1R - 173

REPORTS

DATE:

5/12/1998

Safety & Environmental Solutions, Inc.

KOCH PIPELINE CO., L.P.
Crouch Station
Lea County, New Mexico

Groundwater Investigation Report

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 103
Hobbs, New Mexico 88240
(505) 397-0510

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Purpose

The purpose of this report is to present analytical results from soil and ground water samples collected during and after the installation of three (3) monitoring wells (monitoring wells #3, #4, and #5) at Koch Pipeline Company's Crouch Station located in Section 18 Township 18S Range 36E in Lea County, New Mexico (See Vicinity Map).

Background

This report is the result of the New Mexico Oil Conservation Division requiring Koch to further investigate the possibility of groundwater contamination at the Crouch Station site. As part of the investigation, the New Mexico Oil Conservation Division requested Koch to install two (2) monitoring wells at the site to determine the down-gradient extent of contamination. In addition to the two (2) down-gradient monitoring wells, Koch installed one up-gradient monitoring well (along the North-West property line) to determine background groundwater quality.

Well Location

Monitor well #3 was placed approximately 60' from the north fence line and 8' from the west fence line. Monitor well #4 was placed approximately 109' southeast of existing monitor well #2. Monitor well #5 was placed approximately 98' southwest of monitor well #4 and approximately 473' southeast of monitor well #3. (See Site plan and Engineering plat)

Method

Three additional monitor wells (monitoring wells #3, #4, and #5) were installed at the Crouch Station on May 1, and May 2, 1998. The physical description of the monitor well installations is as follows:

> The well will be drilled to a depth of ten (10) feet below the water table. Split spoon samples will be collected at ten (10) foot intervals and analyzed in the field for BTEX with a PID. All samples collected will be preserved. The sample with the highest field reading will be sent for third party testing for TPH and BTEX confirmation tests. A driller's log noting sample points and changes in lithology will be kept. (See Driller's Log) The well will be cased with 2" PVC pipe with a minimum of fifteen (15) feet of well screen on the bottom, five (5) feet above the water table and ten (10) feet below the water table. Screen will be gravel packed to a point 2-3 feet above the screen, with a bentonite plug set above the gravel pack. The remainder of the casing annulus to surface will be grouted with cement containing 5% bentonite. The well will be equipped with a locking well cap. (See Monitor Well Diagram)

The tops of casing for all wells were surveyed by John West Engineering of Hobbs, New Mexico. Mean sea level elevations were supplied by the survey. (See John West Engineering Company Elevations and Ties Plat). These elevations were used to compute the elevations of the top of water reflected on the Water Table Elevation Map.

Monitoring Parameters

Soil samples were collected using a split spoon sampler driven into the undisturbed soil through the hollow stem auger used to drill the monitor wells. The samples were placed in proper containers with no head space, preserved on ice and transported under chain of custody to the laboratory for analysis. The soil samples were analyzed for the Total Petroleum Hydrocarbon (TPH), and Benzene, Toulene, Ethyl Benzene, and Xylenes (BTEX) content. The monitor wells were developed by bailing 3 to 5 casing volumes of water prior to collecting the sample with a properly decontaminated bailer. The samples were placed in the appropriate container, preserved, and transported under chain of custody to the laboratory for analysis. The ground water samples were analyzed for BTEX, Polynuclear Aromatic Hydrocarbons (PAH), New Mexico Water Quality Control Commission (WQCC) metals, Major Cations & Anions, and Total Dissolved Solids (TDS). SW - 846 protocols were followed for all sample collection to insure the integrity of the sample.

The following table presents the results of the soil samples from each monitor well:

ANALYTES	MW # 3 20'	MW # 3 58'	MW #4 30'	MW #5 30'	MW # 5 57'-59'
Sample Date	4/30/98	4/30/98	5/1/98	5/1/98	5/1/98
TPH	<10	51700	75	65	19
BTEX					
Benzene	<0.002	0.057	<0.002	<0.002	<0.002
Toluene	<0.002	<0.002	<0.002	<0.002	<0.002
Ethyl Benzene	<0.002	<0.002	<0.002	<0.002	<0.002
Total Xylenes	<0.006	<0.006	<0.006	<0.006	<0.006

The bottom hole soil sample from monitor well # 3 (taken at a depth of 58') was analyzed for Total Petroleum Hydrocarbons (TPH) and BTEX. This depth is approximately the soil/water interface region. Results of the analysis show a TPH level of 51,700 ppm and a BTEX level of 0.057 ppm. The Oil Conservation Division clean up standard for soils this distance from groundwater is 100 ppm. The soil sample taken at 20' exhibited a TPH level of <10 ppm and BTEX levels under regulatory limits. ***These results may indicate that contaminated groundwater entered this area in the past and that hydrocarbons were deposited in the soils as the water level fluctuated over the years. The clean sample at 20' supports this hypothesis.***

Monitor well # 4 is a down-gradient well placed approximately 200' southeast of monitor well #2. ***The bottom hole soil sample for this well was too wet for analysis and the 30' sample showed a TPH level of 75 ppm and no BTEX. This TPH level is under the OCD cleanup standard for soil this distance from groundwater.***

The soil samples of monitor wells # 4 and # 5 did not exceed any regulatory limits for TPH or BTEX.

The following table presents the results of the initial analysis of the groundwater samples from monitor wells #1, #3, #4, and #5:

ANALYTES	MW # 1	MW # 3	MW #4	MW #5	WQCC Limits
Sample Date	4/30/98	5/1/98	5/1/98	5/1/98	
Polynuclear Aromatic Hydrocarbons					
Naphthalene	<0.001	<0.001	<0.001	<0.001	0.03
2-Methylnaphthalene	<0.002	<0.002	<0.002	<0.002	0.03
1-Methylnaphthalene	<0.002	<0.002	<0.002	<0.002	0.03
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	
Acenaphthene	<0.001	<0.001	<0.001	<0.001	
Fluorene	<0.001	<0.001	<0.001	<0.001	
Phenanthrene	<0.001	<0.001	<0.001	<0.001	
Anthracene	<0.001	<0.001	<0.001	<0.001	
Fluoranthene	<0.001	<0.001	<0.001	<0.001	
Pyrene	<0.001	<0.001	<0.001	<0.001	
Benzo(a)anthracene	<0.001	<0.001	<0.001	<0.001	
Chrysene	<0.001	<0.001	<0.001	<0.001	
Benzo(b)fluoranthene	<0.001	<0.001	<0.001	<0.001	
Benzo(k)fluoranthene	<0.001	<0.001	<0.001	<0.001	
Benzo(a)pyrene	<0.0007	<0.0007	<0.0007	<0.0007	0.0007
Indeno(1,2,3-cd)pyrene	<0.001	<0.001	<0.001	<0.001	
Dibenzo(a,h)anthracene	<0.001	<0.001	<0.001	<0.001	
Benzo(g,h,i)perylene	<0.001	<0.001	<0.001	<0.001	
Metals					
As	<0.01	<0.01	<0.01	<0.01	0.1
Ag	<0.05	<0.05	<0.05	<0.05	0.05
Ba	1.12	1.37	1.72	2.10	1.0
Cr	<0.05	<0.05	<0.05	0.083	0.05
Pb	<0.05	<0.05	<0.05	<0.05	0.05
Hg	<0.002	<0.002	<0.002	<0.002	0.002
Se	<0.01	<0.01	<0.01	<0.01	0.05

ANALYTES	MW # 1	MW # 3	MW #4	MW #5	WQCC Limits
Sample Date	4/30/98	5/1/98	5/1/98	5/1/98	
Major Cations & Anion					
Na	17	104	143	<1	
Ca	126	115	115	128	
Mg	20	81	42	63	
K	2.3	3.9	11.9	5.7	
Conductivity	1415	1245	1421	1257	
T-Alkalinity	225	420	168	140	
Cl^-	66	66	89	59	250
SO_4	113	398	507	349	600
CO_3	0	0	0	0	
HCO_3	275	420	168	171	
pH	6.68	7.15	7.57	7.67	
TDS	770	930	950	892	1000
BTEX					
Benzene	<0.002	<0.160	<0.007	<0.002	
Toluene	<0.002	<0.002	<0.002	<0.002	
Ethyl Benzene	<0.002	<0.002	<0.002	<0.002	
Total Xylenes	<0.006	<0.006	<0.006	<0.006	

Monitor well # 1, which was installed by Western Technologies, Inc. in October 1997, was sampled and analyzed for BTEX. Analytical results for BTEX were within the regulatory limits. This sample also exhibited a barium level of 1.12 ppm which is slightly greater than the WQCC limit

Monitor well #2, which was installed by Western Technologies, Inc. in October 1997, did not yield any data because the well takes in excess of 24 hours to recharge after well development.

Monitor well # 3 is the up-gradient well placed within 6' of the fence line on the northwest edge of Crouch Station. ***The water sampled from this well shows 0.160 ppm Benzene. The New Mexico Water Quality Control Commission (WQCC) benzene standard for this type of groundwater is 0.010 ppm.*** The result for MW #3 is sixteen (16) times the limit. This **may** indicate that the groundwater entering the area underneath Crouch Station is already contaminated above the WQCC limit for benzene. This sample also exhibited a barium level of 1.37 ppm which is greater than the WQCC limit

The sample from monitor well # 4 exhibited a slightly elevated benzene level, however, this level is below WQCC limits for benzene. This sample also exhibited a barium level of 1.72 ppm, which is above the WQCC limit

The sample from monitor well # 5 exhibited no levels of BTEX, however, this sample exhibited a barium level of 2.10 ppm, which is above the WQCC limit. In addition, this sample exhibited a chromium level of 0.83 ppm, which is also above the WQCC limit.

The following table presents the results of the confirmation samples taken from MW # 3 and MW # 4 on 5/6/98:

ANALYTES	MW # 3	MW # 4
Sample Date	5/6/98	5/6/98
BTEX		
Benzene	1.201	0.005
Toluene	<0.001	<0.001
Ethyl Benzene	<0.001	<0.001
Total Xylenes	<0.003	<0.003

On 5/6/98 SESI performed additional sampling at MW # 3 and MW # 4 to confirm the elevated levels of benzene (i.e., verify the sampling results collected on 5/1/98). Results of the confirmation samples show that MW # 3 exhibits benzene levels 120 times the WQCC limit. The fact that this sample contains such a high level of benzene supports the observation that contamination is entering the property from an up-gradient direction.

The direction of groundwater flow was confirmed by reviewing public records of the Texas New Mexico Pipeline remediation project. Records of this remediation project wereobtained from the Oil Conservation Division (See Excerpts of KEI Subsurface Investigation Report for Texas-New Mexico Pipeline Company). In addition, the direction of the groundwater flow was determined during the water table elevation study performed at the Crouch Station site in conjunction with the installation of the monitor wells.(See Water Table Elevation Map Crouch Station)

The confirmation sample from monitoring well # 4 (a down-gradient well placed approximately 110' southeast of monitor well # 2) ***was also analyzed for BTEX with a result of a 0.005 ppm level of benzene. This level is not above the WQCC standard for benzene in this type of water.***

Additional Work

Monitor well # 2 will be treated with air in an attempt to clear the screen in the casing which should allow the groundwater to recharge the well at an adequate rate. The well was installed using a plug of bentonite pellets. These pellets must be properly hydrated prior to installation to insure proper swelling of the material which will seal the hole around the casing.

Summary

The results of the analytical tests performed on soil and ground water samples obtained from the monitor well installations at the Crouch Station may be summarized as follows:

The up-gradient (background) ground water quality was found and confirmed to have elevated levels of benzene at monitoring well #3.

Highly contaminated soil was encountered at the depth of 58' in monitor well # 3.

No other monitoring wells sampled (i.e., MW #1, MW #4, MW #5) exhibited benzene levels in excess of the WQCC limits in the ground water samples.

Contaminated soil was not encountered at any depth in monitor wells #4 or #5..

All wells sampled exhibited elevated levels of barium in the ground water samples. This contamination is usually associated with some type of drilling or produced water source. However, other contaminates such as chlorides and total dissolved solids which are usually associated with such oilfield sources are not present in any ground water samples collected from any of the wells on the property. The source of this contamination has not been identified.

Monitor well # 5, a down-gradient well, exhibited an elevated level of chromium. The source of this contamination has not been identified.

The results of this investigation show that benzene contamination has entered the property at the northwest property line. The direction of the groundwater flow has been confirmed to flow from the northwest to the southeast at a bearing of approximately 140°. This contamination is almost certainly the result of a source that is located clearly outside the property boundaries of the Crouch Station. The obvious **suspected** source of the contamination entering this area is the historical leak to the northwest of Crouch Station. This leak occurred approximately 10 years ago and is currently undergoing remediation by Texas New Mexico Pipeline Company and Southwestern Public Service. The most current sampling report of the 18 monitor wells installed at that site indicate that the contamination may have traveled past the most down-gradient well.

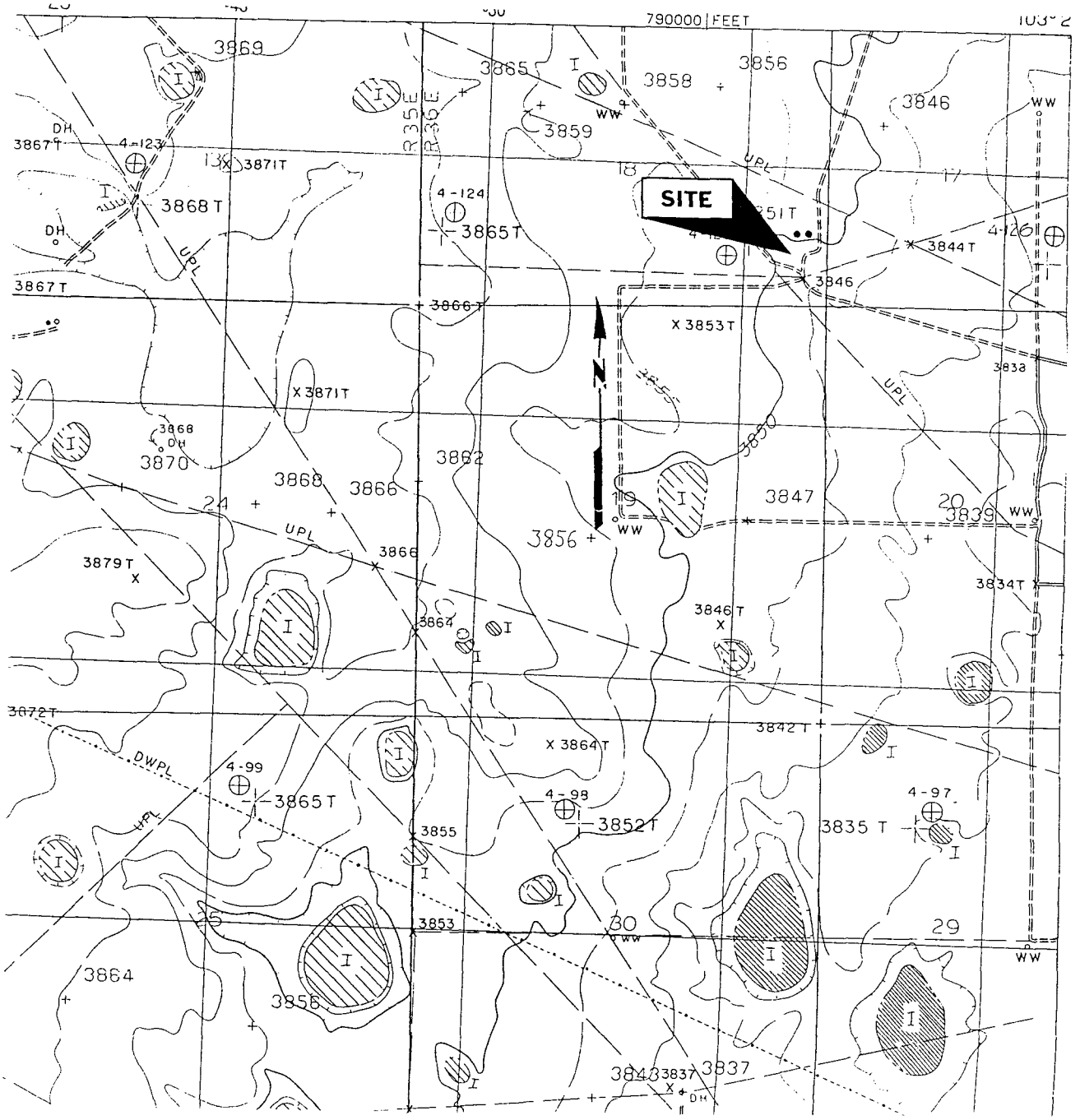
Proposed Abatement Plan

The ground water investigation performed at Crouch Station clearly indicates contamination is migrating onto the property from an up-gradient source. The highest levels of contamination at this site were found to be in the up-gradient well (i.e., monitoring well #3) and not near the spill currently being remediated by the soil vapor extraction system. Koch proposes to perform no further remedial action on the ground water at this site. However, the existing monitor wells will be sampled on a semi-annual basis for the contaminates identified in this report. Semi-annual groundwater sampling reports will be submitted to the Oil Conservation Division in Santa Fe and the district office in Hobbs.

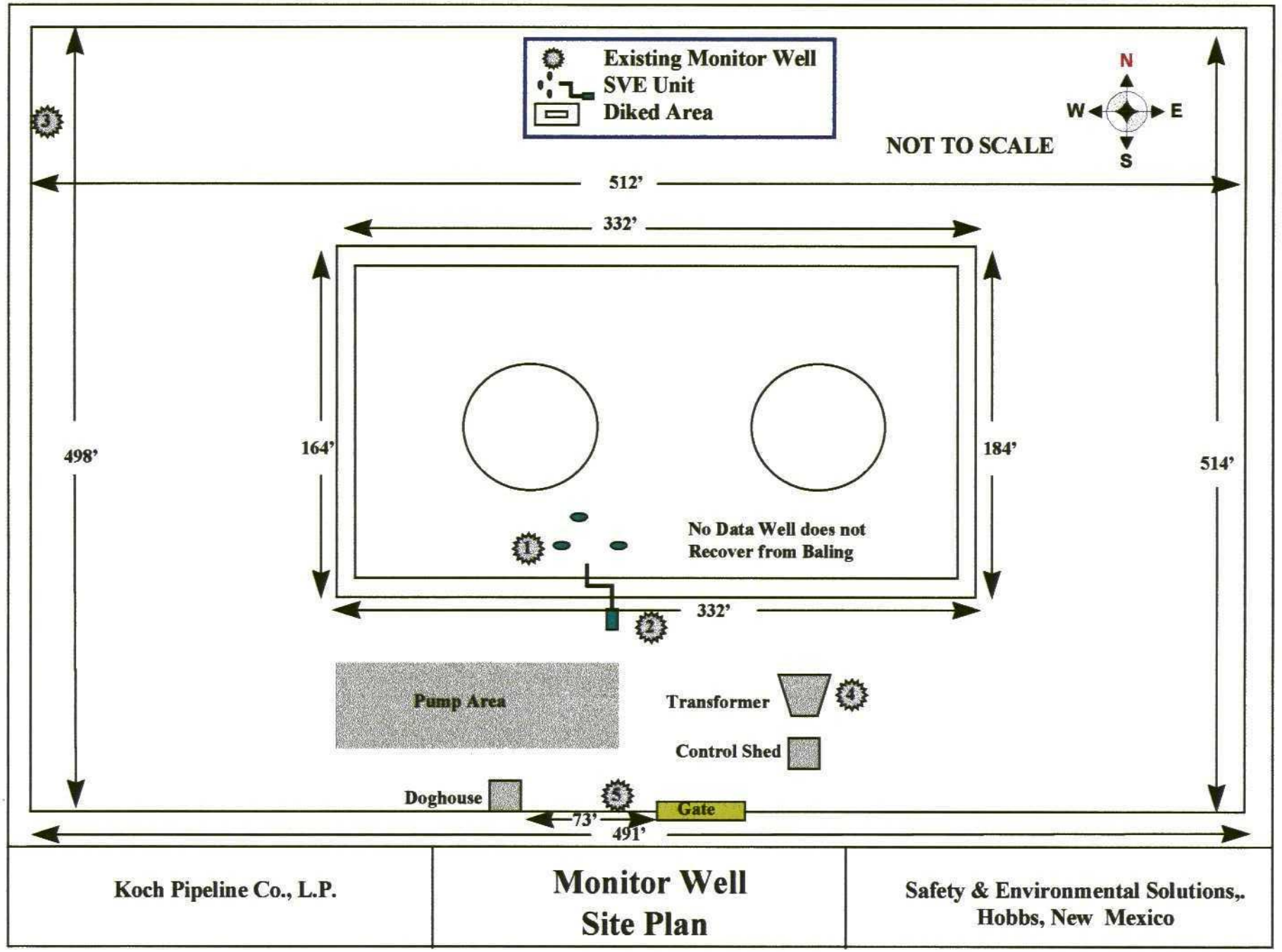
In addition to this monitoring program, Koch proposes to continue to operate the soil vapor extraction system currently in place. The emissions from this system will be sampled weekly and reported quarterly. This sampling program will insure the successful operation of the SVE system and monitor the reduction in the contamination located in the vadose zone in the immediate area of the spill and insure that contamination resulting from this spill will not contaminate the ground water with levels higher than identified by this report.

Maps and Figures

Vicinity Map
Monitor Well Site Plan
Driller's Logs
KEI Ground Water Contour Map May 1, 1997
John West Engineering Company Elevations and Ties Plat
Water Table Elevation Map Crouch Station May 11,1998
Excerpts of REI Subsurface Investigation Report for Texas-New Mexico Pipeline
Analytical Results



Koch Pipeline Co., L.P.	**Crouch Station Vicinity Map**	*Safety & Environmental Solutions, Inc. Hobbs, NM*



Koch Pipeline Co., L.P.	**Monitor Well Site Plan**	Safety & Environmental Solutions,. Hobbs, New Mexico

Atkins Engineering Associates, Inc.
P.O. Box 3156
Roswell, New Mexico 88202

LOG OF BORING Koch Test Hole's

(Page 1 of 1)

Company Name: SAFETY ENVIRONMENTAL
Contact: Bob Allen
Job #: 98178

Date : 4-30-98
Drill Start : 9:45
Drill End : 3:45
Boring Location : N.W. of Tank Batteries

Site Location : Sec. 18 - T28S - R36E
Auger Type : Hollow Stem
Logged by : BATES

Well: # 3
Elev.:

Depth in feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab No.	PID ppm-v	Blows/Ft
0				Silty Clay w/Caliche Rock, Brn. Loose, Dry			
				Caliche Clay w/Rock. Tan. Firm Dry			
5							
				Caliche Rock White Hard Dry			
10				Caliche Clay w/Rock light Tan Firm Dry			
15							
20				Caliche Rock w/clay Tan Hard Dry			
25							
30				Caliche Rock w/Clay Tan Firm Dry			
35							
				Silty Sandy Clay Tan Firm Damp			
40							

3 Ft Above G/S 4"x4"x5' metal well cover
2" sch 40 PVC Casing
11 Ft of Grout
Drill Cuttings

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Atkins Engineering Associates, Inc.
P.O. Box 3156
Roswell, New Mexico 88202

LOG OF BORING _____

Company Name:

Contact:

Job #:

Date	:	Site Location	:
Drill Start	:	Auger Type	:
Drill End	:	Logged by	:
Boring Location	:		

Depth in feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab No.	PID ppm-v	Blows/Ft	Well: # Elev.:
40								2" sch40 PVC casing
45								Drill Cuttings
50				Silty Sand w/ sandstone Tan From Dam				2 Ft Bentonite Plug
55				Water Level 54.05				20 Ft 2" PVC .020 Slot Screen
60				Silty Sand Tan soft saturated				8/16 sand packed
65				Sandstone. Tan. Hard wet				
70				Total Depth 71 Ft.				
75								
80								

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P.O. Box 3156
Roswell, New Mexico 88202

LOG OF BORING Koch Test Holes

(Page 1 of 2)

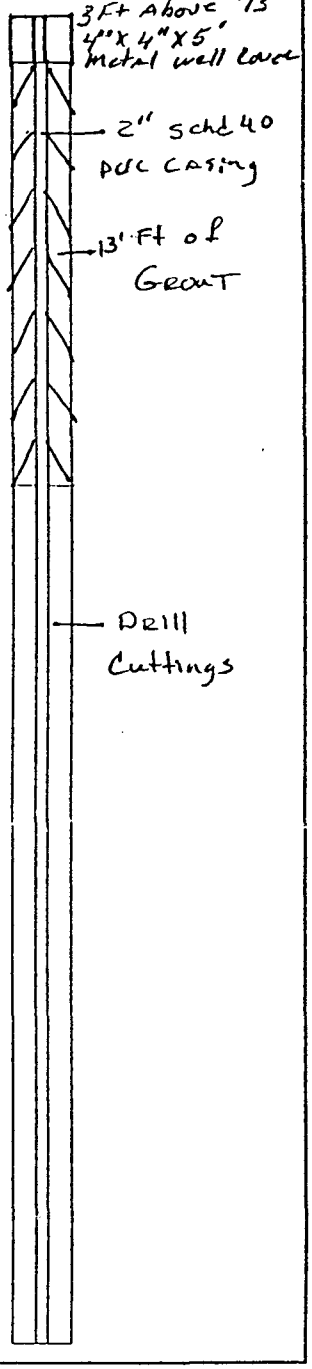
Company Name: Safety Environmental
Contact: Bob Allen
Job #: 98178

Date : 5-1-98
Drill Start : 6:40
Drill End : 1:15
Boring Location : 3 E. of Tank Batteries

Site Location : Sec. 18 T. 28 S - R. 32 E
Auger Type : Hollow Stem
Logged by : Mont Bates

Depth in feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab No.	PID ppm-v	Blows/Ft
0				Caliche Rock w/ clay. Tan. From Dry			
				Caliche Clay w/ Rock Tan Firm Dry			
5							
10			X				
15				Caliche Rock White Hard Dry			
20			X	Unable to recover sample			
25							
30			X	Sandy Caliche w/ Rock Tan Firm Damp			
				Sandy Clay Tan Firm Damp			
35							
40							

Well: # 4
Elev.:



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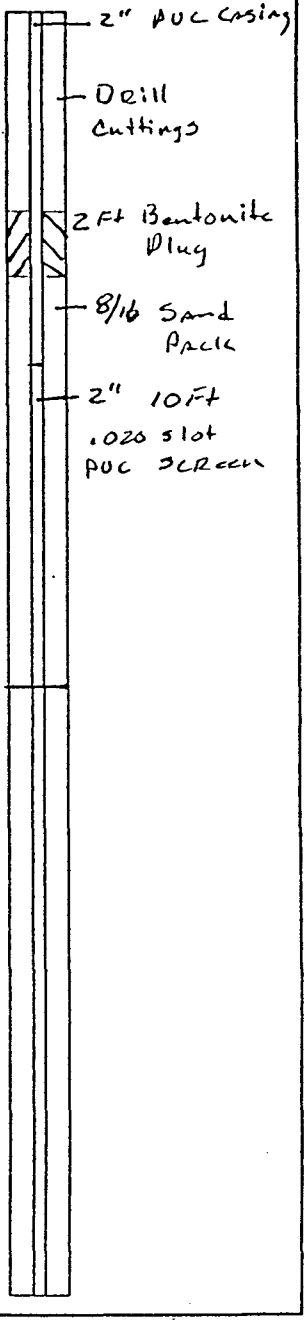
Atkins Engineering Associates, Inc. P.O. Box 3156 Roswell, New Mexico 88202	LOG OF BORING _____ (Page 2 of 2)
Company Name: Contact: Job #:	Date : Drill Start : Drill End : Boring Location : Site Location : Auger Type : Logged by :

Depth in feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab No.	PID ppm-v	Blows/Ft
40							
45							
50							
55				Silty Sand Tan Firm Saturated Water Level 56.0 Ft			
60				Sandstone Tan Hard wet Total Depth 61 Ft			
65							
70							
75							
80							

Well: #
Elev.:



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Atkins Engineering Associates, Inc.
P.O. Box 3156
Roswell, New Mexico 88202

LOG OF BORING Koch Test Holes

(Page 1 of 2)

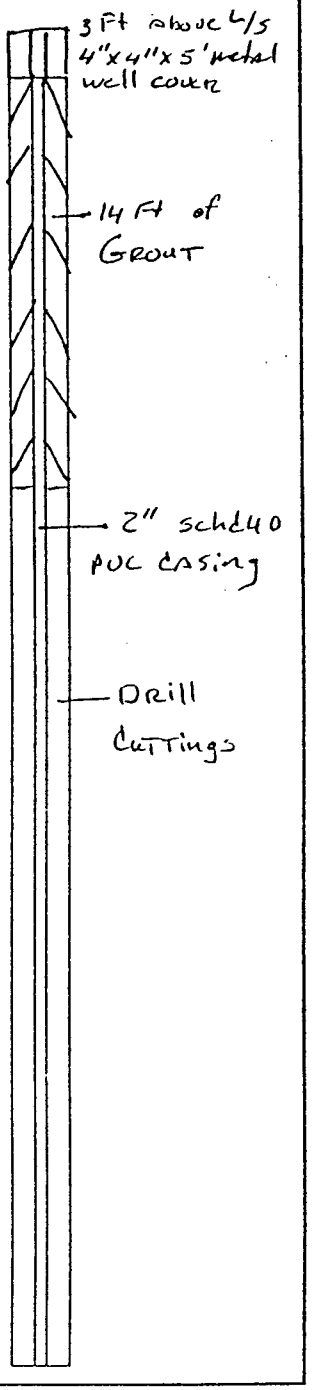
Company Name: "Safety Environmental"
Contact: "Bob Allen"
Job #: 98178 "

Date : 5-1-98
Drill Start : 1:55
Drill End : 6:00
Boring Location : S. of Tank Batteries

Site Location : Sec 19-T 20S R 36E
Auger Type : Hollow Stem
Logged by : Mr. Bates

Depth in feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab No.	PID ppm-v	Blows/Ft
0				Caliche Rock w/ clay Tan Firm Dry			
				Caliche Clay w/ Rock Tan Firm Dry			
5							
10							
15							
20				Caliche Rock w/clay Tan Hard Dry			
25							
				Caliche Clay w/ Rock Tan Firm Dry			
30							
				Sandy Caliche Tan Firm Damp			
35							
				Silty sand Tan Firm Damp			
40							
45							

Well: # 5
Elev.:



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Atkins Engineering Associates, Inc.
P.O. Box 3156
Roswell, New Mexico 88202

LOG OF BORING _____

Company Name:

Contact:

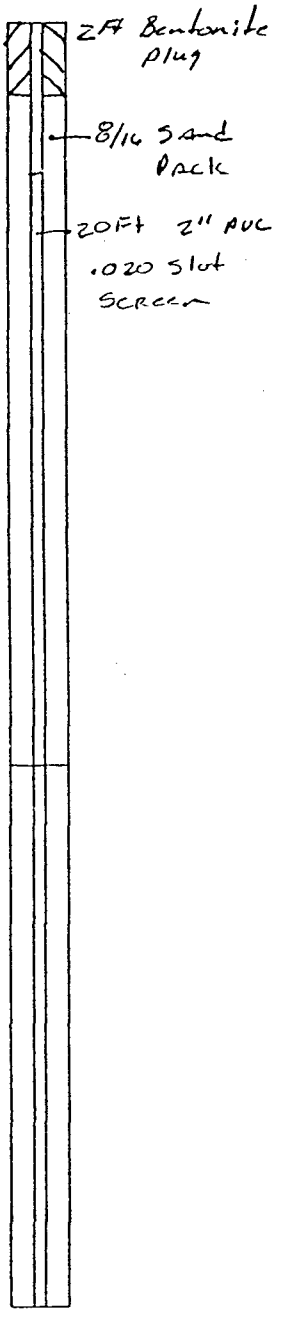
Job #:

Date :
Drill Start :
Drill End :
Boring Location :

Site Location :
Auger Type :
Logged by :

Depth in feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab No.	PID ppm-v	Blows/Ft
45				Sand Stone TAN HARD DRY			
50				Silty Sand TAN Loose Damp			
55				silty sand TAN Loose Moist			
				silty sand TAN Loose saturated			
60							
65							
70				Sandstone TAN Hard wet 71 Ft T/D			
75							
80							
85							
90							

Well: #
Elev.:



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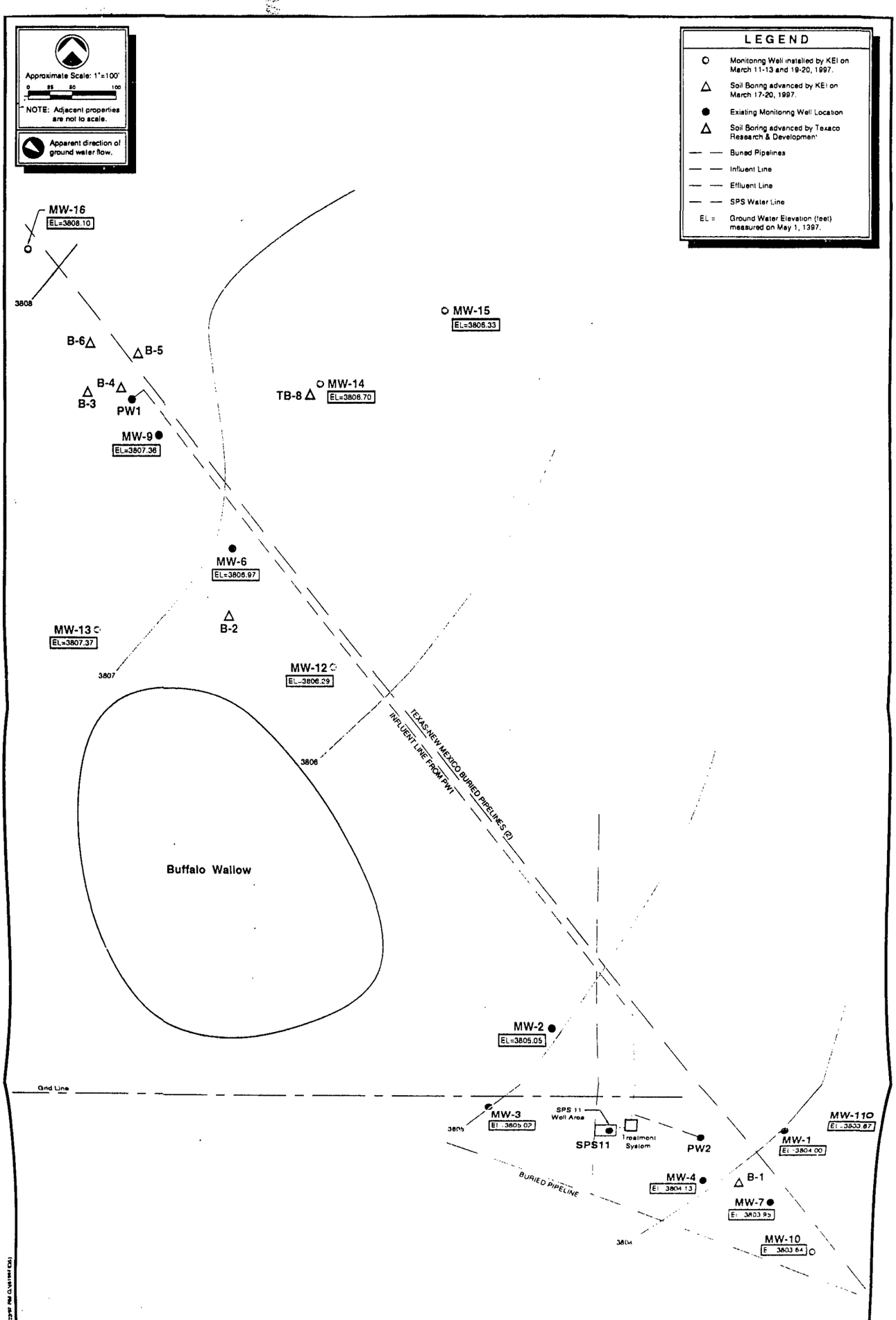
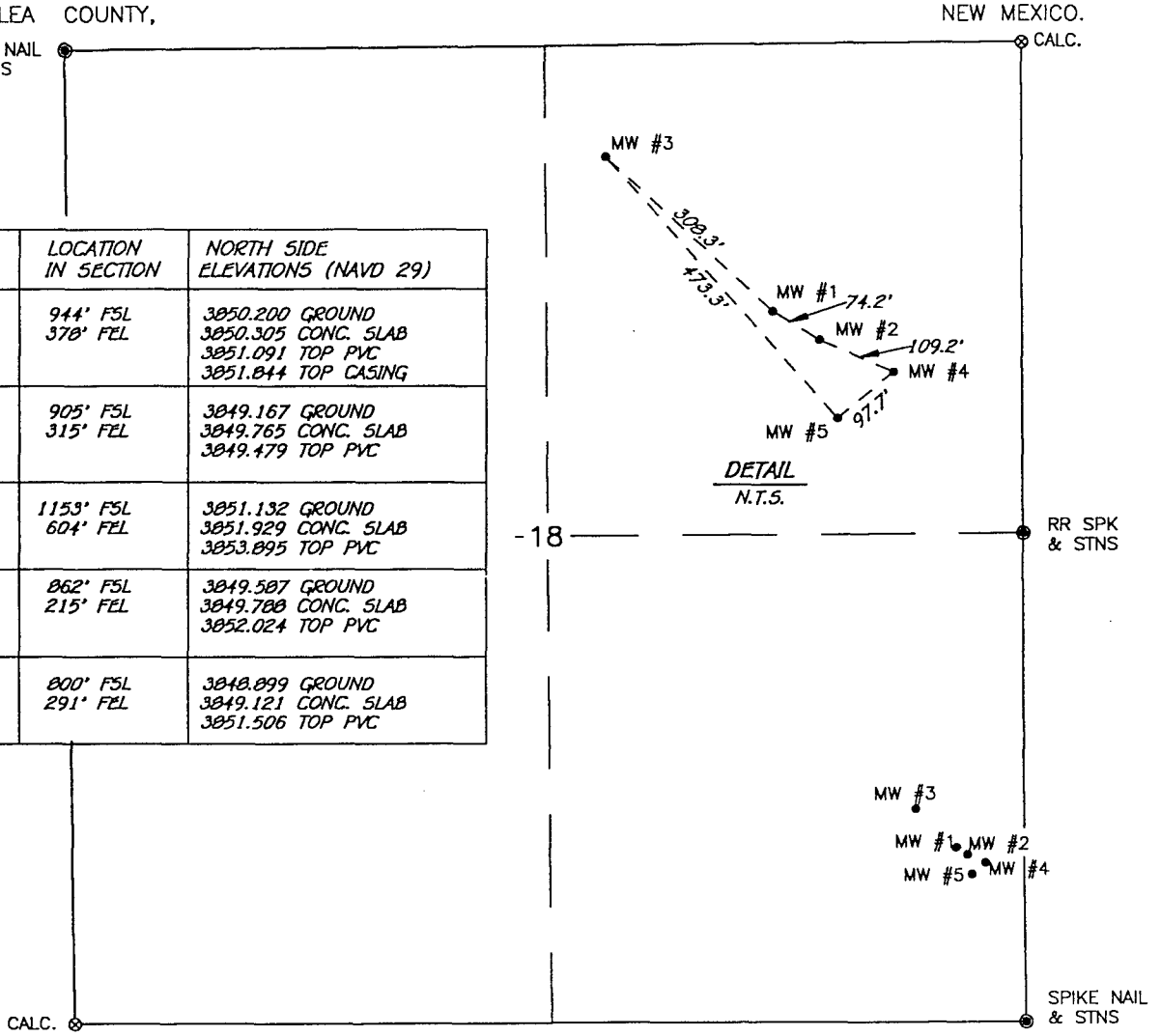


k·e·i	GROUND WATER CONTOUR MAP - MAY 1, 1997	610099
	TNMPL SPS-11 LEA COUNTY, NEW MEXICO	FIG 5

SECTION 18, TOWNSHIP 18 SOUTH, RANGE 36 EAST, N.M.P.M.,

LEA COUNTY, NEW MEXICO.

WELL NO.	LOCATION IN SECTION	NORTH SIDE ELEVATIONS (NAVD 29)
MW #1	944' FSL 378' FEL	3850.200 GROUND 3850.305 CONC. SLAB 3851.091 TOP PVC 3851.844 TOP CASING
MW #2	905' FSL 315' FEL	3849.167 GROUND 3849.765 CONC. SLAB 3849.479 TOP PVC
MW #3	1153' FSL 604' FEL	3851.132 GROUND 3851.929 CONC. SLAB 3853.895 TOP PVC
MW #4	862' FSL 215' FEL	3849.587 GROUND 3849.788 CONC. SLAB 3852.024 TOP PVC
MW #5	800' FSL 291' FEL	3848.899 GROUND 3849.121 CONC. SLAB 3851.506 TOP PVC



1000 0 1000 2000

SCALE: 1"=1000'

I HEREBY CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

NEW MEXICO 12641 REGISTERED PROFESSIONAL SURVEYOR

5-12-98

RONALD J. EIDSON, N.M. R.P.S. No. 3239

GARY G. EIDSON, N.M. R.P.S. No. 12641

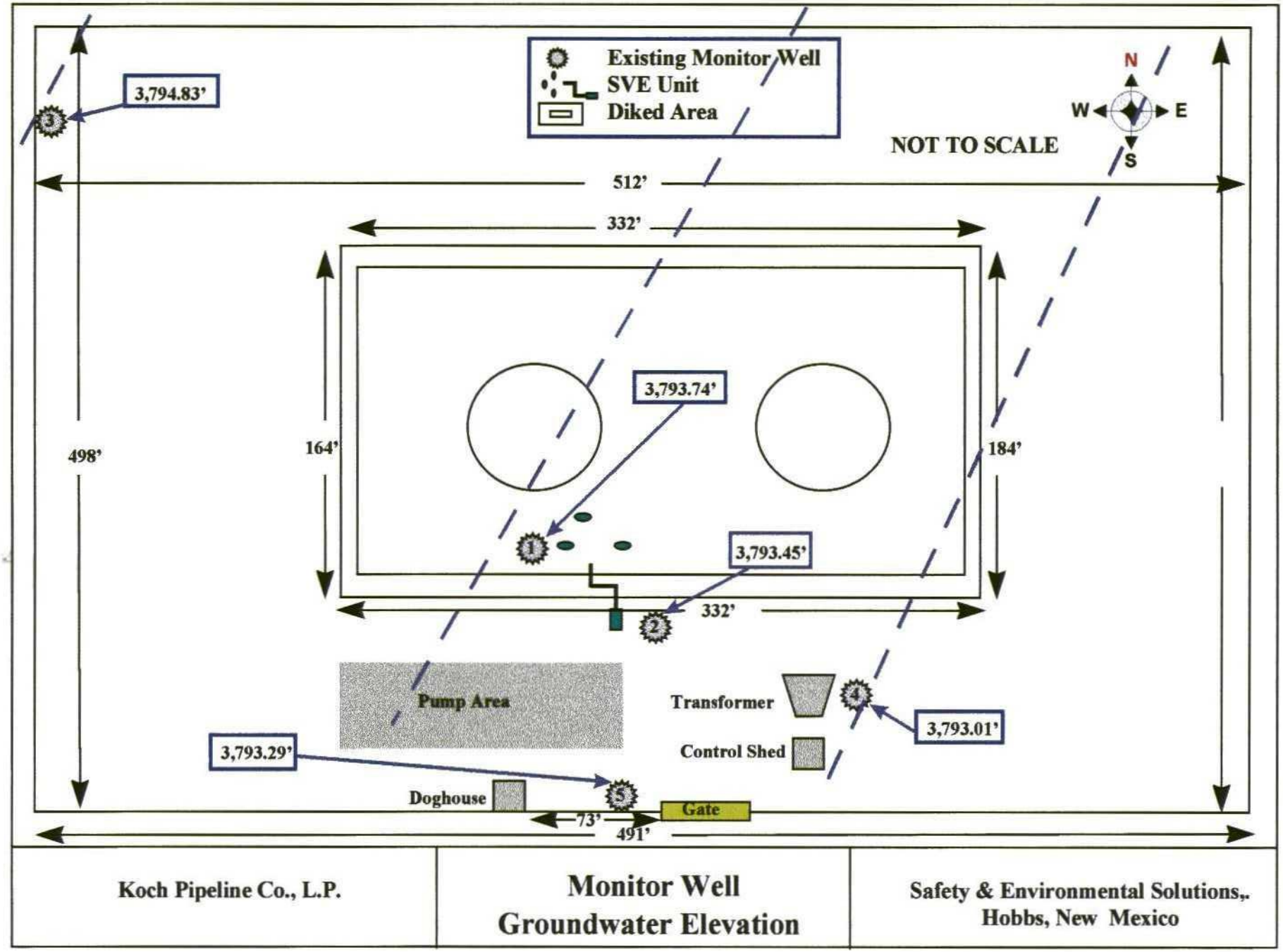
JOHN W. WEST ENGINEERING COMPANY

CONSULTING ENGINEERS & SURVEYORS – HOBBS, NEW MEXICO

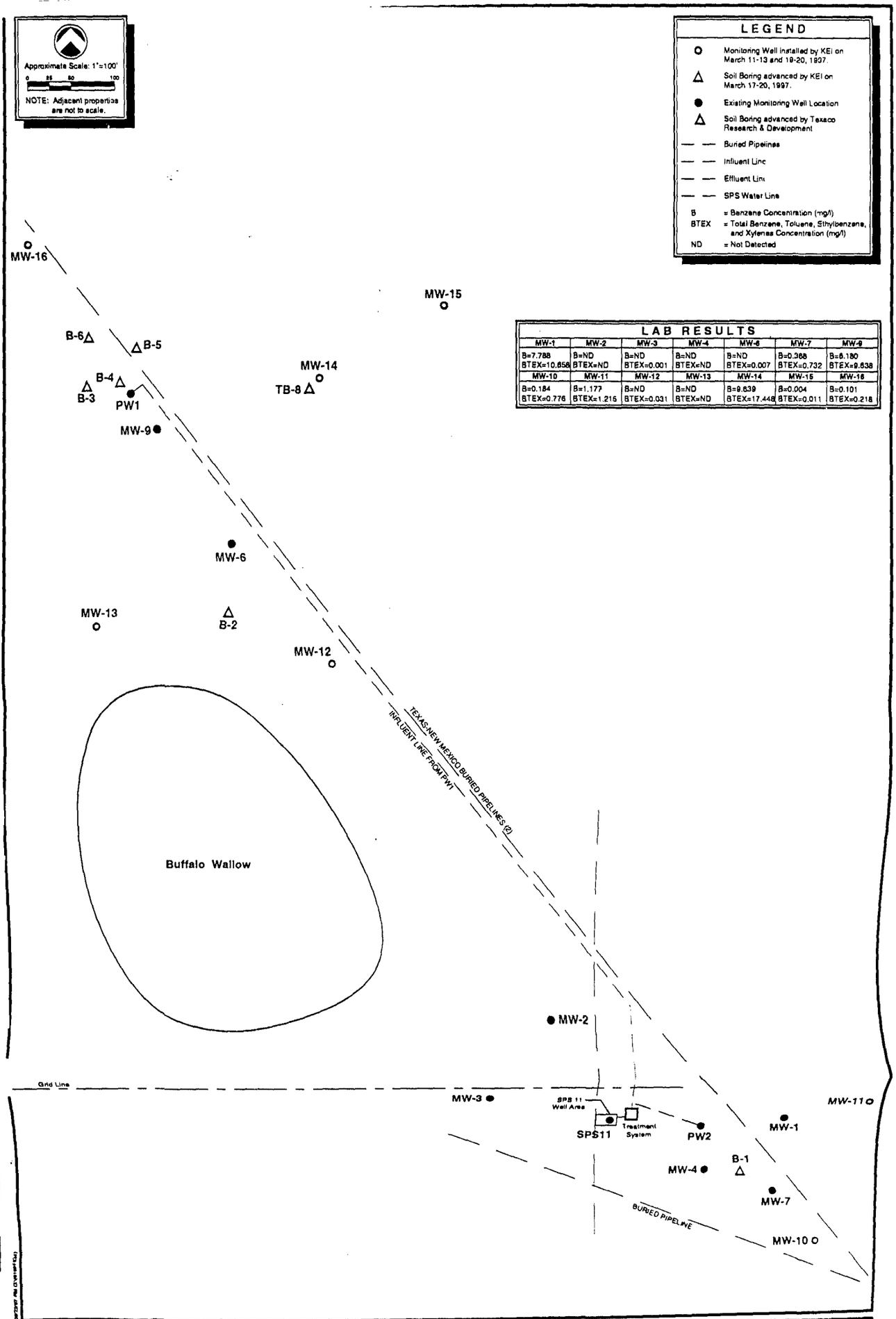
SAFETY & ENVIRONMENTAL SOLUTIONS INC.

LOCATE MONITOR WELLS AT KOCH PIPELINE CO., L.P. CROUCH STATION LOCATED IN SECTION 18, TOWNSHIP 18 SOUTH, RANGE 36 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO.

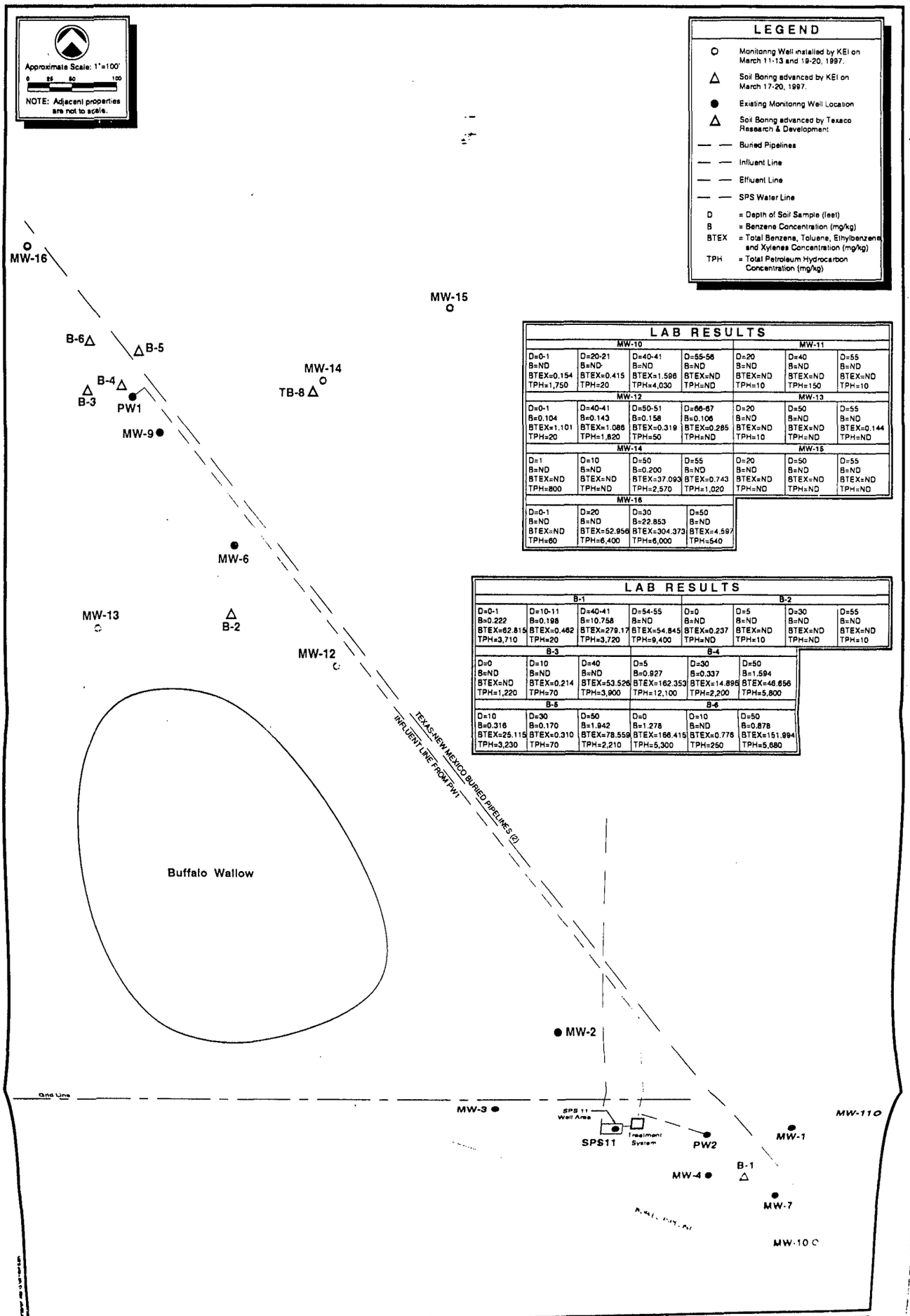
Survey Date: 5/7/98		Sheet 1 of 1 Sheets
W.O. Number: 98-11-0724		Drawn By: J. L. Presley
Date: 5/11/98	DISK: JLP#200	SES0724



Koch Pipeline Co., L.P.	**Monitor Well Groundwater Elevation**	Safety & Environmental Solutions,. Hobbs, New Mexico



k·e·i	GROUND WATER CONCENTRATION MAP - MAY 1, 1997	610099
	TNMPL SPS-11 LEA COUNTY, NEW MEXICO	FIG 4



LAB RESULTS

MW-10				MW-11		
D=0-1 B=ND BTEX=0.154 TPH=1,750	D=20-21 B=ND BTEX=0.415 TPH=20	D=40-41 B=ND BTEX=1.596 TPH=4,030	D=55-56 B=ND BTEX=ND TPH=ND	D=20 B=ND BTEX=ND TPH=10	D=40 B=ND BTEX=ND TPH=150	D=55 B=ND BTEX=ND TPH=10
MW-12				**MW-13**		
D=0-1 B=0.104 BTEX=1.101 TPH=20	D=40-41 B=0.143 BTEX=1.086 TPH=1,820	D=50-51 B=0.158 BTEX=0.319 TPH=50	D=66-67 B=0.106 BTEX=0.285 TPH=ND	D=20 B=ND BTEX=ND TPH=10	D=50 B=ND BTEX=ND TPH=ND	D=55 B=ND BTEX=0.144 TPH=ND
MW-14				**MW-15**		
D=1 B=ND BTEX=ND TPH=800	D=10 B=ND BTEX=ND TPH=ND	D=50 B=0.200 BTEX=37.093 TPH=2,570	D=55 B=ND BTEX=0.743 TPH=1,020	D=20 B=ND BTEX=ND TPH=ND	D=50 B=ND BTEX=ND TPH=ND	D=55 B=ND BTEX=ND TPH=ND
MW-16						
D=0-1 B=ND BTEX=ND TPH=60	D=20 B=ND BTEX=52.956 TPH=6,400	D=30 B=22.853 BTEX=304.373 TPH=6,000	D=50 B=ND BTEX=4.597 TPH=540			

LAB RESULTS

B-1				B-2			
D=0-1 B=0.222 BTEX=62.815 TPH=3,710	D=10-11 B=0.198 BTEX=0.462 TPH=20	D=40-41 B=10.758 BTEX=279.17 TPH=3,720	D=54-55 B=ND BTEX=54.845 TPH=9,400	D=0 B=ND BTEX=0.237 TPH=ND	D=5 B=ND BTEX=ND TPH=10	D=30 B=ND BTEX=ND TPH=ND	D=55 B=ND BTEX=ND TPH=10
B-3				**B-4**			
D=0 B=ND BTEX=ND TPH=1,220	D=10 B=ND BTEX=0.214 TPH=70	D=40 B=ND BTEX=53.526 TPH=3,900	D=5 B=0.927 BTEX=162.353 TPH=12,100	D=30 B=0.337 BTEX=14.896 TPH=2,200	D=50 B=1.594 BTEX=46.656 TPH=5,800		
B-5				**B-6**			
D=10 B=0.316 BTEX=25.115 TPH=3,230	D=30 B=0.170 BTEX=0.310 TPH=70	D=50 B=1.942 BTEX=78.559 TPH=2,210	D=0 B=1.278 BTEX=166.415 TPH=5,300	D=10 B=ND BTEX=0.776 TPH=250	D=50 B=0.878 BTEX=151.994 TPH=5,680		

k·e·i	SOIL CONCENTRATION MAP	610099
	TNMPL SPS 11 LEA COUNTY, NEW MEXICO	FIG 3

TABLE I

SUMMARY OF LABORATORY RESULTS - SOIL
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNMPL SPS-11
LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	SAMPLE DATE	DEPTH (feet)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYLBENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	TPH (mg/kg)
B-1	03/20/97	0 - 1	0.222	10.991	18.776	32.826	62.815	3,710
B-1	03/20/97	10 - 11	0.198	0.151	ND	0.113	0.462	20
B-1	03/20/97	40 - 41	10.758	85.292	75.323	108.244	279.617	3,720
B-1	03/20/97	53 - 54	ND	8.441	17.652	28.752	54.845	9,400
B-2	03/17/97	0	ND	ND	ND	0.237	0.237	ND
B-2	03/17/97	5	ND	ND	ND	ND	ND	10
B-2	03/17/97	30	ND	ND	ND	ND	ND	ND
B-2	03/17/97	55	ND	ND	ND	ND	ND	10
B-3	03/17/97	0	ND	ND	ND	ND	ND	1,220
B-3	03/17/97	10	ND	ND	ND	0.214	0.214	70
B-3	03/17/97	40	ND	7.219	16.764	29.543	53.526	3,900
B-4	03/18/97	5	0.927	7.593	55.077	98.756	162.353	12,100
B-4	03/18/97	30	0.337	0.485	0.639	13.435	14.896	2,200
B-4	03/18/97	50	1.594	11.293	11.954	21.815	46.656	5,800
B-5	03/19/97	10	0.316	ND	8.727	16.076	25.119	3,230
B-5	03/19/97	30	0.17	ND	ND	0.14	0.31	70
B-5	03/19/97	51	1.942	20.447	22.087	34.083	78.559	2,210
B-6	03/18/97	0	1.278	15.924	55.441	93.772	166.415	5,300
B-6	03/18/97	10	ND	0.123	0.163	0.49	0.776	250
B-6	03/18/97	50	0.878	50.806	40.788	59.522	151.994	5,680
MW-10	03/21/97	0 - 1	ND	ND	ND	0.154	0.154	1,750
MW-10	03/21/97	20 - 21	ND	ND	ND	0.415	0.415	20
MW-10	03/21/97	40 - 41	ND	ND	0.196	1.4	1.596	4,030
MW-10	03/21/97	55 - 56	ND	ND	ND	ND	ND	ND
MW-11	03/11/97	20	ND	ND	ND	ND	ND	10
MW-11	03/11/97	40	ND	ND	ND	ND	ND	150
MW-11	03/11/97	55	ND	ND	ND	ND	ND	10
MW-12	03/20/97	0 - 1	0.104	0.136	ND	0.861	1.101	20
MW-12	03/20/97	40 - 41	0.143	ND	ND	0.943	1.086	1,820
MW-12	03/20/97	50 - 51	0.158	ND	ND	0.161	0.319	50
MW-12	03/20/97	66 - 67	0.106	ND	ND	0.179	0.285	ND
MW-13	03/12/97	20	ND	ND	ND	ND	ND	10
MW-13	03/12/97	50	ND	ND	ND	ND	ND	ND
MW-13	03/12/97	55	ND	ND	ND	0.144	0.144	ND
MW-14	03/13/97	1	ND	ND	ND	ND	ND	800
MW-14	03/12/97	10	ND	ND	ND	ND	ND	ND
MW-14	03/12/97	50	0.2	1.402	11.461	24.03	37.093	2,570
MW-14	03/13/97	55	ND	ND	0.182	0.561	0.743	1,020
MW-15	03/13/97	20	ND	ND	ND	ND	ND	ND
MW-15	03/13/97	50	ND	ND	ND	ND	ND	ND
MW-15	03/13/97	55	ND	ND	ND	ND	ND	ND
MW-16	03/19/97	0 - 1	ND	ND	ND	ND	ND	60
MW-16	03/19/97	20	ND	4.056	14.763	34.137	52.956	6,400
MW-16	03/19/97	30	22.853	99.739	72.631	109.15	304.373	6,000
MW-16	03/19/97	50	ND	0.644	1.169	2.784	4.597	540

Appendix A

Appendix B

TABLE II
(continued)

SUMMARY OF LABORATORY RESULTS - GROUND WATER
TEXAS - NEW MEXICO PIPE LINE COMPANY
SPS-11
LEA COUNTY, NEW MEXICO

MONITORING WELL	SAMPLE DATE	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYLBENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)
MW-16	05/01/97	0.101	0.090	0.015	0.012	0.218
PW-1	10/15/96	0.007	ND	ND	ND	0.007
PW-2	05/07/92	0.048	0.054	0.022	0.024	0.148
PW-2	10/15/96	ND	0.001	0.001	0.013	0.015

TABLE III

SUMMARY OF GROUND WATER MONITORING
TEXAS - NEW MEXICO PIPE LINE COMPANY
SPS-11
LEA COUNTY, NEW MEXICO

WELL NO.	DATE MEASURED	PVC ELEVATION (feet)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION		PSH THICKNESS (feet)
				Actual	Corrected	
MW-1	05/06/92	3,859.20	55.37	3803.83	—	—
	07/13/92	3,859.20	55.93	3803.27	—	—
	05/01/97	3,859.20	55.20	3804.00	—	—
MW-2	05/06/92	3,860.90	56.06	3804.84	—	—
	07/13/92	3,860.90	56.43	3804.47	—	—
	05/01/97	3,860.90	55.85	3805.05	—	—
MW-3	05/06/92	3,861.30	56.48	3804.82	—	—
	07/13/92	3,861.30	56.86	3804.44	—	—
	05/01/97	3,861.30	56.28	3805.02	—	—
MW-4	05/06/92	3,859.40	55.36	3804.04	—	—
	07/13/92	3,859.40	55.83	3803.57	—	—
	05/01/97	3,859.40	55.27	3804.13	—	—
MW-5	07/13/92	Unknown	26.48	—	—	—
MW-6	05/06/92	3,862.70	55.78	3806.92	—	—
	07/13/92	3,862.70	56.23	3806.47	—	—
	05/01/97	3,862.70	55.73	3806.97	—	—
MW-7	05/06/92	3,859.40	55.65	3803.75	—	—
	07/13/92	3,859.40	56.15	3803.25	—	—
	05/01/97	3,859.40	55.45	3803.95	—	—
MW-9	05/06/92	3,862.10	54.69	3807.41	—	—
	07/13/92	3,862.10	55.18	3806.92	—	—
	05/01/97	3,862.10	54.74	3807.36	—	—
MW-10	05/01/97	3,860.60	56.96	3803.64	—	—
MW-11	05/01/97	3,860.10	56.43	3803.67	—	—
MW-12	05/01/97	3,863.20	56.91	3806.29	—	—
MW-13	05/01/97	3,862.60	55.23	3807.37	—	—
MW-14	05/01/97	3,863.10	56.40	3806.70	—	—
MW-15	05/01/97	3,861.90	55.57	3806.33	—	—
MW-16	05/01/97	3,863.40	55.30	3808.10	—	—

Appendix A

Appendix B

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO:

Receiving Date: 04/30 & 05/01/98
Reporting Date: 05/02/98
Project Owner: KOCH OIL
Project Name: KOCH KROUCH ST. MW
Project Location: KROUCH STATION

Sampling Date: SEE BELOW
Sample Type: GROUNDWATER
Sample Condition: COOL, INTACT
Sample Received By: GP
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		05/01/98	05/01/98	05/01/98	05/01/98
H3616-1	EXISTING MW INSIDE BERM (04/030/98)	<0.002	<0.002	<0.002	<0.006
H3616-4	MW #3 (05/01/98)	0.160	<0.002	<0.002	<0.006
H3616-5	MW #4	0.007	<0.002	<0.002	<0.006
H3616-6	MW #5	<0.002	<0.002	<0.002	<0.006
Quality Control		0.108	0.104	0.104	0.315
True Value QC		0.100	0.100	0.100	0.300
% Accuracy		108	104	104	105
Relative Percent Difference		1.8	0	1.1	0.7

METHOD: EPA SW 846-8020

Chemist

5/2/98
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO:

Receiving Date: 04/30 & 05/01/98
Reporting Date: 05/02/98
Project Owner: KOCH OIL
Project Name: KOCH KROUCH ST. MW
Project Location: KROUCH STATION

Sampling Date: SEE BELOW
Sample Type: SOIL
Sample Condition: COOL, INTACT
Sample Received By: GP
Analyzed By: BC

LAB NUMBER	SAMPLE ID	TPH (mg/Kg)	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE:		05/02/98	05/01/98	05/01/98	05/01/98	05/01/98
H3616-2	MW #3 20' (04/30/98)	<10	<0.002	<0.002	<0.002	<0.006
H3616-3	MW #3 58'	51700	0.057	<0.002	<0.002	<0.006
H3616-5A	MW #4 30' (05/01/98)	75	<0.002	<0.002	<0.002	<0.006
H3616-6A	MW #5 30'	65	<0.002	<0.002	<0.002	<0.006
H3616-6B	MW #5 57'-59'	19	<0.002	<0.002	<0.002	<0.006
Quality Control		186	0.108	0.104	0.104	0.315
True Value QC		200	0.100	0.100	0.100	0.300
% Recovery		93.2	108	104	104	105
Relative Percent Difference		1.9	1.8	0	1.1	0.7

METHODS: TRPHC - EPA 600/7-79-020, 418.1; BTEX - EPA SW-846-8020

Burgess J. A. Cooke, Ph. D.

5/2/98
Date

H3616BTXLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO:

Receiving Date: 04/30/98
Reporting Date: 05/02/98
Project Owner: KOCH OIL
Project Name: KOCH KROUCH ST. MW
Project Location: KROUCH STATION
Lab Number: H3616-1
Sample ID: EXISTING MW INSIDE BERM

Analysis Date: 05/01/98
Sampling Date: 04/30/98
Sample Type: GROUNDWATER
Sample Condition: COOL, INTACT
Sample Received By: GP
Analyzed By: BC

POLYNUCLEAR AROMATIC HYDROCARBONS - 625 (mg/L)	Sample Result H3616-1	Method Blank	QC	% Recov.	True Value QC
1 Naphthalene	<0.001	<0.001	0.042	84	0.050
2 2-Methylnaphthalene	<0.002	<0.002	0.046	92	0.050
3 1-Methylnaphthalene	<0.002	<0.002	NR	NR	NR
4 Acenaphthylene	<0.001	<0.001	0.048	96	0.050
5 Acenaphthene	<0.001	<0.001	0.048	96	0.050
6 Fluorene	<0.001	<0.001	0.048	96	0.050
7 Phenanthrene	<0.001	<0.001	0.052	104	0.050
8 Anthracene	<0.001	<0.001	0.048	96	0.050
9 Fluoranthene	<0.001	<0.001	0.049	98	0.050
10 Pyrene	<0.001	<0.001	0.046	92	0.050
11 Benzo(a)anthracene	<0.001	<0.001	0.046	92	0.050
12 Chrysene	<0.001	<0.001	0.046	92	0.050
13 Benzo(b)fluoranthene	<0.001	<0.001	0.044	88	0.050
14 Benzo(k)fluoranthene	<0.001	<0.001	0.046	92	0.050
15 Benzo(a)pyrene	<0.0007	<0.0007	0.045	90	0.050
16 Indeno(1,2,3-cd)pyrene	<0.001	<0.001	0.042	84	0.050
17 Dibenzo(a,h,)anthracene	<0.001	<0.001	0.048	96	0.050
18 Benzo(g,h,i)perylene	<0.001	<0.001	0.044	88	0.050

	% Recovery
19 Nitrobenzene-d5	49
20 2-Fluorobiphenyl	66
21 Terphenyl-d14	76

METHODS: EPA 625

Burgess J. A. Cooke, Ph. D.

5/2/98
Date

H3616-1.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO:

Receiving Date: 05/01/98
Reporting Date: 05/02/98
Project Owner: KOCH OIL
Project Name: KOCH KROUCH ST. MW
Project Location: KROUCH STATION
Lab Number: H3616-4
Sample ID: MW #3

Analysis Date: 05/01/98
Sampling Date: 05/01/98
Sample Type: GROUNDWATER
Sample Condition: COOL, INTACT
Sample Received By: GP
Analyzed By: BC

POLYNUCLEAR AROMATIC HYDROCARBONS - 625 (mg/L)	Sample Result H3616-4	Method Blank	QC	% Recov.	True Value QC
1 Naphthalene	<0.001	<0.001	0.042	84	0.050
2 2-Methylnaphthalene	<0.002	<0.002	0.046	92	0.050
3 1-Methylnaphthalene	<0.002	<0.002	NR	NR	NR
4 Acenaphthylene	<0.001	<0.001	0.048	96	0.050
5 Acenaphthene	<0.001	<0.001	0.048	96	0.050
6 Fluorene	<0.001	<0.001	0.048	96	0.050
7 Phenanthrene	<0.001	<0.001	0.052	104	0.050
8 Anthracene	<0.001	<0.001	0.048	96	0.050
9 Fluoranthene	<0.001	<0.001	0.049	98	0.050
10 Pyrene	<0.001	<0.001	0.046	92	0.050
11 Benzo(a)anthracene	<0.001	<0.001	0.046	92	0.050
12 Chrysene	<0.001	<0.001	0.046	92	0.050
13 Benzo(b)fluoranthene	<0.001	<0.001	0.044	88	0.050
14 Benzo(k)fluoranthene	<0.001	<0.001	0.046	92	0.050
15 Benzo(a)pyrene	<0.0007	<0.0007	0.045	90	0.050
16 Indeno(1,2,3-cd)pyrene	<0.001	<0.001	0.042	84	0.050
17 Dibenzo(a,h,)anthracene	<0.001	<0.001	0.048	96	0.050
18 Benzo(g,h,i)perylene	<0.001	<0.001	0.044	88	0.050

	% Recovery
19 Nitrobenzene-d5	70
20 2-Fluorobiphenyl	90
21 Terphenyl-d14	118

METHODS: EPA 625

Burgess J. A. Cooke, Ph. D.

5/2/98
Date

H3616-4.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON, SUITE 103
HOBBS, NM 88240

Receiving Date: 05/01/98
Reporting Date: 05/02/98
Project Owner: KOCH OIL
Project Name: KOCH KROUCH ST. MW
Project Location: KROUCH STATION
Lab Number: H3616-5
Sample ID: MW #4

FAX TO:

Analysis Date: 05/01/98
Sampling Date: 05/01/98
Sample Type: GROUNDWATER
Sample Condition: COOL, INTACT
Sample Received By: GP
Analyzed By: BC

POLYNUCLEAR AROMATIC HYDROCARBONS - 625 (mg/L)	Sample Result H3616-5	Method Blank	QC	% Recov.	True Value QC
1 Naphthalene	<0.001	<0.001	0.042	84	0.050
2 2-Methylnaphthalene	<0.002	<0.002	0.046	92	0.050
3 1-Methylnaphthalene	<0.002	<0.002	NR	NR	NR
4 Acenaphthylene	<0.001	<0.001	0.048	96	0.050
5 Acenaphthene	<0.001	<0.001	0.048	96	0.050
6 Fluorene	<0.001	<0.001	0.048	96	0.050
7 Phenanthrene	<0.001	<0.001	0.052	104	0.050
8 Anthracene	<0.001	<0.001	0.048	96	0.050
9 Fluoranthene	<0.001	<0.001	0.049	98	0.050
10 Pyrene	<0.001	<0.001	0.046	92	0.050
11 Benzo(a)anthracene	<0.001	<0.001	0.046	92	0.050
12 Chrysene	<0.001	<0.001	0.046	92	0.050
13 Benzo(b)fluoranthene	<0.001	<0.001	0.044	88	0.050
14 Benzo(k)fluoranthene	<0.001	<0.001	0.046	92	0.050
15 Benzo(a)pyrene	<0.0007	<0.0007	0.045	90	0.050
16 Indeno(1,2,3-cd)pyrene	<0.001	<0.001	0.042	84	0.050
17 Dibenzo(a,h,)anthracene	<0.001	<0.001	0.048	96	0.050
18 Benzo(g,h,i)perylene	<0.001	<0.001	0.044	88	0.050

	% Recovery
19 Nitrobenzene-d5	56
20 2-Fluorobiphenyl	52
21 Terphenyl-d14	79

METHODS: EPA 625

Burgess J. A. Cooke, Ph. D.

5/2/98
Date

H3615-5.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO:

Receiving Date: 05/01/98
Reporting Date: 05/02/98
Project Owner: KOCH OIL
Project Name: KOCH KROUCH ST. MW
Project Location: KROUCH STATION
Lab Number: H3616-6
Sample ID: MW #5

Analysis Date: 05/01/98
Sampling Date: 05/01/98
Sample Type: GROUNDWATER
Sample Condition: COOL, INTACT
Sample Received By: GP
Analyzed By: BC

POLYNUCLEAR AROMATIC HYDROCARBONS - 625 (mg/L)

		Sample Result H3616-6	Method Blank	QC	% Recov.	True Value QC
1	Naphthalene	<0.001	<0.001	0.042	84	0.050
2	2-Methylnaphthalene	<0.002	<0.002	0.046	92	0.050
3	1-Methylnaphthalene	<0.002	<0.002	NR	NR	NR
4	Acenaphthylene	<0.001	<0.001	0.048	96	0.050
5	Acenaphthene	<0.001	<0.001	0.048	96	0.050
6	Fluorene	<0.001	<0.001	0.048	96	0.050
7	Phenanthrene	<0.001	<0.001	0.052	104	0.050
8	Anthracene	<0.001	<0.001	0.048	96	0.050
9	Fluoranthene	<0.001	<0.001	0.049	98	0.050
10	Pyrene	<0.001	<0.001	0.046	92	0.050
11	Benzo(a)anthracene	<0.001	<0.001	0.046	92	0.050
12	Chrysene	<0.001	<0.001	0.046	92	0.050
13	Benzo(b)fluoranthene	<0.001	<0.001	0.044	88	0.050
14	Benzo(k)fluoranthene	<0.001	<0.001	0.046	92	0.050
15	Benzo(a)pyrene	<0.0007	<0.0007	0.045	90	0.050
16	Indeno(1,2,3-cd)pyrene	<0.001	<0.001	0.042	84	0.050
17	Dibenzo(a,h,)anthracene	<0.001	<0.001	0.048	96	0.050
18	Benzo(g,h,i)perylene	<0.001	<0.001	0.044	88	0.050

		% Recovery
19	Nitrobenzene-d5	54
20	2-Fluorobiphenyl	68
21	Terphenyl-d14	77

METHODS: EPA 625

Burgess J. A. Cooke, Ph. D.

5/2/98
Date

H3616-6.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO:

Receiving Date: 04/30/98* & 05/01/98**
Reporting Date: 05/04/98
Project Owner: KOCH OIL
Project Name: KOCH KROUCH ST. MW
Project Location: KROUCH STATION

Sampling Date: 04/30/98* & 05/01/98**
Sample Type: GROUNDWATER
Sample Condition: COOL, INTACT
Sample Received By: GP
Analyzed By: JC/BC

LAB NUMBER	SAMPLE ID	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Conductivity (u mhos/cm)	T-Alkalinity ($mgCaCO_3/L$)
ANALYSIS DATE:		05/04/98	05/02/98	05/02/98	05/02/98	05/02/98	05/02/98
H3616-1*	EXISTING MW INSIDE BERM	17	126	20	2.3	1415	225
H3616-4**	MW #3	104	115	81	3.9	1245	420
H3616-5**	MW #4	143	115	42	11.9	1421	168
H3616-6**	MW #5	<1	128	63	5.7	1257	140
Quality Control		NR	48	53	NR	1445	NR
True Value QC		NR	50	50	NR	1413	NR
% Accuracy		NR	96	106	NR	102	NR
Relative Percent Difference		NR	6.2	6.0	NR	0.3	NR
METHODS:			SM3500-Ca D	3500-Mg E	8049	120.1	310.1

LAB NUMBER	SAMPLE ID	Cl^- (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	HCO_3 (mg/L)	pH (s.u.)	TDS (mg/L)
ANALYSIS DATE:		05/02/98	05/02/98	05/02/98	05/02/98	05/02/98	05/02/98
H3616-1*	EXISTING MW INSIDE BERM	66	113	0	275	6.68	770
H3616-4**	MW #3	66	398	0	420	7.15	930
H3616-5**	MW #4	89	507	0	168	7.57	950
H3616-6**	MW #5	59	349	0	171	7.67	892
Quality Control		1500	48.9	124	221	7.02	NR
True Value QC		1360	50.0	112	259	7.00	NR
% Accuracy		110	97.8	110	85.4	100	NR
Relative Percent Difference		10.8	2.6	-	-	0.3	
METHODS:		SM4500-Cl-B	375.4	310.1	310.1	150.1	160.1

SM=Std. Methods

Chemist

5-4-98
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 E. CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO:

Receiving Date: 04/30/98* & 05/01/98**
Reporting Date: 05/04/98
Project Owner: KOCH OIL
Project Name: KOCH KROUCH ST. MW
Project Location: KROUCH STATION

Sampling Date: 04/30/98* & 05/01/98**
Sample Type: GROUNDWATER
Sample Condition: COOL, INTACT
Sample Received By: GP
Analyzed By: GP/JC

RCRA METALS

LAB NUMBER	SAMPLE ID	As ppm	Ag ppm	Ba ppm	Cd ppm	Cr ppm	Pb ppm	Hg ppm	Se ppm
ANALYSIS DATE:		05/04/98	05/02/98	05/02/98	05/02/98	05/02/98	05/02/98	05/02/98	05/04/98
H3616-1*	EXISTING MW INSIDE BERM	<0.01	<0.05	1.12	<0.01	<0.05	<0.05	<0.002	<0.01
H3616-4**	MW #3	<0.01	<0.05	1.37	<0.01	<0.05	<0.05	<0.002	<0.01
H3616-5**	MW #4	<0.01	<0.05	1.72	<0.01	<0.05	<0.05	<0.002	<0.01
H3616-6**	MW #5	<0.01	<0.05	2.10	<0.01	0.083	<0.05	<0.002	<0.01
Quality Control		0.480	1.058	19.78	1.013	5.151	5.045	0.0179	0.485
True Value QC		0.500	1.000	20.00	1.000	5.000	5.000	0.0200	0.500
% Recovery		96.0	106	98.9	101	103	101	89.5	97.0
Relative Percent Difference		1.1	0.1	0.9	0.8	1.4	1.6	5.0	1.0
METHODS: EPA 600/4-79-020		206.2	272.1	208.1	213.1	218.1	239.1	245.1	270.2

John J. Carmody, Chemist

5-4-98
Date

H3616M.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DEE WHATLEY
703 EAST CLINTON, SUITE 103
HOBBS, NM 88240
FAX TO:

Receiving Date: 05/06/98
Reporting Date: 05/07/98
Project Number: NOT GIVEN
Project Name: KOCH KROUCH STATION
Project Location: KROUCH STATION

Sampling Date: 05/06/98
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NO.	SAMPLE ID	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)
ANALYSIS DATE:		05/06/98	05/06/98	05/06/98	05/06/98
H3628-1	M.W. #3	1.201	<0.001	<0.001	<0.003
H3628-2	M.W. #4	0.005	<0.001	<0.001	<0.003
Quality Control		0.879	0.099	0.102	0.307
True Value QC		0.100	0.100	0.100	0.300
% Recovery		97.0	99.1	102	103
Relative Percent Difference		5.8	5.9	4.9	4.9

METHODS: BTEX - EPA SW846-8260

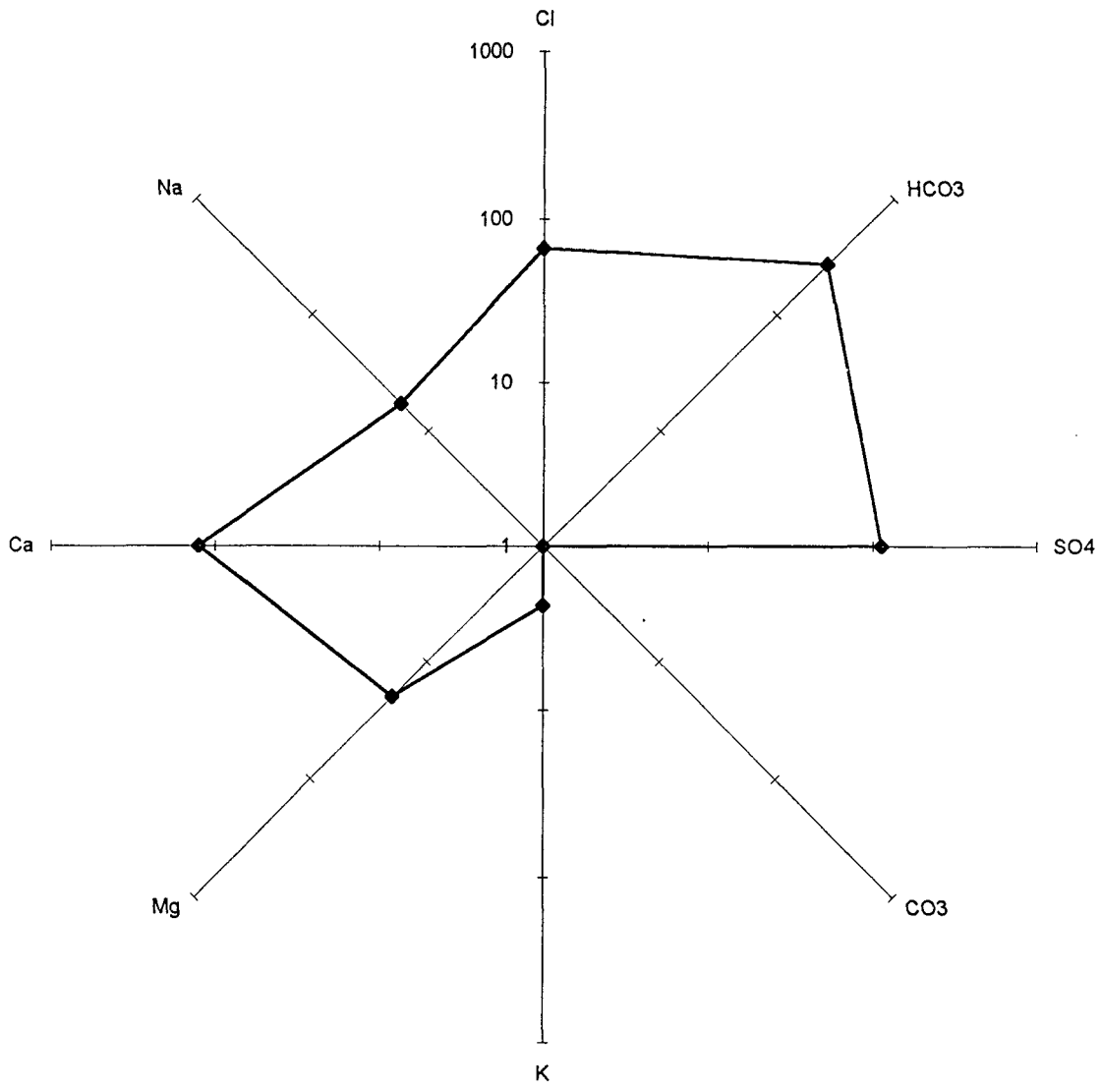
Burgess J. A. Cooke, Ph.D.

5/7/98
Date

H3628-1.XLS

Radar Plot

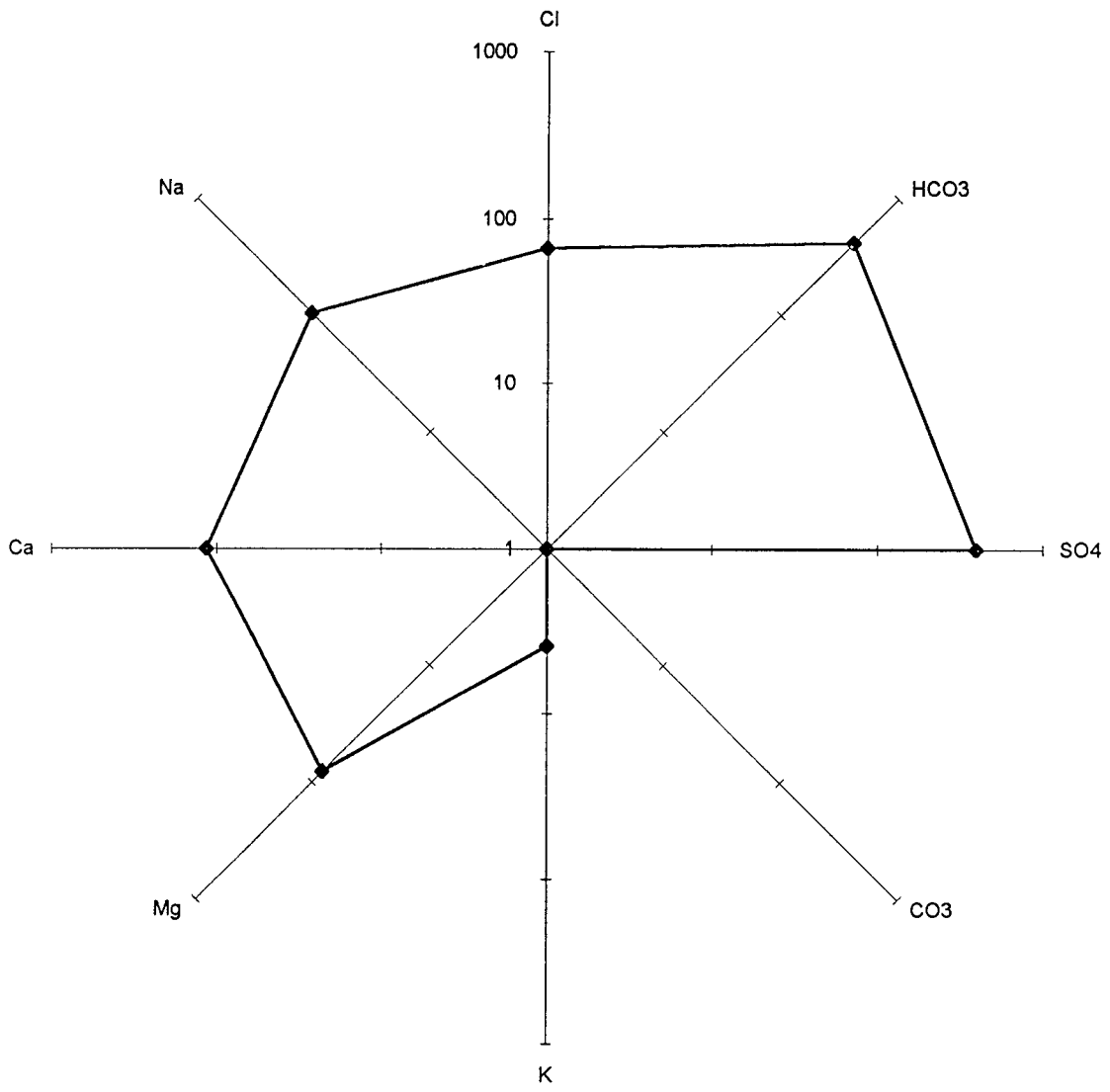
Existing MW inside berm



Cardinal Labs

Radar Plot

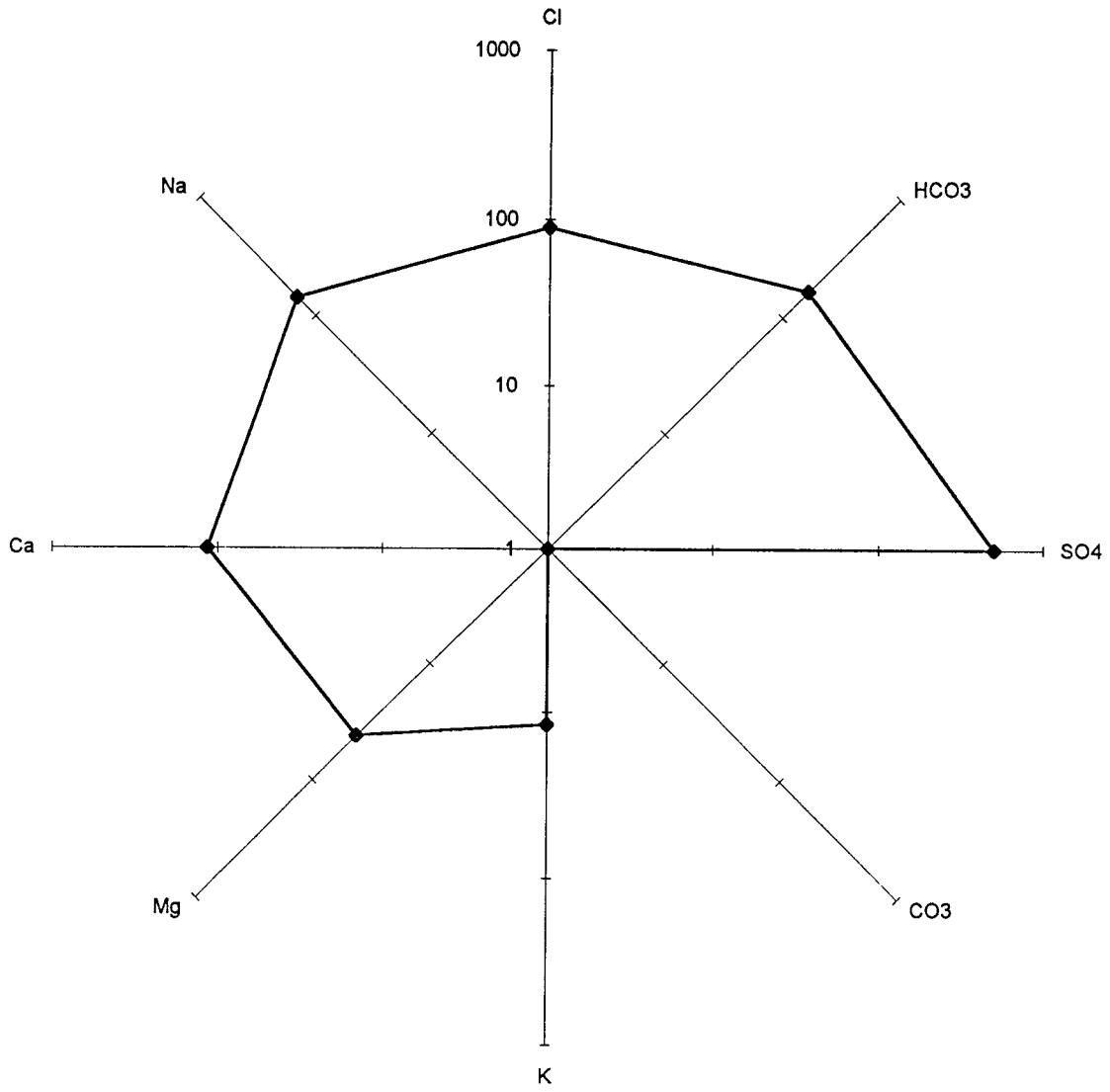
MW #3



Cardinal Labs

Radar Plot

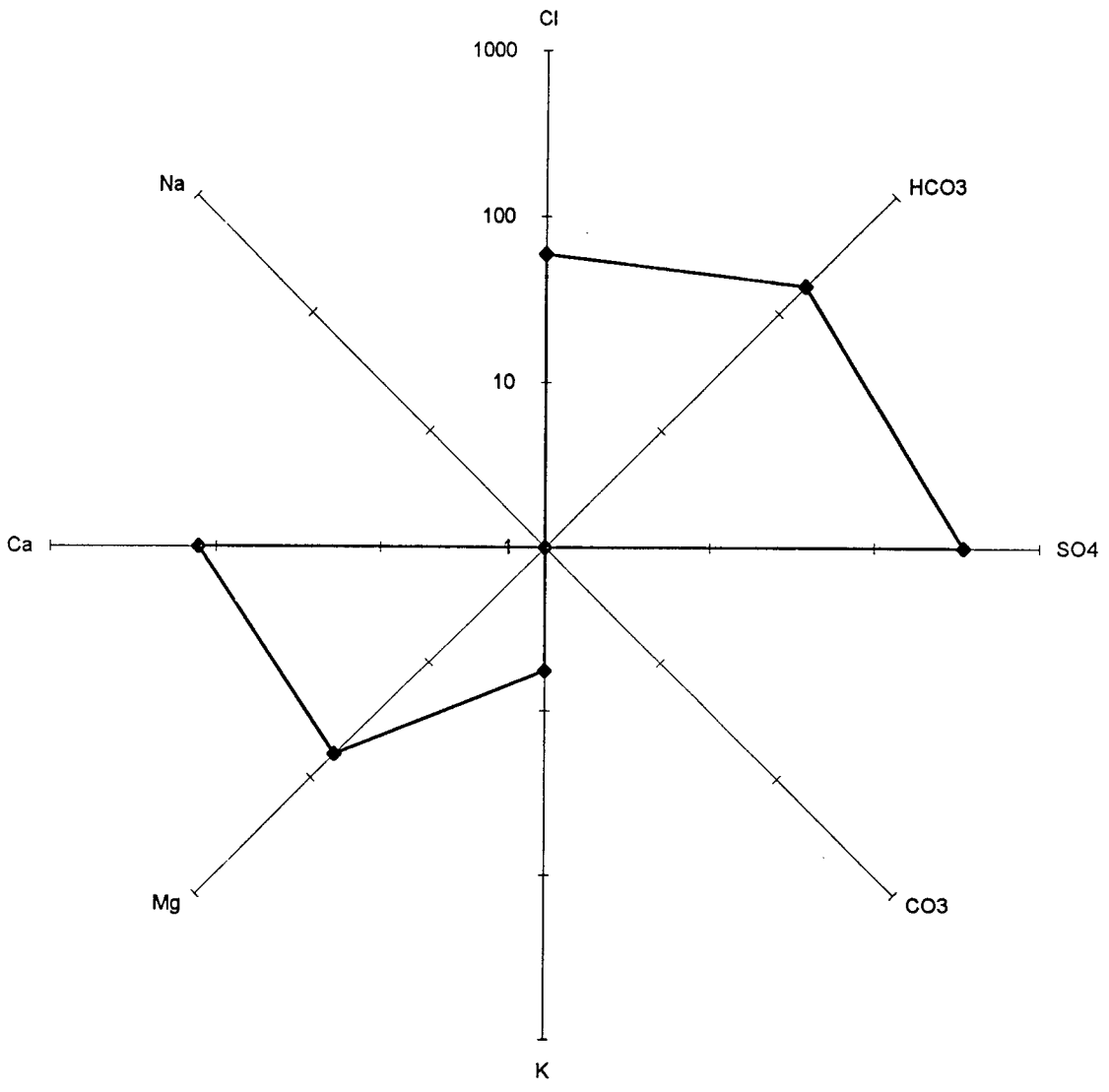
MW #4



Cardinal Labs

Radar Plot

MW #5



Cardinal Labs

Safety & Environmental Solutions, Inc.

703 E. Clinton, Suite 103, Hobbs, New Mexico 88240
(505)397-0510

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: SESI

Phone #: 397-0510

FAX #: 393-4388

Company Name & Address: 703 E. Clinton #103 Hobbs, NM

Project #:

Project Name: Crouch Monitor Wells

Project Location: Koch Crouch Station

Sampler Signature:

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE/Cool	NONE	OTHER	SAMPLING: DATE	TIME	BTEX 8120/5030	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI	WQCC metals	PAH	Major Cations / Anions
H30116-1	Existing monitor well inside berm #1	5		X							X			4/29	1000	X						X		X	X	X

Relinquished by: [signature] Date: 4/30/98 Time: 7:00 am Received by: [signature]

Relinquished by: [signature] Date: 4/30/98 Time: 9:15 am Received by: [signature]

Relinquished by: Date: 21/30/98 Time: 8:25 Received by Laboratory: Anna Hill

REMARKS

Safety & Environmental Solutions, Inc.

703 E. Clinton, Suite 103, Hobbs, New Mexico 88240
(505)397-0510

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: ESI

Phone #:

FAX #:

Company Name & Address:

Project #:

Project Name: Koch Krouch St. M.W

Project Location: Krouch station

Sampler Signature: D W.K

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	BTEX 8020/5030	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI	4 RCC Metals	PAH	Cations Anions
#36162	#1 M.W.#3 20'	1			✓						✓			4-30-98	1:04	✓	✓							✓	✓	✓
#36163	#2 M.W.#3 58'	1			✓						✓			"	"											
#36164	M.W.#3 [redacted]	4		✓							✓			"	"											

Relinquished by:	Date:	Time:	Received by:
D W.	4-30-98		
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS

Safety & Environmental Solutions, Inc.

703 E. Clinton, Suite 103, Hobbs, New Mexico 88240
(505)397-0510

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: SESI

Phone #:

FAX #:

Company Name & Address:

Project #:

Project Name: Kroach Station M.W.

Project Location: Koch Krouch Station

Sampler Signature: D. W.

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	BTEX 8020/5030	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI
H3616-4	M.W. #3	1		✓							✓			5-1-98	2:20		✓						
H3616-5a	M.W. #4 30'	1			✓						✓					✓	✓						
H3616-5	M.W. #4	3		✓							✓												

Relinquished by:	Date:	Time:	Received by:
D. W. Lee	5-1-98	2:55 pm	Scott Windham
Scott Windham	5-1-98	3:34 pm	Received by:
Relinquished by:	Date:	Time: 5/1/98 - 3:30	Received by Laboratory:

REMARKS

Safety & Environmental Solutions, Inc.

703 E. Clinton, Suite 103, Hobbs, New Mexico 88240
(505)397-0510

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: SESI

Phone #:

FAX #:

Company Name & Address:

Project #:

Project Name: Krouch St. M.W.

Project Location: Koch Krouch Station

Sampler Signature:

ANALYSIS REQUEST

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	BTEX 8020/5030	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI
6A	MW #5 30'	1			✓						✓			5-1-98	6:30	✓	✓						
6B	MW #5 57'-59'	1			✓						✓					✓	✓						
6C	MW #5	3		✓							✓												

Relinquished by:	Date:	Time:	Received by:
	5-1-98	6:30pm	
	5-1-98	7:00 pm	
		5/1/98 0700 PM	Received by Laboratory:

REMARKS

CARDINAL LABORATORIES, INC.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Page____ of ____

Company Name:	BILL TO PO #:
Project Manager:	
Address:	Company:
City: State: Zip:	Attn:
Phone #:	Address:
Fax #:	City:
Project #: Project Owner:	State: Zip:
Project Name:	Phone #:
Project Location:	Fax #:

FOR LAB USE ONLY				MATRIX						PRES.			SAMPLING	
LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID:	ICE / COOL	OTHER :	DATE	TIME
H3616-2														
-3														
-4														

ANALYSIS REQUEST

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

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

Sampler Relinquished:	Date:	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #:
	Time:		Fax Result: ☐ Yes ☐ No
Relinquished By:	Date: 04/30/98	Received By: (Lab Staff)	REMARKS:
	Time: 5:00		
Delivered By: (Circle One) Sampler - UPS - Bus - Other: Pat	Sample Condition Cool ☐ Yes ☐ No Intact ☐ Yes ☐ No	CHECKED BY: (Initials)	

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020

101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476

Page____ of ____

Company Name: SESF	BILL TO PO #:
Project Manager:	Company:
Address:	Attn:
City: State: Zip:	Address:
Phone #:	City:
Fax #:	State: Zip:
Project #: Project Owner:	Phone #:
Project Name:	Fax #:
Project Location:	

ANALYSIS REQUEST

FOR LAB USE ONLY				MATRIX						PRES.			SAMPLING	
LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID:	ICE / COOL	OTHER :	DATE	TIME
H3616-4														
H3616-5														

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

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

Sampler Relinquished:	Date:	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #:
	Time:		Fax Result: ☐ Yes ☐ No
Relinquished By:	Date: 5/1/98	Received By: (Lab Staff)	REMARKS:
	Time: 3:30		
Delivered By: (Circle One)	Sample Condition Cool: ☒ Yes ☐ No Intact: ☒ Yes ☐ No	CHECKED BY: (Initials)	
Sampler - UPS - Bus - Other:			

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020

101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476

Company Name: SESF	
Project Manager:	BILL TO PO #:
Address:	Company:
City: State: Zip:	Attn:
Phone #:	Address:
Fax #:	City:
Project #: Project Owner:	State: Zip:
Project Name: Koch Crouch Station	Phone #:
Project Location:	Fax #:

FOR LAB USE ONLY				MATRIX						PRES.			SAMPLING		ANALYSIS REQUEST
LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID:	ICE / COOL	OTHER :	DATE	TIME	
H3616-6a	Soil # 1. 30'		5			✓									
b	Soil # 2 - 57.5'					✓									
	Water -														

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

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

Sampler Relinquished:	Date:	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #:
	Time:		Fax Result: ☐ Yes ☐ No
Relinquished By:	Date:	Received By: (Lab Staff)	REMARKS:
	Time:		
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool ☑ Yes ☐ No Intact ☑ Yes ☐ No	CHECKED BY: (Initials)

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

Safety & Environmental Solutions, Inc.

703 E. Clinton, Suite 103, Hobbs, New Mexico 88240
(505)397-0510

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: SESI

Phone #:

FAX #:

Company Name & Address:

Project #:

Project Name: Mon. to-Wells Kroel Kroeck Station

Project Location: Kroeck Station

Sampler Signature: D. Whatley

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX 8020/5030	TPH 418.1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI
H3628-1	M.W. #3	2		✓							✓			5-6-98	8:00AM	✓							
-2	M.W. #4	2		✓							✓			5-6-98	8:30AM	✓							

Relinquished by:	Date:	Time:	Received by:	REMARKS
Dee Whatley	5-6-98	8:00AM		
Scott Wiedy	5-6-98	9:00AM	Burgett R. Cook	
Relinquished by:	Date:	Time:	Received by Laboratory:	