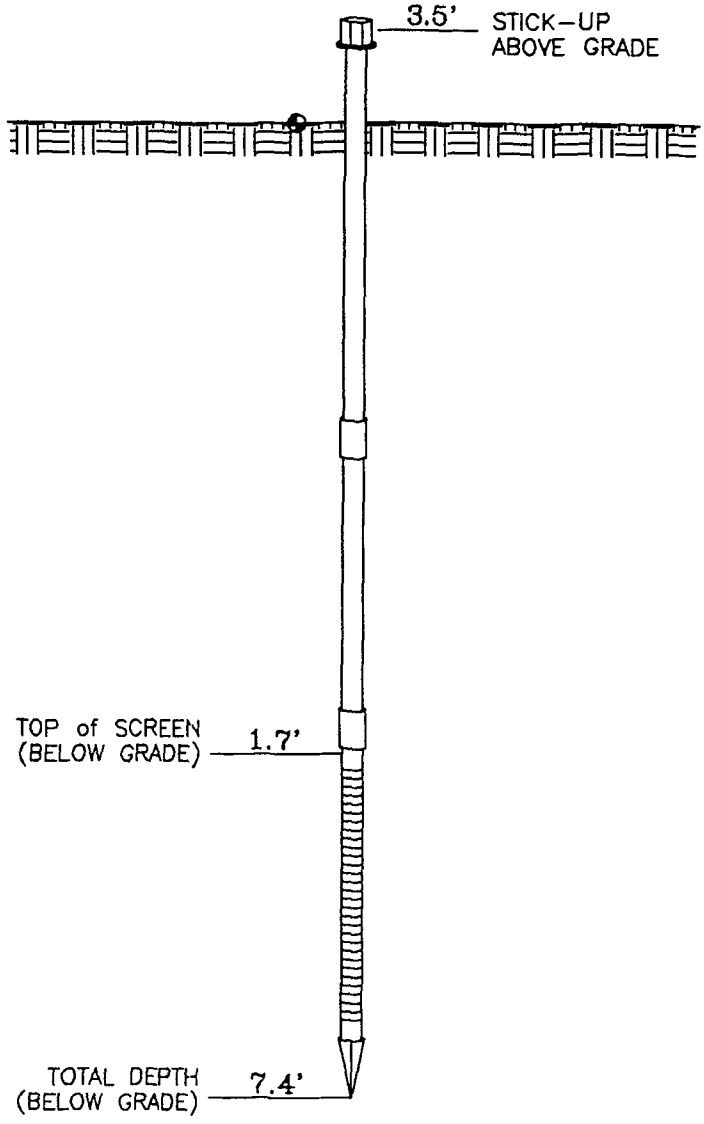
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 10.4 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-07

Site Location/Client : Rexene

Northing : 288308.03

Easting : 1552286.98

Ground Level Elevation : N/A

Top of Casing Elevation : 3733.21

Installation/Adjustment Date : 9/30/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : ?

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : ?

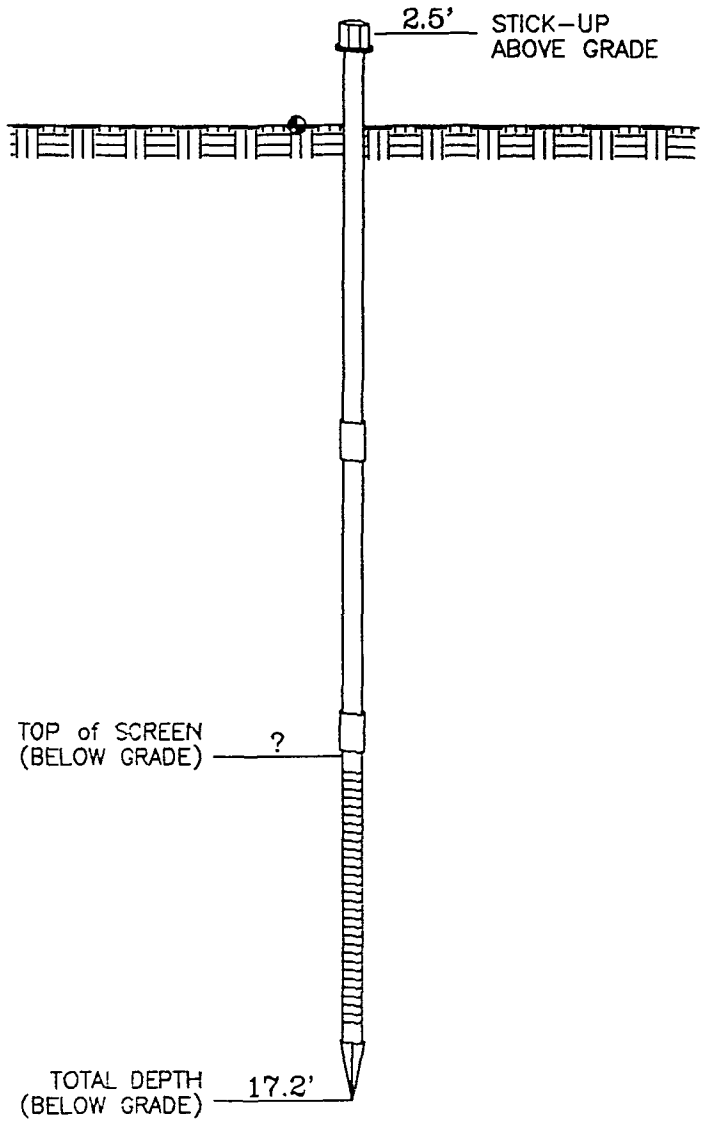
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-06

Site Location/Client : Rexene

Northing : 288786.42

Easting : 1552099.30

Ground Level Elevation : N/A

Top of Casing Elevation : 3729.67

Installation/Adjustment Date : 6/16/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 6.3'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 4.7'

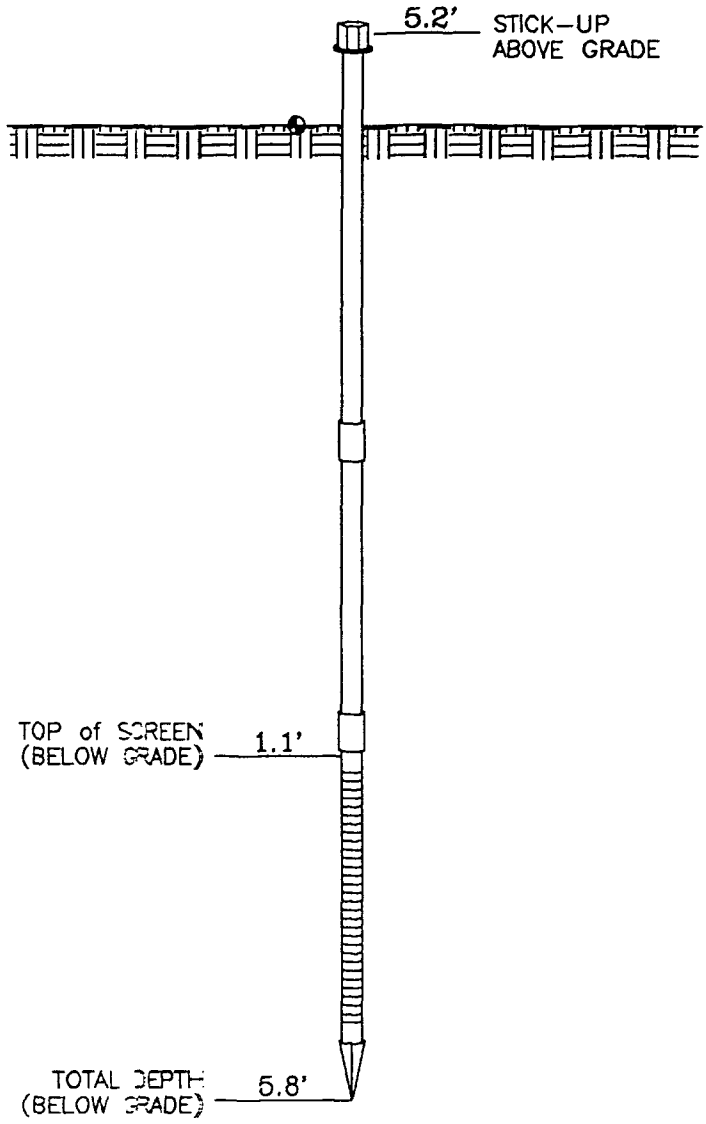
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 7.2 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-09

Site Location/Client : Rexene

Northing : 288874.81

Easting : 1552111.03

Ground Level Elevation : N/A

Top of Casing Elevation : 3730.98

Installation/Adjustment Date : 6/16/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 3.6'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 4.8'

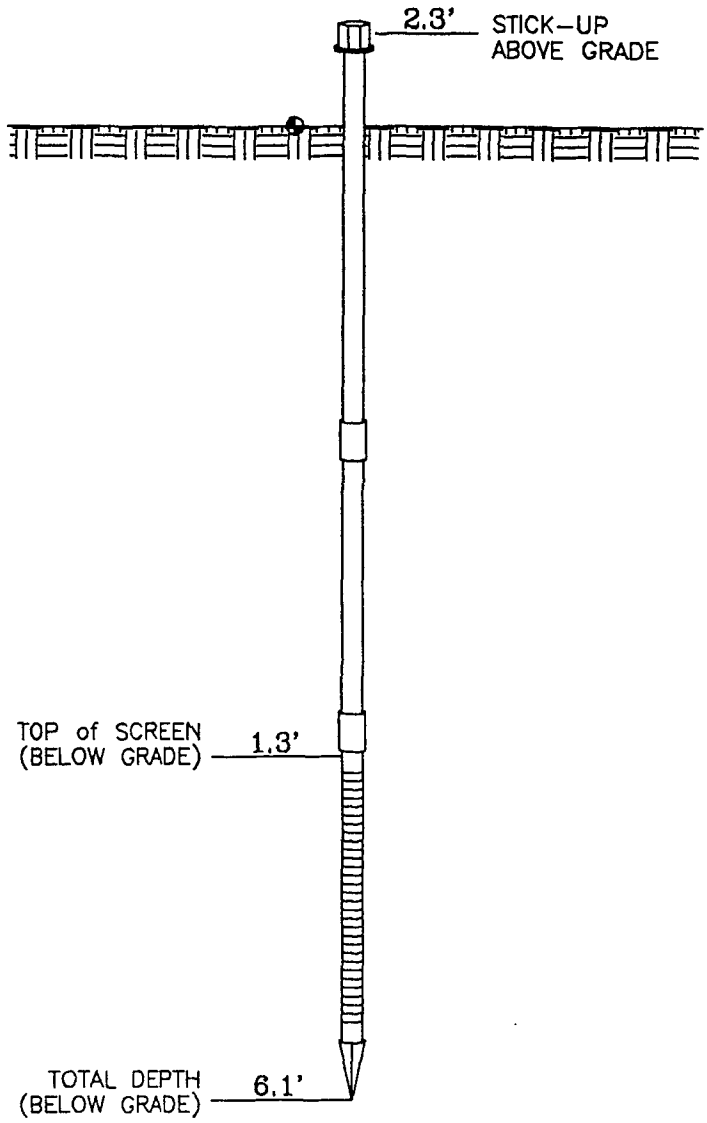
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 5.4 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-10

Site Location/Client : Rexene

Northing : 288781.77

Easting : 1552255.98

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.55

Installation/Adjustment Date : 6/16/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

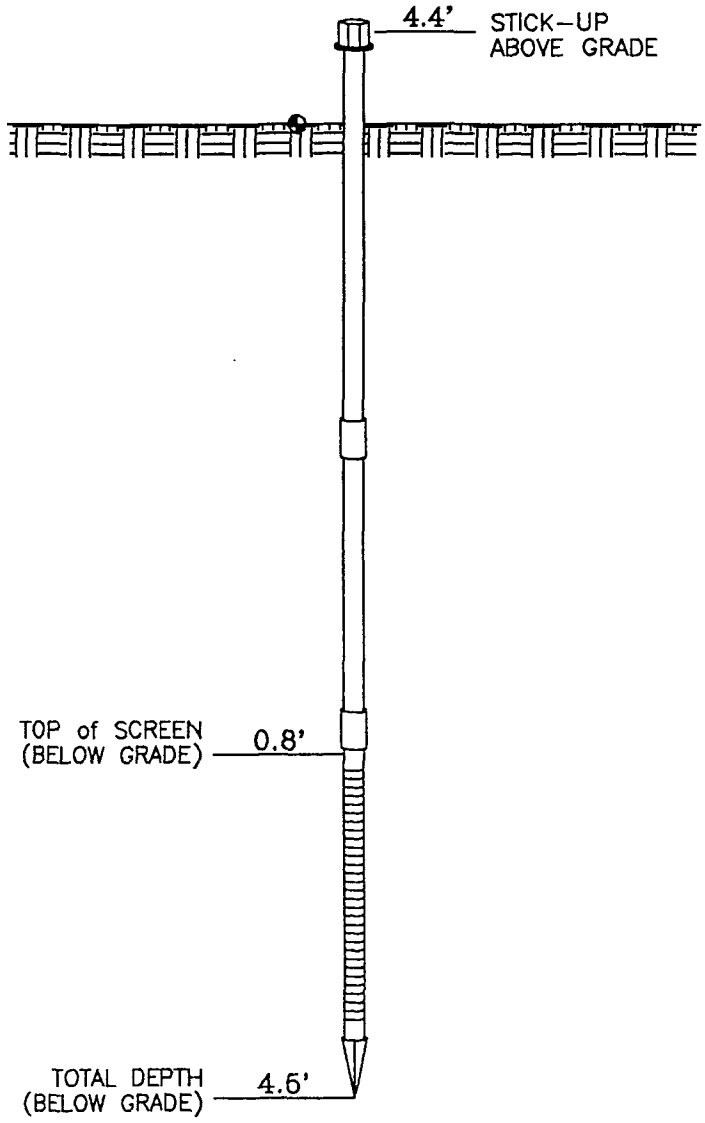
Slot Size :

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 6.0 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-11

Site Location/Client : Rexene

Northing : 289092.90

Easting : 1552168.94

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.59

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

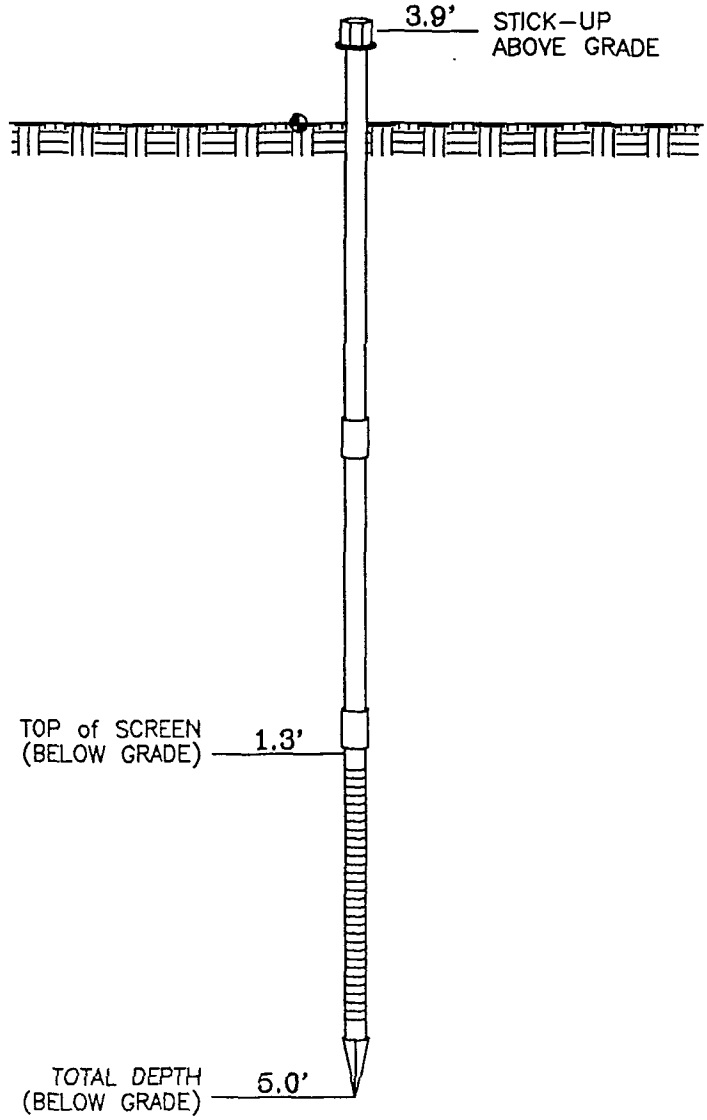
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 2.4 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-12

Site Location/Client : Rexene

Northing : 289331.13

Easting : 1552070.71

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.43

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.1'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

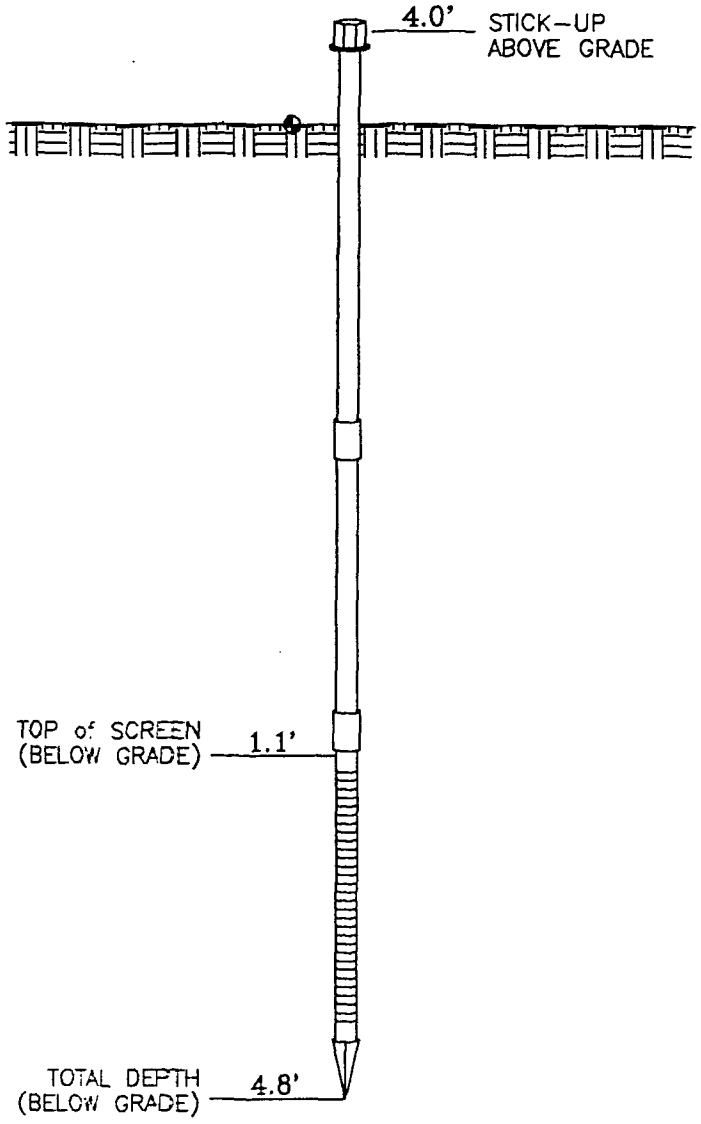
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 2.5 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-13

Site Location/Client : Rexene

Northing : 289520.63

Easting : 1551982.68

Ground Level Elevation : N/A

Top of Casing Elevation : 3730.47

Installation/Adjustment Date : 8/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.1'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

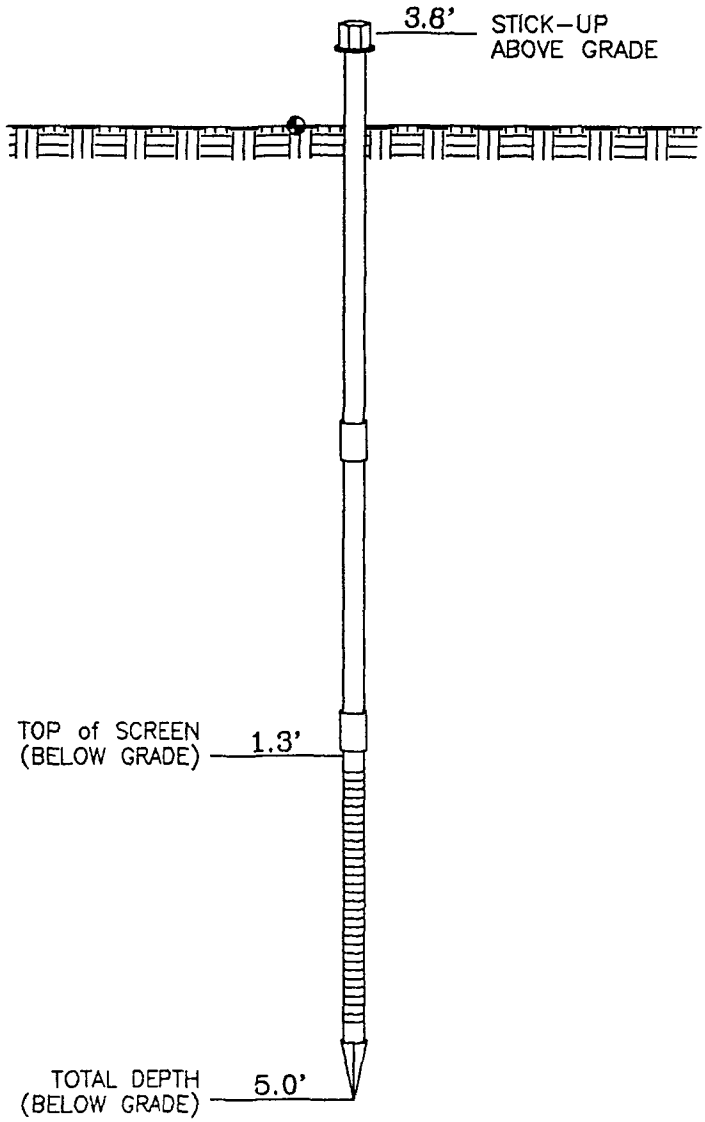
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 2.2 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-14

Site Location/Client : Rexene

Northing : 289762.78

Easting : 1551813.32

Ground Level Elevation : N/A

Top of Casing Elevation : 3730.52

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

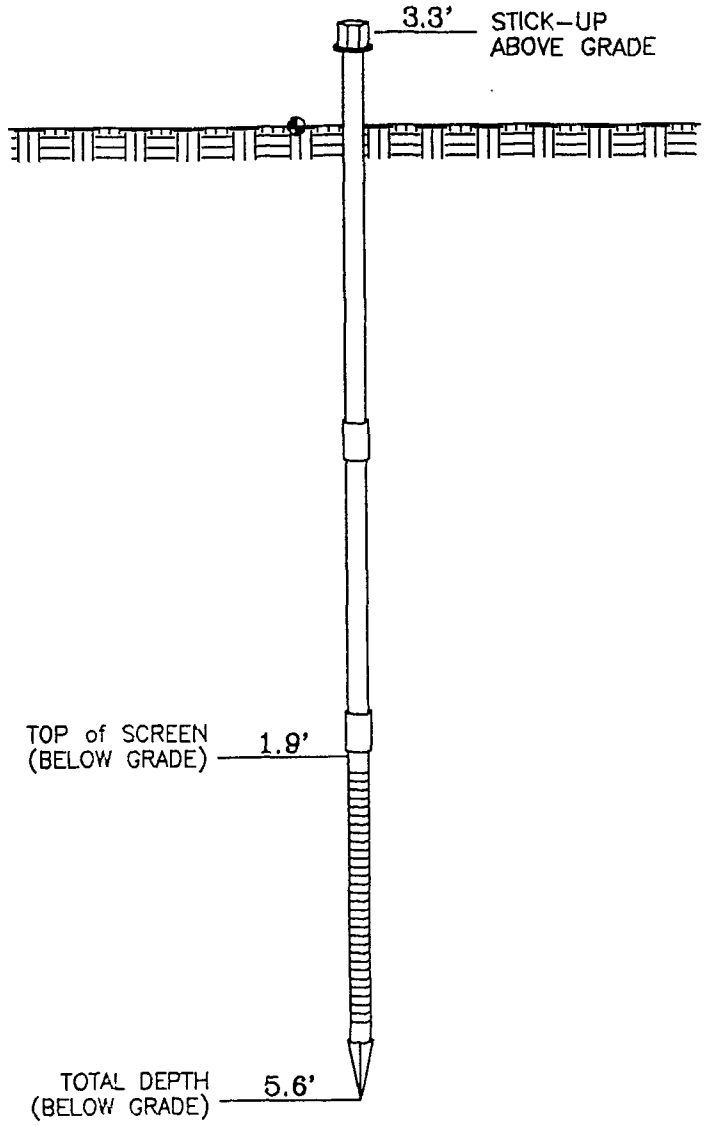
Slot Size :

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 2.1 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-15

Site Location/Client : Rexene

Northing : 289590.39

Easting : 1551453.29

Ground Level Elevation : N/A

Top of Casing Elevation : 3732.97

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 8.3'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

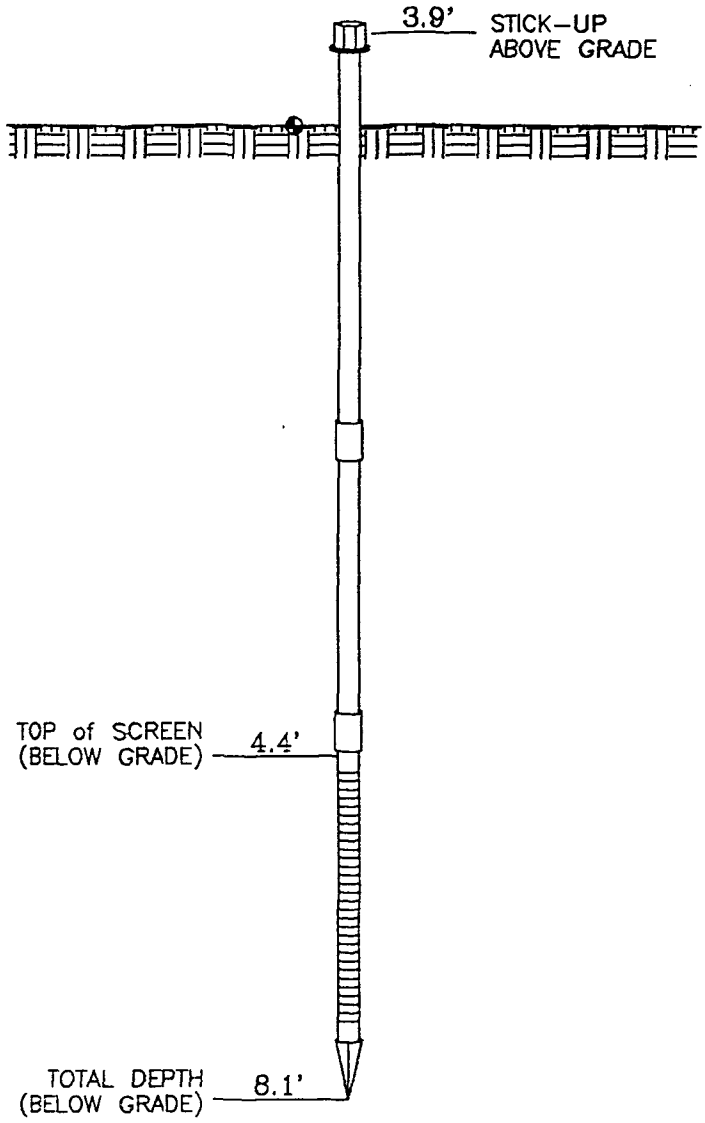
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 2.7 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-16

Site Location/Client : Rexene

Northing : 289461.60

Easting : 1551510.75

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.03

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.1'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

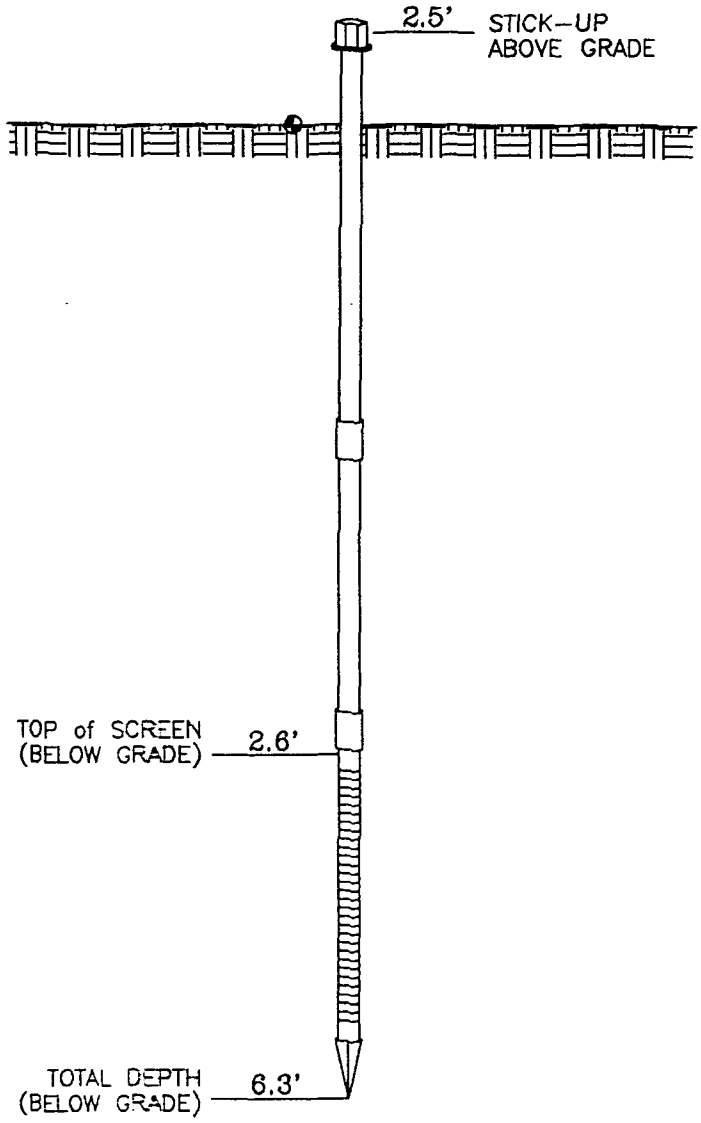
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 5.4 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-17

Site Location/Client : Rexene

Northing : 289298.99

Easting : 1551641.35

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.38

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.9'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

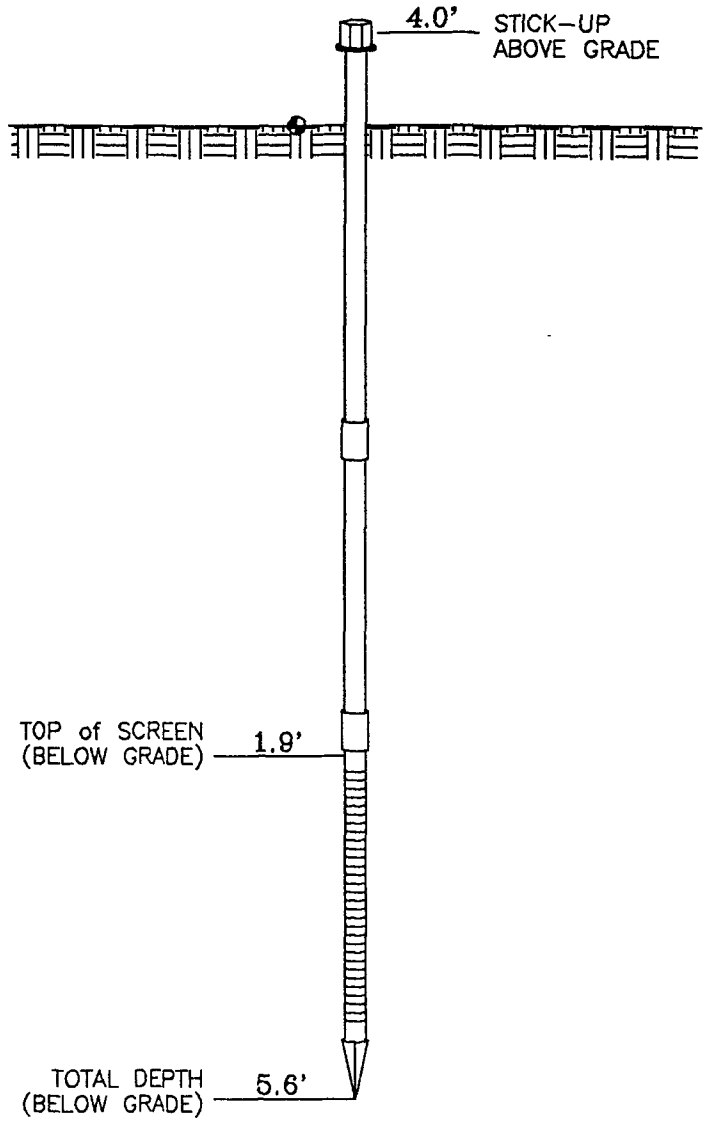
Slot Size :

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 7.0 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-18

Site Location/Client : Rexene

Northing : 289125.42

Easting : 1551800.05

Ground Level Elevation : N/A

Top of Casing Elevation : 3728.60

Installation/Adjustment Date : 10/1/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : 10.3'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

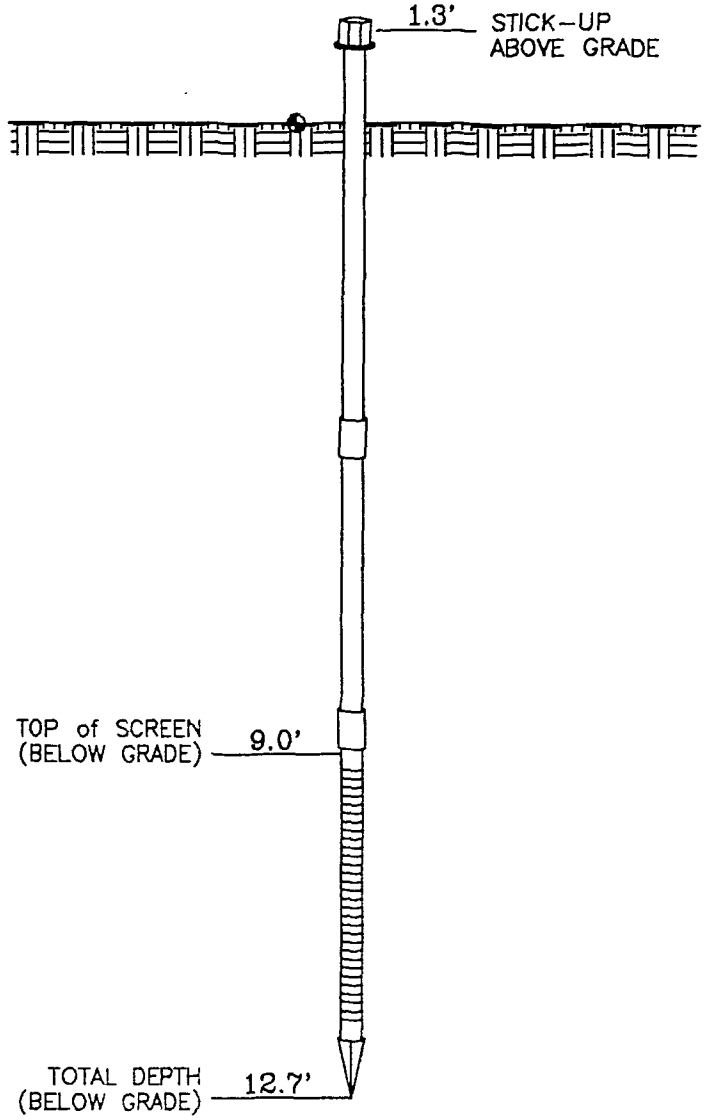
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-19

Site Location/Client : Rexene

Northing : 289039.31

Easting : 1551723.78

Ground Level Elevation : N/A

Top of Casing Elevation : 3729.68

Installation/Adjustment Date : 10/1/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : 5.1'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

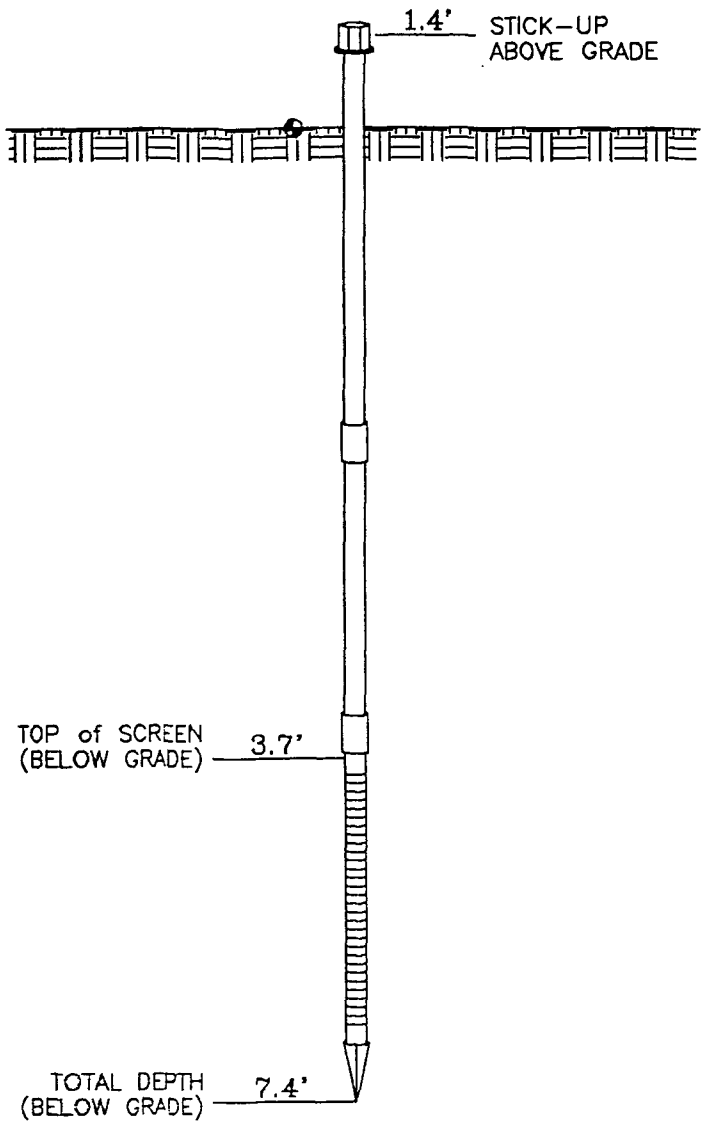
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-20

Site Location/Client : Rexene

Northing : 289088.71

Easting : 1551949.99

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.54

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 4.7'

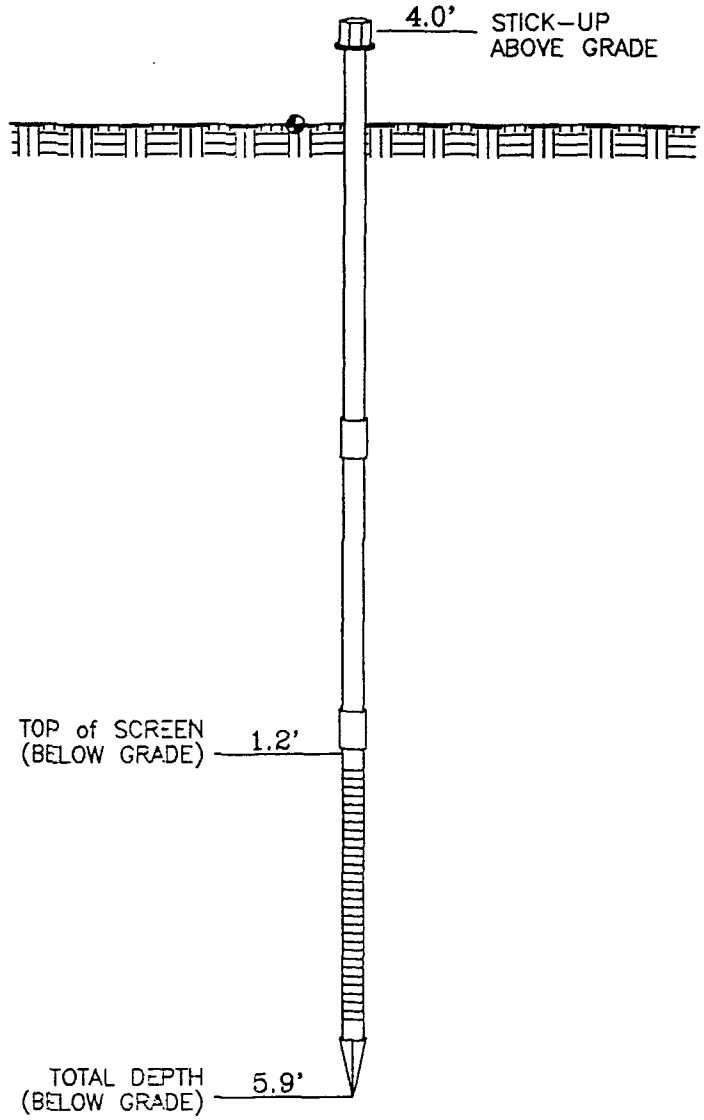
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 2.8 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-21

Site Location/Client : Rexene

Northing : 288829.78

Easting : 1551953.72

Ground Level Elevation : N/A

Top of Casing Elevation : 3730.48

Installation/Adjustment Date : 6/23/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.1'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.7'

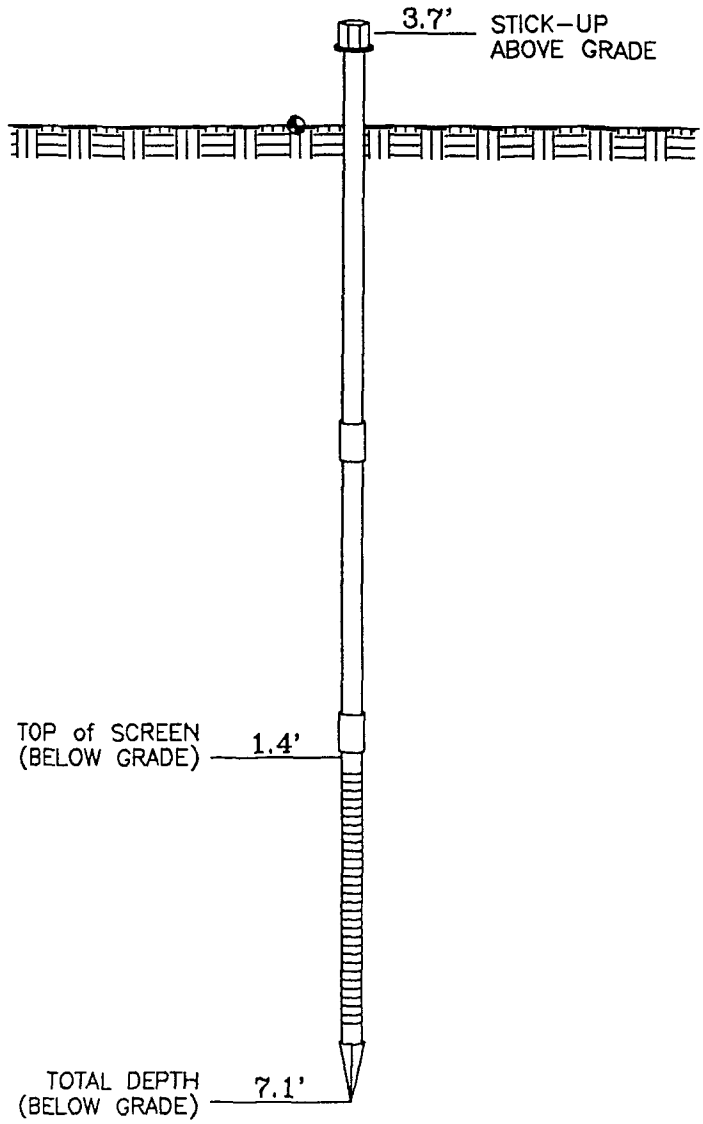
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 7.1 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-22

Site Location/Client : Rexene

Northing : 288698.22

Easting : 1552087.73

Ground Level Elevation : N/A

Top of Casing Elevation : 3728.99

Installation/Adjustment Date : 6/16/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 15.5'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

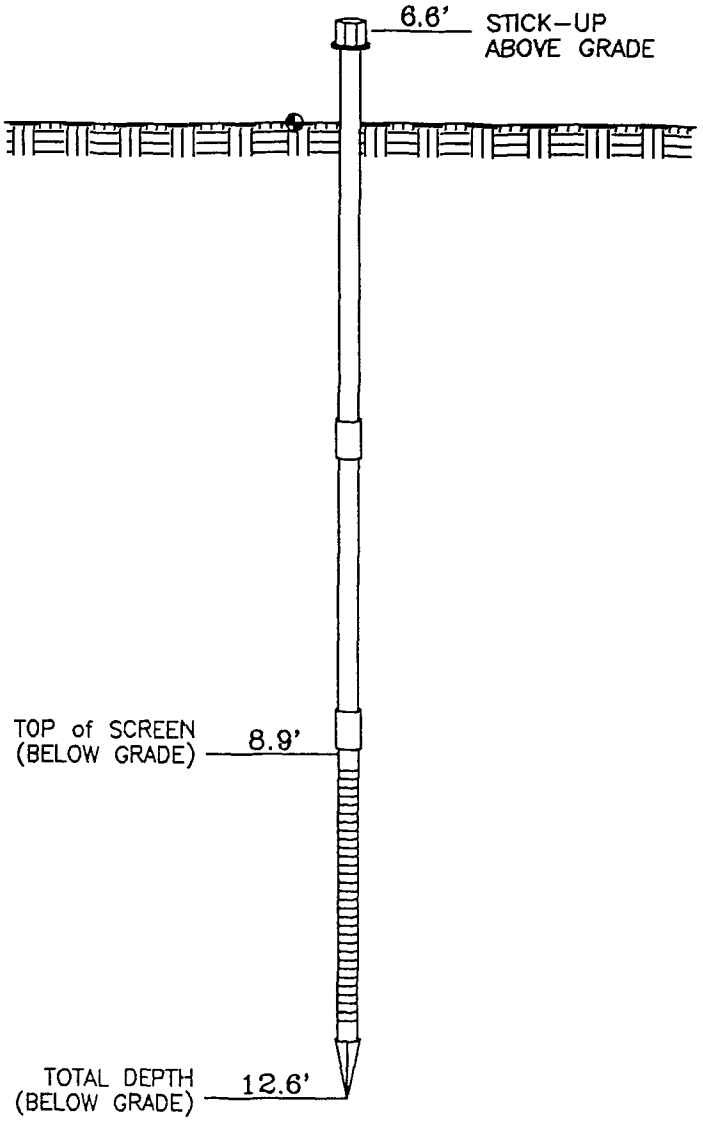
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 4.8 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-23

Site Location/Client : Rexene

Northing : 288604.62

Easting : 1552117.79

Ground Level Elevation : N/A

Top of Casing Elevation : 3729.24

Installation/Adjustment Date : 10/1/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.7'

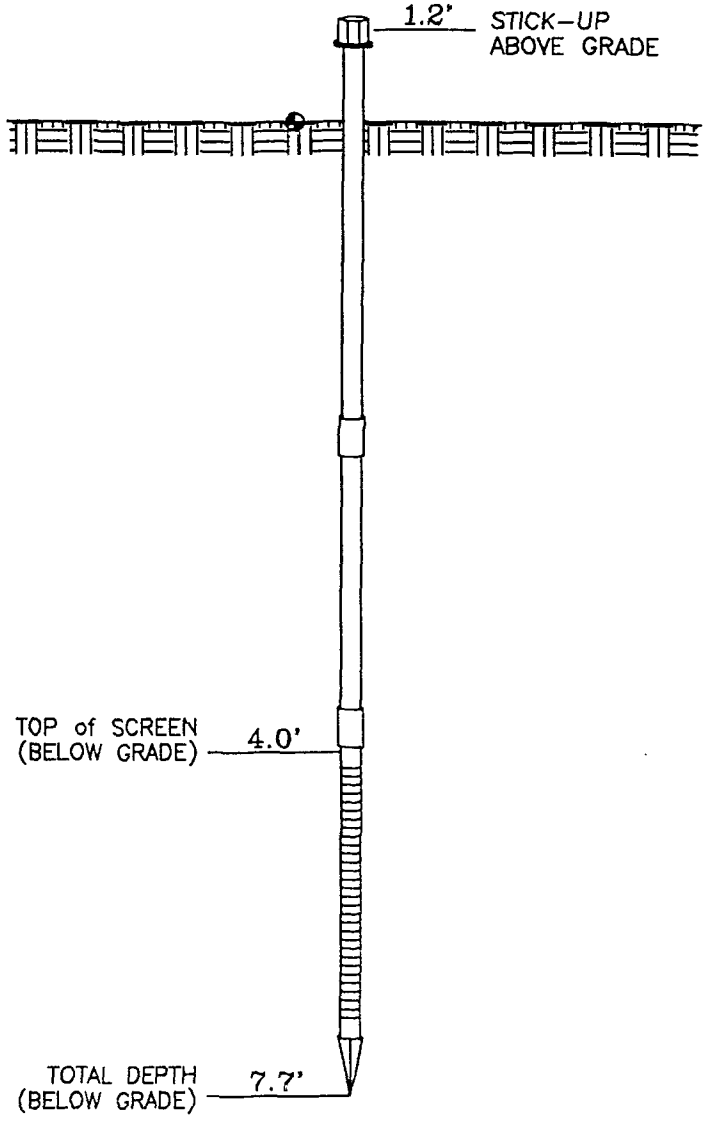
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : _____



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-24

Site Location/Client : Rexene

Northing : 288695.42

Easting : 1552169.91

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.90

Installation/Adjustment Date : 3/16/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.1

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.7'

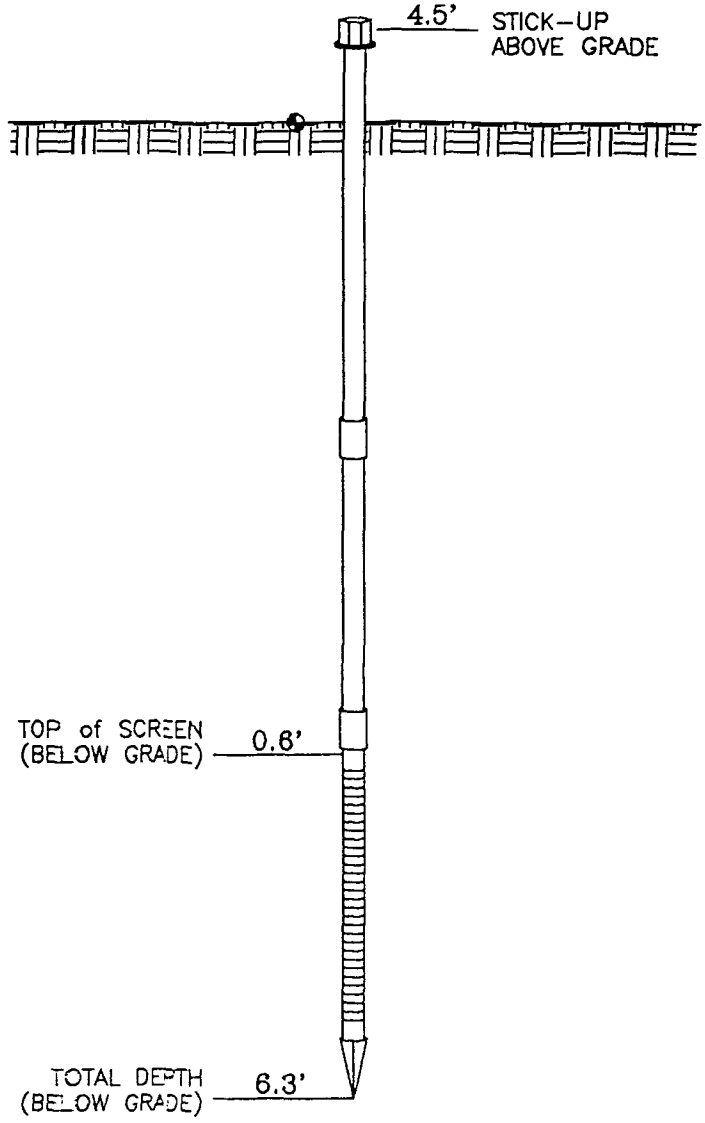
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : Raised 8.0 ft. up from original depth.



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-25

Site Location/Client : Rexene

Northing : 288316.23

Easting : 1552318.12

Ground Level Elevation : N/A

Top of Casing Elevation : 3733.65

Installation/Adjustment Date : 9/30/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : ?

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : ?

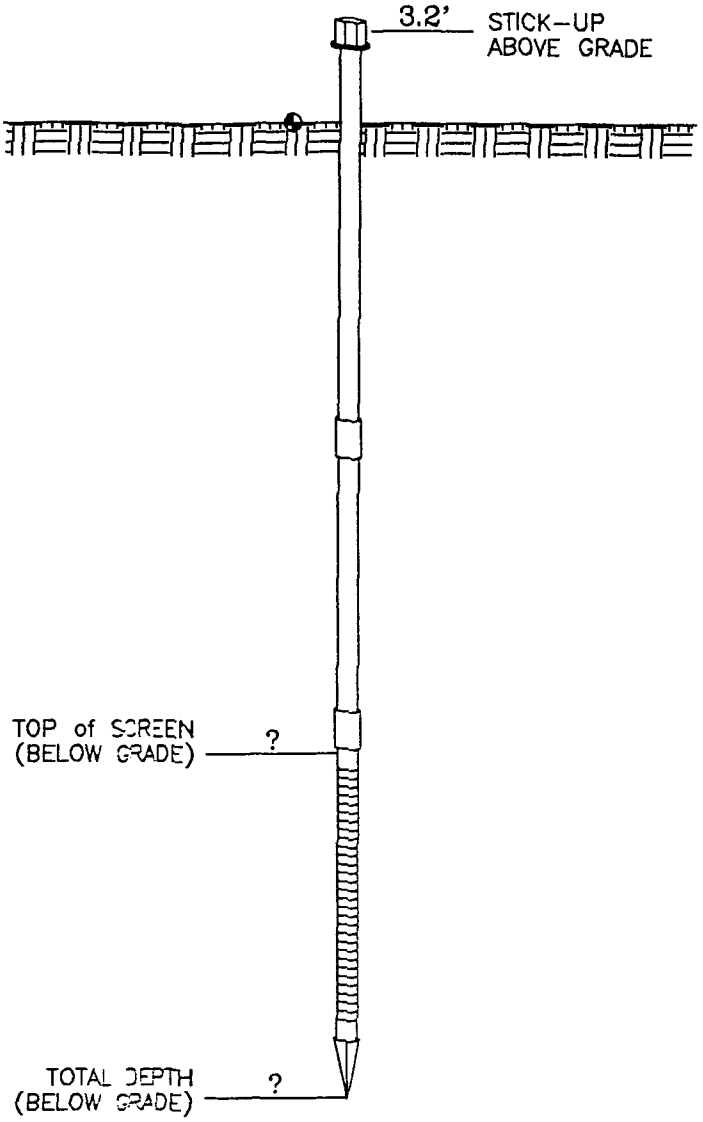
Slot Size : ?

Casing Cap Type : Duct tape

Type of Surface Seal : None

Installation Method : Slide hammer

Remarks : Casing thread damage, prevents cap installation.



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-26S

Site Location/Client : Rexene

Northing : 288343.40

Easting : 1552306.42

Ground Level Elevation : N/A

Top of Casing Elevation : 3732.48

Installation/Adjustment Date : 12/2/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : 5.2

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.5'

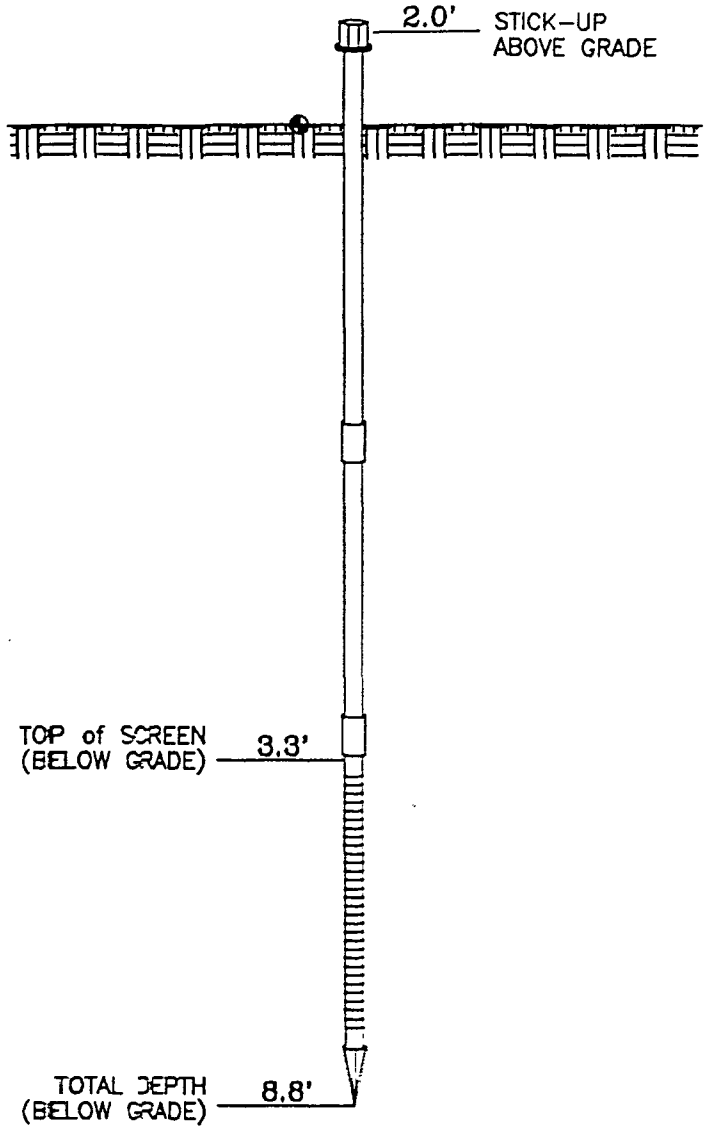
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks : _____



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-26D

Site Location/Client : Rexene

Northing : 286344.28

Easting : 1552308.98

Ground Level Elevation : N/A

Top of Casing Elevation : 3733.42

Installation/Adjustment Date : 12/2/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : 15.4'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.5'

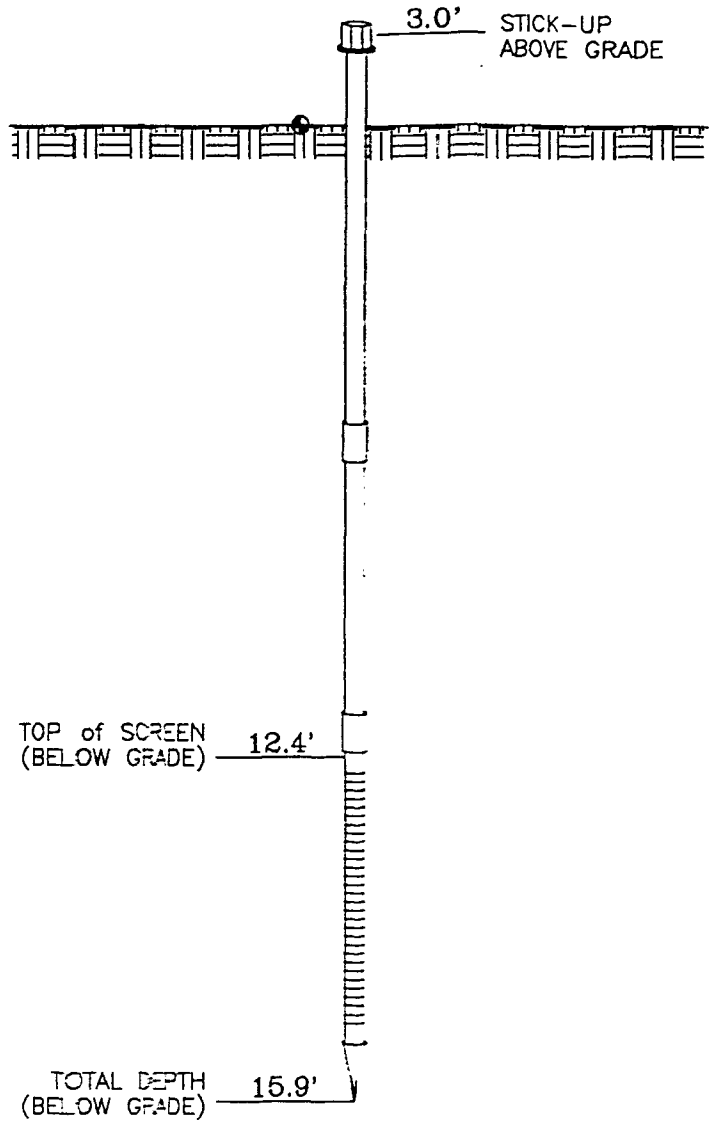
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-27S

Site Location/Client : Rexene

Northing : 288150.70

Easting : 1552443.02

Ground Level Elevation : N/A

Top of Casing Elevation : 3737.16

Installation/Adjustment Date : 12/3/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : 10.3'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.5'

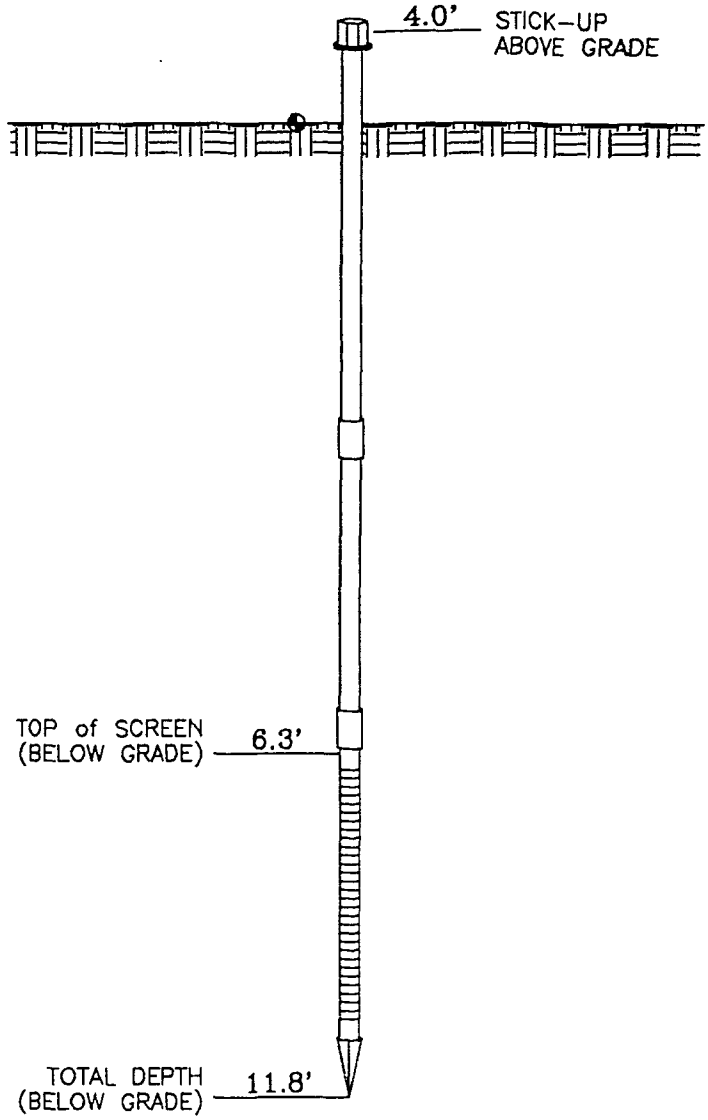
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-27D

Site Location/Client : Rexene

Northing : 288153.15

Easting : 1552442.18

Ground Level Elevation : N/A

Top of Casing Elevation : 3737.12

Installation/Adjustment Date : 12/2/93

Drilling Contractor : PEI

Casing Type : Carbon

Casing Length : 15.4'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.5'

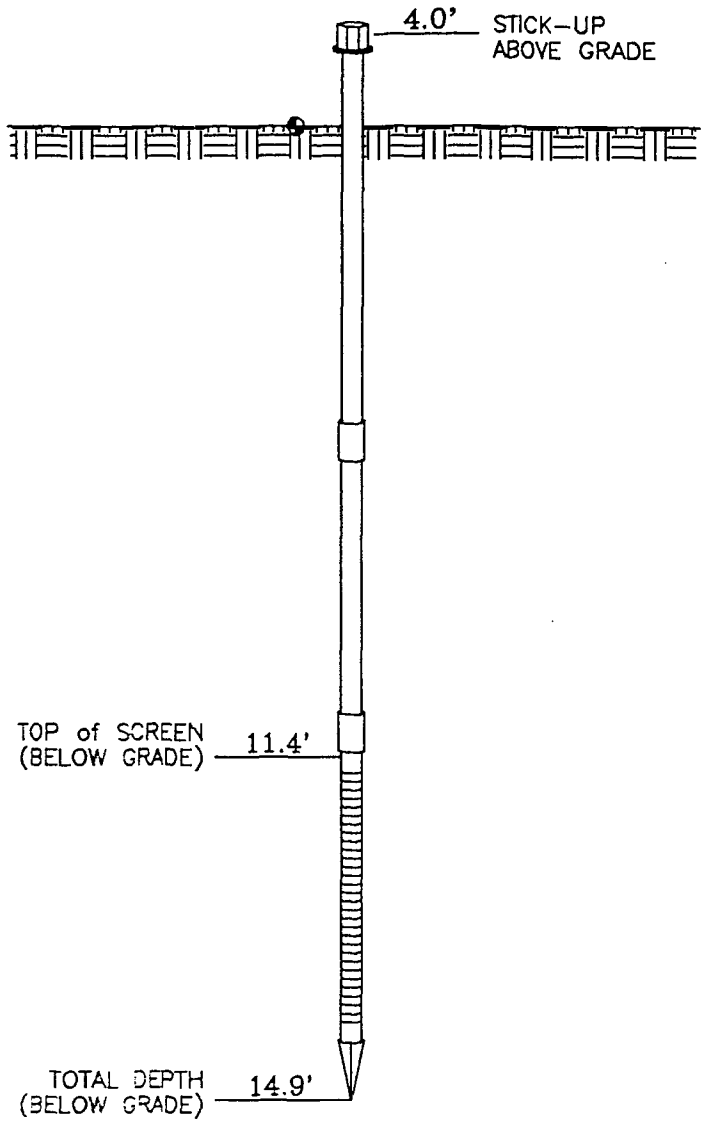
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-28

Site Location/Client : Rexene

Northing : 289062.17

Easting : 1551880.38

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.71

Installation/Adjustment Date : 8/18/94

Drilling Contractor : PEI/GPI

Casing Type : Carbon

Casing Length : 5.3'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.6'

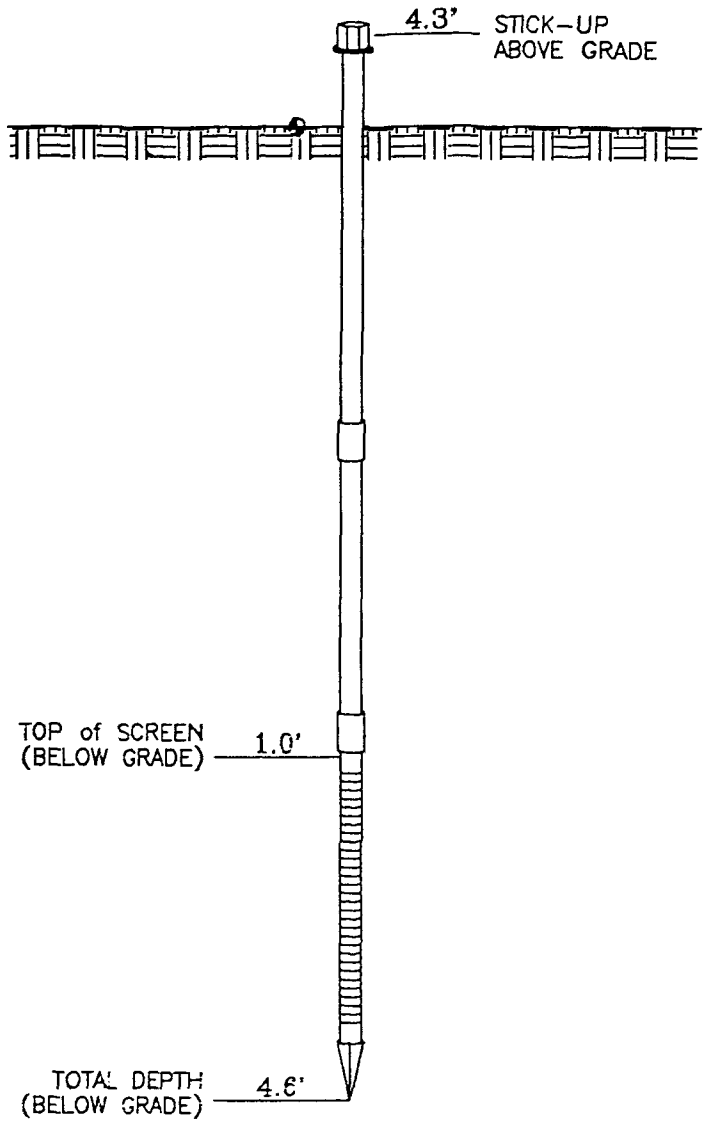
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-29

Site Location/Client : Rexene

Northing : 289167.85

Easting : 1552005.02

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.37

Installation/Adjustment Date : 6/18/94

Drilling Contractor : GPI

Casing Type : Carbon

Casing Length : 5.3'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.6'

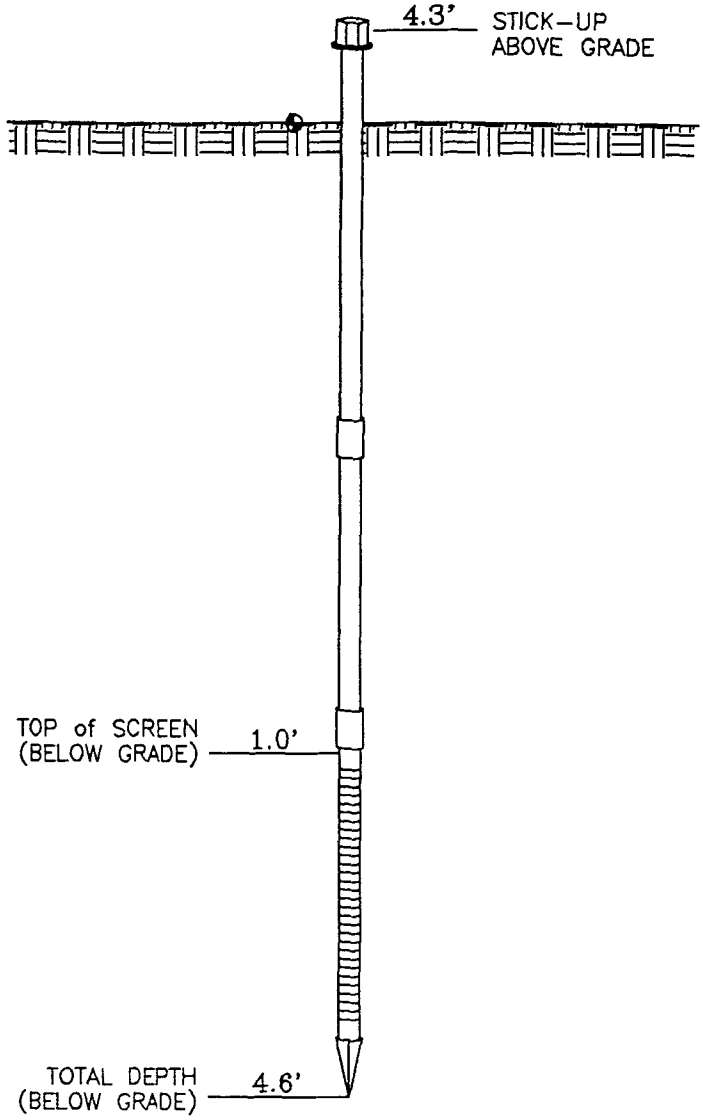
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-30

Site Location/Client : Rexene

Northing : 288429.77

Easting : 1552201.21

Ground Level Elevation : N/A

Top of Casing Elevation : 3733.54

Installation/Adjustment Date : 6/23/94

Drilling Contractor : GPI

Casing Type : Carbon

Casing Length : 8.2'

Casing Dia. : 2"

Screen Type : Wire Wrapped Stainless

Slotted Length : 5.7'

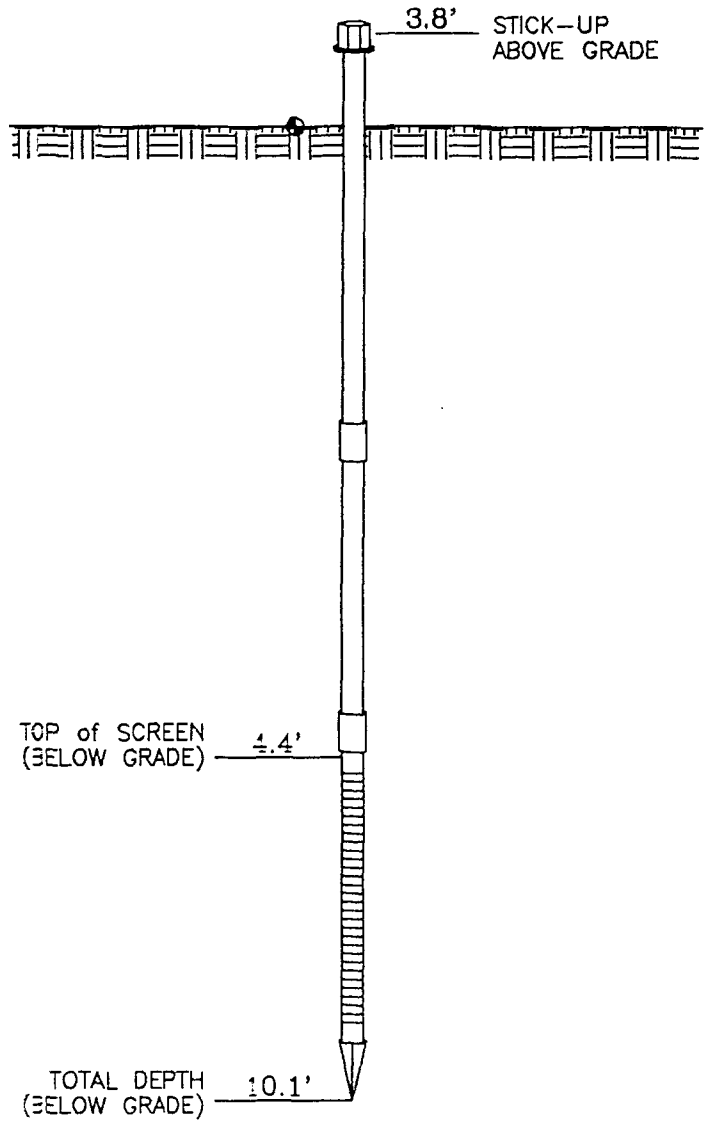
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Drill/Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-31

Site Location/Client : Rexene

Northing : 288173.77

Easting : 1552269.26

Ground Level Elevation : N/A

Top of Casing Elevation : 3737.21

Installation/Adjustment Date : 6/23/94

Drilling Contractor : GPI

Casing Type : Carbon

Casing Length : 10.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.6'

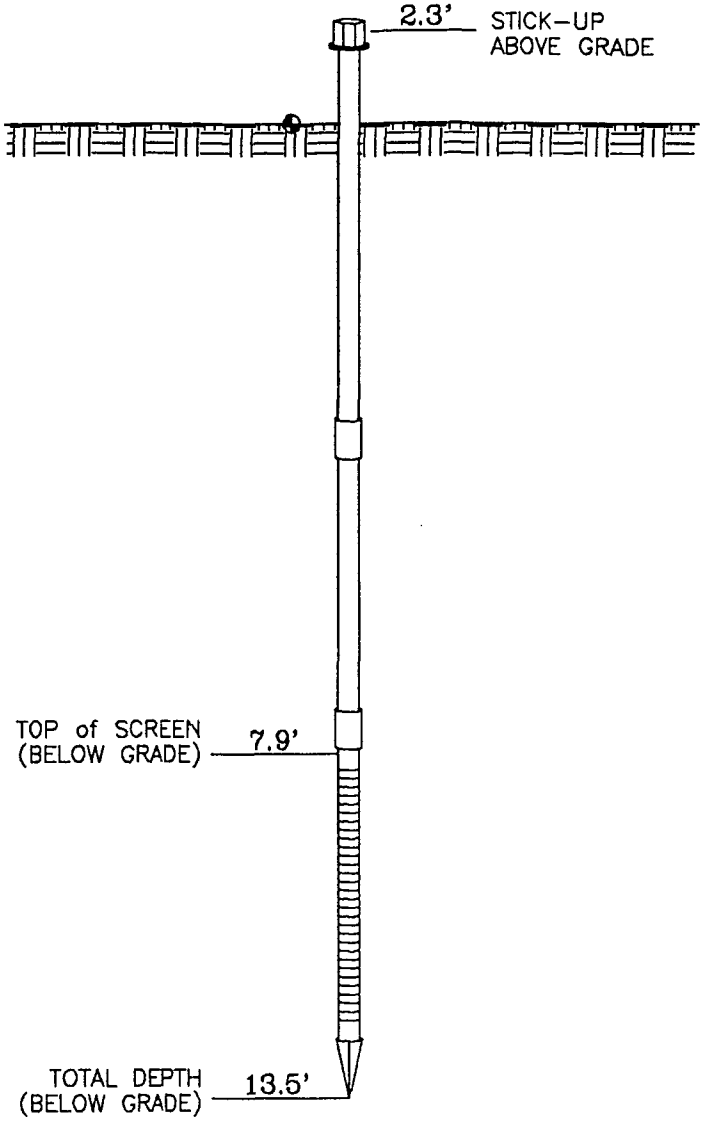
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-32

Site Location/Client : Rexene

Northing : 288102.57

Easting : 1552383.92

Ground Level Elevation : N/A

Top of Casing Elevation : 3736.80

Installation/Adjustment Date : 6/21/94

Drilling Contractor : GPI

Casing Type : Carbon

Casing Length : 10.5'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.6'

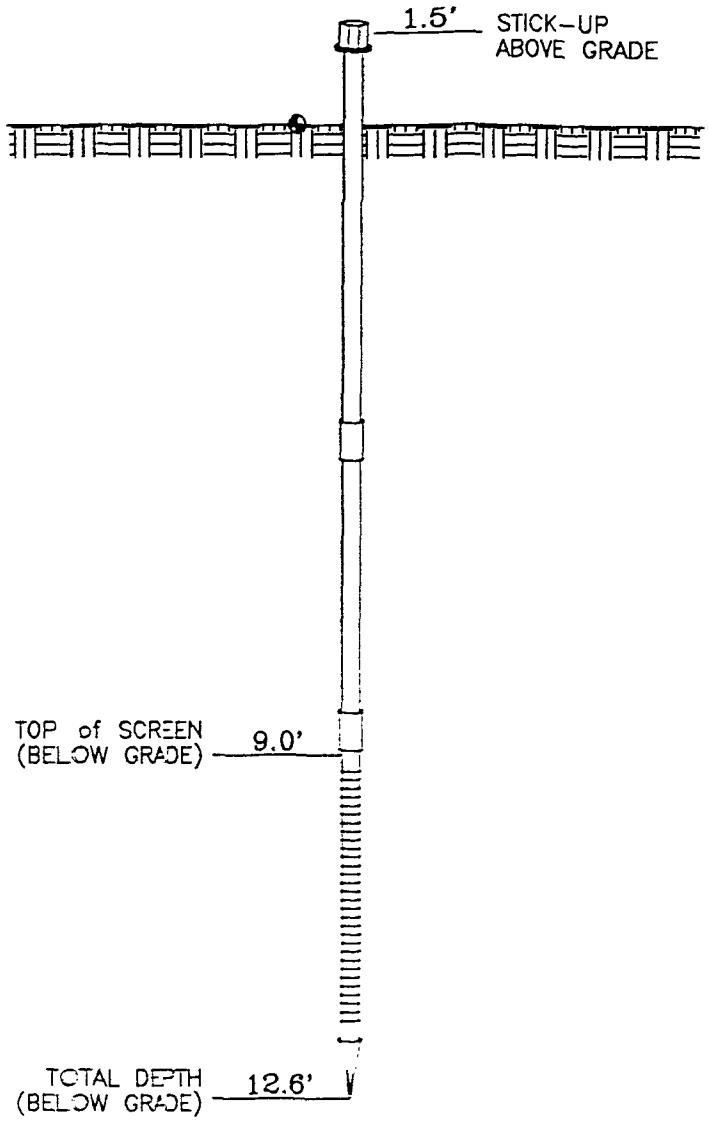
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push/Drill

Remarks :



WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-33

Site Location/Client : Rexene

Northing : 288431.64

Easting : 1552133.31

Ground Level Elevation : N/A

Top of Casing Elevation : 3732.85

Installation/Adjustment Date : 6/23/94

Drilling Contractor : GPI

Casing Type : Carbon

Casing Length : 10.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.7'

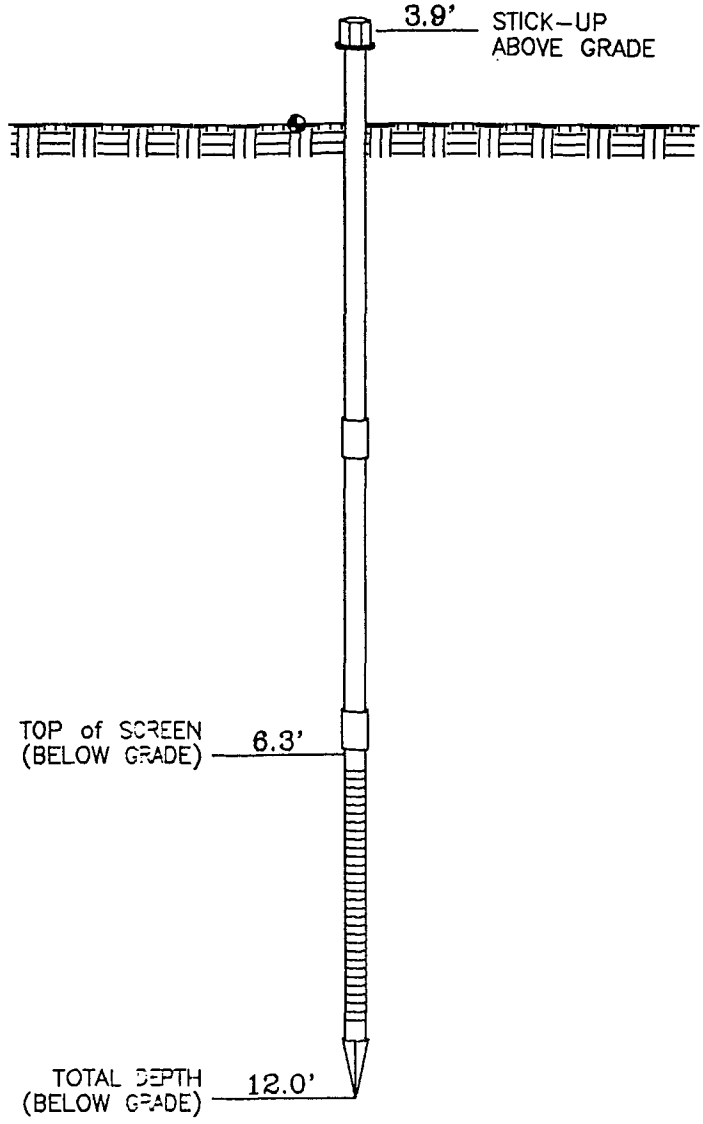
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push/Drill

Remarks :



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-34

Site Location/Client : Rexene

Northing : 288757.04

Easting : 1551947.61

Ground Level Elevation : N/A

Top of Casing Elevation : 3731.54

Installation/Adjustment Date : 6/23/94

Drilling Contractor : GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 5.6'

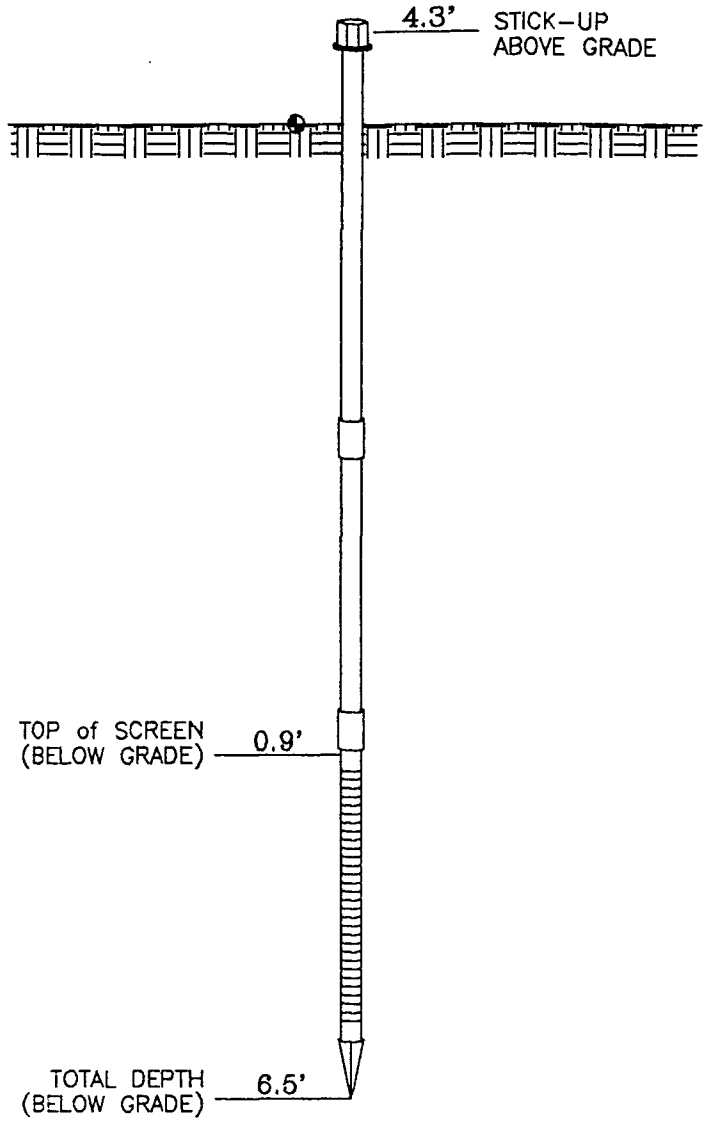
Slot Size : 0.01

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Drill/Push

Remarks : _____



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-35

Site Location/Client : Rexene

Northing : 288810.29

Easting : 1552153.51

Ground Level Elevation : N/A

Top of Casing Elevation : 3728.84

Installation/Adjustment Date : 6/23/94

Drilling Contractor : GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.6'

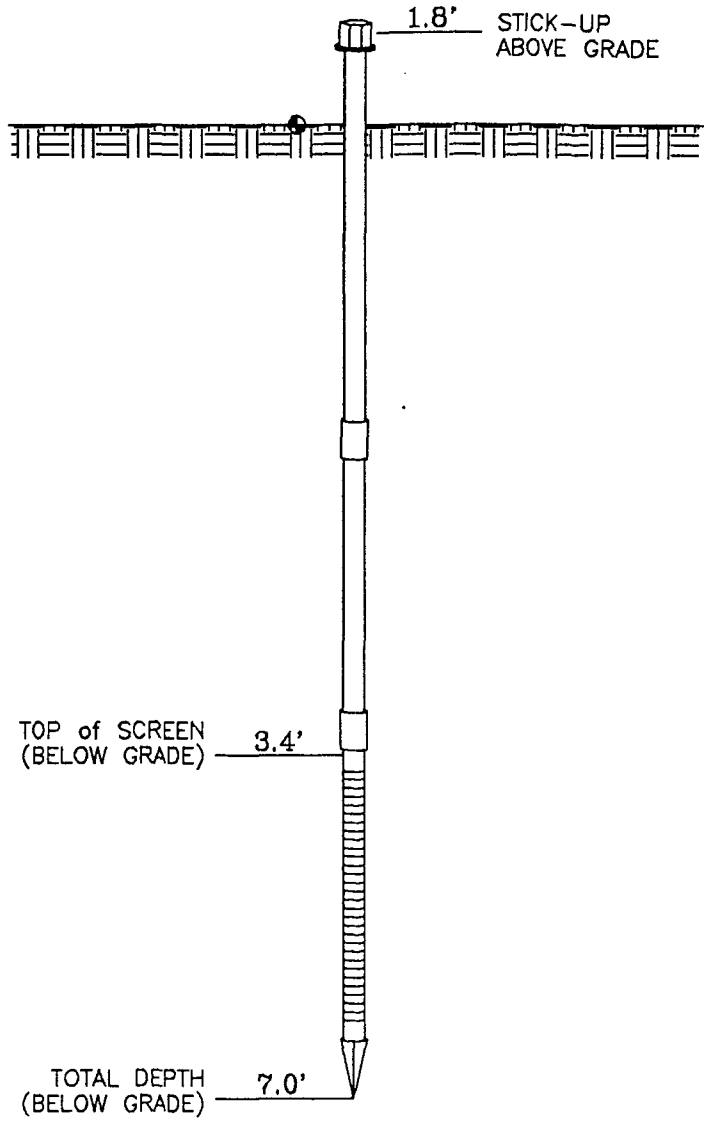
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Drill/Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-36

Site Location/Client : Rexene

Northing : 289245.87

Easting : 1551893.75

Ground Level Elevation : N/A

Top of Casing Elevation : 3729.60

Installation/Adjustment Date : 6/23/94

Drilling Contractor : GPI

Casing Type : Carbon

Casing Length : 5.1'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.6'

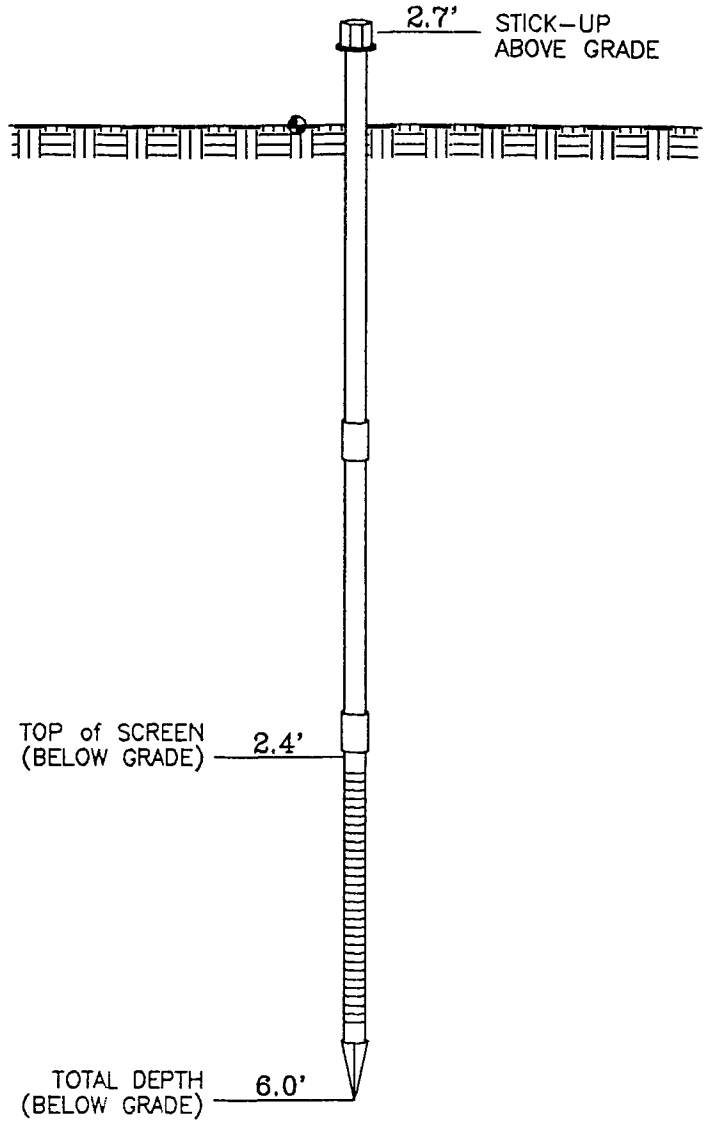
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Drill/Push

Remarks :



WELL POINT DETAIL

NOT TO SCALE – ALL DIMENSIONS APPROXIMATE

Well Point Construction Information

Well Point ID : WP-37

Site Location/Client : Rexene

Northing : 289175.63

Easting : 1551656.80

Ground Level Elevation : N/A

Top of Casing Elevation : 3730.25

Installation/Adjustment Date : 6/23/94

Drilling Contractor : GPI

Casing Type : Carbon

Casing Length : 5.2'

Casing Dia. : 2"

Screen Type : Stainless

Slotted Length : 3.6'

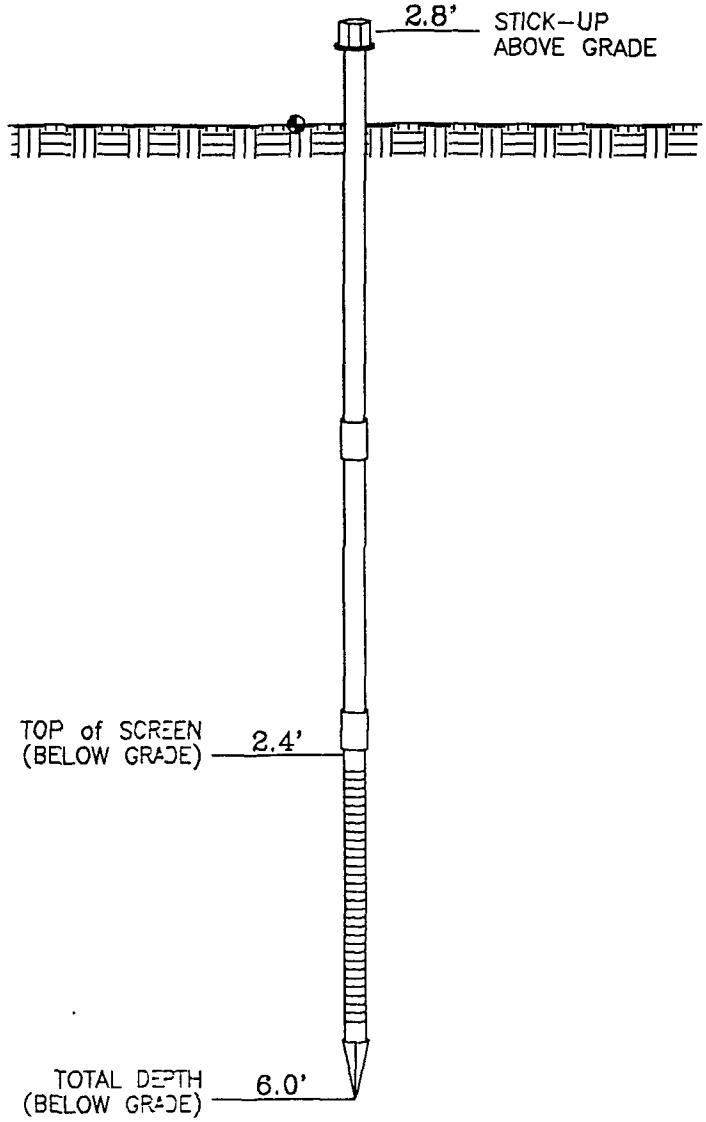
Slot Size : 0.02

Casing Cap Type : Threaded

Type of Surface Seal : None

Installation Method : Push

Remarks :

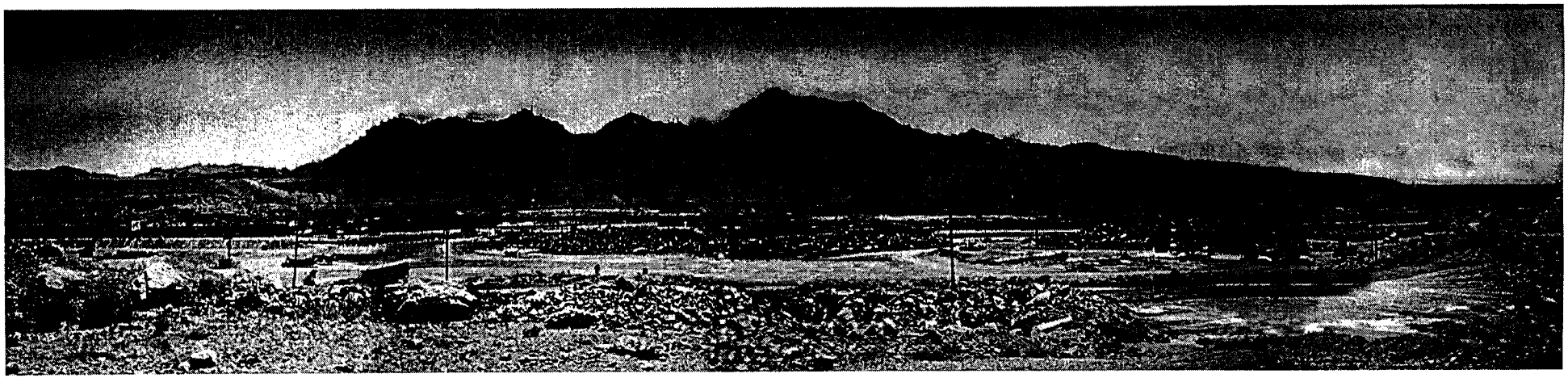


WELL POINT DETAIL

NOT TO SCALE - ALL DIMENSIONS APPROXIMATE

Appendix D

Photograph Used As Part of Geologic Survey



Appendix E

Laboratory Analytical Data
for Soil Analyses

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

GEOSCIENCE CONSULTANTS, LTD.

SOIL ANALYSIS
PROJECT REXENE
PROJECT # 3031-004

CL FILE #094145

PERFORMED BY:
CORE LABORATORIES
3430 UNICORN ROAD
BAKERSFIELD, CA 93308
(805) 392-8600

FINAL REPORT PRESENTED
JULY 13, 1994

INTRODUCTION

Core Laboratories was requested to perform a soil analysis study on behalf of Geoscience Consultants, Ltd. on core samples recovered from the Rexene Project. Presented herein are the results of this study.

The report is divided into six sections. The first section, Analysis Request Summary, identifies the requested procedures and tests for each sample. Also included in the first section, Analysis Techniques, which gives a description of analysis. The second, Geotechnical Analysis Results, contains a tabular presentation of the soil analysis data. The third section, Clay Typing Analysis by X-ray Diffraction, is presented in tabular form. The forth section, Laser Particle Size Analysis, is presented graphically and in tabular form. The fifth section, Capillary Moisture Relationship, is also presented graphically and in tabular form. The last section contains copies of the chain of custodies for the Rexene Project.

We appreciate this opportunity to be of service and hope these data prove beneficial in the development of this project.

TABLE OF CONTENTS

Western Atlas International
A Litton Dresser Company

CORE LABORATORIES

GCL
ENVIRONMENTAL SCIENCE AND EGINEERING
PROJECT NAME: REXENE
PROJECT NO.: 3031-004

CORE LAB FILE NO: 094145
BAKERSFIELD, CA
11-Jul-94

ANALYSIS REQUEST SUMMARY

Sample ID	Location	MOISTURE CONTENT ASTM D-2216	SAT/VERT HYDRAULIC CONDUCTIVITY ASTM D-2434	SAT/HORIZ HYDRAULIC CONDUCTIVITY ASTM D-2434	DRY BULK DENSITY API RP-40	HUMIC CONTENT ASTM D-2974	CATION EXCHANGE CAPACITY (ADSORBED)	CLAY TYPE X-RAY DIFFRACTION	PARTICLE SIZE DISTRIBUTION LASER	CAPILLARY MOISTURE RELATION ASTM D-2325
9406171043	B-1	X								
9406171047	B-1	X								
9406171318	B-2					X				
9406171322	B-2	X								
9406190851	B-4								X	
9406190856	B-4								X	
9406190901	B-4								X	
9406190910	B-4								X	
9406190913	B-4								X	
9406190000	B-4									X
9406190001	B-4									X
9406190920	B-4		X	X						
9406171619	B-5	X								
9406171625	B-5	X					X	X		
9406180631	B-6	X				X				
9406180634	B-6						X	X		
9406180835	B-8				X					
9406180842	B-8	X								
9406181050	B-9	X								
9406201410	B-10	X					X	X		
9406200000	B-11									X
9406201612	B-11				X				X	
9406201616	B-11								X	
9406201620	B-11								X	
9406201625	B-11								X	
9406201630	B-11								X	
9406210816	B-12					X				
9406210830	B-12							X		
9406211510	B-13A	X								
9406211516	B-13A		X	X						
9406200831	B-14	X								

Analysis Techniques

Bulk Density, Particle Size Distribution, Hydraulic Conductivity, Moisture Content, Humic Content, Capillary Moisture Relationship, Cation Exchange Capacity, X-Ray Diffraction

The samples were analyzed utilizing techniques described in API RP-40 (Bulk Density), ASTM D-2216 (Moisture Content), ASTM D-2434 (Hydraulic Conductivity), ASTM D-2974 (Organic Content), and ASTM D-2325 (Capillary Moisture Relationship). Techniques for X-ray Diffraction and Laser Particle Size Analysis are also described below.

Sample Preparation (Bulk Density)

A one-inch diameter plug was drilled from each submitted sample. Liquid nitrogen was used as the bit coolant.

Bulk Density Determination (API RP-40)

One inch diameter plugs were taken from each submitted sample. Bulk density was determined upon each plug as described in API RP-40.

The bulk volume of each sample was calculated using Equation 1.

$$V_b = V_p + V_g \quad (1)$$

Where: V_b = Bulk Volume
V_p = Pore Volume
V_g = Grain Volume

Bulk Density was calculated using Equation 2.

$$D_b = M_g / V_b \quad (2)$$

Where: D_b = Bulk Density
M_g = Dry Grain Mass
V_b = Bulk Volume

Laser Particle Size Analysis (LPSA)

LPSA determines the grain size distribution of a sample by utilizing laser diffraction techniques. A small portion of each disaggregated sample was

dispersed in a liquid medium and repeatedly passed through a laser beam. The resultant dispersion patterns were recorded and analyzed by computer. Particle size fractions are determined as a percentage of the total sample volume and are presented in tabular and graphic formats.

Hydraulic Conductivity Determination (ASTM D-2434)

The soil sample tubes were trimmed in length to fit into the hydraulic conductivity apparatus. The end surfaces were plane and perpendicular to the longitudinal axis of sample. 120 mesh screens were applied to top and bottom of the samples to reduce the possibility of sample movement during testing. The samples were undisturbed and tested in the state in which they were received. Once mounted in the conductivity system, the samples were vacuumed for one-half hour to remove any trapped air in the soil and apparatus. While under vacuum the samples were then saturated with water. A graduated burette was used to measure the initial and final hydraulic head and determine volumes of water introduced to the sample.

The samples were tested and measured a total of six times apiece. A five percent accuracy parameter was used to determine the validity of the experiments. The tests were consistent with the constant tailwater pressure method, Equation 3. Water flowed through the sample until constant flow condition was observed.

$$k = (a * L / A * t) * \ln(h_0/h_1) \qquad (3)$$

Where:

k = Permeability, meters/second

a = Cross-sectional area of the reservoir containing the influent liquid in meters^2

L = Length of sample, meters

A = Cross-sectional area of the sample, meters^2

t = Total time in seconds

h_0 = initial height of water column above chamber outflow port in meters

h_1 = final height of water column above chamber outflow port in meters

Moisture Content Determination (ASTM D-2216)

Upon receipt of the samples, material was removed from both ends of each tube submitted for moisture content determination, immediately weighed, placed into tared drying dishes, and then placed into a convection oven at 110° C until stable dry weights were attained. ASTM water content of the material was calculated using Equation 4.

$$w = [(W_1 - W_2)/(W_2 - W_c)] \times 100 = W_w/W_s \quad (4)$$

Where:

w = water content, %

W_1 = mass of container and moist specimen, g

W_2 = mass of container and oven-dried specimen, g

W_c = mass of container, g

W_w = mass of water, g

W_s = mass of solid particles, g

Humic/Organic Content Determination (ASTM D-2974)

Upon receipt of the samples, material was removed from both ends of each tube submitted for organic content determination, immediately weighed, placed into tared drying dishes, and then placed into a convection oven at 110° C until stable dry weights were attained. After recording the oven dried weight the sample was transfered to a furnace and ignited at 440° C. The substance remaining after ignition is the ash. The ash content is expressed as a percentage of the

mass of the oven-dried sample. The organic matter is determined by subracting percent ash content from one hundred. ASTM ash content of the material was calculated using Equation 5.

$$a = (c \times 100)/b \quad (5)$$

Where:

a = ash content, %

c = mass of ash, g

b = oven-dried specimen, g

ASTM organic content of the material was calculated using Equation 6.

$$om = 100.0 - a \quad (6)$$

Where:

om = organic matter, %

a = ash content, %

Capillary Moisture Relationship (ASTM D-2325)
Porous-Plate Method

The saturated soil samples are placed in contact with a saturated porous plate installed within a pressure chamber. The bottom of each plate is sealed to be airtight. The bottom of each plate is maintained at atmospheric pressure by means of a small drain tube. A desired air pressure (tension) is admitted to the pressure chamber. The volumetric water displaced is monitored until equilibrium. The moisture content of the sample is calculated using equation 7. The procedure is repeated for five additional tension points (between 0.1 and 1 atm).

$$\text{Moisture equivalent} = \text{Moisture Weight/Sample Dry Weight} \quad (7)$$

Cation Exchange Capacity Determination (Adsorbed Water Method)

A representative sample from each tube selected for CEC analysis was prepared for testing by cleaning, disaggration and air drying. The sample is then placed

in a relative humidity oven for seventy-two hours at RH 45% and 60° C. At the end of this time interval, the sample is cooled to room temperature and weighed to the nearest milligram.

The sample is then dried for twenty-four hours at 110°C in a convection oven. The sample is then cooled to room temperature and weighed to the nearest milligram. The Adsorbed Water Indicator (AWI) for the sample is calculated by equation 8.

The Cation Exchange Capacity, milliequivalents/100gm, of the sample is then determined empirically by utilizing a conversion chart developed by Core Laboratories Research and Development.

$$AWI = W_2/W_1 \qquad (8)$$

Where:

AWI = Adsorbed Water Indicator

W_1 = Weight of the humidified sample, g

W_2 = Weight of the oven-dried sample, g

X-ray Diffraction (XRD) Clay Typing

Representative samples were selected from the tubes submitted for XRD analysis. Samples were cleaned, gently disaggregated, and split into clay-size fraction and sand-silt size fraction. The clay size fraction was then analyzed for quantitative clay typing.

X-ray diffraction analysis is a method used for finding the mineral content of a substance. X-ray diffraction is based on the measurements of X-ray reflection geometry. The condition for reflection of X-rays from a parallel arrangement of atoms within a crystal is called the Bragg Angle. The fundamental measurement made with XRD is "d-spacing" of the mineral lattice determined by Bragg's Law, equation 9.

$$n\lambda=2d\sin\theta \qquad (9)$$

Where:

n = order of reflection

λ = wavelength of incident X-rays

d = interplanar spacing between rows of atoms

θ = angle of incident X-rays

Sample Disposition

The residual sample will be stored for thirty days at our Bakersfield facility pending instructions for additional work or permanent storage arrangements.

Western Atlas International

CORE LABORATORIES

GCL
ENVIRONMENTAL SCIENCE AND ENGINEERING
PROJECT NAME: REXENE
PROJECT NO.: 3031-004

C. L FILE NO: 094145
BAKERSFIELD, CA
8-Jul-94

GEOTECHNICAL ANALYSIS RESULTS

Sample ID	Location	Depth	Moisture Content (%)	Saturated/Vert Hydraulic Conductivity (cm/sec)	Saturated/Horiz Hydraulic Conductivity (cm/sec)	Dry Bulk Density (gm/cc)	Humic Content (Organic) (%)	Cation Exchange Capacity (meq/100gm)
9406171043	B-1	4-6'	32.2					
9406171047	B-1	6-8'	24.8					
9406171318	B-2	4-6'					1.0	
9406171322	B-2	6-8'	30.2					
9406190920	B-4	10-12'		2.22E-04	2.28E-04			
9406171619	B-5	4-6'	43.4					
9406171625	B-5	6-8'	27.5					13.6
9406180631	B-6	4-6'	34.0				1.3	
9406180634	B-6	6-8'						12.4
9406180835	B-8	0-2'				1.62		
9406180842	B-8	4-6'	25.8					
9406181050	B-9	6-8'	28.8					
9406201410	B-10	6-8'	34.8					53.0
9406201612	B-11	2-4'				1.68		
9406210816	B-12	6-8'					2.7	
9406211510	B-13A	8-10'	13.7					
9406211516	B-13A	12-14'		3.70E-08	3.54E-08			
9406200831	B-14	2-4'	4.8					

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CORE LABORATORIES

GCL

Table 1

File: 194173

Clay Fraction (< 4 micron) Analysis by X-ray Diffraction (relative abundance %)

Depth, feet	Quartz	K feldspar	Plagioclase	Calcite	Dolomite	Siderite	Pyrite	Illite	Kaolinite	Chlorite	Montmorillonite Smectite	Illite/ Smectite	% *smectite**	% *clay-sized*
9406180634 6-8 ft.	5	0	0	25	0	0	0	23	5	0	42	0	—	*10*
9406210830 10-12 ft.	8	0	0	3	0	0	0	5	12	14	0	58	*50*	*46*
9406201410 6-8 ft.	16	0	0	5	0	0	0	16	24	24	0	15	*50*	*39*
9406171625 6-8 ft.	5	0	0	20	0	0	0	12	6	6	51	0	—	*17*
	34			53				56	47	44	93			

* This is the amount of smectite in mixed-layer illite/smectite clay.

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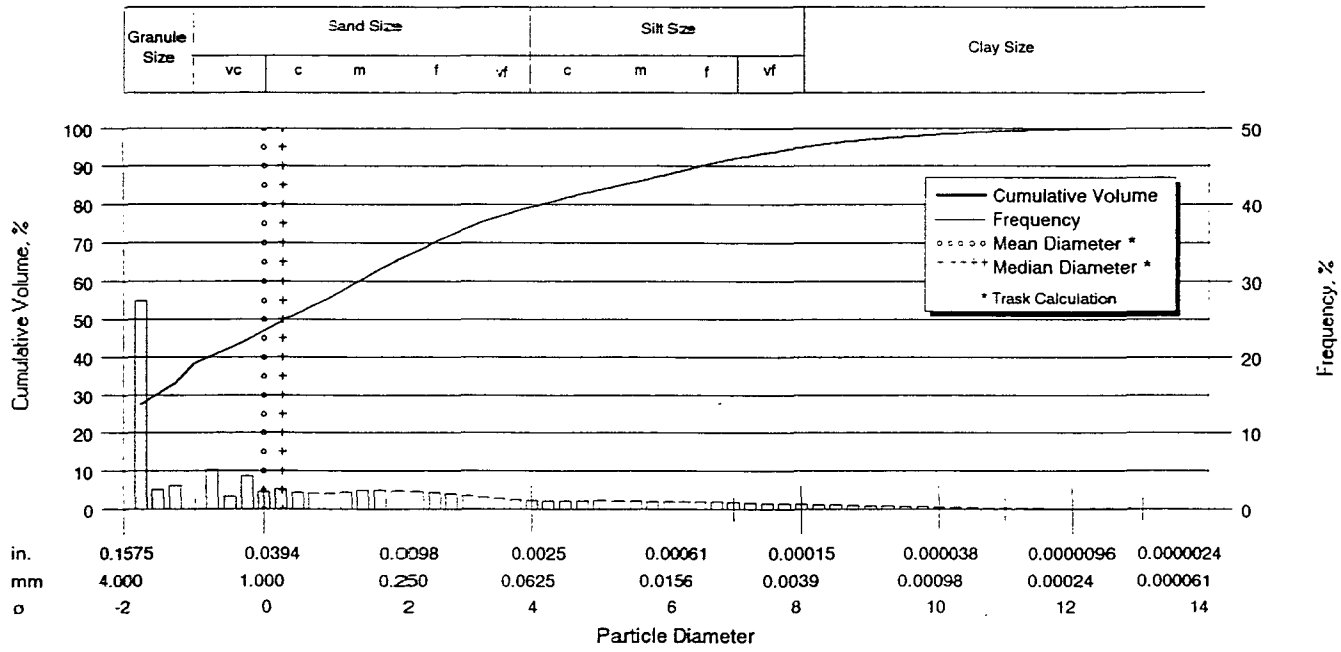
CORE LABORATORIES

Company	GCL	Depth	0-2	File Number	57111-94145
Sample	#9406190851	Loc.	B-4	Date	27-JUN-94
Project	REXENE	State		Analysts	GC

Sieve and Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Granule	6	0.1324	3.36	-1.75	27.45	27.45
	8	0.0936	2.38	-1.25	5.73	33.18
V Coarse	10	0.0787	2.00	-1.00	5.21	38.38
Sand	16	0.0468	1.19	-0.25	6.08	44.46
	20	0.0331	0.84	0.25	4.89	49.35
Coarse	25	0.0280	0.71	0.50	2.21	51.56
Sand	30	0.0232	0.59	0.75	2.13	53.69
	35	0.0197	0.50	1.00	2.09	55.78
	40	0.0165	0.42	1.25	2.30	58.08
Medium	45	0.0138	0.35	1.50	2.50	60.58
Sand	50	0.0118	0.30	1.75	2.52	63.10
	60	0.0098	0.25	2.00	2.46	65.56
	70	0.0083	0.210	2.25	2.34	67.90
Fine	80	0.0070	0.177	2.50	2.19	70.09
Sand	100	0.0059	0.149	2.75	2.02	72.11
	120	0.0049	0.125	3.00	1.80	73.91
	140	0.0041	0.105	3.25	1.58	75.49
Very Fine	170	0.0035	0.088	3.50	1.40	76.89
Sand	200	0.0029	0.074	3.75	1.27	78.16
	230	0.0025	0.063	4.00	1.15	79.31
	270	0.0021	0.053	4.25	1.11	80.42
Silt	325	0.0017	0.044	4.50	1.10	81.52
	400	0.0015	0.037	4.75	1.10	82.62
	450	0.0012	0.031	5.00	1.13	83.75
	500	0.0010	0.025	5.32	1.43	85.18
	635	0.0008	0.020	5.64	1.31	86.49
		0.00061	0.0156	6.00	1.43	87.92
		0.00031	0.0078	7.00	4.03	91.95
		0.00015	0.0039	8.00	3.04	94.99
		0.000079	0.0020	9.00	2.10	97.09
Clay		0.000039	0.00098	10.0	1.29	98.38
		0.000019	0.00049	11.0	0.84	99.22
		0.0000094	0.00024	12.0	0.51	99.73
		0.0000047	0.00012	13.0	0.24	99.97
		0.0000039	0.00010	13.3	0.03	100.00

Sorting Statistics

Parameter	Trask*	Inman**	Folk**
Mean, in			
Mean, mm			
Mean, phi			
Median, in	0.0322	0.0322	0.0322
Median, mm	0.8256	0.8256	0.8256
Median, phi	0.2765	0.2765	0.2765
Standard Deviation, in			
Standard Deviation, mm			
Standard Deviation, phi			
Skewness			
Kurtosis			

* calculated using mm values
* *calculated using phi values

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5			
10			
16			
25			
50	0.0322	0.8256	0.2765
75	0.0043	0.1112	3.1687
84	0.0012	0.0301	5.0549
90	0.0004	0.0110	6.5012
95	0.0002	0.0039	8.0043

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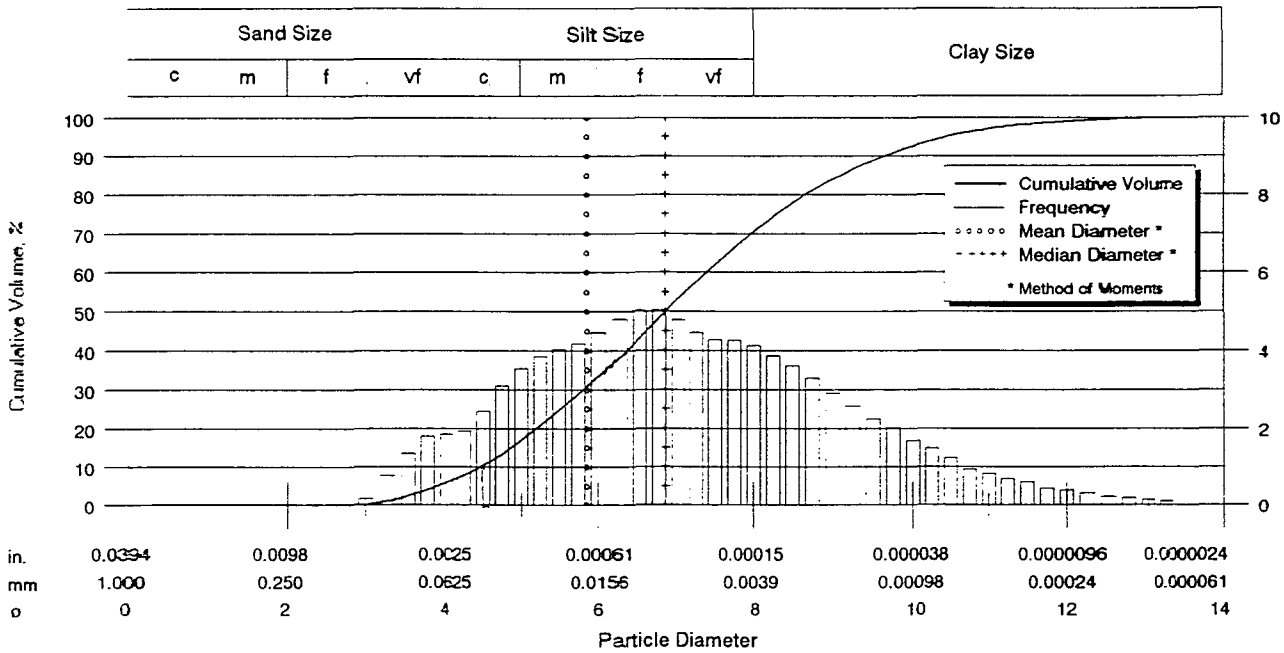
CORE LABORATORIES

Company	GCL	Depth	2-4	File Number	57111-94145
Sample	# 9406190856	Loc.	B-4	Date	27-JUN-94
Project	REXENE	State		Analysts	GC

Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Coarse	20	0.0331	0.84	0.25	0.00	0.00
Sand	25	0.0280	0.71	0.50	0.00	0.00
	30	0.0232	0.59	0.75	0.00	0.00
	35	0.0197	0.50	1.00	0.00	0.00
Medium	40	0.0165	0.42	1.25	0.00	0.00
Sand	45	0.0138	0.35	1.50	0.00	0.00
	50	0.0118	0.30	1.75	0.00	0.00
	60	0.0098	0.25	2.00	0.00	0.00
Fine	70	0.0083	0.210	2.25	0.00	0.00
Sand	80	0.0070	0.177	2.50	0.00	0.00
	100	0.0059	0.149	2.75	0.00	0.00
	120	0.0049	0.125	3.00	0.16	0.16
Very Fine	140	0.0041	0.105	3.25	0.78	0.94
Sand	170	0.0035	0.088	3.50	1.36	2.30
	200	0.0029	0.074	3.75	1.78	4.08
	230	0.0025	0.063	4.00	1.85	5.93
Silt	270	0.0021	0.053	4.25	1.93	7.86
	325	0.0017	0.044	4.50	2.46	10.32
	400	0.0015	0.037	4.75	3.06	13.38
	450	0.0012	0.031	5.00	3.54	16.92
	500	0.0010	0.025	5.32	4.97	21.89
	635	0.0008	0.020	5.64	5.21	27.10
		0.00061	0.0156	6.00	6.34	33.44
		0.00031	0.0078	7.00	19.68	53.12
		0.00015	0.0039	8.00	17.14	70.26
Clay		0.000079	0.0020	9.00	13.68	83.94
		0.000039	0.00098	10.0	8.50	92.44
		0.000019	0.00049	11.0	4.48	96.92
		0.0000094	0.00024	12.0	2.13	99.05
		0.0000047	0.00012	13.0	0.86	99.91
		0.0000039	0.00010	13.3	0.09	100.00

Sorting Statistics

Parameter	[Moment]	[Trask]	[Inman]	[Folk]
Mean, in	0.0007	0.0003	0.0003	0.0003
Mean, mm	0.0172	0.0083	0.0080	0.0082
Mean, phi	5.8581	6.9106	6.9705	6.9258
Median, in	0.0003	0.0003	0.0003	0.0003
Median, mm	0.0088	0.0088	0.0088	0.0088
Median, phi	6.8362	6.8365	6.8365	6.8365
Std Deviation, in	0.0009	0.0167	0.0095	0.0096
Std Deviation, mm	0.0221	0.4270	0.2440	0.2471
Std Deviation, phi	5.5024	1.2277	2.0348	2.0166
Skewness	2.2430	0.9800	0.1642	0.0836
Kurtosis	5.3410	0.2699	0.6205	0.9667
Mode, mm	0.0109			
95% Confidence	0.0129			
Limits, mm	0.0216			
Variance, mm2	0.0005			
Coef. of Variance, %	127.90			

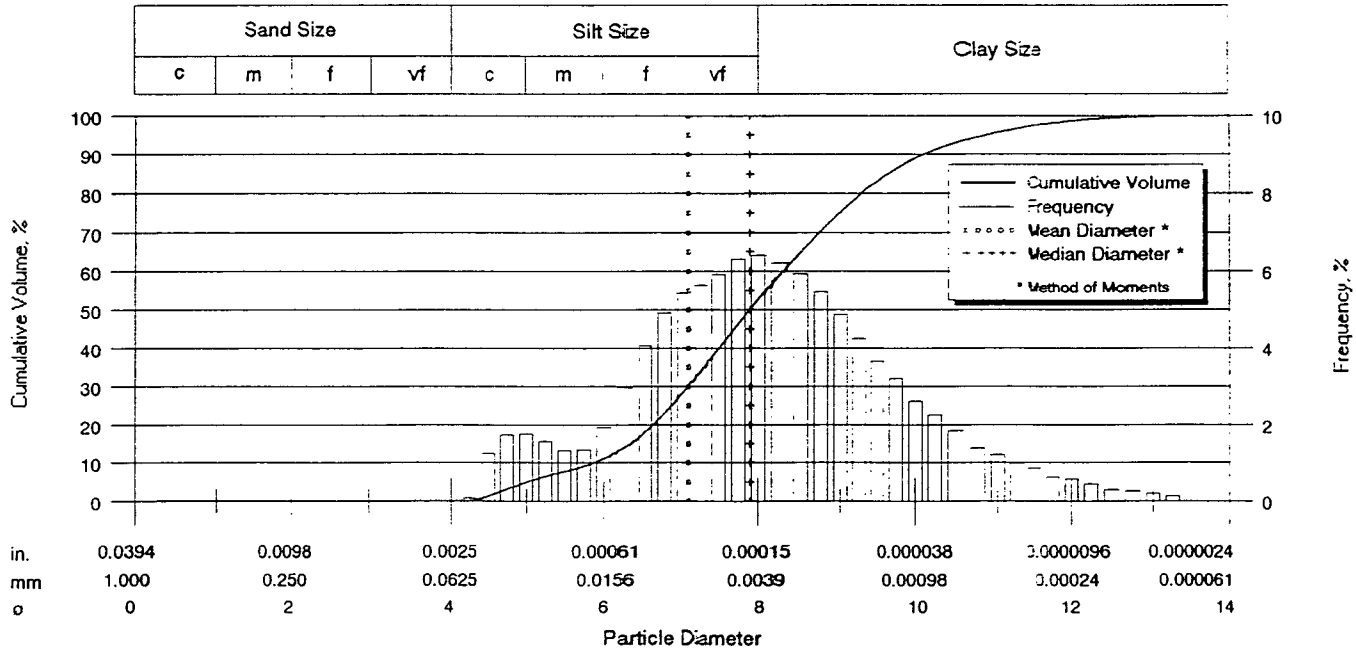
Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0027	0.0682	3.8733
10	0.0018	0.0451	4.4709
16	0.0013	0.0327	4.9357
25	0.0009	0.0219	5.5127
50	0.0003	0.0088	6.8365
75	0.0001	0.0032	8.3086
84	0.0001	0.0019	9.0053
90	0.0000	0.0012	9.6508
95	0.0000	0.0007	10.4680

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

Company	GCL	Depth	4-6	File Number	57111-94145
Sample	# 9406190901	Loc.	B-4	Date	27-JUN-94
Project	REXENE	State		Analyst	GC

Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	[in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Coarse	20	0.0331	0.84	0.25	0.00	0.00
Sand	25	0.0280	0.71	0.50	0.00	0.00
	30	0.0232	0.59	0.75	0.00	0.00
	35	0.0197	0.50	1.00	0.00	0.00
Medium	40	0.0165	0.42	1.25	0.00	0.00
Sand	45	0.0138	0.35	1.50	0.00	0.00
	50	0.0118	0.30	1.75	0.00	0.00
	60	0.0098	0.25	2.00	0.00	0.00
Fine	70	0.0083	0.210	2.25	0.00	0.00
Sand	80	0.0070	0.177	2.50	0.00	0.00
	100	0.0059	0.149	2.75	0.00	0.00
	120	0.0049	0.125	3.00	0.00	0.00
Very Fine	140	0.0041	0.105	3.25	0.00	0.00
Sand	170	0.0035	0.088	3.50	0.00	0.00
	200	0.0029	0.074	3.75	0.00	0.00
	230	0.0025	0.063	4.00	0.00	0.00
Silt	270	0.0021	0.053	4.25	0.08	0.08
	325	0.0017	0.044	4.50	1.25	1.33
	400	0.0015	0.037	4.75	1.72	3.05
	450	0.0012	0.031	5.00	1.77	4.82
	500	0.0010	0.025	5.32	1.96	6.78
	635	0.0008	0.020	5.64	1.63	8.41
		0.00061	0.0156	6.00	2.56	10.97
		0.00031	0.0078	7.00	17.39	28.36
		0.00015	0.0039	8.00	24.33	52.69
Clay		0.000079	0.0020	9.00	22.50	75.19
		0.000039	0.00098	10.0	13.74	88.93
		0.000019	0.00049	11.0	6.68	95.61
		0.0000094	0.00024	12.0	3.04	98.65
		0.0000047	0.00012	13.0	1.22	99.87
		0.0000039	0.00010	13.3	0.13	100.00

Sorting Statistics

Parameter	[Moment]	[Trask]	[Inman]	[Folk]
Mean, in	0.0003	0.0002	0.0002	0.0002
Mean, mm	0.0074	0.0041	0.0040	0.0040
Mean, phi	7.0709	7.9190	7.9754	7.9493
Median, in	0.0002	0.0002	0.0002	0.0002
Median, mm	0.0042	0.0042	0.0042	0.0042
Median, phi	7.8968	7.8971	7.8971	7.8971
Std Deviation, in	0.0004	0.0176	0.0129	0.0122
Std Deviation, mm	0.0093	0.4520	0.3320	0.3118
Std Deviation, phi	6.7451	1.1456	1.5910	1.6813
Skewness	2.5210	0.9872	0.0334	0.0337
Kurtosis	6.5280	0.2536	0.8374	1.1196
Mode, mm	0.0044			
95% Confidence	0.0056			
Limits, mm	0.0093			
Variance, mm2	0.0001			
Coef. of Variance, %	125.30			

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0012	0.0307	5.0271
10	0.0007	0.0169	5.8886
16	0.0005	0.0120	6.3844
25	0.0003	0.0087	6.8489
50	0.0002	0.0042	7.8971
75	0.0001	0.0020	8.9891
84	0.0001	0.0013	9.5663
90	0.0000	0.0009	10.1082
95	0.0000	0.0005	10.8736

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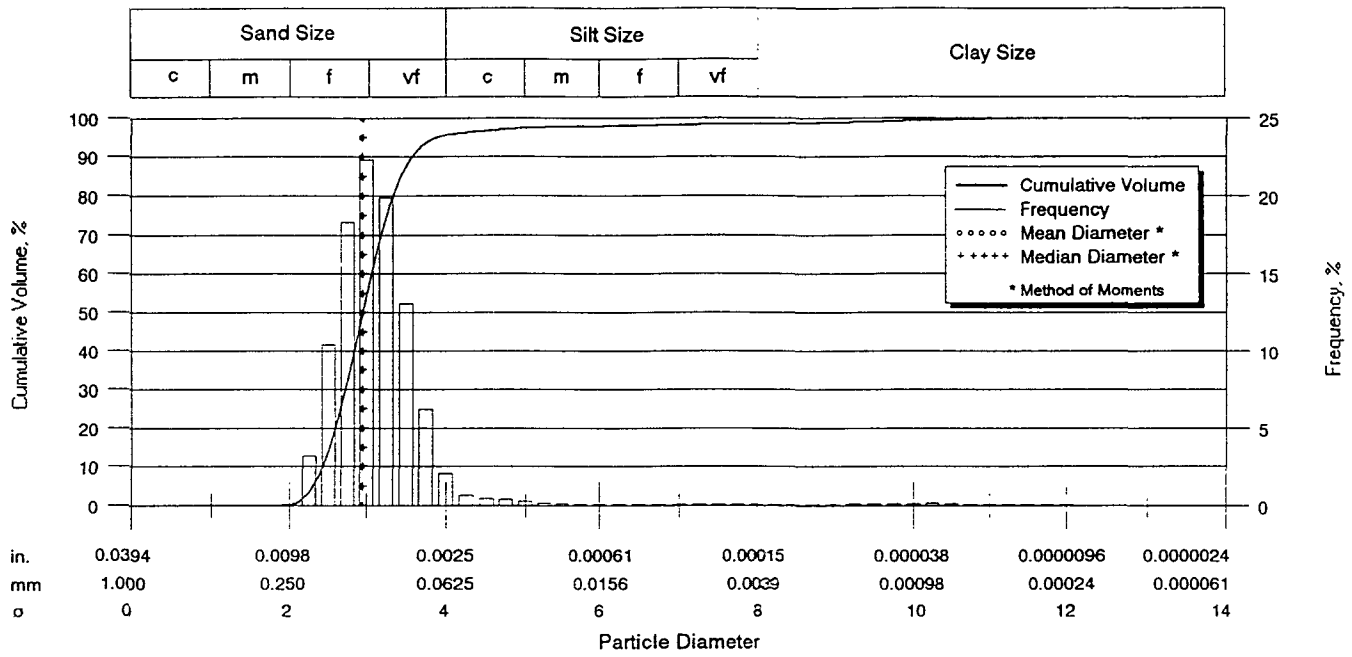
CORE LABORATORIES

Company	GCL	Depth	8-10	File Number	57111-94145
Sample	# 9406190913	Loc.	B-4	Date	27-JUN-94
Project	REXENE	State		Analysts	GC

Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Coarse	20	0.0331	0.84	0.25	0.00	0.00
Sand	25	0.0280	0.71	0.50	0.00	0.00
	30	0.0232	0.59	0.75	0.00	0.00
	35	0.0197	0.50	1.00	0.00	0.00
Medium	40	0.0165	0.42	1.25	0.00	0.00
Sand	45	0.0138	0.35	1.50	0.00	0.00
	50	0.0118	0.30	1.75	0.00	0.00
	60	0.0098	0.25	2.00	0.06	0.06
Fine	70	0.0083	0.210	2.25	3.18	3.24
Sand	80	0.0070	0.177	2.50	10.40	13.64
	100	0.0059	0.149	2.75	18.33	31.97
	120	0.0049	0.125	3.00	22.30	54.27
Very Fine	140	0.0041	0.105	3.25	19.90	74.17
Sand	170	0.0035	0.088	3.50	13.11	87.28
	200	0.0029	0.074	3.75	6.23	93.51
	230	0.0025	0.063	4.00	2.06	95.57
Silt	270	0.0021	0.053	4.25	0.64	96.21
	325	0.0017	0.044	4.50	0.46	96.67
	400	0.0015	0.037	4.75	0.42	97.09
	450	0.0012	0.031	5.00	0.29	97.38
	500	0.0010	0.025	5.32	0.20	97.58
	635	0.0008	0.020	5.64	0.13	97.71
		0.00061	0.0156	6.00	0.13	97.84
		0.00031	0.0078	7.00	0.29	98.13
		0.00015	0.0039	8.00	0.30	98.43
Clay		0.000079	0.0020	9.00	0.35	98.78
		0.000039	0.00098	10.0	0.50	99.28
		0.000019	0.00049	11.0	0.47	99.75
		0.0000094	0.00024	12.0	0.23	99.98
		0.0000047	0.00012	13.0	0.02	100.00
		0.0000039	0.00010	13.3	0.00	100.00

Sorting Statistics

Parameter	[Moment]	[Trask]	[Inman]	[Folk]
Mean, in	0.0051	0.0050	0.0049	0.0050
Mean, mm	0.1304	0.1282	0.1269	0.1276
Mean, phi	2.9390	2.9639	2.9787	2.9700
Median, in	0.0050	0.0050	0.0050	0.0050
Median, mm	0.1292	0.1292	0.1292	0.1292
Median, phi	2.9523	2.9524	2.9524	2.9524
Std Deviation, in	0.0017	0.0181	0.0287	0.0283
Std Deviation, mm	0.0428	0.4645	0.7368	0.7261
Std Deviation, phi	4.5476	1.1062	0.4406	0.4617
Skewness	-0.2410	0.9976	0.3346	0.1224
Kurtosis	0.7650	0.2594	0.8076	1.0949
Mode, mm	0.1392			
95% Confidence Limits, mm	0.1220 to 0.1388			
Variance, mm2	0.0018			
Coef. of Variance, %	32.80			

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0079	0.2026	2.3034
10	0.0072	0.1857	2.4290
16	0.0067	0.1722	2.5381
25	0.0061	0.1576	2.6658
50	0.0050	0.1292	2.9524
75	0.0041	0.1042	3.2621
84	0.0036	0.0935	3.4194
90	0.0033	0.0837	3.5783
95	0.0026	0.0672	3.8963

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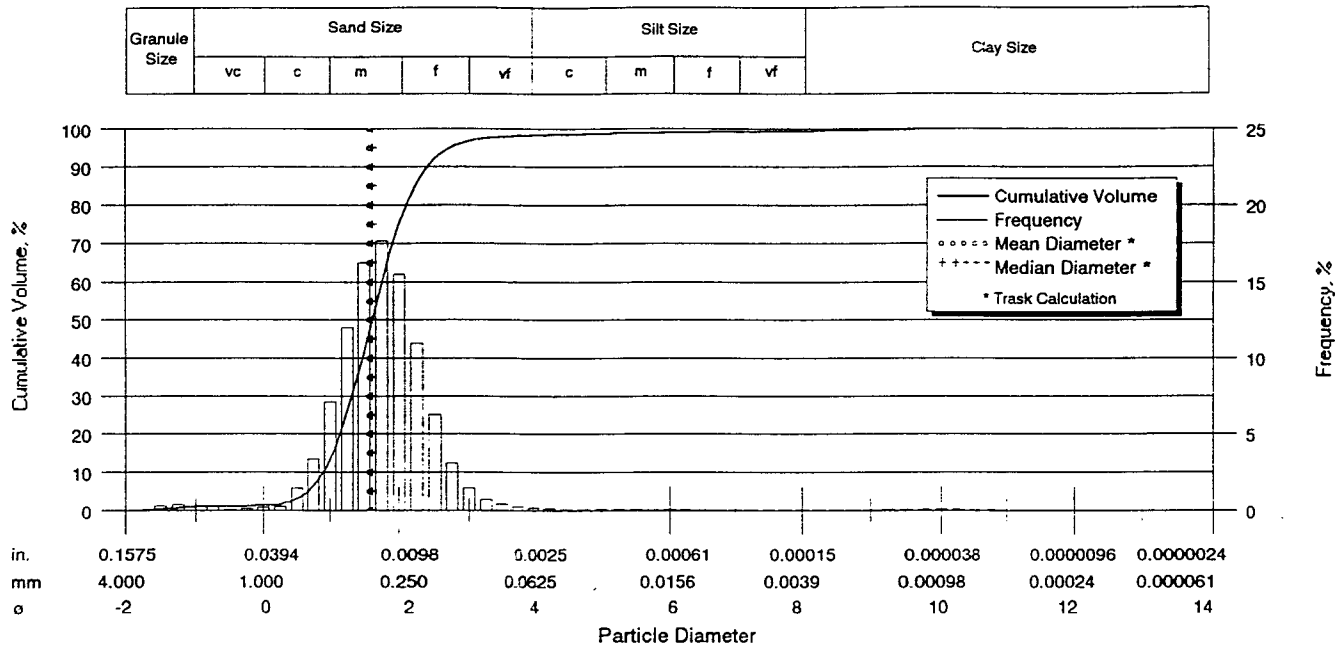
CORE LABORATORIES

Company	GCL	Depth	2-4	File Number	57111-94145
Sample	#9406201612	Loc.	B-11	Date	27-JUN-94
Project	REXENE	State		Analysts	GC

Sieve and Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Granule	6	0.1324	3.36	-1.75	0.00	0.00
	8	0.0936	2.38	-1.25	0.67	0.67
V Coarse	10	0.0787	2.00	-1.00	0.31	0.98
Sand	16	0.0468	1.19	-0.25	0.16	1.14
	20	0.0331	0.84	0.25	0.43	1.57
Coarse	25	0.0280	0.71	0.50	1.44	3.01
Sand	30	0.0232	0.59	0.75	3.33	6.34
	35	0.0197	0.50	1.00	7.12	13.46
	40	0.0165	0.42	1.25	12.03	25.49
Medium	45	0.0138	0.35	1.50	16.24	41.73
Sand	50	0.0118	0.30	1.75	17.65	59.38
	60	0.0098	0.25	2.00	15.49	74.87
	70	0.0083	0.210	2.25	10.98	85.85
Fine	80	0.0070	0.177	2.50	6.30	92.15
Sand	100	0.0059	0.149	2.75	3.09	95.24
	120	0.0049	0.125	3.00	1.45	96.69
	140	0.0041	0.105	3.25	0.73	97.42
Very Fine	170	0.0035	0.088	3.50	0.42	97.84
Sand	200	0.0029	0.074	3.75	0.25	98.09
	230	0.0025	0.063	4.00	0.16	98.25
	270	0.0021	0.053	4.25	0.12	98.37
Silt	325	0.0017	0.044	4.50	0.09	98.46
	400	0.0015	0.037	4.75	0.08	98.54
	450	0.0012	0.031	5.00	0.09	98.63
	500	0.0010	0.025	5.32	0.08	98.71
	635	0.0008	0.020	5.64	0.08	98.79
		0.00061	0.0156	6.00	0.08	98.87
		0.00031	0.0078	7.00	0.24	99.11
		0.00015	0.0039	8.00	0.22	99.33
		0.000079	0.0020	9.00	0.18	99.51
Clay		0.000039	0.00098	10.0	0.33	99.84
		0.000019	0.00049	11.0	0.16	100.00
		0.0000094	0.00024	12.0	0.00	100.00
		0.0000047	0.00012	13.0	0.00	100.00
		0.0000039	0.00010	13.3	0.00	100.00

Sorting Statistics

Parameter	Trask*	Inman**	Folk**
Mean, in	0.0131	0.0126	0.0126
Mean, mm	0.3362	0.3221	0.3234
Mean, phi	1.5727	1.6343	1.6284
Median, in	0.0127	0.0127	0.0127
Median, mm	0.3261	0.3261	0.3261
Median, phi	1.6167	1.6167	1.6167
Standard Deviation, in	0.0508	0.0263	0.0259
Standard Deviation, mm	1.3016	0.6751	0.6631
Standard Deviation, phi	-0.3803	0.5668	0.5927
Skewness	0.9924	0.1513	0.0575
Kurtosis	0.2503	0.8011	1.1001

* calculated using mm values
**calculated using phi values

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0243	0.6235	0.6816
10	0.0209	0.5362	0.8992
16	0.0186	0.4771	1.0675
25	0.0165	0.4228	1.2419
50	0.0127	0.3261	1.6167
75	0.0097	0.2496	2.0025
84	0.0085	0.2175	2.2010
90	0.0074	0.1901	2.3953
95	0.0059	0.1514	2.7233

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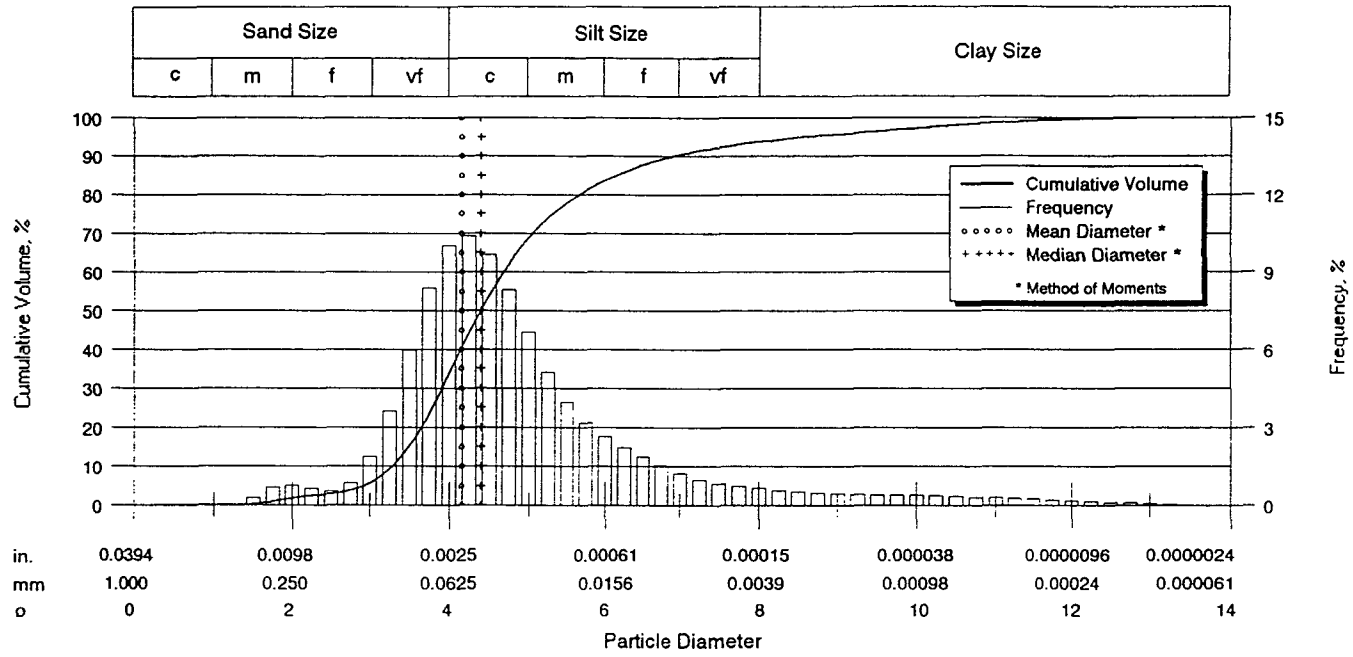
CORE LABORATORIES

Company	GCL	Depth	4-6	File Number	57111-94145
Sample	# 9406201616	Loc.	B-11	Date	27-JUN-94
Project	REXENE	State		Analysts	GC

Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Coarse	20	0.0331	0.84	0.25	0.00	0.00
Sand	25	0.0280	0.71	0.50	0.00	0.00
	30	0.0232	0.59	0.75	0.00	0.00
	35	0.0197	0.50	1.00	0.00	0.00
Medium	40	0.0165	0.42	1.25	0.01	0.01
Sand	45	0.0138	0.35	1.50	0.28	0.29
	50	0.0118	0.30	1.75	0.68	0.97
	60	0.0098	0.25	2.00	0.78	1.75
Fine	70	0.0083	0.210	2.25	0.63	2.38
Sand	80	0.0070	0.177	2.50	0.55	2.93
	100	0.0059	0.149	2.75	0.88	3.81
	120	0.0049	0.125	3.00	1.87	5.68
Very Fine	140	0.0041	0.105	3.25	3.60	9.28
Sand	170	0.0035	0.088	3.50	5.97	15.25
	200	0.0029	0.074	3.75	8.38	23.63
	230	0.0025	0.063	4.00	10.03	33.66
Silt	270	0.0021	0.053	4.25	10.39	44.05
	325	0.0017	0.044	4.50	9.70	53.75
	400	0.0015	0.037	4.75	8.32	62.07
	450	0.0012	0.031	5.00	6.65	68.72
	500	0.0010	0.025	5.32	6.32	75.04
	635	0.0008	0.020	5.64	4.59	79.63
		0.00061	0.0156	6.00	3.96	83.59
		0.00031	0.0078	7.00	6.89	90.48
		0.00015	0.0039	8.00	3.21	93.69
Clay		0.000079	0.0020	9.00	2.02	95.71
		0.000039	0.00098	10.0	1.61	97.32
		0.000019	0.00049	11.0	1.32	98.64
		0.0000094	0.00024	12.0	0.89	99.53
		0.0000047	0.00012	13.0	0.42	99.95
		0.0000039	0.00010	13.3	0.05	100.00

Sorting Statistics

Parameter	[Moment]	[Trask]	[Inman]	[Folk]
Mean, in	0.0022	0.0017	0.0014	0.0015
Mean, mm	0.0562	0.0426	0.0363	0.0397
Mean, phi	4.1543	4.5519	4.7844	4.6561
Median, in	0.0018	0.0018	0.0018	0.0018
Median, mm	0.0474	0.0474	0.0474	0.0474
Median, phi	4.3996	4.3996	4.3996	4.3996
Std Deviation, in	0.0020	0.0172	0.0163	0.0139
Std Deviation, mm	0.0506	0.4398	0.4181	0.3563
Std Deviation, phi	4.3036	1.1851	1.2581	1.4890
Skewness	2.7650	1.0401	1.0877	0.3941
Kurtosis	11.4800	0.2123	1.2554	1.5186
Mode, mm	0.0613			
95% Confidence	0.0462			
Limits, mm	0.0661			
Variance, mm2	0.0026			
Coef. of Variance, %	90.18			

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0051	0.1312	2.9304
10	0.0040	0.1022	3.2903
16	0.0034	0.0868	3.5263
25	0.0028	0.0725	3.7861
50	0.0018	0.0474	4.3996
75	0.0010	0.0251	5.3177
84	0.0006	0.0152	6.0425
90	0.0003	0.0084	6.8978
95	0.0001	0.0026	8.6057

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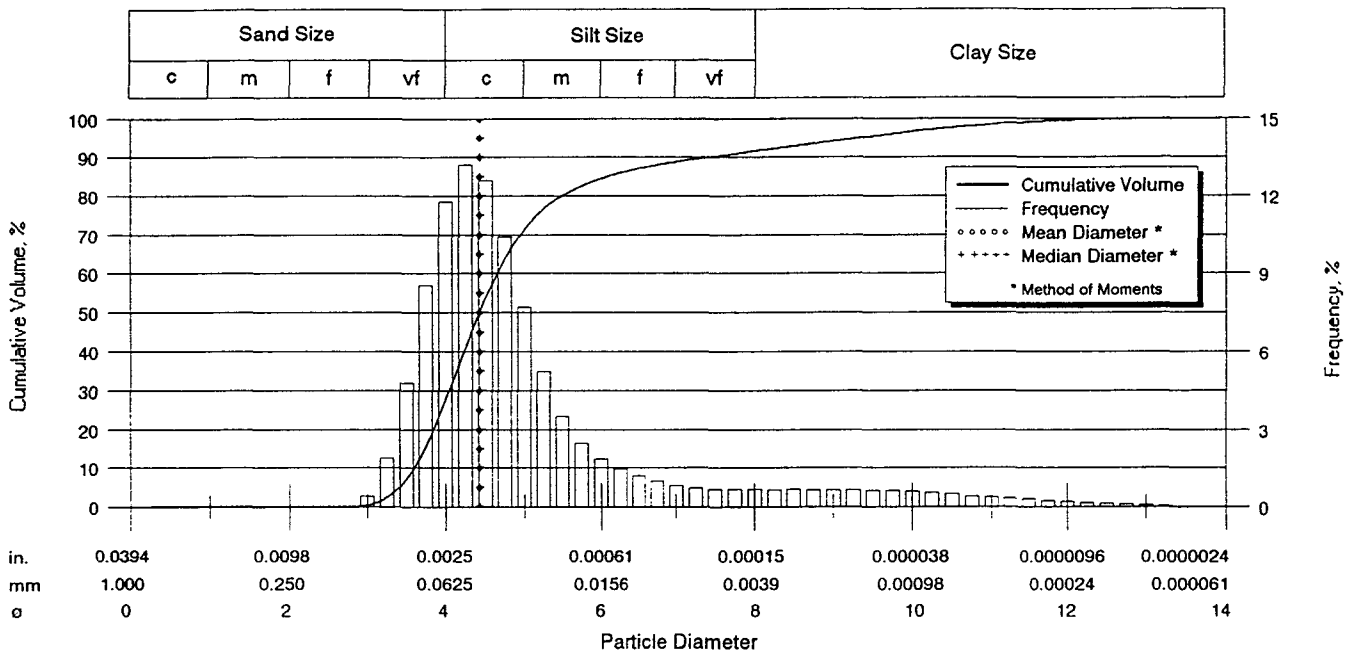
CORE LABORATORIES

Company	GCL	Depth	6-8	File Number	57111-94145
Sample	# 9406201620	Loc.	B-11	Date	27-JUN-94
Project	REXENE	State		Analysts	GC

Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	[in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Coarse	20	0.0331	0.84	0.25	0.00	0.00
Sand	25	0.0280	0.71	0.50	0.00	0.00
	30	0.0232	0.59	0.75	0.00	0.00
	35	0.0197	0.50	1.00	0.00	0.00
Medium	40	0.0165	0.42	1.25	0.00	0.00
Sand	45	0.0138	0.35	1.50	0.00	0.00
	50	0.0118	0.30	1.75	0.00	0.00
	60	0.0098	0.25	2.00	0.00	0.00
Fine	70	0.0083	0.210	2.25	0.00	0.00
Sand	80	0.0070	0.177	2.50	0.00	0.00
	100	0.0059	0.149	2.75	0.01	0.01
	120	0.0049	0.125	3.00	0.41	0.42
Very Fine	140	0.0041	0.105	3.25	1.88	2.30
Sand	170	0.0035	0.088	3.50	4.78	7.08
	200	0.0029	0.074	3.75	8.56	15.64
	230	0.0025	0.063	4.00	11.78	27.42
Silt	270	0.0021	0.053	4.25	13.21	40.63
	325	0.0017	0.044	4.50	12.59	53.22
	400	0.0015	0.037	4.75	10.43	63.65
	450	0.0012	0.031	5.00	7.70	71.35
	500	0.0010	0.025	5.32	6.35	77.70
	635	0.0008	0.020	5.64	3.87	81.57
		0.00061	0.0156	6.00	2.84	84.41
		0.00031	0.0078	7.00	4.44	88.85
		0.00015	0.0039	8.00	2.69	91.54
Clay		0.000079	0.0020	9.00	2.61	94.15
		0.000039	0.00098	10.0	2.46	96.61
		0.000019	0.00049	11.0	1.82	98.43
		0.0000094	0.00024	12.0	1.07	99.50
		0.0000047	0.00012	13.0	0.45	99.95
		0.0000039	0.00010	13.3	0.05	100.00

Sorting Statistics

Parameter	[Moment]	[Trask]	[Inman]	[Folk]
Mean, in	0.0018	0.0017	0.0014	0.0015
Mean, mm	0.0466	0.0424	0.0347	0.0382
Mean, phi	4.4229	4.5587	4.8482	4.7097
Median, in	0.0018	0.0018	0.0018	0.0018
Median, mm	0.0463	0.0463	0.0463	0.0463
Median, phi	4.4328	4.4328	4.4328	4.4328
Std Deviation, in	0.0011	0.0177	0.0183	0.0144
Std Deviation, mm	0.0274	0.4529	0.4699	0.3683
Std Deviation, phi	5.1886	1.1427	1.0896	1.4410
Skewness	0.2530	1.0390	1.7811	0.5188
Kurtosis	-0.2370	0.1584	1.7139	2.0050
Mode, mm	0.0560			
95% Confidence	0.0412			
Limits, mm	0.0520			
Variance, mm2	0.0008			
Coef. of Variance, %	58.82			

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0037	0.0937	3.4163
10	0.0032	0.0825	3.6000
16	0.0029	0.0739	3.7585
25	0.0025	0.0645	3.9542
50	0.0018	0.0463	4.4328
75	0.0011	0.0279	5.1631
84	0.0006	0.0163	5.9378
90	0.0002	0.0059	7.4166
95	0.0001	0.0016	9.3307

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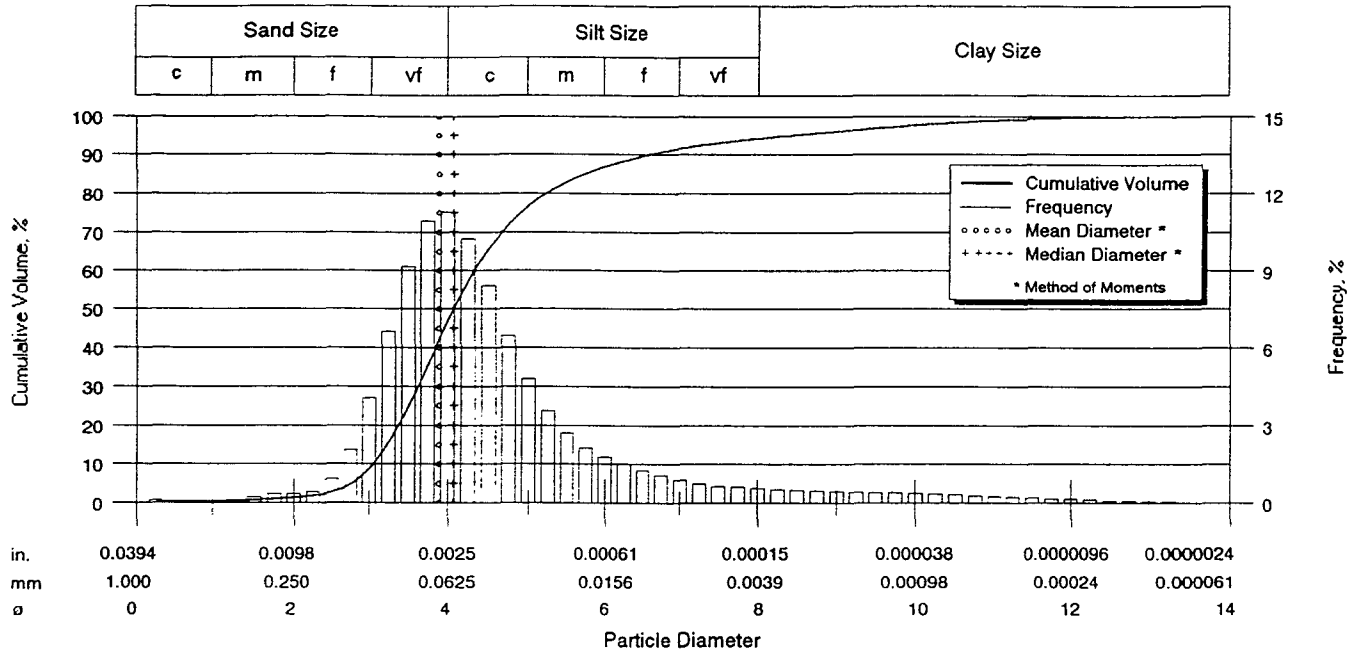
CORE LABORATORIES

Company	GCL	Depth	8-10	File Number	57111-94145
Sample	# 9406201625	Loc.	B-11	Date	27-JUN-94
Project	REXENE	State		Analysts	GC

Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Coarse Sand	20	0.0331	0.84	0.25	0.20	0.20
	25	0.0280	0.71	0.50	0.04	0.24
	30	0.0232	0.59	0.75	0.06	0.30
	35	0.0197	0.50	1.00	0.01	0.31
Medium Sand	40	0.0165	0.42	1.25	0.10	0.41
	45	0.0138	0.35	1.50	0.24	0.65
	50	0.0118	0.30	1.75	0.33	0.98
	60	0.0098	0.25	2.00	0.34	1.32
Fine Sand	70	0.0083	0.210	2.25	0.43	1.75
	80	0.0070	0.177	2.50	0.91	2.66
	100	0.0059	0.149	2.75	2.06	4.72
	120	0.0049	0.125	3.00	4.04	8.76
Very Fine Sand	140	0.0041	0.105	3.25	6.62	15.38
	170	0.0035	0.088	3.50	9.17	24.55
	200	0.0029	0.074	3.75	10.93	35.48
	230	0.0025	0.063	4.00	11.29	46.77
Silt	270	0.0021	0.053	4.25	10.24	57.01
	325	0.0017	0.044	4.50	8.41	65.42
	400	0.0015	0.037	4.75	6.48	71.90
	450	0.0012	0.031	5.00	4.80	76.70
	500	0.0010	0.025	5.32	4.37	81.07
	635	0.0008	0.020	5.64	3.13	84.20
		0.00061	0.0156	6.00	2.65	86.85
		0.00031	0.0078	7.00	4.72	91.57
		0.00015	0.0039	8.00	2.58	94.15
Clay		0.000079	0.0020	9.00	1.97	96.12
		0.000039	0.00098	10.0	1.60	97.72
		0.000019	0.00049	11.0	1.19	98.91
		0.0000094	0.00024	12.0	0.72	99.63
		0.0000047	0.00012	13.0	0.33	99.96
		0.0000039	0.00010	13.3	0.04	100.00

Sorting Statistics

Parameter	[Moment]	[Trask]	[Inman]	[Folk]
Mean, in	0.0026	0.0021	0.0018	0.0020
Mean, mm	0.0676	0.0541	0.0460	0.0500
Mean, phi	3.8877	4.2071	4.4435	4.3206
Median, in	0.0023	0.0023	0.0023	0.0023
Median, mm	0.0593	0.0593	0.0593	0.0593
Median, phi	4.0751	4.0750	4.0750	4.0750
Std Deviation, in	0.0025	0.0172	0.0173	0.0144
Std Deviation, mm	0.0633	0.4408	0.4433	0.3688
Std Deviation, phi	3.9817	1.1818	1.1735	1.4392
Skewness	5.4520	1.0367	1.2919	0.4265
Kurtosis	53.6500	0.1974	1.3970	1.6559
Mode, mm	0.0736			
95% Confidence	0.0552			
Limits, mm	0.0800			
Variance, mm2	0.0040			
Coef. of Variance, %	93.69			

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0057	0.1458	2.7781
10	0.0047	0.1201	3.0580
16	0.0040	0.1037	3.2699
25	0.0034	0.0877	3.5109
50	0.0023	0.0593	4.0750
75	0.0013	0.0334	4.9033
84	0.0008	0.0204	5.6170
90	0.0004	0.0104	6.5841
95	0.0001	0.0030	8.4041

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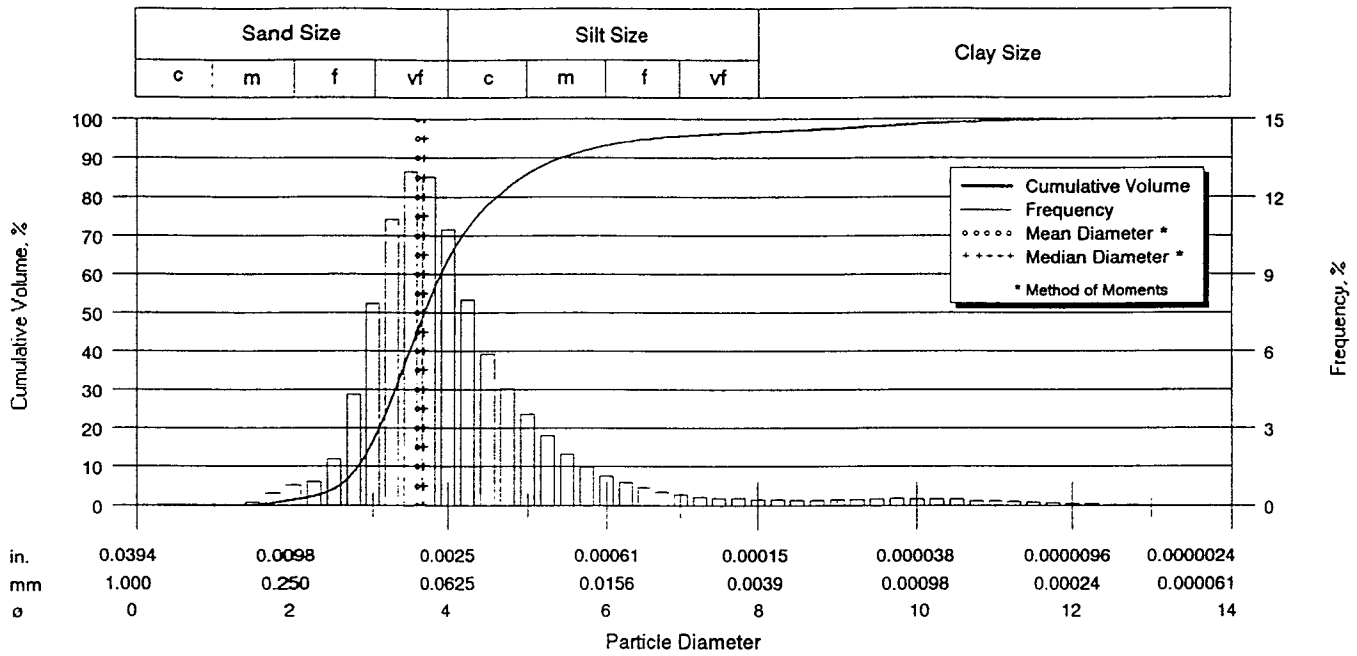
CORE LABORATORIES

Company	GCL	Depth	10-12	File Number	57111-94145
Sample	# 9406201630	Loc.	B-11	Date	27-JUN-94
Project	REXENE	State		Analysts	GC

Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	[in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Coarse	20	0.0331	0.84	0.25	0.00	0.00
Sand	25	0.0280	0.71	0.50	0.00	0.00
	30	0.0232	0.59	0.75	0.00	0.00
	35	0.0197	0.50	1.00	0.00	0.00
Medium	40	0.0165	0.42	1.25	0.00	0.00
Sand	45	0.0138	0.35	1.50	0.13	0.13
	50	0.0118	0.30	1.75	0.47	0.60
	60	0.0098	0.25	2.00	0.79	1.39
Fine	70	0.0083	0.210	2.25	0.92	2.31
Sand	80	0.0070	0.177	2.50	1.79	4.10
	100	0.0059	0.149	2.75	4.29	8.39
	120	0.0049	0.125	3.00	7.86	16.25
Very Fine	140	0.0041	0.105	3.25	11.14	27.39
Sand	170	0.0035	0.088	3.50	12.96	40.35
	200	0.0029	0.074	3.75	12.78	53.13
	230	0.0025	0.063	4.00	10.73	63.86
Silt	270	0.0021	0.053	4.25	8.01	71.87
	325	0.0017	0.044	4.50	5.87	77.74
	400	0.0015	0.037	4.75	4.55	82.29
	450	0.0012	0.031	5.00	3.54	85.83
	500	0.0010	0.025	5.32	3.30	89.13
	635	0.0008	0.020	5.64	2.25	91.38
		0.00061	0.0156	6.00	1.74	93.12
		0.00031	0.0078	7.00	2.51	95.63
		0.00015	0.0039	8.00	1.09	96.72
Clay		0.000079	0.0020	9.00	0.85	97.57
		0.000039	0.00098	10.0	0.98	98.55
		0.000019	0.00049	11.0	0.85	99.40
		0.0000094	0.00024	12.0	0.48	99.88
		0.0000047	0.00012	13.0	0.12	100.00
		0.0000039	0.00010	13.3	0.00	100.00

Sorting Statistics

Parameter	[Moment]	[Trask]	[Inman]	[Folk]
Mean, in	0.0032	0.0028	0.0026	0.0027
Mean, mm	0.0828	0.0724	0.0657	0.0695
Mean, phi	3.5947	3.7882	3.9281	3.8475
Median, in	0.0030	0.0030	0.0030	0.0030
Median, mm	0.0777	0.0777	0.0777	0.0777
Median, phi	3.6863	3.6863	3.6863	3.6863
Std Deviation, in	0.0020	0.0173	0.0204	0.0184
Std Deviation, mm	0.0516	0.4448	0.5231	0.4717
Std Deviation, phi	4.2776	1.1689	0.9348	1.0842
Skewness	1.3160	1.0308	0.9797	0.3543
Kurtosis	3.8070	0.2240	1.1773	1.4226
Mode, mm	0.0883			
95% Confidence Limits, mm	0.0727 – 0.0929			
Variance, mm2	0.0027			
Coef. of Variance, %	62.29			

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0066	0.1688	2.5668
10	0.0056	0.1424	2.8120
16	0.0049	0.1256	2.9933
25	0.0042	0.1087	3.2019
50	0.0030	0.0777	3.6863
75	0.0019	0.0482	4.3746
84	0.0013	0.0344	4.8629
90	0.0009	0.0232	5.4294
95	0.0004	0.0100	6.6375

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CAPILLARY MOISTURE RELATIONSHIP (ASTM D-2325) SAMPLE #: 9406190000; LOCATION: B-4 0-2' S-L PROJECT NAME: REXENE; PROJECT NO. 3031-004		
CAPILLARY PRESSURE (psi)	**HEIGHT ABOVE WATER TABLE(ft)**	**WATER SATURATION (%)**
0.5	1.15	93.2
1.00	2.31	91.5
2.0	4.62	88.2
4.0	9.23	83.6
8.0	18.46	76.0
14.0	32.31	72.5
INITIAL MOISTURE CONTENT (%)		16.6
INITIAL DRY UNIT WEIGHT (g/cc)		1.65
POROSITY (%)		37.1
SPECIFIC GRAVITY		2.62

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CAPILLARY MOISTURE RELATIONSHIP (ASTM D-2325) SAMPLE #: 9406190001; LOCATION: B-4 6 - 8' PROJECT NAME: REXENE; PROJECT NO. 3031-004		
CAPILLARY PRESSURE (psi)	**HEIGHT ABOVE WATER TABLE(ft)**	**WATER SATURATION (%)**
0.5	1.15	99.8
1.00	2.31	85.6
2.0	4.62	76.4
4.0	9.23	56.7
8.0	18.46	43.2
14.0	32.31	41.7
INITIAL MOISTURE CONTENT (%)		11.0
INITIAL DRY UNIT WEIGHT (g/cc)		1.42
POROSITY (%)		36.1
SPECIFIC GRAVITY		2.22

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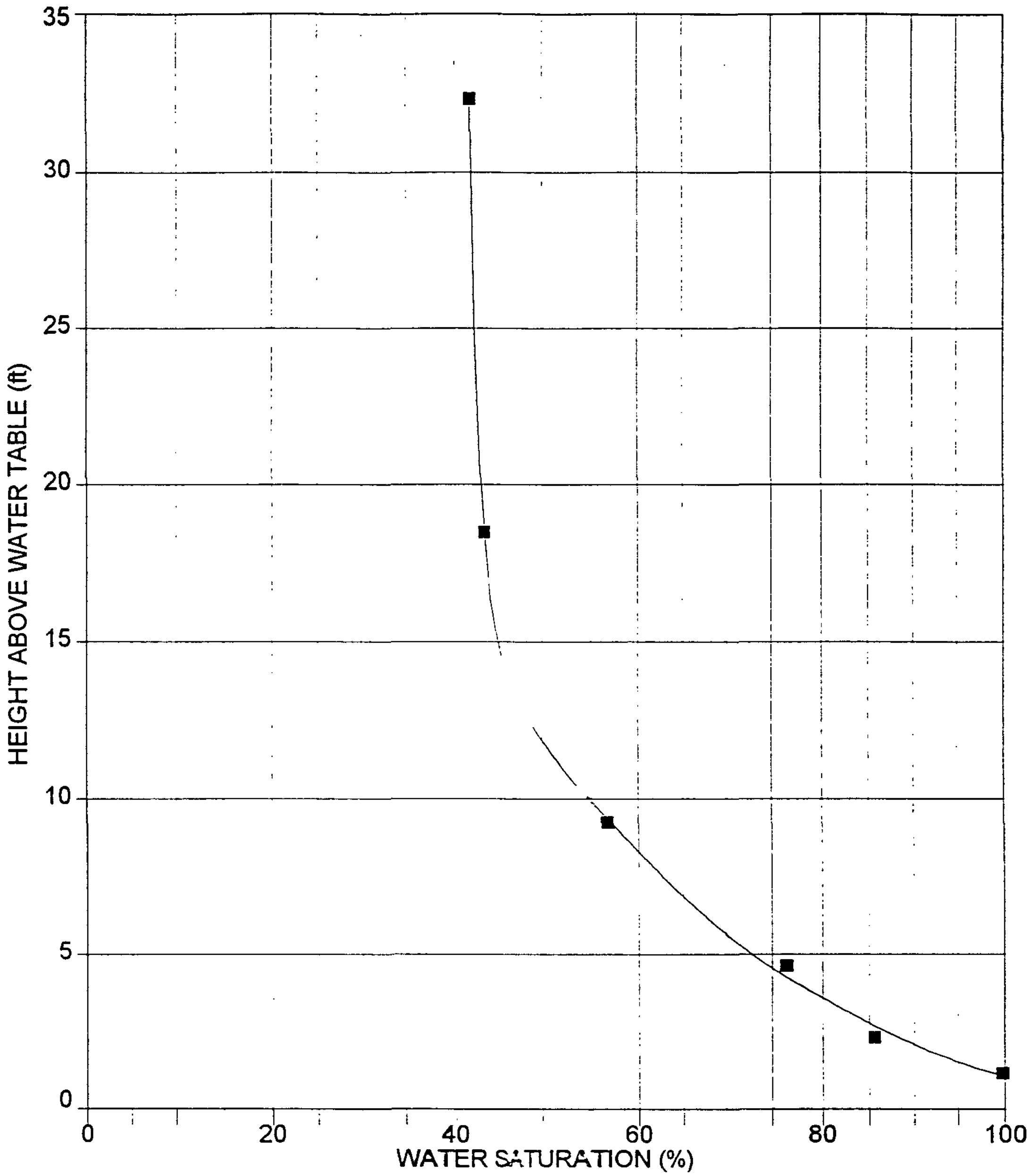
CORE LABORATORIES

CAPILLARY MOISTURE RELATIONSHIP (ASTM D-2325)

SAMPLE #: 9406190001; LOCATION: B-4

ENVIRONMENTAL SCIENCE AND ENGINEERING

PROJECT NAME: REXENE; PROJECT NO. 3031-004



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CAPILLARY MOISTURE RELATIONSHIP (ASTM D-2325) SAMPLE #: 9406200000; LOCATION: B-11 2'-4' PROJECT NAME: REXENE; PROJECT NO. 3031-004		
CAPILLARY PRESSURE (psi)	**HEIGHT ABOVE WATER TABLE(ft)**	**WATER SATURATION (%)**
0.5	1.15	90.8
0.75	1.73	50.4
1.00	2.31	30.2
2.0	4.62	17.6
4.0	9.23	13.3
8.0	18.46	10.6
INITIAL MOISTURE CONTENT (%)		2.8
INITIAL DRY UNIT WEIGHT (g/cc)		1.51
POROSITY (%)		39.4
SPECIFIC GRAVITY		2.49

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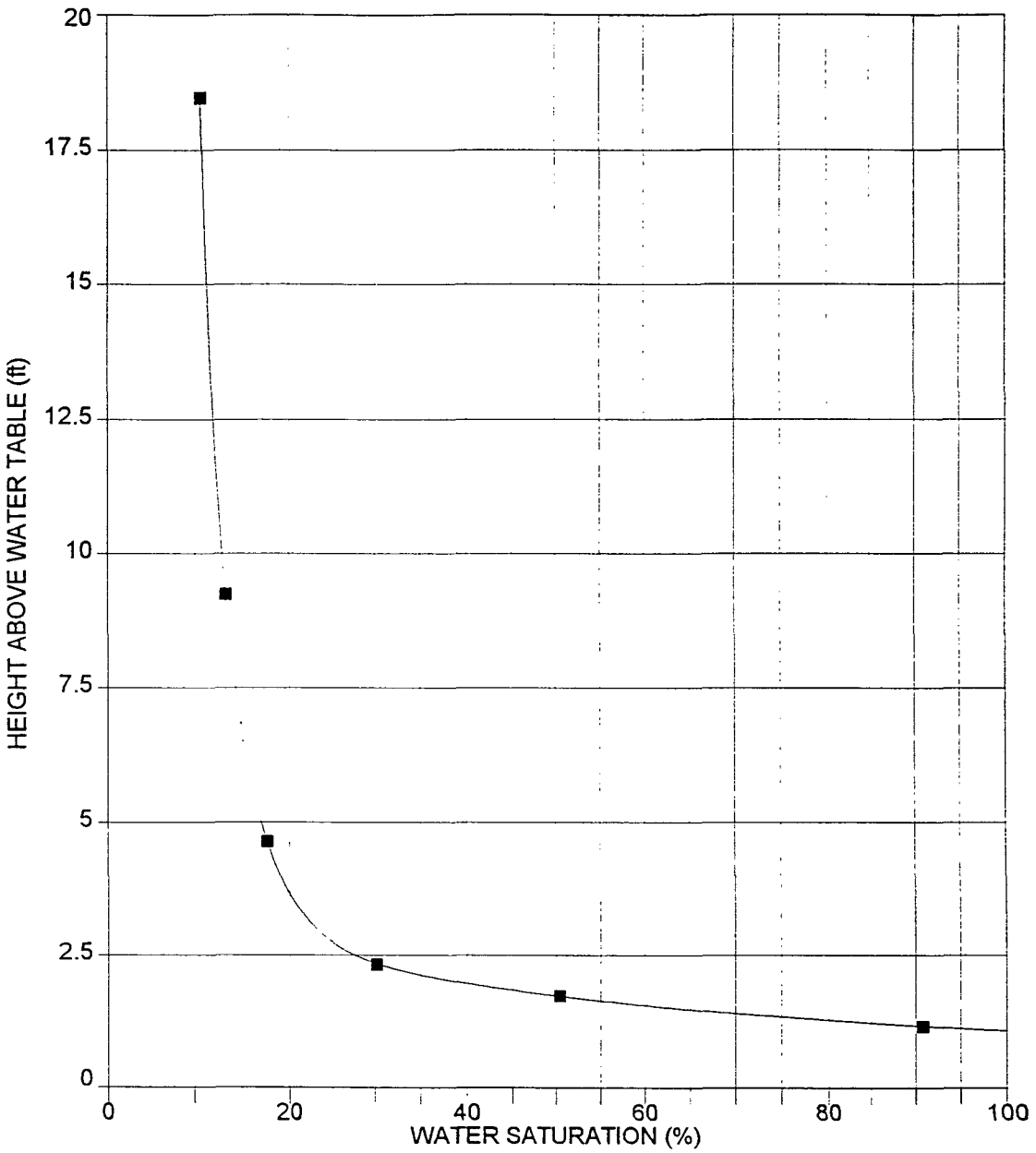
CORE LABORATORIES

CAPILLARY MOISTURE RELATIONSHIP (ASTM D-2325)

SAMPLE #: 9406200000; LOCATION: B-11

ENVIRONMENTAL SCIENCE AND ENGINEERING

PROJECT NAME: REXENE; PROJECT NO. 3031-004



SAND

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Lanham, MD 20706-4325
(301) 459-9677
FAX: (301) 459-3064

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PO Drawer MM
Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

№ 8256

Chain of Custody

Date 6-18-94 Page 1 of 1

Lab Name CORE LABORATORIES
Address 3430 UNICORN RD.
BAKERSFIELD CA 93308
Telephone
Samplers (SIGNATURES) BA. Slipp

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neut/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415.9/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP - Vol., Semi-Vo., Herbicides, Pesticides	TCLP - Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	API-RP-40 BS Density & Bulk Density	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	CEC (Absorbed Water)	CLAY TYPE (X-RAY DIFF.)	ASTM D-2216-80 MOISTURE CONT.	ASTM D-2974 Humic Cont.	Number of Containers
9406180634	SOIL	B-6																							✓	✓ BMG	+ BMG			1
9406180631	SOIL	B-6																									✓	✓	1
9406180835	SOIL	B-8																			✓								1
9406180842	SOIL	B-8																									✓		1

Project Information	
Project	3031-004 Bakers
Project Director	T Thomas
Charge Code No.	3031-004
Shipping ID. No.	8044985874
Via:	Fed Ex

Sample Receipt	
Total No. of Containers	
Chain of Custody Seals	
Rec'd Good Condition/Cold	
Conforms to Record	
Lab No.	

Special Instructions/Comments:
Core Lab file # 94145

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
BA. Slipp 1515 (Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Brent Slippers 6-21-94 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
GCL (Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	M.P Corbon (Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	GIL CASABAR 10:AM (Printed Name) (Date)
(Company)	(Company)	CORE LAB 4/22/94 (Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

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(301) 459-9677
FAX: (301) 459-3064

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FAX: (505) 524-5315

№ 8257

Chain of Custody

Date 6-18-94 Page 1 Of 1

Lab Name CORE LABORATORIES
Address 3430 UNICORN RD.
BAKERSFIELD CA 93308
Telephone (805) 392-8600

Samplers (SIGNATURES)
B.A. Salpas

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Moisture Content ASTM D2216-80				Number of Containers
9406181050	Soil	B-01																							✓				1

Project Information		Sample Receipt	
Project	PLAXENE	Total No. of Containers	
Project Director	T. THOMAS	Chain of Custody Seals	
Charge Code No.	3031-004	Rec'd Good Condition/Cold	
Shipping ID. No.	804498587 4	Conforms to Record	
Via:	FED EX	Lab No.	

Special Instructions/Comments:
Core Lab File # 94145

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
B.A. Salpas 1515 (Signature) (Time)	(Signature) (Time)	(Signature) (Time)
BOB Scheppers 6-21-94 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
GCL (Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	Gil Casabar (Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	GIL CASABAR 10:AM (Printed Name) (Date)
(Company)	(Company)	Core Lab 6/22 (Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

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FAX: (505) 524-5315

№ 8254

Chain of Custody

Date 6/17/94 Page 1 Of 1

Lab Name CORE LABORATORIES
Address 3430 UNICORN RD.
BAKERSFIELD CA 93308
Telephone 805 392 8600

Samplers (SIGNATURES)

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GCMS 624/8240	Base/Neu/Acid Compounds GCMS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	ASTMD 2216-80	ASTMD 2974	(EC & CHLORIDE		Number of Containers
9406171047	Soil	B-1																							✓				1
9406171043	Soil	B-1																							✓				1
9406171318	Soil	B-2																								✓			1
9406171322	Soil	B-2																							✓				1
9406171625	Soil	B-5																							✓				1
9406171625	Soil	B-5 DUP																							//	//	✓		1
9406171619	Soil	B-5																							✓				1

Project Information	Sample Receipt
Project REXENE	Total No. of Containers
Project Director TRENT	Chain of Custody Seals
Charge Code No. 3031-004	Rec'd Good Condition/Cold
Shipping ID. No. 8014985874	Conforms to Record
Via: Fed X	Lab No.

Special Instructions/Comments:
Core Lab file # 94145

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
(Signature) 1530 (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) DAVID NEE (Date) 6/21/94	(Printed Name) (Date)	(Printed Name) (Date)
(Company) GCL	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	(Signature) Gil Casabar (Time)
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) GIL CASABAR JR (Date)
(Company)	(Company)	(Laboratory) Core Lab. 6/22/94

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№ 8258

Chain of Custody

Date 6-19-94 Page 1 Of 1

Lab Name CORE LABORATORIES
Address 3430 UNICORN RD.
BAKERSFIELD CA 93308
Telephone (805) 392-8600

Samplers (SIGNATURES) Kenneth G. Duncan

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP - Vol., Semi-Vol. Herbicides, Pesticides	TCLP - Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Particle size Dist. (Laser)	Capillary moist. Relat. ASTM D 2325	Horiz. + Vert. satur. Conduc. ASTM D2434		Number of Containers
9406190851	Soil	B-4																							✓				1
9406190856	Soil	B-4																							✓				1
9406190901	Soil	B-4																							✓				1
9406190910	Soil	B-4																							✓				1
9406190913	Soil	B-4																							✓				1
9406190000	Soil	B-4																								✓			3
9406190001	Soil	B-4																								✓			2
9406190920	Soil	B-4																									✓		1

Project Information
Project Rexene
Project Director T. Thomas
Charge Code No. 3031-004
Shipping ID. No. 8044985874
Via: Fed X

Sample Receipt
Total No. of Containers
Chain of Custody Seals
Rec'd Good Condition/Cold
Conforms to Record
Lab No.

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
(Signature) Kenneth G. Duncan (Time) 1347	(Signature) B.A. Shipps (Time) 1515	(Signature) (Time)
(Printed Name) Kenneth G. Duncan (Date) 6/21/94	(Printed Name) Bert Schipps (Date) 6-21-94	(Printed Name) (Date)
(Company) GCL	(Company) GCL	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) B.A. Shipps (Time) 1347	(Signature) (Time)	(Signature) Gil Casabar (Time) 10 AM
(Printed Name) Bert Schipps (Date) 6-21-94	(Printed Name) (Date)	(Printed Name) GIL CASABAR (Date) 6/22/94
(Company) GCL	(Company)	(Laboratory) CORE LAB

Special Instructions/Comments:
Core Lab File # 94145

Distribution: White, Canary-Laboratory • Pink, GCL

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№ 8268

Chain of Custody

Date 6/20/94 Page 1 Of 1

Lab Name CORE LABORATORIES
Address 3430 UNICORN RD.
BAKERSFIELD CA 93308
Telephone (805) 392-8600

Samplers (SIGNATURES) Kenneth G. Duncan

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP - Vol., Semi-Vol. Herbicides, Pesticides	TCLP - Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Dry Bulk Density API RP-40	Particle Size Dist. LASER	Capill. Moist. Relat. ASTM D2325		Number of Containers
9406201612	Soil	B-11																								✓			1
9406201612	Soil	B-11																							✓				1
9406200000	Soil	B-11																									✓		1
9406201616	Soil	B-11																								✓			1
9406201620	Soil	B-11																								✓			1
9406201625	Soil	B-11																								✓			1
9406201630	Soil	B-11																								✓			1

Project Information
Project: Rexene
Project Director: T. Thomas
Charge Code No.: 3031-004
Shipping ID. No.: 804498574
Via: FED X

Sample Receipt
Total No. of Containers
Chain of Custody Seals
Rec'd Good Condition/Cold
Conforms to Record
Lab No.

Special Instructions/Comments:
Core Lab File # 94145

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
Kenneth G. Duncan 1347	B A Schippers 1515	(Signature) (Time)
(Signature) (Time)	(Signature) (Time)	(Printed Name) (Date)
Kenneth G. Duncan 6/21/94	Bart Schippers 6-21-94	(Company)
(Printed Name) (Date)	(Printed Name) (Date)	
GCL	GCL	
(Company)	(Company)	

Received By 1.	Received By 2.	Received By (Laboratory) 3.
B A Schippers 1347	(Signature) (Time)	Gil Casabar
(Signature) (Time)	(Printed Name) (Date)	(Signature) (Time)
Bart Schippers 6-21-94	(Company)	Gil Casabar 10AM
(Printed Name) (Date)		(Printed Name) (Date)
GCL		CORE LAB 6/22/94
(Company)		(Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

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№ 8267

Chain of Custody

Date 6-20-94 Page 1 Of 1

Lab Name CORE LABORATORIES
Address 3430 UNICORN RD.
BAKERSFIELD CA 93308
Telephone (805) 392-8600

Samplers (SIGNATURES)
B.A. Schoppes

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	MOISTURE CONT. ASTM D2216-80	CEC (Saturated water)	CLAY TYPE (X-RAY)		Number of Containers
9406200831	Soil	B-14																							✓				1
9406201410	Soil	B-10																							✓	✓	✓		1

Project Information	Sample Receipt	Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
Project REGENCY	Total No. of Containers	B.A. Schoppes 1515 (Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Project Director T. THOMAS	Chain of Custody Seals	BRET SCHOPPES 6-21-94 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
Charge Code No. 3031-004	Rec'd Good Condition/Cold	GCL (Company)	(Company)	(Company)
Shipping ID. No. 8044985874	Conforms to Record	Received By 1.	Received By 2.	Received By (Laboratory) 3.
Via: FED. X.	Lab No.	(Signature) (Time)	(Signature) (Time)	Gil Casaban (Signature) (Time)
Special Instructions/Comments: Core Lab file # 94145		(Printed Name) (Date)	(Printed Name) (Date)	GIL CASABAR 10AM (Printed Name) (Date)
		(Company)	(Company)	CORE LAB 6/22/94 (Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

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FAX: (301) 459-3004

☐ NASA-WSTF
PO Drawer MM
Las Cruces, NM 88004
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FAX: (505) 524-5315

№ 8259

Chain of Custody

Date 6-21-94 Page 1 Of 1

Lab Name CORE LABORATORIES
Address 3430 UNICORN RD.
BAKERSFIELD CA 93308
Telephone (805) 392-8600

Samplers (SIGNATURES) B.A. Schipe,

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Sat. Vol. Hyd. Compnt. ASTM-D-3424 ✓	Sat. Horiz. Conduct. ASTM-D-3434 ✓	Moisture Content ASTM-D-2216-80 ✓			Number of Containers
9406211516	Soil	B-13A																							✓	✓				1
9406211510	Soil	B-13A																									✓			1

Project Information	
Project	REKENE
Project Director	T. THOMAS
Charge Code No.	3031-004
Shipping ID. No.	8044985966
Via:	FED EX.

Sample Receipt	
Total No. of Containers	2
Chain of Custody Seals	✓
Rec'd Good Condition/Cold	✓
Conforms to Record	✓
Lab No.	94145

Special Instructions/Comments:

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
B.A. Schipes 1428 (Signature) (Time)	(Signature) (Time)	(Signature) (Time)
BURT SCHIPPERS 6-22-94 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
GCL (Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	Jeffrey L Smith 10:00 (Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	Jeffrey L. Smith 6/23/94 (Printed Name) (Date)
(Company)	(Company)	Core Lab (Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

RECEIVED AUG 1 8 1994

WESTERN ATLAS

BRICKLAND

Core Laboratories

TR-01

-4' RCRA METALS
BTEX
PAH, TPH
-2' RCRA METALS

TR-02

4' BTEX
TPH
PAH
RCRA METALS

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 941556
Prepared For:

GEOSCIENCE CONSULTANTS, LTD.

505 MARQUETTE NW, SUITE 1100
ALBUQUERQUE, NM 87102

Date: 08/12/94

Linda L. Benkers
Signature

8-12-94
Date:

Name: Linda L. Benkers

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: QA/QC COORDINATOR

WESTERN ATLAS

Core Laboratories

SAMPLE DELIVERY GROUP NARRATIVE

August 15, 1994

Customer: Geoscience Consultants, Ltd.
Project: Rexene COC #8279
Core Laboratories Project Number: 941556

On 6-24-94 Core Laboratories received samples for analysis. The following information is pertinent to the interpretation of the data package.

Organic Analysis:

During the analysis for PAH semivolatiles, a matrix interference was present in sample ID 9406221050 which required a high sample dilution. Sample ID 9406221050 has a elevated detection limit because of the high dilution.

Linda L. Benkers
QA/QC Coordinator

Douglas Georgic
Laboratory Supervisor

WESTERN ATLAS

Core Laboratories

SAMPLE DELIVERY GROUP NARRATIVE

August 15, 1994

Customer: Geoscience Consultants, Ltd.
Project: Rexene COC # 8279
Core Laboratories Project Number: 941556

On 6-24-94 Core Laboratories received samples for analysis. The following information is pertinent to the interpretation of the data package.

Method 8020 GC Analysis :

The medium level extraction blank that was extracted with the 941556 samples was analyzed on 7-10-94.

The method blank analyzed with the 941556 samples had a hit for xylenes at 2 ug/kg. Sample 941556-3 (9406220942) also had a hit for xylenes. It is flagged with a "B".

Core Laboratories policy is to run CCV's after every ten samples. CCV's were run at the start and end of the daily run instead of every ten samples. Spike blank and spike blank duplicates were prepared in exactly the same way as the CCV's and analyzed after 12 samples. All of the QC was acceptable.

Linda L. Benkers
QA/QC Coordinator

James H. Travis
Laboratory Supervisor

WESTERN ATLAS

Core Laboratories

EXPLANATION OF DATA FLAGS

B - This flag is used to indicate that an analyte is present in the method blank as well as in the sample. It indicates that the user should consider this when evaluating the results.

D - This flag indicates that surrogates were diluted out of calibration range and cannot be quantified.

E - This data flag indicates that a sample result is an estimate because the concentration exceeded the calibration range of the instrument.

J - Indicates that a value is an estimate. It is used when a compound is determined to be present based on the mass spectral data, but at a concentration less than the practical quantitation limit of the method. This flag is also used when estimating the concentration of a tentatively identified compound.

X - This flag refers the client to an included case narrative for additional information which may be useful in data evaluation.

* - Used to indicate matrix interference.

WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 09:04
WORK DESCRIPTION...: 9406220904

TR-01 2-4'

LABORATORY I.D...: 941556-0001
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	89	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	6	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	9	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

IENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 00:00
ORK DESCRIPTION...: 9406220000

TR-01 2-11
DUPLICATE

LABORATORY I.D...: 941556-0002
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
senic, Total (As)	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
arium, Total (Ba)	100	1	mg/Kg	6010 (2)	07/01/94	WGL
dmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
hromium, Total (Cr)	7	1	mg/Kg	6010 (2)	07/01/94	WGL
ad, Total (Pb)	10	5	mg/Kg	6010 (2)	07/01/94	WGL
ercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
lenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
ver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 09:42
WORK DESCRIPTION...: 9406220942 TR-01 2-4'

LABORATORY I.D...: 941556-0003
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - VOLATILE AROMATIC ORGANICS		*1250		8020 (2)	07/06/94	JHT
Benzene	13000	1250	ug/Kg			
Toluene	2700	1250	ug/Kg			
Ethyl benzene	23000	1250	ug/Kg			
Xylenes	33000 B	1250	ug/Kg			
4-Bromofluorobenzene (surrogate)	86	0	% Recovery	75-125% Limit		
Time Analyzed	2029	0				

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LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: :
WORK DESCRIPTION...: 9406229015

TR-01 0-2'

LABORATORY I.D...: 941556-0004
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	22	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	145	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	0.8	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	10	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	53	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	0.14	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 09:36
WORK DESCRIPTION...: 9406220936

TR-01 241

LABORATORY I.D...: 941556-0005
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
610 - PAH LIST BY 8270		*3		8270 (2)	07/25/94	DMJ
Acenaphthene	ND	990	ug/Kg			
Acenaphthylene	ND	990	ug/Kg			
Anthracene	ND	990	ug/Kg			
Benzo(a)anthracene	ND	990	ug/Kg			
Benzo(b)fluoranthene	ND	990	ug/Kg			
Benzo(k)fluoranthene	ND	990	ug/Kg			
Benzo(ghi)perylene	ND	990	ug/Kg			
Benzo(a)pyrene	ND	990	ug/Kg			
Chrysene	ND	990	ug/Kg			
Dibenzo(a,h)anthracene	ND	990	ug/Kg			
Fluoranthene	ND	990	ug/Kg			
Fluorene	ND	990	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	990	ug/Kg			
1-Methylnaphthalene	1800	990	ug/Kg			
2-Methylnaphthalene	3000	990	ug/Kg			
Naphthalene	2400	990	ug/Kg			
Phenanthrene	ND	990	ug/Kg			
Pyrene	ND	990	ug/Kg			
Nitrobenzene-d5 (Surrogate)	49	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	71	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	82	0	% Recovery	18-137% Limit		
Time Analyzed	1158	0				
Date Extracted	06/28/94	0				

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Core Laboratories

LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 09:47
WORK DESCRIPTION...: 9406220947 TR-01 2-4'

LABORATORY I.D...: 941556-0006
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	2260	50	mg/Kg	418.1 (1)	06/30/94	WKL

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LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 10:47
WORK DESCRIPTION...: 9406221047 TR-02 4'

LABORATORY I.D...: 941556-0007
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - VOLATILE AROMATIC ORGANICS		*1250		8020 (2)	07/05/94	JHT
Benzene	13000	1250	ug/Kg			
Toluene	3800	1250	ug/Kg			
Ethyl benzene	16000	1250	ug/Kg			
Xylenes	8900	1250	ug/Kg			
4-Bromofluorobenzene (surrogate)	99	0	% Recovery	75-125% Limit		
Time Analyzed	1756	0				

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LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 10:55
WORK DESCRIPTION...: 9406221055 TR-02 4'

LABORATORY I.D...: 941556-0008
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	165	10	mg/Kg	418.1 (1)	06/30/94	WKL

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 10:50
WORK DESCRIPTION...: 9406221050 TR-02 4'

LABORATORY I.D...: 941556-0009
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
610 - PAH LIST BY 8270		*30		8270 (2)	07/25/94	DMJ
Acenaphthene	ND	9900	ug/Kg			
Acenaphthylene	ND	9900	ug/Kg			
Anthracene	ND	9900	ug/Kg			
Benzo(a)anthracene	ND	9900	ug/Kg			
Benzo(b)fluoranthene	ND	9900	ug/Kg			
Benzo(k)fluoranthene	ND	9900	ug/Kg			
Benzo(ghi)perylene	ND	9900	ug/Kg			
Benzo(a)pyrene	ND	9900	ug/Kg			
Chrysene	ND	9900	ug/Kg			
Dibenzo(a,h)anthracene	ND	9900	ug/Kg			
Fluoranthene	ND	9900	ug/Kg			
Fluorene	ND	9900	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	9900	ug/Kg			
1-Methylnaphthalene	12000	9900	ug/Kg			
2-Methylnaphthalene	12000	9900	ug/Kg			
Naphthalene	ND	9900	ug/Kg			
Phenanthrene	ND	9900	ug/Kg			
Pyrene	ND	9900	ug/Kg			
Nitrobenzene-d5 (Surrogate)	54	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	95	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	87	0	% Recovery	18-137% Limit		
Time Analyzed	1720	0				
Date Extracted	06/28/94	0				

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Aurora, CO 80014
(303) 751-1780

WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941556 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8279
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 10:08
WORK DESCRIPTION...: 9406221008 TR-02 2-4'

LABORATORY I.D...: 941556-0010
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	12	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	127	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	10	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	55	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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WESTERN ATLAS

BRICKLAND:

Core Laboratories

TR-03

3' TPH
PAH
BTEX

2-4' RCRA METALS

6' RCRA METALS

TR-04

8' BTEX
PAH

4-6' RCRA METALS

8' TPH

2-4' RCRA METALS

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 941558
Prepared For:

GEOSCIENCE CONSULTANTS, LTD.

505 MARQUETTE NW, SUITE 1100
ALBUQUERQUE, NM 87102

Date: 08/10/94

Linda L Benkers
Signature

8-10-94
Date:

Name: Linda L. Benkers

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: QA/QC COORDINATOR

WESTERN ATLAS

Core Laboratories

EXPLANATION OF DATA FLAGS

B - This flag is used to indicate that an analyte is present in the method blank as well as in the sample. It indicates that the user should consider this when evaluating the results.

D - This flag indicates that surrogates were diluted out of calibration range and cannot be quantified.

E - This data flag indicates that a sample result is an estimate because the concentration exceeded the calibration range of the instrument.

J - Indicates that a value is an estimate. It is used when a compound is determined to be present based on the mass spectral data, but at a concentration less than the practical quantitatic limit of the method. This flag is also used when estimating the concentration of a tentatively identified compound.

X - This flag refers the client to an included case narrative for additional information which may be useful in data evaluation.

* - Used to indicate matrix interference.

WESTERN ATLAS

Core Laboratories

SAMPLE DELIVERY GROUP NARRATIVE

August 15, 1994

Customer: Geoscience Consultants, Ltd.
Project: Rexene COC # 8283
Core Laboratories Project Number: 941558

On 6-24-94 Core Laboratories received samples for analysis. The following information is pertinent to the interpretation of the data package.

Method 8020 GC Analysis :

The medium level extraction blank that was extracted with the 941558 samples was analyzed on 7-10-94.

The method blank analyzed with the 941558 samples had a hit for xylenes at 2 ug/kg. Samples 941558-3 (9406221232) and 941558-6 (9406221510) also had a hit for xylenes. Results are flagged with a "B".

Core Laboratories policy is to run CCV's after every ten samples. CCV's were run at the start and end of the daily run instead of every ten samples. Spike blank and spike blank duplicates were prepared in exactly the same way as the CCV's and analyzed after 12 samples. All of the QC was acceptable.

Linda L. Benkers
QA/QC Coordinator

James H. Travis
Laboratory Supervisor

WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941558 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8283
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 12:30
WORK DESCRIPTION...: 9406221230

TR-3 3'

LABORATORY I.D...: 941558-0001
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-3

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	3310	100	mg/Kg	418.1 (1)	06/29/94	WKL

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Core Laboratories

LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941558 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8283
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 12:31
WORK DESCRIPTION...: 9406221231

TR-03 3'

LABORATORY I.D...: 941558-0002
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-3

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
610 - PAH LIST BY 8270		*3		8270 (2)	07/19/94	DMJ
Acenaphthene	ND	990	ug/Kg			
Acenaphthylene	ND	990	ug/Kg			
Anthracene	ND	990	ug/Kg			
Benzo(a)anthracene	ND	990	ug/Kg			
Benzo(b)fluoranthene	ND	990	ug/Kg			
Benzo(k)fluoranthene	ND	990	ug/Kg			
Benzo(ghi)perylene	ND	990	ug/Kg			
Benzo(a)pyrene	ND	990	ug/Kg			
Chrysene	ND	990	ug/Kg			
Dibenzo(a,h)anthracene	ND	990	ug/Kg			
Fluoranthene	ND	990	ug/Kg			
Fluorene	ND	990	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	990	ug/Kg			
1-Methylnaphthalene	7700	990	ug/Kg			
2-Methylnaphthalene	11000	990	ug/Kg			
Naphthalene	5600	990	ug/Kg			
Phenanthrene	ND	990	ug/Kg			
Pyrene	ND	990	ug/Kg			
Nitrobenzene-d5 (Surrogate)	103	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	61	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	81	0	% Recovery	18-137% Limit		
Time Analyzed	1857	0				
Date Extracted	06/28/94	0				

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WESTERN ATLAS

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LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941558 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8283
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 12:32
WORK DESCRIPTION...: 9406221232

TR-03 3'

LABORATORY I.D...: 941558-0003
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-3

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - VOLATILE AROMATIC ORGANICS		*2500		8020 (2)	07/06/94	JHT
Benzene	24000	2500	ug/Kg			
Toluene	10000	2500	ug/Kg			
Ethyl benzene	65000	2500	ug/Kg			
Xylenes	120000 B	2500	ug/Kg			
4-Bromofluorobenzene (surrogate)	100	0	% Recovery	75-125% Limit		
Time Analyzed	2247	0				

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941558 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8283
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 12:20
WORK DESCRIPTION...: 9406221220 TR-03 4-6'

LABORATORY I.D...: 941558-0005
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-3

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	137	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	7	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	6	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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Core Laboratories

LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941558 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8283
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 15:10
WORK DESCRIPTION...: 9406221510

TR-04 8'

LABORATORY I.D....: 941558-0006
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-4

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - VOLATILE AROMATIC ORGANICS		*125		8020 (2)	07/06/94	JHT
Benzene	ND	125	ug/Kg			
Toluene	ND	125	ug/Kg			
Ethyl benzene	200	125	ug/Kg			
Xylenes	920 B	125	ug/Kg			
4-Bromofluorobenzene (surrogate)	100	0	% Recovery	75-125% Limit		
Time Analyzed	2213	0				

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LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941558 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8283
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 15:15
WORK DESCRIPTION...: 9406221515

TR-04 8'

LABORATORY I.D...: 941558-0007
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-4

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
610 - PAH LIST BY 8270		*3		8270 (2)	07/25/94	DMJ
Acenaphthene	ND	990	ug/Kg			
Acenaphthylene	ND	990	ug/Kg			
Anthracene	ND	990	ug/Kg			
Benzo(a)anthracene	ND	990	ug/Kg			
Benzo(b)fluoranthene	ND	990	ug/Kg			
Benzo(k)fluoranthene	ND	990	ug/Kg			
Benzo(ghi)perylene	ND	990	ug/Kg			
Benzo(a)pyrene	ND	990	ug/Kg			
Chrysene	ND	990	ug/Kg			
Dibenzo(a,h)anthracene	ND	990	ug/Kg			
Fluoranthene	ND	990	ug/Kg			
Fluorene	ND	990	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	990	ug/Kg			
1-Methylnaphthalene	5300	990	ug/Kg			
2-Methylnaphthalene	ND	990	ug/Kg			
Naphthalene	ND	990	ug/Kg			
Phenanthrene	ND	990	ug/Kg			
Pyrene	1700	990	ug/Kg			
Nitrobenzene-d5 (Surrogate)	63	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	95	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	82	0	% Recovery	18-137% Limit		
Time Analyzed	1825	0				
Date Extracted	06/28/94	0				

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Core Laboratories

LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941558 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8283
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 15:17
WORK DESCRIPTION...: 9406221517 TR-04 4-6'

LABORATORY I.D...: 941558-0008
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-4

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	13	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	176	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	0.6	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	9	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	14	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	0.19	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941558 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8283
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 15:00
WORK DESCRIPTION...: 9406221500

TR-04 8'

LABORATORY I.D...: 941558-0009
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-4

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	452	10	mg/Kg	418.1 (1)	06/29/94	WKL

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LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941558 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8283
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 15:16
WORK DESCRIPTION...: 9406221516

TR-04 2-41

LABORATORY I.D...: 941558-0010
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-4

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	53	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	4	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	5	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	0.14	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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BRICKLAND: TR-6 7' TPH

Core Laboratories

FIELD BLANK
RINSATE
TRIP BLANK

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 941560
Prepared For:

GEOSCIENCE CONSULTANTS, LTD.

505 MARQUETTE NW, SUITE 1100
ALBUQUERQUE, NM 87102

Date: 08/01/94

Linda L. Benkers
Signature

8-1-94
Date:

Name: Linda L. Benkers

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: QA/QC COORDINATOR

WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/01/94

JOB NUMBER: 941560 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8281
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 18:26
WORK DESCRIPTION...: 9406221826

TR-6 7'

LABORATORY I.D...: 941560-0001
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-6

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	642	10	mg/Kg	418.1 (1)	06/29/94	WKL

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/01/94

JOB NUMBER: 941560 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8281
DATE SAMPLED.....: 06/23/94
TIME SAMPLED.....: 10:35
WORK DESCRIPTION...: 9406231035

FIELD BLANK

LABORATORY I.D...: 941560-0002
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: FIELD BLANK

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	ND	0.5	ug/L			
Xylenes	ND	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	101	0	% Recovery	85-115% Limit		
Time Analyzed	2055	0				
610 - PAH'S BY 8270		*1		8270 (2)	07/08/94	JMC
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
1-Methylnaphthalene	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
Nitrobenzene-d5 (Surrogate)	76	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl (Surrogate)	68	0	% Recovery	43-116% Limit		
4-Terphenyl-d14 (Surrogate)	89	0	% Recovery	33-141% Limit		
Time Analyzed	1840	0				
Date Extracted	06/30/94	0				

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Core Laboratories

LABORATORY TESTS RESULTS
08/01/94

JOB NUMBER: 941560 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8281
DATE SAMPLED.....: 06/23/94
TIME SAMPLED.....: 11:55
WORK DESCRIPTION...: 9406231155

RINSATE

LABORATORY I.D...: 941560-0003
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: RINSATE

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	ND	0.5	ug/L			
Xylenes	ND	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	101	0	% Recovery	85-115% Limit		
Time Analyzed	2129	0				
610 - PAH'S BY 8270		*1		8270 (2)	07/08/94	JMC
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
1-Methylnaphthalene	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
Nitrobenzene-d5 (Surrogate)	61	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl (Surrogate)	57	0	% Recovery	43-116% Limit		
4-Terphenyl-d14 (Surrogate)	78	0	% Recovery	33-141% Limit		
Time Analyzed	1942	0				
Date Extracted	06/30/94	0				

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/01/94

JOB NUMBER: 941560 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8281
DATE SAMPLED.....: 06/23/94
TIME SAMPLED.....: 14:10
WORK DESCRIPTION...: 9406231410

TRIP BLANK

LABORATORY I.D...: 941560-0004
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TRIP BLANK

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	ND	0.5	ug/L			
Xylenes	ND	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	101	0	% Recovery	85-115% Limit		
Time Analyzed	2203	0				

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WESTERN ATLAS

BRICKLAND:

Core Laboratories

TR-03
3' PAH

TR-05
2-4' RCRA METALS
5-6' RCRA METALS
10-11' TPH
PAH
BTEX

TRIP

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 941557
Prepared For:

GEOSCIENCE CONSULTANTS, LTD.

505 MARQUETTE NW, SUITE 1100
ALBUQUERQUE, NM 87102

Date: 08/12/94

Linda L. Benkers
Signature

8-12-94
Date:

Name: Linda L. Benkers

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: QA/QC COORDINATOR

WESTERN ATLAS

Core Laboratories

SAMPLE DELIVERY GROUP NARRATIVE

August 15, 1994

Customer: Geoscience Consultants, Ltd.
Project: Rexene COC # 8284
Core Laboratories Project Number: 941557

On 6-24-94 Core Laboratories received samples for analysis. The following information is pertinent to the interpretation of the data package.

Method 8020 GC Analysis :

The medium level extraction blank that was extracted with the 941557 samples was analyzed on 7-10-94.

The method blank analyzed with the 941557 samples had a hit for xylenes at 2 ug/kg. Sample 941557-6 (9406221620) also had a hit for xylenes. It is flagged with a "B".

Core Laboratories policy is to run CCV's after every ten samples. CCV's were run at the start and end of the daily run instead of every ten samples. Spike blank and spike blank duplicates were prepared in exactly the same way as the CCV's and analyzed after 12 samples. All of the QC was acceptable.

Linda L. Benkers
QA/QC Coordinator

James H. Travis
Laboratory Supervisor

WESTERN ATLAS

Core Laboratories

EXPLANATION OF DATA FLAGS

B - This flag is used to indicate that an analyte is present in the method blank as well as in the sample. It indicates that the user should consider this when evaluating the results.

D - This flag indicates that surrogates were diluted out of calibration range and cannot be quantified.

E - This data flag indicates that a sample result is an estimate because the concentration exceeded the calibration range of the instrument.

J - Indicates that a value is an estimate. It is used when a compound is determined to be present based on the mass spectral data, but at a concentration less than the practical quantitatic limit of the method. This flag is also used when estimating the concentration of a tentatively identified compound.

X - This flag refers the client to an included case narrative for additional information which may be useful in data evaluation.

* - Used to indicate matrix interference.

WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941557 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8284
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 00:05
WORK DESCRIPTION...: 9406220005 TR-03 3'

LABORATORY I.D...: 941557-0001
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-3

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
610 - PAH LIST BY 8270		*3		8270 (2)	07/19/94	DMJ
Acenaphthene	ND	990	ug/Kg			
Acenaphthylene	ND	990	ug/Kg			
Anthracene	ND	990	ug/Kg			
Benzo(a)anthracene	ND	990	ug/Kg			
Benzo(b)fluoranthene	ND	990	ug/Kg			
Benzo(k)fluoranthene	ND	990	ug/Kg			
Benzo(ghi)perylene	ND	990	ug/Kg			
Benzo(a)pyrene	ND	990	ug/Kg			
Chrysene	ND	990	ug/Kg			
Dibenzo(a,h)anthracene	ND	990	ug/Kg			
Fluoranthene	ND	990	ug/Kg			
Fluorene	ND	990	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	990	ug/Kg			
1-Methylnaphthalene	7100	990	ug/Kg			
2-Methylnaphthalene	10000	990	ug/Kg			
Naphthalene	4400	990	ug/Kg			
Phenanthrene	ND	990	ug/Kg			
Pyrene	ND	990	ug/Kg			
Nitrobenzene-d5 (Surrogate)	87	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	59	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	70	0	% Recovery	18-137% Limit		
Time Analyzed	1649	0				
Date Extracted	06/28/94	0				

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941557 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8284
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 16:10
WORK DESCRIPTION...: 9406221610

TR-05 2-41

LABORATORY I.D...: 941557-0002
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-5

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	59	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	4	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	5	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941557 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8284
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 16:12
WORK DESCRIPTION...: 9406221612 TR-05 4-6'

LABORATORY I.D...: 941557-0003
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-5

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	38	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	4	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	5	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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WESTERN ATLAS

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LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941557 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8284
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 16:15
WORK DESCRIPTION...: 9406221615 TR-05 10-11'

LABORATORY I.D...: 941557-0004
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-5

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	414	10	mg/Kg	418.1 (1)	06/29/94	WKL

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LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941557 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8284
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 16:17
WORK DESCRIPTION...: 9406221617 TR-05 10-11'

LABORATORY I.D...: 941557-0005
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-5

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
610 - PAH LIST BY 8270		*3		8270 (2)	07/19/94	DMJ
Acenaphthene	ND	990	ug/Kg			
Acenaphthylene	ND	990	ug/Kg			
Anthracene	ND	990	ug/Kg			
Benzo(a)anthracene	ND	990	ug/Kg			
Benzo(b)fluoranthene	ND	990	ug/Kg			
Benzo(k)fluoranthene	ND	990	ug/Kg			
Benzo(ghi)perylene	ND	990	ug/Kg			
Benzo(a)pyrene	ND	990	ug/Kg			
Chrysene	ND	990	ug/Kg			
Dibenzo(a,h)anthracene	ND	990	ug/Kg			
Fluoranthene	ND	990	ug/Kg			
Fluorene	ND	990	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	990	ug/Kg			
1-Methylnaphthalene	ND	990	ug/Kg			
2-Methylnaphthalene	ND	990	ug/Kg			
Naphthalene	ND	990	ug/Kg			
Phenanthrene	ND	990	ug/Kg			
Pyrene	1600	990	ug/Kg			
Nitrobenzene-d5 (Surrogate)	65	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	82	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	92	0	% Recovery	18-137% Limit		
Time Analyzed	1753	0				
Date Extracted	06/28/94	0				

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LABORATORY TESTS RESULTS
08/10/94

JOB NUMBER: 941557 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8284
DATE SAMPLED.....: 06/22/94
TIME SAMPLED.....: 16:20
WORK DESCRIPTION...: 9406221620

TR-05 10-11'

LABORATORY I.D...: 941557-0006
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TR-5

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - VOLATILE AROMATIC ORGANICS		*125		8020 (2)	07/06/94	JHT
Benzene	ND	125	ug/Kg			
Toluene	89	125	ug/Kg			
Ethyl benzene	240	125	ug/Kg			
Xylenes	440 B	125	ug/Kg			
4-Bromofluorobenzene (surrogate)	109	0	% Recovery	75-125% Limit		
Time Analyzed	2138	0				

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LABORATORY TESTS RESULTS
08/12/94

JOB NUMBER: 941557 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8284
DATE SAMPLED.....: 06/23/94
TIME SAMPLED.....: 14:15
WORK DESCRIPTION...: 9406231415

TRIP

LABORATORY I.D...: 941557-0007
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: TRIP

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	ND	0.5	ug/L			
Xylenes	ND	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	100	0	% Recovery	85-115% Limit		
Time Analyzed	2020	0				

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WESTERN ATLAS

BRICKLAND:

B-13 OR B-13A (SAME BORING)

Core Laboratories

10-12' TPH
8-10' RCRA METALS

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 941559
Prepared For:

GEOSCIENCE CONSULTANTS, LTD.

505 MARQUETTE NW, SUITE 1100
ALBUQUERQUE, NM 87102

Date: 07/27/94

Linda L. Benkers
Signature

7-27-94
Date:

Name: Linda L. Benkers

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: QA/QC COORDINATOR

WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
07/27/94

JOB NUMBER: 941559 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8278
DATE SAMPLED.....: 06/21/94
TIME SAMPLED.....: 15:13
WORK DESCRIPTION...: 9406211513 B-13 10-12'

LABORATORY I.D...: 941559-0001
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: B-13A

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	6150	100	mg/Kg	418.1 (1)	06/29/94	WKL

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WESTERN ATLAS

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LABORATORY TESTS RESULTS
07/27/94

JOB NUMBER: 941559 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8278
DATE SAMPLED.....: 06/21/94
TIME SAMPLED.....: 15:10
WORK DESCRIPTION...: 9406211510 B-13 8-10'

LABORATORY I.D...: 941559-0002
DATE RECEIVED....: 06/24/94
TIME RECEIVED....: 10:30
REMARKS.....: B-13A

RCRA METALS

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	57	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	8	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	13	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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BRICKLAND:

Core Laboratories

WESTERN ATLAS

2-4' RCRA METALS
4-6' TOC
pH
TPH
RCRA METALS
BTEX
PAH
0-2' TPH
6-8' TCLP (METALS)
TCLP (BENZENE)
0-2' TPH
2-4' TPH
4-6' TPH
6-8' TPH
2-4' RCRA (METALS)
6-8' RCRA (METALS)
8-10' TPH

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 941540
Prepared For:

GEOSCIENCE CONSULTANTS, LTD.

505 MARQUETTE NW, SUITE 1100
ALBUQUERQUE, NM 87102

Date: 08/03/94

B-5 4-6' TPH
BTEX
PAH
B-6 4-6' TPH
B-7 0-2' TPH
B-7 2-4' TPH
4-6' TPH
6-8' TPH
B-8 4-6' TOC
pH
TCLP (METALS)
TCLP (BENZENE)
6-8' TPH

B-9 0-2' TPH
2-4' TPH
4-6' TPH
6-8' pH
TPH
8-10' TPH
10-12' TPH
B-10 8-10' RCRA METALS
10-12' TPH
BTEX
PAH
B-11 4-6' TOC
pH
8-10' RCRA METALS
PAH
10-12' TPH
BTEX
B-12 8-10' TCLP (METALS)
TCLP (BENZENE)
10-12' TPH
12-14' TPH
B-14 0-2' TPH
2-4' TPH
4-6' TPH
6-8' TPH
TCLP (METALS)
TCLP (BENZENE)
BTEX
PAH
8-10' TPH

Linda L. Benkers
Signature

8-3-94
Date:

Name: Linda L. Benkers

Title: QA/QC COORDINATOR

Core Laboratories
10703 East Bethany Drive
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RINSATE
TRIP BLANK
FIELD BLANK

WESTERN ATLAS

Core Laboratories

SAMPLE DELIVERY GROUP NARRATIVE

August 3, 1994

Customer: Geoscience Consultants, Ltd.
Project: Rexene Project
Core Laboratories Project Number: 941540

On 6-22-94 Core Laboratories received samples for analysis. The following information is pertinent to the interpretation of the data package.

Organic Analysis:

During analysis of PAH semivolatiles on sample ID 9406201625, nitrobenzene surrogate was not recovered. Reanalysis of the sample confirmed the original result. It is believed that the high matrix interference present caused problems with detecting and quantitating the nitrobenzene surrogate.

The reported total petroleum hydrocarbon (TPH) analysis on sample ID 9406181050 Location B-9A was performed six days past the EPA recommended holding time. This error occurred at the time of sample login and receipt when sample ID's 9406181050 Locations B-9 and B-9A were logged in as a single sample. TPH analysis on sample ID 9406181050 Location B-9 was performed within holding time; however, TPH analysis was requested on the container labeled B-9A. Reanalysis using the correct sample was performed as soon as the error was detected.

Linda L. Benkers
QA/QC Coordinator

Douglas Georgic
Laboratory Supervisor

WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 10:38
WORK DESCRIPTION...: 9406171038 B-1 2-4'

LABORATORY I.D...: 941540-0004
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	18	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	137	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	10	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	74	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	0.14	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 10:43
WORK DESCRIPTION...: 9406171043 B-1 4-6'

LABORATORY I.D...: 941540-0003
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Organic Carbon	0.32	0.01	%	9060 (2) Modified	07/29/94	PJM
Soil pH (1:1 PASTE)	8.13	0.01	pH units	9045 (2)	07/12/94	KDS
Total Petroleum Hydrocarbon	97	10	mg/Kg	418.1 (1)	07/05/94	WKL
Arsenic, Total (As)	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	179	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	9	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	7	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL
8020 - VOLATILE AROMATIC ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	1	ug/Kg			
Toluene	ND	1	ug/Kg			
Ethyl benzene	ND	1	ug/Kg			
Xylenes	ND	1	ug/Kg			
4-Bromofluorobenzene (surrogate)	99	0	% Recovery	75-125% Limit		
Time Analyzed	1208	0				
610 - PAH LIST BY 8270		*1		8270 (2)	07/11/94	JMC
Acenaphthene	ND	330	ug/Kg			
Acenaphthylene	ND	330	ug/Kg			
Anthracene	ND	330	ug/Kg			
Benzo(a)anthracene	ND	330	ug/Kg			
Benzo(b)fluoranthene	ND	330	ug/Kg			
Benzo(k)fluoranthene	ND	330	ug/Kg			
Benzo(ghi)perylene	ND	330	ug/Kg			
Benzo(a)pyrene	ND	330	ug/Kg			
Chrysene	ND	330	ug/Kg			
Dibenzo(a,h)anthracene	ND	330	ug/Kg			
Fluoranthene	ND	330	ug/Kg			
Fluorene	ND	330	ug/Kg			

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Core Laboratories

LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 10:43
WORK DESCRIPTION...: 9406171043 B-1 4-6'

LABORATORY I.D...: 941540-0003
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Indeno(1,2,3-cd)pyrene	ND	330	ug/Kg			
1-Methylnaphthalene	ND	330	ug/Kg			
2-Methylnaphthalene	ND	330	ug/Kg			
Naphthalene	ND	330	ug/Kg			
Phenanthrene	ND	330	ug/Kg			
Pyrene	ND	330	ug/Kg			
Nitrobenzene-d5 (Surrogate)	60	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	58	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	89	0	% Recovery	18-137% Limit		
Time Analyzed	1905	0				
Date Extracted	06/28/94	0				

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Core Laboratories

LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 13:09
WORK DESCRIPTION...: 9406171309 B-2 0-2'

LABORATORY I.D...: 941540-0006
DATE RECEIVED.....: 06/22/94
TIME RECEIVED.....: 09:45
REMARKS.....: B-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	1240	20	mg/Kg	418.1 (1)	07/05/94	WKL

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Core Laboratories

LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 13:22
WORK DESCRIPTION...: 9406171322 B-2 6-8'

LABORATORY I.D...: 941540-0005
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, TCLP (As) ✓	<0.05	0.05	mg/L	TCLP 6010 (2)	07/13/94	WGL
Barium, TCLP (Ba) ✓	2.1	0.5	mg/L	TCLP 6010 (2)	07/13/94	WGL
Cadmium, TCLP (Cd) ✓	<0.01	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
Chromium, TCLP (Cr) ✓	<0.01	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
Lead, TCLP (Pb) ✓	<0.05	0.05	mg/L	TCLP 6010 (2)	07/13/94	WGL
Mercury, TCLP (Hg) ✓	<0.003	0.003	mg/L	TCLP 7470 (2)	07/14/94	LMT
Selenium, TCLP (Se) ✓	<0.1	0.1	mg/L	TCLP 6010 (2)	07/13/94	WGL
Silver, TCLP (Ag) ✓	<0.01	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
TCLP - Volatile Organics		*10		8240 (2)	07/02/94	MLA
Benzene	260	10	ug/L			
TCLP ZHE Physical Characterization		*1		1311 (2)	06/28/94	SGM
% Solids	100	0.5	%			
% Liquid	<0.5	0.5	%			
% Aqueous-Extract	100	0.5	%			
% Non-aqueous-Extract	<0.5	0.5	%			
TCLP Extraction Date	06/28/94	0				
TCLP Physical Characterization		*1		1311 (2)	07/15/94	SGM
% Solids	100	0.5	%			
% Liquid	<0.5	0.5	%			
% Aqueous-Extract	100	0.5	%			
% Non-aqueous-Extract	<0.5	0.5	%			
TCLP Extraction Date	07/11/94	0				

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 14:42
WORK DESCRIPTION...: 9406171442 B-3 0-2'

LABORATORY I.D...: 941540-0007
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-3

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	373	10	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 14:50
WORK DESCRIPTION...: 9406171450 B-3 2-4'

LABORATORY I.D...: 941540-0008
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-3

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	828	10	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 14:53
WORK DESCRIPTION...: 9406171453 B-3 4-6'

LABORATORY I.D...: 941540-0009
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-3

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	757	10	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 15:02
WORK DESCRIPTION...: 9406171502 B-3 6-8'

LABORATORY I.D...: 941540-0010
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-3

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Organic Carbon	0.10	0.01	%	9060 (2) Modified	07/29/94	PJM
Soil pH (1:1 PASTE)	8.03	0.01	pH units	9045 (2)	07/12/94	KDS
Total Petroleum Hydrocarbon	871	10	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8273
DATE SAMPLED.....: 06/19/94
TIME SAMPLED.....: 08:56
WORK DESCRIPTION...: 9406190856 B-4 2-4'

LABORATORY I.D...: 941540-0029
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-4

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As) ✓	21	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba) ✓	183	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd) ✓	1.1	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr) ✓	11	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb) ✓	46	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg) ✓	0.41	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se) ✓	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag) ✓	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8273
DATE SAMPLED.....: 06/19/94
TIME SAMPLED.....: 09:10
WORK DESCRIPTION...: 9406190910 B-4 6-8'

LABORATORY I.D...: 941540-0030
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-4

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	204	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	8	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	9	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8273
DATE SAMPLED.....: 06/19/94
TIME SAMPLED.....: 09:13
WORK DESCRIPTION...: 9406190913

B-4 8-10'

LABORATORY I.D...: 941540-0031
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-4

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	254	10	mg/Kg	418.1 (1)	07/11/94	TSK

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8299
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 16:19
WORK DESCRIPTION...: 9406171619 B-5 4-6'

LABORATORY I.D...: 941540-0001
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-5

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	677	10	mg/Kg	418.1 (1)	07/05/94	WKL
8020 - VOLATILE AROMATIC ORGANICS		*1250		8020 (2)	06/29/94	JHT
Benzene	12000	1250	ug/Kg			
Toluene	2800	1250	ug/Kg			
Ethyl benzene	6600	1250	ug/Kg			
Xylenes	16000	1250	ug/Kg			
4-Bromofluorobenzene (surrogate)	98	0	% Recovery	75-125% Limit		
Time Analyzed	2244	0				
610 - PAH LIST BY 8270		*3		8270 (2)	07/11/94	JMC
Acenaphthene	ND	990	ug/Kg			
Acenaphthylene	ND	990	ug/Kg			
Anthracene	ND	990	ug/Kg			
Benzo(a)anthracene	ND	990	ug/Kg			
Benzo(b)fluoranthene	ND	990	ug/Kg			
Benzo(k)fluoranthene	ND	990	ug/Kg			
Benzo(ghi)perylene	ND	990	ug/Kg			
Benzo(a)pyrene	ND	990	ug/Kg			
Chrysene	ND	990	ug/Kg			
Dibenzo(a,h)anthracene	ND	990	ug/Kg			
Fluoranthene	ND	990	ug/Kg			
Fluorene	ND	990	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	990	ug/Kg			
1-Methylnaphthalene	3700	990	ug/Kg			
2-Methylnaphthalene	6000	990	ug/Kg			
Naphthalene	1800	990	ug/Kg			
Phenanthrene	ND	990	ug/Kg			
Pyrene	ND	990	ug/Kg			
Nitrobenzene-d5 (Surrogate)	65	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	63	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	75	0	% Recovery	18-137% Limit		
Time Analyzed	1701	0				
Date Extracted	06/28/94	0				

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8299
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 16:29
WORK DESCRIPTION...: 9406171629 B-5 4'-6' (duplicate)

LABORATORY I.D...: 941540-0002
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-5A

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
10 - PAH LIST BY 8270		*3		8270 (2)	07/11/94	JMC
Acenaphthene	ND	990	ug/Kg			
Acenaphthylene	ND	990	ug/Kg			
Anthracene	ND	990	ug/Kg			
Benzo(a)anthracene	ND	990	ug/Kg			
Benzo(b)fluoranthene	ND	990	ug/Kg			
Benzo(k)fluoranthene	ND	990	ug/Kg			
Benzo(ghi)perylene	ND	990	ug/Kg			
Benzo(a)pyrene	ND	990	ug/Kg			
Chrysene	ND	990	ug/Kg			
Dibenzo(a,h)anthracene	ND	990	ug/Kg			
Fluoranthene	ND	990	ug/Kg			
Fluorene	ND	990	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	990	ug/Kg			
1-Methylnaphthalene	8600	990	ug/Kg			
2-Methylnaphthalene	13000	990	ug/Kg			
Naphthalene	5300	990	ug/Kg			
Phenanthrene	ND	990	ug/Kg			
Pyrene	ND	990	ug/Kg			
Nitrobenzene-d5 (Surrogate)	60	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	66	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	80	0	% Recovery	18-137% Limit		
Time Analyzed	1803	0				
Date Extracted	06/28/94	0				

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8271
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 06:31
WORK DESCRIPTION...: 9406180631

LABORATORY I.D...: 941540-0012
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-6

B-6 4-6'

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECH
Total Petroleum Hydrocarbon	3760	100	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

LIENT I.D.....: REXENE COC #8271
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 07:33
ORK DESCRIPTION...: 9406180733

LABORATORY I.D...: 941540-0013
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-7

B-7 0-2'

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
otal Petroleum Hydrocarbon	4670	100	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8271
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 07:38
WORK DESCRIPTION...: 9406180738 B-7 2-4'

LABORATORY I.D...: 941540-0014
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-7

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	1230	20	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8271
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 07:43
WORK DESCRIPTION...: 9406180743 B-7 4-6'

LABORATORY I.D...: 941540-0015
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-7

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	1600	20	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8271
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 07:49
WORK DESCRIPTION...: 9406180749 B-7 6-8'

LABORATORY I.D...: 941540-0016
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-7

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	1560	20	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8271
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 08:42
WORK DESCRIPTION...: 9406180842 B-8 4-6'

LABORATORY I.D...: 941540-0017
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Organic Carbon	2.01	0.01	%	9060 (2) Modified	07/29/94	PJM
Soil pH (1:1 PASTE)	8.25	0.01	pH units	9045 (2)	07/12/94	KDS
Arsenic, TCLP (As) ✓	0.11	0.05	mg/L	TCLP 6010 (2)	07/13/94	WGL
Barium, TCLP (Ba) ✓	0.8	0.5	mg/L	TCLP 6010 (2)	07/13/94	WGL
Cadmium, TCLP (Cd) ✓	0.12	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
Chromium, TCLP (Cr) ✓	<0.01	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
Lead, TCLP (Pb) ✓	82	2	mg/L	TCLP 6010 (2)	07/13/94	WGL
Mercury, TCLP (Hg) ✓	<0.003	0.003	mg/L	TCLP 7470 (2)	07/14/94	LMT
Selenium, TCLP (Se) ✓	<0.1	0.1	mg/L	TCLP 6010 (2)	07/13/94	WGL
Silver, TCLP (Ag) ✓	<0.01	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
TCLP - Volatile Organics		*10		8240 (2)	07/02/94	MLA
Benzene	1100	10	ug/L			
TCLP ZHE Physical Characterization		*1		1311 (2)	06/28/94	SGM
% Solids	100	0.5	%			
% Liquid	<0.5	0.5	%			
% Aqueous-Extract	100	0.5	%			
% Non-aqueous-Extract	<0.5	0.5	%			
TCLP Extraction Date	06/28/94	0				
TCLP Physical Characterization		*1		1311 (2)	07/15/94	SGM
% Solids	100	0.5	%			
% Liquid	<0.5	0.5	%			
% Aqueous-Extract	100	0.5	%			
% Non-aqueous-Extract	<0.5	0.5	%			
TCLP Extraction Date	07/11/94	0				

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8271
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 08:45
WORK DESCRIPTION...: 9406180845 B-8 6-8'

LABORATORY I.D...: 941540-0018
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	1790	50	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

LIENT I.D.....: REXENE COC #8272
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 10:37
ORK DESCRIPTION...: 9406181037 B-9 0-2'

LABORATORY I.D...: 941540-0023
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-9

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
otal Petroleum Hydrocarbon	404	50	mg/Kg	418.1 (1)	07/11/94	TSK

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8272
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 10:43
WORK DESCRIPTION...: 9406181043 B-9 2-4'

LABORATORY I.D...: 941540-0024
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-9

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	48	10	mg/Kg	418.1 (1)	07/11/94	TSK

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LABORATORY TESTS RESULTS
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JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8272
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 10:47
WORK DESCRIPTION...: 9406181047 B-9 4-6'

LABORATORY I.D...: 941540-0025
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-9

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	55	10	mg/Kg	418.1 (1)	07/11/94	TSK

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8272
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 10:50
WORK DESCRIPTION...: 9406181050 B-9 6-8'

LABORATORY I.D...: 941540-0021
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-9

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Soil pH (1:1 PASTE)	9.05	0.01	pH units	9045 (2)	07/12/94	KDS

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8272
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 10:50
WORK DESCRIPTION...: 9406181050 B-9 6-8'

LABORATORY I.D...: 941540-0055
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-9A

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	34	10	mg/Kg	418.1 (1)	07/22/94	TSK

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

LIENT I.D.....: REXENE COC #8272
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 10:55
ORK DESCRIPTION...: 9406181055 B-9 6-8' (DUPLICATE)

LABORATORY I.D...: 941540-0022
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-9

EST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
otal Petroleum Hydrocarbon	108	10	mg/Kg	418.1 (1)	07/05/94	WKL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8272
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 10:56
WORK DESCRIPTION...: 9406181056

LABORATORY I.D...: 941540-0026
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-9

B-9 8-10'

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	50	10	mg/Kg	418.1 (1)	07/11/94	TSK

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8272
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 11:00
WORK DESCRIPTION...: 9406181100 B-9 10-12'

LABORATORY I.D...: 941540-0027
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-9

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	39	10	mg/Kg	418.1 (1)	07/11/94	TSK

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8275
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 14:14
WORK DESCRIPTION...: 9406201414

B-10 8-10'

LABORATORY I.D...: 941540-0039
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-10

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As) ✓	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba) ✓	136	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd) ✓	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr) ✓	7	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb) ✓	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg) ✓	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se) ✓	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag) ✓	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8275
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 14:19
WORK DESCRIPTION...: 9406201419

LABORATORY I.D...: 941540-0040
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-10

B-10 10-12'

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	715	10	mg/Kg	418.1 (1)	07/11/94	TSK
8020 - VOLATILE AROMATIC ORGANICS		*250		8020 (2)	06/29/94	JHT
Benzene	ND	250	ug/Kg			
Toluene	340	250	ug/Kg			
Ethyl benzene	290	250	ug/Kg			
Xylenes	1500	250	ug/Kg			
4-Bromofluorobenzene (surrogate)	101	0	% Recovery	75-125% Limit		
Time Analyzed	2354	0				
610 - PAH LIST BY 8270		*3		8270 (2)	07/11/94	JMC
Acenaphthene	ND	990	ug/Kg			
Acenaphthylene	ND	990	ug/Kg			
Anthracene	ND	990	ug/Kg			
Benzo(a)anthracene	ND	990	ug/Kg			
Benzo(b)fluoranthene	ND	990	ug/Kg			
Benzo(k)fluoranthene	ND	990	ug/Kg			
Benzo(ghi)perylene	ND	990	ug/Kg			
Benzo(a)pyrene	ND	990	ug/Kg			
Chrysene	ND	990	ug/Kg			
Dibenzo(a,h)anthracene	ND	990	ug/Kg			
Fluoranthene	ND	990	ug/Kg			
Fluorene	ND	990	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	990	ug/Kg			
1-Methylnaphthalene	4700	990	ug/Kg			
2-Methylnaphthalene	3000	990	ug/Kg			
Naphthalene	ND	990	ug/Kg			
Phenanthrene	2300	990	ug/Kg			
Pyrene	ND	990	ug/Kg			
Nitrobenzene-d5 (Surrogate)	54	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	70	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	93	0	% Recovery	18-137% Limit		
Time Analyzed	2109	0				
Date Extracted	06/28/94	0				

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8276
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 16:16
WORK DESCRIPTION...: 9406201616 B-11 4-6'

LABORATORY I.D...: 941540-0043
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-11

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Organic Carbon	0.57	0.01	%	9060 (2) Modified	07/29/94	PJM
Soil pH (1:1 PASTE)	7.75	0.01	pH units	9045 (2)	07/12/94	KDS

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8276
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 16:25
WORK DESCRIPTION...: 9406201625 B-11 8-10'

LABORATORY I.D...: 941540-0041
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-11

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As) ✓	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba) ✓	132	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd) ✓	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr) ✓	7	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb) ✓	6	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg) ✓	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se) ✓	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag) ✓	<1	1	mg/Kg	6010 (2)	07/01/94	WGL
610 - PAH LIST BY 8270		*60		8270 (2)	07/12/94	JMC
Acenaphthene	ND	19800	ug/Kg			
Acenaphthylene	ND	19800	ug/Kg			
Anthracene	ND	19800	ug/Kg			
Benzo(a)anthracene	ND	19800	ug/Kg			
Benzo(b)fluoranthene	ND	19800	ug/Kg			
Benzo(k)fluoranthene	ND	19800	ug/Kg			
Benzo(ghi)perylene	ND	19800	ug/Kg			
Benzo(a)pyrene	ND	19800	ug/Kg			
Chrysene	ND	19800	ug/Kg			
Dibenzo(a,h)anthracene	ND	19800	ug/Kg			
Fluoranthene	ND	19800	ug/Kg			
Fluorene	ND	19800	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	19800	ug/Kg			
1-Methylnaphthalene	79000	19800	ug/Kg			
2-Methylnaphthalene	160000	19800	ug/Kg			
Naphthalene	51000	19800	ug/Kg			
Phenanthrene	ND	19800	ug/Kg			
Pyrene	ND	19800	ug/Kg			
Nitrobenzene-d5 (Surrogate)	0 *	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	84	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	84	0	% Recovery	18-137% Limit		
Time Analyzed	1933	0				
Date Extracted	06/28/94	0				
Semi-Volatile Organic - Surrogates		*3		8270(2)/625(6)	07/11/94	JMC
Nitrobenzene-d5 (Surrogate)	0 *	0	% Recovery	23-120% Limit		

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8276
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 16:25
WORK DESCRIPTION...: 9406201625

LABORATORY I.D...: 941540-0041
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-11

B-11 8-10'

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
2-Fluorobiphenyl (Surrogate)	42	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	74	0	% Recovery	18-137% Limit		
Date Extracted	06/28/94	0				
Time Analyzed	2109	0				

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8276
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: :
WORK DESCRIPTION...: 9406207000 B-11 8-10' (DUPLICATE)

LABORATORY I.D...: 941540-0042
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-11

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, Total (As)	<5	5	mg/Kg	6010 (2)	07/01/94	WGL
Barium, Total (Ba)	148	1	mg/Kg	6010 (2)	07/01/94	WGL
Cadmium, Total (Cd)	<0.5	0.5	mg/Kg	6010 (2)	07/01/94	WGL
Chromium, Total (Cr)	6	1	mg/Kg	6010 (2)	07/01/94	WGL
Lead, Total (Pb)	6	5	mg/Kg	6010 (2)	07/01/94	WGL
Mercury, Total (Hg)	<0.10	0.10	mg/Kg	7470 (2)	07/13/94	LMT
Selenium, Total (Se)	<10	10	mg/Kg	6010 (2)	07/01/94	WGL
Silver, Total (Ag)	<1	1	mg/Kg	6010 (2)	07/01/94	WGL

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8276
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 16:30
WORK DESCRIPTION...: 9406201630 B-11 10-12'

LABORATORY I.D...: 941540-0044
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-11

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	889	10	mg/Kg	418.1 (1)	07/11/94	TSK
8020 - VOLATILE AROMATIC ORGANICS		*250		8020 (2)	06/30/94	JHT
Benzene	ND	250	ug/Kg			
Toluene	ND	250	ug/Kg			
Ethyl benzene	ND	250	ug/Kg			
Xylenes	2800	250	ug/Kg			
4-Bromofluorobenzene (surrogate)	103	0	% Recovery	75-125% Limit		
Time Analyzed	0029	0				

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8277
DATE SAMPLED.....: 06/21/94
TIME SAMPLED.....: 08:21
WORK DESCRIPTION...: 9406210821 B-12 8-10'

LABORATORY I.D...: 941540-0045
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-12

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Arsenic, TCLP (As) ✓	<0.05	0.05	mg/L	TCLP 6010 (2)	07/13/94	WGL
Barium, TCLP (Ba) ✓	0.6	0.5	mg/L	TCLP 6010 (2)	07/13/94	WGL
Cadmium, TCLP (Cd) ✓	<0.01	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
Chromium, TCLP (Cr) ✓	<0.01	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
Lead, TCLP (Pb) ✓	<0.05	0.05	mg/L	TCLP 6010 (2)	07/13/94	WGL
Mercury, TCLP (Hg) ✓	<0.003	0.003	mg/L	TCLP 7470 (2)	07/14/94	LMT
Selenium, TCLP (Se) ✓	<0.1	0.1	mg/L	TCLP 6010 (2)	07/13/94	WGL
Silver, TCLP (Ag) ✓	0.02	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
TCLP - Volatile Organics		*10		8240 (2)	07/02/94	MLA
Benzene	ND	10	ug/L			
TCLP ZHE Physical Characterization		*1		1311 (2)	06/28/94	SGM
% Solids	100	0.5	%			
% Liquid	<0.5	0.5	%			
% Aqueous-Extract	100	0.5	%			
% Non-aqueous-Extract	<0.5	0.5	%			
TCLP Extraction Date	06/28/94	0				
TCLP Physical Characterization		*1		1311 (2)	07/15/94	SGM
% Solids	100	0.5	%			
% Liquid	<0.5	0.5	%			
% Aqueous-Extract	100	0.5	%			
% Non-aqueous-Extract	<0.5	0.5	%			
TCLP Extraction Date	07/11/94	0				

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08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8277
DATE SAMPLED.....: 06/21/94
TIME SAMPLED.....: 08:30
WORK DESCRIPTION...: 9406210830 B-12 10-12'

LABORATORY I.D...: 941540-0047
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-12

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	483	10	mg/Kg	418.1 (1)	07/11/94	TSK

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08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8277
DATE SAMPLED.....: 06/21/94
TIME SAMPLED.....: 08:35
WORK DESCRIPTION...: 9406210835 B-12 12-14'

LABORATORY I.D...: 941540-0046
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-12

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	313	10	mg/Kg	418.1 (1)	07/11/94	TSK

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JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8274
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 08:25
WORK DESCRIPTION...: 9406200825 B-14 0-2'

LABORATORY I.D...: 941540-0033
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-14

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	44	10	mg/Kg	418.1 (1)	07/11/94	TSK

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08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

LIENT I.D.....: REXENE COC #8274
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 08:31
ORK DESCRIPTION...: 9406200831

B-14 2-4'

LABORATORY I.D...: 941540-0034
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-14

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
otal Petroleum Hydrocarbon	46	10	mg/Kg	418.1 (1)	07/11/94	TSK

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JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

LIENT I.D.....: REXENE COC #8274
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 08:45
ORK DESCRIPTION...: 9406200845 B-14 4-6'

LABORATORY I.D...: 941540-0035
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-14

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
otal Petroleum Hydrocarbon	737	10	mg/Kg	418.1 (1)	07/11/94	TSK

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JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8274
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 08:41
WORK DESCRIPTION...: 9406200841 B-14 6-8'

LABORATORY I.D...: 941540-0032
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-14

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	596	10	mg/Kg	418.1 (1)	07/11/94	TSK
Arsenic, TCLP (As) ✓	<0.05	0.05	mg/L	TCLP 6010 (2)	07/13/94	WGL
Barium, TCLP (Ba) ✓	3.0	0.5	mg/L	TCLP 6010 (2)	07/13/94	WGL
Cadmium, TCLP (Cd) ✓	<0.01	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
Chromium, TCLP (Cr) ✓	<0.01	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
Lead, TCLP (Pb) ✓	0.07	0.05	mg/L	TCLP 6010 (2)	07/13/94	WGL
Mercury, TCLP (Hg) ✓	<0.003	0.003	mg/L	TCLP 7470 (2)	07/14/94	LMT
Selenium, TCLP (Se) ✓	<0.1	0.1	mg/L	TCLP 6010 (2)	07/13/94	WGL
Silver, TCLP (Ag) ✓	0.08	0.01	mg/L	TCLP 6010 (2)	07/13/94	WGL
TCLP - Volatile Organics		*10		8240 (2)	07/02/94	MLA
Benzene	190	10	ug/L			
TCLP ZHE Physical Characterization		*1		1311 (2)	06/28/94	SGM
% Solids	100	0.5	%			
% Liquid	<0.5	0.5	%			
% Aqueous-Extract	100	0.5	%			
% Non-aqueous-Extract	<0.5	0.5	%			
TCLP Extraction Date	06/28/94	0				
TCLP Physical Characterization		*1		1311 (2)	07/15/94	SGM
% Solids	100	0.5	%			
% Liquid	<0.5	0.5	%			
% Aqueous-Extract	100	0.5	%			
% Non-aqueous-Extract	<0.5	0.5	%			
TCLP Extraction Date	07/11/94	0				
8020 - VOLATILE AROMATIC ORGANICS		*625		8020 (2)	06/29/94	JHT
Benzene	1700	625	ug/Kg			
Toluene	ND	625	ug/Kg			
Ethyl benzene	2500	625	ug/Kg			
Xylenes	2700	625	ug/Kg			
4-Bromofluorobenzene (surrogate)	90	0	% Recovery	75-125% Limit		

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8274
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 08:41
WORK DESCRIPTION...: 9406200841 B-14 6-8'

LABORATORY I.D...: 941540-0032
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-14

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Time Analyzed	2319	0				
610 - PAH LIST BY 8270		*3		8270 (2)	07/11/94	JMC
Acenaphthene	ND	990	ug/Kg			
Acenaphthylene	ND	990	ug/Kg			
Anthracene	ND	990	ug/Kg			
Benzo(a)anthracene	ND	990	ug/Kg			
Benzo(b)fluoranthene	ND	990	ug/Kg			
Benzo(k)fluoranthene	ND	990	ug/Kg			
Benzo(ghi)perylene	ND	990	ug/Kg			
Benzo(a)pyrene	ND	990	ug/Kg			
Chrysene	ND	990	ug/Kg			
Dibenzo(a,h)anthracene	ND	990	ug/Kg			
Fluoranthene	ND	990	ug/Kg			
Fluorene	ND	990	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	990	ug/Kg			
1-Methylnaphthalene	2200	990	ug/Kg			
2-Methylnaphthalene	3800	990	ug/Kg			
Naphthalene	2100	990	ug/Kg			
Phenanthrene	ND	990	ug/Kg			
Pyrene	ND	990	ug/Kg			
Nitrobenzene-d5 (Surrogate)	55	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl (Surrogate)	64	0	% Recovery	30-115% Limit		
4-Terphenyl-d14 (Surrogate)	85	0	% Recovery	18-137% Limit		
Time Analyzed	2007	0				
Date Extracted	06/28/94	0				

10703 East Bethany Drive
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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8274
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 08:43
WORK DESCRIPTION...: 9406200843 B-14 8-10'

LABORATORY I.D...: 941540-0036
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: B-14

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	369	10	mg/Kg	418.1 (1)	07/11/94	TSK

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8274
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 10:40
WORK DESCRIPTION...: 9406201040 RINSATE

LABORATORY I.D...: 941540-0037
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: RINSATE

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	2.3	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	1.9	0.5	ug/L			
Xylenes	1.7	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	98	0	% Recovery	85-115% Limit		
Time Analyzed	0322	0				
8270 - PAH'S BY 8270		*1		8270 (2)	07/10/94	JMC
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
1-Methylnaphthalene	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
Nitrobenzene-d5 (Surrogate)	64	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl (Surrogate)	56	0	% Recovery	43-116% Limit		
4-Terphenyl-d14 (Surrogate)	88	0	% Recovery	33-141% Limit		
Time Analyzed	0628	0				
Date Extracted	06/25/94	0				

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Aurora, CO 80014
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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8271
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 09:40
WORK DESCRIPTION...: 9406180940 RINSATE

LABORATORY I.D...: 941540-0019
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: RINSATE

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	ND	0.5	ug/L			
Xylenes	ND	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	104	0	% Recovery	85-115% Limit		
Time Analyzed	0138	0				
610 - PAH'S BY 8270		*1		8270 (2)	07/10/94	JMC
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
1-Methylnaphthalene	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
Nitrobenzene-d5 (Surrogate)	79	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl (Surrogate)	70	0	% Recovery	43-116% Limit		
4-Terphenyl-d14 (Surrogate)	90	0	% Recovery	33-141% Limit		
Time Analyzed	0425	0				
Date Extracted	06/25/94	0				

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

LIENT I.D.....: REXENE COC #8270
DATE SAMPLED.....: 06/17/94
TIME SAMPLED.....: 15:03
ORK DESCRIPTION...: 9406171503

TRIP BLANK

LABORATORY I.D...: 941540-0011
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: TRIP BLANK

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	ND	0.5	ug/L			
Xylenes	1.2	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	105	0	% Recovery	85-115% Limit		
Time Analyzed	0104	0				

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8299
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 05:45
WORK DESCRIPTION...: 9406180545

TRIP BLANK

LABORATORY I.D...: 941540-0028
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: TRIP BLANK

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	ND	0.5	ug/L			
Xylenes	ND	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	101	0	% Recovery	85-115% Limit		
Time Analyzed	0248	0				

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WESTERN ATLAS

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LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8271
DATE SAMPLED.....: 06/18/94
TIME SAMPLED.....: 09:55
WORK DESCRIPTION...: 9406180955 FIELD BLANK

LABORATORY I.D...: 941540-0020
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: FIELD BLANK

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	ND	0.5	ug/L			
Xylenes	ND	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	102	0	% Recovery	85-115% Limit		
Time Analyzed	0213	0				
8270 - PAH'S BY 8270		*1		8270 (2)	07/10/94	JMC
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
1-Methylnaphthalene	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
Nitrobenzene-d5 (Surrogate)	77	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl (Surrogate)	69	0	% Recovery	43-116% Limit		
4-Terphenyl-d14 (Surrogate)	83	0	% Recovery	33-141% Limit		
Time Analyzed	0526	0				
Date Extracted	06/25/94	0				

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
08/03/94

JOB NUMBER: 941540 CUSTOMER: GEOSCIENCE CONSULTANTS, LTD. ATTN:

CLIENT I.D.....: REXENE COC #8274
DATE SAMPLED.....: 06/20/94
TIME SAMPLED.....: 10:55
WORK DESCRIPTION...: 9406201055

FIELD BLANK

LABORATORY I.D...: 941540-0038
DATE RECEIVED....: 06/22/94
TIME RECEIVED....: 09:45
REMARKS.....: FIELD BLANK

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/30/94	JHT
Benzene	ND	0.5	ug/L			
Toluene	ND	0.5	ug/L			
Ethyl benzene	ND	0.5	ug/L			
Xylenes	ND	0.5	ug/L			
4-Bromofluorobenzene (surrogate)	101	0	% Recovery	85-115% Limit		
Time Analyzed	0357	0				
8270 - PAH'S BY 8270		*1		8270 (2)	07/10/94	JMC
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
1-Methylnaphthalene	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
Nitrobenzene-d5 (Surrogate)	86	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl (Surrogate)	77	0	% Recovery	43-116% Limit		
4-Terphenyl-d14 (Surrogate)	91	0	% Recovery	33-141% Limit		
Time Analyzed	0729	0				
Date Extracted	06/25/94	0				

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GROUNDWATER TECHNOLOGY ®

Remediation Technology Laboratory

4080 Pike Lane, Suite B. Concord, CA 94520 USA
Tel: (510) 671-2116 Fax: (510) 687-0843

July 20, 1994

Trent Thomas
Geoscience Consultants, Ltd. (GCL)
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

Dear Mr. Thomas,

Enclosed please find the analytical results for the samples received by the Remediation Technology Laboratory on 6/22/94.

Analytical work for this project has undergone a rigorous Quality Assurance/Quality Control procedure to ensure quality and accuracy. Your reference number for correspondence regarding these results is R7013 and your contact person is George E. Hocker.

All samples will be discarded 8/20/94, unless directed otherwise. If you have any questions regarding this analysis, or if we can be of further assistance, please call us at (510) 671-2116.

Sincerely,
GROUNDWATER TECHNOLOGY, INC.

Carol A. Daly, Project Manager
Remediation Technology Laboratory

REMEDIATION TECHNOLOGY LABORATORY

4080 Pike Lane Concord, CA 94520 510-685-7852

Results of Bacteria Enumeration

Project Name:	Rexene	**Sampling Date:**	6/17/94
Client Name:	GCL	**Date Received:**	6/22/94
Site Location:	Unknown	**Date Completed:**	7/18/94
Project Manager:	Trent Thomas	**Report Date:**	7/20/94
Matrix:	Soil	**Log-In Number:**	R7013

	Lab No.	Sample ID	Contaminant Utilizing Bacteria(1)		Total Heterotrophic Bacteria	
			Non-Volatile	Volatile		
B-1	7013-1	9406171043	3.1×10^4	3.7×10^4	2.6×10^5	4-6'
B-3	7013-2	9406171502	7.7×10^3	(8.2×10^2)	3.1×10^4	6-8'

(1) Contaminant = Non-Volatile-Fuel Oil
Volatile-Gasoline

Plate counts reported in colony-forming units per dry gram soil. Spread plate technique based on Methods of Soil Analysis, Part 2, Chemical and Microbiological Properties, Amer. Soc. of Agronomy, Soil Science Soc. of Amer., 1982, Madison, WI chapter 37; Standard Methods for the Examination of Water and Wastes, 17th edition, AWWA, APHA, WPCF, 1989, Method 9215C. Results in parentheses do not fall within the range of 30-300 colonies per plate and are therefore reported as estimated counts.

a:comptacles4\gclcub1.thb

R7053

GCL
Environmental Science and Engineering
A BDM International Company

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Albuquerque, NM 87102
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FAX: (505) 842-0595

☐ Mid Atlantic Region
4221 Forbes Blvd., Ste. 240
Lanham, MD 20706-4325
(301) 459-9677
FAX: (301) 459-3064

☐ NASA-WSTF
PO Drawer MM
Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

№ 8315

Chain of Custody

Date 6/17/94 Page 1 of 1

Lab Name GTEL Environmental Laboratories
Address 4080 Pike Lane
Concord, CA 94520
Telephone 415/685-7852

Samplers (SIGNATURES) [signature]

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP - Vol., Semi-Vol. Herbicides, Pesticides	TCLP - Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Back - Hetero	Bact - Non Vol	Hc Vtil Vol		Number of Containers
9406171043	Soil	B-4																							✓	✓	✓		1
9406171502	Soil	B-3																							✓	✓	✓		1
~~9406171625~~	~~Soil~~	~~B-5~~																											
~~9406171625~~	~~Soil~~	~~B-5~~																											

THOMAS

Project Information	Sample Receipt
Project REXENE	Total No. of Containers
Project Director TRENT	Chain of Custody Seals
Charge Code No. 3031.004	Rec'd Good Condition/Cold
Shipping ID. No. 2750047053	Conforms to Record
Via: Fed X	Lab No.

Special Instructions/Comments:
ANALYTES
BACK. HETERO. BACT. NON. VOL. HC VTIL
VOL. HC VTIL (Contaminants per B. Stipper 6-21-94)

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
[signature] 1500		
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
DAVID NEE 6/21/94		
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
GCL		
(Company)	(Company)	(Company)

Received By 1.	Received By 2.	Received By (Laboratory) 3.
		[signature] 0930
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
		CAROL A. DALY 6-22-94
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
		RTC
(Company)	(Company)	(Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

GROUNDWATER TECHNOLOGY ®

Remediation Technology Laboratory

4080 Pike Lane, Suite B, Concord, CA 94520 USA
Tel: (510) 671-2116 Fax: (510) 687-0843

July 20, 1994

Trent Thomas
Geoscience Consultants, Ltd. (GCL)
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

Dear Mr. Thomas,

Enclosed please find the analytical results for the samples received by the Remediation Technology Laboratory on 6/22/94.

Analytical work for this project has undergone a rigorous Quality Assurance/Quality Control procedure to ensure quality and accuracy. Your reference number for correspondence regarding these results is R7014 and your contact person is George E. Hocker.

All samples will be discarded 8/20/94, unless directed otherwise. If you have any questions regarding this analysis, or if we can be of further assistance, please call us at (510) 671-2116.

Sincerely,
GROUNDWATER TECHNOLOGY, INC.

Carol A. Daly, Project Manager
Remediation Technology Laboratory

REMEDIATION TECHNOLOGY LABORATORY

4080 Pike Lane Concord, CA 94520 510-685-7852

Results of Bacteria Enumeration

Project Name:	Rexene	**Sampling Date:**	6/18/94
Client Name:	GCL	**Date Received:**	6/22/94
Site Location:	Unknown	**Date Completed:**	7/18/94
Project Manager:	Trent Thomas	**Report Date:**	7/20/94
Matrix:	Soil	**Log-In Number:**	R7014

Lab No.	Sample ID	Contaminant Utilizing Bacteria[1]		Total Heterotrophic Bacteria
		Non-Volatile	Volatile	
7014-1	9406180749	<100	<100	(6.0 x 10^2)

B-7

6-8'

(1)Contaminant= Non-Volatile/Fuel Oil
Volatile/Gasoline

Plate counts reported in colony-forming units per dry gram soil. Spread plate technique based on Methods of Soil Analysis, Part 2, Chemical and Microbiological Properties, Amer. Soc. of Agronomy, Soil Science Soc. of Amer., 1982, Madison, WI chapter 37; Standard Methods for the Examination of Water and Wastes, 17th edition, AWWA, APHA, WPCF, 1989, Method 9215C. Results in parentheses do not fall within the range of 30-300 colonies per plate and are therefore reported as estimated counts.

a:comptabes4\gctc-tb3.thb

R70A

№ 8314

GCL
Environmental Science and Engineering
A BDM International Company

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FAX: (301) 459-3064

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Las Cruces, NM 88004
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FAX: (505) 524-5315

Chain of Custody

Date 6-18-94 Page 1 of 1

Lab Name GTEL Environmental Laboratories
Address 4080 Pike Lane
Concord, CA 94520
Telephone 415/685-7852
Samplers (SIGNATURES) BA Skipper

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 501/801	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Back. Heterotroph. Bacteria	Non-Volatile HC Util. (fuel oil)	Vol. HC Util. (consortium w/BTEX)		Number of Containers
9406180749	SOIL	B-7																							✓	✓	✓		1

GTEL# 014

Project Information	
Project	Rexene
Project Director	T. Thomas
Charge Code No.	3031.004
Shipping ID. No.	2750047053
Via:	Fed. Ex.

Sample Receipt	
Total No. of Containers	
Chain of Custody Seals	
Rec'd Good Condition/Cold	
Conforms to Record	
Lab No.	

	1.	2.	3.
Relinquished By (Signature)	BA Skipper		
(Time)	1515		
(Printed Name)	BURT SCHIPPERS		
(Date)	6-21-94		
(Company)	GCL		
Received By (Signature)			Carol Daly
(Time)			0930
(Printed Name)			CAROL A. DALY
(Date)			6-22-94
(Company) / (Laboratory)			RTL

Special Instructions/Comments:
Contaminants per B. Skippers 6-22-94

Distribution: White, Canary-Laboratory • Pink, GCL

GROUNDWATER TECHNOLOGY ®

Remediation Technology Laboratory

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Tel: (510) 671-2116 Fax: (510) 687-0843

July 20, 1994

Trent Thomas
Geoscience Consultants, Ltd. (GCL)
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

Dear Mr. Thomas,

Enclosed please find the analytical results for the samples received by the Remediation Technology Laboratory on 6/22/94.

Analytical work for this project has undergone a rigorous Quality Assurance/Quality Control procedure to ensure quality and accuracy. Your reference number for correspondence regarding these results is R7015 and your contact person is George E. Hocker.

All samples will be discarded 8/20/94, unless directed otherwise. If you have any questions regarding this analysis, or if we can be of further assistance, please call us at (510) 671-2116.

Sincerely,
GROUNDWATER TECHNOLOGY, INC.

Carol A. Daly, Project Manager
Remediation Technology Laboratory

REMEDIATION TECHNOLOGY LABORATORY

4080 Pike Lane Concord, CA 94520 510-685-7852

Results of Bacteria Enumeration

Project Name:	Rexene	**Sampling Date:**	6/20/94
Client Name:	GCL	**Date Received:**	6/22/94
Site Location:	Unknown	**Date Completed:**	7/19/94
Project Manager:	Trent Thomas	**Report Date:**	7/20/94
Matrix:	Soil	**Log-In Number:**	R7015

Lab No.	Sample ID	Contaminant Utilizing Bacteria(1)		Total Heterotrophic Bacteria
		Non-Volatile	Volatile	
7015-1	9406201625	4.0×10^2	6.1×10^3	8.7×10^3

B-11

8-10'

(1) Contaminant = Non-Volatile-Fuel Oil
Volatile-Gasoline

Plate counts reported in colony-forming units per dry gram soil. Spread plate technique based on Methods of Soil Analysis, Part 2, Chemical and Microbiological Properties, Amer. Soc. of Agronomy, Soil Science Soc. of Amer., 1982, Madison, WI chapter 37; Standard Methods for the Examination of Water and Wastes, 17th edition, AWWA, APHA, WPCF, 1989, Method 9215C. Results in parentheses do not fall within the range of 30-300 colonies per plate and are therefore reported as estimated counts.

a:comptables4\gcicub2.thb

R7015

GCL
Environmental Science and Engineering
A BDM International Company

☑ Albuquerque
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102
(505) 842-0001
FAX: (505) 842-0595

☐ Mid Atlantic Region
4221 Forbes Blvd., Ste. 240
Lanham, MD 20706-4325
(301) 459-9677
FAX: (301) 459-3064

☐ NASA-WSTF
PO Drawer MM
Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

№ 8306

Chain of Custody

Date 6/20/94 Page ___ of ___

Lab Name GTEL Environmental Laboratories
Address 4080 Pike Lane
Concord, CA 94520
Telephone 415/685-7852

Samplers (SIGNATURES) Kenneth G. Duncan

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Background Heterotr. Bacteria	Volatile Hydrocarbon Utilizers (something w/BTEX)	Non-Volatile Hydrocarbon Utilizers (lube oil)		Number of Containers
9406201625	Soil	B-11																							✓	✓	✓		1
~~9406201625~~	~~Soil~~	~~B-11~~																											
KGD																													

Project Information
Project Rexene
Project Director T. Thomas
Charge Code No. 3031-004
Shipping ID. No. 2750047053
Via: FED. EX.

Sample Receipt

Total No. of Containers	
Chain of Custody Seals	
Rec'd Good Condition/Cold	
Conforms to Record	
Lab No.	

Special Instructions/Comments: Contaminants per B. Skippers 6-22-94

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
(Signature) Kenneth G. Duncan (Time) 13:50	(Signature) (Time)	(Signature) (Time)
(Printed Name) Kenneth G. Duncan (Date) 6/21/94	(Printed Name) (Date)	(Printed Name) (Date)
(Company) GCL	(Company)	(Company)

Received By 1.	Received By 2.	Received By (Laboratory) 3.
(Signature) B.A. Skippers (Time) 1350	(Signature) (Time)	(Signature) Carol A. Daly (Time) 0930
(Printed Name) Burt Skippers (Date) 6-21-94	(Printed Name) (Date)	(Printed Name) Carol A. Daly (Date) 6-22-94
(Company) GCL	(Company)	(Laboratory) RTL

Distribution: White, Canary-Laboratory • Pink, GCL

Appendix F

Water Level Data

Rexene - Brickland Facility
Water Level Data

Well ID	TOC Elevation (ft. AMSL)	Top of Screen Elevation (ft. AMSL)	Water Level Date	Depth to Product (ft. BTOC)	Depth to Water (ft. BTOC)	Water Level Elevation (ft. AMSL)	Water below Top of Screen ft.
MW-1	3727.60	3720.95	04/01/90	--	--	3724.91	-3.96
MW-1	3727.60	3720.95	07/01/90	--	--	3726.19	-5.24
MW-1	3727.60	3720.95	09/30/93	--	--	3725.78	-4.83
MW-1	3727.60	3720.95	12/03/93	--	--	3724.28	-3.33
MW-1	3727.60	3720.95	07/11/94	NP	4.03	3723.57	-2.62
MW-1	3727.60	3720.95	09/26/94	NP	5.20	3722.40	-1.45
MW-2	3726.57	NA	04/01/90	--	--	3726.74	NA
MW-2	3726.57	NA	07/01/90	--	--	3727.92	NA
MW-2	3726.57	NA	09/30/93	NM	NM	NM	NA
MW-2	3726.57	NA	12/03/93	NM	NM	NM	NA
MW-2	3726.57	NA	07/11/94	NP	3.95	3722.62	NA
MW-2	3726.57	NA	09/26/94	NP	4.60	3721.97	NA
MW-3s	3733.76	3727.26	04/01/90	--	--	3724.36	2.9
MW-3s	3733.76	3727.26	07/01/90	--	--	3725.68	1.58
MW-3s	3733.76	3727.26	09/30/93	--	--	3725.29	1.97
MW-3s	3733.76	3727.26	12/03/93	--	--	3724.07	3.19
MW-3s	3733.76	3727.26	07/11/94	NP	4.13	3729.63	-2.37
MW-3s	3733.76	3727.26	09/26/94	NP	5.50	3728.26	-1
MW-3d	3733.78	3706.38	04/01/90	--	--	3723.92	-17.54
MW-3d	3733.78	3706.38	07/01/90	--	--	3725.60	-19.22
MW-3d	3733.78	3706.38	09/30/93	--	--	3725.22	-18.84
MW-3d	3733.78	3706.38	12/03/93	--	--	3724.01	-17.63
MW-3d	3733.78	3706.38	07/11/94	NP	4.22	3729.56	-23.18
MW-3d	3733.78	3706.38	09/26/94	NP	5.58	3728.20	-21.82
MW-4	3728.86	3722.76	04/01/90	--	--	3724.37	-1.61
MW-4	3728.86	3722.76	07/01/90	--	--	3725.59	-2.83
MW-4	3728.86	3722.76	09/30/93	--	--	3725.21	-2.45
MW-4	3728.86	3722.76	12/03/93	--	--	3724.04	-1.28
MW-4	3728.86	3722.76	07/11/94	NP	3.30	3725.56	-2.8
MW-4	3728.86	3722.76	09/26/94	NP	4.18	3724.68	-1.92
MW-5	3729.70	3725.20	04/01/90	--	--	3724.35	0.85
MW-5	3729.70	3725.20	07/01/90	--	--	3725.50	-0.3
MW-5	3729.70	3725.20	09/30/93	--	--	3725.11	0.09
MW-5	3729.70	3725.20	12/03/93	--	--	3723.98	1.22
MW-5	3729.70	3725.20	07/11/94	NP	3.82	3725.88	-0.68
MW-5	3729.70	3725.20	09/26/94	NP	5.00	3724.70	0.5
MW-6s	3734.67	3728.07	04/01/90	--	--	3724.07	4

Rexene - Brickland Facility
Water Level Data

Well ID	TOC Elevation (ft. AMSL)	Top of Screen Elevation (ft. AMSL)	Water Level Date	Depth to Product (ft. BTOC)	Depth to Water (ft. BTOC)	Water Level Elevation (ft. AMSL)	Water below Top of Screen ft.
MW-6s	3734.67	3728.07	07/01/90	--	--	3725.35	2.72
MW-6s	3734.67	3728.07	09/30/93	--	--	3725.08	2.99
MW-6s	3734.67	3728.07	12/03/93	--	--	3723.78	4.29
MW-6s	3734.67	3728.07	07/11/94	NP	5.10	3729.57	-1.5
MW-6s	3734.67	3728.07	09/26/94	NP	6.45	3728.22	-0.15
MW-6d	3734.38	3706.88	04/01/90	--	--	3724.08	-17.2
MW-6d	3734.38	3706.88	07/01/90	--	--	3725.33	-18.45
MW-6d	3734.38	3706.88	09/30/93	--	--	3725.00	-18.12
MW-6d	3734.38	3706.88	12/03/93	--	--	3723.75	-16.87
MW-6d	3734.38	3706.88	07/11/94	NP	5.05	3729.33	-22.45
MW-6d	3734.38	3706.88	09/26/94	NP	6.40	3727.98	-3727.98
MW-7	3728.96	3723.16	04/01/90	--	--	3724.16	
MW-7	3728.96	3723.16	07/01/90	--	--	3725.44	-3725.44
MW-7	3728.96	3723.16	09/30/93	--	--	3725.16	-2
MW-7	3728.96	3723.16	12/03/93	--	--	3723.91	-0.75
MW-7	3728.96	3723.16	07/11/94	NP	3.07	3725.89	-2.73
MW-7	3728.96	3723.16	09/26/94	NP	4.50	3724.46	-1.3
MW-8	3729.55	3724.85	04/01/90	--	--	3724.33	0.52
MW-8	3729.55	3724.85	07/01/90	--	--	3725.34	-0.49
MW-8	3729.55	3724.85	09/30/93	--	--	3725.10	-0.25
MW-8	3729.55	3724.85	12/03/93	--	--	3723.38	1.47
MW-8	3729.55	3724.85	07/11/94	NP	3.45	3726.10	-1.25
MW-8	3729.55	3724.85	09/26/94	NP	4.73	3724.82	0.03
MW-9s	3730.03	3724.33	04/01/90	--	--	3723.75	0.58
MW-9s	3730.03	3724.33	07/01/90	--	--	3724.98	-0.65
MW-9s	3730.03	3724.33	09/30/93	--	--	3724.84	-0.51
MW-9s	3730.03	3724.33	12/03/93	--	--	3723.52	0.81
MW-9s	3730.03	3724.33	07/11/94	NP	4.72	3725.31	-0.98
MW-9s	3730.03	3724.33	09/26/94	NP	6.10	3723.93	0.4
MW-9d	3730.70	3704.10	04/01/90	--	--	3723.74	-19.64
MW-9d	3730.70	3704.10	07/01/90	--	--	3724.94	-20.84
MW-9d	3730.70	3704.10	09/30/93	--	--	Silted in	3704.1
MW-9d	3730.70	3704.10	12/03/93	--	--	Silted in	3704.1
MW-9d	3730.70	3704.10	07/11/94	--	--	Obstructed	3704.1
MW-9d	3730.70	3704.10	09/26/94	--	--	Obstructed	3704.1
MW-10	3732.58	3723.58	04/01/90	--	--	3723.81	-0.23
MW-10	3732.58	3723.58	07/01/90	--	--	3725.32	-1.74

Rexene - Brickland Facility
Water Level Data

Well ID	TOC Elevation (ft. AMSL)	Top of Screen Elevation (ft. AMSL)	Water Level Date	Depth to Product (ft. BTOC)	Depth to Water (ft. BTOC)	Water Level Elevation (ft. AMSL)	Water below Top of Screen ft.
MW-10	3732.58	3723.58	09/30/93	7.00	12.42	3724.50	-0.916
MW-10	3732.58	3723.58	12/03/93	NM	NM	NM	3723.58
MW-10	3732.58	3723.58	07/11/94	6.55	10.00	3725.34	-1.76
MW-10	3732.58	3723.58	09/26/94	8.00	10.40	3724.10	-0.52
MW-11	3731.40	3721.60	04/01/90	--	--	3724.19	-2.59
MW-11	3731.40	3721.60	07/01/90	--	--	3725.10	-3.5
MW-11	3731.40	3721.60	09/30/93	--	--	3724.91	-3.31
MW-11	3731.40	3721.60	12/03/93	--	--	3723.78	-2.18
MW-11	3731.40	3721.60	07/11/94	NP	5.65	3725.75	-4.15
MW-11	3731.40	3721.60	09/26/94	6.85	6.90	3724.54	-2.94
MW-12	3727.37	3710.47	04/01/90	--	--	3723.53	-13.06
MW-12	3727.37	3710.47	07/01/90	--	--	3726.68	-16.21
MW-12	3727.37	3710.47	09/30/93	--	--	3726.09	-15.62
MW-12	3727.37	3710.47	12/03/93	--	--	3724.91	-14.44
	3727.37	3710.47	07/11/94	NP	3.30	3724.07	-13.6
MW-12	3727.37	3710.47	09/26/94	NP	4.65	3722.72	-12.25
MW-13	3732.49	NA	04/01/90	--	--	3724.41	NA
MW-13	3732.49	NA	07/01/90	--	--	3725.50	NA
MW-13	3732.49	NA	09/30/93	--	--	3725.22	NA
MW-13	3732.49	NA	12/03/93	--	--	NM	NA
MW-13	3732.49	NA	07/11/94	NP	6.54	3725.95	NA
MW-13	3732.49	NA	09/26/94	NP	7.65	3724.84	NA
MW-14	3730.40	3725.40	07/11/94	NP	4.43	3725.97	-0.57
MW-14	3730.40	3725.40	09/26/94	NP	5.85	3724.55	0.85
MW-15	3738.62	3724.92	07/11/94	NP	13.00	3725.62	-0.7
MW-15	3738.62	3724.92	09/26/94	NP	14.34	3724.28	0.64
MW-16	3737.07	3727.07	07/11/94	NP	11.35	3725.72	1.35
MW-16	3737.07	3727.07	09/26/94	NP	12.72	3724.35	2.72
MW-17	3732.04	3726.64	07/11/94	NP	6.08	3725.96	0.68
MW-17	3732.04	3726.64	09/26/94	NP	7.52	3724.52	2.12
WP-1	3733.54	3725.24	10/06/93	--	--	3724.26	0.98
WP-1	3733.54	3725.24	12/03/93	--	--	3723.27	1.97
WP-1	3733.54	3725.24	07/11/94	NP	8.28	3725.26	-0.02
WP-1	3733.54	3725.24	09/26/94	NP	9.05	3724.49	0.75

Rexene - Brickland Facility
Water Level Data

Well ID	TOC Elevation (ft. AMSL)	Top of Screen Elevation (ft. AMSL)	Water Level Date	Depth to Product (ft. BTOC)	Depth to Water (ft. BTOC)	Water Level Elevation (ft. AMSL)	Water below Top of Screen ft.
WP-2	3731.81	3718.81	10/06/93	--	--	3723.62	-4.81
WP-2	3731.81	3718.81	12/03/93	--	--	3723.17	-4.36
WP-2	3731.81	3718.81	07/11/94	NP	6.50	3725.31	-6.5
WP-2	3731.81	3718.81	09/26/94	NP	9.34	3722.47	-3.66
WP-3	3729.26	3724.06	10/06/93	--	--	3724.10	-0.04
WP-3	3729.26	3724.06	12/03/93	--	--	3724.28	-0.22
WP-3	3729.26	3724.06	07/11/94	NP	5.54	3723.72	0.34
WP-3	3729.26	3724.06	09/26/94	NP	6.10	3723.16	0.9
WP-4	3731.98	3726.78	10/06/93	--	--	NM	NA
WP-4	3731.98	3726.78	12/03/93	--	--	3723.08	3.7
WP-4	3731.98	3726.78	07/11/94	NP	6.46	3725.52	1.26
WP-4	3731.98	3726.78	09/26/94	NP	7.50	3724.48	2.3
WP-5	3731.99	3726.89	10/06/93	--	--	3724.19	2.7
WP-5	3731.99	3726.89	12/03/93	--	--	3723.37	3.52
WP-5	3731.99	3726.89	07/11/94	NP	6.46	3725.53	1.36
WP-5	3731.99	3726.89	09/26/94	NP	7.35	3724.64	2.25
WP-6	3731.79	3726.59	10/06/93	--	--	3723.26	3.33
WP-6	3731.79	3726.59	12/03/93	--	--	3726.44	0.15
WP-6	3731.79	3726.59	07/11/94	NP	5.98	3725.81	0.78
WP-6	3731.79	3726.59	09/26/94	NP	7.07	3724.72	1.87
WP-7	3733.21	NA	10/06/93	--	--	3724.84	NA
WP-7	3733.21	NA	12/03/93	--	--	3723.89	NA
WP-7	3733.21	NA	07/11/94	NP	7.27	3725.94	NA
WP-7	3733.21	NA	09/26/94	NP	7.93	3725.28	NA
WP-8	3729.67	3723.37	10/06/93	--	--	3724.33	-0.96
WP-8	3729.67	3723.37	12/03/93	--	--	3723.38	-0.01
WP-8	3729.67	3723.37	07/11/94	NP	3.85	3725.82	-2.45
WP-8	3729.67	3723.37	09/26/94	NP	4.90	3724.77	-1.4
WP-9	3730.98	3727.38	10/06/93	--	--	3724.26	3.12
WP-9	3730.98	3727.38	12/03/93	--	--	3723.48	3.9
WP-9	3730.98	3727.38	07/11/94	NP	5.13	3725.85	1.53
WP-9	3730.98	3727.38	09/26/94	NP	6.33	3724.65	2.73
WP-10	3731.55	3726.35	10/06/93	--	--	3724.22	2.13
WP-10	3731.55	3726.35	12/03/93	--	--	3723.40	2.95
WP-10	3731.55	3726.35	07/11/94	NP	5.96	3725.59	0.76

Rexene - Brickland Facility
Water Level Data

Well ID	TOC Elevation (ft. AMSL)	Top of Screen Elevation (ft. AMSL)	Water Level Date	Depth to Product (ft. BTOC)	Depth to Water (ft. BTOC)	Water Level Elevation (ft. AMSL)	Water below Top of Screen ft.
WP-10	3731.55	3726.35	09/26/94	8.70	8.90	3722.81	3.54
WP-11	3731.59	3726.39	10/06/93	--	--	3724.35	2.04
WP-11	3731.59	3726.39	12/03/93	--	--	3723.53	2.86
WP-11	3731.59	3726.39	07/11/94	NP	5.50	3726.09	0.3
WP-11	3731.59	3726.39	09/26/94	DRY	0.00	3731.59	-5.2
WP-12	3731.43	3726.33	10/06/93	--	--	3724.53	1.8
WP-12	3731.43	3726.33	12/03/93	--	--	3723.62	2.71
WP-12	3731.43	3726.33	07/11/94	NP	5.54	3725.89	0.44
WP-12	3731.43	3726.33	09/26/94	DRY	0.00	3731.43	-3731.43
WP-13	3730.47	3725.37	10/06/93	--	--	3724.50	0.87
WP-13	3730.47	3725.37	12/03/93	--	--	3723.75	1.62
WP-13	3730.47	3725.37	07/11/94	NP	4.95	3725.52	-0.15
WP-13	3730.47	3725.37	09/26/94	NP	6.25	3724.22	1.15
WP-14	3730.52	3725.32	10/06/93	--	--	3724.76	0.56
WP-14	3730.52	3725.32	12/03/93	--	--	3723.94	1.38
WP-14	3730.52	3725.32	07/11/94	NP	4.22	3726.30	-0.98
WP-14	3730.52	3725.32	09/26/94	TAR	0.00	3730.52	-5.2
WP-15	3732.97	3724.67	10/06/93	--	--	3724.57	0.1
WP-15	3732.97	3724.67	12/03/93	--	--	3723.71	0.96
WP-15	3732.97	3724.67	07/11/94	NP	7.21	3725.76	-1.09
WP-15	3732.97	3724.67	09/26/94	NP	8.07	3724.90	-0.23
WP-16	3731.03	3725.93	10/06/93	--	--	3724.62	1.31
WP-16	3731.03	3725.93	12/03/93	--	--	3723.73	2.2
WP-16	3731.03	3725.93	07/11/94	NP	5.03	3726.00	-0.07
WP-16	3731.03	3725.93	09/26/94	IN SILT	5.54	3725.49	0.44
WP-17	3731.38	3725.48	10/06/93	--	--	3724.48	1
WP-17	3731.38	3725.48	12/03/93	--	--	3723.62	1.86
WP-17	3731.38	3725.48	07/11/94	NP	5.38	3726.00	-0.52
WP-17	3731.38	3725.48	09/26/94	DRY	0.00	3731.38	-5.9
WP-18	3728.60	3718.30	10/06/93	--	--	3724.42	-6.12
WP-18	3728.60	3718.30	12/03/93	--	--	3723.62	-5.32
WP-18	3728.60	3718.30	07/11/94	NP	2.58	3726.02	-7.72
WP-18	3728.60	3718.30	09/26/94	NP	3.85	3724.75	-6.45
WP-19	3729.68	3724.58	10/06/93	--	--	3724.52	0.06

Rexene - Brickland Facility
Water Level Data

Well ID	TOC Elevation (ft. AMSL)	Top of Screen Elevation (ft. AMSL)	Water Level Date	Depth to Product (ft. BTOC)	Depth to Water (ft. BTOC)	Water Level Elevation (ft. AMSL)	Water below Top of Screen ft.
WP-19	3729.68	3724.58	12/03/93	--	--	3722.68	1.9
WP-19	3729.68	3724.58	07/11/94	NP	3.71	3725.97	-1.39
WP-19	3729.68	3724.58	09/26/94	NP	4.97	3724.71	-0.13
WP-20	3731.54	3726.34	10/06/93	--	--	3724.40	1.94
WP-20	3731.54	3726.34	12/03/93	--	--	3723.37	2.97
WP-20	3731.54	3726.34	07/11/94	NP	3.22	3728.32	-1.98
WP-20	3731.54	3726.34	09/26/94	PRODUCT	6.70	3724.84	1.5
WP-21	3730.48	3725.38	10/06/93	--	--	3724.37	1.01
WP-21	3730.48	3725.38	12/03/93	--	--	3723.49	1.89
WP-21	3730.48	3725.38	07/11/94	NP	4.95	3725.53	-0.15
WP-21	3730.48	3725.38	09/26/94	NP	5.77	3724.71	0.67
WP-22	3728.99	3713.49	10/06/93	--	--	3724.21	-10.72
WP-22	3728.99	3713.49	12/03/93	--	--	3723.42	-9.93
WP-22	3728.99	3713.49	07/11/94	NP	3.00	3725.99	-12.5
WP-22	3728.99	3713.49	09/26/94	NP	4.33	3724.66	-11.17
WP-23	3729.24	3724.04	10/06/93	--	--	3723.80	0.24
WP-23	3729.24	3724.04	12/03/93	--	--	3723.22	0.82
WP-23	3729.24	3724.04	07/11/94	NP	5.00	3724.24	-0.2
WP-23	3729.24	3724.04	09/26/94	NP	5.43	3723.81	0.23
WP-24	3731.90	3726.80	10/06/93	--	--	3724.29	2.51
WP-24	3731.90	3726.80	12/03/93	--	--	3723.37	3.43
WP-24	3731.90	3726.80	07/11/94	NP	6.22	3725.68	1.12
WP-24	3731.90	3726.80	09/26/94	NP	5.41	3726.49	0.31
WP-25	3733.65	NA	10/06/93	--	--	3723.68	NA
WP-25	3733.65	NA	12/03/93	--	--	3723.73	NA
WP-25	3733.65	NA	07/11/94	7.70	7.92	3725.91	NA
WP-25	3733.65	NA	09/26/94	PRODUCT	PRODUCT	3733.65	NA
WP-26s	3732.48	3727.18	12/03/93	--	--	3722.29	4.89
WP-26s	3732.48	3727.18	07/11/94	6.80	9.00	3725.24	1.94
WP-26s	3732.48	3727.18	09/26/94	7.73	10.32	3724.23	2.948
WP-26d	3733.42	3718.02	12/03/93	--	--	3719.55	-1.53
WP-26d	3733.42	3718.02	07/11/94	NP	7.70	3725.72	-7.7
WP-26d	3733.42	3718.02	09/26/94	NP	8.74	3724.68	-6.66
WP-27s	3737.16	3726.86	12/03/93	--	--	3723.38	3.48

Rexene - Brickland Facility
Water Level Data

Well ID	TOC Elevation (ft. AMSL)	Top of Screen Elevation (ft. AMSL)	Water Level Date	Depth to Product (ft. BTOC)	Depth to Water (ft. BTOC)	Water Level Elevation (ft. AMSL)	Water below Top of Screen ft.
WP-27s	3737.16	3726.86	07/11/94	NP	11.70	3725.46	1.4
WP-27s	3737.16	3726.86	09/26/94	NP	12.70	3724.46	2.4
WP-27d	3737.12	3721.72	12/03/93	--	--	3726.98	-5.26
WP-27d	3737.12	3721.72	07/11/94	11.87	11.98	3725.23	-3.508
WP-27d	3737.12	3721.72	09/26/94	12.75	13.20	3724.28	-2.56
WP-28	3731.71	3726.41	07/11/94	NP	7.67	3724.04	2.37
WP-28	3731.71	3726.41	09/26/94	NP	6.64	3725.07	1.34
WP-29	3731.37	3726.07	07/11/94	NP	5.78	3725.59	0.48
WP-29	3731.37	3726.07	09/26/94	NP	6.53	3724.84	1.23
WP-30	3733.54	3725.34	07/11/94	NP	10.46	3723.08	2.26
WP-30	3733.54	3725.34	09/26/94	NP	9.54	3724.00	1.34
WP-31	3737.21	3727.01	07/11/94	NP	11.73	3725.48	1.53
WP-31	3737.21	3727.01	09/26/94	NP	12.65	3724.56	2.45
WP-32	3736.80	3726.30	07/11/94	--	Dry	Dry	3726.3
WP-32	3736.80	3726.30	09/26/94	--	Dry	Dry	3726.3
WP-33	3732.85	3722.65	07/11/94	NP	7.08	3725.77	-3.12
WP-33	3732.85	3722.65	09/26/94	NP	8.25	3724.60	-1.95
WP-34	3731.54	3726.34	07/11/94	NP	7.32	3724.22	2.12
WP-34	3731.54	3726.34	09/26/94	NP	6.81	3724.73	1.61
WP-35	3728.84	3723.64	07/11/94	NP	3.30	3725.54	-1.9
WP-35	3728.84	3723.64	09/26/94	NP	4.17	3724.67	-1.03
WP-36	3729.60	3724.50	07/11/94	NP	3.63	3725.97	-1.47
WP-36	3729.60	3724.50	09/26/94	NP	4.75	3724.85	-0.35
WP-37	3730.25	3725.05	07/11/94	NP	4.44	3725.81	-0.76
WP-37	3730.25	3725.05	09/26/94	NP	5.62	3724.63	0.42

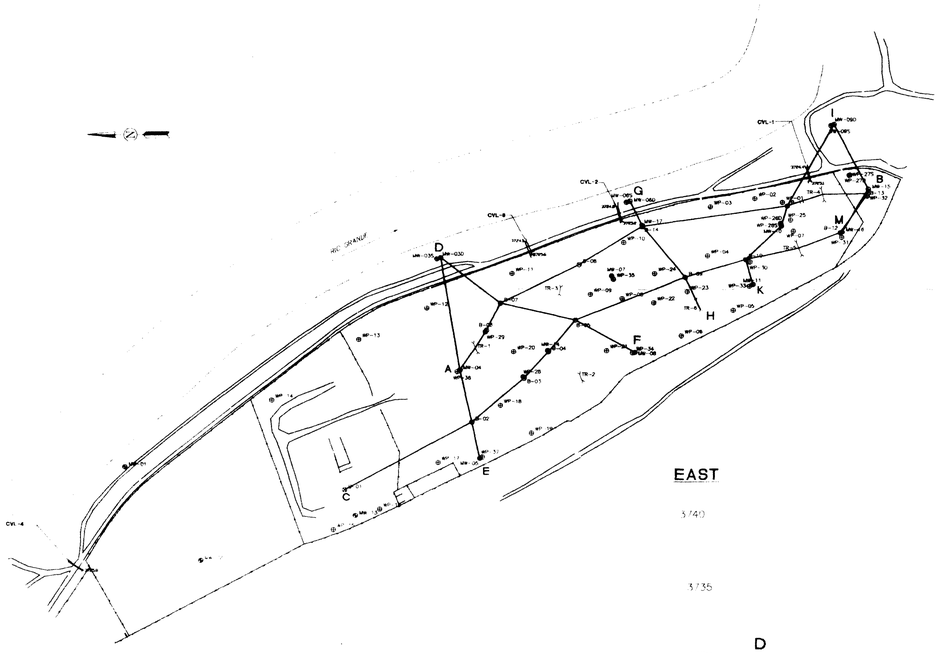
G:\REXWORK\WLDATA.WQ2

AMSL - Above Mean Sea Level
BTOC - Below Top Of Casing
NA - Not Applicable/Available
NM - Not Measured
NP - Not Present

Rexene - Brickland Facility
Water Level Data

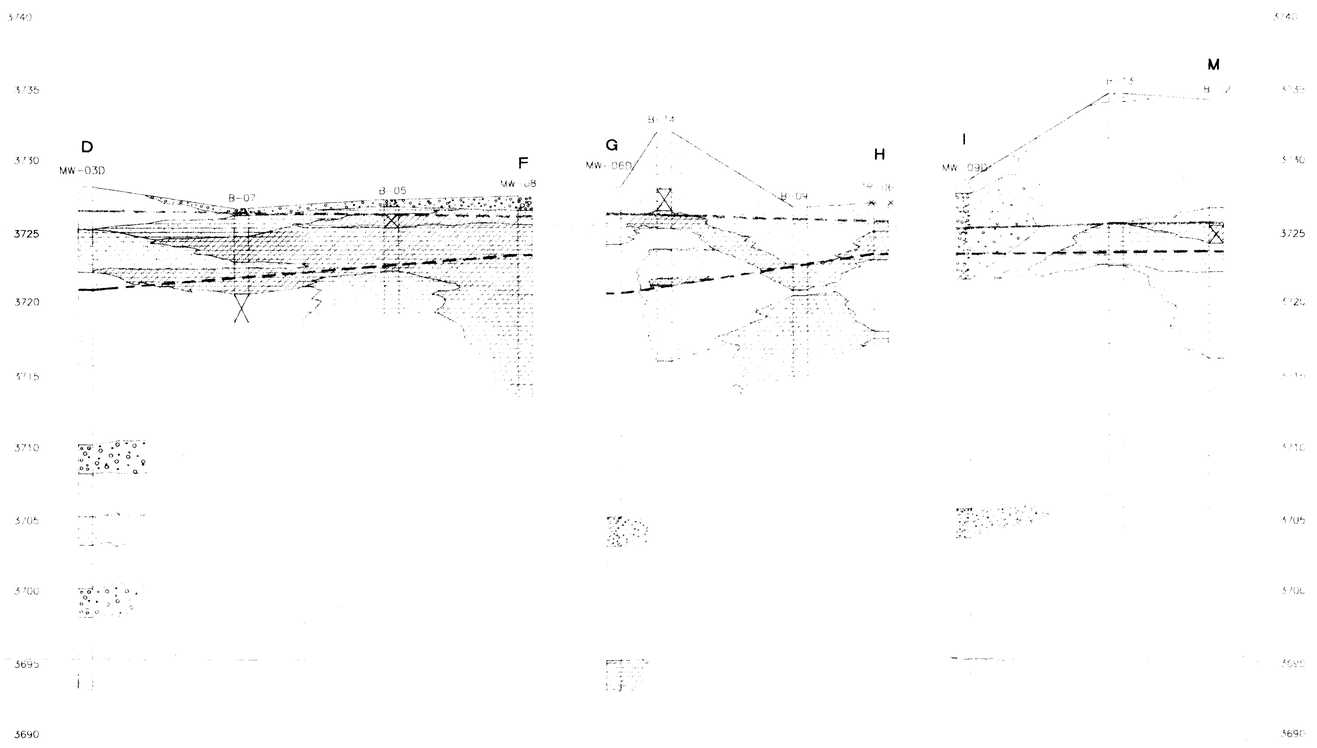
Well ID	TOC Elevation (ft. AMSL)	Top of Screen Elevation (ft. AMSL)	Water Level Date	Depth to Product (ft. BTOC)	Depth to Water (ft. BTOC)	Water Level Elevation (ft. AMSL)	Water below Top of Screen ft.

Water level elevations adjusted for product thickness using specific gravity of 0.8.



EAST

WEST



LEGEND

- GRAVEL
- SANDY GRAVEL (GW)
- SILTY GRAVEL (GW-GM)
- CLAYEY GRAVEL (GW-GC)
- SAND
- GRAVELLY SAND (SW)
- SILTY SAND (SW-SM)
- CLAYEY SAND (SW-SC)
- GRAVELLY SILT
- SANDY SILT
- CLAY (CL)
- GRAVELLY CLAY (CL)
- SANDY CLAY (CL)
- SILTY CLAY (CL)
- SILT (ML)
- NO RECOVERY, LOST SAMPLE
- SMEAR ZONE (DASHED WHERE INFERRED) (DATE) OBSERVED WATER TABLE LEVEL
- SMEAR ZONE (DASHED WHERE INFERRED) (DATE) OBSERVED WATER TABLE LEVEL

80 40 0 200
100 60 20 100

VERTICAL SCALE : 1" = 5'
HORIZONTAL SCALE : 1" = 100'

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DEC 05 1994
OIL CONSERVATION DIV.
SANTA FE

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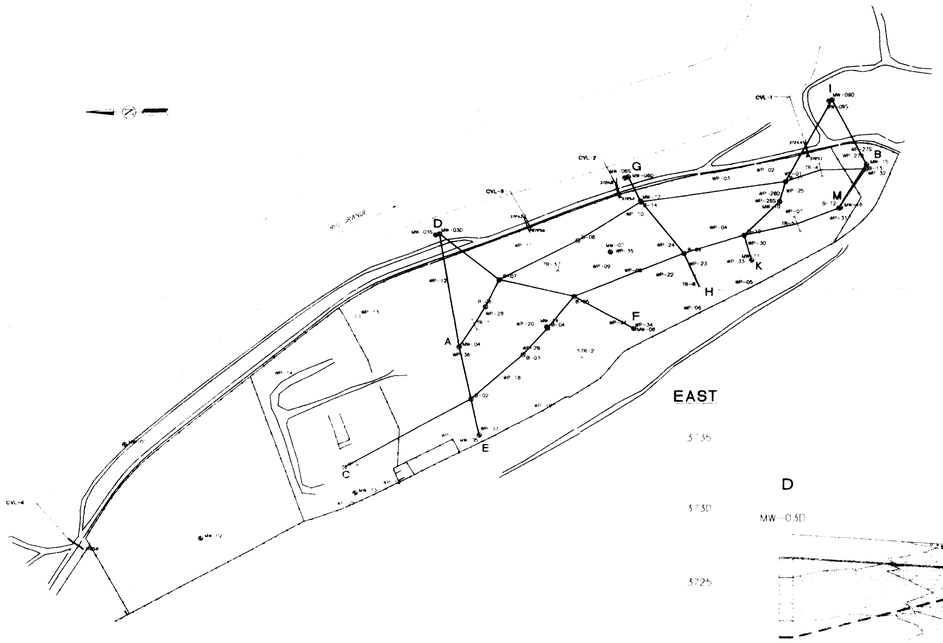
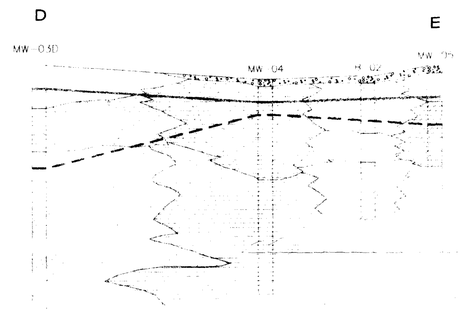
PLATE C
TRANSVERSE CROSS-SECTIONS
(2 of 2) FOR LITHOLOGIC DESCRIPTION
at the FORMER BRICKLAND REFINERY SITE

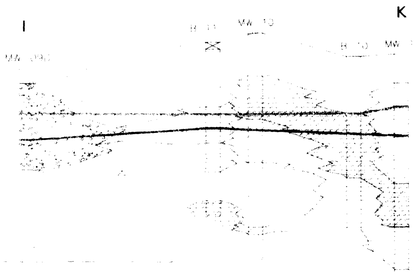
CLIENT: REXENE	
DATE: 10/26/94	REV. NO.: 0
AUTHOR: B.A.S.	DRAWN BY: M.P.
CK'D BY: M.S./B.A.S.	FILE: TRVRS2-A.DWG



EAST

WEST





LEGEND

GRAVEL	GRAVELLY SILT
SANDY GRAVEL (GW)	SANDY SILT
SILTY GRAVEL (GW-GM)	CLAY (CL)
CLAYEY GRAVEL (GW-GC)	GRAVELLY CLAY (CL)
SAND	SANDY CLAY (CL)
GRAVELLY SAND (SW)	SILTY CLAY (CL)
SILTY SAND (SW-SM)	SILT (ML)
CLAYEY SAND (SW-SC)	NO RECOVERY, LOST SAMPLE

SMEAR ZONE (DASHED WHERE INFERRED)
HIGHEST OBSERVED WATER TABLE LEVEL

SMEAR ZONE (DASHED WHERE INFERRED)
LOWEST OBSERVED WATER TABLE LEVEL

VERTICAL SCALE: 1" = 40'
HORIZONTAL SCALE: 1" = 100'

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OIL CONSERVATION DIV.
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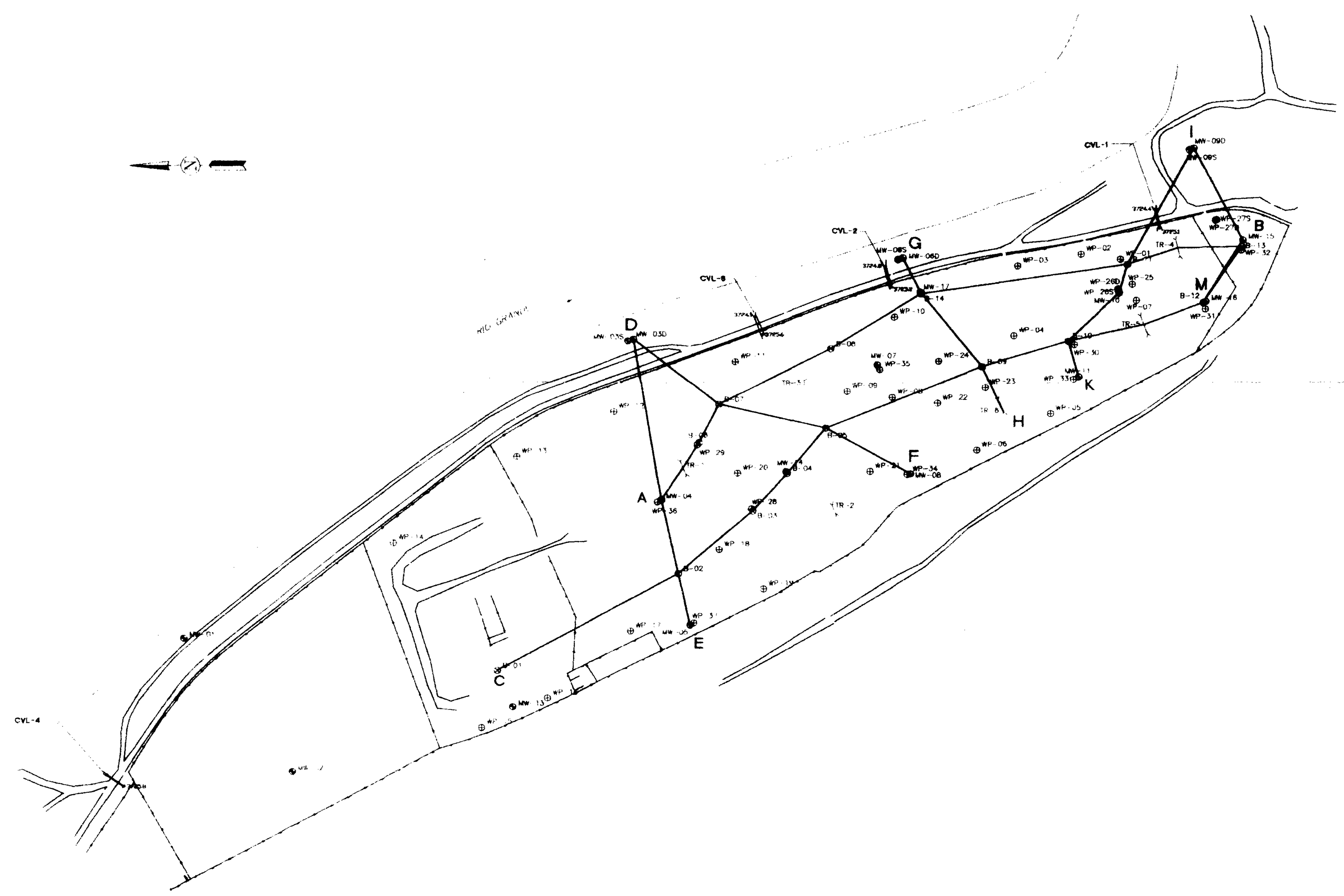
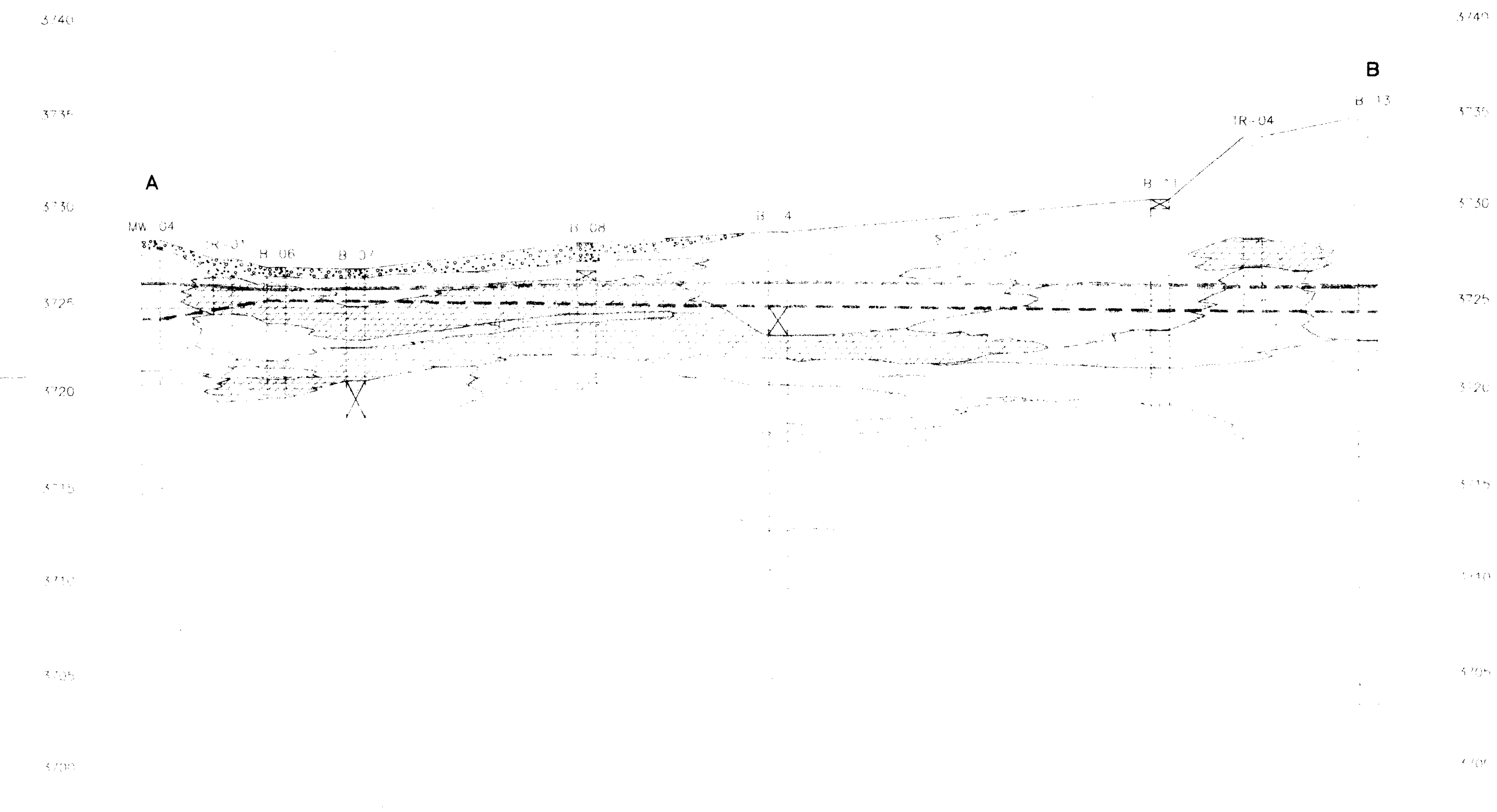
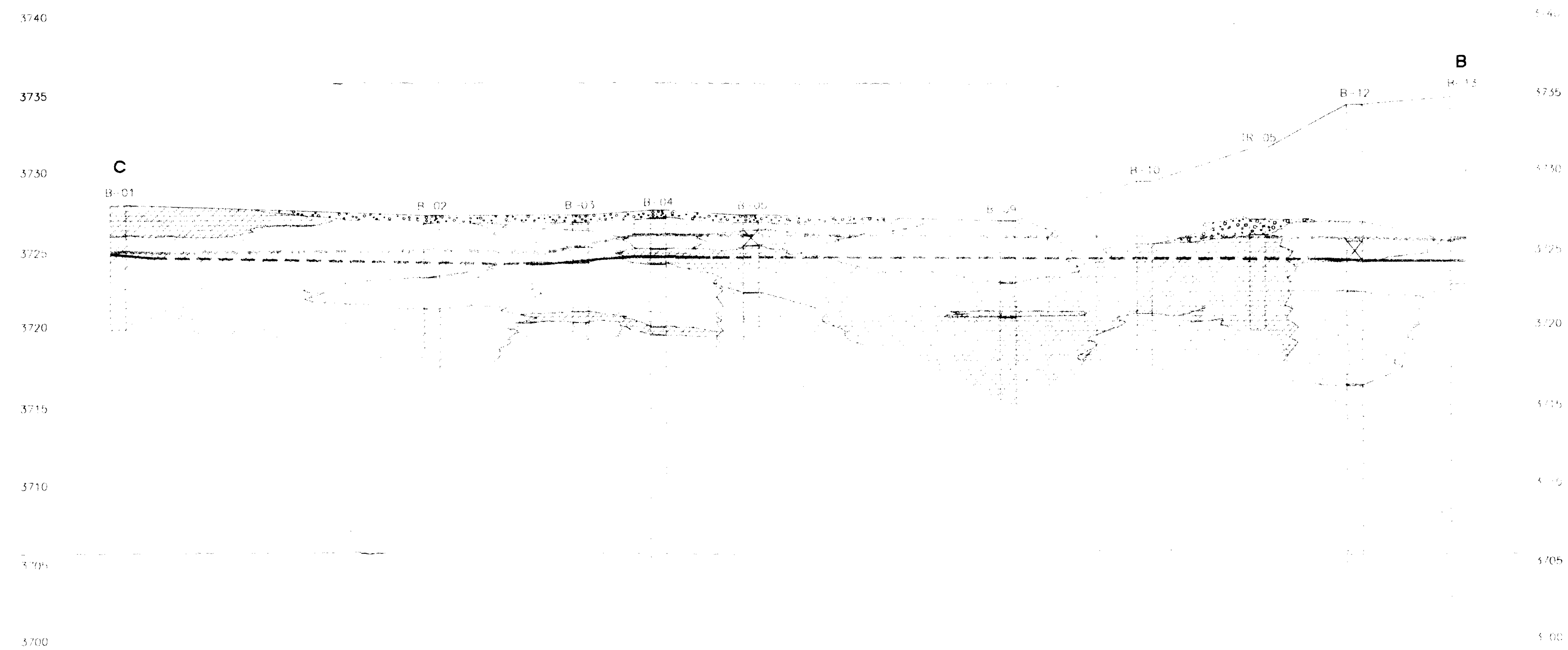
PLATE B
TRANSVERSE CROSS-SECTIONS
(1 of 2) FOR LITHOLOGIC DESCRIPTION
FORMER BRICKLAND REFINERY SITE

CLIENT: REXENE	
DATE: 10/26/94	REV. NO.: 0
AUTHOR: B.A.S.	DRAWN BY: M.P.
CK'D BY: M.S./B.A.S.	FILE: TRVRS1.A.DWG







LEGEND

GRAVEL	GRAVELLY SILT
SANDY GRAVEL (GW)	SANDY SILT
SILTY GRAVEL (GW-GM)	CLAY (CL)
CLAYEY GRAVEL (GW-GC)	GRAVELLY CLAY (CL)
SAND	SANDY CLAY (CL)
GRAVELLY SAND (SW)	SILTY CLAY (CL)
SILTY SAND (SW-SM)	SILT (ML)
CLAYEY SAND (SW-SC)	NO RECOVERY, LOST SAMPLE

SMEAR ZONE (DASHED WHERE INFERRED) HIGHEST OBSERVED WATER TABLE LEVEL

(DASHED WHERE INFERRED) EARLIEST OBSERVED WATER TABLE LEVEL

80 4 200
100 60 20 100

VERTICAL SCALE
HORIZONTAL SCALE

RECEIVED
DEC 0 5 1994
OIL CONSERVATION DIV.
SANTA FE

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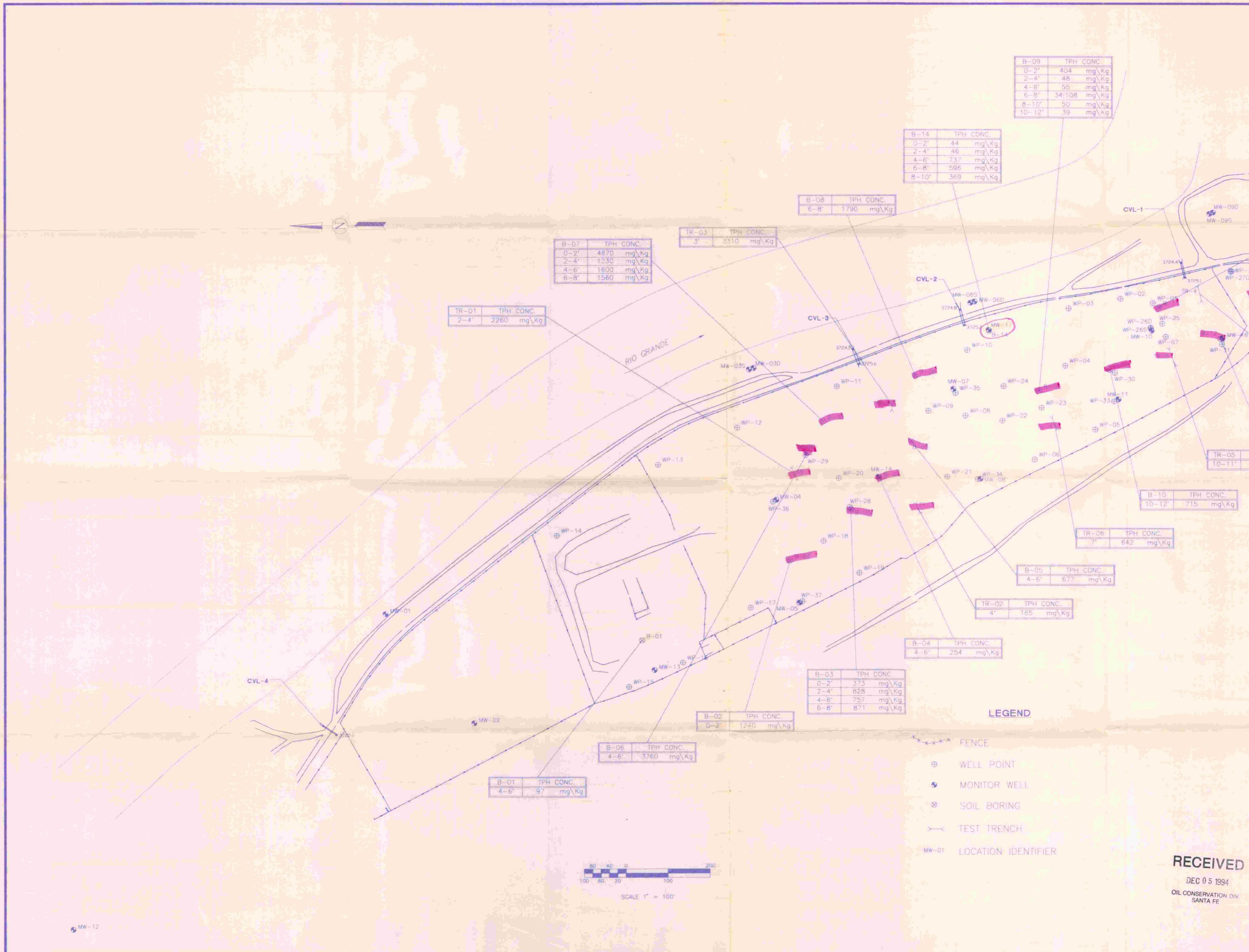
PLATE D
LONGITUDINAL CROSS-SECTION for LITHOLOGIC DESCRIPTION at the FORMER BRICKLAND REFINERY SITE

CLIENT: REXENE

DATE: 10/26/94	REV. NO: 0
AUTHOR: B.A.S.	DRAWN BY: M.P.
CK'D BY: M.S./B.A.S.	FILE: LNGTD1-A.DWG

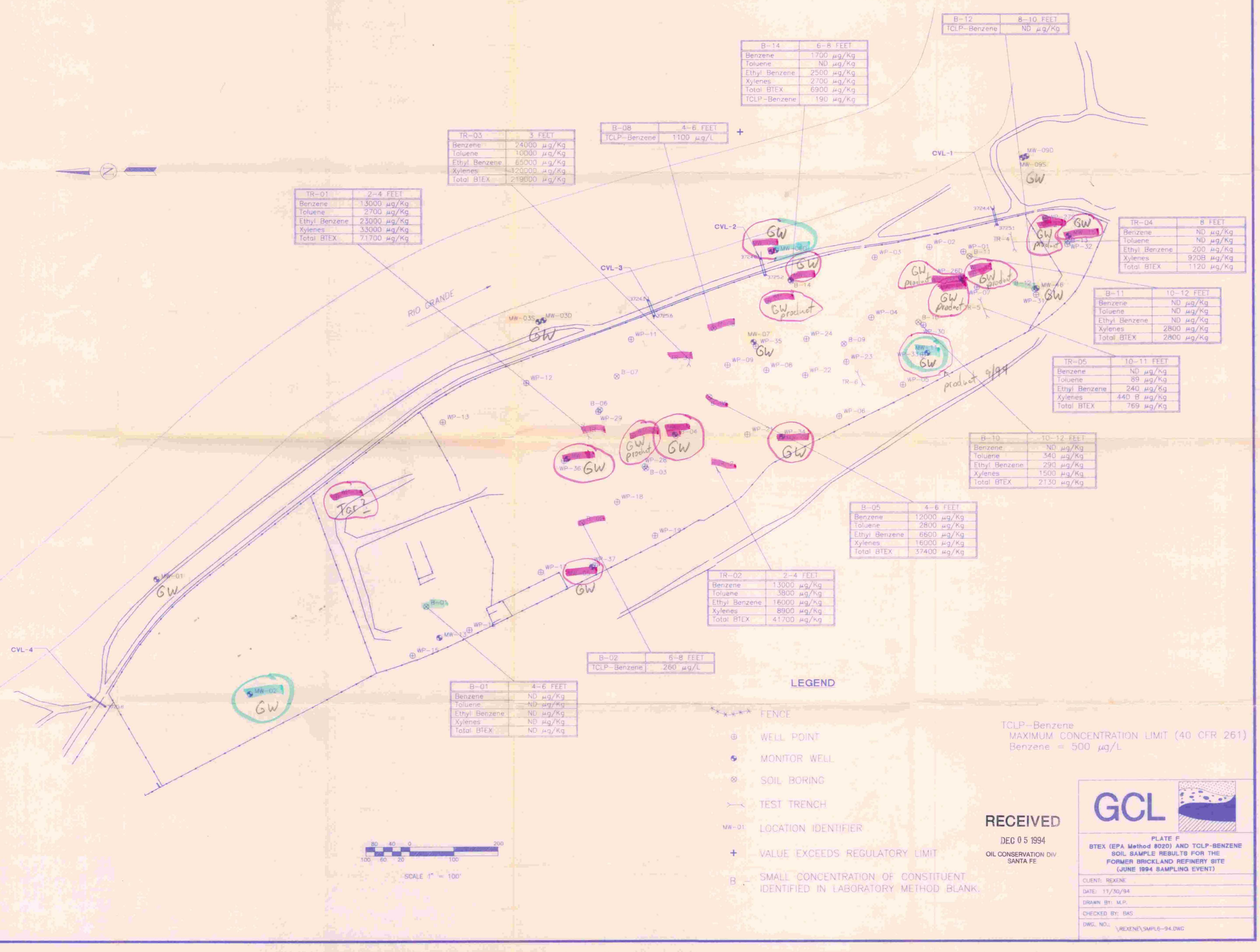


B-09 TPH CONC.
0-2' 404 mg\Kg
2-4' 48 mg\Kg
4-6' 55 mg\Kg
6-8' 34;108 mg\Kg
8-10' 50 mg\Kg
10-12' 39 mg\Kg
B-14 TPH CONC.
0-2' 44 mg\Kg
2-4' 46 mg\Kg
4-6' 737 mg\Kg
6-8' 596 mg\Kg
8-10' 369 mg\Kg
B-08 TPH CONC.
6-8' 1790 mg\Kg
TR-03 TPH CONC.
3' 3310 mg\Kg
B-07 TPH CONC.
0-2' 4870 mg\Kg
2-4' 1230 mg\Kg
4-6' 1600 mg\Kg
6-8' 1560 mg\Kg
TR-01 TPH CONC.
2-4' 2260 mg\Kg
B-11 TPH CONC.
10-12' 889 mg\Kg
B-13 TPH CONC.
10-12' 6150 mg\Kg
TR-04 TPH CONC.
8' 452 mg\Kg
B-12 TPH CONC.
10-12' 483 mg\Kg
12-14' 313 mg\Kg
TR-05 TPH CONC.
10-11' 414 mg\Kg
B-10 TPH CONC.
10-12' 715 mg\Kg
TR-06 TPH CONC.
7' 642 mg\Kg
B-05 TPH CONC.
4-6' 677 mg\Kg
TR-02 TPH CONC.
4' 165 mg\Kg
B-04 TPH CONC.
4-6' 254 mg\Kg
B-03 TPH CONC.
0-2' 373 mg\Kg
2-4' 828 mg\Kg
4-6' 757 mg\Kg
6-8' 871 mg\Kg
B-02 TPH CONC.
0-2' 1240 mg\Kg
B-06 TPH CONC.
4-6' 3760 mg\Kg
B-01 TPH CONC.
4-6' 97 mg\Kg
RIO GRANDE
CVL-1
CVL-2
CVL-3
CVL-4
MW-09D
MW-09S
MW-08S
MW-06D
MW-17
MW-03S
MW-03D
MW-07
MW-15
MW-16
MW-10
MW-11
MW-14
MW-04
MW-05
MW-13
MW-01
MW-02
MW-12
WP-02
WP-03
WP-04
WP-05
WP-06
WP-07
WP-08
WP-09
WP-10
WP-11
WP-12
WP-13
WP-14
WP-15
WP-17
WP-18
WP-20
WP-21
WP-22
WP-23
WP-24
WP-25
WP-26D
WP-26S
WP-27S
WP-27D
WP-28
WP-29
WP-30
WP-31
WP-32
WP-33
WP-35
WP-36
WP-37
B-01
LEGEND
FENCE
WELL POINT
MONITOR WELL
SOIL BORING
TEST TRENCH
MW-01 LOCATION IDENTIFIER
80 40 0 200
100 60 20 100
SCALE 1" = 100'

GCL

PLATE E
TOTAL PETROLEUM HYDROCARBON
(EPA Method 418.1)
SOIL SAMPLE RESULTS FOR THE
FORMER BRICKLAND REFINERY SITE
(JUNE 1994 SAMPLING EVENT)

CLIENT: REXENE
DATE: 11/30/94
DRAWN BY: M.P.
CHECKED BY: BAS
DWG. NO.: \REXENE\SMPL6-94.DWG



TR-01	2-4 FEET
Benzene	13000 µg/Kg
Toluene	2700 µg/Kg
Ethyl Benzene	23000 µg/Kg
Xylenes	33000 µg/Kg
Total BTEX	71700 µg/Kg

TR-03	3 FEET
Benzene	24000 µg/Kg
Toluene	10000 µg/Kg
Ethyl Benzene	65000 µg/Kg
Xylenes	120000 µg/Kg
Total BTEX	219000 µg/Kg

B-08	4-6 FEET
TCLP-Benzene	1100 µg/L

B-14	6-8 FEET
Benzene	1700 µg/Kg
Toluene	ND µg/Kg
Ethyl Benzene	2500 µg/Kg
Xylenes	2700 µg/Kg
Total BTEX	6900 µg/Kg
TCLP-Benzene	190 µg/Kg

B-12	8-10 FEET
TCLP-Benzene	ND µg/Kg

TR-04	8 FEET
Benzene	ND µg/Kg
Toluene	ND µg/Kg
Ethyl Benzene	200 µg/Kg
Xylenes	920B µg/Kg
Total BTEX	1120 µg/Kg

B-11	10-12 FEET
Benzene	ND µg/Kg
Toluene	ND µg/Kg
Ethyl Benzene	ND µg/Kg
Xylenes	2800 µg/Kg
Total BTEX	2800 µg/Kg

TR-05	10-11 FEET
Benzene	ND µg/Kg
Toluene	89 µg/Kg
Ethyl Benzene	240 µg/Kg
Xylenes	440 B µg/Kg
Total BTEX	769 µg/Kg

B-10	10-12 FEET
Benzene	ND µg/Kg
Toluene	340 µg/Kg
Ethyl Benzene	290 µg/Kg
Xylenes	1500 µg/Kg
Total BTEX	2130 µg/Kg

B-05	4-6 FEET
Benzene	12000 µg/Kg
Toluene	2800 µg/Kg
Ethyl Benzene	6600 µg/Kg
Xylenes	16000 µg/Kg
Total BTEX	37400 µg/Kg

TR-02	2-4 FEET
Benzene	13000 µg/Kg
Toluene	3800 µg/Kg
Ethyl Benzene	16000 µg/Kg
Xylenes	8900 µg/Kg
Total BTEX	41700 µg/Kg

B-02	6-8 FEET
TCLP-Benzene	260 µg/L

B-01	4-6 FEET
Benzene	ND µg/Kg
Toluene	ND µg/Kg
Ethyl Benzene	ND µg/Kg
Xylenes	ND µg/Kg
Total BTEX	ND µg/Kg

LEGEND

- FENCE
- WELL POINT
- MONITOR WELL
- SOIL BORING
- TEST TRENCH
- MW-01 LOCATION IDENTIFIER
- \+ VALUE EXCEEDS REGULATORY LIMIT
- B SMALL CONCENTRATION OF CONSTITUENT IDENTIFIED IN LABORATORY METHOD BLANK.

TCLP-Benzene
MAXIMUM CONCENTRATION LIMIT (40 CFR 261)
Benzene = 500 µg/L

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PLATE F
BTEX (EPA Method 8020) AND TCLP-BENZENE
SOIL SAMPLE RESULTS FOR THE
FORMER BRICKLAND REFINERY SITE
(JUNE 1994 SAMPLING EVENT)

CLIENT: REXENE
DATE: 11/30/94
DRAWN BY: M.P.
CHECKED BY: BAS
DWG. NO.: \REXENE\SMPL6-94.DWG

TR-03	10-11 FEET	
PYRENE	1600	µg/Kg
TOTAL PAH(s)	1600	µg/Kg

B-14	6-8 FEET	
1-METHYLNAPTHALENE	7200	µg/Kg
2-METHYLNAPTHALENE	7800	µg/Kg
NAPTHALENE	2100	µg/Kg
TOTAL PAH(s)	8100	µg/Kg

TR-03	3 FEET	
1-METHYLNAPTHALENE	7700;7100	µg/Kg
2-METHYLNAPTHALENE	11000;10000	µg/Kg
NAPTHALENE	5600;4400	µg/Kg
TOTAL PAH(s)	24,300;21,500	µg/Kg

TR-01	2-4 FEET	
1-METHYLNAPTHALENE	1800	µg/Kg
2-METHYLNAPTHALENE	3000	µg/Kg
NAPTHALENE	2400	µg/Kg
TOTAL PAH(s)	7200	µg/Kg

TR-04	8 FEET	
1-METHYLNAPTHALENE	5300	µg/Kg
PYRENE	1700	µg/Kg
TOTAL PAH(s)	7000	µg/Kg

B-11	8-10 FEET	
1-METHYLNAPTHALENE	79000	µg/Kg
2-METHYLNAPTHALENE	160000	µg/Kg
NAPTHALENE	51000	µg/Kg
TOTAL PAH(s)	290,000	µg/Kg

B-10	10-12 FEET	
1-METHYLNAPTHALENE	4700	µg/Kg
2-METHYLNAPTHALENE	3000	µg/Kg
PHENANTHRENE	2300	µg/Kg
TOTAL PAH(s)	10,000	µg/Kg

B-05	4-6 FEET	
1-METHYLNAPTHALENE	3700;8600	µg/Kg
2-METHYLNAPTHALENE	6000;13000	µg/Kg
NAPTHALENE	1800;5300	µg/Kg
TOTAL PAH(s)	11,500;26,900	µg/Kg

TR-02	4-6 FEET	
1-METHYLNAPTHALENE	12000	µg/Kg
2-METHYLNAPTHALENE	12000	µg/Kg
TOTAL PAH(s)	24,000	µg/Kg

B-01	4-6 FEET	
PAH(s)	ND	µg/Kg
TOTAL PAH(s)	ND	µg/Kg

GW above WQCC

GW above WQCC (napthalene phenol)

GW above WQCC (Phenol)

RIO GRANDE

CVL-1 CVL-2 CVL-3 CVL-4

MW-01 MW-02 MW-03S MW-03D MW-04 MW-05S MW-05D MW-06S MW-06D MW-07 MW-08 MW-09S MW-09D MW-10 MW-11 MW-12 MW-13 MW-14 MW-15 MW-16 MW-17

B-01 B-02 B-03 B-04 B-05 B-06 B-07 B-08 B-09 B-10 B-11 B-12 B-13

WP-01 WP-02 WP-03 WP-04 WP-05 WP-06 WP-07 WP-08 WP-09 WP-10 WP-11 WP-12 WP-13 WP-14 WP-15 WP-16 WP-17 WP-18 WP-19 WP-20 WP-21 WP-22 WP-23 WP-24 WP-25 WP-26D WP-26S WP-27D WP-27S WP-28 WP-29 WP-30 WP-31 WP-32 WP-33 WP-34 WP-35 WP-36 WP-37

TR-1 TR-2 TR-3 TR-4 TR-5 TR-6

LEGEND

- FENCE
- WELL POINT
- MONITOR WELL
- SOIL BORING
- TEST TRENCH
- LOCATION IDENTIFIER

ANALYTE LIST

Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(b)flouranthene
Benzo(k)flouranthene
Benzo(ghi)perylene
Benzo(a)pyrene
Chrysene
Dibenzo(a,h)anthracene
Flouranthene
Fluorene
Indeno(1,2,3-cd)pyrene
1-Methylnaphthalene
2-Methylnaphthalene
Naphthalene
Phenanthrene
Pyrene

80 40 0 200
100 60 20 100
SCALE 1" = 100'

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PLATE G
POLYAROMATIC HYDROCARBON (EPA Method 8270)
SOIL SAMPLE RESULTS
FOR THE
FORMER BROWNFIELD REFINERY SITE
(JUNE 1994 SAMPLING EVENT)

CLIENT: REXENE
DATE: 11/4/94
DRAWN BY: M.P.
CHECKED BY: BAS
DWG. NO.: \REXENE\SMPL6-94.DWG

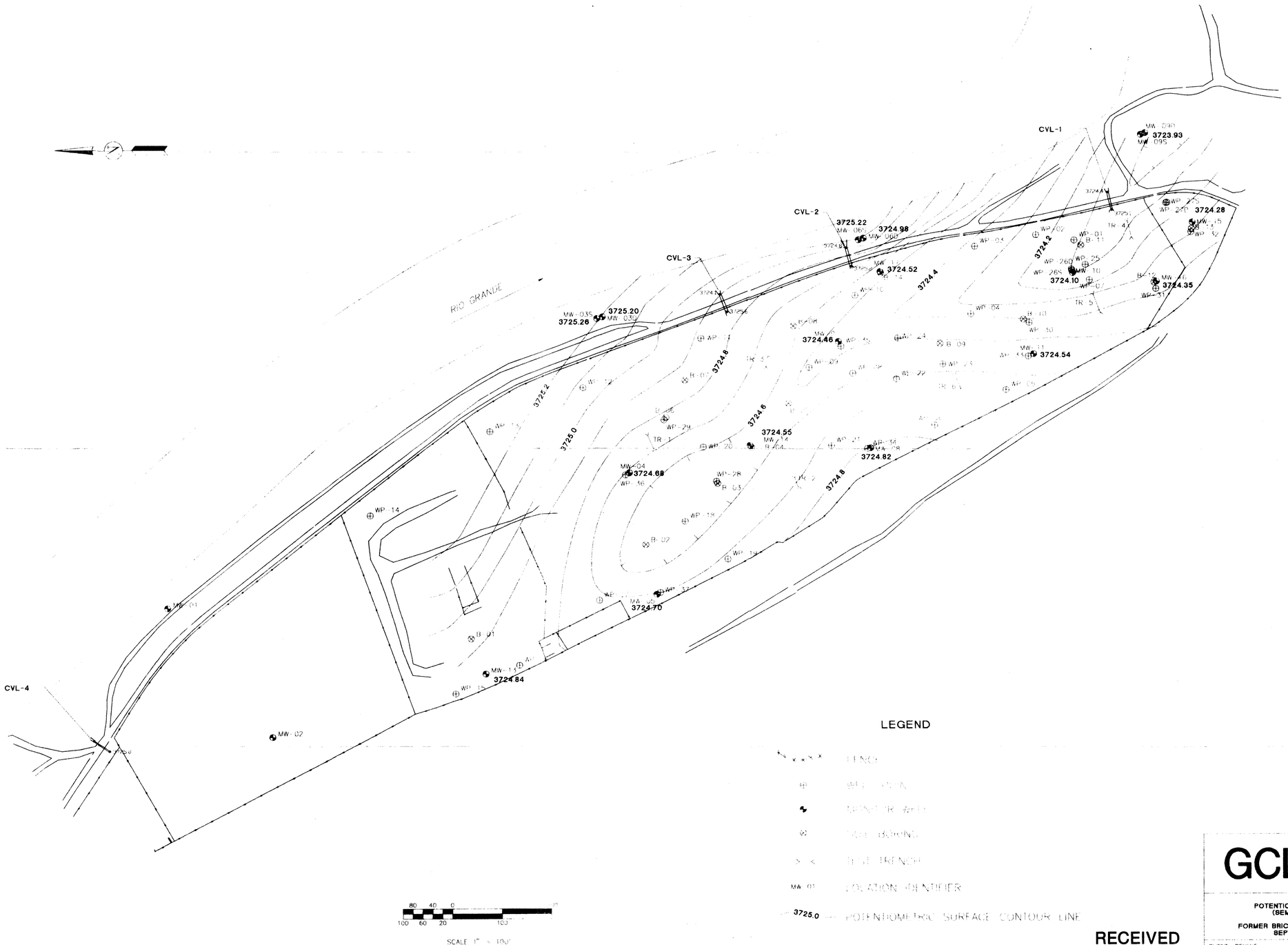

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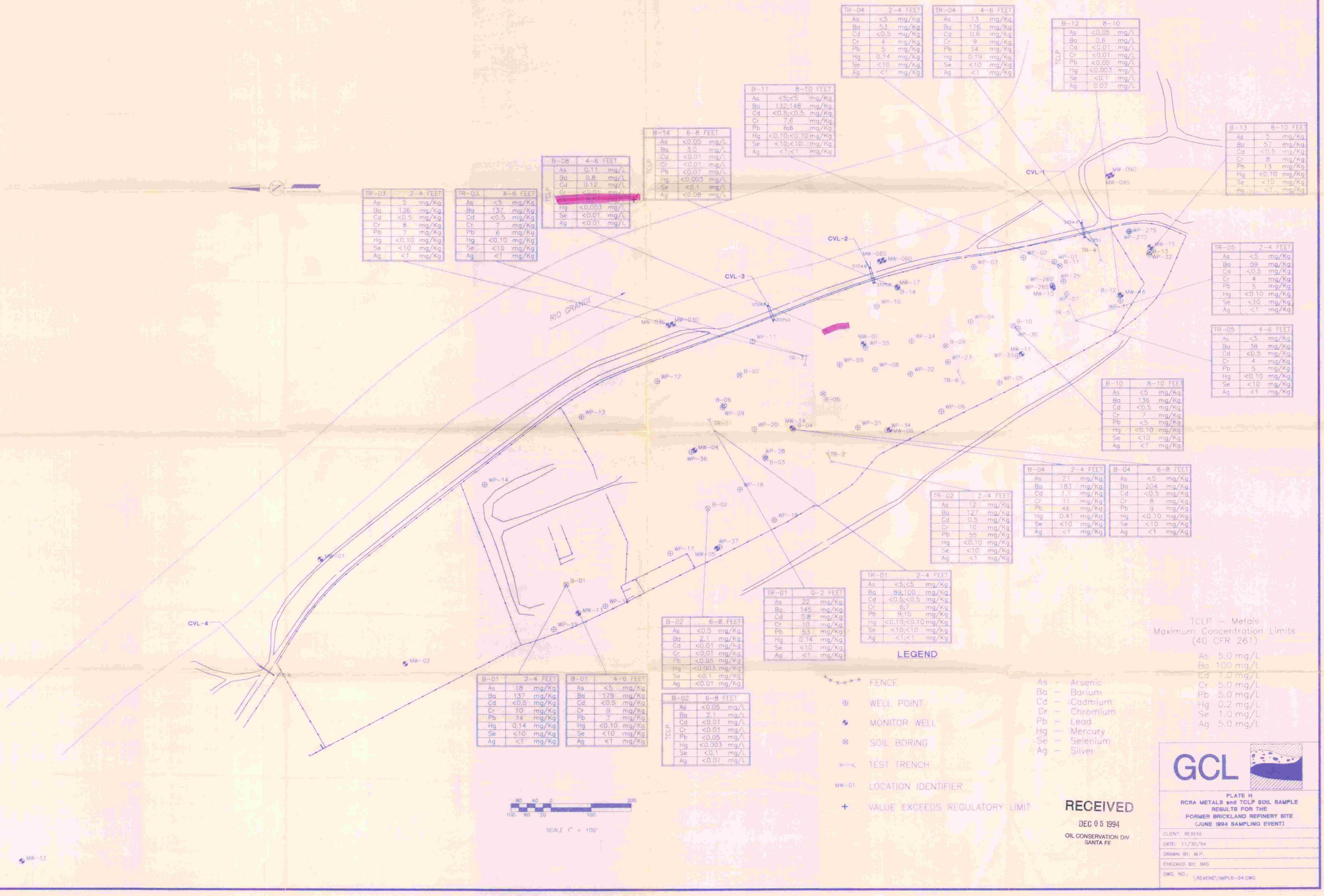
PLATE J
POTENTIOMETRIC SURFACE
(SEMI-CONFINED)
AQUIFER
FORMER BRICKLAND REFINERY SITE
SEPTEMBER 1994

CLIENT: REXENE
DATE: 11/4/94
DRAWN BY: M.P.
CHECKED BY: B.L.S.
DWG. NO.: \REXENE\PTNTMTRC.DWG



TR-03	2-4 FEET
As	5 mg/Kg
Ba	136 mg/Kg
Cd	<0.5 mg/Kg
Cr	8 mg/Kg
Pb	7 mg/Kg
Hg	<0.10 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

TR-03	4-6 FEET
As	<5 mg/Kg
Ba	137 mg/Kg
Cd	<0.5 mg/Kg
Cr	7 mg/Kg
Pb	6 mg/Kg
Hg	<0.10 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

B-08	4-6 FEET
TCLP As	0.11 mg/L
Ba	0.8 mg/L
Cd	0.12 mg/L
Cr	<0.01 mg/L
Pb	[redacted]
Hg	<0.003 mg/L
Se	<0.01 mg/L
Ag	<0.01 mg/L

B-14	6-8 FEET
TCLP As	<0.05 mg/L
Ba	3.0 mg/L
Cd	<0.01 mg/L
Cr	<0.01 mg/L
Pb	<0.07 mg/L
Hg	<0.003 mg/L
Se	<0.1 mg/L
Ag	<0.08 mg/L

TR-04	2-4 FEET
As	<5 mg/Kg
Ba	53 mg/Kg
Cd	<0.5 mg/Kg
Cr	4 mg/Kg
Pb	5 mg/Kg
Hg	0.14 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

TR-04	4-6 FEET
As	13 mg/Kg
Ba	176 mg/Kg
Cd	0.6 mg/Kg
Cr	9 mg/Kg
Pb	14 mg/Kg
Hg	0.19 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

B-11	8-10 FEET
As	<5;<5 mg/Kg
Ba	132;148 mg/Kg
Cd	<0.5;<0.5 mg/Kg
Cr	7.6 mg/Kg
Pb	6;6 mg/Kg
Hg	<0.10;<0.10 mg/Kg
Se	<10;<10 mg/Kg
Ag	<1;<1 mg/Kg

B-12	8-10
TCLP As	≤0.05 mg/L
Ba	0.6 mg/L
Cd	<0.01 mg/L
Cr	<0.01 mg/L
Pb	<0.05 mg/L
Hg	<0.003 mg/L
Se	<0.1 mg/L
Ag	0.02 mg/L

B-13	8-10 FEET
As	5 mg/Kg
Ba	57 mg/Kg
Cd	<0.5 mg/Kg
Cr	8 mg/Kg
Pb	13 mg/Kg
Hg	<0.10 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

TR-05	2-4 FEET
As	<5 mg/Kg
Ba	59 mg/Kg
Cd	<0.5 mg/Kg
Cr	4 mg/Kg
Pb	5 mg/Kg
Hg	<0.10 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

TR-05	4-6 FEET
As	<5 mg/Kg
Ba	38 mg/Kg
Cd	<0.5 mg/Kg
Cr	4 mg/Kg
Pb	5 mg/Kg
Hg	<0.10 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

B-10	8-10 FEET
As	<5 mg/Kg
Ba	136 mg/Kg
Cd	<0.5 mg/Kg
Cr	7 mg/Kg
Pb	<5 mg/Kg
Hg	<0.10 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

B-04	2-4 FEET
As	21 mg/Kg
Ba	183 mg/Kg
Cd	1.1 mg/Kg
Cr	11 mg/Kg
Pb	46 mg/Kg
Hg	0.41 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

B-04	6-8 FEET
As	<5 mg/Kg
Ba	204 mg/Kg
Cd	<0.5 mg/Kg
Cr	8 mg/Kg
Pb	9 mg/Kg
Hg	<0.10 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

TR-02	2-4 FEET
As	12 mg/Kg
Ba	127 mg/Kg
Cd	0.5 mg/Kg
Cr	10 mg/Kg
Pb	55 mg/Kg
Hg	<0.10 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

TR-01	0-2 FEET
As	22 mg/Kg
Ba	145 mg/Kg
Cd	0.8 mg/Kg
Cr	10 mg/Kg
Pb	53 mg/Kg
Hg	0.14 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

TR-01	2-4 FEET
As	<5;<5 mg/Kg
Ba	89;100 mg/Kg
Cd	<0.5;<0.5 mg/Kg
Cr	6;7 mg/Kg
Pb	9;10 mg/Kg
Hg	<0.10;<0.10 mg/Kg
Se	<10;<10 mg/Kg
Ag	<1;<1 mg/Kg

B-02	6-8 FEET
As	<0.5 mg/Kg
Ba	2.1 mg/Kg
Cd	<0.01 mg/Kg
Cr	<0.01 mg/Kg
Pb	<0.05 mg/Kg
Hg	<0.003 mg/Kg
Se	<0.1 mg/Kg
Ag	<0.01 mg/Kg

B-02	6-8 FEET
TCLP As	<0.05 mg/L
Ba	2.1 mg/L
Cd	<0.01 mg/L
Cr	<0.01 mg/L
Pb	<0.05 mg/L
Hg	<0.003 mg/L
Se	<0.1 mg/L
Ag	<0.01 mg/L

B-01	2-4 FEET
As	18 mg/Kg
Ba	137 mg/Kg
Cd	<0.5 mg/Kg
Cr	10 mg/Kg
Pb	74 mg/Kg
Hg	0.14 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

B-01	4-6 FEET
As	<5 mg/Kg
Ba	129 mg/Kg
Cd	<0.5 mg/Kg
Cr	9 mg/Kg
Pb	7 mg/Kg
Hg	<0.10 mg/Kg
Se	<10 mg/Kg
Ag	<1 mg/Kg

LEGEND

- FENCE
- WELL POINT
- MONITOR WELL
- SOIL BORING
- TEST TRENCH
- MW-01 LOCATION IDENTIFIER
- \+ VALUE EXCEEDS REGULATORY LIMIT

TCLP - Metals
Maximum Concentration Limits
(40 CFR 261)

As	5.0 mg/L
Ba	100 mg/L
Cd	1.0 mg/L
Cr	5.0 mg/L
Pb	5.0 mg/L
Hg	0.2 mg/L
Se	1.0 mg/L
Ag	5.0 mg/L

As - Arsenic
Ba - Barium
Cd - Cadmium
Cr - Chromium
Pb - Lead
Hg - Mercury
Se - Selenium
Ag - Silver

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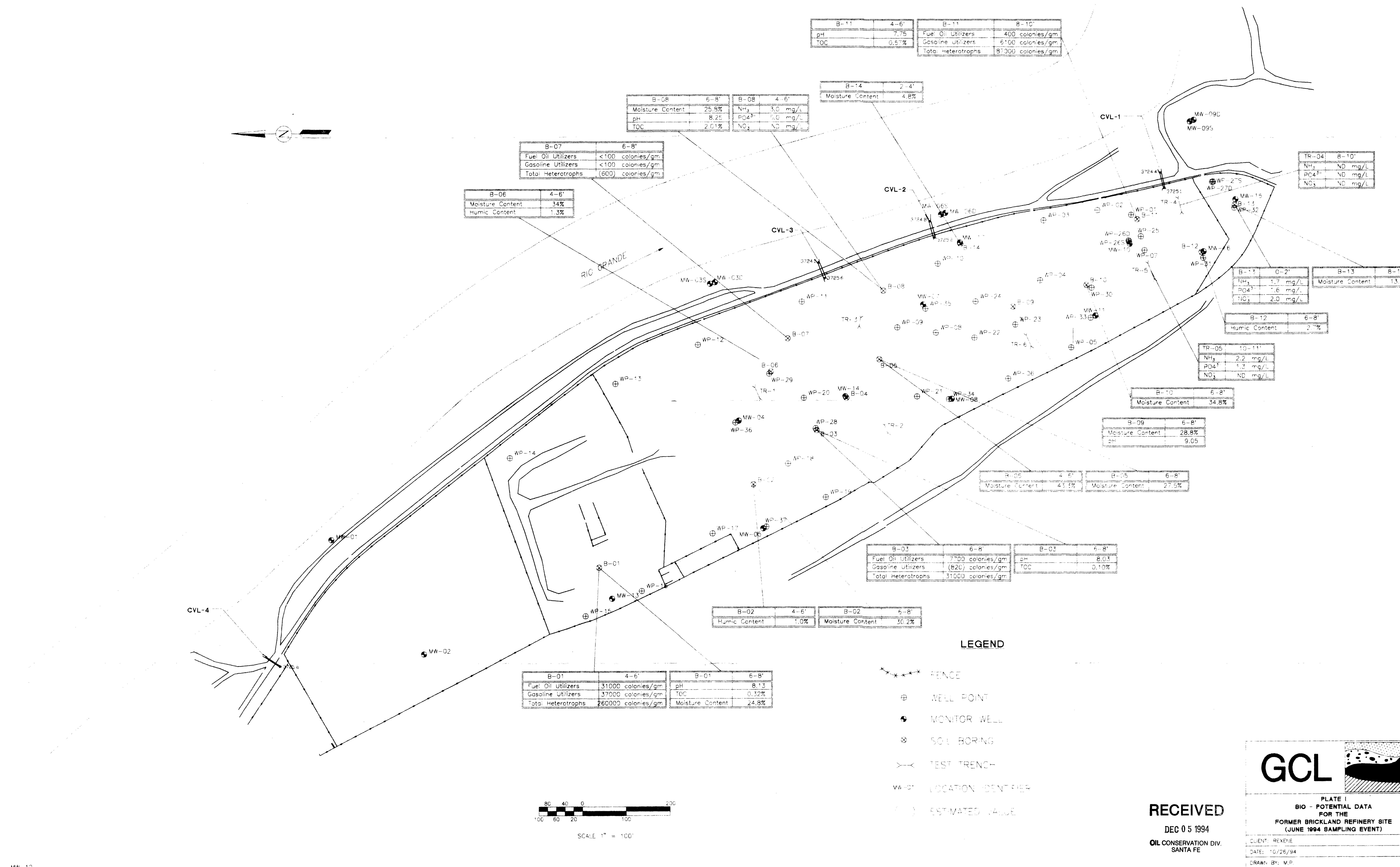
PLATE H
RCRA METALS and TCLP SOIL SAMPLE
RESULTS FOR THE
FORMER BRICKLAND REFINERY SITE
(JUNE 1994 SAMPLING EVENT)

CLIENT: REXENE
DATE: 11/30/94
DRAWN BY: M.P.
CHECKED BY: BAS
DWG. NO.: \REXENE\SMPL6-94.DWG



B-11	4-6'
pH	7.75
TOC	0.57%

B-11	8-10'
Fuel Oil Utilizers	400 colonies/gm
Gasoline Utilizers	6100 colonies/gm
Total Heterotrophs	87000 colonies/gm

B-14	2-4'
Moisture Content	4.8%

B-08	6-8'
Moisture Content	25.8%
pH	8.25
TOC	2.01%

B-08	4-6'
NH_3	3.0 mg/L
$PO4^{3-}$	5.0 mg/L
NO_3^-	ND mg/L

B-07	6-8'
Fuel Oil Utilizers	<100 colonies/gm
Gasoline Utilizers	<100 colonies/gm
Total Heterotrophs	(600) colonies/gm

B-06	4-6'
Moisture Content	34%
Humic Content	1.3%

TR-04	8-10'
NH_3	ND mg/L
$PO4^{3-}$	ND mg/L
NO_3^-	ND mg/L

B-13	0-2'
NH_3	1.7 mg/L
$PO4^{3-}$	1.6 mg/L
NO_3^-	2.0 mg/L

B-13	8-10'
Moisture Content	13.7%

B-12	6-8'
Humic Content	2.7%

TR-05	10-11'
NH_3	2.2 mg/L
$PO4^{3-}$	1.3 mg/L
NO_3^-	ND mg/L

B-10	6-8'
Moisture Content	34.8%

B-09	6-8'
Moisture Content	28.8%
pH	9.05

B-05	4-6'
Moisture Content	43.3%

B-05	6-8'
Moisture Content	27.5%

B-03	6-8'
Fuel Oil Utilizers	7700 colonies/gm
Gasoline Utilizers	(820) colonies/gm
Total Heterotrophs	31000 colonies/gm

B-03	6-8'
pH	8.03
TOC	0.10%

B-02	4-6'
Humic Content	1.0%

B-02	6-8'
Moisture Content	30.2%

B-01	4-6'
Fuel Oil Utilizers	31000 colonies/gm
Gasoline Utilizers	37000 colonies/gm
Total Heterotrophs	260000 colonies/gm

B-01	6-8'
pH	8.13
TOC	0.32%
Moisture Content	24.8%

LEGEND

- FENCE
- WELL POINT
- MONITOR WELL
- SOIL BORING
- TEST TRENCH
- MW-01 LOCATION IDENTIFIER
- ( ) ESTIMATED VALUE

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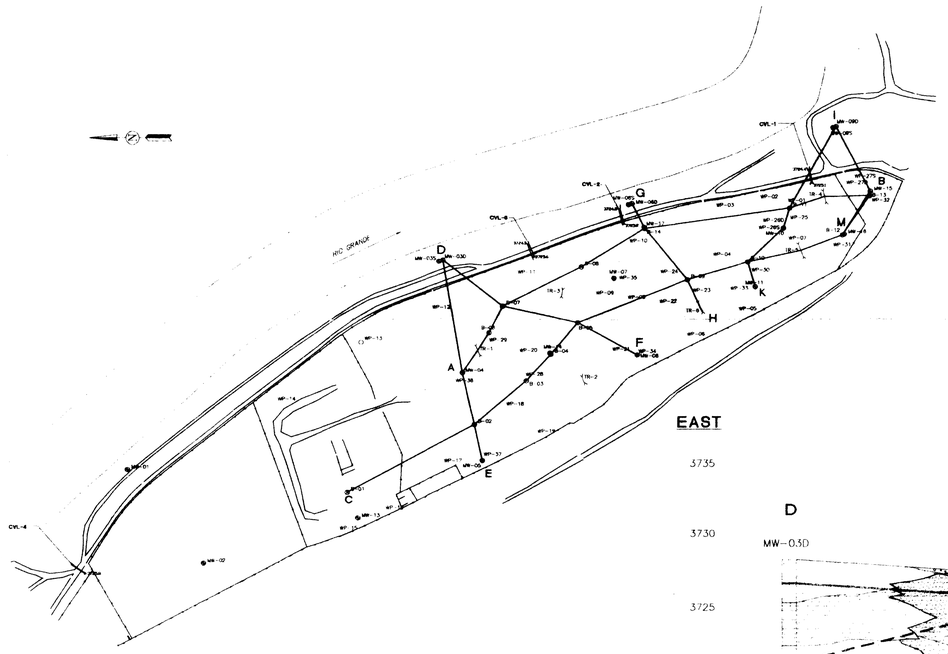
PLATE I
BIO - POTENTIAL DATA FOR THE FORMER BRICKLAND REFINERY SITE (JUNE 1994 SAMPLING EVENT)

CLIENT: REXENE
DATE: 10/26/94
DRAWN BY: M.P.
CHECKED BY: BAS
DWG. NO.: \REXENE\SMPL6-94.DWG



LEGEND

GRAVEL	GRAVELLY SILT
SANDY GRAVEL (GW)	SANDY SILT
SILTY GRAVEL (GW-GM)	CLAY (CL)
CLAYEY GRAVEL (GW-GC)	GRAVELLY CLAY (CL)
SAND	SANDY CLAY (CL)
GRAVELLY SAND (SW)	SILTY CLAY (CL)
SILTY SAND (SW-SM)	SILT (ML)
CLAYEY SAND (SW-SC)	NO RECOVERY, LOST SAMPLE

SMEAR ZONE (DASHED WHERE INFERRED)
HIGHEST OBSERVED WATER TABLE LEVEL

SMEAR ZONE (DASHED WHERE INFERRED)
LOWEST OBSERVED WATER TABLE LEVEL

ZONE OF HYDROCARBON CONTAMINATION ESTIMATED TO BE > 100 mg/Kg

ZONE OF HYDROCARBON CONTAMINATION ESTIMATED TO BE < 100 mg/Kg

80 40 0 200
100 60 20 100

VERTICAL SCALE : 1" = 5'
HORIZONTAL SCALE : 1" = 100'

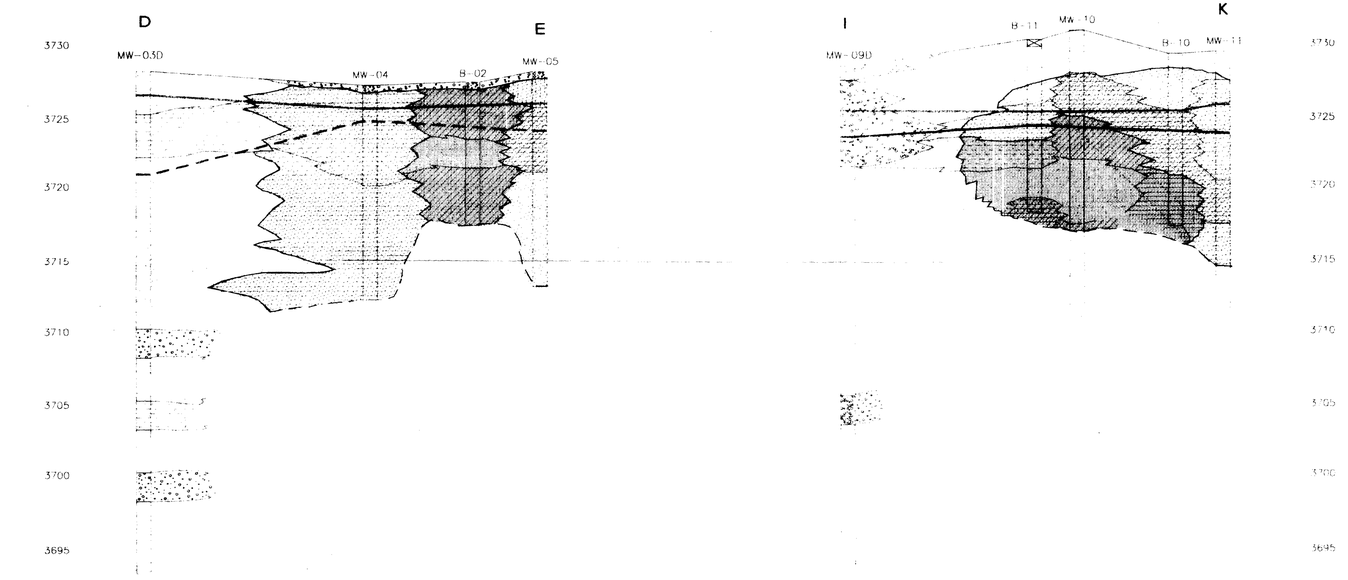


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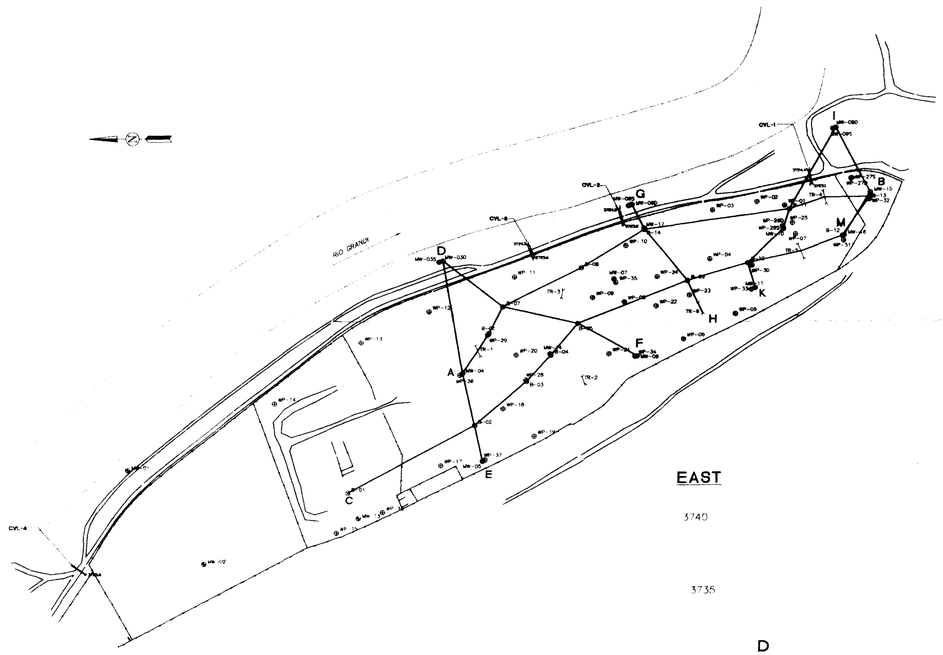
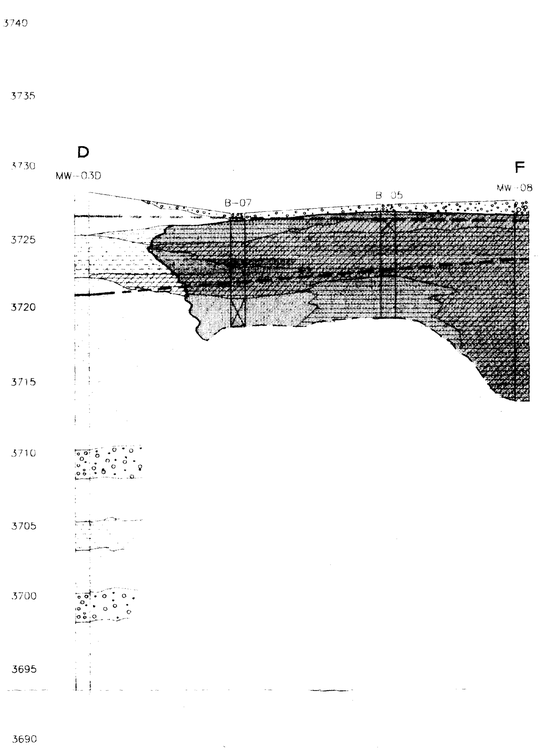
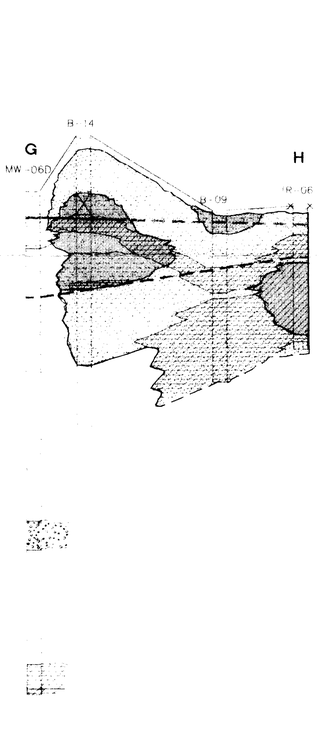
PLATE K
ESTIMATE of PETROLEUM HYDROCARBON CONTAMINATED SOILS at the FORMER BRICKLAND REFINERY (TRANSVERSE CROSS-SECTIONS (1 of 2))

CLIENT: REXENE	
DATE: 10/26/94	REV. NO.: 0
AUTHOR: B.A.S.	DRAWN BY: M.P.
CK'D BY: M.S./B.A.S.	FILE: TRVRS1-A.DWG

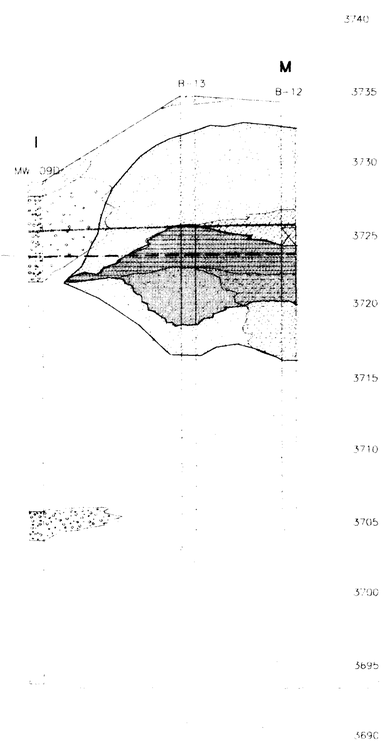


EAST





WEST



LEGEND

GRAVEL	GRAVELLY SILT
SANDY GRAVEL (GW)	SANDY SILT
SILTY GRAVEL (GW-GM)	CLAY (CL)
CLAYEY GRAVEL (GW-GC)	GRAVELLY CLAY (CL)
SAND	SANDY CLAY (CL)
GRAVELLY SAND (SW)	SILTY CLAY (CL)
SILTY SAND (SW-SM)	SILT (ML)
CLAYEY SAND (SW-SC)	NO RECOVERY, LOST SAMPLE

SMEAR ZONE (DASHED WHERE INFERRED)
HIGHEST OBSERVED WATER TABLE LEVEL

SMEAR ZONE (DASHED WHERE INFERRED)
LOWEST OBSERVED WATER TABLE LEVEL

ZONE OF HYDROCARBON CONTAMINATION ESTIMATED TO BE > 100 mg/Kg

ZONE OF HYDROCARBON CONTAMINATION ESTIMATED TO BE < 100 mg/Kg

80 40 0 200
100 60 20 100

VERTICAL SCALE : 1" = 5'
HORIZONTAL SCALE : 1" = 100'

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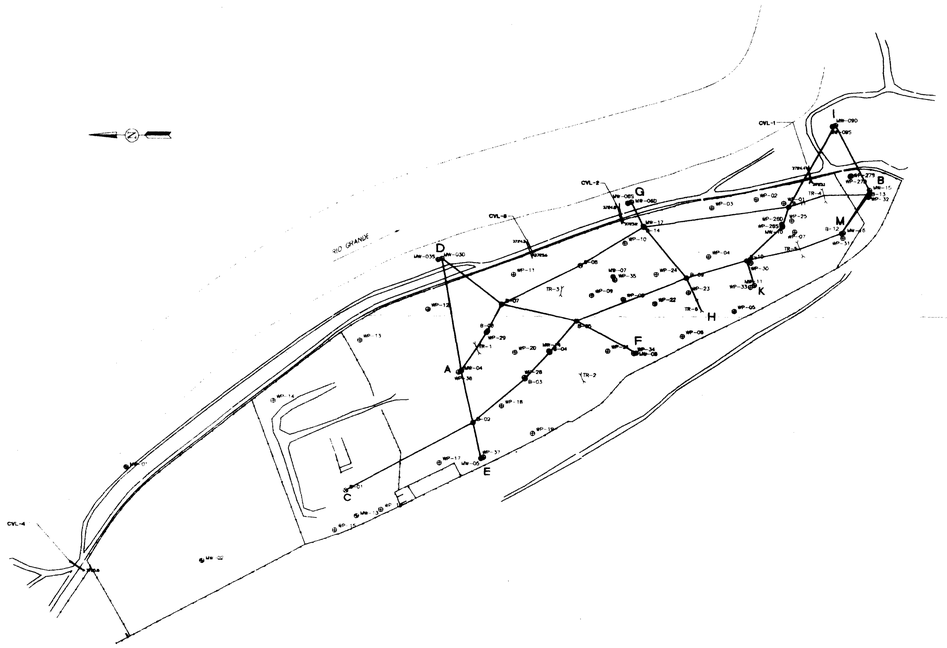
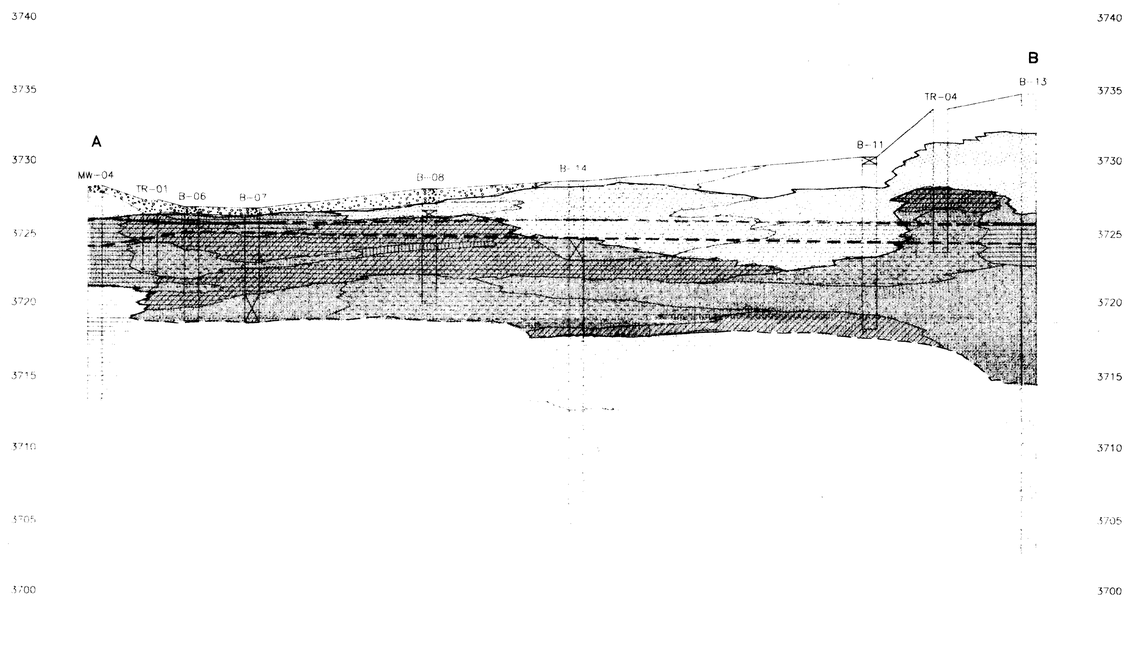
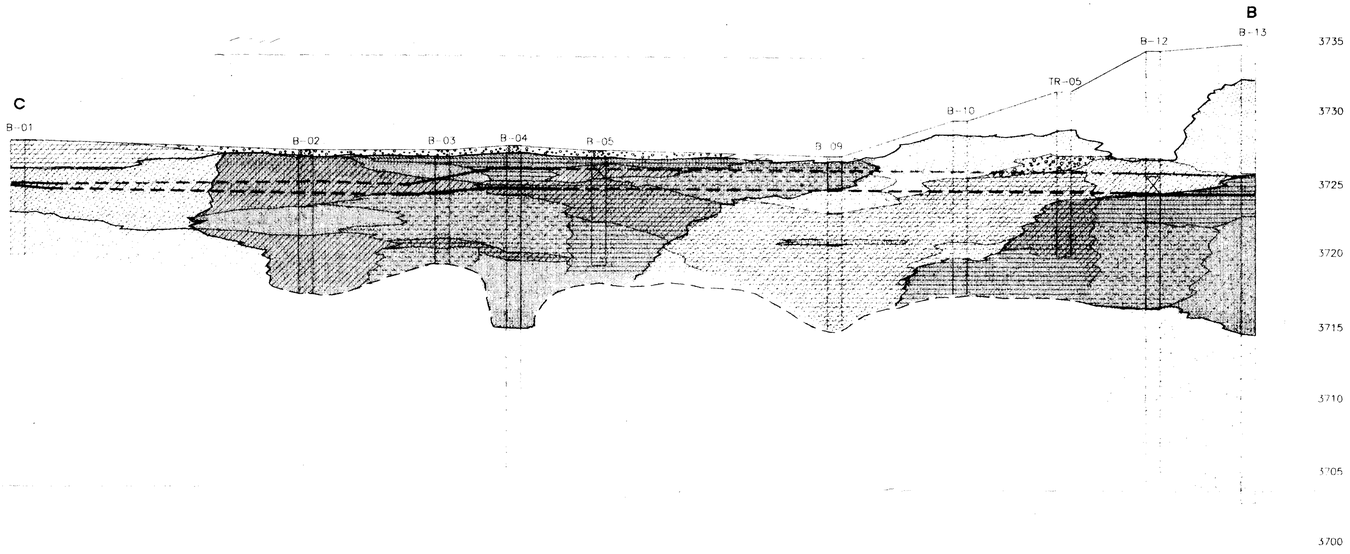
PLATE 2
ESTIMATE of PETROLEUM HYDROCARBON CONTAMINATED SOILS at the FORMER BRICKLAND REFINERY (TRAVERSE CROSS-SECTIONS (2 of 2))

CLIENT: REXENE	
DATE: 10/26/94	REV. NO.: 0
AUTHOR: B.A.S.	DRAWN BY: M.P.
CK'D BY: M.S./B.A.S.	FILE: TRVRS2-A.DWG







LEGEND

GRAVEL	GRAVELLY SILT
SANDY GRAVEL (GW)	SANDY SILT
SILTY GRAVEL (GW-GM)	CLAY (CL)
CLAYEY GRAVEL (GW-GC)	GRAVELLY CLAY (CL)
SAND	SANDY CLAY (CL)
GRAVELLY SAND (SW)	SILTY CLAY (CL)
SILTY SAND (SW-SM)	SILT (ML)
CLAYEY SAND (SW-SC)	NO RECOVERY, LOST SAMPLE

SMEAR ZONE (DASHED WHERE INFERRED)
HIGHEST OBSERVED WATER TABLE LEVEL

SMEAR ZONE (DASHED WHERE INFERRED)
LOWEST OBSERVED WATER TABLE LEVEL

ZONE OF HYDROCARBON CONTAMINATION ESTIMATED TO BE > 100 mg/Kg

ZONE OF HYDROCARBON CONTAMINATION ESTIMATED TO BE < 100 mg/Kg

80 40 0 200
100 60 20 100

VERTICAL SCALE : 1" = 5'
HORIZONTAL SCALE : 1" = 100'

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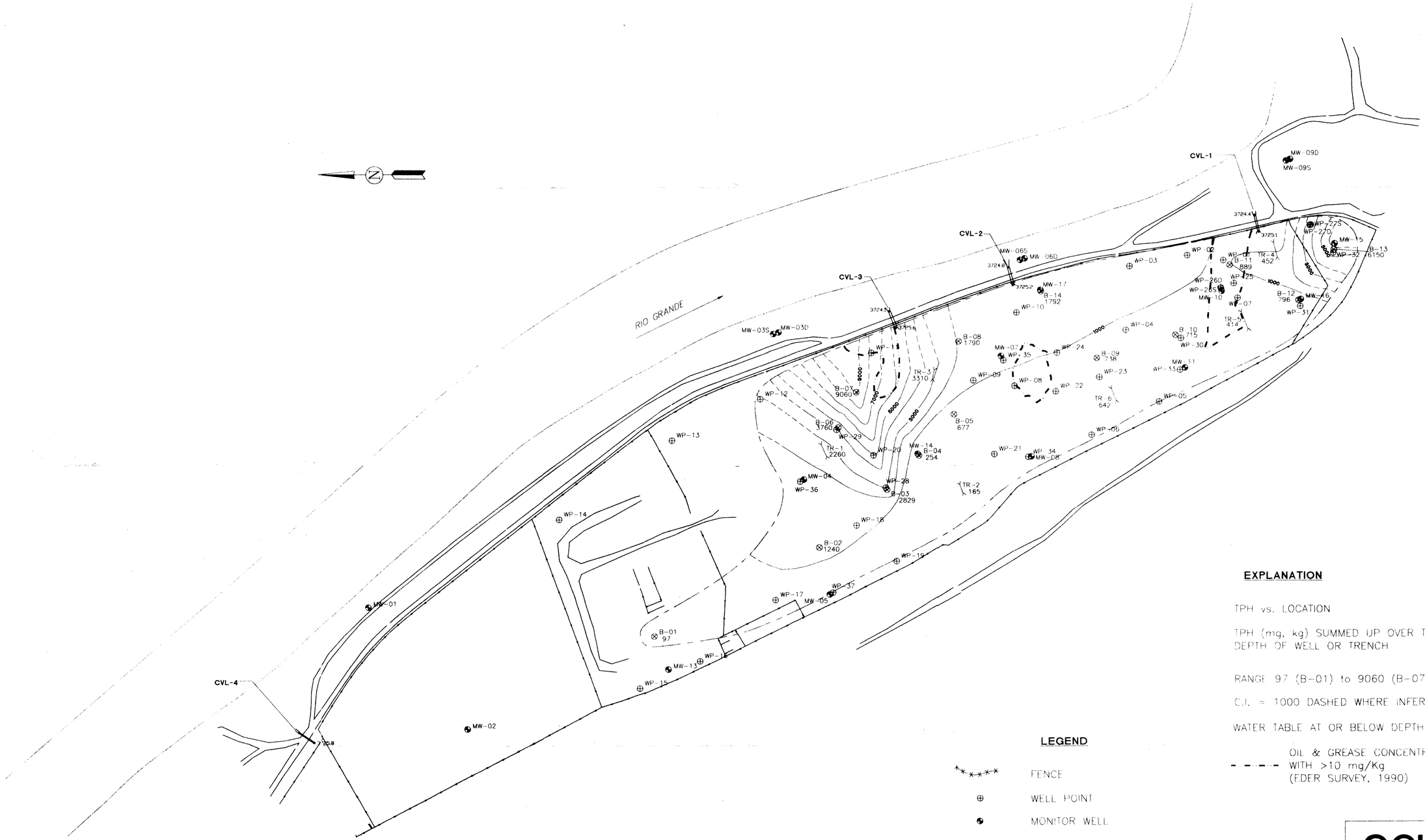
PLATE M
ESTIMATE of PETROLEUM HYDROCARBON CONTAMINATED SOILS at the FORMER BRICKLAND REFINERY (LONGITUDINAL CROSS-SECTIONS)

CLIENT: REXENE	
DATE: 10/26/94	REV. NO.: 0
AUTHOR: B.A.S.	DRAWN BY: M.P.
CK'D BY: M.S./B.A.S.	FILE: LNGTD1-A.DWG



LEGEND

- FENCE
- WELL POINT
- MONITOR WELL
- SOIL BORING
- TEST TRENCH
- MW-01 — LOCATION IDENTIFIER
- ESTIMATED ZONE OF HYDROCARBON CONTAMINATION

EXPLANATION

TPH vs. LOCATION

TPH (mg, kg) SUMMED UP OVER TOTAL DEPTH OF WELL OR TRENCH

RANGE 97 (B-01) to 9060 (B-07)

C.I. = 1000 DASHED WHERE INFERRED

WATER TABLE AT OR BELOW DEPTH OF SAMPLES

OIL & GREASE CONCENTRATION WITH >10 mg/Kg (EDER SURVEY, 1990)

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PLATE N
ESTIMATED AREAL EXTENT OF PETROLEUM HYDROCARBON CONTAMINATED SOILS AT THE FORMER BRICKLAND REFINERY SITE

CLIENT:	REXENE
DATE:	11/30/94
DRAWN BY:	M.P.
CHECKED BY:	BLS
DWG. NO.:	\REXENE\INVMAP.DWG