

GW - 21

REPORTS

YEAR(S):

1991



P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

August 22, 1991

Mr. Francis Cherry, Jr.
District Manager
Bureau of Land Management
Roswell District
P. O. Box 1397
Roswell, New Mexico 88202-1397

Dear Mr. Cherry:

Please find attached the summary report requested in your July 5, 1991 letter. All requested data is included. With regard to the risk assessment analysis, we have identified potential contractors having the capability to complete such a study. We have subsequently received bid proposals from four of them. At this time, we have narrowed the potential companies to two and need to resolve some questions prior to committing to the work. However, we do plan on committing to a company to perform the risk assessment analysis by August 30, 1991.

If you have any questions, please contact me at your convenience at (915) 687-8528.

Sincerely,

A handwritten signature in cursive script, appearing to read 'A. J. Kavran'.

A. J. Kavran
Environmental and Safety Supervisor

AJK/elk

Attachment

cc: ✓ D. G. Boyer - OCD
J. L. Benson
A. R. Kukla
R. F. Unger

INTRODUCTION

A letter was received from Mr. Francis R. Cherry Jr., District Manager of the Roswell Bureau of Land Management office, on July 8, 1991 in regards to the ongoing investigation at the Indian Basin Facility. In this letter, the BLM requested that a monthly summary report be submitted to their office by August 5, 1991. A subsequent letter from Mr. Cherry dated July 18, 1991 extended this deadline to August 22, 1991. Each letter requested specific data to be presented in this monthly summary. These are addressed in the following section and included in the Appendices. Copies of the two above referenced letters can be found in Appendix A.

INVESTIGATION ACTIVITIES

1. BLM Request:

Maps and cross-sections of the site.

Response:

These are included in Appendix B through E. Several cross-sections oriented both North-South and East-West from the alluvium down to the Lower Queen are presented. They illustrate in detail the subsurface geology of this area under investigation.

Appendix F and G are borehole logs and monitor well installation diagrams. They provide not only a detailed description of the lithology but also the water levels encountered during drilling, as well as the construction of the monitor wells.

2. BLM Request:

The monthly report shall include a potentiometric map of the site and copies of water well test data.

Response:

Appendix H, I, and J contain potentiometric maps of the Deep Bedrock Aquifer, the Shallow Bedrock Aquifer and the Alluvium.

Also included in Appendix K are the analytical results obtained from several of the monitor wells. This includes BTEX and chloride analysis of the water extracted from these wells.

3. BLM Request:

Fluid recovery totals.

Response:

As of August 18, 1991 total fluid recovery of the site is 3584 BC and 63,478 BW.

LIST OF APPENDICES

- A - Bureau of Land Management Correspondence
- B - Map of Cross Section Orientation
- C - Cross Section A-A'
- D - Cross Section B-B'
- E - Cross Section C-C'
- F - Borehole Logs
- G - Monitor Well Diagrams
- H - Potentiometric Map - Deep Bedrock
- I - Potentiometric Map - Shallow Bedrock
- J - Potentiometric Map - Alluvium
- K - Monitor Well Analytical Data

APPENDIX A

Bureau of Land Management Correspondence



United States Department of the Interior
BUREAU OF LAND MANAGEMENT

Roswell District Office
P.O. Box 1397
Roswell, New Mexico 88202-1397



IN REPLY
REFER TO:

1703 (064)

Marathon Oil Company
Attention: A. J. Kavran
P.O. Box 552
Midland, Tx 79702

Re: Indian Basin Gas Plant Incident

Gentlemen:

This letter clarifies the Bureau of Land Management's (BLM) position concerning characterization and remediation of the Indian Basin Gas Plant Site. The BLM reporting and approval requirements are also included in this letter.

We reviewed this case with our Washington Office Hazardous Materials Management staff. The following regulatory status is based on that review.

The materials released at the Indian Basin Gas Plant Site were condensate and produced waters. The condensate is exempted from the remediation requirements and liability under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) but is subject to regulation under the Resource Conservation and Recovery Act (RCRA). The produced waters are exempted from RCRA regulation, but if contaminated with hazardous substances, are subject to remediation and liability provisions of CERCLA. The data from the bedrock drilling provides evidence of groundwater contamination. This indicates potential for violation of the Clean Water Act (CWA), the New Mexico Water Quality Act, and CERCLA section 105(g) at the release site.

The site remediation policy set forth in this letter is designed to assure rapid assessment and response to the potential release of hazardous substances, pollutants, and contaminants. It is also meant to reduce future risk and liability to the potentially responsible parties, including the U.S. Government. We intend to assure compliance with Federal and State laws and regulations on authorized public land uses.

In cases such as this, BLM seeks advice from State regulatory agencies regarding compliance. The New Mexico Oil Conservation Division (NMOCD) is responsible for ensuring compliance with the New Mexico Water Quality Act. The standards established by the NMOCD for characterization and remediation at the site are the minimum acceptable standards. The BLM has the authority to establish more stringent standards. Characterization and remediation actions at the site require the written approval of the BLM authorized officer before work begins.

MCR

JUL 8 1991

JUL 05 1991
Environmental & Safety

Site characterization and remediation require effective communication and teamwork. To achieve this, the BLM requires Marathon holds weekly meetings with BLM and NMOCD. The first meeting will be on July 11, 1991, at the Roswell District Office at 1:00 p.m. Future meetings will be held every Thursday.

We require a written report of the past weeks' activities at these meetings. The minimum data required in these reports include drilling data, sample reports, water well test data, and recovery/remediation activities. During the meeting we can discuss future work and the need for BLM personnel on site over the weekend. We will discuss additional reporting needs during the first meeting.

The BLM also requires monthly summary reports. The first summary report is due August 5, 1991. The minimum data required in the first reports includes the following:

1. All maps and cross sections presented at the June 10, 1991, meeting. This information shall be updated to include the new data from the bedrock drill holes.
2. A hydrologic report based on "real time" data. The report shall at a minimum include a potentiometric map of the site and copies of water well test data.

The BLM requires a risk assessment analysis before any remedial actions begin at the site. This analysis is also due August 5, 1991. The following items comprise a risk assessment analysis.

1. Hazard Identification: used to determine if there is a causal relationship between the materials released at the site and health effects in man and animals.
2. Dose-Response Assessment: used to determine whether known or predicted levels can cause the effect based upon epidemiological and laboratory bio-assays.
3. Exposure Assessment: used to determine the potential routes of exposure and levels of exposure. This includes a pathway analysis.
4. Risk Characterization: describes the nature of the risk and the uncertainty.

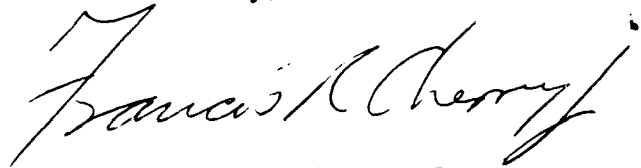
The goal of the risk assessment/risk management process is to identify risks, place risks in perspective, and manage the risks in a cost-effective manner to protect public health and the environment.

One goal in this project is to meet the clean-up and documentation requirements set by Federal and State law. Marathon shall follow the investigation and clean up guidance required by the National Contingency Plan (NCP). The BLM must also protect that public health and public land resources. Pursuant to provisions of the Federal Land Policy and Management Act (FLPMA), all actions at the site require BLM approval.

The first summary report and the risk assessment analysis are due August 5, 1991. The BLM will not authorize any additional remedial or clean up actions at the site until these reports are reviewed and approved. The BLM may seek technical and regulatory review assistance from the BLM Service Center staff, the New Mexico Environment Department, the Environmental Protection Agency, or consultants.

If you have any questions concerning this letter, please contact Al Collar at 505-622-9042.

Sincerely,

A handwritten signature in cursive script, reading "Francis R. Cherry, Jr.", written in dark ink.

Francis R. Cherry, Jr.
District Manager



United States Department of the Interior
BUREAU OF LAND MANAGEMENT

Roswell District Office
P.O. Box 1397
Roswell, New Mexico 88202-1397



IN REPLY
REFER TO:
1703 (064)

JUL 18 1991

Marathon Oil Company
Attention: A.J. Kavran
P.O. Box 552
Midland, Tx 79702

Re: Indian Basin Gas Plant Incident

Gentlemen:

This letter is the approval letter for the Site Characterization Plan (SCP) for the Indian Basin Gas Plant incident, as amended by the Phase II Work Plan. The SCP and amendments detail the method to be used for delineation of the contaminated area. Further amendments to this plan require written approval from the Bureau of Land Management (BLM) and Oil Conservation Division (OCD) before additional work begins.

As we discussed on July 11, 1991, the main purpose of our weekly meetings is to establish a coordinated effort for characterization and remediation of the spill area. In addition to the meetings, you are required to submit a written report detailing the past weeks' activities every week.

We also discussed the monthly summary report and risk assessment analysis. The monthly summary provides the BLM and OCD with updated geologic and hydrologic data, fluid recovery totals, and other pertinent information. The risk assessment analysis is required risk management. It also serves as a guide to remedial actions. As requested, we have extended the deadline for these reports. The due date is August 22, 1991.

If you have any questions regarding this letter or actions at the site, please contact Al Collar or Tim Kreager at the Roswell District Office at (505) 622-9042.

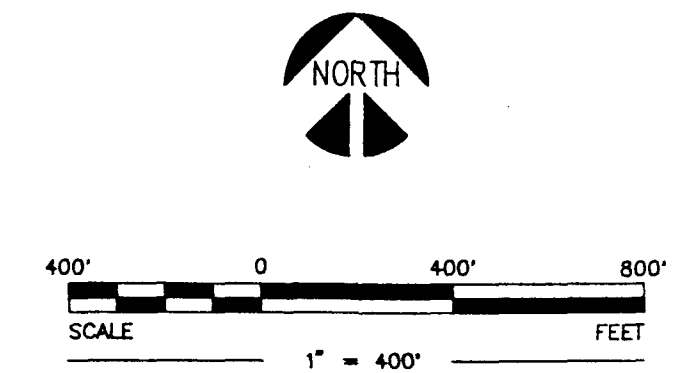
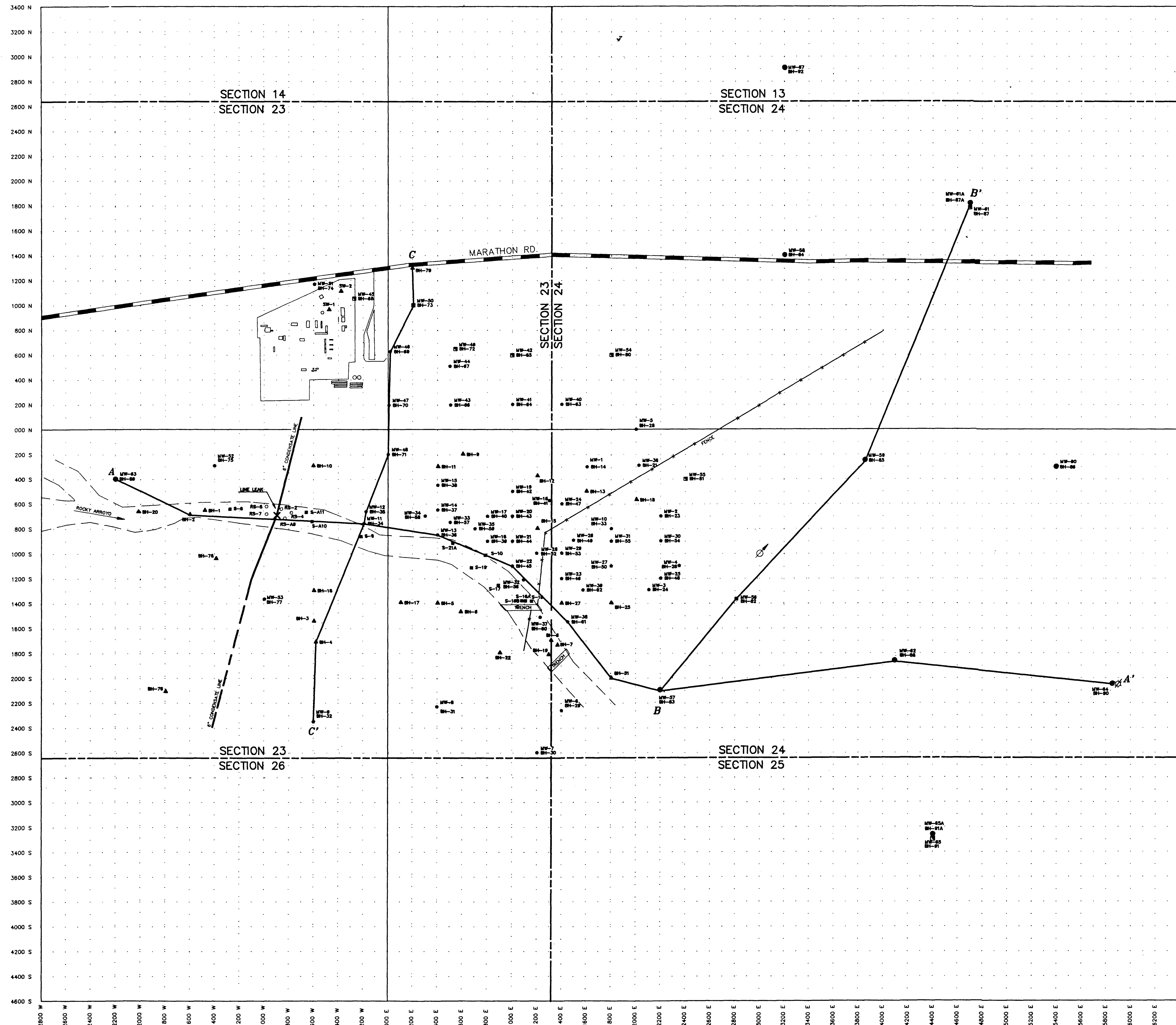
Sincerely,

Francis R. Cherry, Jr.
District Manager

APPENDIX B

Map of Cross Section Orientation

INDIAN BASIN GAS PLANT ARTESIA, NEW MEXICO



LEGEND

- BH-3 ▲ SOIL CHARACTERIZATION BOREHOLE
- MW-1 ● SHALLOW ALLUVIUM GROUNDWATER MONITORING WELL
- MW-63 ● DEEP BEDROCK WELL LOCATION
- MW-61 ■ SHALLOW BEDROCK WELL LOCATION
- BH-87 ●
- SW-1 ▲ WATER SUPPLY WELL
- RS-2 ○ 4-INCH PVC RECOVERY SUMP
- S-A11 ■ 24-INCH GALVANIZED STEEL RECOVERY SUMP
- ✕ DRY HOLE, PLUGGED & ABANDONED
- ⊙ INJECTION / DISPOSAL WELL
- A— LOCATION OF GEOLOGICAL CROSS-SECTION

DRAFT

Figure Title: LINE OF GEOLOGICAL CROSS SECTIONS A-A', B-B' & C-C'		Client: MARATHON OIL COMPANY	
Document Title: PHASE II INVESTIGATION		Location: INDIAN BASIN GAS PLANT	
ROBERTS/SCHORNICK & ASSOCIATES, INC. Environmental Consultants 3700 West Robinson, Suite 200 Birmingham, Alabama 35202 Phone: (205) 281-3886 Fax: (205) 281-3878		DATE: 7/9/91	PREPARED BY: B.J.S.
		SCALE: 1"=400'	CHECKED BY: B.J.S.
		PROJECT NO: 91029 M54	DRAFTED BY: RML
		PLATE NO.:	

APPENDIX C

Cross Section A-A'

APPENDIX D

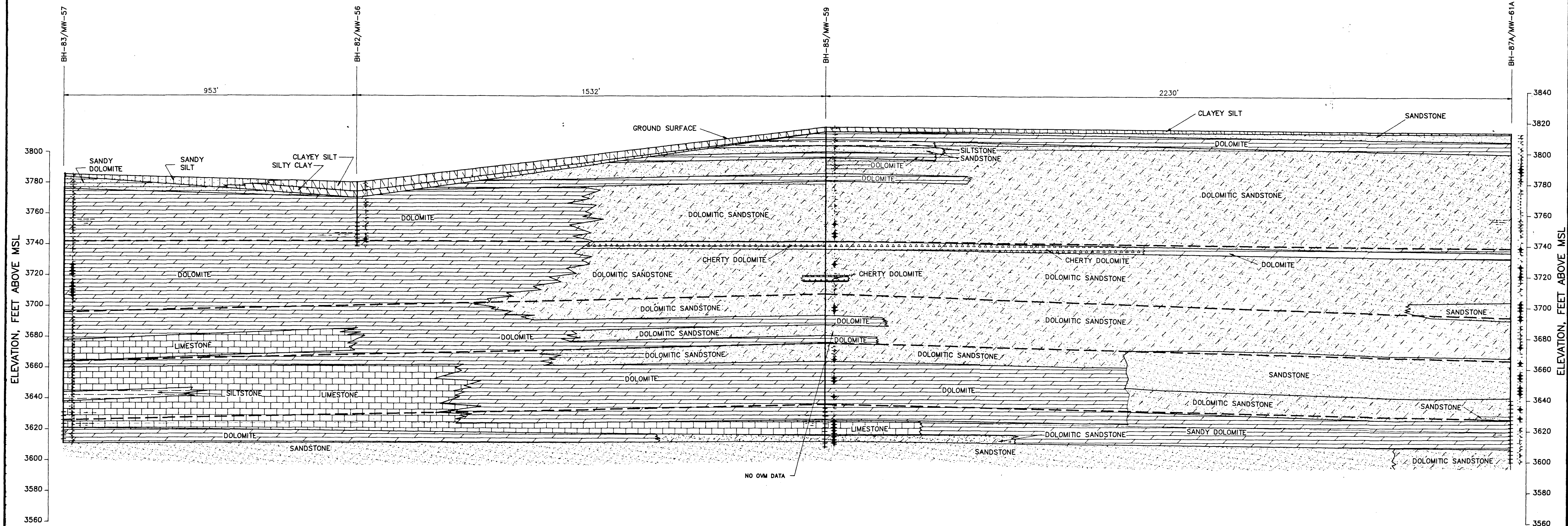
Cross Section B-B'

B

SOUTHWEST

B'

NORTHEAST



LEGEND:

	DOLOMITE		GRAVEL		CLAY
	LIMESTONE		DOLOMITIC		
	SILT		SANDY		
	SANDSTONE		CLAYEY		
	SILTSTONE		CHERTY		

--- GROUNDWATER LEVEL AT TIME OF DRILLING

- - - 24 Hr. STABILIZED GROUNDWATER LEVEL

||||| MONITOR WELL SCREEN INTERVAL

- - - - GAMMARAY MARKER

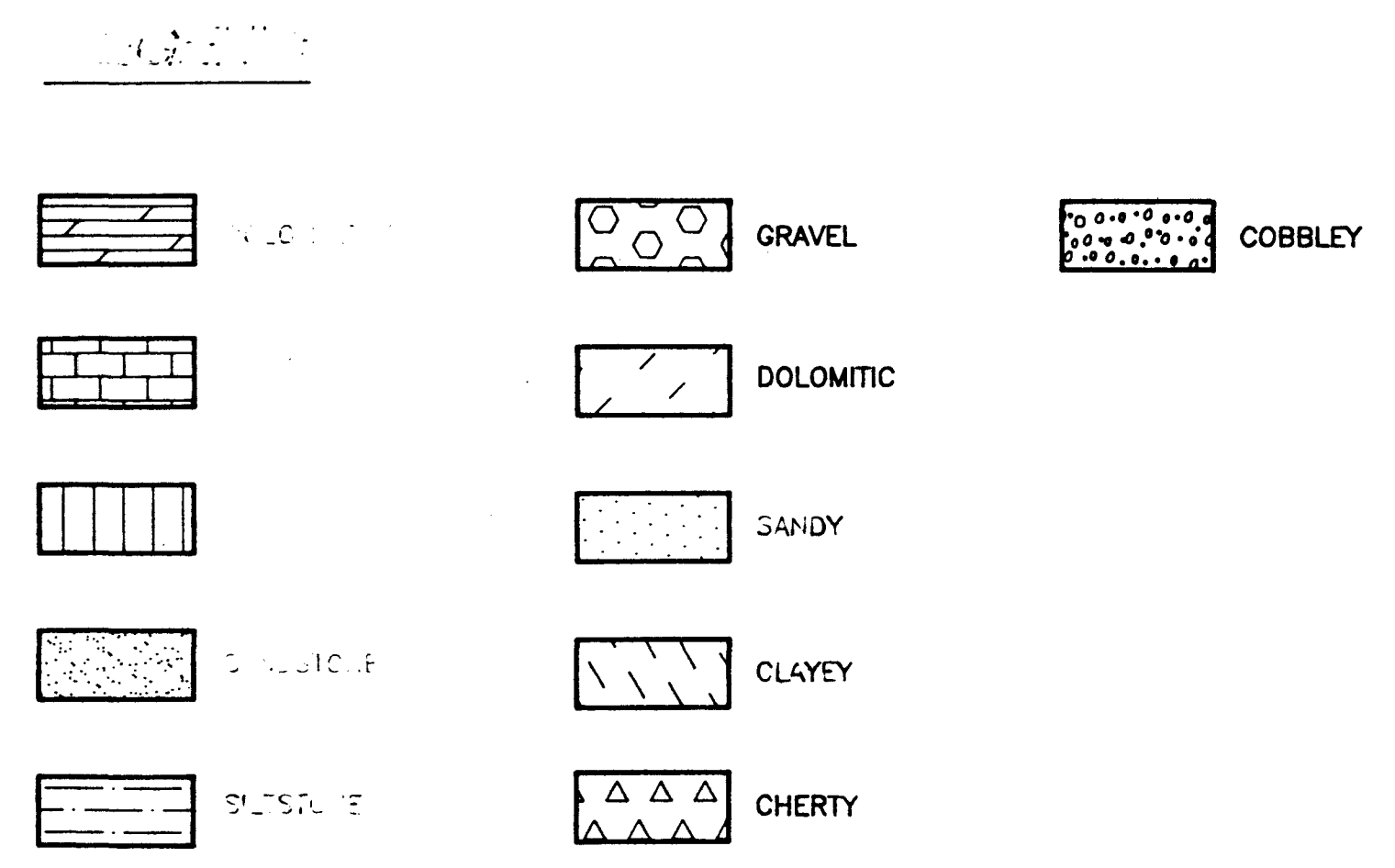
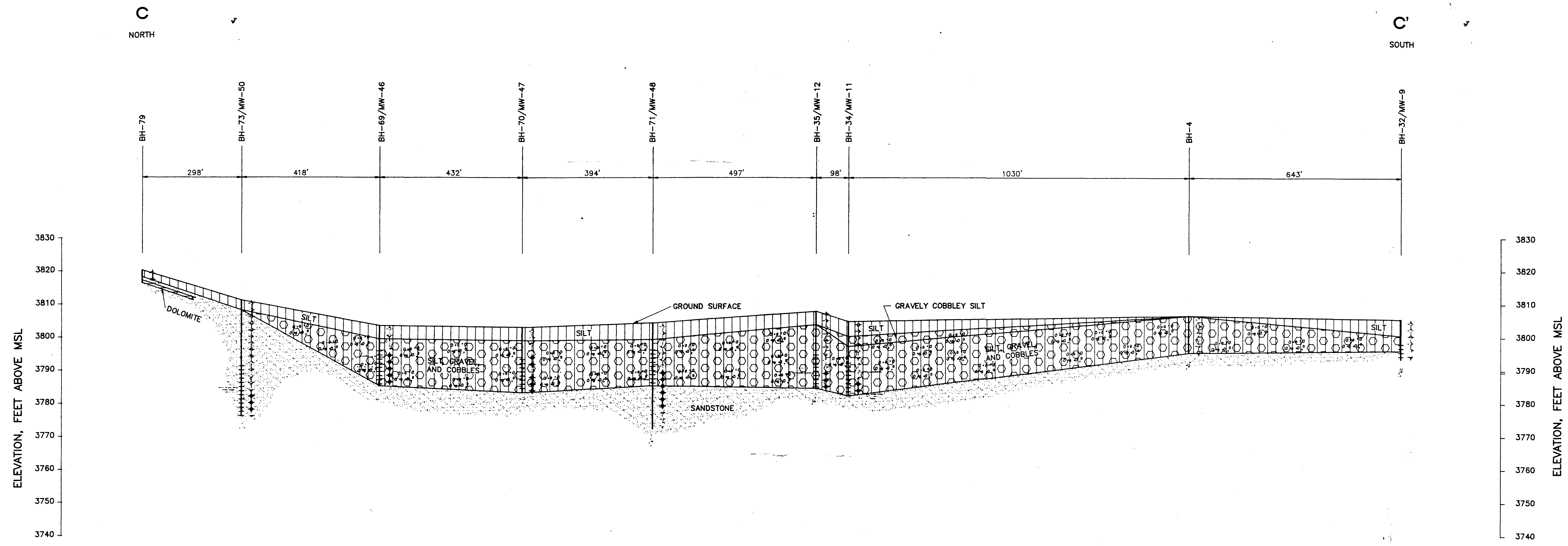
SCALE: VERTICAL: 1"=30'
HORIZONTAL: 1"=150'
VERTICAL EXAGGERATION x5

DRAFT

Figure Title: GEOLOGICAL CROSS-SECTION B-B'	Client: MARATHON OIL COMPANY
Document Title: PHASE II INVESTIGATION	Location: INDIAN BASIN GAS PLANT
ROBERTS/SCHORNICK & ASSOCIATES, INC. Environmental Consultants 2700 West Robinson, Suite 200 Wichita, Oklahoma 67222 (405) 281-3585	DATE: 8/16/91 SCALE: AS SHOWN PROJECT NO: 91029.01 PREPARED BY:D.H.C. CHECKED BY:B.J.S. DRAFTED BY:S.A.R. DRAWING NO.

APPENDIX E

Gross Section C-C'



- GROUNDWATER LEVEL AT TIME OF DRILLING
- 24 Hr. STABILIZED GROUNDWATER LEVEL
- NO ACCESS TO MEASURE GROUNDWATER LEVEL (PUMPING)
- GROUNDWATER NOT OBSERVED WHILE DRILLING
- MONITOR WELL SCREEN INTERVAL

SCALE: VERTICAL: 1"=15'
 HORIZONTAL: 1"=150'
 VERTICAL EXAGGERATION x10

Figure Title: GEOLOGICAL CROSS-SECTION C-C'		Client: MARATHON OIL COMPANY	
Document Title: PHASE II INVESTIGATION		Location: INDIAN BASIN GAS PLANT	
ROBERTS/SCHORNICK & ASSOCIATES, INC. Environmental Consultants 3700 West Robinson, Suite 200 Norman, Oklahoma 73078 (405) 321-3896		DATE: 8/16/91	PREPARED BY: D.H.C.
		SCALE: AS SHOWN	CHECKED BY: B.J.S.
		PROJECT NO: 91029.01	DRAFTED BY: S.A.R.
			DRAWING NO.

DRAFT

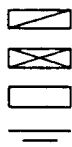
APPENDIX F

Borehole Logs

[illegible]

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0										SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OWM READING	RECOVERY	DEPTH			
		Start: 10:00 Stop: 10:25																		BACKGROUND OVM READING: SOIL: <u>0.1</u> PPM AIR: <u>0.2</u> PPM
	0	GROUND SURFACE: 3809.5														NS			2.5	0
	3.0	BOULDERY COBBLELY GRAVELLY SILT: NONIMBRI-CATED, UNCONSOLIDATED, BOULDERS-COBLES FROM 10CM TO 3M., DOLOMITE, WELL ROUNDED., PEBBLES AND GRAVEL	GM													1	1.0	1.2	3.7	
		AUGER REFUSAL AT 3.0' GROUNDWATER NOT OBSERVED														NR			4.0	
	5	SOIL VENT AT 2.37'																		5
		BOREHOLE OVM READING: 0.3 PPM																		
		BACKGROUND: 0.3 PPM																		
		SOIL VENT OVM READING AFTER 24 HOURS: 0.1 PPM																		
	10																			10
	15																			15
	20																			20
	25																			25
	30																			30
	35																			35



SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
 L LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-2**

DATE DRILLED 4/19/91
 DRILLING METHOD HSA
 DRILLED BY SHB
 LOGGED BY MJL
 CHECKED BY BJS
 DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0											SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH				
		Start: 14:45 Stop: 16:19																		BACKGROUND OVM READING: SOIL: <u>0.1</u> PPM AIR: <u>0.1</u> PPM	
		GROUND SURFACE: 3805.3																			
	0	BOULDERY COBBLELY SILT: UNCONSOLIDATED, COBBLES AND BOULDERS FROM 10CM TO 3M., ROUNDED., DOLOMITIZED, DRY, GRAYISH BROWN, 10 YR 5/2	GM													1	0.1		1.5	0	
																					2.5
																					3.3
																					4.0
	5																				5.1
																					5.5
																					9.0
	10																				10.2
																					10.5
	12.7	AUGER REFUSAL AT 12.7' GROUNDWATER NOT OBSERVED DURING DRILLING BOREHOLE OVM READING: 21 PPM														4	0.3	1.2	12.0	5	
																					12.4
																					12.7
	15																				
	20																				
	25																				
	30																				
	35																				

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-3**

DATE DRILLED 4/19/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0													SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		Start: 10:45 Stop: 11:30 GROUND SURFACE: 3806.6																				
	0	BOULDERY COBBLELY GRAVELLY SILT: UNCONSOLIDATED, LIGHT BROWNISH GRAY TO GRAYISH BROWN, 10 YR 6/2 TO 5/2, DRY, VERY HARD DRILLING, COBBLESTOBOULDERS FROM 10CM TO 2M., GRAVELLY, ROUNDED., POORLY SORTED	GM															1	0.2		1.0	0
					NS														2.5			
					2	0.4	1.5												4.0			
	5				3	0.4	1.5												5.5	5		
					NS																	
	10																	4	0.2	0.8	9.8	10
	11.0	DOLOMITE: GRAYISH BROWN, 10 YR 5/2, MASSIVE, HARD	DOLOMITE															NR			10.5	
	11.2																					
		AUGER REFUSAL AT 11.2'																				
		GROUNDWATER NOT OBSERVED DURING DRILLING																				
	15	BOREHOLE OVM (THROUGH AUGERS): 0.1 PPM																				15
		SOIL VENT INSTALLED TO 8.0'																				
		SOIL VENT HEADSPACE AFTER 24 HOURS: 0.1 PPM																				
	20																					20
	25																					25
	30																					30
	35																					35



SPLIT-SPOON SAMPLER



STANDARD PENETRATION TEST



UNDISTURBED SAMPLE



WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)



LABORATORY TEST LOCATION



PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-4**

DATE DRILLED 4/22/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

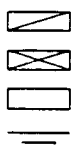
3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 17:50 Stop: 18:33 GROUND SURFACE: 3797.8																		
	0	BOULDERY COBBLELY SILT: GRAYISH BROWN, 10 YR 5/2 TO LIGHT BROWNISH GRAY, 10 YR 6/2, COBBLES-BOULDERS FROM 10CM TO 1.5M., GRAVELLY, DRY, VERY HARD DRILLING	GM												1	0.7		1.0	0	
													NS			2.5				
													2	1.8	1.2	3.7				
													NR			4.0				
	5												3	0.8	1.2	5.2				
										NR			5.5							
	7.5	AUGER REFUSAL AT 7.5 GROUNDWATER NOT OBSERVED DURING DRILLING BOREHOLE OVM : 1.2 PPM SOIL VENT TUBE AT 6.25' BOREHOLE OVM FROM SOIL VENT TUBE AFTER 24 HOURS: 7.0 PPM													4	0.6	1.2	7.2		
												NR			7.5					
	10																			10
	15																			15
	20																			20
	25																25			
	30																30			
	35																35			



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-5**

DATE DRILLED 4/20/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS									SAMPLE				REMARKS	
					PPM X 1.0									NUMBER	OVM READING	RECOVERY	DEPTH		
					2	4	6	8	10	12	14	16	18						
		Start: 9:55 Stop: 10:10																	BACKGROUND OVM READING: SOIL: <u>0.1</u> PPM AIR: <u>0.1</u> PPM
	0	GROUND SURFACE: 3781.6																	
		BOULDERY COBBLELY GRAVELLY SILT: LIGHT GRAYISH BROWN, 10 YR 6/2, POORLY SORTED, GRAVEL FROM 1.0CM TO 10CM., COBBLES-BOULDERS FROM 10CM TO 1M., ROUNDED., DOLOMITIZED	GM											NS					
	4.0													1	0.1	0.5	2.5		
														NR			3.0		
														NS			4.0		
	5	DOLOMITE: LIGHT BROWN, 10 YR 5/2, MASSIVE, JOINTED, FRACTURED	DOLOMITE																
		AUGER REFUSAL AT 4.0'																	
		GROUNDWATER NOT OBSERVED DURING DRILLING																	
		BOREHOLE OVM THROUGH AUGERS: 0.1 PPM																	
	10	SOIL VENT TUBE AT 2.5'																	
		SOIL VENT OVM READING AFTER 24 HOURS: 0.1 PPM																	
	15																		
	20																		
	25																		
	30																		
	35																		



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-6**

DATE DRILLED 4/21/91
DRILLING METHOD HSB
DRILLED BY HSB
LOGGED BY MJL
CHECKED BY BJS
DRAWN BY: SAR

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0										SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 10:50 Stop: 11:40																		
	0	GROUND SURFACE: 3782.5																		
		BOULDERY COBBLELY GRAVELLY SILT: LIGHT GRAYISH BROWN TO GRAYISH BROWN, 10 YR 5/2. UNCONSOLIDATED, DRY, COBBLES-BOULDERS FROM 10CM TO 3M., ROUNDED., DOLOMITE, POORLY SORTED	GM	0.0 to 4.0												NS				0
	4.0																			
	4.1	DOLOMITE: GRAYISH BROWN, 10 YR 6/2, MASSIVE FRACTURED, JOINTED	DOLOMITE													NR	0.1	1.4	2.5	
	5	AUGER REFUSAL AT 4.0'																		5
		GROUNDWATER NOT OBSERVED DURING DRILLING																		
		BOREHOLE OVM READING (THROUGH AUGERS): 0.1 PPM																		
	10	SOIL VENT TUBE INSTALLED TO 2.0'																		10
		SOIL VENT HEADSPACE READING AFTER 24 HOURS: 0.1 PPM																		
	15																			15
	20																			20
	25																			25
	30																			30
	35																			35



SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
 L LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SO. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-7**

DATE DRILLED 4/21/91
 DRILLING METHOD HSA
 DRILLED BY SHB
 LOGGED BY MJL
 CHECKED BY BJS
 DRAWN BY: SAR

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0										SAMPLE				REMARKS		
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH				
		Start: 16:31 Stop: 17:03																			
		GROUND SURFACE: 3795.9																			
	0	BOULDERY COBBLELY SILT: UNCONSOLIDATED, GRAYISH BROWN, 10 YR 5/2, POORLY SORTED, ROUNDED, COBBLES-BOULDERS FROM 10CM TO 2M., GRAVELLY, VERY HARD DRILLING	GM												1	0.7		1.0	0		
																	NS				
	5																2	0.4	0.8	4.8	5
																	NR			5.5	
																	NS				
	10														3	1.0	0.9	9.0	10		
	11.0														NR			10.5			
	11.2	DOLOMITE: GRAYISH BROWN, 10 YR 5/2, MASSIVE VERY HARD	DOLOMITE												NR			11.2			
		AUGER REFUSAL AT 11.2'																			
		BOREHOLE OVM READING (THROUGH AUGERS): 0.1 PPM																			
	15	GROUNDWATER NOT OBSERVED DURING DRILLING																	15		
		SOIL VENT TUBE INSTALLED TO 8.0'																			
		SOIL VENT HEADSPACE 24 HOURS: 0.1 PPM																			
	20																		20		
	25																		25		
	30																		30		
	35																		35		

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-8**

DATE DRILLED 4/22/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0										SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 12:20 Stop: 13:12 GROUND SURFACE: 3798.8																		
	0	CLAYEY SILT: YELLOWISH BROWN, 10 YR 5/4, DRY, UNCONSOLIDATED, ROOTLETS TO 1.0', CALICHE VEINS BELOW 1.7', VERY FINE QUARTZ, 60% SILT, 40% CLAY, VERY LOW PLASTICITY	ML												1	0.4	2.6		0	
												2	0.2		2.0					
												NR			2.6					
												3		2.0	3.0					
	5																		5	
	6.0	COBBLELY BOULDERY SILT: GRAYISH BROWN, 10 YR 5/2, WELL ROUNDED, POORLY SORTED UNCONSOLIDATED	GM												NR			5.0		
												NS			6.1					
	9.5														NR			9.0		
	10	AUGER REFUSAL AT 9.5'																9.5	10	
		GROUNDWATER NOT OBSERVED DURING DRILLING																		
		BOREHOLE OVM READING: 0.9PPM																		
		SOIL VENT TUBE INSTALLED TO 7.5'																		
	15	SOIL VENT OVM READING AFTER 24 HOURS: 0.9 PPM																	15	
		BACKGROUND: 0.5 PPM																		
	20																		20	
	25																		25	
	30																		30	
	35																		35	

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-9**

DATE DRILLED 4/23/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

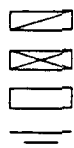
ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0													SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		Start: 16:37 Stop: 17:05 GROUND SURFACE: 3808.9																				
	0	CLAYEY SILT: BROWN, 10 YR 5/3, DRY, VERY LOW PLASTICITY, VERY FINE QUARTZ, 60% SILT, 40% CLAY, CALICHE VEINS, UNCONSOLIDATED	ML															1	0.3		1.0	0
					NS															2.5		
					2	0.7	1.5													4.0		
	5				3	0.5	0.8													4.8	5	
	5.5				NR															5.5		
		BOULDERY COBBLELY SILT: GRAYISH BROWN, 10 YR 5/2, UNCONSOLIDATED, POORLY SORTED, COBBLES/BOULDERS FROM 10 CM TO 1M	GM															NS				
					4	0.4	0.5													9.0		
	10				NS															9.5	10	
					5	0.2	0.2													13.0		
	13.2																			13.2		
	15	AUGER REFUSAL AT 13.2'																				15
		GROUNDWATER NOT OBSERVED DURING DRILLING																				
		BOREHOLE OVM THROUGH AUGER: 7.8 PPM																				
	20																					20
	25																					25
	30																					30
	35																					35



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

└─ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-10**

DATE DRILLED 4/23/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

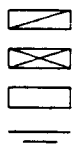
PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 21.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 11:17 Stop: 12:04 GROUND SURFACE: 3801.2																		
	0	CLAYEY SILT: BROWN, 2.5 YR 5/2, DRY, MOD. COMPACTED, VERY LOW PLASTICITY, CALICHE VEINS BELOW 3.0'; 60% SILT, 40% CLAY, VERY FINE QUARTZ	ML												1	0.3		1.0	0	
													NS			2.5				
													2	0.1	1.5	4.0				
	5												3	0.1	1.2	5.2				
													NR			5.5				
	6.5	BOULDERY COBBLELY SILT: GRAYISH BROWN, 10 YR 5/2, UNCONSOLIDATED, POORLY SORTED, COBBLES/BOULDERS FROM 10CM TO 0.5M, GRAVELLY, ROUNDED	GM														9.0			
													4	0.1	1.1	10.1				
													NR			10.5				
	10												NS							
																13.0				
	13.0	DOLOMITE: GRAY, 5 Y 6/1, CRYSTALLINE, MASSIVE VERY HARD, NONEFFERVESCENT ON SURFACE, EFFERVESCENT ON SCRATCHED SURFACE WITH HCL	DOLOMITE											5	420.0	0.1	13.1			
	13.1																			
	15	BORING TERMINATED AT 13.1'																	15	
		GROUNDWATER NOT OBSERVED DURING DRILLING																		
		BOREHOLE OVM READING AT 13.0' THROUGH AUGERS: 152 PPM																		
	20																		20	
	25																		25	
	30																		30	
	35																		35	



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-11**

DATE DRILLED 4/24/91
DRILLING METHOD HSA
DRILLED BY SHB
LOGGED BY MJL
CHECKED BY BJS
DRAWN BY: SAR

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 11.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.1 PPM AIR: 0.1 PPM	
		Start: 14:55 Stop: 16:04 GROUND SURFACE: 3793.7																	
	0	CLAYEY SILT: BROWN, 7.5 YR 5/2, DRY, UNCONSOLIDATED, VERY LOW PLASTICITY, CALICHE VEINS, 60% SILT, 40% CLAY, VERY FINE QUARTZ	ML											1	0.2		1.0		0 -
														NS			2.5		
														2	0.3	1.3	3.8		
														NR			4.0		
														3	0.3	1.0	5.0		
	5.2	BOULDERY COBBLELY SILT: GRAYISH BROWN, 10 YR 5/2, DRY, UNCONSOLIDATED, POORLY SORTED, COBBLES/BOULDERS FROM 10CM TO 50CM, ROUNDED, GRAVELLY	GM											NR			5.5	5 -	
														NS					
																	9.0		
														4	0.2	0.8	9.8		
	10													NR			10.5	10 -	
														NS					
	12.1		CL											5	220.0		12.0		
	12.3	CLAYEY SAND: BROWN, 7.5 YR 5/2, MOIST, MED. PLASTICITY, QUARTZ, FINE GRAIN, STRONG HYDROCARBON ODOR, SAMPLE WET WITH HYDROCARBON, 60% CLAY, 25% SAND, 15% SILT												NR		0.2	12.2		
	12.5	DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 5/2, MASSIVE, VERY HARD	DOLOMITE														12.5		
	15	AUGER REFUSAL AT 12.5' BOREHOLE OVM READING THROUGH AUGERS: 5.0 PPM GROUNDWATER NOT OBSERVED DURING DRILLING																15 -	
	20																	20 -	
	25																	25 -	
	30																	30 -	
	35																	35 -	

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-12**

DATE DRILLED 4/24/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 16.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 10:15 Stop: 11:55																		
		GROUND SURFACE: 3790.6																		
	0	CLAYEY SILT: BROWN, 7.5 YR 5/2, DRY, VERY LOW PLASTICITY, UNCONSOLIDATED FROM 0.0 TO 1.5', MOD. COMPACTED BELOW 1.5', CALICHE VEINS, 60% SILT, 40% CLAY, VERY FINE QUARTZ	ML													1	0.6		1.0	0
																NS			2.5	
																2	0.2	1.2	3.7	
																NR			4.0	
																3	0.2	1.5		
	5															NS			5.5	5
	8.0																			
		BOULDERY COBBLELY SILT: GRAYISH BROWN, 10 YR 5/2, UNCONSOLIDATED TO MOD. COMPACTED, GRAVELLY, COBBLES/BOULDERS FROM 5 CM TO 20 CM, GRAVEL TO 5 CM., ROUNDED TO SUBROUNDED	GM													4	0.2	1.5	9.0	
	10															NS			10.5	10
	14.0															5	320.0	0.1	14.0	
	14.1															NR			14.1	
	14.2																		14.2	
	15	SANDY CLAY: GRAYISH BROWN, 10 YR 5/2, WET WITH HYDROCARBON, STRONG ODOR, FINE QUARTZ DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 6/2, MASSIVE	CL DOLOMITE																	15
		AUGER REFUSAL AT 14.2'																		
		BOREHOLE OVM THROUGH AUGERS AT 13.5': 220 PPM																		
	20	GROUNDWATER NOT OBSERVED DURING DRILLING																		20
	25																			25
	30																			30
	35																			35

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-13**

DATE DRILLED 4/25/91

DRILLING METHOD HSA

DRILLED BY HSB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 110											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 13:38 Stop: 14:30 GROUND SURFACE: 3791.4																		
	0	CLAYEY SILT: BROWN, 7.5 YR, DRY FROM 0.0 TO 9.0'. LOW TO MED. PLASTICITY, VERY FINE QUARTZ 60% SILT, 40% CLAY	ML													1	0.2		1.0	0
					NS													2.5		
					2	0.2	1.1											3.6		
					NR													4.0		
					NS															
	5																			5
		MOIST BELOW 9.0'														3	0.4	0.8	9.0	
	10	SATURATED BELOW 11.26'														NR			9.8	10
					NS													10.5		
	13.5	SANDY GRAVEL: DARK GRAY, 10 YR 5/1, COARSE GRAVEL, FINE GRAIN, SATURATED, QUARTZ, ROUNDED TO SUBANGULAR, POORLY SORTED, STRONG ODOR DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 5/2, MASSIVE AUGER REFUSAL AT 15.1'	GM													6	11.1	1.5	13.5	
	15				7	220.0												14.7		
	15.1				NR													15.1		
			DOLOMITE																	15
	20																			20
	25																			25
	30																			30
	35																			35

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-14 (MW-1)**

DATE DRILLED **4/25/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 16:40 Stop: 17:40																		
		GROUND SURFACE: 3794.1																		
	0	CLAYEY SILT: BROWN, 7.5 YR 5/2, DRY, VERY LOW PLASTICITY, UNCONSOLIDATED FROM 0.0 TO 1.5', CAUCHE DEPOSITS, 60% SILT, 40% CLAY	ML	/ / / /												1	0.2		1.0	0
																NS			2.5	
																2	0.8	0.8	3.3	
																NR			4.0	
	4.2															3	1.0	0.9	4.9	
	5	GRAVELLY COBBLELY SILT: UNCONSOLIDATED TO MOD. CONSOLIDATED, PEBBLES TO 2 CM., COBBLES TO 10 CM., ROUND	GM	○ ○ ○ ○												NR			5.0	5
																NS				
																4	2.6	0.6	9.0	
	10															NR			9.6	10
																NS			10.5	
																			13.0	
	13.1	AUGER REFUSAL AT 13.1'														5	2.0	0.1	13.1	
	15	GROUNDWATER NOT OBSERVED DURING DRILLING																		15
		BOREHOLE OVM READING THROUGH AUGER: 0.6 PPM																		
	20																			20
	25																			25
	30																			30
	35																			35

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-15**

DATE DRILLED 4/25/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

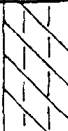
ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM X 0.0										NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18						
		Start: 10:08 Stop: 12:37																	BACKGROUND
		GROUND SURFACE: 3806.2																	OVM READING
	0	SILTY CLAY: DARK YELLOWISH BROWN, 10 YR 4/6, DRY, V. LOW PLASTICITY, V. FINE QUARTZ, 60% CLAY, 40% SILT	CL												1	0.0	0	1.0	SOIL: 0.0
															NS			2.5	AIR: 0.0
	3.5														2	0.0	0.8	3.3	
															NR			4.0	
	5	BOULDERY COBBLEY SILT: GRAYISH BROWN, 10 YR 5/2, POORLY SORTED, MOD. TO POORLY CONSOLIDATED, COBBLES/BOULDERS FROM 5-CM TO 15-CM, GRAVELLY, ROUND	GM												3	0.0	0.5	4.5	
															NR			5.5	
															NS			8.0	
															4	0.0	1.0	9.0	
	10														NR			9.5	
															NS				
	14.0	AUGER REFUSAL AT 14.0'																14.0	
															NR	0.0		14.2	
	15	GROUNDWATER NOT OBSERVED DURING DRILLING.																	
		BOREHOLE OVM THROUGH AUGERS: 22 PPM																	
	20																		
	25																		
	30																		
	35																		



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)



LABORATORY TEST LOCATION



PENETROMETER (TONS/SQ. FT.)



NR: NO RECOVERY



NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/9102**

BORING NUMBER **BH-16**

DATE DRILLED **4/28/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 0.0													SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		Start: 13:30 Stop: 14:22 GROUND SURFACE: 3799.5																				
	0	SILTY CLAY: BROWN, 10 YR 5/3, VERY LOW PLASTICITY, DRY, VERY FINE QUARTZ, 60% CLAY, 40% SILT	CL													1	0.0		0	0		
														NS			2.5					
	3.0													2	0.0	1.5	4.0					
														3	0.0	0.5	4.5					
	5	BOULDERY COBBLEY SILT: GRAYISH BROWN, 10 YR 5/2, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO 15CM, ROUND	GM													NR			5.5	5		
														NS								
														4	0.0	0.8	9.8					
	10													NR			10.0					
		AUGER REFUSAL AT 10.0'																				
		GROUNDWATER NOT OBSERVED DURING DRILLING.																				
		BOREHOLE OVM THROUGH AUGERS: 66 PPM																				
	15																					
	20																					
	25																					
	30																					
	35																					

	SPLIT-SPOON SAMPLER
	STANDARD PENETRATION TEST
	UNDISTURBED SAMPLE
	WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
 L LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER *BH-17*

DATE DRILLED 4/26/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-1895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 0.0										SAMPLE				REMARKS			
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		Start: 16:14 Stop: 17:02																				
		GROUND SURFACE: 3788.6																				
	0	SILTY CLAY: BROWN, 7.5 YR 5/4, DRY, VERY LOW PLASTICITY, CALICHE VEINS, DARK BROWN, 10 YR 4/5 BELOW 4.0'	CL													1	0.0		0			
																		NS			1.0	
																		2	0.0	1.0		2.5
																		NR				3.5
																		3	0.0	0.5		4.0
	5															NR				4.5		
																				5.5		
	9.0	CLAYEY SILT: DARK BROWN, 10 YR 4/3, VERY FINE QUARTZ, MOIST, LOW PLASTICITY, ROOT CHANNELS, SANDY, CALICHE VEINS, 60% SILT, 40% CLAY	ML																	9.0		
	10																4	0.0	1.5		10.5	
																	NS					
	14.0	GRAVELLY CLAY: BROWN, 10 YR 4/3, PEBBLE TO 3 CM, ROUND, 60% CLAY, 20% SILT, 20% PEBBLE	CL																	14.0		
	14.5																					
	15	DOLOMITE: GRAYISH BROWN, 10 YR 7/2, MASSIVE	DOLOMITE													5	0.0	1.5		15.5		
		AUGER REFUSAL AT 14.5'																				
		GROUNDWATER NOT OBSERVED DURING DRILLING.																				
	20	BOREHOLE OVM THROUGH AUGERS: 0.6 PPM																				
	25																					
	30																					
	35																					

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-18**

DATE DRILLED **4/26/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 0.0										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
	0	GROUND SURFACE: NO DATA																BACKGROUND
	1.0	SANDY SILT: VERY FINE GRAIN SAND, 10% SAND, 90% SILT, NO PLAST., 10 YR 5/3, BROWN, DRY, SUBRND., DOLOMITE COBBLES TO 1.0' DIAMETER, GRASS AND ROOTS AT SURFACE	SM											NS				OVM READING
		COBBLEY GRAVELLY SILT: GRAVEL TO 0.15' DIAMETER, SUBRND, DOLOMITE, VERY FINE GRAIN SAND, 20% GRAVEL AND COBBLES, 80% SILT, 10 YR 6/2, LIGHT GRAYISH BROWN, DRY, UNCONSOLIDATED	GM															SOIL: 0.0
	5																	AIR: 2.0
														1	0.0	0.6	2.5	
														NR			3.1	
														NS			4.0	
														2	0.0	0.9	5.0	
														NR			5.9	
														NS			6.5	
														3	0.0	1.3	7.5	
														NR			8.8	
														NS			9.0	
	10																10.0	
														4	0.0	1.2	11.2	
														NR			11.5	
														NS			12.5	
														5	0.0	0.5	13.0	
														6	0.0	0.6	13.6	
	13.6	AUGER REFUSAL 13.6'																
	15	NO GROUNDWATER AFTER DRILLING																
		BOREHOLE OVM: 0.0 PPM																
	20																	
	25																	
	30																	
	35																	

-  SPUT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/9102**

BORING NUMBER **BH-19**

DATE DRILLED **4/27/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM X 0.0										NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18						
		GROUND SURFACE: NO DATA																	
	0	SANDY SILT: VERY FINE GRAIN SAND, 10% SAND, 90% SILT, NO PLAST., 10 YR 6/3, PALE BROWN, DRY, UNCONSOLIDATED	SM												NS				
	1.0	COBBLELY GRAVELLY SILT: SUBRND., DOLOMITE GRAVEL AND COBBLES, 10 YR 6/2, LIGHT GRAYISH BROWN, DRY, UNCONSOLIDATED	GM															2.5	
															1	0.0	0.8	3.3	
															NR			4.0	
															NS			5.0	
	5														2	0.0	0.9	5.9	
															NR			6.5	
															NS			7.5	
															3	0.0	1.5	9.0	
															NS			10.0	
	10														4	0.0	1.3	11.3	
	11.5														NR			11.3	
	12.0	DOLOMITE: 10 YR 6/1, GRAY TO LIGHT GRAY, VERY HARD	DOLOMITE												NS			12.0	
		AUGER REFUSAL 12.0'																	
		NO GROUNDWATER AT TIME OF BORING																	
	15	BOREHOLE OVM READING 0.0 PPM																	
	20																		
	25																		
	30																		
	35																		

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/9102**

BORING NUMBER **BH-20**

DATE DRILLED **4/28/91**

DRILLING METHOD **hss**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0										SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
	0	GROUND SURFACE: 3791.4 GRAVELLY SILT: GRAVEL TO 0.5' DIAMETER, 10% GRAVEL, 90% SILT, 10 YR 6/3, PALE BROWN TO 0.6', 10 YR 8/2, WHITE AFTER 0.6', DRY	GM													NS				0
	5.1	AUGER REFUSAL 5.1' NO GROUNDWATER AT TIME OF BORING BOREHOLE OVM: 0.0 PPM														1	1.4	1.0	2.5	
																NS			4.1	
																2	1.0	1.0	5.1	
	10																			10
	15																			15
	20																			20
	25																			25
	30																			30
	35																			35

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-21 (MW-36)**

DATE DRILLED 4/30/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

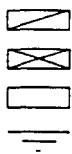
3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0											SAMPLE			REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		GROUND SURFACE: 3792.7																		
	0	COBBLELY SILT: 10% DOLOMITE COBBLES, 90% SILT, NO PLASTICITY, 10 YR 6/3, PALE BROWN, AFTER 0.5', 10 YR 7/2, LIGHT GRAY, DRY, COBBLES TO 0.6' DIAMETER	SM													NS			2.5	
		AFTER 2.0', 30% COBBLES, 70% SILT														1	0.9	1.4	3.9	
																NR	1.2	0.2	4.0	
																NS			4.2	
	5	INCREASING COBBLES WITH DEPTH														3	1.9	0.5	8.0	
																NS			9.0	
	10	12.8 TO 13.3', 7.5 YR 5/4, BROWN, SLIGHTLY MOIST, SILT														4	2.7	1.3	10.3	
		MINOR GRAVEL TO .05' DIAMETER														NR			10.5	
		5% CLAY, BINDED, MOIST														NS			12.0	
		14.2 SANDY DOLOMITE: VERY FINE GRAIN SAND, 20% SAND, 80% DOLOMITE, VERY HARD, DRY, MINOR	SAND/DOLOMITE													5	2.9	1.5	13.5	
	15	2.5 Y 8/6, YELLOW TO 10 YR 6/8, BROWNISH YELLOW, IRON OXIDE, POSSIBLE SULFUR STAINING														NS			13.7	
		NO GROUNDWATER ENCOUNTERED TO 14.4'														6	1.7	0.7	14.4	
		BORING TERMINATED AT 14.4'																		
	20																			
	25																			
	30																			
	35																			



SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-22**

DATE DRILLED 4/30/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0													SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
	0	GROUND SURFACE: 3786.9																				
	0	CLAYEY SILT: 10% CLAY, 90% SILT, LOW PLASTICITY, 7.5 YR 6/4, LIGHT BROWN, DRY, MASSIVE	ML													NS			2.5			
	4.0	SANDY CLAYEY SILT: 10% SAND, 10% CLAY, 80% SILT, VERY FINE GRAIN SILICA SAND, LOW PLASTICITY, 7.5 YR 7/2, PINKISH GRAY, DRY	ML														1	7.0	1.2	3.7		
	5															NR			4.0			
	5																NS			5.0		
	7.3	COBBLELY SILT: ABUNDANT DOLOMITE COBBLES, MINOR SUBROUNDED DOLOMITE GRAVEL, UNCONSOLIDATED, DRY, 5 YR 7/1, LIGHT GRAY	GM														2	1.6	1.4	6.4		
	10																NR			6.5		
	10																NS			7.0		
	10																NS	2.0	0.3	7.3		
	10																4	3.5	0.9	9.0		
	13.9	AUGER REFUSAL 13.9'															NR			9.9		
	15															NS			10.5			
	15																		12.0			
	15															5	3.1	0.8	12.8			
	15															NR			13.7			
	15	NO GROUNDWATER ENCOUNTERED														NS			13.9			

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-23 (MW-2)**

DATE DRILLED 5/1/91
 DRILLING METHOD HSA
 DRILLED BY SBH
 LOGGED BY WEP
 CHECKED BY BJS
 DRAWN BY: SAR

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
					PPM X 1.0											NUMBER	OVM READING	RECOVERY	DEPTH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
					2	4	6	8	10	12	14	16	18																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		GROUND SURFACE: 3785.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/90129**

BORING NUMBER **BH-24 (MW-3)**

DATE DRILLED **5/2/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3495

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
	0	GROUND SURFACE: 3789.8																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
	0	SANDY CLAYEY SILT: VERY FINE GRAIN SAND, 10% SAND, 10% CLAY, 80% SILT, 10 YR 6/3, PALE BROWN, DRY, UNCONSOLIDATED AFTER 0.3', 10 YR 7/2, LIGHT GRAY	ML	//											NS				0	
	2.6														1	3.5	0.6	2.6		
	2.6	AUGER REFUSAL 2.6' NOT ABLE TO SAMPLE BEDROCK NO GROUNDWATER ENCOUNTERED BOREHOLE OVM: 1.1 PPM																		
	5																		5	
	10																		10	
	15																		15	
	20																		20	
	25																		25	
	30																		30	
	35																		35	



SPLIT-SPOON SAMPLER



STANDARD PENETRATION TEST



UNDISTURBED SAMPLE



WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)



LABORATORY TEST LOCATION



PENETROMETER (TONS/SQ. FT.)



NR: NO RECOVERY



NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-25**

DATE DRILLED 5/3/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM X 0.0											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18							
	0	GROUND SURFACE: 3784.1																		
	2.0	SANDY CLAYEY SILT: VERY FINE GRAIN SAND, 10% SAND, 10% CLAY, 80% SILT, LOW PLASTICITY, 10 YR 6/4, LIGHT YELLOWISH BROWN, DRY, UNCONSOLIDATED, MINOR SUBROUNDED DOLOMITE GRAVEL	ML											NS				0		
		COBBLEY SILT: DOLOMITE, COBBLES, 10 YR 7/2, LIGHT GRAY, DRY, UNCONSOLIDATED, ABUNDANT GRAVEL TO 0.15" DIAMETER	GM											1	0.0	0.9		2.5		
														NR				3.4		
														2	0.0	1.5		4.0		
	5													NS				5.5		
														3	0.0	1.0		7.0		
														NR				8.0		
														NS				8.5		
														4	0.0	0.8		9.0		
	10													NR				9.8		
														NS				10.5		
														NR				12.5		
														NS				13.0		
														5	0.0	0.6		13.5		
														NR				14.1		
														NS				14.5		
	16.8																			
	16.9	SANDSTONE: VERY FINE GRAIN QUARTZ, 10 YR 7/2, LIGHT GRAY, DRY, HARD, WEAK CEMENTATION, FRIABLE	SANDSTONE															16.9		
	20	AUGER REFUSAL 16.9' NO GROUNDWATER ENCOUNTERED BOREHOLE OVM: 0.0 PPM																		
	25																			
	30																			
	35																			

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-26 (MW-4)**

DATE DRILLED 5/3/91 - 5/4/91

DRILLING METHOD HSA

DRILLED BY SBH

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

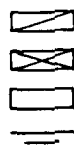
3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

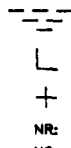
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM X <u>2.0</u>											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18							
		GROUND SURFACE: 3793.1																		
	0	SANDY CLAYEY SILT: NO PLAST., VERY FINE GRAIN SAND, 10 YR 6/3, 80% SILT, 10% SAND, 10% CLAY, PALE BROWN, DRY, MINOR SUBRND. DOLOMITE GRAVEL, UNCONSOLIDATED	SM													NS				
	3.4	AUGER REFUSAL 3.4'														1	37.0	0.9	2.5	
		NO GROUNDWATER ENCOUNTERED																	3.4	
	5																			
	10																			
	15																			
	20																			
	25																			
	30																			
	35																			



SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/9102**

BORING NUMBER **BH-27**

DATE DRILLED 5/4/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		GROUND SURFACE: 3799.8																		
	0	SANDY SILT: 20% VERY FINE GRAIN SAND, 80% SILT, NO PLAST., 10 YR 7/3, VERY PALE BROWN, DRY, UNCONSOLIDATED	SM												NS				0	
	3.7	SILTY SANDSTONE: VERY FINE GRAIN QUARTZ, 10 YR 8/2, WHITE, DRY, WEAKLY CEMENTED, FRIABLE	SILTY SANDSTONE												1	0.0	1.2	2.5		
	5														NR			3.7		
															NS			4.0		
															2	0.0	1.0	5.0		
															NS			6.0		
																		7.0		
															3	2.0	0.6	7.6		
															NS					
		MOIST AT 8.0'; 2.5 Y 7/4, PALE YELLOW.																9.0		
		VERY MOIST AT 9.0'													4	0.0	0.3	9.3		
															NS					
	10																	11.0		
	11.2	AUGER REFUSAL 11.2'													5	0.0	0.2	11.2		
		NO GROUNDWATER ENCOUNTERED																		
		BOREHOLE OVM: 8 PPM																		
	15																			
	20																			
	25																			
	30																			
	35																			

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/90129**

BORING NUMBER **BH-28 (MW-5)**

DATE DRILLED 5/4/91 & 5/5/91

DRILLING METHOD HSA

DRILLED BY SBH

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0																SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH								
	0	GROUND SURFACE: 3783.2																							
	0	COBBLEY SILT: DOLOMITE COBBLES TO 1.5' DIAMETER, 10 YR 5/3, BROWN, DRY, UNCONSOLIDATED	GM																		NS				0
		AFTER 0.9', 10 YR 8/2, WHITE, ABUNDANT SUB-RND. DOLOMITE GRAVEL																							
	2.5																				1	13.0	1.1	3.6	
																					NR			4.0	
	5																				NS			5.0	
																					2	6.0	0.7	5.7	
																					NS			7.0	
																					3	6.0	1.2	8.2	
																					NS			8.5	
																					4	11.0	0.6	9.1	
	10																				NS				
	12.3																							12.0	
	12.3	AUGER REFUSAL 12.3'																							
		NO GROUNDWATER ENCOUNTERED																							
	15																								
	20																								
	25																								
	30																								
	35																								

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/90129**

BORING NUMBER **BH-29 (MW-6)**

DATE DRILLED 5/5/91

DRILLING METHOD HSA

DRILLED BY SBH

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 2.1											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 8:10 Stop: 10:50																		BACKGROUND OVM READING: SOIL: 0.2 PPM AIR: 0.2 PPM
		GROUND SURFACE: 3783.5																		
	0	BOULDERY COBBLEY SILT: BROWN, 7.5 YR 5/6, DRY, UNCONSOLIDATED. COBBLES/BOULDERS FROM 5 CM TO 1 M. VERY FINE QUARTZ, GRAVELLY, WELL ROUNDED PEBBLES	GM													1	0.2		0.6	0
					NS															
					2	42.0	1.5												2.5	
					3	3.8	1.5												4.0	
	5				NS														5.5	
					NS														8.0	
																NR	0.0		9.5	
	10															4	1.6	0.4	9.9	10
																NS			10.3	
																5	0.7	0.6	12.6	
	13.5															NR			13.5	
		SILTY CLAY: BROWN, 10 YR 5/6, VERY FINE QUARTZ, LOW PLASTICITY, DRY, MED. COMPACTED, ABUNDANT CALICHE AND ROOT CHANNELS, 60% CLAY, 40% SILT, WEATHERED AT CONTACT, CALICHE CEMENTED	CL													6	0.2	1.5	15.0	15
	15															NS			16.0	
	15.5															NR			16.3	
	16.3	DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 5/2, VERY HARD, SANDY, MASSIVE	DOLOMITE																	
		AUGER REFUSAL AT 16.3'																		
		GROUNDWATER NOT OBSERVED DURING DRILLING																		
	20																			20
	25																			25
	30																			30
	35																			35

SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-30 (MW-7)**

DATE DRILLED **5/6/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.5											SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH				
		Start: 15:05 Stop: 17:40																			
		GROUND SURFACE: 3792.8																			
	0	BOULDERY COBBLEY SILT: BROWN, 10 YR 5/6, DRY, VERY LOW PLASTICITY, UNCONSOLIDATED, GRAVELLY, COBBLES/BOULDERS FROM 5 CM TO 1 M, ROUNDED	GM													1	0.9	1.0	1.0	0	
					NS																
					2	369.0	0.8														
					NR																
					3	5.3	1.1														
	5				NR																5
					NS																
					4	24.1	0.8														
					NR																
					NS																
					5	0.2	1.0														
	10				NS																10
					6	0.2	0.4														
					NS																
					7	0.2	0.1														
		NS																			
	15.3	NR																15			
		AUGER REFUSAL AT 15.3'																			
		GROUNDWATER NOT OBSERVED DURING DRILLING																			
	20																			20	
	25																			25	
	30																			30	
	35																			35	

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-31 (MW-8)**

DATE DRILLED 3/6/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3893

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 1.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH		
		Start: 8:45 Stop: 10:08 GROUND SURFACE: 3805.6																	BACKGROUND OVM READING: SOIL: 0.0 AIR: 0.0
	0	CLAYEY SILT: DARK BROWN, 7.5 YR 4/2, VERY FINE QUARTZ, DRY, VERY LOW PLASTICITY, GRAVELLY, 60% SILT, 40% CLAY, CALICHE DEPOSITS	ML												1	0.2		0.6	
															NS				
															2	0.2	0.6	2.5	
															NR			3.1	
															3	0.2	0.1	4.0	
															0		0.0	4.3	
	5	BOULDERY COBBLEY SILT: BROWN, 7.5 YR 5/2, DRY, UNCONSOLIDATED, GRAVELLY, COBBLES/BOULDER FROM 5 CM TO 50 CM, ROUNDED	GW												NS			5.5	
															4	0.2	0.1	7.0	
															NS			7.1	
															5	0.2	0.6	9.0	
	9.5	SANDSTONE: QUARTZ, GRAYISH YELLOW TO YELLOWISH GRAY, 5 Y 8/4 TO 7/2, FINE GRAIN, WELL SORTED, POORLY CEMENTED, FRIABLE	SANDSTONE												NR			9.6	
	10														NS			10.0	
	12.0	AUGER REFUSAL AT 12.0'																12.0	
		BOREHOLE REAMED TO 12.1' TO INSTALL MONITOR WELL																	
	15	GROUNDWATER NOT OBSERVED DURING DRILLING																	
	20																		
	25																		
	30																		
	35																		

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/9102:**

BORING NUMBER **BH-32 (MW-9)**

DATE DRILLED **5/7/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 27.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 13:00 Stop: 14:44 GROUND SURFACE: 3788.7																		
	0	CLAYEY SILT: YELLOWISH BROWN, 10 YR 5/4, DRY, VERY LOW PLASTICITY, VERY FINE QUARTZ, CALICHE DEPOSITS, 60% SILT, 40% CLAY	CL	/ / / / /												1	1.0		0.5	0
																NS				
																2	1.1	0.6	2.5	
																NR			3.1	
																3		1.1	4.0	
	5	SILTY CLAY: DARK BROWN, 10 YR 4/3, VERY FINE QUARTZ, LOW PLASTICITY, MOD. COMPACTED.	CL	/ / / / /												NR	0.2		5.1	5
																NS			5.5	
																4	0.2	0.8	9.0	
	10	MOIST BELOW 9.5', LOW PLASTICITY		/ / / / /												NR			9.8	10
																NS			10.5	
																5	23.0	0.7	12.0	
	12.6	BOULDERY COBBLEY GRAVEL: LIGHT GRAYISH BROWN, 10 YR 5/2 TO 6/2, ROUND, CALICHE, CEMENTED, HARD	GM	o o o o												NR			12.7	
	13.5	CLAYEY SAND: SANDY CLAY, BROWN, 10 YR 5/3, QUARTZ, FINE GRAIN, WELL SORTED, SATURATED, MED. PLASTICITY, STRONG HYDROCARBON ODOR	CL/SM													NS			13.0	
																6	540.0	1.3	14.8	
	15															NR			15.0	15
																NS				
	16.6	AUGER REFUSAL AT 16.6'														NR			16.5	
		BOREHOLE REEMED 10 INCHES TO A DEPTH OF 17.01', 5/8/91																	16.6	
	20																			20
	25																			25
	30																			30
	35																			35

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-33 (MW-10)**

DATE DRILLED 5/7/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJR

CHECKED BY BJS

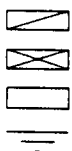
DRAWN BY: SAR

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3894

PAGE 1 OF 1

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x <u>31.0</u>											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 14:23 Stop: 16:40 GROUND SURFACE: 3804.8																		
	0	CLAYEY SILT: YELLOWISH BROWN, 10 YR 5/4, DRY, UNCONSOLIDATED, VERY LOW PLASTICITY, VERY FINE QUARTZ, 70% SILT, 30% CLAY	ML												1	0.0		1.0	0	
					NS														2.5	
	4.5	GRAVELLY COBBLE SILT: GRAYISH BROWN, 10 YR 5/2, VERY FINE QUARTZ, POORLY SORTED, ANGULAR, ABUNDANT, K-FELDSPARS/BIONITE, MOD. COMPACTED, STRUCTURELESS, CaCO3 CEMENTED	SM												2	0.0	1.1	3.6		
					NR														4.0	
	5	COBBLE BOULDERY SILT: GRAYISH BROWN, 10 YR 5/2, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO 1 M, ROUND, DOLOMITE	GM												3	0.0	1.1	5.1	5	
					NR														5.5	
	7.5														4	0.0	1.1	8.1		
					NR														8.5	
					NS														9.0	
	10														5	2.5	1.3	10.3	10	
					NR														10.5	
	15	HYDROCARBON ODOR BELOW 18.01', MOIST													6	8.6	1.5	13.5		
					NS															
	20	HYDROCARBON SATURATED AT CONTACT SANDSTONE: LIGHT OLIVE GRAY, 5 Y 6/2, QUARTZ FINE GRAIN, WELL SORTED, MICACEOUS, FRIABLE, NONCALCAREOUS													7	479.0	1.5	17.5		
					NS														19.0	
	22.2	AUGER REFUSAL AT 22.5'													8	545.0	1.2	21.2	20	
	22.5				NR														21.3	
					NS														22.0	
	25														9	605.0	2.5	22.5		
	30																			
	35																			



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-34 (MW-11)**

DATE DRILLED 5/8/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 22.0											SAMPLE			REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 14:30 Stop: 17:35 GROUND SURFACE: 3807.9																		
	0	CLAYEY SILT: LIGHT YELLOWISH BROWN, 10 YR 6/4, DRY, VERY FINE QUARTZ, UNCONSOLIDATED, 60% SILT, 40% CLAY, CALICHE DEPOSITS	ML	/ / / / /												1	0.8		0.5	0
																NS			2.5	
																2	1.1	1.5	4.0	
	4.0															3	0.2	0.5	4.5	
	5	BOULDER COBBLEY SILT: LIGHT GRAYISH BROWN, 10 YR 6/2, POORLY SORTED, GRAVELLY, COBBLES BOULDERS FROM 5 CM TO 1 M, ROUND	GM													NR			5.5	5
																NS			7.0	
																4	1.6	1.5	8.5	
																NS			9.5	
	10															5	2.5	1.0	10.5	10
																NR			11.0	
																NS			12.0	
																6	1.1	0.5	12.5	
																NS			13.0	
																NS			14.0	
	15															7	9.1	0.8	14.8	15
																NR			15.5	
																NS			17.5	
																8	47.1	1.5	19.0	
	20	CLAYEY BELOW 19.5', SANDY, QUARTZ, MED GRAIN, MOIST, MED PLASTICITY, STRONG HYDROCARBON ODOR														9	157.5	0.7	19.7	20
																NR			20.0	
																NS			22.5	
	23.0															10	440.0	0.5	23.0	
	23.3	SANDSTONE: LIGHT OLIVE GRAY, 5 Y 6/2, QUARTZOSE, FINE GRAIN, POORLY CEMENTED, NON-CALCAREOUS, FRIABLE, MICACEOUS	SANDSTONE													NS			23.3	
	25	BORING TERMINATED 23.3'																		25
		GROUNDWATER NOT OBSERVED DURING DRILLING																		
	30																			30
	35																			35



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-35 (MW-12)**

DATE DRILLED 5/9/91
DRILLING METHOD HSA
DRILLED BY SHB
LOGGED BY MJL
CHECKED BY BJS
DRAWN BY: SAR

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

[illegible]

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3793.5					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3794.97 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX
	0	SILT: BROWN (7.5 YR 5/3), LOOSE NO PLASTICITY, DRY	ML		1		1.00
	2.7	CLAYEY SILT: LT. BROWN (7.5 YR 6/4), SLIGHTLY PLASTICITY, DRY, 10% CLAY, SOME CALICHE DEPOSITS, 90% SILT, LOOSE	ML		2		4.85
	5				3		6.71
	7.8	CLAYEY SILT: LIGHT BROWN, (7.5 YR 6/4) AND PINK (7.5 YR 7/3), SLIGHTLY PLASTICITY, FIRM, DRY, 25% CLAY, 20% CLAY DEPOSITS	CL		4		8.71
	9.3				5		
	10	SILTY CLAY: BROWN (7.5 YR 5/3), 20% SILT, 5% CALICHE DEPOSITS, SLIGHTLY PLASTICITY, HARD, DRY, SLIGHTLY MOIST AT 12.5' TO 12.6', NO ODOR	CL		6		
	12.9				7		
	14.0	SILTY GRAVEL: LT BROWN (7.5 YR 6/4), GRAVEL COARSE WITH SOME FINE 5 MM TO 30 MM, SLIGHTLY MOIST, POORLY SORTED, HYDROCARBON SATURATION BELOW 13.4'	GM		8		
	15				9		
	18.2	SANDY GRAVEL: DARK GRAY (7.5 YR 4/0) SATURATED, SAND 10%, COARSE GRAINED, SUBANG., GRAVEL FINE TO COARSE 10-50 MM, STRONG HYDROCARBON ODOR, POORLY GRADED, LARGER GRAVEL WITH ROUNDED	GP		10		
	19.3	BEDROCK, LIMESTONE, BROWN, DOLOMITE, DENSE, HARD, WEATHERED GRAY ON SURFACES	DOLO.		11		18.37 18.82 19.3
	20	HSA REFUSAL AT 19.3'					7-3/8"
	25						
	30						
	35						

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3833

JOB NAME/NUMBER **MW-37 (BH-00)**

BORING NUMBER **MARATHON/01089**

DATE DRILLED 5/26/01

DRILLING METHOD HSA

DRILLED BY SHB

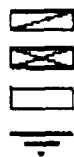
LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR PAGE 1 OF 1

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 37.0											SAMPLE			REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 07:40 Stop: 10:00																	BACKGROUND OVM READING: SOIL: 0.2 PPM AIR: 0.2 PPM	
		GROUND SURFACE: 3901.4																		
	0	CLAYEY SILT: BROWN, 7.5 YR 5/4, DRY, VERY LOW PLASTICITY, CALCICHE DEPOSITS, VERY FINE QUARTZ, 70% SILT, 30% CLAY	ML													1	1.7		1.0	0
																NS			2.5	
																2	18.1	1.3	3.8	
																NR			4.0	
																	253.0	1.1	5.1	
	5															NS			5.5	5
																			7.0	
	7.3	BOULDER COBBLEY SILT: LIGHT BROWNISH GRAY, 10 YR 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO 50 CM.	GM													4	213.0	0.4	7.4	
																NS			8.5	
																5	728.0	0.7	9.0	
	10															NR			9.7	10
																NS			10.9	
		ABUNDANT GRAVEL FROM 12.0-14.0', PEBBLES FROM 1.0 CM TO 3.0 CM														6	228.0	1.0	12.0	
																NS			13.0	
		CLAYEY FROM 14.0-14.5', SANDY, MOIST, MED. GRAIN QUARTZ, MED. PLASTICITY														7	108.0	0.5	14.0	
	15	BOULDERS > 1" BELOW 14.5'														NS			14.5	15
																			17.0	
	17.2	GRAVEL: GRAY TO GRAYISH BROWN, 10 YR 5/1 TO 5/2, MODERATLY SORTED, VERY COARSE GRAIN QUARTZ, PEBBLES 0.5 TO 1.0 CM, RND TO SUBRND., COBBLEY, HYDROCARBON SATURATED CLAYEY BELOW 17.0'	GP													8	289.0	0.8	17.8	
																NR			18.8	
																NS			19.0	
	20															9	322.0	0.5	19.5	20
	20.5	SANDSTONE: BROWN, 10 YR 5/3, FINE GRAIN, QUARTZOSE, WELL SORT, POORLY CEMENTED, FRIABLE	SANDSTONE													NS			22.0	
	22.1	BORING TERMINATED AT 22.0'														10	342.0	0.5	22.5	
		BOREHOLE REEMED TO 10"																		
	25																			25
	30																			30
	35																			35



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-37 (MW-14)**

DATE DRILLED 5/11/01

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

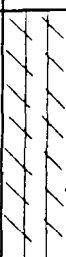
DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-5888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>2</u>										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		Start: 15:45 Stop: 17:00 Resume: 10:00 Finish: 10:30 GROUND SURFACE: 3801.5																BACKGROUND OVM READING: SOIL: <u>0.0</u> PPM AIR: <u>0.0</u> PPM
	0	CLAYEY SILT: LIGHT YELLOWISH BROWN, 10 YR 6/4. VERY FINE QUARTZ, DRY, LOW PLASTICITY, CALICHE DEPOSITS, 70% SILT, 30% CLAY	ML											1	1.1		1.0	0
														NS			2.5	
														2	1.0	1.2	3.7	
														NR			4.0	
	5		CM											3	0.2	1.1	5.1	5
														NR			5.5	
														NS			7.0	
														4	1.1	0.4	7.4	
	6.5	COBBLEY-BOULDERY SILT: LIGHT GRAYISH BROWN TO YELLOWISH BROWN, 10 YR 6/2 TO 6/4. GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 3 CM TO 50 CM, ROUND TO SUBROUND	CM											NR			8.5	
														NS			9.0	
														5	4.4	0.8	9.8	
														NR			10.5	
	10	CLAYEY FROM 9.0' TO 9.8', SANDY, FINE TO MED. GRAIN QUARTZ, FIRM, MOD. TO LOW PLASTICITY	CM											NS			12.0	10
														6	4.9	0.4	12.4	
														NS			14.0	
														7	35.0	1.0	15.0	
	15													NR			15.5	15
														NS			17.0	
														NR	0.0		17.4	
	17.38	AUGER REFUSAL AT 17.38'																
	20	GROUNDWATER NOT OBSERVED DURING DRILLING.																
	25																	
	30																	
	35																	



SPLIT-SPOON SAMPLER



STANDARD PENETRATION TEST



UNDISTURBED SAMPLE



WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)



LABORATORY TEST LOCATION



PENETROMETER (TONS/SQ. FT.)



NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-38 (MW-15)**

DATE DRILLED 5/11/91 & 5/12/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 15										SAMPLE			REMARK
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		Start: 13:15 Stop:																BACKGROUND
		GROUND SURFACE: 3798.4																OVM READING:
																		SOIL: 0.1
																		AIR: 0.1
	0	CLAYEY SILT: V. PALE BROWN TO LT. YELLOWISH BROWN, 10 YR 7/4 TO 6/4, DRY, V. LOW PLASTICITY, GRAVELLY BELOW 3.0', PEBBLES TO 1-CM. ROUND, V. FINE QUARTZ MATRIX, 65% SILT, 35% CLAY, 5% GRAVEL	CL											1	0.8		1.0	0
														NS			2.5	
	3.5													2	2.1	0.9	3.4	
														NR			4.0	
	5	BOULDERY COBBLEY SILT: LIGHT BROWNISH GRAY, 10 YR 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 4-CM TO 1-M, ROUND CLAYEY FROM 4.5' TO 5.0'												3	0.2	1.0	5.0	5
														NR			5.5	
														NS			7.0	
														4	0.7	0.8	7.8	
														NR			8.5	
														NS			9.0	
	10													5	0.7	0.8	9.8	10
														NR			10.5	
														NS			12.0	
														6	2.6	0.8	12.8	
														NR			13.5	
														NS			14.0	
	15													7	6.8	1.1	15.1	15
														NR			15.5	
														NS			17.0	
														8	17.1	0.8	17.8	
														NR			18.5	
														NS			19.0	
	20													9	269	0.9	19.9	20
	20.5													NR			20.5	
	21.0	SANDSTONE: LIGHT OLIVE GRAY, 5 YR 6/2, QUARTZORE, FINE GRAIN, WELL SORTED, POORLY CEMENTED, FRIABLE, MICACEOUS, NON-CALCAREOUS	SS											10	268		21.0	
		BORING TERMINATED AT 21.0'																
	25	GROUNDWATER NOT OBSERVED DURING DRILLING.																
	30																	
	35																	

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-39 (MW-16)**

DATE DRILLED **5/12/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

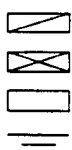
ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 20										SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM		
		GROUND SURFACE: 3797.5																		
	0	CLAYEY SANDY SILT: VERY FINE GRAINED SAND, 10% CLAY, 10% SAND, 80% SILT, UNCONSOLIDATED, DRY, 7.5 YR 7/4 PINK	SM											NS			2.5		0	
															1	0.0	0.9	3.4		
															NR			4.0		
	5	ABUNDANT COBBLES AFTER 6.0'													NS			5.0		5
															2	0.0	0.4	5.4		
															NR			6.5		
															NS			7.0		
															3	7	1.1	8.1		
	9.4														NS			10.0		
	10	COBBLEY SILTY SAND: 10% COBBLES, 20% SILT, 70% SAND, VERY FINE GRAINED SILICA SAND, SLIGHTLY MOIST, 7.5 YR 7/4 PINK, UNCONSOLIDATED, DOLOMITE COBBLES	GM												4	0.0	0.5	10.5		10
														NR			11.5			
														NS			12.0			
														5	0.0	0.1	12.1			
														NS			12.7			
														6	11	0.3	13.0			
	14.0	COBBLEY SANDY SILT: VERY FINE GRAINED SAND, SLIGHTLY MOIST, 7.5 YR 7/4 PINK, UNCONSOLIDATED, DOLOMITE COBBLES	GM											NS			14.0			
	15													7	30	0.5	14.5		15	
▽ 15.9														NS						
	17.7	AUGER REFUSAL AT 17.7'												8	376	0.1	17.0			
		GROUNDWATER NOT OBSERVED DURING DRILLING.												NS			17.1			
																	17.7			
	20	BOREHOLE OVM READING: 19.0 PPM																	20	
	25																		25	
	30																		30	
	35																		35	



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-40 (MW-17)**

DATE DRILLED 5/13/91 & 5/14/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

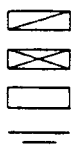
3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x <u>23</u>																SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH								
	0	GROUND SURFACE: 3793.5																							
	0	CLAYEY SILT: 10% CLAY, 90% SILT, LOW PLASTICITY, 10 YR 6/3 PALE BROWN, UNCONSOLIDATED, DRY	SC	/ / / / /														NS			2.5				
																		1	11.5	1.2	3.7				
																		NR			4.0				
	5																	NS			5.0				
	6.0	GRAVELLY COBBLEY SILT: 10 YR 7/2 LIGHT GRAY, UNCONSOLIDATED, SUB-ROUNDED, DOLOMITE GRAVEL AND COBBLES, DRY	GM	o o o o o														2	0.0	1.1	6.1				
																		NR			5.5				
																		NS			7.5				
	9.0	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10% COBBLES, 20% SAND, 70% SILT, SLIGHTLY MOIST, 10 YR 7/2 LIGHT GRAY, UNCONSOLIDATED, STRONG CONDENSATE ODOR	GM	o o o o o														3	2.8	1.0	8.5				
																		NR			9.0				
	10																	4	50	1.0	10.0				
																		NR			10.5				
		VERY MOIST AFTER 12.5'	GM	o o o o o														NS			12.0				
																		5	378	0.5	12.5				
																		NR			13.5				
	13.4																	6	408	0.1	13.6				
	15																	NS			15.2				
	15.2	AUGER REFUSAL AT 15.2'																							
		GROUNDWATER OBSERVED DURING DRILLING.																							
	20																								
	25																								
	30																								
	35																								



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-41 (MW-18)**

DATE DRILLED 5-14-91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM x 40											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18							
		GROUND SURFACE: 3795.4																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
	0	CLAYEY SILT: 10% CLAY, 90% SILT, 10 YR 6/3 PALE BROWN, DRY, UNCONSOLIDATED	SC												NS			2.5	0	
															1	0.0	.98	3.3		
															NR			4.0		
	5	SLIGHTLY MOIST AFTER 5.0'													NS			5.0	5	
	6.0	COBBLEY CLAYEY SILT: 10% COBBLES, 10% CLAY, 80% SILT, 10 YR 6/3, PALE BROWN, SLIGHTLY MOIST, UNCONSOLIDATED	GM												2	0.0	1.3	6.3		
															NR			6.5		
															NS			7.5		
															3	0.0	1.0	8.5		
															NR			9.0		
	10	COBBLEY SANDY SILT: VERY FINE GRAINED SAND, DOLOMITE COBBLES, 10 YR 7/1 LIGHT GRAY, DRY, UNCONSOLIDATED	GM												4	59	0.9	9.9	10	
	10.2														NR			10.5		
															NS			12.0		
	12.3	COBBLEY CLAYEY SILT: 10 YR 7/1 LIGHT GRAY, DOLOMITE COBBLES, 10 YR 5/4 YELLOW BROWN, SILTY CLAY BINDER, MOIST, MOD. CONSOLIDATED	GM												5	124	1.1	13.1		
															NS			14.0		
	14.6	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, DOLOMITE COBBLES, 10 YR 7/1 LIGHT GRAY, SATURATED, STRONG CONDENSATE ODOR AT 17.0', SATURATED WITH 5 YR 3/1 VERY DARK GRAY, VISCOUS MATERIAL, STRONG CONDENSATE ODOR	GM												6	344	1.2	15.2	15	
	15	AUGER REFUSAL AT 17.3'													NS			17.0		
	17.3														7	716	0.3	17.3		
	20	GROUNDWATER ENCOUNTERED AT 14.8'																	20	
		HEAVING SANDS AT T.D. 17.3'																		
	25																		25	
	30																		30	
	35																		35	

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-42 (MW-19)**

DATE DRILLED 5/15/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3825

PAGE 1 OF 1

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>31</u>										SAMPLE				REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		GROUND SURFACE: 3794.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-43 (MW-20)**

DATE DRILLED 5/16/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 2										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
	0	GROUND SURFACE: 3796.1																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	0	SANDY CLAYEY SILT: VERY FINE GRAIN SAND, 10% SAND, 10% CLAY, 80% SILT, NO PLASTICITY, 7.5 YR 7/2 PINK GRAY, DRY, MINOR CALICHE, UNCONSOLIDATED	SM											NS			2.5	0
														1	0.0	1.3	3.8	
														NR			4.0	
	5													NS			5.0	5
	6.5	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10 YR 7/2 LIGHT GRAY, DOLOMITE COBBLES AND GRAVEL, DRY, UNCONSOLIDATED	GM											2	0.0	1.1	6.1	
														NR			6.5	
														NS			7.0	
														3	0.0	0.7	7.7	
														NS			9.0	
	10													4	3.0	0.6	9.6	10
														NS			12.0	
		AFTER 12.0', CALICHE CEMENTATION, MINOR SLIGHTLY MOIST, 7.5 YR 6/4 LIGHT BROWN, CLAY BINDER												5	7.0	0.4	12.4	
														NS			14.0	
	15	SLIGHTLY MOIST AFTER 14.0'												6	11	0.9	14.9	15
														NR			15.5	
														NS			17.0	
	18.0													7	23	1.5	18.5	
		SANDSTONE: VERY FINE GRAIN SILICA HIGHLY WEATHERED AND FRACTURED, 2.5 YR 7/4 PALE YELLOW, FRACTURE IN FILLING WITH MOTTLED 7.5 YR 5/4 BROWN SILTY CLAY, SLIGHTLY MOIST IN FRACTURE, MOIST IN SANDSTONE, HIGHLY FRIABLE AND MOIST AFTER 20.0', AFTER 20.6' VERY HARD SANDSTONE	SS											NS			19.0	
	20													8	7	1.1	20.1	20
	21.20													NR			20.5	
														9	2	0.1	20.7	
														NR			21.2	
		AUGER REFUSAL AT 20.7'																
	25	GROUNDWATER NOT ENCOUNTERED DURING BORING.																25
	30																	30
	35																	35

-  SPOUT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-44 (MW-21)**

DATE DRILLED **5/16/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3797.5																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	0	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10 YR 6/3 PALE BROWN, DRY, UNCONSOLIDATED, DOLOMITE COBBLES AND GRAVEL, AFTER 3.0' 10 YR 7/2 LIGHT GRAY, CALICHE CEMENTATION 2'-3'	GM											NS			0	
	2.5														0.0	0.1	2.5	
	4.0													NR			4.0	
	5	COBBLEY SILTY SAND: 10% COBBLES, 30% SILT, 60% SAND, VERY FINE TO FINE SAND, 10 YR 8/3 VERY PALE BROWN, DRY, DENSE	GM											2	0.0	1.2	5.2	5
	7.0													NS			7.0	
	7.5													3	0.0	0.5	7.5	
	8.0													NS			8.0	
	9.0	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10 YR 7/4 VERY PALE BROWN, SLIGHTLY MOIST, UNCONSOLIDATED, DOLOMITE COBBLES	GM											4	3.0	1.1	10.1	10
	10.1													NR			10.1	
	12.0	AFTER 12.0' MINOR 7.5 YR 6/4 LIGHT BROWN, MOIST CLAYEY SAND BINDER	GM											NS			12.0	
	12.7													5	0.0	0.7	12.7	
	14.0													NS			14.0	
	15.1	SILTY CLAY: 40% SILT, 60% CLAY, LOW PLASTICITY, STIFF, 10 YR 5/4 YELLOW BROWN, MOIST, MINOR SUBROUNDED DOLOMITE GRAVEL	CL											6	3.0	1.1	15.1	15
	15.6	DOLOMITE: VERY HARD, MICROCRYSTALLINE, 10 YR 6/1 LIGHT GRAY TO GRAY, DRY	DOLO.											NS		0.1	15.6	
	15.6	AUGER REFUSAL AT 15.6'																
	20	GROUNDWATER NOT OBSERVED DURING BORING																20
		NO GROUNDWATER AFTER 24 HOURS																
	25																	25
	30																	30
	35																	35

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-45 (MW-22)**

DATE DRILLED 5/17/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

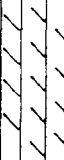
ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3899

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 0.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING SOIL: <u>CL</u> AIR: <u>CL</u>		
		GROUND SURFACE: 3792.4																		
	0	CLAYEY SILT: 10% CLAY, 90% SILT, 10 YR 7/4 VERY PALE BROWN, DRY TO SLIGHTLY MOIST, UNCONSOLIDATED, NO PLASTICITY	CL												NS				2.5	
	4.5														1	0.0	1.5		4.0	
	5	GRAVELLY SILT: 10 YR 8/3, VERY PALE BROWN, DRY TO SLIGHTLY MOIST, SUB-ROUNDED DOLOMITE GRAVEL TO 0.08' DIA.	GM												NS				5.0	
	6.0														2	0.0	1.1		6.1	
															NR				6.5	
															NS				7.0	
		COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10 YR 8/3 VERY PALE BROWN, DRY SLIGHTLY MOIST, UNCONSOLIDATED, DOMOMITE COBBLES, MINOR CALICHE CEMENTATION	GM												3	0.0	1.5		8.5	
															NS				9.0	
	10														NR		0.0		10.5	
	10.8														NS				10.9	
	10.9	SANDY DOLOMITE: VERY FINE GRAIN SAND, 10 YR 7/2 LIGHT GRAY, VERY HARD, DRY	DOLO.																	
		AUGER REFUSAL AT 10.9'																		
		GROUNDWATER NOT OBSERVED DURING BORING																		
	15	NO GROUNDWATER AFTER 24 HOURS																		
	20																			
	25																			
	30																			
	35																			



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

└ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/910:**

BORING NUMBER **BH-46 (MW-23)**

DATE DRILLED **5/17/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 2.0										SAMPLE				REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		GROUND SURFACE: 3791.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-47 (MW-24)**

DATE DRILLED **5/18/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 2.0										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3784.7																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	0	CLAYEY SILT: 10% CLAY, 90% SILT, 10 YR 7/3 VERY PALE BROWN, DRY, UNCONSOLIDATED	CL											NS				0
	1.0	GRAVELLY SANDY SILT: 10 YR 8/3 VERY PALE BROWN, DRY, UNCONSOLIDATED	GM														2.5	
														1	0.0	1.1	3.6	
														NR			4.0	
														NS			5.0	
	5													2	0.0	1.0	6.0	5
														NR			6.5	
														NS			7.0	
														3	0.0	0.9	7.9	
	8.2	SILT: 10 YR 7/1 LIGHT GRAY, DRY, VERY HARD	DOLO.											NS			8.2	
	8.3													4	25	0.1	8.3	
	10	AUGER REFUSAL AT 8.3'																10
		GROUNDWATER NOT OBSERVED DURING BORING																
		NO GROUNDWATER READING AFTER 24 HOURS																
	15																	15
	20																	20
	25																	25
	30																	30
	35																	35

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-48 (MW-25)**

DATE DRILLED 5/18/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>28</u>										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3791.0																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	0	CLAYEY SANDY SILT: VERY FINE GRAIN SILICA SAND, 10% CLAY, 10% SAND, 80% SILT, 10 YR 8/4 VERY PALE BROWN, DRY, NO PLASTICITY, UNCONSOLIDATED, MINOR CALICHE	CL												NS			2.5	0
	4.0														1	0.0	1.5	4.0	
	5	COBBLE SANDY SILT: VERY FINE GRAIN SILICA SAND, 10 YR 8/3 VERY PALE BROWN, CALICHE CEMENTATION, DRY TO SLIGHTLY MOIST ABUNDANT SUBROUNDED DOLOMITE GRAVEL													2	0.0	1.1	5.1	5
															NS			7.0	
															3	0.0	1.0	8.0	
															NS			9.0	
	10														4	0.0	1.0	10.0	10
															NS			12.0	
		AFTER 12.0', MINOR MOIST 7.5 YR 5/4 BROWN, SILTY CLAY BINDER	GM												5	4.6	1.1	13.1	
															NR			13.5	
															NS			14.0	
															6	35	1.0	15.0	
	15														NR			15.6	15
															NS			17.0	
		SATURATION AFTER 17.0', STRONG CONDENSATE ODOR													7	296	0.9	17.9	
															NR			18.5	
															NS			19.0	
															NS			19.4	
	19.4 19.5	SANDSTONE: VERY FINE GRAIN SILICA SAND, 2.5 YR 7/2 LIGHT GRAY WITH 2.5 YR 5/0 GRAY BANDS, VERY HARD	SS												8	546	0.1	19.5	20
	20	AUGER REFUSAL AT 19.5'																	
		GROUNDWATER ENCOUNTERED DURING BORING: 17.66'																	
	25																		25
	30																		30
	35																		35

-  SPOUT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-49 (MW-26)**

DATE DRILLED 5/18/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 3.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
	0	GROUND SURFACE 3788.0'																		
	0	SANDY SILT: VERY FINE GRAIN SAND, 10 YR 6/4 LIGHT YELLOW BROWN, DRY, UNCONSOLIDATED	SM													NS				0
	2.8	COBBLE SANDY SILT: VERY FINE GRAIN SILICA SAND, 10 YR 8/2 WHITE, DRY, UNCONSOLIDATED, ABUNDANT DOLOMITE GRAVEL	GM													1	10.7	0.8	2.5	
	4.5															NR			4.0	
	5	SILTY SAND: VERY FINE TO FINE SILICA SAND, 20% SILT, 80% SAND, 10 YR 6/2 LT. YELLOW BROWN, SLIGHTLY MOIST, UNCONSOLIDATED	SM													2	48	0.6	5.0	5
																NR			5.6	
																NS			8.5	
	8.3	COBBLE SANDY SILT: VERY FINE GRAIN SAND, 10 YR 7/2 VERY PALE BROWN, DRY, UNCONSOLIDATED, DOLOMITE COBBLES AND MINOR SUBROUNDED GRAVEL	GM													3	0.0	1.1	7.5	
																NR			8.8	
																NS			9.0	
	10															4	36	0.4	10.0	10
																NS			10.4	
		CALICHE CEMENTATION AFTER 12.5'														5	0.0	0.2	12.3	
																NS			12.5	
		AFTER 15.5', SLIGHTLY MOIST 5 YR 5/4 RED BROWN, SILT/CLAY BINDER														6	21	0.8	14.0	
	15															NS			14.8	15
																7	0.0	0.3	15.2	
	16.0																		16.0	
		AUGER REFUSAL AT 16.0'																		
		GROUNDWATER NOT ENCOUNTERED DURING BORING.																		
	20																			20
	25																			25
	30																			30
	35																			35

SPOUT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-60 (MW-27)**

DATE DRILLED 5/19/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

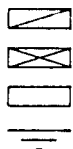
NORMAN, OKLAHOMA 73072

(405) 321-3885

PAGE 1 OF 1

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM x 0.5											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18							
		Start: 07:40 Stop: 09:35 GROUND SURFACE: 3790.8																		
	0	CLAYEY SILT: BROWN, 10 YR 5/3, DRY, VERY LOW PLASTICITY, 70% SILT, 30% CLAY	CL													1	0.0		1.0	0
	1.5	SANDSTONE: WHITE TO PALE YELLOW, 2.5 YR 8/2 TO 8/4, QUARTZOSE, FINE GRAIN, WELL SORTED, FLAT BEDDED, INTERBEDDED WITH MUDSTONE SEAMS, 0.5' THICK, THINBEDDED	SS													NS			2.5	
																2	0.0	1.1	3.6	
																NR			4.0	
																3	3.5	0.5	4.5	
	5	DOLOMITE: LIGHT BROWNISH GRAY, 10 YR 6/2, MASSIVE, VERY HARD	DOLO.													NR			5.5	5
	7.0	AUGER REFUSAL AT 7.0'														NS		0.0	6.5	
		GROUNDWATER NOT ENCOUNTERED DURING BORING.														NR			7.2	
	10																			10
	15																			15
	20																			20
	25																			25
	30																			30
	35																			35



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-51**

DATE DRILLED **5/20/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.5											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 10:05 Stop: 12:50																		BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
		GROUND SURFACE: 3794.9																		
	0	CLAYEY SILT: LIGHT YELLOWISH BROWN, 10 YR 6/4, DRY, VERY LOW PLASTICITY, CALICHE DEPOSITS, 70% SILT, 30% CLAY	CL													1	0.0		1.0	0
					NS													2.5		
					2	0.0	1.0											3.5		
					NR													4.0		
					3	0.0	1.0											5.0		
	5	BOULDERY-COBBLEY SILT: LIGHT YELLOW-ISH BROWN TO LIGHT BROWNISH GRAY, 10 YR 6/2 TO 6/4, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 3 CM TO 0.5 M, ROUND, DOLOMITE	GM													NR			5.5	5
					NS													7.0		
					4	0.0	0.4											7.4		
					NR													8.0		
					5													9.0		
	6.0															NR			9.4	
					NS													10.0		
					4	0.0	0.4											12.0		
					NR													12.2		
					5	0.0	0.4											13.0		
	10	CLAYEY-GRAVELLY SAND: BROWN, 7.5 YR 7/2, MOIST, VERY FINE TO FINE QUARTZ, MANGANESE NODULES DOLOMITE PEBBLES FROM 0.5 TO 1 CM ROUND, 70% SAND, 20% CLAY, 10% PEBBLES	ML													NR			14.0	10
					NS													15.0		
					6	1.5	0.2											15.5		
					NR													17.0		
					7	24.6	1.0											17.2		
	12.5	AUGER REFUSAL AT 17.0'														NR			17.0	15
					NS													17.2		
					NR															
					NS															
					NR															
	15	GROUNDWATER NOT ENCOUNTERED DURING BORING.														NR				20
					NS															
					NR															
					NS															
					NR															
	17.0															NR				25
					NS															
					NR															
					NS															
					NR															
	20															NR				30
					NS															
					NR															
					NS															
					NR															
	25															NR				35
					NS															
					NR															
					NS															
					NR															
	30															NR				
					NS															
					NR															
					NS															
					NR															
	35															NR				
					NS															
					NR															
					NS															
					NR															

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-52 (MW-28)**

DATE DRILLED 5/20/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM X 0.1											NUMBER	OVM READING	RECOVERY	DEPTH	
		Start: 15:10 Stop: 16:20																		BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
		GROUND SURFACE: 3792.0																		
	0	CLAYEY SILT: BROWN, 10 YR 5/5, DRY, VERY LOW PLASTICITY, VERY FINE QUARTZ 70% SILT, 10% CLAY, 20% SAND	CL													1	1.5		1.0	0
																NS			2.5	
	3.0															2	0.0	0.2	2.7	
																NR			4.0	
																3	0.0	0.5	4.5	
	5	BOULDERY-COBBLEY SILT: BROWN TO LIGHT BROWNISH GRAY, 10 YR 5/3 TO 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO 0.5 M, ROUND TO SUBROUND, DOLOMITE														NR			5.5	5
																NS			7.0	
			GM													4	0.0	1.0	8.0	
																NR			8.5	
																NS			9.0	
	10	CLAYEY FROM 9.0' TO 10.0', SANDY/ GRAVELLY, BROWN TO STRONG BROWN, 10 YR 5/4 TO 5/6, MOIST, LOW PLASTICITY, FINE TO VERY FINE QUARTZ														5	0.0	0.9	9.9	10
																NR			10.5	
																NS			12.0	
	12.3															NR			12.3	
																NR			12.7	
		AUGER REFUSAL AT 12.3'																		
		GROUNDWATER NOT ENCOUNTERED DURING BORING.																		
	15																			15
	20																			20
	25																			25
	30																			30
	35																			35

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-53 (MW-29)**

DATE DRILLED 5/20/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3885

PAGE 1 OF 1

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM x 2.0											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18							
		Start: 08:40 Stop: 09:50																		
		GROUND SURFACE: 3786.0																		
	0	CLAYEY SILT: BROWN TO BROWNISH YELLOW, 10 YR 5/3 TO 5/4, DRY, VERY LOW PLASTICITY, CALICHE DEPOSITS, 70% SILT, 30% CLAY, VERY FINE QUARTZ	CL													1	0.2		1.0	0
					NS														2.5	
					2	32.5	1.1												3.6	
					NR														4.0	
					3	32.3	1.0												5.0	
	5															NR			5.5	5
																NS				
	7.5	COBBLEY SILT, BROWN TO LIGHT GRAY-ISH BROWN, 10 YR 5/2 TO 5/2, MOD. WELL SORTED, COBBLES FROM 4 CM TO 10 CM, GRAVELLY, ROUND TO SUB-ROUND	GM													4	19.9	0.7	7.0	
					NR														7.7	
					NS														8.5	
					NS														9.0	
					NR														9.2	
	10																			
	10.5	DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 6/2, MASSIVE, HARD	DOLO.													NS			12.0	
	12.5				NR														12.1	
		BORING TERMINATED AT 12.5'																		
		GROUNDWATER NOT ENCOUNTERED DURING BORING.																		
	15																			
	20																			
	25																			
	30																			
	35																			

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-54 (MW-30)**

DATE DRILLED 5/21/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 2.0											SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH				
		Start: 13:20 Stop: 14:40																			
		GROUND SURFACE: 3788.7																			
	0	CLAYEY SILT: BROWN TO VERY PALE BROWN, 10 YR 5/3 TO 7/4, VERY LOW PLASTICITY, CALICHE DEPOSITS, 70% SILT, 30% CLAY, VERY FINE QUARTZ	CL												1	0.0		0	0		
					NS															1.0	
																	2	0.0	1.1	2.5	
																	NR			3.6	
																				4.0	
	5																3	0.0	1.1	5.1	5
																	NR			5.5	
																	NS			7.0	
																	4	0.0	1.1	8.1	
																	NR			8.5	
	9.5	BOULDERY/COBBLEY SILT, DARK BROWN TO LIGHT GRAYISH BROWN, 10 YR 4/3 TO 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 3.0 CM TO >20 CM, ROUND TO SUBROUND	GM												5	0.0	0.7	9.7	10		
	10															NR			10.5		
																NS			12.0		
																6	9.2	0.5	12.5		
																NR			13.0		
																NS			14.0		
																7	21.5	0.5	14.5	15	
	15															NR			14.7		
																NS			17.0		
	16.96																8	41.5	0.4	17.4	17.4
	17.4	AUGER REFUSAL AT 17.4'																			
	20																				
	25																				
	30																				
	35																				

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-55 (MW-31)**

DATE DRILLED 5/21/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

PAGE 1 OF 1

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE			REMARKS
					PPM X <u>20</u>											NUMBER	OVM READING	RECOVERY	
		Start: 11:15 Stop: 15:07			2	4	6	8	10	12	14	16	18						
		GROUND SURFACE: 3795.2																	
	0	CONGLOMERATE: VERY PALE BROWN TO LIGHT GRAYISH BROWN, 10 YR 7/3 TO 6/2, LIMESTONE/DOLOMITE PEBBLES, COBBLES, BOULDERS, COBBLES/BOULDERS FROM 5 CM TO 2 M, ROUND TO SUBROUND, CARBONATE CEMENT, WEATHERED AT SURFACE, HARD	CNG.										NS				0		
											NR					2.5			
											NS					0.0			
											1	10.7	0.4			4.0			
											NR					4.4			
	5																5		
	8.5												NS				7.0		
													NR	0.0	0.2		7.5		
	10	BOULDERY-COBBLEY SILT: BROWN TO LIGHT GRAYISH BROWN, 10 YR 5/3 TO 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 4 CM TO 20 CM, ROUND TO SUBROUND, VERY FINE QUARTZ	GM										NS				9.0		
											3	470	1.5			10.5			
											NS					12.0			
											NR					12.2			
											NS					14.0			
	14.5	AUGER REFUSAL AT 14.5'											NR	0.0	0.0		14.5		
	15	GROUNDWATER NOT OBSERVED DURING DRILLING.															15		
	20																20		
	25																25		
	30																30		
	35																35		

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-56 (MW-32)**

DATE DRILLED 5/22/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 20											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 07:30 Stop: 09:45																		BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
		GROUND SURFACE: 3800.9																		
	0	CLAYEY SILT: LIGHT BROWN, 7.5 YR 6/4, DRY, VERY LOW PLASTICITY, VERY FINE QUARTZ, CALICHE DEPOSITS, 70% SILT, 30% CLAY	CL													1	0.0		1.0	0
					NS														2.5	
					2	0.0	1.1												3.6	
					NR														4.0	
					3	0.0	0.8												4.8	
	4.5	BOULDERY-COBBLEY SILT: LIGHT BROWN TO LIGHT BROWNISH GRAY, 7.5 YR 6/4 TO 10 YR 6/2, POORLY SORTED, GRAVELLY, COBBLES/BOULDERY FROM 2 CM TO >15 CM, ROUND TO SUB-ROUND	GM													NR			5.5	5
					NS														7.0	
					4	0.0	1.5												8.5	
					NS														9.0	
					5	1.5	0.5												9.5	
					NR														10.0	
	10					NS													12.0	
					6	6.1	1.0												13.0	
					NR														13.5	
					NS														14.0	
		NR														14.5				
	15	CLAYEY BELOW 17.5', SANDY, FINE TO MED. GRAIN QUARTZ, MOIST, VERY STRONG HYDROCARBON ODOR SATURATED BELOW 18.0', HYDROCARBON ODOR														NS				15
																			17.0	
					8	232	0.8												17.8	
					NR														18.0	
					NS														18.5	
	18.5	DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 6/2, MASSIVE, HARD	DOLO.													NR				20
	18.65																		18.65	
					9	330	0.15													
	20	AUGER REFUSAL AT 18.65'																		25
		GROUNDWATER NOT OBSERVED DURING DRILLING.																		
	25																			
	30																			
	35																			35

SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-57 (MW-33)**

DATE DRILLED **5/23/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3884

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 20											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 14:33 05/23/91 Stop: 15:44 Resume: 7:30 05/24/91 Finish: 11:35 GROUND SURFACE: 3803.7																		
	0	CLAYEY SILT: PALE BROWN TO BROWN, 10 YR 5/3 TO 6/3, DRY, VERY LOW PLASTICITY, VERY FINE QUARTZ, CALICHE DEPOSITS, 70% SILT, 30% CLAY	CL	//												1	0.0		1.0	0
	2.7			//												NS			2.5	
				//												2	0.0	0.6	3.1	
				//												NR			4.0	
	5	BOULDERY-COBBLEY SILT: BROWN TO LIGHT GRAYISH BROWN, 10 YR 5/3 TO 6/4, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO > 50 CM, ROUND TO SUBROUND, DOLOMITE WITH CALICHE WEATHERING, GRAVELLY,		//												NR		0.0	5.0	5
				//												NS			7.0	
				//												3	0.0	0.5	7.5	
				//												NR			8.0	
				//												NS			9.0	
	10	HYDROCARBON ODOR FROM 9.0' TO 9.9', DRY		//												4	150.7	0.9	9.9	
				//												NR			10.5	10
				//												NS			12.0	
				//												5	0.0	1.0	13.0	
				//												NR			13.5	
				//												NS			14.0	
				//												NR		0.0	14.2	
	15			//												NS			17.0	15
				//												6	327	0.5	17.5	
				//												NR			17.8	
	18.6	AUGER REFUSAL AT 18.6'		//												7	298	0.8	18.6	
	20	GROUNDWATER NOT OBSERVED DURING DRILLING.		//																20
	25			//																25
	30			//																30
	35			//																35

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-58 (MW-34)**

DATE DRILLED 5/23/91 & 5/24/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

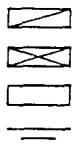
ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM X 20										NUMBER	OVM READING	RECOVERY	DEPTH	
		Start: 14:58 5/24/91 Stop: 08:45 5/25/91			2	4	6	8	10	12	14	16	18						
		GROUND SURFACE: 3799.0																	
	0	CLAYEY SILT: LIGHT YELLOWISH BROWN, 10 YR 6/4, VERY FINE QUARTZ, DRY, LOW PLASTICITY, CALICHE DEPOSITS, 70% SILT, 30% CLAY	ML											1	0.0		1.0	0	
														NS			2.5		
	2.9	CLAYEY SILT: DUSKY YELLOW (5 YR 6/4), DRY, LOOSE, VERY SLIGHTLY PLASTIC, 10% CLAY, 70% SILT	ML											2	0.0	1.0	3.5		
														NR		1.1	4.0		
	5	CLAYEY SILT: LIGHT BROWN (5 YR 6/4) SLIGHTLY PLASTIC, 30% CLAY, CALICHE DEPOSITS 25%, 45% SILT DRY	CL											3	0.0		5.1	5	
														NR			5.5		
														NS			7.5		
	8.0	CLAYEY SILT: LIGHT BROWN (7.5 YR 6/4), FIRM, 30% CLAY, SLIGHTLY PLASTIC, FRIABLE, DRY	CL											4	14.8	1.5	9.0		
														5	1.6	0.9	10.5	10	
	10																		
	11.0	GRAVEL AND COBBLES IN CLAYEY SILT: 50% COARSE, 50% FINE, GRAVEL FINE TO COARSE, 5 TO 75MM, SEGMENTS OF COBBLES SIZE UNKNOWN, CLAYEY SILT, PINKISH GRAY (7.5 YR 7/2), LOOSE, DRY, VERY LOW PLASTIC, COBBLES AND GRAVEL, WELL ROUNDED, POORLY SORTED DOLOMITE, GRAY LIMESTONE	GM											NS			12.5		
														6	7.0	0.9	13.4		
														NR			14.0		
	14.5													7	46.7	0.7	14.7		
	15	GRAVEL AND COBBLES: COARSE GRAVEL 25-75MM, COBBLES POSSIBLE TO BOULDER SIZE, DECREASING CLAYEY SILT TO 20% LIMESTONE FACTION TYPICALLY LIGHT BROWNISH GRAY (2.5 YR 6/2), FAIR ODOR OF HYDROCARBON AT 14.5', VERY SLIGHTLY MOIST, 30% GS GRAVEL, 50% COBBLES, SATURATED WITH HYDROCARBONS	GM											NR			15.5	15	
														NS			17.5		
	16.84													8	414	0.5	18.0		
														NR			18.9		
	18.9																		
	20	HSA REFUSAL AT 18.9'																20	
		BEDROCK LIGHT BROWNISH GRAY, DOLOMITE, LIMESTONE, DENSE (10 YR 6/2)																	
	25																	25	
	30																	30	
	35																	35	



SPUT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-59 (MW-35)**

DATE DRILLED 5/24/91 TO 5/25/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR

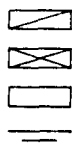
PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM x 30										NUMBER	OVM READING	RECOVERY	DEPTH	
		Start: 09:10 Stop: 10:50			2	4	6	8	10	12	14	16	18					BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
		GROUND SURFACE: 3795.5																	
	0	SILT: BROWN (7.5 YR 5/3), LOOSE NO PLASTICITY, DRY	ML											1	0.0		1.0	0	
														NS			2.5		
	2.7	CLAYEY SILT: LIGHT BROWN , (7.5 YR 6/4) SLIGHTLY PLASTIC, DRY, 10% CLAY, SOME CALICHE DEPOSITS, 90% SILT, LOOSE	ML											2	0.0	1.3	3.8		
														NR			4.0		
	5		ML											3	0.0	1.5	5.5	5	
														NS			7.5		
	7.8													4	0.0	1.5	9.0		
	9.3	CLAYEY SILT: LIGHT BROWN, (7.5 YR 6/4) AND PINK (7.5 YR 7/3), SLIGHTLY PLASTIC, FIRM, DRY, 25% CLAY, 20% CLAY DEPOSITS	CL											5	0.0	1.3	10.3		
	10		CL											NR			10.5	10	
		SILTY CLAY: BROWN (7.5 YR 5/3), 20% SILT, 5% CALICHE DEPOSITS, SLIGHTLY PLASTIC, HARD, DRY, SLIGHTLY MOIST AT 12.5' TO 12.9', NO ODOR												NS			12.5		
12.95	12.9		GM											6	0.0	0.9	13.4		
	14.0	SILTY GRAVEL: LIGHT BROWN (7.5, YR 6/4), GRAVELS, COARSE WITH SOME FINE 5 MM TO 30 MM, SLIGHTLY MOIST, POORLY SORTED, HYDROCARBON SATURATION BELOW 13.4'												NR			14.0		
	15		GP											7	449	0.5	14.5		
		SANDY GRAVEL: DARK GRAY (7.5 YR 4/0) SATURATED, SAND 10%, COARSE GRAINED, SUBANG., GRAVEL FINE TO COARSE 10- 50 MM, STRONG HYDROCARBON ODOR, POORLY GRADED, LARGER GRAVEL WELL ROUNDED												NR			15.5	15	
														NS			17.5		
	19.2													8	388	1.0	18.5		
	19.3	BEDROCK, LIMESTONE, BROWN, DOLOMITE, DENSE, HARD, WEATHERED GRAY ON SURFACES	DOLO.											NS			19.0		
	20													9	583	0.3	19.3	20	
		HSA REFUSAL AT 19.3'																	
	25																	25	
	30																	30	
	35																	35	



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-60 (MW-37)**

DATE DRILLED **5/26/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD # 83 FOR MORE DETAILED LITHOLOGIC DESCRIPTION					
	0	GROUND SURFACE: 3813.80					
	3.5	CLAYEY SILT:	ML		1		
		SANDSTONE:	SAND-STONE		2		
	8.0				3		
	10	SANDY DOLOMITE:	SANDY DOLO.		4		
	13.0				5		
	17.0	SANDSTONE:	SAND-STONE		6		
	20	DOLOMITE - SANDY DOLOMITE:	DOLO. & SANDY DOLO.		7		
	21.0				8		
		SANDSTONE:	SAND-STONE		9		
	30				10		
		SANDSTONE:	SAND-STONE		11		
					12		
					13		
					14		
					15		
	40				16 GC		
					17 GC		
					18 GC		
					19 GC		
					20 GC		
					21 GC		
					22 GC		
					23 GC		
					24 GC		
					25 GC		
					26 GC		
					27 GC		
					28 GC		
	58.0	BORING TERMINATED AT 58.0'					
	60	NOTE: SEE LOG BH-87 FOR MORE IN-DEPTH DESCRIPTION.					
	70						

PAGE 1 OF 1

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3898

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 47										SAMPLE				REMARKS
					2	4	8	8	10	12	14	16	18	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		Start: 14:30 Stop: 17:00																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
		GROUND SURFACE: 3795.4																	
	0	SILT: BROWN (7.5 YR 5/3), LOOSE, NO PLASTICITY, DRY	ML												1	0.0		1.0	0
															NS			2.5	
	3.8	CLAYEY SILT: PALE RED (10 YR 6/3), 10% CLAY, 20% CALICHE DEPOSITS, FIRM, FRIABLE, DRY, GRADING TO PINKISH WHITE (5 YR 8/2) BELOW 4.0'	CL												2	0.0	1.5	4.0	
	5														3	0.0	0.4	4.4	
															NR			5.5	5
	7.5	SILTY GRAVELLY SAND: PINKISH WHITE (5 YR 8/2), LOOSE, ANGULAR, FINE GRAINED, DRY, 30% SILT, 15% GRAVEL	GM												4	0.0	0.8	7.5	
															NR			8.3	
	9.5														5	0.0	0.9	9.0	
	10	CLAYEY SILT: BROWN (7.5 YR 5/4), 25% CLAY, TRACE CALICHE DEPOSITS, SOFT, LOOSE, DRY	ML												NR			9.9	10
															NS			10.5	
	12.5	CLAYEY GRAVEL AND POSS. COBBLES: LT. BROWN (7.5 YR 6/4), CLAY 25%, V. SLIGHTLY PLASTIC, MOIST, NO ODOM, GRAVEL 50%, GRAY (7.5 YR N 5/0), COARSE AND FINE 5-40 MM	GC												6	0.0	1.5	12.5	
	14.3														7	935	0.8	14.0	
	15	SILTY GRAVEL AND COBBLES: SILT 10%, GRAVEL 50%, COBBLES 40%, WELL ROUNDED SOME GREASY DARK GRAY SUBSTANCES ON GRAVEL SURFACES (7.5 YR N 4/0) STRONG HYDROCARBON ODOR, WET	GP												NR			14.8	15
															NS			15.5	
	17.8	WEATHERED SANDSTONE: LIGHT BROWN (7.5 YR 6/3), V. FINE GRAINED, POORLY CEMENTED, FRIABLE, ODOR, WET, SOME SILT 20%	WEATH. SS												8	538	0.5	17.5	
	19.2														NS			18.0	
	19.5	SILTY SANDSTONE: LIGHT GRAY (2.5 YR N 6/0), CALCAREOUS CEMENT, VERY FINE GRAINED, WET, SOFT, POORLY CEMENT, FRIABLE	SAND STONE												9	30	0.5	19.5	20
	20																		
	25	HSA REFUSAL AT 19.5'																	25
	30																		30
	35																		35



SPLIT-SPoon SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

└─ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-62 (MW-39)**

DATE DRILLED **5/27/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(206) 191-1686

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 0.0											SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH				
		Start: 08:40 Stop: 10:40																		BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
		GROUND SURFACE: 3801.2																			
	0	SILT: PINKISH GRAY (7.5 YR 7/2), LOOSE, DRY	ML													1	0.0		1.0	0	
																NS			2.5		
	3.0	CLAYEY SILT: LIGHT BROWN (7.5 YR 6/4) 20% CLAY, 10% CALICHE DEPOSITS, VERY SLIGHTLY PLASTIC, FRIABLE TO LOOSE GRADING TO PINKISH WHITE (7.5 YR 8/2) AT 7.0', DRY	ML													2	0.0	1.5	4.0	5	
	5															3	0.0	1.0	5.0		
																NR		5.5			
																NS			7.5		
																4	0.0	0.5	8.0		
	9.2	SANDSTONE: VERY PALE BROWN (10 YR 8/3), VERY FINE GRAINED, SILTY, CALC. CEMENT, MOD. CEMENTED, FRIABLE, DRY	SS													NS			9.0		
	10		DOLOMITE: LIGHT BROWNISH GRAY (10 YR 6/2), DENSE, HARD, DRY	DOLO.													5	0.0	0.2	9.2	10
																	NS				
	12.1															6	0.0	0.1	12.0		
		HSA REFUSAL AT 12.1'																	12.1		
	15																			15	
	20																			20	
	25																			25	
	30																			30	
	35																			35	

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-63 (MW-40)**

DATE DRILLED 5/28/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>35</u>											SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: <u>0.0</u> PPM AIR: <u>0.0</u> PPM			
		GROUND SURFACE: 3797.3																			
	0	SILT: WEAK RED (2.5 YR 5/2), LOOSE, DRY	ML												1	0.0		1.0			0
														NS			2.5				
	2.8	SILTY CLAY: REDDISH BROWN (5 YR 5/3), 25% SILT, 15% CALICHE DEPOSITS, FIRM, FRIABLE, DRY	CL												2	0.0	1.3	3.8			
														NR			4.0				
	4.7	SILTY CLAY: PINK (7.5 YR 7/3), 20% SILT, 30% CALICHE DEPOSITS, FIRM, FRIABLE, DRY	CL												3	0.0	1.2	5.2			5
	5													NR			5.5				
			CL											NS			7.5				
	8.5														4	0.0	1.5	9.0			
		CLAYEY GRAVEL AND COBBLES: GRAVEL IS DOLOMITIC, LIMESTONE GRAY (5 YR 5/1), DENSE, 60% GRAVEL, 10% COBBLES, 30% CLAY, CLAY IS LIGHT BROWN (9.5 YR 6/3) DRY	GC												5	0.0	1.0	10.0			10
	10														NR			10.5			
														NS			12.5				
															6	0.0	1.0	13.5			
														NR			14.0				
15.03	14.5	CLAYEY GRAVEL AND COBBLES: AS ABOVE BUT SATURATED BELOW 14.5' WITH STRONG HYDROCARBON ODOR	GC												7	46	0.8	14.8			15
	15														NR			15.5			
														NS			17.5				
	18.0	SILTY SANDSTONE: OLIVE GRAY (5 YR 5/2), VERY SOFT, VERY FINE GRAINED, VERY POORLY CEMENTED, VERY FINELY BEDDED, SATURATED, STRONG HYDRO-CARBON ODOR	SILTY SAND STONE												8	685	0.8	18.3			
															NR			19.0			20
	20														9	407	0.5	19.5			
														NS							
	22.5	POSSIBLY DOLOMITE BELOW 22.8', VERY HARD	DOLO.												10	39	0.3	22.8			
	23.0														NS			23.0			
	25	HSA REFUSAL AT 23.0'																			25
	30																				30
	35																				35

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-64 (MW-41)**

DATE DRILLED 5/29/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0											SAMPLE			REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM		
		GROUND SURFACE: 3802.7																		
	0	SILT: BROWN (7.5 YR 5/4), LOOSE, DRY	ML											1	0.0		1.0			0
														NS			2.5			
	2.8	CLAYEY SILT: PINK (7.5 YR 7/3), 25% CLAY, SLIGHTLY LOOSE, DRY, VERY SLIGHTLY PLASTIC	ML											2	0.0	1.5				
	4.8	CLAYEY SILT: PINKISH WHITE (5 YR 8/2), LOOSE, DRY 25% CLAY, CONTAINS TRACE OF GRAVEL	ML											3	0.0	1.0				
	5													NR			5.5			5
														NS			7.5			
	7.5	SANDSTONE: PINKISH GRAY (7.5 YR 7/2), POORLY CEMENTED, CALICHE DEPOSITS, FRIABLE, DRY. VERY FINE GRAINED, SILTY, DRY	SILTY SAND STONE											4	0.0	0.2	7.7			
	9.0													NS			9.0			
	10	SANDSTONE: VERY SILTY LIGHT GRAY (5 YR 7/1), HARD, FRIABLE, VERY FINE GRAINED, FAIRLY WELL CEMENTED, CALCAREOUS, DRY, VERY FINELY BEDDED	SAND STONE											5	0.0	0.3	9.3			10
														NS			10.5			
														6	6.6	0.3	10.8			
														NS						
														7	1.6	0.1	12.5			
	14.0													NS			12.6			
	15	SANDSTONE: BROWN (7.5 YR 5/2), SLIGHTLY DOLOMITIC, CALCAREOUS CEMENT, FAIRLY WELL CEMENTED, HARD, VERY SLIGHTLY FRIABLE, DRY	SAND STONE											8	3.3	0.2	14.2			15
														NS						
														9	13.2	0.1	17.1			
														NS			19.0			
	20													10	0.0					20
														NS						
	22.0	HSA REFUSAL AT 22.0'															22.0			
	25																			25
	30																			30
	35																			35

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-65 (MW-42)**

DATE DRILLED **5/30/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

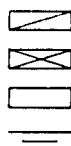
ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
					PPM X <u>42</u>											NUMBER	OVM READING	RECOVERY	DEPTH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
					2	4	6	8	10	12	14	16	18																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		GROUND SURFACE: 3800.1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																</



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-66 (MW-43)**

DATE DRILLED 5/31/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM X <u>19</u>										NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18						
		GROUND SURFACE: 3801.1																	BACKGROUND OVM READING: SOIL: <u>0.0</u> PPM AIR: <u>0.0</u> PPM
	0	SILT: LIGHT BROWN (7.5 YR 6/4), SOFT, DRY, LOOSE	ML												1	0.0		1.0	0
															NS			2.5	
	3.3	CLAYEY SILT: 7.5 YR 5/4, BROWN, FIRM, CALICHE NODULES, DRY, FRIABLE, 15% CLAY, 10% CALICHE, 75% SILT	ML												2	0.0	1.2	3.7	
															NS			4.0	
	5		ML												3	0.0	1.0	5.0	5
															NS			7.5	
	9.0														4	0.0	1.3	8.8	
															NS			9.0	
	10	SILT, GRAVEL & COBBLES: 2.5 YR 6/2, LIGHT BROWNISH GRAY AND 7.5 YR 7/2 PINKISH GRAY, LIGHTLY CEMENT, HARD, DRY, V. SILTY DOLOMITIC LIMESTONE GRAVELS, WET AT 14.3'	GM												5	0.0	0.8	9.8	10
															NS			12.5	
	14.3														6	0.0	1.0	13.5	
															NS			14.0	
	14.4	CLAYEY SILT: 10 YR 4/4, SOFT, WET, LOW PLASTICITY, STRONG HYDROCARBON ODOR, 30% CLAY, 70% SILT (LENS) AT 14.4-15.0	CL												7	180	1.0	15.0	15
	15														NS			17.5	
															8	359	1.3	18.8	
															NS			19.0	
	20														9	375	1.2	20.2	20
															NS			22.0	
	22.1 22.3	SANDSTONE: 2.5 YR 5/4, LIGHT OLIVE BROWN, FINE GRAINED, SILTY, HARD, STRONG HYDROCARBON ODOR	SS												10	107	0.3	22.3	
		HSA REFUSAL AT 22.3'																	
	25																		25
	30																		30
	35																		35

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-67 (MW-44)**

DATE DRILLED 6/1/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.5										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3806.6																
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, LOOSE, SOFT, DRY	ML											1	0.0		1.0	0
	2.7													NS			2.5	
		CLAYEY SILT: 7.5 YR 5/4, BROWN, NON-PLASTIC, DRY, FRIABLE, CALICHE NODULES, 15% CLAY, 10% CALICHE, 75% SILT												2	0.0	1.5	4.0	
	5		ML											3	0.0	1.5	5.5	5
														NS			7.5	
	9.3													4	0.0	1.5	9.0	
	10	SANDSTONE: 2.5 YR 8/4, PALE YELLOW, MODERATLY HARD, SLIGHTLY CEMENTED, FINE GRAINED, SILTY												5	0.0	0.9	9.9	10
		COLOR CHANGES TO 2.5 YR 5/6 LIGHT OLIVE BROWN WITH INCREASED MOISTURE												NS			12.5	
														6	0.0	0.2	14.2	
	15	2.5 YR 4/4 OLIVE BROWN AND 2.5 YR 5/6 LIGHT OLIVE BROWN AT 17.5', CEMENTED, HARD AT 18.0, WET AT 18.5'	GM											NS			17.0	15
	18.5													7	0.0	0.6	17.6	
														NS			19.0	
	20													8	9.9	0.6	19.6	20
														NS			22.5	
	24.0													9	2.8	0.4	22.9	
	25	HSA REFUSAL AT 24.0'												NS			24.0	25
	30																	30
	35																	35



SPLIT-SPOON SAMPLER



STANDARD PENETRATION TEST



UNDISTURBED SAMPLE



WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)



LABORATORY TEST LOCATION



PENETROMETER (TONS/SQ. FT.)



NR: NO RECOVERY



NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-68 (MW-45)**

DATE DRILLED 6/1/91 & 6/2/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-1885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM X <u>38</u>											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18							
		GROUND SURFACE: 3803.5																		
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, LOOSE, SOFT, DRY	ML													1	0.0		1.0	0
																NS			2.5	
	3.2	CLAYEY SILT: 7.5 YR 5/4, BROWN, DRY, FRIABLE, CALICHE NODULES AND PRECIPITATION, 15% CLAY, 10% CALICHE, 75% SILT	ML													2	0.0	1.0	3.5	
	4.0															NS			4.0	
	5															3	47	1.1	5.1	5
		SILT, GRAVEL AND COBBLES: 7.5 YR 7/2 PINKISH GRAY, GRAVEL FINE TO COARSE, DRY, DOLOMITIC LIMESTONE AND CHERTY GRAVELS AND COBBLES														NS			7.5	
		WET AT 12.5'														4	49	1.1	8.6	
																NS			9.0	
																5	120	0.4	9.4	
	10	DARK GRAY SLUDGE AT 11.0'	GM													NS			10.5	10
																6	764	0.5	11.0	
																NS			12.5	
																7	575	0.8	13.3	
																NS			14.0	
																8	305	1.0	15.0	15
																NS			17.5	
	17.9	SANDSTONE: 2.5 YR 5/4, LIGHT OLIVE BROWN, FINE GRAINED, HARD	SS													9	556	0.7	18.2	
	18.2																			
		AUGER REFUSAL AT 18.2'																		
	20	BOREHOLE OVM READING: 80 PPM																		20
	25																			25
	30																			30
	35																			35

 SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

 WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-69 (MW-46)**

DATE DRILLED 6/2/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>38</u>													SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		GROUND SURFACE: 3803.0																				
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, LOOSE, SOFT, DRY	ML														1	0.0		1.0	0	
																	NS			2.5		
	3.0	CLAYEY SILT: 7.5 YR 5/4, BROWN, HARD, DRY, CALICHE, 15% CLAY, 25% CALICHE, 60% SILT	ML														2	0.0	1.0	3.5		
	3.7																NS			4.0		
	5	SILT, GRAVEL & COBBLES: 7.5 YR 7/2, PINKISH GRAY, DOLOMITIC LIMESTONE, VERY HARD, DRY, BLACK HYDROCARBON SLUDGE AT 4.8' TO 5.0', COBBLES AND GRAVEL ARE 10 YR 7/1, LIGHT GRAY AT 6.5'-T.D.															3	33	1.0	5.0	5	
																	NS			7.5		
																	4	11.5	0.5	8.0		
																	NS			9.0		
	10		GM														5	231	0.4	9.4	10	
																	NS			12.5		
																	6	87.2	1.0	13.5		
																	NS			14.0		
	15																7	767	1.0	15.0	15	
																	NS			17.5		
																	8	562	1.0	18.5		
																	NS			19.0		
	19.7																9	540	0.5	19.5		
	20	AUGER REFUSAL AT 19.7'															NS			19.7	20	
	25																				25	
	30																				30	
	35																				35	

 SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

 WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-70 (MW-47)**

DATE DRILLED 6/3/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

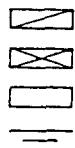
ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>37</u>											SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: <u>0.0</u> PPM AIR: <u>0.0</u> PPM			
		GROUND SURFACE: 3804.4																			
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, LOOSE, SOFT, DRY	ML												1	0.0		1.0			0
														NS			2.5				
	3.0	CLAYEY SILT: 7.5 YR 5/4, BROWN, NON-PLASTIC, DRY, FRIABLE, CALICHE PRESENT, 15% CLAY, 10% CALICHE	ML												2	0.0	1.0	3.5			
														NS			4.0				
	5														3	0.0	1.0	5.0			5
		SILT, GRAVEL, COBBLES: SILT IS 7.5 YR 7/2, PINKISH GRAY, GRAVEL & COBBLES ARE 10 YR 7/1 LIGHT GRAY TO 7.5 YR 6/4 LIGHT BROWN, GRAVELS ARE DOLOMITIC LIMESTONE, LOOSE, CALICHE IN SILT													NS			7.5			
															4	0.0	0.5	8.0			
															NS			9.0			
	10		GM												5	0.0	0.3	9.3			10
															NS			12.5			
															6	0.0	0.7	13.2			
															NS			14.0			
	15														7	767	1.0	15.0			15
															NS			17.5			
															8	738	0.2	17.7			
															NS			19.0			
	19.0														9	694	0.3	19.3			
	20	SANDSTONE: 2.5 YR 5/6, LIGHT OLIVE BROWN, MODERATLY, HARD, FINE GRAINED, SLIGHT HYDROCARBON ODOR, MOIST AT 22.0', COLOR CHANGES TO 2.5 YR 4/4, OLIVE BROWN AT 22.0'													NS			22.5			20
			SS												10	428	0.3	22.8			
															NS			24.0			
	25														11	216	0.5	24.5			25
															NS			27.5			
															12	11	0.5	28.0			
															NS			29.0			
	29.0														13	16	0.5	29.5			
	30	SANDSTONE: 2.5 YR 6/0 TO 7/0, GRAY TO LIGHT GRAY, DRY, HARD, FINE GRAINED	SS												NS						30
	32.0	AUGER REFUSAL AT 32.0'																32.0			
	35																				35



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

└─ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-71 (MW-48)**

DATE DRILLED **6/4/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **JMB**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 4											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		GROUND SURFACE: 3803.7																		
	0	SILT: 10 YR 7/3, VERY PALE BROWN, LOOSE, DRY, SOFT	ML													1	0.0		1.0	0
																NS			2.5	
	3.0	SANDSTONE: 2.5 YR 8/2, WHITE, FRIABLE, HIGHLY WEATHERED, SOFT TO MODERATLY HARD, SLIGHTLY MOIST AT 4.0', 2.5 YR 7/4, PALE YELLOW, SLIGHTLY CEMENTED AT 7.5, MODERATLY HARD TO HARD, COLOR CHANGES TO 2.5 YR 7/2, LIGHT GRAY, 2.5 YR 6/8, OLIVE YELLOW AT 9.5' CEMENTED HARD LAYERS AT 17'-17.3', 17.8'-18.0	SS												2	0.0	1.5	4.0		
	5												3	0.0	0.5	4.5	5			
													NS							
													4	0.0	0.2	7.5				
													NS			7.7				
													5	0.0	0.2	9.0				
	10															9.2	10			
													NS							
													6	0.0	0.3	12.5				
													NS			12.8				
										7	0.0	0.3	14.0							
	15												14.3	15						
										NS										
										8	0.0	0.2	17.5							
										NS			17.7							
										9	71	0.6	19.0							
	20												19.6	20						
										NS										
													22.5							
										NS			24.0							
	24.0	AUGER REFUSAL AT 24.0'													10	26	0.4	24.4	25	
	25	BOREHOLE OVM READING: 59.0 PPM																		
	30																		30	
	35																		35	

SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-72 (MW-49)**

DATE DRILLED **6/5/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **JMB**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

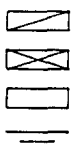
ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM X <u>8</u>											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18							
		GROUND SURFACE: 3811.2																		
	0	SILT: 10 YR 7/3, VERY PALE BROWN, LOOSE, DRY, SOFT	ML													1	0.0		1.0	0
	2.5	SANDSTONE: 2.5 YR 8/2, WHITE, DRY, MODERATELY HARD, VERY FINE GRAINED, SILTY, WEATHERED														NS			2.5	
																2	0.0	1.3	3.8	
																NS			4.0	
	5	2.5 YR 7/4 PALE YELLOW AT 4.0'														3	0.0	0.3	4.3	
																NS				5
																			7.5	
		2.5 YR 6/8 OLIVE YELLOW AT 8.5' MOIST AT 9.0'														4	0.0	0.3	7.8	
																NS			9.0	
	10															NS				10
																			12.5	
																5	0.0	0.3	12.8	
																NS			14.0	
	15															NS				15
		CEMENTED LAYER SET 13.0'-17.5'	SS																17.5	
																6	0.0	0.6	18.1	
		VERY MOIST TO WET AT 19.0'														NS			19.0	
	20	2.5 YR 4/4 OLIVE BROWN AT 20.0'														7	0.0	0.5	19.5	
																NS				20
																			22.5	
																8	0.0	0.2	22.7	
																NS			24.0	
	25	VERY HARD & CEMENTED AT 24.0'-25.0'														NS				25
																			27.5	
																NS			28.5	
																9	125	0.5	29.0	
	30															NS				30
																			32.5	
																10	160	0.5	33.0	
																NS			34.0	
	35	T.D. 35.0'														11	74	1.0	35.0	35



SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-73 (MW-50)**

DATE DRILLED **6/5/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **JMB**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 0										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3809.3																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, LOOSE, DRY, SOFT	ML											1	0.0		1.0	0
	2.8	CLAYEY SILT: 7.5 YR 5/4, BROWN, FIRM, FRIABLE, DRY, CALICHE, 15% CLAY, 10% CALICHE	ML											NS			2.5	
														2	0.0	1.0	3.5	
														NS			4.0	
	5		ML											3	0.0	0.1	4.1	5
														NS			7.5	
	8.5													4	0.0	1.0	8.5	
														NS			9.0	
	10	SILT, GRAVEL, COBBLES: SILT IS 10 YR 6/4 TO 5/4, LIGHT YELLOWISH BROWN TO YELLOWISH BROWN, DRY, GRAVEL & COBBLES ARE 2.5 YR 5/0 TO 4/0, GRAY TO DARK GRAY AND ARE DOLOMITIC LIMESTONE, VUGGY POROSITY, LIMESTONE IS ALSO 2.5 YR 6/2 LIGHT BROWNISH GRAY	GM											5	0.0	0.6	9.6	10
														NS			12.5	
	15													6	0.0	0.6	13.1	
														NS			14.0	
	16.5													7	0.0	0.7	14.7	15
														NS			17.5	
	17.9													8	0.0	0.5	18.0	
	18.5	SANDSTONE: 2.5 YR 6/6, OLIVE YELLOW HARD, FINE GRAINED, SILTY	SS															
	20	T.D. 18.5'																20
	25																	25
	30																	30
	35																	35

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-74 (MW-51)**

DATE DRILLED 6/6/91
 DRILLING METHOD HSA/SS
 DRILLED BY SHB
 LOGGED BY JMB
 CHECKED BY BJS
 DRAWN BY: SAR

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE			REMARKS	
					PPM X 0											NUMBER	OVM READING	RECOVERY		DEPTH
					2	4	6	8	10	12	14	16	18							
		GROUND SURFACE: 3815.3																		
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, ROOTLETS TOP 2.0', LOOSE, SOFT, DRY	ML													1	0.0		1.0	0
	2.8	CLAYEY SILT: 7.5 YR 5/4, BROWN, FRIABLE, FIRM, NON-PLASTIC, DRY, CALICHE, 15% CLAY, 10% CALICHE	ML													NS			2.5	
	4.7															2	0.0	1.2	3.7	
	5															NS			4.0	
	5	SILT, GRAVEL & COBBLES: SILT IS 10 YR 6/4 TO 5/4, LIGHT YELLOWISH BROWN TO YELLOWISH BROWN, DRY, GRAVEL & COBBLES ARE 2.5 YR 5/0 TO 4/0, GRAY TO LIGHT GRAY TO 2.5 YR 6/2 LIGHT BROWNISH GRAVEL, GRAVELS ARE DOLOMITIC LIMESTONE, VUGGY POROSITY														3	0.0	0.9	4.9	5
																NS			7.5	
																4	0.0	0.6	8.1	
																NS			9.0	
	10		GM													5	0.0	1.0	10.1	10
																NS			12.5	
																NS			14.0	
	15															6	0.0	1.0	15.0	15
																NS			17.5	
																7	0.0	0.5	18.0	
	19.0															NS			19.0	
	19.25	DOLOMITIC LIMESTONE: 7.5 YR 6/2, PINKISH GRAY, VERY HARD, VUGGY POROSITY, MOIST	LS													8	0.0	0.35	19.35	20
	20	T.D. 19.25'																		
	25																			25
	30																			30
	35																			35

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-75 (MW-52)**

DATE DRILLED 6/6/91 & 6/7/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>2.5</u>											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
	0	GROUND SURFACE: 3814.4																		
	0	SILT: 10 YR 4/3 BROWN TO DARK BROWN, LOOSE, SOFT, DRY	ML													1	0.0		1.0	0
	3.0															NS			2.5	
	3.5	SILT, GRAVELS: 5 YR 7/1, LIGHT GRAY, GRAVEL IS LIMESTONE, VUGGY POROSITY, DRY	GM	OOO												2	0.0	0.7	3.2	
	5	AUGER REFUSAL AT 3.5'																		5
	10																			10
	15																			15
	20																			20
	25																			25
	30																			30
	35																			35

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-76**

DATE DRILLED 6/7/91
 DRILLING METHOD HSA/SS
 DRILLED BY SHB
 LOGGED BY JMB
 CHECKED BY BJS
 DRAWN BY: SAR

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>2.5</u>											SAMPLE				REMARKS		
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		Start: 14:00 Stop: 15:30																				
		GROUND SURFACE: 3807.5																				
	0	COBBLEY CLAYEY SILT: BROWN, 10 YR 4/3, DRY, VERY LOW PLASTICITY, COBBLES FROM 3 CM TO 10 CM, SUB-ROUND	GM												1	0.0		1.0	0			
					NS																2.5	
					2	0.0	1.0														3.5	
					NR																4.0	
					3	0.0	0.2														4.2	
	5				NR																5.5	5
					NS																7.5	
					4	0.0	0.7														8.2	
					NR																8.5	
					NS																9.0	
		5	0.0	0.5														9.5				
	10	6	0.0	0.2														10.0	10			
		NR																11.0				
		7	0.0	0.6														11.6				
		NR																12.5				
	13.6	AUGER REFUSAL AT 13.6'																13.0				
	15	GROUNDWATER NOT OBSERVED DURING DRILLING																13.6				
																			15			
	20																		20			
	25																		25			
	30																		30			
	35																		35			

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-77 (MW-53)**

DATE DRILLED 6/7/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

BORING RECORD																						
GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>0.0</u>										SAMPLE				REMARKS			
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		Start: 08:35 Stop: 09:35 GROUND SURFACE: 3812.3																				
	0	COBBLEY CLAYEY SILT: BROWN, 10 YR 5/3, DRY, VERY LOW PLASTICITY, VERY FINE QUARTZ, COBBLES FROM 3CM TO 10 CM, SUBROUND	GM													1	0.0		1.0	0		
																		NS			2.5	
																		2	0.0	0.3	2.8	
																		NR			4.0	
																		3	0.0	0.4	4.4	
	5																	NS			5.5	5
	6.4																	NR	0.0		6.4	
		AUGER REFUSAL AT 6.4'																				
		GROUNDWATER NOT OBSERVED DURING DRILLING																				
	10																			10		
	15																			15		
	20																			20		
	25																			25		
	30																			30		
	35																			35		

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-78**

DATE DRILLED 6/8/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

DRAWN BY: SAR

PAGE 1 OF 1

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 0.0											SAMPLE				REMARKS		
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		Start: 13:00 Stop: 13:25																				
		GROUND SURFACE: 3820.2																				
	0	CLAYEY SILT: YELLOWISH BROWN, 10 YR 5/4, QUARTZ, VERY FINE GRAIN, GRAVELLY, DRY	ML														1	0.0		1.0	0	
	2.0	SANDSTONE: PALE TO VERY PALE BROWN, 10 YR 6/3 TO 7/5, QUARTZOSE, VERY FINE GRAIN, WEATHERED FROM 2.5 TO 3.0', COMPETENT-HARD BELOW 3.0', CaCo3 PRESENT	SS														NS			2.5		
	3.0																NR	0.0		3.1		
	3.8			DOLO.														NS			3.8	
																		NR	0.0		3.9	
	5	DOLOMITE: LIGHT BROWNISH GRAY, 10 YR 6/2, SANDY, MASSIVE, VERY HARD																			5	
		AUGER REFUSAL AT 3.8'																				
		GROUNDWATER NOT OBSERVED DURING DRILLING																				
	10																				10	
	15																				15	
	20																				20	
	25																				25	
	30																				30	
	35																				35	

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-79**

DATE DRILLED 6/8/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 4.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	20	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3821.80																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	0	CLAYEY SILT: 15% CLAY, 80% 7.5 YR 6/4, UNCONSOLIDATED, DRY	CL												NS				0
	3.5	SILTSTONE: 2.5 YR 8/1 WHITE, HARD, DRY	SILTSTONE												1	0.0	0.8	3.0	
	5														NR			4.0	
	6.0	SANDY DOLOMITE: VERY FINE GRAIN SILICA SAND, 10 YR 7/1 LIGHT GRAY, VERY HARD, FRACTURED, DRY	SANDY DOLOMITE												2	0.0		5.0	5
	8.0														NR			5.9	
	10	SANDSTONE: VERY FINE GRAIN SILICA, WELL SORTED, HARD, MOIST, 10 YR 7/2 LIGHT GRAY, MASSIVE, MINOR IRON OXIDE MOTTLING, FRACTURES (HORIZONTAL) AT 8.1, 8.8, 9.7, 10, & 10.3 FEET, SANDY DOLOMITE INTERBEDDED AT 10.3' TO 10.8', FRACTURES AT 6.2, 8.0, 10.2, 11.7, 12.8, 13.1, 13.9, 15.9 SANDSTONE VERY MOIST AFTER 12.6'	SANDSTONE												3	4.0		8.0	
	15														NS		0.9	8.8	
	20														4	0.0		10.8	
	25														5	0.0		10.0	10
	30														6	0.0		12.0	
	35														7	0.0		14.0	
	40														8	82		16.0	15
	45														NR			18.8	
	50														9	9	10.0	19.5	20
	55														10	0.0		21.3	
	60														11	0.0		23.5	
	65														12	47		25.5	25
	70														13	0.0		27.5	
	75														14	0.0		29.8	
	80														15	0.0		31.5	30
	85														16	0.0		33.5	

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR NO RECOVERY
- NS NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-80 (MW-54)**

DATE DRILLED **6/16/91 TO 6/17/91**

DRILLING METHOD **HSA WATER CORE**

DRILLED BY **SHB**

LOGGED BY **WEP**

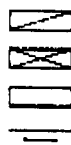
CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 3

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM X 4.0										NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18						
		GROUND SURFACE: 3821.90																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	35	AFTER 35.1', MODERATELY WELL CEMENTED, ABUNDANT FRACTURES - EVERY .2 FEET	SANDSTONE												17	4.6		35.5	35
		AFTER 36.0', 2.5 YR 6/2 LIGHT BROWN GRAY TO 2.5 YR 6/4 LIGHT YELLOW BROWN IRON OXIDE STAINING, MOIST MOD. WELL CEMENTED AFTER 38.8', 2.5 YR 4/2 DARK GRAY BROWN GRADING INTO 10 YR 3/1 VERY DARK GRAY, VERY FINE GRAIN SANDSTONE BETWEEN 42.5' AND 43.5', VERY FINE GRAIN SILTY SANDSTONE 5 YR 4/1 DARK GRAY													18	0.0		37.5	
	40														NR			38.8	
																		39.5	
															19	0.0	5.0		40
															20	0.0		41.5	
															21	0.0		43.5	
	45														NR			44.5	45
																		46.1	
PVC CONDUCTOR SET AT 46'		SANDSTONE: VERY FINE GRAIN, 10 YR 5/1 GRAY TO 10 YR 3/1 VERY DARK GRAY, VERY HARD, MODERATELY FRACTURED, AFTER 47.0' 2.5 YR 7/0 LIGHT GRAY, MOTTLED WITH 10 YR 6/3 PALE BROWN, SLIGHTLY DOLOMITIC AFTER 50.7', BETWEEN 54.8' AND 55' 5 YR 4/1 DARK GRAY	SANDSTONE												22	1.0	10.0	48.0	
	50														23	1.0		50.0	50
		CONTINUING ALTERNATING BANDS OF 10 YR 5/1 GRAY AND 2.5 YR 7/6 LIGHT GRAY MOTTLED WITH 10 YR 6/3 PALE BROWN													24	7.2		52.0	
															25	39		54.0	
	55														26	4.6		56.0	55
															27	1.0	10.0	58.0	
															28	0.0		60.0	
	60														29	7.0		62.0	60
		BETWEEN 62.6' AND 62.7': SILTY SANDSTONE 5 YR 6/2 OLIVE GRAY, HIGHLY WEATHERED													30	3.3		64.0	
															31	3.3		66.0	65
	65														32	1.0		68.0	
															33	58		70.0	70



SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
 L LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 N. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-1605

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-80 (MW-54)**

DATE DRILLED **6/16/91 TO 6/17/91**

DRILLING METHOD **HSA/WATER CORE**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 2 OF 3

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 4.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
		GROUND SURFACE: 3821.90																	
	70		SAND-STONE												34	3.0		72.0	70
	72.0	DOLOMITE: GRADATIONAL CONTACT WITH SANDSTONE, 5 YR 5/1 GRAY, VERY HARD, HORIZONTAL FRACTURES AT 72.6, 73, 73.3, 73.4, 74.7, 75.0, STRONG CONDENSATE ODOR AT 76.0'	DOLOMITE												*			74.0	
	75														*			76.0	75
		T.D. 78.0'																	
		WATER LEVEL AFTER DRILLING 14.90'																	
	80	* SAMPLES BROKEN PRIOR TO OVM																	80
	85																		85
	90																		90
	95																		95
	100																		100
	105																		105

-  SPUT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-80 (MW-54)**

DATE DRILLED 6/16/91 TO 6/17/91

DRILLING METHOD HSA WATER CORE

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 3 OF 3

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

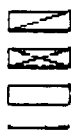
3705 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.0										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
	0	GROUND SURFACE:																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	0	32.1 TO 32.2 FEET FRIABLE, SANDSTONE INTERBED, 5 YR 5/3 OLIVE, MOIST, IRON OXIDE AND PYRITE ALONG FRACTURES BELOW 33' AFTER 34.3', VERY HARD, FINE GRAIN, LARGE	DOLOMITIC SANDSTONE											11	3.3	10	37.0	0
																	39.0	
	5	DOLOMITIC SANDSTONE: VERY FINE GRAIN SAND, GRADATIONAL CONTACT WITH DOLOMITE, VERY HARD 10 YR 6/1 LIGHT GRAY-GRAY 10 YR 5/2 GRAY BROWN 38.9' TO 39.8', FRACTURES 38.7', 37.8', 38.8', 42.4', 43.8', 44', 44.7'	SANDSTONE											13	84		41.0	5
														14	15.2		43.0	
														15	9.0		45.0	
	10	SANDSTONE: VERY FINE GRAIN SILICA 2.5 YR 6/2 LIGHT BROWN GRAY, VERY HARD BETWEEN 8.9 AND 7.4 FEET, 10 YR 4/1 DARK GRAY ZONE, SILTSTONE INTERBED BETWEEN 42.8 AND 43.4 FEET: HIGHLY FRIABLE AND WEATHERED, 2.5 YR 4/2 DARK GRAY BROWN BETWEEN 43.4 AND 44.4 FEET DOLOMITIC SANDSTONE: VERY FINE GRAINED, 10 YR 6/1 LIGHT GRAY TO GRAY AFTER 44.4 FEET SANDSTONE: VERY FINE GRAIN 5 YR 4/1 DARK GRAY, MOD. HARD, 5 YR 4/1 DARK GRAY 45 TO 46.1 FEET	DOLOMITE SANDSTONE											16	44	10	47.0	10
														17	9.9		49.0	
														18	78		51.0	15
	15	DOLOMITIC SANDSTONE: VERY FINE GRAIN, 7.5 YR 7/0 LIGHT GRAY, VERY HARD, HORIZONTAL FRACTURES AT 44.1'	DOLOMITE SANDSTONE											19	7.0		53.0	
		SANDY DOLOMITE: VERY FINE GRAIN 10 YR 6/2 LIGHT BROWN GRAY, VERY HARD, HORIZONTAL FRACTURES AT 40.0, 51.9, 52.7, 53.5, 53.7, 45' FRACTURE AT 49.9', VERTICAL FRACTURE AT 44.2' TO 55.0', PYRITE, CALCITE AND HEMATITE FRACTURE FILL, STRONG CONDENSATE ODOR AFTER 53.0'	DOLOMITE											20	362		55.0	20
														21	4.0	10	57.0	
														22	7.2		59.0	
	25	DOLOMITE: 10 YR 6/2 LIGHT BROWN GRAY, HIGHLY FRACTURED WITH THIN INTERBEDS OF DOLOMITIC SILTSTONE AND SANDSTONE, STRONG CONDENSATE ODOR												23	3.0		61.0	25
														24	1.0		63.0	
														25	36		65.0	
	30	T.D. 65.0'																30



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (IN HOLLOW)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NO. NO. RECOVERY

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-81 (MW-55)**

DATE DRILLED

DRILLING METHOD **HSA WATER CORE**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 2 OF 2

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(800) 521-3888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.0										SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM		
		GROUND SURFACE: 3792.60																		
	0	SILT: WELL GRADED, VFG, 90% SILT, 10% SAND, NO PLASTICITY, 10 YR 8/4 VERY PALE BROWN, NO ODOR, DRY SOFT NON STRATIFIED, CALCITE CEMENT, HCL(+)	ML												1	0.0	GC	2		0
	5	-COLOR CHANGE TO 10 YR 6/8													NS		GC	5		5
		SANDSTONE: VERY FINE GRAINED SILICA, 10 YR 6/3 PALE BROWN, 10 YR 5/3 BROWN, MODERATELY HARD TO VERY HARD, SLIGHTLY MOIST, WEATHERED, MOIST AND FRIABLE BETWEEN 18.5 AND 21.5', AFTER 21.5' VERY HARD, FRACTURES LARGELY CEMENTED, FRACTURES AT 15.2, 16.0, 16.8, 17.2, 17.5, 18.5, 19.7, 20.0, 20.8, 21-21.5, 23.3, 24.0, NO ODOR	SANDSTONE												2	0.0	GC	6		
															3	0.0	GC	7		
															4	0.0	GC	8		
	10	12" CONDUCTOR TO 11 FEET													5	0.0	GC	10		10
															6	0.0	GC	13		
	15														NS		GC	15		15
															7	1.9		17		
															8	0.0		19		
	20														9	0.0		21		20
															10	0.0		23		
	25														11	0.0		25		25
															12	11		27		
															13	20		29		
	30														14	9.9		31		30
	30.5	SANDY DOLOMITE: VERY FINE SAND, 10 YR 6/1, LIGHT GRAY TO GRAY, VERY HARD	SANDY DOLOMITE												15	0.0		33		
	31.5	DOLOMITE: MICRO CRYSTALLINE, 2.5 YR 6/2, LT BROWN GRAY, VERY HARD, FRACTURES AT 31.6, 32.1, 32.2, 32.5-33.5, 33.8, 33.9, 35.1, 35.7 FEET	DOLOMITE												16	0.0		35		35

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-1400

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-81 (MW-55)**

DATE DRILLED **8/20/91 TO 8/21/91**

DRILLING METHOD **HSA/WATER CORE**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS																SAMPLE				REMARKS
					PPM X 11.2																NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18												
		GROUND SURFACE: 3780.30																							
	0	CLAYEY SILT: 20% CLAY, 80% SILT, 10 YR 5/3, BROWN, DRY, UNCONSOLIDATED, LOW PLASTICITY	CL															1	0.0	GC	2.0	0			
																		NS	0.0		4.0				
	5																	2	2.0	GC	5.0				
	6.0	SILTY CLAY: 30% SILT, 70% CLAY, 10 YR 5/3 BROWN, SOFT, MED. PLASTICITY, MINOR SUBANG DOLOMITE GRAVEL TO 1/4 INCH, MINOR DOLOMITE COBBLES TO APPROXIMATELY 3 INCHES	CL															NS	0.0		7.0	5			
																		3	55.0	GC	8.0				
	9.5																	NS	0.0		9.0				
	10	DOLOMITE: 10 YR 4/1, DARK GRAY TO 10 YR 6/1, GRAY-LIGHT GRAY, DRY, HARD VERTICAL FRACTURE BETWEEN 16.2-17.0' MODERATELY FRACTURED BELOW 17.0'	DOLOMITE															4	25.0	GC	10.0	10			
																		5	25.3	GC	12.0				
	15																	6	5.0	GC	14.0				
																		7	0.0	GC	15.0	15			
	17.7																	8	8.0		17.0				
		DOLOMITE: WITH INTERBEDS OF SILTY DOLOMITE 10 YR 5/2, GRAYISH BROWN, 10 YR 6/2, LIGHT BROWNISH GRAY, AND 10 YR 5/1, GRAY, ABUNDANT HEMATITE-REPLACED FOSSILS - POSSIBLY GRAPTOLITES OR SPONGE SPICULES, AFTER 21.0', CHERT-LIKE CONCOIDAL FRACTURING	DOLOMITE/SILTY DOLO.															9	0.0		19.0				
	20																	10	0.0		21.0	20			
																		11	0.0		23.0				
	25																	NR			25.0	25			
		DOLOMITE: 10 YR 5/2, GRAYISH BROWN, MICRO-CRYSTALLINE, VERY HARD, HIGHLY FRACTURED, 2.5 Y 6/2, LIGHT BROWNISH GRAY SILT ALONG HORIZONTAL, FRACTURES, MINOR IRON OXIDE STAINING	DOLOMITE															12	1.0	9.0	27.0				
																		13	1.7		29.0				
	30																	14	8.0		31.0	30			
																		15	9.0		33.0				
	35	STRONG CONDENSATE ODOR IN FRACTURE AT 32.8' IN FRACTURE 45' FROM VERTICAL																16	0.0		34.0				
																		NR			35.0	35			

6/21/91
32.75'

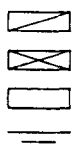
--- WATER TABLE (TIME OF BORING)
 L LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLE
 GC: GRAB COMPOSITE

JOB NAME/NUMBER **MARATHON/91029.01**
 BORING NUMBER **BH-82 (MW-56)**
 DATE DRILLED 6/15/91 & 6/19/91
 DRILLING METHOD SCHRAMM ROTARY/CORE
 DRILLED BY BOYLES BROC & SHB
 LOGGED BY WEP
 CHECKED BY BJS
 DRAWN BY: SAR PAGE 1 OF 2

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM X 11.2											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18	18						
	35	GROUND SURFACE: 3780.30																		
	35.6'	STRONG CONDENSATE ODOR IN FRACTURES TO 35.6'	DOLOMITE													17	224.0	5.0	35	
	40	AFTER 35.6', FRACTURES LARGELY CEMENTED														18	0.0		37.0	
	41.0															19	0.0		39.0	
	41.2'	T.D. 41.2'																	41.0	
	45	GROUNDWATER AT 32.75' 1/8" FLOATING PRODUCT STRONG CONDENSATE ODOR 6/21/91																		
	50																			
	55																			
	60																			
	65																			
	70																			



CME CONTINUOUS AUGER SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
PENETROMETER (TONS/SQ. FT.)

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-82 (MW-56)**

DATE DRILLED 6/15/91 & 6/19/91

DRILLING METHOD SCHRAMM ROTARY/CORE

DRILLED BY BOYLES BRO & SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 2 OF 2

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 48.0	SAMPLE				REMARKS
						NUMBER	OVM READING	RECOVER	DEPTH	
	0	GROUND SURFACE: 3785.60								
	0	SANDY SILT: VERY FINE GRAIN SAND, 20% SAND, 80% SILT, LOOSE, UNCONSOLIDATED, MASSIVE, 7.5 YR 5/4, BROWN, DRY	SM			1		SC	1.0	0
	2.0					NS			2.1	
						NS			3.1	
	5	SANDY DOLOMITE: VERY FINE-FINE GRAIN SILICA SAND, 10 YR 6/2, LIGHT BROWNISH GRAY TO 7.5 YR 6/2, PINKISH GRAY, VERY HARD, DRY, PITTED, HEMATITE AND CALCITE FRACTURE FILL ~10% PRIMARY POROSITY HORIZONTAL FRACTURES AT 2.3', 2.5', 2.6', 2.9', 3.1', 3.3', 3.7', 4.0', 4.1', 4.5', 5.0', 5.4', VERTICAL FRACTURES AT 3.3'-4.0', CHERT AFTER 7.0', 7.3'-7.5', SILTSTONE, 10 YR 5/2, GRAYISH BROWN, HIGHLY WEATHERED, FIRM VERY MOIST, IRON OXIDE STAINING, HORIZONTAL FRACTURES AT 9.4', 9.8', 10.0', 10.2', AND 10.7', MINOR VERTICAL FRACTURES	SANDY DOLOMITE			2	0.0	3.9	5.0	5
							0.0		7.0	
						4	0.0	5.0	9.0	
						NR			10.0	
	10	DOLOMITE/SILTSTONE/CHERT: INTERBEDDED, VERY HARD, 10 YR 6/2, LIGHT BROWNISH GRAY, 10 YR 7/2, LIGHT GRAY AND 7.5 YR 7/2, PINKISH GRAY, MODERATELY FRACTURED, POSSIBLE FRACTURE IN CHERT	SILTSTONE/DOLOMITE/CHERT			5	0.0	19.5	12.0	10
						6	0.0		14.0	
	15					7	0.0		16.0	15
						8	0.0		18.0	
						9	0.0		19.5	
						NR			20.0	
	20	DOLOMITE: MICROCRYSTALLINE, 10 YR 5/2, GRAYISH BROWN, 10 YR 5/1, GRAY AND 10 YR 4/1, DARK GRAY, VERY HARD, UNSATURATED, VERY LOW PRIMARY POROSITY, HORIZONTAL FRACTURES AT 20.3', 20.6', 21.6', 22.0', 22.4', 25.0', 27.2', 28.0', 28.5', 28.6', 29.2', 29.7', MINOR IRON OXIDE STAINING IN FRACTURES ALSO 10 YR 3/1, DARK GRAY ALONG PARTINGS	DOLOMITE			NS		20.0		20
	25									25
	30	HIGHLY FRACTURED AFTER 30.5-32.6'				10	0.0	8.0	30.0	30
						11	0.0		32.0	
						12	0.0		34.0	
	35	10 YR 6/3, PALE BROWN, MINOR POSSIBLE CHERT AND HEMATITE ALONG FRACTURES								35

	SPUT-SPOON SAMPLER		WATER TABLE (TIME OF BORING)
	STANDARD PENETRATION TEST		LABORATORY TEST LOCATION
	UNDISTURBED SAMPLE		PENETROMETER (TONS/SQ. FT.)
	WATER TABLE (24 HOURS)	NR: NO RECOVERY	NS: NOT SAMPLE

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-83 (NW-57A)**

DATE DRILLED **6/17/91 - 6/18/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY **SAR**

PAGE 1 OF 5

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3730 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-1888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM X 48.0										NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18						
		GROUND SURFACE: 3785.80																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
	35	DOLOMITE: 10 YR 6/2, LIGHT BROWNISH GRAY, SLIGHT ODOR, DRY, DENSE, THIN SILTSTONE LAYERS, HCl (+) ON SCRATCHING													13	18.0		38.0	35
															14	0.0	GC	38.0	
	40	DOLOMITE: INTERBEDDED WITH SILTY DOLOMITE, HCl (+), DRILLED SOFT AT 41.0', MINOR HEMATITE	DOLOMITE												4	0.0	GC	40.0	40
6/20/91 ▽ 41.7'															5	0.0	GC	42.0	
	45	10 YR 8/1, GRAY, 10 YR 6/1, BROWNISH-YELLOW, 10 YR 3/1, VERY DARK GRAY, DRY, DENSE, NO ODOR, MINOR BLACK REDUCED STAINING													17	0.0	GC	44.0	45
	48.0	DOLOMITE: DOMINANT COLOR 10 YR 6/3, PALE BROWN, PROMINANT BLACK STAINING, NO ODOR, DENSE	DOLOMITE												18	0.0	GC	46.0	
															19	0.0	GC	48.0	
	50																	50.0	50
	50.5	DOLOMITE: DARK GRAY, 2.5 YR N 4/0, AND LIGHT GRAY, 7.5 YR N 7/0, VERY FINE CRYSTALLINE, NO PRIMARY POROSITY OBSERVED, VERY SLIGHTLY SANDY TEXTURE	DOLOMITE												20	23.1	GC	52.0	
															21	17.8	GC	54.0	
	55														22	93.3	GC	56.0	55
	58.0	DOLOMITE: GRAY, 7.5 YR 6/0, AND PINKISH GRAY 7.5 YR 6/2, MICROCRYSTALLINE, DENSE, HARD, DRY	DOLOMITE												23	9.9	GC	58.0	
	58.0	DOLOMITE: LIGHT GRAY, 7.5 YR N 7/0, VERY FINE CRYSTALLINE, SLIGHTLY SANDY TEXTURE, DENSE, HARD, DRY, LIGHT, HYDROCARBON ODOR IN 60.0-62.0', SAMPLE, POSSIBLE CONDENSATE ODOR PRESENT IN 62.0-64.0' SAMPLE	DOLOMITE												24	175.4	GC	60.0	60
	60														25	808.0	GC	62.0	
															26	957.0	GC	64.0	
	65														27	442.0	GC	66.0	65
	65.5	GYPSUM: WHITE, 5 YR 8/1, SOFT, DRY, CHALKY	GYPSUM												28	27.1	GC	68.0	
	67.0	DOLOMITE: LIGHT GRAY, 10 YR 7/1, VERY FINE CRYSTALLINE, HARD, DENSE, DRY, LIGHT HYDRO- CARBON ODOR	DOLOMITE															68.0	
		DOLOMITE: GRAYISH BROWN, 10 YR 5/2, AND PINKISH GRAY, 7.5 YR 7/2, MICROCRYSTALLINE, CHERTY, HARD, DENSE, DRY, HYDROCARBON ODOR DECREASING SLIGHTLY FROM ABOVE	DOLOMITE												29	8.8	GC	68.0	
	70																	70.0	70



ONE CONTINUOUS AUGER SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SG. FT.)
GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-83 (MW-57A)**

DATE DRILLED **6/17/91 - 6/18/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 2 OF 5

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 N. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 48.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	20	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3783.60																	BACKGROUND OVM READING SOIL: 0.0 PPM AIR: 0.0 PPM
	70	CONTINUED FROM PREVIOUS PAGE	DOLOMITE												30	130.4	GC	72.0	70
															31	141.7	GC	74.0	
	75	DOLOMITE: DARK GRAY, 7.5 YR N 4/0, VERY FINE CRYSTALLINE, DENSE, HARD, DRY, FAIR ODOR	DOLOMITE												32	305.0	GC	76.0	75
	78.0	DOLOMITE: PINKISH GRAY, 7.5 YR 6/2, MICRO-CRYSTALLINE, DENSE, HARD, DRY, CHERTY, SLIGHT HYDROCARBON ODOR	DOLOMITE												33	114.5	GC	78.0	
															34	130.4	GC	80.0	
	80	DOLOMITE: LIGHT BROWNISH GRAY, 10 YR 6/2, AND PINKISH GRAY, 7.5 YR 6/2, MICROCRYSTALLINE, DENSE, CHERTY, DRY, NO ODOR OBSERVED	DOLOMITE												35	4.8	GC	82.0	80
															36	0.8	GC	84.0	
	85														37	1.0	GC	86.0	85
															38	1.0	GC	88.0	
	87.5	DOLOMITE: AS ABOVE WITH COLOR GRADING TO GRAY, 2.5 Y N 5/0, AT 87.0'	DOLOMITE												39	0.0	GC	90.0	90
	90	DOLOMITE: LIGHT BROWNISH GRAY, 10 YR 6/2, VERY FINE CRYSTALLINE, DENSE, DRY	DOLOMITE												40	0.0	GC	92.0	
	91.5	SILTSTONE: DUSKY YELLOW GREEN, 5 GY 5/2, SOFT, FRIABLE, DRY	SILTSTONE												41	0.0	GC	94.0	
		DOLOMITE: LIGHT BROWNISH GRAY, 10 YR 6/2, VERY FINE CRYSTALLINE, DENSE, DRY, HARD	DOLOMITE												42	0.0	GC	96.0	95
	95														43	0.0	GC	98.0	
	98.0	DOLOMITE: PINKISH GRAY 7.5 YR 6/2, MICRO CRYSTALLINE, DENSE, CHERTY WITH INTERBEDDED MINOR SILTSTONE, DUSKY YELLOWISH GREEN, 5 GY 5/2, SOFT, FRIABLE	DOLOMITE WITH INTER-BEDDED SILTSTONE												44	0.0	GC	100.0	100
	100	DOLOMITE: PINKISH GRAY, 7.5 YR 6/2, AND 7.5 YR 7/2, VERY FINE CRYSTALLINE, DENSE, HARD, DRY, WITH MINOR INTERBEDDED SILTSTONE, DUSKY YELLOWISH GREEN, 5 GY 5/2, HARD, FRIABLE, FISSILE													45	0.0	GC	102.0	
															46	0.0	GC	104.0	
	105														47	0.0	GC	106.0	105

-  ONE CONTINUOUS AUGER SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
-  GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-83 (MW-57A)**

DATE DRILLED **8/17/91 - 8/18/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 3 OF 5

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

3700 W. 40TH AVENUE
NORMAN, OK 73072
505-327-3000

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 48.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18		NUMBER	OW READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3785.80																	BACKGROUND OVM READING: SOIL: 0.0 PPM ... 0.0 ...
	105	CONTINUES FROM PREVIOUS PAGE													47	0.0	GC	108.0	105
	106.0		DOLOMITE												48	0.0	GC	108.0	
	108.0	DOLOMITE: LIGHT GRAY, 10 YR 7/2, FINE CRYSTALLINE TO SLIGHTLY SANDY, SOME CALCAREOUS CEMENT, SOME INTERBEDDED SILTSTONE, CALCAREOUS FIRM, FRIABLE, VERY PALE BROWN, 10 YR 8/3	DOLOMITE & SILTSTONE												49	0.0	GC	110.0	
	110	LIMESTONE: PINKISH GRAY, 5 YR 8/2, SLIGHTLY DOLOMITIC, VERY FINE CRYSTALLINE, MOD. HARD, CHALKY INTERBEDDED WITH SILTSTONE, POORLY CEMENTED, SOFT. POWDERY IN CUTTINGS, DRY, NO ODOR	LIMESTONE												50	0.0	GC	112.0	110
															51	0.0	GC	114.0	
	115														52	0.0	GC	116.0	115
															53	0.0	GC	118.0	
															54	0.0	GC	120.0	
	119.5	LIMESTONE: VERY PALE BROWN, 10 YR 8/4, VERY SILTY, FIRM TO SOFT, VERY CHALKY, DRY NO ODOR	LIMESTONE												55	0.0	GC	122.0	120
	120														56	0.0	GC	124.0	
	122.0	DOLOMITE: LIGHT GRAY, 5 YR 7/1, SCATTERED MINORITE YELLOWISH BROWN 5 YR 3/4 MOD. VERY FINE CRYSTALLINE, SLIGHTLY CALCAREOUS, WITH MINOR SL INTERBEDDED, SILTSTONE, CALCAREOUS, SOFT	DOLOMITE												57	1.3	GC	128.0	125
	125														58	0.0	GC	130.0	
	128.0	LIMESTONE: VERY PALE BROWN, 10 YR 8/4, FINE CRYSTALLINE, SOFT-FIRM, CHALKY, SILTY, SLIGHTLY GYPSIFEROUS LIMESTONE, POWDERY APPEARANCE IN CUTTINGS, NO ODOR, DRY	LIMESTONE												59	0.0	GC	132.0	130
	130														60	0.0	GC	134.0	
															61	0.0	GC	136.0	135
	135	LIMESTONE: VERY PALE BROWN, 10 YR 8/4, TO WHITE, 5 YR 8/1, FINE CRYSTALLINE, FIRM-SOFT, SLIGHTLY GYPSIFEROUS, VERY CHALKY, SILTY, 50% OF CUTTINGS ARE POWDER ON SAMPLE, NO ODOR, DRY													62	0.0	GC	138.0	
															63	0.0	GC	140.0	
	140.0														64	0.0	GC	140.0	140



SPLIT-SPHOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
MEASUREMENT (LUNDS/BL. P.T.)
GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BB-00 (MH-0/A)**

DATE DRILLED **6/17/91 - 6/18/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **B/S**

DRAWN BY: **SAR**

PAGE 4 OF 5

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 N. ROBINSON

NORMAN, OKLAHOMA 73072

405-221-5445

BORING RECORD

DEPT. OR UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 45.0											DAVID			REMARKS	
					2	4	6	8	10	12	14	16	18	20	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING	SOIL PPM
		GROUND SURFACE: 8785.80																		
	140	LIMESTONE AS ABOVE, BECOMING VERY SILTY AND INTERBEDDED WITH SILTSTONE	LIMESTONE & SILTSTONE												65	0.0	GC		140	
	142	SILTSTONE: LIGHT BROWNISH GRAY, 10 YR 6/2, VERY POORLY CEMENTED, VERY SLIGHTLY MOIST, CALCAREOUS CEMENT, INTERBEDDED WITH MINOR LIMESTONE AS ABOVE	SILTSTONE												66	1.0	GC		142.0	
	145														67	4.8	GC		145	
	148	LIMESTONE: LIGHT YELLOWISH BROWN, 10 YR 6/4, SANDY, COARSELY CRYSTALLINE, FIRM, FRAGILE	LIMESTONE												68	3.3	GC		148.0	
	150	LIMESTONE: VERY PALE BROWN, 10 YR 8/3, SANDY, INTERBEDDED WITH SANDSTONE AND SILTSTONE, VERY FINE GRAINED, CALCAREOUS, POORLY CEMENTED, VERY SLIGHTLY MOIST, LIGHT BROWNISH GRAY, 10 YR 6/4	LIMESTONE & INTER-BEDDED SANDSTONE & SILTSTONE												69	0.6	GC		150.0	
	154	AS ABOVE: BUT PREDOMINANTLY SILTSTONE AND VERY FINE GRAINED SANDSTONE, VERY SLIGHTLY MOIST, CALCAREOUS, NO FREE WATER, SLIGHTLY POROUS	SILTSTONE & SANDSTONE												70	0.0	GC		152.0	
	155														71	0.0	GC		154.0	
	158	LIMESTONE: VERY PALE BROWN, 10 YR 8/3, VERY SANDY, INTERBEDDED WITH SILTSTONE, VERY SLIGHTLY MOIST, MOISTURE INCREASING, BELOW 162.0'	LIMESTONE & SILTSTONE												72	0.0	GC		155	
	160														73	1.9	GC		158.0	
	162	LIMESTONE: PINKISH GRAY, 5 YR 7/2, VERY FINE CRYSTALLINE, DOLOMITIC, CHALKY DULL APPEARANCE, VUGULAR, FRACTURED, HARD, SATURATED, HOLE IS MAKING SMALL VOLUME OF WATER, NO HYDROCARBON ODOR OBSERVED	LIMESTONE												74	3.3	GC		160.0	
	165		DOLOMITIC LIMESTONE												75	1.0	GC		162.0	
	168	DOLOMITE: LIGHT BROWNISH GRAY, 10 YR 8/2, VERY FINE CRYSTALLINE, TRACE AMOUNT OF VUGULAR POROSITY, HARD, SATURATED, NO ODOR, SLIGHTLY CALCAREOUS, BECOMING DENSE BELOW 170.0', WITH TRACE OF FRACTURES	DOLOMITE												76	0.0	GC		164.0	
	170														77	0.0	GC		165	
	172	GRADING TO DOLOMITIC SANDSTONE, MEDIUM GRAINED AND SANDY DOLOMITE, GRAYISH BROWN, 10 YR 5/2, AND LIGHT BROWNISH GRAY, 10YR 8/2, MODERATELY CEMENTED, GOOD INTERGRANULAR POROSITY, SATURATED, HOLE IS MAKING LARGE VOLUME OF WATER BELOW 172.0'	DOLOMITIC SANDSTONE												78	0.0	GC		168.0	
	175	T.D. 175.0'													79	0.0	GC		170	
															80	0.0	GC		172.0	
															81	0.0	GC		174.0	
															82	0.0	GC		175.0	

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-83 (MW-57)**

DATE DRILLED 8/24/91

DRILLING METHOD 7 - 5/8" AIR HAMMER

DRILLED BY BOYLES BROS.

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

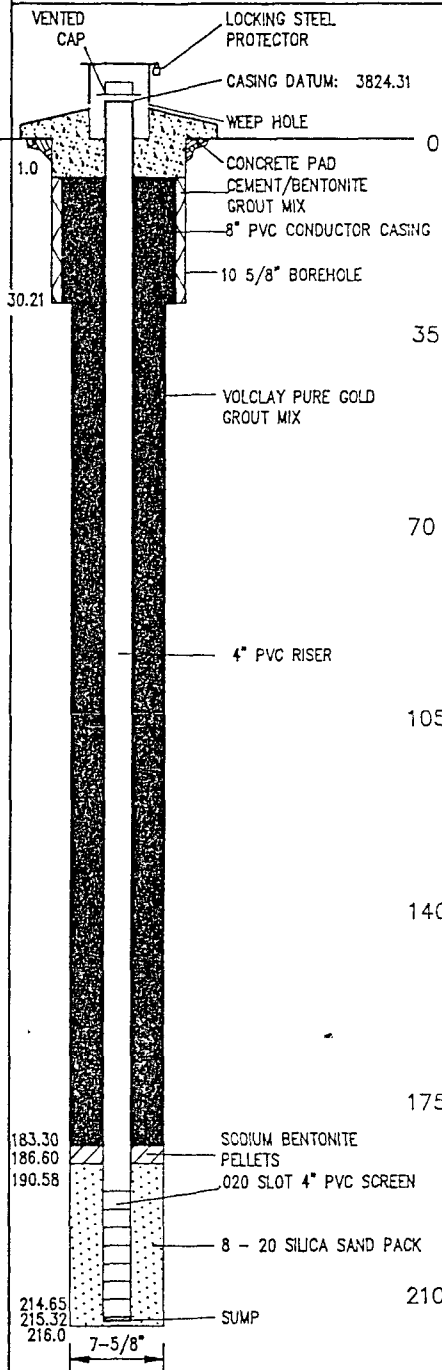
NORMAN, OKLAHOMA 73072

(405) 321-1885

PAGE 5 OF 5

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD # 84 FOR MORE DETAILED LITHOLOGIC DESCRIPTION					
		GROUND SURFACE: 3821.60					
	0	CLAYEY SILT:	ML				VENTED CAP
	5.0	SILTSTONE:	SILTSTONE				LOCKING STEEL PROTECTOR
	10.0	DOLOMITE:	DOLOMITE				CASING DATUM: 3824.31
	15.0	DOLOMITE:	DOLOMITE				WEEP HOLE
	18.0	DOLOMITE:	DOLOMITE				CONCRETE PAD
	22.0	DOLOMITE:	DOLOMITE				CEMENT/BENTONITE GROUT MIX
	28.0	SANDSTONE:	SANDSTONE				8" PVC CONDUCTOR CASING
	30.0	DOLOMITE:	DOLOMITE				10 5/8" BOREHOLE
	35	SANDSTONE:	SANDSTONE				
	42.0	SANDSTONE:	SANDSTONE				
	44.0	SANDSTONE:	SANDSTONE				
	48.0	SANDSTONE:	SANDSTONE				
	55.0	SANDSTONE:	SANDSTONE				
	65.0	SANDSTONE:	SANDSTONE				
	70						
	76.0	DOLOMITE:	DOLOMITE				
	82.0	SANDSTONE:	SANDSTONE				
	84.0	SANDSTONE:	SANDSTONE				
	94.0	SANDSTONE:	SANDSTONE				
	97.0	DOLOMITE:	DOLOMITE				
	100.0	DOLOMITE:	DOLOMITE				
	104.0	DOLOMITE:	DOLOMITE				
	105	DOLOMITE:	DOLOMITE				
	112.0	SANDY DOLOMITE:	DOLOMITE				
	118.0	SANDY DOLOMITE:	DOLOMITE				
	124.0	DOLOMITE:	DOLOMITE				
	135.0	DOLOMITE:	DOLOMITE				
	138.0	DOLOMITE:	DOLOMITE				
	140	DOLOMITE:	DOLOMITE				
	142.0	SANDY DOLOMITE:	DOLOMITE				
	160.0	SANDY DOLOMITE:	DOLOMITE				
	164.0	SILTSTONE:	SILTSTONE				
	172.0	DOLOMITE:	DOLOMITE				
	175						
	192.0	DOLOMITE:	DOLOMITE				
	198.0	DOLOMITIC LIMESTONE:	LIMESTONE				
	202.0	LIMESTONE:	LIMESTONE				
	205.0	LIMESTONE:	LIMESTONE				
	207.0	LIMESTONE:	LIMESTONE				
	210	SANDSTONE:	SANDSTONE				
	216.0	T.D. 216.0'					
	245						



- | | | | |
|--|---------------------------|-----------------|------------------------------|
| | SPLIT-SPOON SAMPLER | | WATER TABLE (TIME OF BORING) |
| | STANDARD PENETRATION TEST | | LABORATORY TEST LOCATION |
| | UNDISTURBED SAMPLE | | PENETROMETER (TONS/SQ. FT.) |
| | WATER TABLE (24 HOURS) | NR: NO RECOVERY | |
| | | NS: NOT SAMPLED | |

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **MW-58 (BH-84)**

DATE DRILLED **6/31/91**

DRILLING METHOD **7-5/8" AIR HAMMER**

DRILLED BY **BOYLES BROS.**

LOGGED BY **WEP**

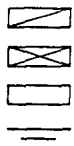
CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS		
					PPM X 18.3										NUMBER	OVM READING	RECOVERY	DEPTH			
					2	4	6	8	10	12	14	16	18								
		GROUND SURFACE: 3816.60																			
	0	CLAYEY SILT: LIGHT BROWN, 7.5 YR 6/3, 10% CLAY, SOFT, VERY FRIABLE, DRY	ML												1	0.0	GC				0
															2	0.0	GC	2.0			
	3.0	DOLOMITE: LIGHT GRAY, 10 YR 7/2, VERY FINE CRYSTALLINE TO MICROCRYSTALLINE, CHERTY, DENSE, DRY	DOLOMITE												3	0.0	GC			4.0	
	5														4	0.0	GC	6.0			5
	8.0	SILTSTONE: YELLOW 10 YR 7/8, LIMONITIC, SILICEOUS CEMENT, SLIGHT BANDED APPEARANCE, MOD. HARD, DRY	SILTSTONE												5	0.0	GC	8.0			
	10														6		GC	10.0			10
	11.0	SANDSTONE: LIGHT GRAY, 2.5 YR 7/2, TO LIGHT BROWNISH GRAY, 2.5 Y 6/2, VERY FINE GRAIN, SILICEOUS CEMENT, DENSE, DRY	SANDSTONE												7	2.4	GC	12.0			
															8	0.0	GC	14.0			
	15														9	19.9	GC	16.0			15
	16.0	DOLOMITE: LIGHT GRAY, 10 YR 7/2, MICRO-CRYSTALLINE, WITH TRACE OF COARSELY CRYSTALLINE DOLOMITE, DENSE, DRY, INTERBEDDED WITH MINOR SILTSTONES AND SAND STONES, AS ABOVE	DOLOMITE												10	0.0	GC	18.0			
																	GC	20.0			
	20	SANDSTONE: PINKISH GRAY, 7.5 YR 6/2, VERY FINE GRAIN, VERY SILTY, MASSIVE, SLIGHTLY HARD, FRIABLE, SLIGHTLY CALCAREOUS CEMENT, PREDOMINANTLY SILICEOUS, DRY	SANDSTONE												11	0.0	GC	22.0			20
															12	14.2	GC	24.0			
	25														13	0.0	GC	26.0			25
															14	0.0	GC	28.0			
															15	3.9	GC	30.0			
	30	SANDSTONE: VERY FINE GRAIN, SILTY, 10 YR 5/2, GRAYISH BROWN, MOD. HARD, DRY, WEAKLY CEMENTED	SANDSTONE												16	9.0	GC	32.0			30
	32.0	DOLOMITIC SANDSTONE: VERY FINE GRAINED SILICA SAND, 2.5 YR 5/2, GRAY BROWN, MODERATELY HARD, SLIGHT CONDENSATE ODOR, SLIGHTLY MOIST, MINOR INTERBEDS AT 10 YR 5/1, GRAY, HARD DOLOMITIC SANDSTONE	DOLOMITIC SANDSTONE												17	44.0	GC	34.0			
	35														18	65.0	GC	35.0			35



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

└ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-85 (MW-59)**

DATE DRILLED **6/28/91**

DRILLING METHOD **10-5/8" AIR ROTARY**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 6

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3695

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM X 18.3											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18							
		GROUND SURFACE: 3816.60																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
	35	CONTINUED FROM PREVIOUS PAGE	SANDSTONE												18	65.0	GC	36.0	35	
															19	34.9	GC	38.0		
															20	98.0	GC	40.0		
	40														21	23.2	GC	42.0	40	
															22	27.0	GC	44.0		
															23	18.6	GC	46.0		
	45														24	7.8	GC	48.0	45	
	47.0														25	26.0	GC	50.0		
	48.0	SANDSTONE: VERY FINE GRAIN SILICA SAND, WELL SORTED, WEAKLY CEMENTED, SILTY, 2.5 Y 5/2, GRAYISH BROWN, SLIGHTLY MOIST	SANDSTONE												26	20.0	GC	52.0		
		DOLOMITIC SANDSTONE: VERY FINE GRAIN SAND, 10 YR 5/1, GRAY WITH MINOR 10 YR 3/1, VERY DARK GRAY, VERY FINE GRAIN SANDSTONE, INTERBEDS, MODERATELY HARD, MASSIVE, COLOR VARIES FROM 10 Y 5/1, GRAY, TO 2.5 Y 4/2, DARK GRAY WITH DEPTH, MINOR VERY FINE GRAIN IRON PYRITE OBSERVED	DOLOMITE/SANDSTONE												27	37.0	GC	54.0	50	
	50														28	21.0	GC	56.0		
															29	88.0	GC	58.0		
															30	56.0	GC	60.0		
	55														31	36.0	GC	62.0	55	
															32	278.0	GC	64.0		
															33	28.0	GC	66.0		
	60														34	22.0	GC	68.0	60	
															35	106.0	GC	70.0		
	65																		65	
	70																		70	

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
-  GC: GRAB COMPOSIT

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-85 (MW-59)**

DATE DRILLED 6/28/91

DRILLING METHOD 10-5/8" AIR ROTARY

DRILLED BY BOYLES BROS.

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR

PAGE 2 OF 6

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNITED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 10.1										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
		GROUND SURFACE: 3818.60																	
	0	CLAYEY SILT: LIGHT BROWN, 7.5 YR 8/3, 10% CLAY, SOFT, VERY FRIABLE, DRY	ML											1	0.0	GC			0
														2	0.0	GC	2.0		
	3.0	DOLOMITE: LIGHT GRAY, 10 YR 7/2, VERY FINE CRYSTALLINE TO MICROCRYSTALLINE, CHERTY, DENSE, DRY	DOLOMITE											3	0.0	GC	4.0		
	5													4	0.0	GC	6.0		5
														5	0.0	GC	8.0		
	8.0	SILTSTONE: YELLOW 10 YR 7/8, LIMONITIC, SILICEOUS CEMENT, SLIGHT BANDED APPEARANCE, MOD. HARD, DRY	SILTSTONE											6	0.0	GC	10.0		10
	11.0	SANDSTONE: LIGHT GRAY, 2.5 YR 7/2, TO LIGHT BROWNISH GRAY, 2.5 Y 8/2, VERY FINE GRAIN, SILICEOUS CEMENT, DENSE, DRY	SANDSTONE											7	0.0	GC	12.0		
														8	0.0	GC	14.0		
	15													9	19.8	GC	16.0		15
	18.0	DOLOMITE: LIGHT GRAY, 10 YR 7/2, MICRO-CRYSTALLINE, WITH TRACE OF COARSELY CRYSTALLINE DOLOMITE, DENSE, DRY, INTERBEDDED WITH MINOR SILTSTONES AND SAND STONES, AS ABOVE	DOLOMITE											10	0.0	GC	18.0		
														11	0.0	GC	20.0		20
	20	SANDSTONE: PINKISH GRAY, 7.5 YR 8/2, VERY FINE GRAIN, VERY SILTY, MASSIVE, SLIGHTLY HARD, FRIABLE, SLIGHTLY CALCAREOUS CEMENT, PREDOMINANTLY SILICEOUS, DRY	SANDSTONE											12	0.0	GC	22.0		
														13	14.2	GC	24.0		
	25													14	0.0	GC	26.0		25
														15	0.0	GC	28.0		
														16	0.0	GC	30.0		30
	30	SANDSTONE: VERY FINE GRAIN, SILTY, 10 YR 5/2, GRAYISH BROWN, MOD. HARD, DRY, WEAKLY CEMENTED	SANDSTONE											17	3.9	GC	32.0		
	32.0	DOLOMITIC SANDSTONE: VERY FINE GRAINED SILICA SAND, 2.5 YR 5/2, GRAY BROWN, MODERATELY HARD, SLIGHT CONDENSATE ODOR, SLIGHTLY MOIST, MINOR INTERBEDS AT 10 YR 5/1, GRAY, HARD DOLOMITIC SANDSTONE	DOLOMITIC SANDSTONE											18	44.0	GC	34.0		
	35													19	65.0	GC	35.0		35



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

└─ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-85 (MW-59)**

DATE DRILLED **6/28/91**

DRILLING METHOD **10-5/8" AIR ROTARY**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 6

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 N. ROBINSON

NORMAN, OKLA. 73072

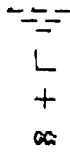
(405) 321-3888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 18.3										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH		
		GROUND SURFACE: 38'6.00																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	35	CONTINUED FROM PREVIOUS PAGE	DOLOMITIC SANDSTONE												18	65.0	GC	38.0	35
															19	34.9	GC	38.0	
															20	98.0	GC	40.0	
	40														21	23.2	GC	42.0	40
															22	27.0	GC	44.0	
															23	18.6	GC	46.0	
	45														24	7.8	GC	48.0	45
															25	28.0	GC	50.0	
	47.0	SANDSTONE: VERY FINE GRAIN SILICA SAND, WELL SORTED, WEAKLY CEMENTED, SILTY, 2.5 Y 5/2, GRAYISH BROWN, SLIGHTLY MOIST	SANDSTONE												26	20.0	GC	52.0	
	48.0	DOLOMITIC SANDSTONE: VERY FINE GRAIN SAND, 10 YR 5/1, GRAY WITH MINOR 10 YR 3/1, VERY DARK GRAY, VERY FINE GRAIN SANDSTONE, INTERBEDS, MODERATELY HARD, MASSIVE, COLOR VARIES FROM 10 Y 5/1, GRAY, TO 2.5 Y 4/2, DARK GRAY WITH DEPTH, MINOR VERY FINE GRAIN IRON PYRITE OBSERVED	DOLOMITIC SANDSTONE												27	37.0	GC	54.0	
	50														28	21.0	GC	56.0	50
															29	88.0	GC	58.0	
															30	58.0	GC	60.0	
	55														31	36.0	GC	62.0	55
															32	278.0	GC	64.0	
															33	28.0	GC	66.0	
	60														34	22.0	GC	68.0	60
															35	108.0	GC	70.0	
	65																		65
	70																		70



SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 GC: GRAB COMPOSIT

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3885

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-85 (MW-69)**

DATE DRILLED **6/28/81**

DRILLING METHOD **10-5/8" AIR ROTARY**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

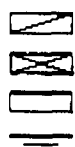
CHECKED BY **BJS**

DRAWN BY **SAR**

PAGE 2 OF 5

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.3								SAMPLE				REMARKS		
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY		DEPTH	
		GROUND SURFACE: 5816.60																	
	70	CONTINUED FROM PREVIOUS PAGE	SANDSTONE											36	106.0	GC		70	
		AFTER 72.0 FEET, ABUNDANT IRON OXIDE STAINING												37	79.0	GC	72.0		
	74.0	CHERTY DOLOMITE: 2.5 Y 5/2, GRAYISH BROWN, VERY HARD, CONCHIDIAL FRACTURES	DOLOMITE											38	13.0	GC	74.0		
	75													39	10.0	GC	76.0	75	
																	78.0		
	79.0	DOLOMITIC SANDSTONE: VERY FINE GRAIN SILICA SAND, VERY HARD, 2.5 Y 5/2, GRAYISH BROWN, 10 YR 8/1, LGHT GRAY TO GRAY, AND 10 YR 4/2, DARK GRAYISH BROWN, MINOR IRON OXIDE STAINING, DRY, MINOR CHERTY DOLOMITE INTERBEDS	SANDSTONE DOLOMITE											40	16.0	GC	80.0		
	80													41	16.0	GC	82.0	80	
														42	48.0	GC	84.0		
	84.0	SANDSTONE: VERY FINE GRAIN SILICA, MOD. HARD, SLIGHT CARBONATE CEMENT, IRON OXIDE STAINING, SILTY, 2.5 Y 6/2, LIGHT BROWNISH GRAY, DRY	SANDSTONE											43	52.0	GC	86.0		
	85													44		GC	88.0	85	
	87.0	DOLOMITIC SANDSTONE: VERY FINE GRAIN SILICA SAND, MOD. HARD, 2.5 Y 4/2, DARK GRAYISH BROWN	SANDSTONE DOLOMITE											45	132.0	GC	90.0		
	90													46	23.0	GC	92.0	90	
														47	26.0	GC	94.0		
		AFTER 94.0', ABUNDANT HEMATITE												48	8.0	GC	96.0		
	95													49	35.0	GC	98.0	95	
	98.0	CHERTY DOLOMITE: HARD, CONCHIDIAL FRACTURES, DRY, 10 YR 8/3, PALE BROWN, MINOR IRON OXIDE STAINING	DOLOMITE											50	19.0	GC	100.0		
	100	CHERTY DOLOMITE: 10 YR 8/3, PALE BROWN, VERY HARD, HIGHLY FRACTURED, HORIZONTAL FRACTURES AT 100.2', 100.3', 100.8', 100.8', 101.0', 101.2', 101.6', 101.8', AND 102.0', VERTICAL FRACTURE BETWEEN 100.5'-102.3', IRON OXIDE STAIN, CALCITE AND MINOR MANGANESE OXIDE ALONG FRACTURES, HIGHLY FRACTURED BETWEEN 102.3'-104.8', AND 107.3'												51	9.0	2.3	101.0	100	
														52	21.0		102.3		
														53	3.8	5.0	104.3		
	105													54	0.0			105	



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-85 (MW-59)**

DATE DRILLED **8/28/91**

DRILLING METHOD **10-5/8" AIR ROTARY**

DRILLED BY **BOYLES BROS.**

LOGGED BY **QMR**

CHECKED BY **BJS**

DRAWN BY **SAR**

PAGE 3 OF 6

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3750 N. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-5888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM X 18.3										NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND
																			SOIL: _____ PPM
																			AIR: _____ PPM
		GROUND SURFACE: 3816.00																	
	105	CONTINUED FROM PREVIOUS PAGE	DOLOMITE												54	1.2		108.3	105
															55	4.0		107.3	
															56	9.2	5.0	108.3	
															57	2.8		111.3	110
	110	DOLOMITE: 10 YR 8/2, LIGHT BROWNISH GRAY, GRADATIONAL CONTACT WITH CHERTY DOLOMITE, SUGARY, VERY HARD, FRACTURES LARGELY REPLACED WITH CALCITE, MINOR CHLORITE, IRON OXIDE, DRY	DOLOMITE												58	30.0		112.3	
															59	30.0	GC	114.0	
															60	70.0	GC	116.0	115
	115	DOLOMITIC SANDSTONE: VERY FINE GRAIN SAND, 10 YR 3/1, VERY DARK GRAY, MODERATELY HARD, DRY, MINOR 10 YR 5/2, GRAYISH BROWN DOLOMITE INTERBEDS	SANDSTONE DOLOMITE												61	181	GC	118.0	
		AFTER 120.0', COLOR CHANGE TO 10 YR 5/2, GRAYISH BROWN, DOLOMITIC SANDSTONE													62	385.0	GC	120.0	120
	120														63	84.0	GC	122.0	
															64	71.0	GC	124.0	
	122.0	DOLOMITE: MICROCRYSTALLINE, 10 YR 5/2, GRADATIONAL CONTACT WITH DOLOMITIC SANDSTONE, DRY	DOLOMITE												65	81.0	GC	126.0	125
		MINOR IRON OXIDE STAINING AFTER 126.0'													66	78.0	GC	128.0	
	125														67	53.0	GC	130.0	135
															NS	5.0		135.0	
	130	SANDY DOLOMITE: VERY FINE GRAIN SAND, GRADATIONAL CONTACT WITH DOLOMITE, 10 YR 5/2, GRAYISH BROWN, HARD, DRY	SANDY DOLOMITE																
	130.5	DOLOMITIC SANDSTONE: VERY FINE GRAIN SILICA, VERY HARD, 5 Y 6/1, LIGHT GRAY TO GRAY, AFTER 133.0', DISCONTINUOUS BANDS OF 10 YR 3/1, VERY DARK GRAY COLOR, HORIZONTAL FRACTURES AT 130.2', 130.5', 131.1', 133.1', 134.4', AND 134.8'	SANDSTONE DOLOMITE																130
	135	DOLOMITE: MICROCRYSTALLINE AND SUGARY, GRADATIONAL CONTACT WITH DOLOMITIC SANDSTONE, ABUNDANT FRACTURES LARGELY FILLED WITH CALCITE, IRON PYRITE, AND MANGANESE OXIDE, OCCASIONAL VERY THIN INTERBEDS OF DOLOMITIC SANDSTONE, 2.5 Y 3/2, GRAYISH BROWN AND 5 YR 5/2, REDDISH GRAY, 10 YR 5/1, GRAY ALONG FRACTURES	DOLOMITE												NS	4.7		135.0	130
	135.5	FRACTURES 135.3', 135.7', 136.1', 136.6', 136.8', 137.5',																	
																			140

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
-  GC: GRAB COMPOSIT

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 821-5888

JOB NAME/NUMBER **MARATHON/91029.0.**

BORING NUMBER **BH-85 (MW-59)**

DATE DRILLED **8/28/91**

DRILLING METHOD **10-5/8" AIR ROTARY**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 4 OF 6

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNITED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 18.3										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3616.60																
	140	CONTINUED FROM PREVIOUS PAGE 137.8', 138.8', 140.1', 141.0', 141.3', AND 141.5'	DOLOMITE											NS		5.3		140
	141.6	DOLOMITIC SANDSTONE: VERY FINE GRAIN SAND, 2.5 Y 5/2, GRAYISH BROWN, MASSIVE, VERY HARD, WELL CEMENTED, HORIZONTAL FRACTURES AT 141.6', 142.3', 143.3', AND 143.8', FRACTURES LARGELY CEMENTED WITH CALCITE, ABUNDANT VERY FINE PYRITE, HIGHLY WEATHERED SILTY SANDSTONE INTERBEDDED BETWEEN 143.4' AND 143.7', ABUNDANT IRON OXIDE STAINING AND IRON PYRITE WITHIN INTERBED.	DOLOMITIC SANDSTONE											68	5.0		143.4	
	145													NS			143.7	
														69			145.0	145
															3.2	GC		
		AFTER 148.0', 10 YR 5/2, GRAYISH BROWN												70	42.0	GC	148.0	
	150													71			150.0	150
															283.0	GC		
	152	DOLOMITE: MICROCRYSTALLINE, 10 YR 6/2, LIGHT BROWNISH GRAY, VERY HARD, DRY, MINOR INTERBEDS OF 10 YR 3/1, GRAY, VERY FINE GRAIN SANDSTONE	DOLOMITE											72	48.0	GC	152.0	
														73			154.0	
	155	MINOR INTERBED OF 2.5 Y 7/4, PALE YELLOW SILTY SANDSTONE												74	66.0	GC	156.0	155
															44.0	GC		
														75			158.0	
															67.0	GC		
	160													76			160.0	160
															33.0	GC		
														77			162.0	
															137.0	GC		
	165													78			164.0	
															108.0	GC		
														79			166.0	165
															80.0	GC		
														80			168.0	
															64.0	GC		
	170													81			170.0	170
															44.0	GC		
														82			172.0	
															23.0	GC		
																	174.0	
	175													83	127.0	GC	176.0	175



SPLIT-SPHOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

□ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-85 (MH-59)**

DATE DRILLED **6/28/91**

DRILLING METHOD **10-5/8" AIR ROTARY**

DRILLED BY **BOYLES BROS.**

LOGGED BY **CHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 5 OF 6

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3750 W. ROBINSON

NORMAN, OKLAHOMA 73072

TEL. 341-3833

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNITED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.3											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		GROUND SURFACE: 3818.80																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
	175	CONTINUED FROM PREVIOUS PAGE	DOLOMITE												88	127.0	GC	176.0	175	
															84	10.0	GC	178.0		
															85	15.0	GC	180.0		
	180	SUGARY WITH MINOR IRON PYRITE AFTER 180.0'													86	2.0	GC	182.0	180	
															87	11.0	GC	184.0		
															88	6.0	GC	186.0		
	185	AFTER 186.0' MINOR IRON OXIDE STAINING													89	2.6	GC	188.0	185	
															90	3.5	GC	190.0		
	190	DOLOMITIC LIMESTONE: 7.5 YR 8/4, PINK, 7.5 YR 7/2, PINKISH GRAY, HARD, SATURATION AND STRONG CONDENSATE ODOR AT 191.0', AFTER 192.0' NO OBVIOUS SATURATED, CHALKY, MICROCRYSTALLINE	DOLOMITIC LIMESTONE												91	660.0	GC	192.0	190	
	192	DOLOMITE: 10 YR 8/2, LIGHT BROWNISH GRAY, HARD, MICROCRYSTALLINE, DRY	DOLOMITE												92	572.0	GC	194.0		
	194														93					
	195	LIMESTONE: 10 YR 6/2, LIGHT BROWNISH GRAY, HARD, CHALKY IN CUTTINGS, DRY, STRONG CONDENSATE ODOR	LIMESTONE												94	619.0	GC	196.0	195	
															95	273.0	GC	198.0		
															96	143.0	GC	200.0		
	200	SATURATION AFTER 200.0'													97				200	
	201	SANDY DOLOMITE: VERY FINE GRAIN SAND, MICROCRYSTALLINE, 10 YR 8/2 LIGHT BROWNISH GRAY, SATURATED, CONDENSATE ODOR	SANDY DOLOMITE												98	343.0	GC	202.0		
															99	581.0	GC	204.0		
	204														98					
	205	SANDSTONE: CARBONATE CEMENT, VERY FINE GRAIN SAND, 10 YR 7/3, VERY PALE BROWN, CONDENSATE ODOR, HARD, SATURATED, MINOR IRON OXIDE STAINING, HIGHLY CEMENTED AFTER 206.0', INTERBEDDED 10 YR 5/1, GRAY SANDSTONE	SANDSTONE												99	297.0	GC	206.0	205	
																44.0	GC	208.0		
	208	T.O. 208.0' WATER LEVEL 1 HOUR AFTER DRILLING 191.0', 0.9' OF FLOATING PRODUCT																		
	210																		210	



SPLIT-SPHOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
 L LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-85 (MW-59)**

DATE DRILLED **8/28/91**

DRILLING METHOD **10-5/8" AIR ROTARY**

DRILLED BY **BOYLES BROS.**

LOGGED BY **CHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

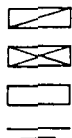
PAGE 6 OF 6

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 371-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	DVM SOIL GAS PPM x 20.0										SAMPLE			REMARKS				
					2	4	6	8	10	12	14	16	18	NUMBER	DVM READING	RECOVERY	DEPTH	BACKGROUND DVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM				
		GROUND SURFACE: 3812.10																				
	0	CLAYEY SILT: YELLOWISH BROWN, 10YR 5/6, VERY LOW PLASTICITY, DRY, 60% SILT, 40% CLAY	CL											1	0.6	GC			0			
	1.5	DOLOMITE: LIGHT GRAY, 10YR 7/2, MASSIVE, HARD, INTERBEDDED WITH SILTSTONE AND SANDSTONE, QUARTZ, VERY FINE GRAIN, NONCALCAREOUS, CONCOIDAL FRACTURE	DOLOMITE INTERBEDDED WITH SANDSTONE AND SILTSTONE											2	0.0	GC	2.0					
																3	0.0	GC	4.0			
	5																4	0.0	GC	6.0		5
																	5	0.0	GC	8.0		
	9.0																6	0.0	GC	10.0		10
	10	DOLOMITIC SANDSTONE: LIGHT GRAY TO PINKISH GRAY, 10YR 7/2 TO 6/2, MASSIVE, MODERATELY HARD, MOD. WELL CEMENTED, NONCALCAREOUS	DOLOMITIC SANDSTONE											7	5.1	GC	12.0					
		SANDSTONE: LIGHT GRAY TO YELLOW, 10YR 7/2 TO 7/8, VERY FINE GRAIN, THIN BEDDED, MOD. WELL CEMENTED, NONCALCAREOUS, VERY FINE GRAIN FROM 16 TO 18 FEET	SANDSTONE											8	0.0	GC	14.0					
	15																9	0.8	GC	16.0		15
																	10	0.6	GC	18.0		
	19.0																11	0.0	GC	20.0		20
	20				DOLOMITIC SANDSTONE: LIGHT GRAY TO GRAY, 10YR 7/2 TO 5/1, VERY FINE GRAIN, MASSIVE, WELL CEMENTED, HARD, NONCALCAREOUS	DOLOMITIC SANDSTONE											12	0.8	GC	22.0		
		SANDSTONE: YELLOW, 10YR 7/8, VERY FINE GRAIN, THIN BEDDED, ABUNDANT IRON STAIN, WELL CEMENTED, NONCALCAREOUS	SANDSTONE											13	0.0	GC	24.0					
	25																14	1.1	GC	26.0		25
																	15	1.1	GC	28.0		
	27.0																16	2.2	GC	30.0		30
	30				SILTSTONE: YELLOW, 10YR 7/8, VERY FINE QUARTZ, CALCAREOUS, DRY	SILTSTONE											17	2.9	GC	32.0		
	32.5	DOLOMITE: LIGHT GRAY, 10YR 7/2, SANDY, FINE GRAIN QUARTZ, INTERBEDDED SANDSTONE - SILTSTONE, YELLOW, 10YR 7/8, CALCAREOUS, MOD. HARD	DOLOMITE WITH SANDSTONE & SILTSTONE											18	5.7	GC	34.0					
	34.5																		35			



SPLIT-SPoon SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED
GC: GRAB COMPOSITE

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-86 (MW-60)**

DATE DRILLED 7-9-91 TO 7-12-91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY M.J.

CHECKED BY BJS

DRAWN BY: DKS

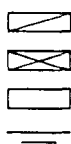
PAGE 1 OF 7

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 20.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING SOIL: 0.0 PPM AIR: 0.0 PPM		
		GROUND SURFACE: 3812.10																		
	35	DOLOMITIC SANDSTONE: GRAY, 10YR 5/1 TO PINKISH GRAY, 7.5YR 6/2, VERY FINE GRAIN, MASSIVE, MOD. WELL CEMENTED	DOLOMITIC SANDSTONE												19			36.0	35	
	37.0	DOLOMITIC: LIGHT GRAY, 10YR 7/2, INTERBEDDED WITH SANDSTONE, YELLOW, 10YR 7/8, MOD. TO PARTLY CEMENTED, NONCALCAREOUS	DOLOMITIC W/ INTER-BEDDED SANDSTONE												20	2.9	GC	38.0		
																18.1	GC	40.0		
	40	DOLOMITIC SANDSTONE: LIGHT GRAY TO GRAY, 10YR 7/2 TO 5/1, MASSIVE, MOD. HARD, VERY FINE GRAIN QUARTZ	DOLOMITIC SANDSTONE												21	59.0	GC	42.0	40	
															22	4.9	GC	44.0		
															23	5.8	GC	46.0		
	45	SANDSTONE: GRAY, 10YR 5/1 TO YELLOW, 10YR 7/8, VERY FINE QUARTZ, THIN BEDDED, WEAKLY CEMENTED, ABUNDANT BIOTITE AND K. FELDSPAR, NONCALCAREOUS, INTERBEDDED WITH THIN DOLOMITIC SANDSTONE	SANDSTONE AND DOLOMITIC SANDSTONE												24	92.0	GC	48.0	45	
															25	6.0	GC	50.0		
	49.5	DOLOMITIC SANDSTONE: GRAY, 10YR 5/1, VERY FINE QUARTZ, MASSIVE, MOD. HARD	DOLOMITIC SANDSTONE												26	1.3	GC	52.0	50	
	50.5	SANDSTONE: YELLOW, 10YR 5/1 TO LIGHT GRAY, 10YR 7/2, VERY FINE QUARTZ, WEAKLY CEMENTED, THIN BEDDED, IRON STAINING, GRAY, 10YR 5/1 FROM 53 TO 54 FEET, VERY POORLY CEMENTED, FRIABLY MOIST	SANDSTONE												27	4.2	GC	54.0		
															28	8.2	GC	56.0		
	55														29	4.2	GC	58.0	55	
															30	5.1	GC	60.0		
	59.0	DOLOMITIC SANDSTONE: GRAY, 10YR 5/1, VERY FINE GRAIN, MASSIVE, MOD. HARD, WELL CEMENTED, INTERBEDDED WITH SANDSTONE FROM 63 TO 68 FEET, YELLOWISH BROWN, 10YR 5/4, WEAKLY CEMENTED	DOLOMITIC SANDSTONE AND INTER-BEDDED SANDSTONE												31	151.8	GC	62.0	60	
	60														32	186.0	GC	64.0		
															33	17.4	GC	66.0		
	65														34	134.0	GC	68.0	65	
															35	283.0	GC	70.0		
	70																	70.0	70	



SPLIT-SPoon SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED
GC: GRAB COMPOSITE

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-86 (MW-60)**

DATE DRILLED 7-9-91 TO 7-12-91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY MJL

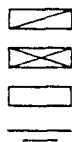
CHECKED BY BJS

DRAWN BY: DKS

PAGE 2 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNITED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 20.0										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
	70	GROUND SURFACE: 3812.10																70
		CONTINUED FROM PREVIOUS PAGE																
	71.0	SANDSTONE: YELLOW, 10YR 5/1, VERY FINE QUARTZ, WEAKLY CEMENTED, THIN BEDDED, MOIST	SANDSTONE											36	140.0	GC	72.0	
	72.0	DOLOMITIC SANDSTONE: GRAY, 10YR 5/1, VERY FINE GRAIN, MASSIVE, MOIST, WELL CEMENTED, INTERBEDDED WITH SANDY DOLOMITE, LIGHT GRAY TO VERY PALE BROWN, 10YR 7/2 TO 7/3, VERY FINE QUARTZ, MASSIVE	DOLOMITIC SANDSTONE/DOLOMITE											37	24.0	GC	74.0	
	73.0	DOLOMITE: LIGHT GRAY TO VERY PALE BROWN, 10YR 7/2 TO 7/3, MICROCRYSTALLINE, MASSIVE, CONCOIDAL FRACTURE	DOLOMITE											38	17.4	GC	76.0	75
	75													39	2.0	GC	78.0	
	77.5	SANDY DOLOMITE: GRAY TO LIGHT BROWNISH GRAY, 10YR 5/1 TO 6/2, MASSIVE, VERY FINE GRAIN TO CRYSTALLINE	SANDY DOLOMITE											40	2.4	GC	80.0	
	80													41	10.5	GC	82.0	80
	81.0	SANDSTONE: BROWN TO YELLOWISH BROWN, 10YR 5/3 TO 5/4, VERY FINE QUARTZ, MOD. CEMENTED TO WEAKLY CEMENTED, INTERBEDDED WITH MINOR DOLOMITIC SANDSTONE, GRAY, 10YR 5/1, HARD, MASSIVE, MOIST	SANDSTONE AND INTER-BEDDED DOLOMITIC SANDSTONE											42	129.2	GC	84.0	
	85													43	21.9	GC	86.0	85
														44	13.3	GC	88.0	
														45	13.2	GC	90.0	
	90													46	3.8	GC	92.0	90
														47	36.2	GC	94.0	
	93.0	SANDY DOLOMITE: GRAY TO LIGHT BROWNISH GRAY, 10YR 5/1 TO 6/2, MASSIVE, VERY FINE GRAIN TO CRYSTALLINE	SANDY DOLOMITE											48	3.8	GC	96.0	
	95	DOLOMITE - SANDY DOLOMITE: VERY PALE BROWN TO GRAY, 10YR 7/2 TO 5/1, INTERBEDDED	DOLOMITE INTER-BEDDED WITH SANDY DOLOMITE											49	3.5	GC	98.0	95
														50	3.5	GC	100.0	
	100	DOLOMITE: LIGHT GRAY TO VERY PALE BROWN, 10YR 7/2 TO 7/3, MICROCRYSTALLINE, MASSIVE, CONCOIDAL FRACTURE	DOLOMITE											51	2.0	GC	102.0	100
														52	13.2	GC	104.0	
	105													53	2.9	GC	106.0	105



SPLIT-SPoon SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

GC: GRAB COMPOSITE

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-86 (MW-60)**

DATE DRILLED 7-9-91 to 7-12-91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY M.J.

CHECKED BY BJS

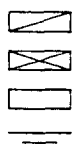
DRAWN BY: DKS

PAGE 3 OF 7

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3825

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	DVM SOIL GAS PPM x 20.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	DVM READING	RECOVERY	DEPTH		
		GROUND SURFACE: 3812.10																	BACKGROUND DVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	105	CONTINUED FROM PREVIOUS PAGE	DOLOMITE												53	2.9	GC	106.0	105
															54	1.7	GC	108.0	
	109.0														55	2.6	GC	110.0	
	110	SANDY DOLOMITE: GRAY 10YR 5/1, MASSIVE, HARD, INTERBEDDED WITH SANDSTONE, YELLOWISH BROWN, 10YR 5/4, QUARTZ, VERY FINE GRAIN, THIN BEDDED, NONCALCAREOUS	SANDY DOLOMITE INTER-BEDDED WITH SANDSTONE												56	62.7	GC	112.0	110
															57	15.9	GC	114.0	
	115														58	46.1	GC	116.0	115
		DOLOMITIC SANDSTONE: GRAY, 10YR 5/1, QUARTZ, VERY FINE GRAIN, MOD. HARD, WELL CEMENTED, MASSIVE, INTERBEDDED WITH SANDSTONE, QUARTZ, VERY FINE GRAIN, THIN BEDDED, WEAKLY CEMENTED	DOLOMITE SANDSTONE INTER-BEDDED WITH SANDSTONE												59	343.0	GC	118.0	
															60	316.0	GC	120.0	
	120														61	91.5	GC	122.0	120
	121.0	DOLOMITE: VERY PALE BROWN, 10YR 7/2, MICROCRYSTALLINE, MASSIVE, CONCORDAL FRACTURE	DOLOMITE												62	21.9	GC	124.0	
	125														63	68.2	GC	126.0	125
		SAND BELOW 126.0 FEET, QUARTZ													64	76.3	GC	128.0	
	127.0	SANDY DOLOMITE: GRAY, 10YR 5/1, VERY FINE GRAIN, MASSIVE	SANDY DOLOMITE												65	11.8	GC	130.0	
	130														66	2.6	GC	132.0	130
	131.0	DOLOMITIC SANDSTONE: GRAY, 10YR 5/1 TO PINKISH GRAY, 7.5YR 7/2, VERY FINE GRAIN, WELL CEMENTED, MOD. HARD, MASSIVE	DOLOMITIC SANDSTONE												67	15.8	GC	134.0	
	135														68	100.2	GC	136.0	135
															69	132.7	GC	138.0	
	137.0	SANDY DOLOMITE: LIGHT BROWNISH GRAY, 5YR 7/1, VERY FINE GRAIN, MASSIVE, HARD	SANDY DOLOMITE												70	20.5	GC	140.0	140
		MINOR DOLOMITIC SANDSTONE FROM 142 TO 144 FEET																	



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

GC: GRAB COMPOSITE

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-86 (MW-60)**

DATE DRILLED 7-9-91 to 7-12-91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY M.J.

CHECKED BY BJS

DRAWN BY: DKS

PAGE 4 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

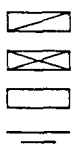
3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	DVM SOIL GAS PPM x 20.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	DVM READING	RECOVERY	DEPTH	BACKGROUND DVM READING SOIL: 0.0 PPM AIR: 0.0 PPM	
		GROUND SURFACE: 3812.10																	
	140	SANDY DOLOMITE: LIGHT BROWNISH GRAY, 5YR 7/1, VERY FINE GRAIN, MASSIVE, HARD	SANDY DOLOMITE											71	10.0	GC	142.0		140
		MINOR DOLOMITIC SANDSTONE FROM 142 TO 144 FEET												72	6.2	GC	144.0		
	145	DOLOMITIC SANDSTONE: GRAY, 10YR 5/1 TO LIGHT BROWNISH GRAY, 5YR 7/1, VERY FINE GRAIN, WELL CEMENTED, HARD, MASSIVE, INTERBEDDED WITH SANDSTONE, LIGHT GRAY, 10YR 7/2, TO YELLOWISH BROWN, 10YR 5/4, VERY FINE GRAIN, WEAKLY CEMENTED, MINOR IRON STAINING AND SMALL SCALE FRACTURES	DOLOMITIC SANDSTONE WITH INTER-BEDDED SANDSTONE											73	7.6	GC	146.0		145
														74	15.6	GC	148.0		
														75	19.0	GC	150.0		
	150													76	16.3	GC	152.0		150
														77	24.1	GC	154.0		
														78	27.0	GC	156.0		
	155													79	22.3	GC	158.0		155
														80	16.7	GC	160.0		
	160													81	24.3	GC	162.0		160
														82	24.1	GC	164.0		
														83	4.9	GC	166.0		
	165													84	6.7	GC	168.0		165
														85	25.7	GC	170.0		
	169.0	SILTSTONE: VERY PALE ORANGE TO GRAYISH ORANGE, 10YR 8/2 TO 7/4, VERY FINE QUARTZ, INTERBEDDED, MOIST, CaCO3 CEMENTED	SILTSTONE											86	75.6	GC	172.0		170
	170	SANDY DOLOMITE: LIGHT BROWNISH GRAY, 5YR 7/1, VERY FINE GRAIN TO CRYSTALLINE, MASSIVE	SANDY DOLOMITE											87	20.1	GC	174.0		
														88	8.5	GC	176.0		175



SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED
 GC: GRAB COMPOSITE

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-86 (MW-60)**

DATE DRILLED 7-9-91 TO 7-12-91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY M.J.L.

CHECKED BY BJS

DRAWN BY: DKS

PAGE 5 OF 7

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3825

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 20.0													SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		GROUND SURFACE: 3812.10																				
	175	CONTINUED FROM PREVIOUS PAGE	SANDY DOLOMITE													88	8.5	GC	176.0	175		
	176.0	DOLOMITE: GRAY, 10YR 5/1 TO 6/1, MICRO-CRYSTALLINE, MOD. HARD, MASSIVE, CONCOIDAL FRACTURE	DOLOMITE													89	7.8	GC	178.0			
																90	4.0	GC	180.0			
	180															91	2.2	GC	182.0	180		
																92	4.9	GC	184.0			
	185	SANDSTONE: GRAYISH ORANGE TO MOD. YELLOWISH BROWN, 10YR 7/4 TO 5/4, FINE TO MEDIUM GRAIN, ROUND TO SUBROUND, WELL SORTED, CaCO3 CEMENTED, MOD. HARD DOLOMITE: GRAY, 10YR 5/1 TO 6/1, MICRO-CRYSTALLINE, MOD. HARD, MASSIVE, CONCOIDAL FRACTURE	SANDSTONE DOLOMITE													93	4.0	GC	186.0	185		
	185.5														94	2.9	GC	188.0				
															95	4.2	GC	190.0				
	190														96	2.6	GC	192.0	190			
		MINOR INTERBEDDED LIMESTONE FROM 193.5 TO 197.0 FEET, VERY PALE ORANGE, 10YR 2/2, SILTY, MASSIVE, CONCOIDAL FRACTURE, EFFER-VESENCE IN HCL	DOLOMITE WITH INTER-BEDDED LIMESTONE													97	1.5	GC	194.0			
	195														98	2.4	GC	196.0	195			
															99	2.4	GC	198.0				
	200														100	2.2	GC	200.0	200			
		INTERBEDDED DOLOMITIC SANDSTONE FROM 201 TO 203 FEET, QUARTZ, VERY FINE GRAIN, LIGHT GRAY, 10YR 7/1, MOD. CEMENTED, NONCALCAREOUS DOLOMITIC SANDSTONE: GRAY, 10YR 5/1, VERY FINE GRAIN, WELL CEMENTED, MOD. HARD	DOLOMITIC SANDSTONE													101	2.2	GC	202.0			
	203.0														102	2.2	GC	204.0				
															103	12.9	GC	206.0	205			
	205														104	30.4	GC	208.0				
															105	7.6	GC	210.0	210			

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED
- GC: GRAB COMPOSITE

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-86 (MW-60)**

DATE DRILLED 7-9-91 to 7-12-91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: DKS

PAGE 6 OF 7

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	DVM SOIL GAS											SAMPLE			REMARKS	
					PPH x 20.0											NUMBER	DVM READING	RECOVERY		DEPTH
					2	4	6	8	10	12	14	16	18							
210.0	210	GROUND SURFACE: 3812.10	SANDSTONE WITH INTER-BEDDED SANDY DOLOMITE													106	1.7	GC	210.2	210
		SANDSTONE: LIGHT GRAY TO YELLOW, 10YR 7/1 TO 7/6, QUARTZ, FINE TO MEDIUM GRAIN, ANGULAR TO SUBROUND, WEAKLY TO VERY POORLY CEMENTED, MOD. SORTED, SATURATED, INTERBEDDED WITH SANDY DOLOMITE, LIGHT BROWNISH GRAY, 5YR 7/1, SANDSTONE MEDIUM GRAIN BELOW 215 FEET, SUBROUND													107	2.2	GC	212.0		
															108	2.2	GC	214.0		
	215														109	1.5	GC	216.0	215	
															110	0.4	GC	218.0		
															111	0.0	GC	220.0		
	220				BORING TERMINATED AT 220.0 FEET														220	
	225																		225	
	230																		230	
235															235					
240															240					
245															245					

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

GC: GRAB COMPOSITE

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-86 (MW-60)**

DATE DRILLED 7-9-91 TO 7-12-91

DRILLING METHOD AIR HAMMER

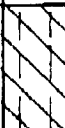
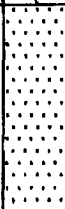
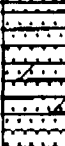
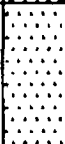
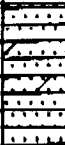
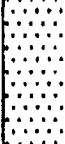
DRILLED BY BOYLES BROTHERS

LOGGED BY M.J.

CHECKED BY BJS

DRAWN BY: DKS PAGE 7 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>3.0</u>												SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: <u>0.0</u> PPM AIR: <u>0.0</u> PPM			
		Start: 14:15 7/9/91 Stop: 18:00 7/9/91 Resume: 15:20 7/12/91 Finish: 18:30 7/12/91 GROUND SURFACE: 3313.30																			
	0	CLAYEY SILT: VERY PALE BROWN, 10 YR 7/3, VERY FINE QUARTZ, DRY, VERY LOW PLASTICITY, 70% SILT, 30% CLAY	ML												1	0.0	GC	2.0	0		
	3.5														2	0.0	GC	4.0			
	5	SANDSTONE: WHITE TO LIGHT GRAY, 10 YR 8/2 TO 7/1, QUARTZ, VERY FINE GRAIN, CALCICHE CEMENTED, WEAK, CALCAREOUS	SAND- STONE												3	0.0	GC	6.0	5		
															4	0.0	GC	8.0			
	9.0														5	0.0	GC	10.0			
	10	SANDY DOLOMITE: GRAY, 10 YR 5/1, VERY FINE GRAIN, MASSIVE, HARD TO MOD. HARD, MINOR Fe STAIN	SANDY DOLOMITE												6	0.0	GC	12.0	10		
	13.0														7	0.0	GC	14.0			
	15	SANDSTONE: WHITE TO LIGHT BROWNISH GRAY, 2.5 YR 8/2 TO 6/2, QUARTZ, VERY FINE GRAIN, VERY POORLY CEMENTED, ABUNDANT Fe STAIN	SAND- STONE												8	0.8	GC	16.0	15		
	17.0														9	0.0	GC	18.0			
	20	DOLOMITE: SANDY DOLOMITE, LIGHT GRAY TO LIGHT BROWNISH GRAY, 10 YR 7/1 TO 6/2, MICROCRYSTALLINE TO VERY FINE GRAIN, MASSIVE	SANDY DOLOMITE												10	0.0	GC	20.0	20		
	21.0														11	2.8	GC	22.0			
	25	SANDSTONE: WHITE TO LIGHT GRAY, 10 YR 8/1, QUARTZ, FINE TO VERY FINE GRAIN, WEAKLY CEMENTED, FRIABLE, VERY WELL SORTED	SAND- STONE												12	0.0	GC	24.0			
															13	1.7	GC	26.0	25		
															14	0.0	GC	28.0			
		GRAYISH ORANGE, 10 YR 7/4 BELOW 28.0'													15	36.2	GC	30.0	30		
	30	SANDSTONE: GRAY TO DARK GRAYISH BROWN, 10 YR 8/1 TO 4/2, QUARTZ, VERY FINE GRAIN, WELL SORTED, MINOR BIOTITE, POORLY TO WEAKLY CEMENTED, FRIABLE, NONCALCAREOUS	SAND- STONE												16	38.1	GC	32.0			
		GRAYISH BROWN, 2.5 YR 5/2 FROM 33' TO , VERY POORLY CEMENTED, STRUCTURELESS, MOIST													17	37.1	GC	34.0			
	35																		35		



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

□ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED
GC GRAB COMPOSITE

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-87 (MW-61)**

DATE DRILLED **7/9/91 & 7/12/91**

DRILLING METHOD **AIR HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 2

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

4051 321-3488

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 3.0											SAMPLE			REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 14:15 7/9/91 Stop: 18:00 7/9/91 Resume: 15:20 7/12/91 Finish: 18:30 7/12/91 GROUND SURFACE: 3313.30																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
	35	CONTINUED FROM PREVIOUS PAGE	SAND-STONE													18	6.0	GC	36.0	35
																19	12.6	GC	38.0	
																20	12.5	GC	40.0	
	40															21	12.2	GC	42.0	40
																22	12.2	GC	44.0	
																23	18.3	GC	46.0	45
	45															24	17.1	GC	48.0	
																25	51.3	GC	50.0	50
	50	LIGHT OLIVE GRAY, 5 YR 6/1 TO GRAY, 10 YR 5/1, MOD. HARD, ABUNDANT BIOTITE SATURATED AT 53.0' OLIVE GRAY 5 YR 4/1 BELOW 54', VERY FINE GRAIN, VERY WELL CEMENTED, HARD, NONCALCAREOUS														26	66.4	GC	52.0	
														27	6.9	GC	54.0	55		
	55															28	3.1	GC	56.0	
	56.0	BORING TERMINATED AT 56.0'																		
	60																			
	65																			
	70																			

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED
GC: GRAB COMPOSITE

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-87 (MW-61)**

DATE DRILLED 7/9/91 & 7/12/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR PAGE 2 OF 2

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.0										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		Start: 07:45 7/13/91 Stop: 11:35 7/13/91																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
		GROUND SURFACE: 3813.60																
	0	CLAYEY SILT: BROWN, 10 YR 5/3, VERY FINE QUARTZ, DRY, VERY LOW PLASTICITY 70% SILT, 30% CLAY	ML											1	10.7	GC	2.0	0
	1.0													2	0.0	GC	4.0	
		SANDSTONE: GRAY TO DARK GRAY, 10 YR 6/1 TO 4/2, QUARTZ, VERY FINE GRAIN, WELL SORTED, MINOR BIOTITE, WEAKLY TO MOD. CEMENTED, FRIABLE, NONCALCAREOUS	SAND- STONE WITH INTER- BEDDED DOLO.											3	0.0	GC	6.0	5
	5													4	0.0	GC	8.0	
		INTERBEDDED THIN, DOLOMITE BELOW 5.0, LIGHT GRAY, 2.5 YR 7/2, MICRO- CRYSTALLINE, CONCOIDOL FRACTURE												5	0.4	GC	10.0	
	9.0													6	0.2	GC	12.0	10
	10	DOLOMITE: LIGHT GRAY TO LIGHT BROWN- ISH GRAY, 10 YR 7/2 TO 6/2, MICRO- CRYSTALLINE, MASSIVE, CONCOIDOL FRACTURE INTERBEDDED WITH SANDY DOLOMITE, GRAY 10 YR 6/1, VERY FINE GRAIN	DOLO. WITH INTER- BEDDED SANDY DOLO.											7	0.4	GC	14.0	
														8	1.1	GC	16.0	15
	15	SANDSTONE: LIGHT OLIVE GRAY, 5 YR 5/2 TO LIGHT OLIVE BROWN, 5 YR 5/6, QUARTZ, VERY FINE GRAIN, WEAKLY CEMENTED, ABUNDANT, Fe STAIN	SAND- STONE WITH INTER- BEDDED SANDY DOLO.											9	0.0	GC	18.0	
		INTERBEDDED SANDY DOLOMITE FROM 17.0' TO 23.0', LIGHT BROWNISH GRAY, 10 YR 6/2, VERY FINE GRAIN TO MICROCRYSTALLINE, MASSIVE, HARD												10	2.6	GC	20.0	20
	20													11	3.5	GC	22.0	
														12	211	GC	24.0	25
	23.0	SANDSTONE: LIGHT BROWNISH GRAY TO GRAYISH BROWN, 2.5 YR 6/2 TO 5/2, QUARTZ, VERY FINE GRAIN, WELL SORTED, ROUND TO SUBROUND, MOD. TO WEAKLY CEMENTED, NONCALCAREOUS, YELLOWISH BROWN, 10 YR 5/4 BELOW 28.0', VERY POORLY CEMENTED, LOOSE, LIGHT GRAY, 2.5 YR 7/N FROM 31' TO 35.3', MOD. HARD, WELL CEMENTED, NONCALCAREOUS	SAND- STONE											13	109	GC	26.0	
	25													14	3.1	GC	28.0	
														15	22.1	GC	30.0	30
	30													16	38.0	GC	32.0	
														17	20.5	GC	34.0	
	35													18	22.3	GC	35.0	35



SPLIT-SPOON SAMPLER



STANDARD PENETRATION TEST



UNDISTURBED SAMPLE



WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)



LABORATORY TEST LOCATION



PENETROMETER (TONS/SQ. FT.)



GC: GRAB COMPOSIT

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-87A (MW-61A)**

DATE DRILLED 7/13/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY MJL

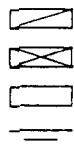
CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		Start: 07:45 7/13/91 Stop: 11:35 7/13/91 GROUND SURFACE: 3813.60																		
	35	SANDSTONE: LIGHT BROWNISH GRAY, 2.5 YR 6/2, QUARTZ, VERY FINE GRAIN, VERY POORLY TO WEAKLY CEMENTED BELOW 35.0', STRUCTURELESS, MOIST, MINOR Fe STAIN	SAND- STONE													18	22.3	GC	36.0	35
					19	5.3	GC	38.0												
					20	11.4	GC	40.0												
	40				21	11.8	GC	42.0												
					22	10.0	GC	44.0												
					23	17.6	GC	46.0												
	45				24	18.1	GC	48.0												
					25	13.6	GC	50.0												
	50				26	90.4	GC	52.0												
					27	49.9	GC	54.0												
	55	GRAYISH BROWN, 2.5 YR 5/2 BELOW 48.0', MOIST MOD. WELL CEMENTED FROM 49.0' TO 51.0', DRY WELL CEMENTED BELOW 51.0', HARD, MASSIVE, SATURATION AT GRADATIONAL CHANGE, VERY DARK GRAYISH BROWN TO GRAY, 10 YR 3/2 TO 5/1, MASSIVE														28	16.1	GC	56.0	55
					29	2.9	GC	58.0												
					30	2.4	GC	60.0												
	60				31	4.2	GC	62.0												
					32	15.1	GC	64.0												
					33	8.5	GC	66.0												
	65				34	8.6	GC	68.0												
					35	6.2	GC	70.0												
	70	BORING TERMINATED AT 70.0' REEM HOLE TO 10"																		70



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
PENETROMETER (TONS/SQ. FT.)
GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029**

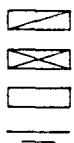
BORING NUMBER **BH-87A (MW-61A)**

DATE DRILLED 7/13/91
DRILLING METHOD AIR HAMMER
DRILLED BY BOYLES BROTHERS
LOGGED BY MJL
CHECKED BY BJS
DRAWN BY: SAR PAGE 2 OF 7

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM		
		Resume: 08:00 7/14/91																		
		GROUND SURFACE: 3813.60																		
	70	SANDSTONE: VERY DARK GRAYISH BROWN, 10 YR 3/2, VERY FINE GRAIN, MOD. CEMENTED, MOD. HARD, DRY	SANDSTONE												36	5.5	GC	72.0	70	
															37	8.0	GC	74.0		
	75														38	114.6	GC	76.0	75	
	77.0	SANDY DOLOMITE: GRAY 10 YR 5/1, VERY FINE GRAIN TO CRYSTALLINE, HARD, MASSIVE	SANDY DOLOMITE												39	57.5	GC	78.0		
	80														40	4.2	GC	80.0	80	
															41	2.6	GC	82.0		
	83.0	SANDSTONE: GRAY, 10 YR 5/1, QUARTZ, VERY FINE TO FINE GRAIN, WELL SORTED, ROUND TO SUBROUND, NONCALCAREOUS, MOD. TO WELL CEMENTED, MASSIVE	SANDSTONE												42	25.2	GC	84.0		
	85														43	26.4	GC	86.0	85	
															44	241	GC	88.0		
															45	62.2	GC	90.0		
	90														46	89.5	GC	92.0	90	
															47	265	GC	94.0		
	95	DOLOMITIC SANDSTONE: GRAY, 10 YR 6/1, VERY FINE GRAIN TO CRYSTALLINE, NONCALCAREOUS, MASSIVE, HARD	DOLOMITE SANDSTONE												48	62.4	GC	96.0	95	
															49	14.9	GC	98.0		
	100														50	18.8	GC	100	100	
	101.0	SANDY DOLOMITE: LIGHT GRAY, 10 YR 6/1, CRYSTALLINE, MINOR VERY FINE SAND, MASSIVE, HARD, CONCOIDOL FRACTURE	SANDY DOLOMITE												51	10.7	GC	102		
															52	13.4	GC	104		
	105														53	11.1	GC	105	105	



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-87A (MW-61A)**

DATE DRILLED **7/13/91**

DRILLING METHOD **AIR HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 3 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	20	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3813.60																	
	105	SANDY DOLOMITE: LIGHT GRAY TO LIGHT BROWNISH GRAY, 10 YR 6/1 TO 6/2, CRYSTALLINE, MINOR VERY FINE SAND, MASSIVE, HARD, CONCOIDOL FRACTURE DOLOMITIC SANDSTONE W/ INTERBEDDED SANDY DOLOMITE: LIGHT GRAY TO LIGHT BROWNISH GRAY, 10 YR 6/1 TO 5/1, MASSIVE	SANDY DOLOMITIC												53	11.1	GC	106	105
	107.0														54	8.7	GC	108	
	110		DOLOMITIC SANDSTONE W/ INTERBEDDED SANDY DOLO.												55	9.4	GC	110	
	111.0	SANDSTONE: LIGHT GRAY, 10 YR 7/1, QUARTZ, VERY FINE GRAIN, WELL SORTED, MINOR BIOTITE, MOD. WELL CEMENTED													56	147	GC	112	110
	115		SANDSTONE												57	140.1	GC	114	
	120														58	124	GC	116	115
	122.0	SANDY DOLOMITE: LIGHT GRAY TO LIGHT GRAYISH BROWN, 6/1 TO 6/2, VERY FINE GRAIN TO MICROCRYSTALLINE, MASSIVE, HARD													59	34.4	GC	118	
	125		SANDY DOLOMITE												60	115.9	GC	120	120
	130														61	213.9	GC	122	
	131.0	DOLOMITIC: SANDSTONE: GRAY, 10 YR 5/1 TO 5/2, VERY FINE GRAIN, MOD. HARD, MOD. WELL CEMENTED													62	16.7	GC	124	
	135		DOLOMITIC SANDSTONE												63	12.3	GC	126	125
	140														64	3.8	GC	128	
															65	0.4	GC	130	130
															66	2.4	GC	132	
															67	0.4	GC	134	
															68	7.6	GC	136	135
															69	56.8	GC	138	
															70	139.3	GC	140	140



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

□ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-87A (MW-61A)**

DATE DRILLED **7/13/91**

DRILLING METHOD **AIR HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE **4** OF **7**

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

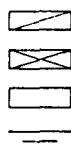
3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.0										SAMPLE				REMARKS		
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH				
		GROUND SURFACE: 3813.60																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM		
	140	DOLOMITIC SANDSTONE: GRAY, 10 YR 5/1	DOLOMITIC SANDSTONE																140		
	141.0	VERY FINE GRAIN, MOD. HARD, MOD. WELL CEMENTED, MASSIVE	SANDY DOLOMITE													71	39.2	GC	142		
		SANDY DOLOMITE: GRAY TO LIGHT BROWNISH GRAY, 10 YR 5/1 TO 7/2. VERY FINE GRAIN TO CRYSTALLINE, HARD, MASSIVE															72	37.8	GC	144	
	145																73	15.4	GC	146	
	147.0	DOLOMITIC SANDSTONE: GRAY 10 YR 5/1, VERY FINE GRAIN, MOD. HARD, MOD. WELL CEMENTED, MASSIVE	DOLOMITIC SANDSTONE														74	18.3	GC	148	
	149.0	SANDSTONE: YELLOWISH GRAY, 5 YR 7/2 QUARTZ, VERY FINE GRAIN, MOD. WELL SORTED, WEAKLY CEMENTED, ABUNDANT BIOTITE, NONCALCAREOUS															75	119.9	GC	150	
	150	ABUNDANT K-FELDSPAR BELOW 152', FINE TO VERY FINE GRAIN, MOD. WELL SORTED, MOD. WELL TO EVEN CEMENTED	SANDSTONE														76	83.2	GC	152	
		VERY THIN SANDY MUDSTONE SEAM AT 156.5', MOIST, BANDED LIGHT GRAY TO DARK GRAY, ORGANIC ODOR INTERBEDDED WHITE TO VERY LIGHT GRAY, N/8 TO N/9																77	71.6	GC	154
	155	SANDSTONE FROM 157' TO VERY FINE GRAIN, VERY WELL SORTED, WEAKLY TO MOD. CEMENTED																78	31.7	GC	156
																		79	119.5	GC	158
																		80	221.8	GC	160
	160																	81	75.6	GC	162
																		82	32.0	GC	164
	165																	83	167.3	GC	166
																		84	360	GC	168
		FINE TO MED. GRAIN FROM 170' TO 171', MOD. SORTED, VERY PALE BROWN TO BROWNISH YELLOW, 10 YR 7/4 TO 6/6																85	245.9	GC	170
	170																	86	13.8	GC	172
	171.0	DOLOMITIC SANDSTONE: GRAY TO LIGHT BROWNISH GRAY, 10 YR 6/1 TO 6/2, VERY FINE GRAIN TO CRYSTALLINE, MOD. HARD, MASSIVE	DOLOMITIC SANDSTONE															87	13.4	GC	174
																		88	7.8	GC	175
	175																			175	



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-87A (MW-61A)**

DATE DRILLED **7/13/91**

DRILLING METHOD **AIR HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 5 OF 7

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 18.0										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		Resume: 08:00 7/14/91 Stop: 19:19 7/14/91 Resume: 07:00 7/15/91 Finish: 10:05 7/15/91																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
		GROUND SURFACE: 3813.60																
	175	DOLOMITIC SANDSTONE: GRAY TO LIGHT BROWNISH GRAY, 10 YR 6/1 TO 6/2, VERY FINE GRAIN TO CRYSTALLINE, MOD. HARD, MASSIVE	DOLOMITIC SANDSTONE											88	7.8	GC	176	175
														89	43.7	GC	178	
														90	190.9	GC	180	180
	180													91	14.3	GC	182	
														92	10.0	GC	184	
														93	127.3	GC	186	185
	185	SANDSTONE: GRAYISH BROWN, 10 YR 5/4, QUARTZ, VERY FINE GRAIN, WELL SORTED, MOD. WELL CEMENTED	SANDSTONE											94	29.0	GC	188	
	187.0	SANDY DOLOMITE: DOLOMITIC SANDSTONE, GRAY TO LIGHT BROWNISH GRAY, 10 YR 6/1 TO 6/2, INTERBEDDED, UNITS 1.5 FT. THICK, CRYSTALLINE TO VERY FINE GRAIN, MASSIVE	SANDY DOLOMITE W/INTER-BEDDED DOLOMITIC SANDSTONE											95	6.9	GC	190	190
	190													96	46.1	GC	192	
														97	2.4	GC	194	
	194													98	1.3	GC	196	195
	195	SATURATED BELOW 194.0' NO ODOR												99	0.0	GC	198	
														100	15.8	GC	200	200
	200	FRACTURED BELOW 200'												101	0.6	GC	202	
														102	0.4	GC	204	
	205													103	0.4	GC	206	205
	206.0	SANDSTONE: VERY PALE BROWN TO BROWNISH YELLOW, 10 YR 6/3 TO 6/6, MEDIUM TO COURSE GRAIN, ANGULAR TO SUBROUND, VERY POORLY SORTED, CALCAREOUS, SATURATED, ABUNDANT ANGULAR DOLOMITE AND LIMESTONE FRAGMENTS	SANDSTONE											104	0.0	GC	208	
														105	1.1	GC	210	210



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
GC GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-87A (MW-61A)**

DATE DRILLED 7/13/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 6 OF 7

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM X 18.0											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18							
		Resume: 07:00 7/15/91 Stop: 10:05 7/15/91																		
		GROUND SURFACE: 3813.60																		
	210	SANDSTONE: PALE BROWN TO BROWNISH YELLOW, 10 YR 6/3 TO 6/6, MED. TO COURSE GRAIN, VERY POORLY SORTED, ANGULAR TO SUBROUND, CALCAREOUS, SATURATED, ABUNDANT, ANGULAR DOLOMITE AND LIMESTONE FRAGMENTS, MOD. WELL CEMENTED, HARD	SANDSTONE													106	0.8	GC	210	
																			212	
																107	0.4	GC	214	
	214.0	BORING TERMINATED AT 214.0'																		
	215																			215
	220																			220
	225																			225
	230																			230
	235																			235
	240																			240
	245																			245

 SPLIT-SPOON SAMPLER

 STANDARD PENETRATION TEST

 UNDISTURBED SAMPLE

 WATER TABLE (24 HOURS)

 WATER TABLE (TIME OF BORING)

 LABORATORY TEST LOCATION

 PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-87A (MW-61A)**

DATE DRILLED 7/13/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3893

PAGE 7 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 85											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		GROUND SURFACE: 3817.00																		
	0.3	SILT: SOME CHERT AND DOLOMITE FRAGMENTS, COLOR 10 YR 8/3 PALE BROWN, DRY	ML												1	0.0	GC	2.0	0	
		CHERTY DOLOMITE: DRY FRAGMENTS, CHERT COLOR 10 YR 5/4, YELLOWISH BROWN DOLOMITE COLOR 10 YR 5/2 GRAYISH BROWN	CHERTY DOLOMITE SILTSTONE												2	0.0	GC	4.0		
	5														3	9.0	GC	6.0	5	
	7.0	SILTSTONE: CHERTY, DOLOMITE, DRY, COLOR 10 YR 8/4 LIGHT YELLOWISH BROWN	SILTSTONE DOLOMITE												4	5.0	GC	8.0		
															5	11	GC	10.0		
	10	CHERTY DOLOMITE: 10 YR 5/4 YELLOWISH BROWN, SILTSTONE INTERBEDS, IRON OXIDE STAIN ON SOME SILTSTONE, DRY, COLOR 10 YR 5/3 (IRON STAIN) BROWNISH YELLOW	CHERTY DOLOMITE												6	7.0	GC	12.0	10	
	12.0														7	102	GC	14.0		
	15	DOLOMITE SILTSTONE: DRY 10 YR 7/1 LIGHT GRAY, SOME CHERT 10 YR 7/3 VERY PALE YELLOW BROWN	DOLOMITE SILTSTONE												8	97	GC	16.0	15	
															9	3.0	GC	18.0		
	20														10	2.0	GC	20.0	20	
	22.0														11	4.0	GC	22.0		
	25	SANDSTONE: VERY FINE, DRY, 10 YR 8/1 WHITE, GRADATIONAL CONTACT WITH OVERLYING SILTSTONE, SOME CHERT SILTSTONE, DRY	SANDSTONE												12	2.0	GC	24.0		
															13	2.0	GC	26.0	25	
															14	2.0	GC	28.0		
	30														15	NS	GC	30.0	30	
		SANDSTONE: VERY FINE, DRY, 10 YR 8/1, WHITE TO 10 YR 8/2 VERY PALE BROWN, SOME SILTSTONE	SANDSTONE												16	4.0	GC	32.0		
	34.0														17	8.0	GC	34.0		
	35	SANDSTONE: VERY FINE, 5 YR 8/1, GRAY	SANDSTONE												18	16	GC	35.0	35	

SPOUT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-88 (MW-62)**

DATE DRILLED 7/19/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY DHC

CHECKED BY BJS

DRAWN BY: SAR PAGE 1 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 N. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-5000

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 88										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
		GROUND SURFACE: 3817.00																	
	35	SANDSTONE: VERY FINE, 5 YR 8/1 GRAY, CHERT 10 YR 7/3 VERY PALE BROWN, DRY, WELL CEMENTED, 10 YR 8/1 GRAY	SANDSTONE												18	18	GC	36.0	35
															19	8	GC	38.0	
															20	20	GC	40.0	
	40	SANDSTONE: FINE, LOOSELY CEMENTED, 10 YR 7/4 VERY PALE BROWN, FINE QUARTZ	SANDSTONE												21	2	GC	42.0	40
	42.0	SANDSTONE: VERY FINE, 7.5 YR 7/0 LIGHT GRAY, DRY, WELL CEMENTED													22	2	GC	44.0	
															23	4	GC	46.0	45
	45		SANDSTONE												24	4	GC	48.0	
															25	8.5	GC	50.0	
	50	SANDSTONE: FINE, 10 YR 7/7 LIGHT GRAY, DRY, MOD. CEMENTED	SANDSTONE												26	25	GC	52.0	50
	52.0	SANDSTONE: FINE, 10 YR 7/7 LIGHT GRAY, SLIGHT MOISTURE, POOR TO MOD. CEMENTED	SANDSTONE												27	8	GC	54.0	
	54.0	SANDSTONE: VERY FINE, 7.5 YR 8/0 WHITE TO 7.5 YR 7/0 LIGHT GRAY, WELL CEMENTED, DRY, PROBABLY DOLOMITE CEMENT													28	14	GC	56.0	55
	55														29	70	GC	58.0	
			SANDSTONE												30	7	GC	60.0	
	60														31	17	GC	62.0	60
															32	102	GC	64.0	
	65														33	8	GC	66.0	65
	66.0	CHERTY DOLOMITE: DRY, 5 YR 7/1 LIGHT GRAY	CHERTY DOLOMITE												34	26	GC	68.0	
															35	6	GC	70.0	70



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

□ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-88 (MW-62)**

DATE DRILLED 7/21/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY DHC

CHECKED BY BJS

DRAWN BY SAR

PAGE 2 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 88										SAMPLE				REMARKS		
					2	4	5	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH				
		GROUND SURFACE: 3817.00																			
	70	CHERTY DOLOMITE: (CONT.)	CHERTY DOLOMITE												38	4	GC	72.0		70	
	72.0	DOLOMITIC SANDSTONE: VERY FINE, WELL CEMENTED, DRY, 2.5 YR 6/0, GRAY	DOLOMITIC SANDSTONE												37	123	GC				
	74.0	DOLOMITE: 5 YR 7/1 LIGHT GRAY AND DOLOMITE SANDSTONE, DRY	DOLOMITE												38	67	GC	74.0			
	75		DOLOMITE SANDSTONE															76.0		75	
	77.0	DOLOMITIC SANDSTONE: VERY FINE, 2.5 YR 6/0 GRAY WELL CEMENTED SLIGHTLY MOIST	DOLOMITIC SANDSTONE												39	91	GC	78.0			
															40	84	GC	80.0			
	80		DOLOMITIC SANDSTONE												41	18	GC	82.0		80	
															42	24	GC	84.0			
	85														43	70	GC	86.0		85	
															44	43	GC	88.0			
															45	5	GC	90.0			
	90														46	5	GC	92.0		90	
	92.0	CHERTY DOLOMITE: DRY, 10 YR 7/3, VERY PALE BROWN	CHERTY DOLOMITE												47	5	GC	94.0			
	95														48	7	GC	96.0		95	
	98.0	CHERT: 5 YR 7/3 PINKISH GRAY, DRY, CONCHOIDAL FRACTURE, DRY	CHERT												49	3	GC	98.0			
															50	3	GC	100			
	100	CHERTY DOLOMITE: 7.5 YR 6/2, PINKISH GRAY, DRY	CHERTY DOLOMITE												51	0.3	GC	102		100	
	102.0	CHERTY DOLOMITE: 10 YR 6/2, LIGHT BROWNISH GRAY, DRY	CHERTY DOLOMITE												52	3	GC	104			
	105														53	17	GC	105		105	



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

□ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC GRAB COMPOSIT

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3710 N. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-5495

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-88 (MW-62)**

DATE DRILLED **7/22/81**

DRILLING METHOD **AIR HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC**

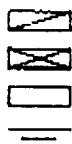
CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 3 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM X 88										NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18						
		GROUND SURFACE: 3817.00																	BACKGROUND
	105	CHERTY DOLOMITE: (CONT.)	CHERTY DOLOMITE												53	17	GC	108	OVM READING:
	106.0																		SOIL: 0.0 PPM
		CHERTY DOLOMITE: 10 YR 7/1, LIGHT GRAY, DRY, CONCHOIDAL FRACTURES	CHERTY DOLOMITE												54	37	GC		AIR: 0.0 PPM
															55	28	GC	108	
	110																	110	
															56	5	GC		110
															57	5	GC	112	
	114.0																	114	
	115	DOLOMITIC SANDSTONE: VERY FINE, 7.5 YR 7/0 LIGHT GRAY AND INTERBEDDED SILTSTONE 10 YR: 8/4 VERY PALE BROWN, DRY	SANDSTONE												58	78	GC		115
	118.0																	116	
		CHERTY DOLOMITE: 10 YR 7/1, LIGHT GRAY, DRY (A3 ABOVE)													59	3	GC		
			CHERTY DOLOMITE															118	
	120														60	4	GC	120	
																			120
															61	78	GC		
																		122	
															62	53	GC	124	
	125																	124	
															63	13	GC		125
																		126	
															64	3	GC	128	
	128.0																	128	
		DOLOMITIC SANDSTONE: VERY FINE 7.5 YR 7/0 LIGHT GRAY, DRY, WELL CEMENTED													65	0.3	GC		
	130		DOLOMITIC SANDSTONE															130	130
															66	1	GC		
																		132	
															67	1	GC	134	
	134.0																	134	
	135	CHERTY DOLOMITE: DRY, INTERBEDDED, VERY FINE SANDSTONE	DOLOMITE SANDSTONE												68	0.7	GC		135
	136.0																	136	
															69	0	GC	138	
																		138	
															70	0.2	GC		
	140																	140	140



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-88 (MW-62)**

DATE DRILLED **7/22/91**

DRILLING METHOD **AIR HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC**

CHECKED BY **BJS**

DRAWN BY: **SAR**

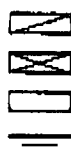
PAGE 4 OF 7

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 N. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3000

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OWN SOIL GAS PPM X 88										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	20	NUMBER	OWN READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3817.00																	BACKGROUND OWN READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	140	DOLOMITIC SANDSTONE: VERY FINE, 7.5 YR 8/0 WHITE, WELL CEMENTED, DRY, HAS PETROLEUM ODOR	DOLOMITIC SANDSTONE												71	2	GC	142	140
															72	351	GC	144	
	145														73	281	GC	146	145
															74	53	GC	148	
															75	58	GC	150	
	150	DOLOMITIC SANDSTONE: VERY FINE, 7.5 YR 8/0 WHITE AND CHERY DOLOMITE. 10 YR 7/1, LIGHT GRAY, DRY	DOLOMITIC SANDSTONE												76	106	GC	152	150
															77	3	GC	154	
	154.0	CHERTY DOLOMITE: 10 YR 7/1, LIGHT GRAY, DRY	CHERTY DOLOMITE												78	16	GC	156	155
	155														79	28	GC	158	
															80	83	GC	160	
	160														81	14	GC	162	160
	162.0	DOLOMITIC SANDSTONE: VERY FINE, 7.5 YR 8/0, WHITE, DRY	DOLOMITIC SANDSTONE												82	7	GC	164	
	164.0	INTERBEDDED VERY FINE SANDSTONE AND CHERY DOLOMITE (AS ABOVE), DRY	SANDSTONE DOLOMITE												83	9	GC	166	165
	165														84	4	GC	168	
															85	2	GC	170	
	170														86	2	GC	172	170
															87	3	GC	174	
	174.0	CHERTY DOLOMITE	CHERTY DOLOMITE												88	3	GC	175	175



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

GC GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-88 (MW-62)**

DATE DRILLED **7/23/91**

DRILLING METHOD **AIR HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 3 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 N. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-1000

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X <u>85</u>										SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: <u>0.0</u> PPM AIR: <u>0.0</u> PPM		
		GROUND SURFACE: 3817.00																		
	175	CHERTY DOLOMITE: 10 YR 7/1 LIGHT GRAY, DRY	CHERTY DOLOMITE											88	3	GC	176		175	
																89	1	GC	178	
																90	60	GC	180	
	180															91	1	GC	182	180
														92	1	GC	184			
	184.0																			
	185	INTERBEDDED VERY FINE DOLOMITIC SANDSTONE: 7.5 YR 8/0 YR WHITE, WELL CEMENTED, AND CHERTY DOLOMITE, 10 YR 7/1, LIGHT GRAY, DRY	SANDSTONE											93	1	GC	186		185	
																94	1	GC	188	
																95	0	GC	190	
	190															96	0	GC	192	190
		VERY CHERTY DOLOMITE, 10 YR 8/1, GRAY, DRY	CHERTY DOLOMITE																	
																97	0	GC	194	
	195															98	0	GC	196	195
																99	0	GC	198	
	198.0	CHERTY DOLOMITE: 5 YR 7/1 LIGHT GRAY, DRY	CHERTY DOLOMITE											100	0	GC	200			
	200	INTERBEDDED CHERTY DOLOMITE: 10 YR 7/2 LIGHT GRAY, SILTSTONE 5 YR 8/1 WHITE AND VERY FINE SANDSTONE 10 YR 8/1, WHITE, DRY	CHERTY DOLOMITE											101	1	GC	202		200	
	202.0	CHERTY DOLOMITE: 2.5 YR 8/2 LIGHT YELLOWISH BROWN (OIL STAIN) DRY, AND SILT	CHERTY DOLOMITE											102	580	GC	204			
	204.0																			
	205	CHERTY DOLOMITE: 10 YR 8/3 PALE BROWN (OIL STAIN) STRONG ODOR, & PRODUCT	CHERTY DOLOMITE											103	1520	GC	206		205	
														104	1763	GC	208			
														105	639	GC	209			
	210													106	855	GC	210		210	

	SPLIT-SPOON SAMPLER		WATER TABLE (TIME OF BORING)
	STANDARD PENETRATION TEST		LABORATORY TEST LOCATION
	UNDISTURBED SAMPLE		PENETROMETER (TONS/SQ. FT.)
	WATER TABLE (24 HOURS)		GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-88 (MW-62)**

DATE DRILLED 7/22/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY DHC

CHECKED BY BJS

DRAWN BY: SAR

PAGE 6 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

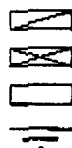
3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-1888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 88										SAMPLE				REMARKS		
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH				
		GROUND SURFACE: 3817.00																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM		
	210	CONTINUES FROM PREVIOUS PAGE	CHERTY DOLOMITE													106	858	GC	211	210	
	211.0	SANDSTONE: VERY FINE GRAIN 7.5 YR 8/8 REDDISH YELLOW, VERY FINE GRAIN, SAT. HYDROCARBON ODOR, THIN LENSES OF HARDER SLIGHTLY MORE COARSE GRAIN, SANDSTONE FINE TO MED. ROUND-SUBROUND	SANDSTONE														107	930	GC	213	
	215																108	945	GC	215	215
																	109	918	GC	217	
																	110	838	GC	219	
	220																111	875	GC	221	220
	223.0	BORING TERMINATED AT 223.0'															112	833	GC	223	
	225																			225	
	230																			230	
	235																			235	
	240																			240	
	245																			245	



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONE/SQ. FT.)

GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-88 (MW-62)**

DATE DRILLED 7/24/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY DHC

CHECKED BY BJS

DRAWN BY: SAR

PAGE 7 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

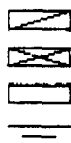
3700 N. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-5045

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 10										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
	0	GROUND SURFACE: 3823.30																
	0	GRAVELLY COBBLE SILT: BROWN, 7.5 YR 5/4, DRY, VERY FINE QUARTZ, COBBLES/ BCUCLDER, GRAVEL, UNCONSOLIDATED												1	7	GC	2.0	0
														2	5.5	GC	4.0	
	5		GM											3	3	GC	6.0	5
														4	23	GC	8.0	
	10													5	6	GC	10.0	10
	12.0													6	3.6	GC	12.0	
		CHERTY DOLOMITE: 5 YR 7/0 LT. GRAY, VERY HARD, DRY, MICRO-X/N, WITH FINE GRAIN SAND LENSES THROUGHOUT FROM 14'-20'												7	4	GC	14.0	
	15		CHERTY DOLOMITE											8	16	GC	18.0	15
														9	3	GC	18.0	
	20													10	0	GC	20.0	20
		CHERTY DOLOMITE: 5 YR 7/0 LT. GRAY, VERY HARD, DRY, VERY FINE X/N-MICRO X/N	CHERTY DOLOMITE											11	0	GC	22.0	
														12	0	GC	24.0	
	24.0													13	4	GC	26.0	25
	24.3	SANDSTONE: 10 YR 8/6 YELLOW, DRY, HARD, FRIABLE, VERY FINE GRAIN ROUND-SUBROUND	SANDSTONE											14	0	GC	28.0	
	25													15	18	GC	30.0	30
		DOLOMITE: WITH SAND LENSES, SOME CALCIUM CARBONATE PRESENT, FAIR TO GOOD EPERVERSSENCE (ON FINES NOT CHIPS) SOME CHERT PRESENT THROUGHOUT	DOLOMITE											16	129	GC	32.0	
	30													17	5	GC	34.0	
														18	2	GC	35.0	35



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
 L LABORATORY TEST LOCATION
 + PENETROMETER (TONS/SQ. FT.)
 GC GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-89 (MW-63)**

DATE DRILLED **7/25/81**

DRILLING METHOD **AIR HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **TPG**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 326-3898

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 10										SAMPLE				REMARKS		
															NUMBER	OVM READING	RECOVERY	DEPTH			
					2	4	6	8	10	12	14	16	18								
		GROUND SURFACE: 3823.30 CONTINUES FROM PREVIOUS PAGE																			
	35														18	2	GC	38.0			35
															19	3	GC	38.0			
															20	15	GC	40.0			
	40	INTERBEDDED SILTSTONE STARTING AT 38.0', 7.5 YR 7/0 LT. GRAY, HARD, DRY, SOME CARBONATE PRESENT PROB. DUE TO CARBONATE FILLED FRACTURES CUTTINGS NOT EPERVESSANT POWDER IS EPERVESSANT DOLOMITE-MICRO-X/N, DENSE, VERY HARD	DOLOMITE WITH INTER-BEDDED SILTSTONE												21	7	GC	42.0			40
															22	2.7	GC	44.0			
	45														23	2.2	GC	48.0			45
															24	10	GC	48.0			
															25	6.1	GC	50.0			
	50														26	8.8	GC	52.0			50
															27	1.7	GC	54.0			
															28	7.4	GC	56.0			
	55														29	5.9	GC	58.0			55
															30	5.8	GC	60.0			
	60														31	4.5	GC	62.0			60
															32	8.0	GC	64.0			
	64.0														33	86	GC	66.0			65
	65	SANDSTONE: 7.5 YR, LT. GRAY, FRIABLE, VERY FINE GRAIN, ROUND-SUBROUND, MOTTLED FROM 64.0' WEAK CARBONATE CEMENTATION	SANDSTONE												34	208	GC	68.0			
															35	257	GC	70.0			70



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SG. FT.)
GC GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-89 (MW-63)**

DATE DRILLED 7/25/91
DRILLING METHOD AIR HAMMER
DRILLED BY BOYLES BROTHERS
LOGGED BY TPQ
CHECKED BY BJS
DRAWN BY: SAR PAGE 2 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 E. HARRISON
NORFOLK, VIRGINIA 23502
(804) 733-3333

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 10										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
		GROUND SURFACE: 3823.30																	
	70	SOME DOLOMITE MICRO-X/N IN 72'-74'. SAMPLE, VERY HARD, DENSE, NO ODOR	SANDSTONE											36	247	GC	72.0		70
														37	5.8	GC	74.0		
	75													38	3.2	GC	76.0		75
	76.0	DOLOMITE: 7.5 YR 7/0 LT GRAY, VERY HARD, DENSE, MICRO-X/N, COLOR CHANGE ABOUT 77'-78', 2.5 YR 5/2 WEAK RED. VERY HARD, DENSE MICRO-X/N	DOLOMITE											39	0.8	GC	78.0		
														40	0.3	GC	80.0		
	80		DOLOMITE											41	0.0	GC	82.0		80
														42	0.1	GC	84.0		
	85													43	0.0	GC	86.0		85
														44	0.0	GC	88.0		
	88.0	SANDSTONE: 7.5 YR 7/0 TO 8/0 LT. GRAY TO GRAY, DRY TO MOIST (90-92). SOFT, FRIABLE, NO ODOR, VERY FINE- MED. GRAIN, ROUND-SUBROUND ANGULAR, SOME DOLOMITE PRESENT FASTER DRILLING THAN DOLOMITE, ZONES OF MOISTURE 90'-92', 93'-94', 95'-95.5'	SANDSTONE											45	0.0	GC	90.0		90
	90													46	1.4	GC	92.0		
														47	6.3	GC	94.0		
	95													48	8.9	GC	96.0		95
	96.0	DOLOMITE: 7.5 YR 7/0 TO 7/2 LT. GRAY TO PINKISH GRAY, DRY, HARD DENSE, MICRO-X/N, NO ODOR	DOLOMITE											49	14.8	GC	98.0		
	99.9													50	6.9	GC	100		
	100	SANDSTONE: 7.5 YR 7/0 LT. GRAY, SOFT, DRY, FRIABLE, NO ODOR TO SLIGHT ODOR, VERY FINE TO FINE GRAIN, ROUND-SUBROUND	SANDSTONE											51	19.8	GC	102		100
														52	5.1	GC	104		
	105													53	27	GC	105		105



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-89 (MW-63)**

DATE DRILLED 7/25/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY TPG

CHECKED BY BJS

DRAWN BY: SAR

PAGE 3 OF 7

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3760 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS	
					PPM X 10											NUMBER	OVM READING	RECOVERY	DEPTH		
					2	4	6	8	10	12	14	16	18					BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM			
		GROUND SURFACE: 3823.30																			
	105	CONTINUED FROM PREVIOUS PAGE	SANDSTONE													53	27	GC	106	105	
	106.0															54	8	GC	108		
	110	DOLOMITE: 5 YR 6/1 TO 6/2, LIGHT GRAY TO PINKISH GRAY, DENSE, VERY HARD, SOME CHEST														55	8.2	GC	110	110	
	115															56	4.8	GC	112		
	120															57	4.5	GC	114		
	125															58	6.7	GC	116	115	
	130	SANDSTONE LENS: 117'-117.5', 10 YR 8/8 YELLOW, SOFT, FRIABLE, DRY, NO ODOR	DOLOMITE													59	6.9	GC	118		
	135															60	5.9	GC	120		
	140															61	29.5	GC	122	120	
																62	17.7	GC	124		
																63	30.5	GC	126	125	
																64	10.3	GC	128		
		TRACE SAND FROM 128'-130'														65	6.9	GC	130	130	
																66	3.5	GC	132		
																67	2.2	GC	134		
																68	1.7	GC	136	135	
																69	4.5	GC	138		
																70	3.8	GC	140	140	

SPOON-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SG. FT.)

GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-89 (MW-63)**

DATE DRILLED 7/25/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY TPG

CHECKED BY BJS

DRAWN BY: SAR PAGE 4 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 10										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
		GROUND SURFACE: 3823.30																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	140	DOLOMITE; GRAY TO PINKISH GRAY, 5 YR 6/1 TO 6/2, MASSIVE, MICRO-CRYSTALLINE TO VERY FINE GRAIN	DOLOMITE											71	4.3	GC	142	140
														72	6.8	GC	144	
	145													73	18.2	GC	146	145
														74	14.3	GC	148	
														75	9.3	GC	150	
	150													76	3.2	GC	152	150
														77	5.9	GC	154	
														78	6.4	GC	156	
	155													79	4.3	GC	158	155
														80	1.7	GC	160	
	160													81	0.9	GC	162	160
														82	5.9	GC	164	
														83	5.6	GC	166	
	165													84	0.9	GC	168	165
														85	6.6	GC	170	
	170													86	3.8	GC	172	170
														87	5.1	GC	174	
														88	3.8	GC	175	175

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOSIT

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-89 (MW-63)**

DATE DRILLED 7/25/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY TPG

CHECKED BY BJS

DRAWN BY: SAR PAGE 5 OF 7

BORING RECORD

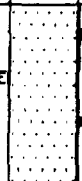
GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 10										SAMPLE				REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		GROUND SURFACE: 3823.30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</

SPOON-SAMPLER STANDARD PENETRATION TEST UNDISTURBED SAMPLE WATER TABLE (24 HOURS)	WATER TABLE (TIME OF BORING) LABORATORY TEST LOCATION PENETROMETER (TONS/SQ. FT.) GC: GRAB COMPOSIT	JOB NAME/NUMBER MARATHON/91029 BORING NUMBER BH-89 (MW-63) DATE DRILLED <u>7/25/91</u> DRILLING METHOD <u>AIR HAMMER</u> DRILLED BY <u>BOYLES BROTHERS</u> LOGGED BY <u>TPG</u> CHECKED BY <u>BJS</u> DRAWN BY: <u>SAR</u>
--	--	---

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 N. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 421-3485

PAGE 6 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS		
					PPM X 10										NUMBER	OVM READING	RECOVERY	DEPTH			
					2	4	6	8	10	12	14	16	18								
		GROUND SURFACE: 3823.30																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM			
	210	SANDSTONE: (CONT. AS ABOVE)	SANDSTONE												106	2.4	GC	212	210		
		COURSE GRAIN FROM 213' TO 215'. POORLY SORTED, ANGULAR, POORLY CEMENTED															107	1.1	GC	214	
	215	SANDY DOLOMITE. GRAY TO PINKISH GRAY, 5 YR 8/1 TO 6/2, VERY FINE GRAIN TO CRYSTALLINE, MASSIVE	SANDY DOLOMITE												108	4.0	GC	216	215		
																	109	4.0	GC	218	
																	110	2.2	GC	220	
	220	BORING TERMINATED AT 220.0'																	220		
	225																		225		
	230																		230		
	235																		235		
	240																		240		
	245																		245		

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
-  GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **BH-89 (MW-63)**

DATE DRILLED 7/25/81

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY TPG

CHECKED BY BJS

DRAWN BY: SAR

PAGE 7 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 521-5888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE			REMARKS	
					PPM X 43.2											NUMBER	OVM READING	RECOVERY		DEPTH
					2	4	6	8	10	12	14	16	18							
		GROUND SURFACE: 3796.2																		
	0	SILTY SAND: SANDY LOAM SOIL 10 YR 6/4, LIGHT YELLOWISH BROWN, DRY	ML													1	0.0	GC	2.0	0
	2.0	SANDSTONE: FINE, DRY, 2.5 YR 7/4, PALE YELLOW	SANDSTONE													2	2.0	GC	4.0	
																3	2.0	GC	6.0	5
	5															4	1.0	GC	8.0	
																5	1.0	GC	10.0	
	10	SANDSTONE: FINE, DRY, 7.5 YR 7/8, REDDISH YELLOW, RON STAIN, WELL CEMENTED	SANDSTONE													6	0.0	GC	12.0	10
	12.0	SANDSTONE: FINE, DRY, 10 YR 8/1, WHITE	SANDSTONE													7	0.0	GC	14.0	
	14.0	SANDSTONE: VERY FINE, DRY, 7.5 YR 7/8, REDDISH YELLOW, WELL CEMENTED	SANDSTONE													8	0.0	GC	16.0	15
	15															9	1.0	GC	18.0	
	18.0	SANDSTONE: VERY FINE, DRY, 7.5 YR 8/2, PINKISH WHITE	SANDSTONE													10	4.0	GC	20.0	20
	18.0	SANDSTONE: VERY FINE, DRY, 10 YR 8/4, VERY PALE BROWN	SANDSTONE													11	0.0	GC	22.0	
	20															12	2.0	GC	24.0	
	22.0	SANDSTONE: FINE, 7.5 Y 7/2, PINKISH GRAY, INTERBEDDED WITH CHERT, 10 YR 6/4, PALE RED, DRY	SANDSTONE													13	8.0	GC	26.0	25
	24.0	SANDSTONE: 10 YR 7/1, LIGHT GRAY, VERY FINE, INTERBEDDED WITH CHERTY DOLOMITE, 7.5 YR 7/4 PINK, DRY	SANDSTONE													14	3.0	GC	28.0	
	25															15	0.0	GC	30.0	30
	26.0	SANDSTONE: FINE, 10 YR 8/4, VERY PALE BROWN, DRY	SANDSTONE													16	0.0	GC	32.0	
	28.0	SANDSTONE: FINE, 10 YR 8/3, VERY PALE BROWN, INTERBEDDED WITH VERY FINE SANDSTONE WELL CEMENTED, 10 YR 7/1, LIGHT GRAY, AND CHERT, 7.5 YR 7/4, PINK, DRY	SANDSTONE													17	1.0	GC	34.0	
	30															18	1.0	GC		35
	35																			

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

GC: GRAB COMPOSITE

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-90 (MW-64)**

DATE DRILLED **8/5-10/91**

DRILLING METHOD **AIR ROTARY**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC, WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR** PAGE 1 OF 6

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3710 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X .432										SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	
	35	GROUND SURFACE: 3798.2																BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	36.0	DOLOMITIC SANDSTONE: VERY FINE, 10 YR 6/1, GRAY, INTERBEDDED WITH SANDY DOLOMITIC LIMESTONE, 10 YR 7/3, VERY PALE BROWN, DRY	DOLOMITE											19	0.0	GC	36.0	
														20	0.0	GC	38.0	
														21	467.0	GC	40.0	40
	40	SANDSTONE: VERY FINE GRAIN, 10 YR 5/4, YELLOWISH BROWN, 10 YR 4/2, DARK GRAYISH BROWN, CARBONATE CEMENT, HARD, DRY	SANDSTONE											22	29.1	GC	42.0	
														23			44.0	
														24	80.9	GC	46.0	45
														25	197.5	GC	48.0	
														26	362.0	GC	50.0	50
	50	SANDSTONE: VERY FINE GRAIN, 10 YR 5/2, GRAYISH BROWN, WITH 10 YR 3/1, VERY DARK GRAY MOTTLING AND MINOR IRON OXIDE STAINING, VERY HARD, DRY, MINOR INTERBEDS OF DOLOMITIC SANDSTONE, MINOR IRON PYRITE CRYSTALS MINOR 10 YR 5/3, BROWN CHERT INTERBEDS	SANDSTONE											27	33.6	GC	52.0	
														28	124.6	GC	54.0	
														29	812.0	GC	56.0	55
														30	588.0	GC	58.0	
														31	54.2	GC	60.0	60
	59.0	DOLOMITIC CHERT: 10 YR 6/3, PALE BROWN, CONCHOIDAL FRACTURE, VERY HARD	DOLOMITE CHERT											32	24.6	GC	62.0	
	60													33	53.5	GC	64.0	
														34	36.7	GC	66.0	65
	64.0	SANDY DOLOMITE/SANDSTONE: VERY FINE GRAIN SANDSTONE, 10 YR 1/1, DARK GRAY, 10 YR 5/3, BROWN, HARD, DRY	SANDSTONE DOLOMITE											35	167.9	GC	68.0	
	65																70.0	70



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3703 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3885

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-90 (MW-64)**

DATE DRILLED **8/5-10/81**

DRILLING METHOD **AIR ROTARY**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC, WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 2 OF 8

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x <u>43.2</u>										SAMPLE				REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		GROUND SURFACE: 3798.2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

└ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-80 (MW-64)**

DATE DRILLED **8/5-10/81**

DRILLING METHOD **AIR ROTARY**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC, WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 3 OF 6

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3730 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3818

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 43.2											SAMPLE			REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	DOWN READING	RECOVERY	DEPTH		
		GROUND SURFACE: 3736.2																	
	105	DOLOMITE: FRACTURED WITH CALCITE IN-FILLING 104-108'	DOLOMITE													54	30.1	GC	108.0
		MINOR 10 YR 4/1, DARK GRAY, SANDY DOLOMITE INTERBEDS 108.0-110.0'														55	20.5	GC	108.0
	110															56	49.8	GC	110.0
																57	93.0	GC	112.0
	112.0	DOLOMITIC LIMESTONE: 10 YR 7/2, LIGHT GRAY, VERY HARD, DRY, INTERBED OF VERY FINE GRAIN DOLOMITE, 10 YR 5/1, GRAY, PACKSTONE	DOLOMITE													58			114.0
		MINOR IRON PYRITE														59	97.0	GC	116.0
	115	10 YR 7/3, VERY PALE BROWN AND 10 YR 5/1, GRAY, AFTER 120.0'														60	27.0	GC	118.0
																61	24.0	GC	120.0
	120															62	55.0	GC	122.0
																63	232.0	GC	124.0
	125	LIMESTONE: 5 YR 7/4, PINK, 10 YR 8/2, HARD, DRY, WITH 10 YR 7/2, VERY FINE GRAIN SANDSTONE INTERBED	LIMESTONE													64	252.0	GC	126.0
																65	68.0	GC	128.0
																66	44.0	GC	130.0
	130	DOLOMITE LIMESTONE: 10 YR 5/2, DRY, HARD	DOLOMITE													67	25.0	GC	132.0
	132.0	SANDSTONE: VERY FINE GRAIN, 10 YR 5/2, GRAYISH BROWN, HARD, DRY, WELL CEMENTED,	SANDSTONE													68	20.0	GC	134.0
		MODERATELY HARD, POORLY CEMENTED AND MOIST AFTER 136.0'														69	38.0	GC	136.0
	135															70	37.0	GC	138.0
																	69.8	GC	140.0
	140																		140.0

SPOUT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-90 (MW-64)**

DATE DRILLED 8/5-10/91

DRILLING METHOD AIR ROTARY

DRILLED BY BOYLES BROTHERS

LOGGED BY DHC, WEP

CHECKED BY BJS

DRAWN BY: SAR PAGE 4 OF 8

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
5700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-5885

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 43.2										SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		GROUND SURFACE: 3786.2																		
	140	SANDSTONE: CONTINUED FROM PREVIOUS PAGE	SANDSTONE												71	101.7	GC			140
															72	84.9	GC			
	144.0																			144.0
	145	FINE ISH BROWN, HARD, SLIGHTLY MOIST, CARBONATE CEMENT	SANDSTONE												73	35.9	GC			145
	146.0																			146.0
		DOLOMITIC LIMESTONE: 2.5 Y 8/2, LIGHT BROWNISH GRAY, HARD, DRY	DOLOMITIC LIMESTONE												74	30.5	GC			
															75	16.8	GC			148.0
	150																			150.0
	151.0	SANDSTONE: VERY FINE GRAIN, 10 YR 7/3, VERY PALE BROWN CARBONATE CEMENT, HARD, SLIGHTLY MOIST	SANDSTONE												78	17.5	GC			152.0
															77	40.9	GC			154.0
	155														78	10.5	GC			156.0
															79	12.7	GC			158.0
															80	9.2	GC			160.0
	160	DOLOMITIC LIMESTONE: 10 YR 5/2, GRAYISH BROWN, HARD, DRY, MINOR INTERBEDS OF 10 YR 7/3, SANDSTONE	DOLOMITIC LIMESTONE												81	4.6	GC			162.0
															82	10.5	GC			164.0
	165														83	12.4	GC			168.0
															84	27.0	GC			168.0
															85	42.0	GC			170.0
	170	10 YR 8/2, LIGHT BROWNISH GRAY, FRACTURED WITH CALCITE, CHLORITE, AND IRON OXIDE, FRACTURE FILL, SATURATION AFTER 172.0'													86	55.0	GC			172.0
															87	10.0	GC			174.0
	175														88	33.0	GC			



SPLIT-SPHOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-90 (MW-64)**

DATE DRILLED **8/5-10/81**

DRILLING METHOD **AIR ROTARY**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC, WEP**

CHECKED BY **SJS**

DRAWN BY: **SAR**

PAGE 5 OF 5

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

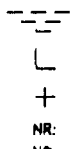
(405) 321-3480

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS	
					PPM X 43.2										NUMBER	OVM READING	RECOVERY	DEPTH		
					2	4	6	8	10	12	14	16	18							
		GROUND SURFACE: 3798.2																		
	175		DOLOMITIC LIMESTONE															176.0	175	
					89	33.0	GC												178.0	
					90	13.5	GC												180.0	
	180				91	8.0	GC												182.0	180
					92	2.0	GC												184.0	
					93	12.0	GC												186.0	
	185				94	14.8	GC												188.0	185
					95	5.7	GC												190.0	
	190				96	9.0	GC												192.0	190
		AFTER 192.0', PREDOMINATELY 10 YR 7/3, VERY PALE BROWN AND 10 YR 5/1, GRAY, SATURATED			97	3.8	GC												194.0	
			98	3.1	GC												196.0			
	195		99	8.4	GC												198.0	195		
			100	9.0	GC												200.0			
	200	T.D. 200.0' GROUNDWATER ENCOUNTERED AT 172.0' 24 HOURS GROUNDWATER AT 167.30																200		
	205																	205		
	210																	210		



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-90 (MW-64)**

DATE DRILLED **8/5-10/91**

DRILLING METHOD **AIR ROTARY**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC, WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 6 OF 8

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OK 73072
(405) 121-3888

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL BAG PPM x 4.6										SAMPLE				REMARKS	
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING SOIL: 0.0 PPM AIR: 0.0 PPM		
		GROUND SURFACE: 3784.0																		
	0	SANDY SILTY LOAM: 10 YR 5/6, YELLOWISH BROWN, DRY	ML												1	3.0	GC	2.0		0
															2	2.0	GC			
	4.0														3	1.0	GC	4.0		
	5	CHERTY DOLOMITIC LIMESTONE: 10 YR 6/2, LIGHT BROWNISH GRAY, INTERBEDDED WITH CLAYEY SILTSTONE 10 YR 6/6, LIGHT BROWNISH YELLOW, DRY	CHERTY DOLOMITIC LIMESTONE												4	2.0	GC	6.0		5
															5	1.0	GC	8.0		
	10																	10.0		10
	12.0	CHERTY DOLOMITIC LIMESTONE: 10 YR 5/3, BROWN, INTERBEDDED WITH SILTSTONE, 10 YR 6/6, LIGHT BROWNISH YELLOW DRY	CHERTY DOLOMITIC LIMESTONE												6	4.0	GC	12.0		
		CHERTY DOLOMITIC LIMESTONE: 10 YR 5/2, GRAYISH BROWN AND CHERT, 10 YR 6/4, BROWNISH YELLOW, DRY	CHERTY DOLOMITIC LIMESTONE												7	2.0	GC	14.0		
	15														8	0.0	GC	16.0		15
															9	0.0	GC	18.0		
															10	1.0	GC	20.0		
	20	CHERTY DOLOMITIC: 10 YR 6/1, GRAY AND CHERT, 5 YR 7/3, PINK, DRY	CHERTY DOLOMITIC												11	0.0	GC	22.0		20
															12	7.9	GC	24.0		
	25														13	6.8	GC	26.0		25
															14	91.3	GC	28.0		
	28.0	DOLOMITIC: 10 YR 7/1, LIGHT GRAY, VERY HARD, DRY	DOLOMITIC												15	22.4	GC	30.0		30
	30														16	9.8	GC	32.0		
															17	9.8	GC	34.0		
	35.0														18	4.6	GC			35

-  SPLIT-SPHOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
-  NO RECOVERY
-  NOT SAMPLED
-  GRAIN COMPOSITE

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 1735 E. 15TH AVE.
 DENVER, CO 80202-7367E

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-91 (MW-65)**

DATE DRILLED **8/7-8/91**

DRILLING METHOD **AIR ROTARY, DOWNHOLE HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC/JMB**

CHECKED BY **BJS**

DRAWN BY **SAR**

PAGE **1** OF **2**

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X .58										SAMPLE			REMARKS
					1	2	3	4	5	6	7	8	9	10	NUMBER	OVM READING	RECOVERY	
		GROUND SURFACE: 3784.0																BACKGROUND OVM READING: SOIL: 0.0 72 AIR: 0.0 72
	35	DOLOMITE: 10 YR 7/1, LIGHT GRAY, VERY HARD, DRY	DOLOMITE															35
															19	3.5	GC	36.0
															20	0.1	GC	38.0
	40														21	5.7	GC	40.0
															22	7.2	GC	42.0
	42.5	SANDSTONE: 5 YR 4/3, REDDISH BROWN, VERY FINE GRAIN, SOFT, MOIST TO WET	SANDSTONE												23	4.6	GC	44.0
	44.0	CHERTY DOLOMITE: DOLOMITE 10 YR 5/2, GRAYISH BROWN, CHERT IS: 10 YR 5/6, YELLOWISH BROWN, HARD, CHERT EXHIBITS CONCHOIDAL FRACTURING, DOLOMITE - MICROCRYSTALLINE	DOLOMITE												24	3.5	GC	46.0
	45														25	17.9	GC	48.0
															26	5.3	GC	50.0
	50														27	22.2	GC	52.0
	54.0																	54.0
	55	T.D. 54.0'																55
	60																	60
	65																	65
	70																	70



SPLIT-SPOON SAMPLER



STANDARD PENETRATION TEST



UNDISTURBED SAMPLE



WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)



LABORATORY TEST LOCATION



PENETROMETER (TONS/20 FT.)



NR: NO RECOVERY



NS: NOT SAMPLED



GC: GRAB COMPOSITE

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENGINEERING CONSULTANTS

NORFOLK, VIRGINIA 23502

(404) 241-1111

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-91 (MW-65)**

DATE DRILLED **8/7-8/91**

DRILLING METHOD **AIR ROTARY, DOWNHOLE HAMMER**

DRILLED BY **BOYLES BROTHERS**

LOGGED BY **DHC/JMB**

CHECKED BY **BJS**

DRAWN BY **SAR**

PAGE **2** OF **2**

APPENDIX G

Monitor Well Diagrams

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		Start: 13:38 Stop: 14:30 GROUND SURFACE: 3791.4					
	0	CLAYEY SILT: BROWN, 7.5 YR, DRY FROM 0.0 TO 9.0', LOW TO MED. PLASTICITY, VERY FINE QUARTZ 60% SILT, 40% CLAY	ML		1 NS		
	5				2 1.1 NR NS		
	10	MOIST BELOW 9.0'			3 0.8 NR NS		
	13.5	SANDY GRAVEL: DARK GRAY, 10 YR 5/1, COARSE GRAVEL, FINE GRAIN, SATURATED, QUARTZ, ROUND TO SUBANGULAR, POORLY SORTED, STRONG ODOR	GW		6 1.5		
	15	DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 5/2, MASSIVE AUGER REFUSAL 15.1'			NR		
	20						
	25						
	30						
	35						

SPLIT-SPOON SAMPLER	WATER TABLE (TIME OF BORING)
STANDARD PENETRATION TEST	LABORATORY TEST LOCATION
UNDISTURBED SAMPLE	PENETROMETER (TONS/SQ. FT.)
WATER TABLE (24 HOURS)	NR: NO RECOVERY
	NS: NOT SAMPLED

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3885

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-1 (BH-14)**

DATE DRILLED **4/25/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

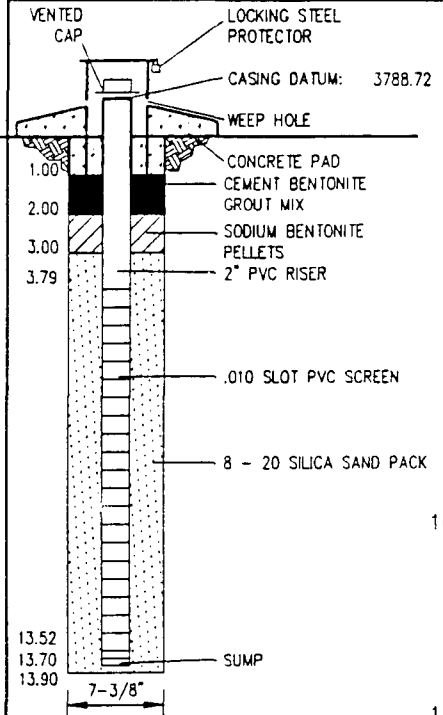
CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL	
							Diagram	Labels
	0	GROUND SURFACE: 3786.9						
	0	CLAYEY SILT: 10% CLAY, 90% SILT, LOW PLAST., 7.5 YR 6/4, LIGHT BROWN, DRY, MASSIVE	ML		NS			
	4.0	SANDY CLAYEY SILT: 10% SAND, 10% CLAY, 80% SILT, VERY FINE GRAIN SILICA SAND, LOW PLAST., 7.5 YR 7/2, PINKISH GRAY, DRY	ML		NR	1.2		
	5				2	1.4		
	7.3	COBBLE SILT: ABUNDANT DOLOMITE COBBLES, MINOR SUBROUNDED DOLOMITE GRAVEL, UNCONSOLIDATED, DRY, 5 YR 7/1, LIGHT GRAY	GM		NS	0.3		
	10				4	0.9		
	13.9	AUGER REFUSAL 13.9'			5	0.8		
	15	NO GROUNDWATER ENCOUNTERED			NR			
	20							
	25							
	30							
	35							



- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-2 (BH-23)**

DATE DRILLED 5/2/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3785.4					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3787.50 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX 2" PVC RISER SODIUM BENTONITE PELLETS .010 SLOT PVC SCREEN 8 - 20 SILICA SAND PACK SUMP 7-3/8"
	0	SANDY CLAYEY SILT: 10% SAND, 10% CLAY, 80% SILT, VERY FINE GRAIN SAND, MINOR DOLOMITE GRAVEL, 10 YR 6/4, LIGHT YELLOWISH BROWN, DRY, UNCONSOLIDATED	ML		NS		
	1				1 1.5		
	2				2 1.0		
	3				3 1.1		
	4				4 0.8		
	5				5 0.8		
	6				6 1.0		
	10.8	COBBLE SILT: 10 YR 7/3, VERY PALE BROWN, DOLOMITE COBBLES, DRY, UNCONSOLIDATED, MINOR DOLOMITE GRAVEL > 0.1' DIAMETER	GM		NR		
	15.3	SANDY DOLOMITE: VERY FINE GRAIN SAND, 10 YR 6/3, PALE BROWN VERY HARD, DRY	DOLOMITE		NR		
	15	AUGER REFUSAL 15.3'					
	15	NO GROUNDWATER ENCOUNTERED					
	15	BOREHOLE OVM: 0.0 PPM					
	20						
	25						
	30						
	35						

- | | |
|---------------------------|------------------------------|
| SPLIT-SPOON SAMPLER | WATER TABLE (TIME OF BORING) |
| STANDARD PENETRATION TEST | LABORATORY TEST LOCATION |
| UNDISTURBED SAMPLE | PENETROMETER (TONS/SQ. FT.) |
| WATER TABLE (24 HOURS) | NR: NO RECOVERY |
| | NS: NOT SAMPLED |

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-3 (BH-24)**

DATE DRILLED **5/2/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3784.1					
	2.0	SANDY CLAYEY SILT: VERY FINE GRAIN SAND, 10% SAND, 10% CLAY, 80% SILT, LOW PLAST., 10 YR 6/4, LIGHT YELLOWISH BROWN, DRY, UNCONSOLIDATED, MINOR SUBRND. DOLOMITE GRAVEL	ML		NS		
		COBBLEY SILT: DOLOMITE, COBBLES, 10 YR 7/2, LIGHT GRAY, DRY, UNCONSOLIDATED, ABUNDANT GRAVEL TO 0.15" DIAMETER	GM		1 0.9		
					NR 2 1.5		
	5				NS		
					3 1.0		
					NR NS 4 0.8		
	10				NR NS		
					NR NS 5 0.6		
	15				NR NS		
	16.8						16.61
	16.9	SANDSTONE: VERY FINE GRAIN QUARTZ, 10 YR 7/2, LIGHT GRAY, DRY, HARD, WEAK CEMENTATION, FRIABLE	SANDSTONE				16.90
	20	AUGER REFUSAL 16.9' NO GROUNDWATER ENCOUNTERED BOREHOLE OVM: 0.0 PPM AUGER REFUSAL 16.9' NO GROUNDWATER ENCOUNTERED BOREHOLE OVM: 0.0 PPM					
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-4 (BH-26)**

DATE DRILLED 5/3/91 - 5/4/91

DRILLING METHOD HSA

DRILLED BY SBH

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3799.8					
	3.7	SANDY SILT: 20% VERY FINE GRAIN SAND, 80% SILT, NO PLAST., 10 YR 7/3, VERY PALE BROWN, DRY, UNSOLIDATED	SM		1 1.2		
	5	SILTY SANDSTONE: VERY FINE GRAIN QUARTZ, 10 YR 8/2, WHITE, DRY, WEAKLY CEMENTED, FRIABLE	SILTY SANDSTONE		2 1.0		
					3 0.6		
		MOIST AT 8.0'; 2.5 Y 7/4, PALE YELLOW,			4 0.3		
		VERY MOIST AT 9.0'			5 0.2		
	10	AFTER 11.0', VERY HARD					
	11.2	AUGER REFUSAL 11.2'					
		NO GROUNDWATER ENCOUNTERED					
		BOREHOLE OVM: 8 PPM					
	15						
	20						
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/90129**

BORING NUMBER **MW-5 (BH-28)**

DATE DRILLED 5/5/91

DRILLING METHOD HSA

DRILLED BY SBH

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3783.2					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3785.17 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX 2" PVC RISER SODIUM BENTONITE PELLETS .010 SLOT PVC SCREEN 8 - 20 SILICA SAND PACK SUMP 7-3/8"
	0	COBBLEY SILT: DOLOMITE COBBLES TO 1.5' DIAMETER, 10 YR 5/3, BROWN, DRY, UNCONSOLIDATED	GM	0.00	NS		
	1	AFTER 0.9', 10 YR 8/2, WHITE, ABUNDANT SUB-RND. DOLOMITE GRAVEL		0.00	NR	1.1	
	2			0.00	NS	0.7	
	3			0.00	NS	1.2	
	4			0.00	NS	0.6	
	12.3	AUGER REFUSAL 12.3'					
	15	NO GROUNDWATER ENCOUNTERED					
	20						
	25						
	30						
	35						

SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)
 WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/90129**

BORING NUMBER **MW-6 (BH-29)**

DATE DRILLED 5/5/91

DRILLING METHOD HSA

DRILLED BY SBH

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3885

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		Start: 8:10 Stop: 10:50 GROUND SURFACE: 3783.5					
	0	BOULDERY COBBLEY SILT: BROWN, 7.5 YR 5/6, DRY, UNCONSOLIDATED, COBBLES/BOULDERS FROM 5 CM TO 1 M, VERY FINE QUARTZ, GRAVELLY, WELL ROUNDED PEBBLES	GM	0.0	1 NS		
				0.0	2 1.5		
				0.0	3		
	5			0.0	NS		
				0.0	NR 0.0		
				0.0	NR 0.4		
	10			0.0	NS		
				0.0	5 0.6		
	13.5	SILTY CLAY: BROWN, 10 YR 5/6, VERY FINE QUARTZ, LOW PLASTICITY, DRY, MED. COMPACTED, ABUNDANT CALICHE AND ROOT CHANNELS, 60% CLAY, 40% SILT, WEATHERED AT CONTACT, CALICHE CEMENTED	CL	0.0	6 1.5		
	15.5	DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 5/2, VERY HARD, SANDY, MASSIVE	DOLOMITE	0.0	NS		
	16.3	AUGER REFUSAL AT 16.3'		0.0	NR		
		GROUNDWATER NOT OBSERVED DURING DRILLING					
	20						
	25						
	30						
	35						

SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-7 (BH-30)**

DATE DRILLED 5/6/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

DRAFT

9

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		Start: 8:45 Stop: 10:08 GROUND SURFACE: 3805.6					
	0	CLAYEY SILT: DARK BROWN, 7.5 YR 4/2, VERY FINE QUARTZ, DRY, VERY LOW PLASTICITY, GRAVELLY, 60% SILT, 40% CLAY, CALICHE DEPOSITS	ML		1 NS		
					2 0.6 NR		
					3 0.3 NR		
	5	BOULDERY COBBLEY SILT: BROWN, 7.5 YR 5/2, DRY, UNCONSOLIDATED, GRAVELLY, COBBLES/BOULDER FROM 5 CM TO 50 CM, ROUNDED	GW		4 0.1 NS		
	9.5	SANDSTONE: QUARTZ, GRAYISH YELLOW TO YELLOWISH GRAY, 5 Y 8/4 TO 7/2, FINE GRAIN, WELL SORTED, POORLY CEMENTED, FRIABLE	SANDSTONE		5 0.6 NS		
	10						
	12.0	AUGER REFUSAL 12.0'					
		BOREHOLE REAMED TO 13.90' TO INSTALL MONITOR WELL					
	15	GROUNDWATER NOT OBSERVED DURING DRILLING					
	20						
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-9 (BH-32)**

DATE DRILLED 5/7/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		Start: 13:00 Stop: 14:44 GROUND SURFACE: 3788.7					
	0	CLAYEY SILT: YELLOWISH BROWN, 10 YR 5/4, DRY, VERY LOW PLASTICITY, VERY FINE QUARTZ, CALICHE DEPOSITS, 60% SILT, 40% CLAY	ML		1 NS		1.00
					2 0.6		
					NR		
					3 1.1		
	5	SILTY CLAY: DARK BROWN, 10 YR 4/3, VERY FINE QUARTZ, LOW PLASTICITY, MOD. COMPACTED.	CL		NR		5.25
					NS		
	10				4 0.8		
		MOIST BELOW 9.5', LOW PLASTICITY			NR		
					NS		
	12.6				5 0.7		
	13.5	BOULDERY COBBLE GRAVEL: LIGHT GRAYISH BROWN, 10 YR 5/2 TO 6/2, ROUND, CALICHE, CEMENTED, HARD	GM		NR		
					NS		
			CL/SM		6 4.3		
	15	CLAYEY SAND: SANDY CLAY, BROWN, 10 YR 5/3, QUARTZ, FINE GRAIN, WELL SORTED, SATURATED, MED. PLASTICITY, STRONG HYDROCARBON ODOR			NR		
					NS		
	16.6	AUGER REFUSAL AT 16.6'			NR	0.0	16.35
		BOREHOLE REEAMED 10 INCHES TO A DEPTH OF 17.01', 5/8/91					16.30
							17.00
	20						
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-10 (BH-33)**

DATE DRILLED **5/7/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		Start: 14:23 Stop: 16:40 GROUND SURFACE: 3804.8					
	0	CLAYEY SILT: YELLOWISH BROWN, 10 YR 5/4, DRY, UNCONSOLIDATED, VERY LOW PLASTICITY, VERY FINE QUARTZ, 70% SILT, 30% CLAY	ML		1 NS		0 -
	4.5	GRAVELLY COBBLEY SILT: GRAYISH BROWN, 10 YR 5/2, VERY FINE QUARTZ, POORLY SORTED, ANGULAR, ABUNDANT, K-FELDSPARS/BIOTITE, MOD. COMPACTED, STRUCTURELESS, CaCO ₃ CEMENTED	SM		2 1.1 3 NR 4 1.1		5 -
	7.5	COBBLEY BOULDERY SILT: GRAYISH BROWN, 10 YR 5/2, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO 1 M, ROUND, DOLOMITE	GM		5 1.3 6 1.5 7 1.5 8 1.2 9 2.5		10 -
	10						12.52
	15						.010 SLOT PVC SCREEN
	20						8 - 20 SILICA SAND PACK
	22.2	HYDROCARBON SATURATED AT CONTACT					
	22.5	SANDSTONE: LIGHT OLIVE GRAY, 5 Y 6/2, QUARTZ, FINE GRAIN, WELL SORTED, MICACEOUS, FRIABLE, NOCALCAREOUS	SANDSTONE				SUMP
	25	AUGER REFUSAL AT 22.5' BOREHOLE REMMED TO 22.82'					10-5/8"
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-11 (BH-34)**

DATE DRILLED **5/8/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **M.J.**

CHECKED BY **BJS**

DRAWN BY: **SAR** PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		Start: 14:30 Stop: 17:35					
	0	GROUND SURFACE: 3807.9					
	0	CLAYEY SILT: LIGHT YELLOWISH BROWN, 10 YR 6/4, DRY, VERY FINE QUARTZ, UNCONSOLIDATED, 60% SILT, 40% CLAY, CALICHE DEPOSITS	ML		1 NS		
	4.0				2 1.5		
	5	BOULDER COBBLE SILT: LIGHT GRAYISH BROWN, 10 YR 6/2, POORLY SORTED, GRAVELLY, COBBLES, BOULDERS FROM 5 CM TO 1 M, ROUND	GM		3 0.5		
					4 1.5		
	10				5 1.0		
					6 0.5		
					7 0.8		
	15				8 1.5		
	20	CLAYEY BELOW 19.5', SANDY, QUARTZ, MED. GRAIN, MOIST, MED. PLASTICITY, STRONG HYDROCARBON ODOR			9 0.7		
	23.0	SANDSTONE: LIGHT OLIVE GRAY, 5 Y 6/2, QUARTZ ORE, FINE GRAIN, POORLY CEMENTED, NON-CALCAREOUS, FRIABLE, MICACEOUS	SANDSTONE		10 0.5		
	23.3						
	25	BORING TERMINATED 23.3'					
		GROUNDWATER NOT OBSERVED DURING DRILLING					
	30						
	35						

SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-12 (BH-35)**

DATE DRILLED 5/10/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		Start: 13:10 Stop: 15:00 GROUND SURFACE: 3799.5					
	0	CLAYEY SILT: YELLOWISH BROWN, 10 YR 5/4, VERY FINE QUARTZ, DRY, VERY LOW PLASTICITY, 70% SILT, 30% CLAY	ML		1 NS		0
					2 NR	1.0	
					3 NR	0.5	
	5				4 NS		5
					5 NR	0.4	
	7.2	BOULDERY COBBLEY SILT: GRAVEL, LIGHT GRAYISH BROWN, 10 YR 6/2, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO 1 M., ROUND	GM		6 NS		7.85
					7 NR	1.1	
	10				8 NS		10
					9 NS	1.5	
	12.5	SANDY GRAVELLY CLAY: BROWN, 7.5 YR 5/4, MOIST, MED. PLASTICITY, FINE GRAIN QUARTZ, FIRM, OCCASIONAL LARGE GRAVEL, 60% CLAY, 40% SAND, CALICHE DEPOSITS	CL		10 NS		
	13.5	BOULDERY COBBLEY SILT: GRAVELLY, LIGHT GRAYISH BROWN, 10 YR 6/2, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO 1 M., ROUND	GM		11 NS	0.4	
	15				12 NS		15
					13 NR	1.0	
	17.5	GRAVEL: GRAY, 10 YR 5/1, MOD. WELL SORTED, ANGULAR, PEBBLES 5-10 MM, HYDROCARBON SATURATED	GP		14 NS	0.7	
	19.7	SANDSTONE: PALE OLIVE, 5 Y 6/4, FINE GRAIN, WELL SORTED, POORLY CEMENTED, FRIABLE, NONCALCAREOUS, MICACIOUS	SANDSTONE		15 NS		19.34
	20	BORING TERMINATED AT 19.7'					19.64
		NO GROUNDWATER ENCOUNTERED DURING DRILLING					7-3/8"
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-13 (BH-36)**

DATE DRILLED 5/10/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		Start: 07:40 Stop: 10:00 GROUND SURFACE: 3801.4					
	0	CLAYEY SILT: BROWN, 7.5 YR 5/4, DRY, VERY LOW PLASTICITY, CAUCHI DEPOSITS, VERY FINE QUARTZ, 70% SILT, 30% CLAY	ML		1 NS		0
					2 1.3		
					NR		
					3 1.1		
					NR		
	5				NS		5
					4 0.4		
	7.3	BOULDER COBBLEY SILT: LIGHT BROWNISH GRAY, 10 YR 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO 50 CM.,	GM		NR		7.10
					NS		
					5 0.7		
					NR		
	10				NS		10
		ABUNDANT GRAVEL FROM 12.0-14.0', PEBBLES FROM 1.0 CM TO 3.0 CM			6 1.0		
					NS		
		CLAYEY FROM 14.0-14.5', SANDY, MOIST, MED. GRAIN QUARTZ, MED. PLASTICITY BOULDERS > 1M BELOW 14.5'			7 0.5		
	15				NS		15
					8 0.8		
	17.2	GRAVEL: GRAY TO GRAYISH BROWN, 10 YR 5/1 TO 5/2, MODERATLY SORTED, VERY COARSE GRAIN QUARTZ, PEBBLES 0.5 TO 1.0 CM, RND TO SUBRND., COBBLEY, HYDROCARBON SATURATED CLAYEY BELOW 17.0'	GP		NR 0.0		
					NS		
					9 0.5		
					NS		
	20						20
	20.5	SANDSTONE: BROWN, 10 YR 5/3, FINE GRAIN, QUARTZORE, WELL SORT, POORLY CEMENTED, FRIABLE	SANDSTONE				
	22.1	BOREING TERMINATED AT 22.0'			10 0.5		
		BOREHOLE REEMED TO 10"					
	25						25
	30						30
	35						35

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3885

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-14 (BH-37)**

DATE DRILLED 5/11/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL	
							VENTED CAP	LOCKING STEEL PROTECTOR
		Start: 15:45 Stop: 17:00						
		GROUND SURFACE: 3801.5						CASING DATUM: 3803.59
	0	CLAYEY SILT: LIGHT YELLOWISH BROWN, 10 YR 6/4, VERY FINE QUARTZ, DRY, LOW PLASTICITY, CALCICHE DEPOSITS, 70% SILT, 30% CLAY	ML		1 NS		1.00	WEEP HOLE
					2 1.2			CONCRETE PAD
					3 1.1			CEMENT BENTONITE GROUT MIX
	5				4 NS		3.00	4" PVC RISER
					5 0.8			SODIUM BENTONITE PELLETS
	6.5	COBBLEY-BOULDERY SILT: LIGHT GRAYISH BROWN TO YELLOWISH BROWN, 10 YR 6/2 TO 6/4, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 3 CM TO 50 CM, ROUND TO SUBROUND	GM		6 0.4		5.50	
					7 1.0		7.30	
	10	CLAYEY FROM 9.0' TO 9.8', SANDY, FINE TO MEDIUM GRAIN QUARTZ, FIRM, MODERATE TO LOW PLASTICITY			8 NS			.020 SLOT PVC SCREEN
					9 NS			8 - 20 SILICA SAND PACK
	15				10 NS			
	17.4	AUGER REFUSAL AT 17.40'			11 NS		17.08 17.38	SUMP
	20							
	25							
	30							
	35							

- CME CONTINUOUS AUGER SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-15 (BH-38)**

DATE DRILLED **5/11/91 & 5/12/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **MJL**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		Start: 13:15 Stop: 16:45 GROUND SURFACE: 3798.4					
	0	CLAYEY SILT: VERY PALE BROWN TO LIGHT YELLOWISH BROWN, 10 YR 7/4 TO 6/4, DRY, VERY LOW PLASTICITY, GRAVELLY BELOW 3.0', PEBBLES TO 1 CM. ROUND, VERY FINE QUARTZ MATRIS, 65% SILT, 35% CLAY, 5% GRAVEL	ML		1		
	3.5				2	0.9	
	5	BOULDERY COBBLEY SILT: LIGHT BROWNISH GRAY, 10 YR 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 4 CM TO 1 M, ROUND CLAYEY FROM 4.5' TO 5.0'			3	1.0	
					4	0.8	
	10		GM		5	0.8	
					6	0.8	
	15				7	1.1	
					8	0.8	
	20				9	0.9	
	20.5	SANDSTONE: LIGHT OLIVE GRAY, 5 YR 6/2, QUARTZ, FINE GRAIN, WELL SORTED, POORLY CEMENTED, FRIABLE, MICACEOUS, CAREOUS	SANDSTONE		10		
	21.0						
		BORING TERMINATED AT 21.0'					
	25	GROUNDWATER NOT OBSERVED DURING DRILLING.					
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-16 (BH-39)**

DATE DRILLED 5/12/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3797.5					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3799.55 WEEP HOLE CONCRETE PAD
	0.5	CLAYEY SANDY SILT: VERY FINE GRAINED SAND, 10% CLAY, 10% SAND, 80% SILT, UNCONSOLIDATED, DRY, 7.5 YR 7/4 PINK	SM		1 0.9 NR NS		CEMENT BENTONITE GROUT MIX SODIUM BENTONITE PELLETS
	5	ABUNDANT COBBLES AFTER 6.0'			2 0.4 NR NS		2" PVC RISER
	9.4	COBBLEY SILTY SAND: 10% COBBLES, 20% SILT, 70% SAND, VERY FINE GRAINED SILICA SAND, SLIGHTLY MOIST, 7.5 YR 7/4 PINK, UNCONSOLIDATED, DOLOMITE COBBLES	GM		3 1.1 NS		8 - 20 SILICA SAND PACK
	10				4 0.5 NR NS		.010 SLOT PVC SCREEN
	14.0	COBBLEY SANDY SILT: VERY FINE GRAINED SAND, SLIGHTLY MOIST, 7.5 YR 7/4 PINK, UNCONSOLIDATED, DOLOMITE COBBLES	GM		5 0.3 NS		
	15				6 0.3 NS		
	17.7	AUGER REFUSAL AT 17.7'			7 0.5 NS		SUMP
	20	GROUNDWATER NOT OBSERVED DURING DRILLING.			8 NS		
		BOREHOLE OVM READING: 19.0 PPM					
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-17 (BH-40)**

DATE DRILLED **5/13/91 & 5/14/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3793.5					
	0	CLAYEY SILT: 10% CLAY, 90% SILT, LOW PLASTICITY, 10 YR 6/3 PALE BROWN, UNCONSOLIDATED, DRY	SC		NS		0.5
	1				1 1.2		2.00
	2				NR		4.00
	3				NS		4.89
	4				2 1.1		
	5				NR		
	6.0	GRAVELLY COBBLEY SILT: 10 YR 7/2 LT. GRAY, UNCONSOLIDATED, SUBROUNDED DOLOMITE GRAVEL AND COBBLES, DRY	GM		NS		
	7				3 1.0		
	8				NR		
	9.0				4 1.0		
	10	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10% COBBLES, 20% SAND, 70% SILT, SLIGHTLY MOIST, 10 YR 7/2 LT. GRAY, UNCONSOLIDATED, STRONG CONDENSATE ODOR	GM		NS		
	11				5 0.5		
	12				NR		
	13.4	VERY MOIST AFTER 12.5'			6 0.1		
	14.52				NS		
	15.2	AUGER REFUSAL AT 15.2'					
	15	GROUNDWATER OBSERVED DURING DRILLING.					
	20						
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-18 (BH-41)**

DATE DRILLED **5/14/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3795.4					
	0	CLAYEY SILT: 10% CLAY, 90% SILT, 10 YR 6/3 PALE BROWN, DRY, UNCONSOLIDATED	SC		NS		1.00
	5	SLIGHTLY MOIST AFTER 5.0'			1 98		3.50
	6.0				NR		5.50
		COBBLEY CLAYEY SILT: 10% COBBLES, 10% CLAY, 80% SILT, 10 YR 6/3, PALE BROWN, SLIGHTLY MOIST, UNCONSOLIDATED	GM		2 1.3		7.05
	10				NR		
	10.2	COBBLEY SANDY SILT: VERY FINE GRAINED SAND, DOLOMITE COBBLES, 10 YR 7/1 LIGHT GRAY, DRY, UNCONSOLIDATED	GM		3 1.0		
	12.3				NR		
	12.3	COBBLEY CLAYEY SILT: 10 YR 7/1 LT. GRAY, DOLOMITE COBBLES, 10 YR 5/4 YELLOW BROWN, SILTY CLAY BINDER, MOIST, MOD. CONSOLIDATED	GM		4 0.9		
	14.6				NR		
	15	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, DOLOMITE COBBLES, 10 YR 7/1 LT. GRAY, SATURATED, STRONG CONDENSATE ODOR AT 17.0', SATURATED WITH 5 YR 3/1 VERY DARK GRAY, VISCIOUS MATERIAL, STRONG CONDENSATE ODOR	GM		5 1.1		
	17.3				NR		
		AUGER REFUSAL AT 17.3'			6 1.0		
	20	GROUNDWATER ENCOUNTERED AT 14.8'			7 0.3		
		HEAVING SANDS AT T.D. 17.3'					
	25						
	30						
	35						

▽ 14.8

16.7



SPLIT-SPOON SAMPLER



STANDARD PENETRATION TEST



UNDISTURBED SAMPLE



WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)



LABORATORY TEST LOCATION



PENETROMETER (TONS/SQ. FT.)



NR: NO RECOVERY



NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-19 (BH-42)**

DATE DRILLED **5/16/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3794.8					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3797.59 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX 2" PVC RISER SODIUM BENTONITE PELLETS 8 - 20 SILICA SAND PACK .010 SLOT PVC SCREEN SUMP 7-3/8"
	0 - 6.0	CLAYEY SILT: 10% CLAY, 90% SILT, 10 YR 6/3 PALE BROWN, DRY TO SLIGHTLY MOIST, NO PLASTICITY	CL	NS	1 0.9		
	6.0 - 5	COBBLEY SANDY SILT: 10 YR 7/3 VERY PALE BROWN, SLIGHTLY MOIST TO DRY, UNCONSOLIDATED, DOLOMITE COBBLES TO APPROXIMATE 0.5 FEET DIA. AFTER 6.0', CLAYEY SILT BINDER, SLIGHTLY MOIST	GM	NR	2 0.9		
	5 - 9.0			NS	3 0.9		
	9.0 - 10	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10 YR 8/2 WHITE, DRY, UNCONSOLIDATED, DOLOMITE COBBLES, MINOR DOLOMITE GRAVEL	GM	NS	4 0.9		
	10 - 14.1	MINOR CLAYEY SILT BINDER AFTER 12.0', SLIGHTLY MOIST		NR	5 0.9		
	14.1 - 15	AUGER REFUSAL AT 14.1'					
	15 - 20	GROUNDWATER NOT OBSERVED DURING BORING.					
	20 - 25						
	25 - 30						
	30 - 35						

 SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)
 WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-20 (BH-43)**

DATE DRILLED **5/16/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3796.1					
	0	SANDY CLAYEY SILT: VERY FINE GRAIN SAND, 10% SAND, 10% CLAY, 80% SILT, NO PLASTICITY, 7.5 YR 7/2 PINK GRAY, DRY, MINOR CALICHE, UNCONSOLIDATED	SM		NS		1.00
	5				1 1.0		
	6.5				NR		
					NS		
					2 1.1		
					NR		
		COBBLE SANDY SILT: VERY FINE GRAIN SAND, 10 YR 7/2 LT. GRAY, DOLOMITE COBBLES AND GRAVEL, DRY, UNCONSOLIDATED	GM		NS		7.00
					3 0.7		
					NS		
					4 0.6		9.00
					NS		
	10				5 0.4		10.63
		AFTER 12.0', CALICHE CEMENTATION, MINOR SLIGHTLY MOIST, 7.5 YR 6/4 LT. BROWN, CLAY BINDER			NS		
					6 0.9		
	15	SLIGHTLY MOIST AFTER 14.0'			NR		
					NS		
					7 1.5		
	18.0		SANDSTONE		NS		
		SANDSTONE: VERY FINE GRAIN SILICA HIGHLY WEATHERED AND FRACTURED, 2.5 YR 7/4 PALE YELLOW, FRACTURE IN FILLING WITH MOTTLED 7.5 YR 5/4 BROWN SILTY CLAY, SLIGHTLY MOIST IN FRACTURE, MOIST IN SANDSTONE, HIGHLY FRIABLE AND MOIST AFTER 20.0', AFTER 20.6' V. HARD SANDSTONE			8 1.1		
	20				NR		20.77
					9 0.1		21.2
		AUGER REFUSAL AT 20.7'			NR		
	25	GROUNDWATER NOT ENCOUNTERED DURING BORING.					
	30						
	35						

- SPLIT-SPOON SAMPLER
- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- WATER TABLE (24 HOURS)

- WATER TABLE (TIME OF BORING)
- LABORATORY TEST LOCATION
- PENETROMETER (TONS/SQ. FT.)
- NR: NO RECOVERY
- NS: NOT SAMPLED

JOB NAME/NUMBER **MW-21 (BH-44)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED **5/16/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD									
GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL		
		GROUND SURFACE: 3797.5							
	0	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10 YR 6/3 PALE BROWN, DRY, UNCONSOLIDATED, DOLOMITE COBBLES AND GRAVEL, AFTER 3.0' 10 YR 7/2 LIGHT GRAY, CALICHE CEMENTATION 2'-3'	GM	0.0-0.5	NS		1.00		0
	4.0	COBBLEY SILTY SAND: 10% COBBLES, 30% SILT, 60% SAND, VERY FINE TO FINE SAND, 10 YR 8/3 VERY PALE BROWN, DRY, DENSE	GM	0.5-1.0	NR		2.50		
	5			1.0-1.5	2	1.2	4.50		5
	8.0	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10 YR 7/4 VERY PALE BROWN, SLIGHTLY MOIST, UNCONSOLIDATED, DOLOMITE COBBLES	GM	1.5-2.0	NS		5.59		
	10	AFTER 12.0' MINOR 7.5 YR 6/4 LIGHT BROWN, MOIST CLAYEY SAND BINDER	GM	2.0-2.5	NS				
	14.5	SILTY CLAY: 40% SILT, 60% CLAY, LOW PLASTICITY, STIFF, 10 YR 5/4 YELLOW BROWN, MOIST, MINOR SUBROUNDED DOLOMITE GRAVEL	CL	2.5-3.0	NS				
	15.5	DOLOMITE: VERY HARD, MICROX, 10 YR 6/1 LT. GRAY TO GRAY, DRY	DOLO.	3.0-3.5	NS		15.1		15
	15.6	AUGER REFUSAL AT 15.6'		3.5-4.0	NS		15.6		
	20	GROUNDWATER NOT OBSERVED DURING BORING		4.0-4.5					20
		NO GROUNDWATER AFTER 24 HOURS		4.5-5.0					
	25			5.0-5.5					25
	30			5.5-6.0					30
	35			6.0-6.5					35

SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-22 (BH-45)**

DATE DRILLED 5/17/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

DRAWN BY: SAR

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3792.4					
	0	CLAYEY SILT: 10% CLAY, 90% SILT, 10 YR 7/4 VERY PALE BROWN, DRY TO SLIGHTLY MOIST, UNCONSOLIDATED, NO PLASTICITY	CL		NS		0
	4.5				1	1.5	1.00
	5	GRAVELLY SILT: 10 YR 8/3, VERY PALE BROWN, DRY TO SLIGHTLY MOIST, SUB-ROUNDED DOLOMITE GRAVEL TO 0.08" DIA.	GM		2	0.1	4.00
	6.0				NR		4.96
		COBBLE SANDY SILT: VERY FINE GRAIN SAND, 10 YR 8/3 VERY PALE BROWN, DRY SLIGHTLY MOIST, UNCONSOLIDATED, DOLOMITE COBBLES, MINOR CALICHE CEMENTATION	GM		3	1.5	
	10				NR		
	10.8				NS		9.56
	10.9	SANDY DOLOMITE: VERY FINE GRAIN SAND, 10 YR 7/2 LIGHT GRAY, VERY HARD, DRY	DOLO.		NS		10.0
		AUGER REFUSAL AT 10.9'					10.9
	15	GROUNDWATER NOT OBSERVED DURING BORING					
		NO GROUNDWATER AFTER 24 HOURS					
	20						
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-23 (BH-46)**

DATE DRILLED 5/18/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3835

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	'N' VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3791.0					
	0	CLAYEY SILT: 10% CLAY, 90% SILT, 10 YR 7/4 VERY PALE BROWN, NO PLASTICITY, DRY, UNCONSOLIDATED	CL		NS		1.00
	5	SLIGHTLY MOIST AFTER 6.0'			1 NR NS		2.00
	6.5				2 NR NS		4.50
	9.5	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10 YR 8/2 WHITE, DRY, SUB-ROUNDED DOLOMITE COBBLES AND MINOR GRAVEL, UNCONSOLIDATED CALICHE CEMENTATION AFTER 8.5'	GM		3 NR NS		5.96
	10		GC		4 NR NS		10.58
	10.9	COBBLEY SILTY CLAY: 10% COBBLES, 30% SILT, 60% CLAY, MINOR CALICHE CEMENTATION, 10 YR 5/4 YELLOW BROWN, MOIST, DOLOMITE COBBLES, UNCONSOLIDATED	DOLO.		5 NR NS		11.00
	11.0	SANDY DOLOMITE: VERY FINE GRAIN SILICA, 10 YR 7/1 LIGHT GRAY, DRY					7-3/8"
	15	AUGER REFUSAL AT 11.0'					
		GROUNDWATER NOT OBSERVED DURING BORING					
	20						
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-24 (BH-47)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 5/18/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3708 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 361-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3784.7					
	0	CLAYEY SILT: 10% CLAY, 90% SILT, 10 YR 7/3 VERY PALE BROWN, DRY, UNCONSOLIDATED	CL		NS		
	1.0	GRAVELLY SANDY SILT: 10 YR 8/3 VERY PALE BROWN, DRY, UNCONSOLIDATED	GM		1 NR		
	5				2 NR		
	8.2	SLIGHTLY MOIST AFTER 7.0'			3 NS		
	8.3	SANDY DOLOMITE: VERY FINE GRAIN SAND, 10 YR 7/1 LIGHT GRAY, DRY, VERY HARD	DOLO.		4 NS		
	10						
	15	AUGER REFUSAL AT 8.3'					
	20	GROUNDWATER NOT OBSERVED DURING BORING					
	25	NO GROUNDWATER READING AFTER 24 HOURS					
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-25 (BH-48)**

DATE DRILLED 5/18/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3791.0					
	0	CLAYEY SANDY SILT: VERY FINE GRAIN SILICA SAND, 10% CLAY, 10% SAND, 80% SILT, 10 YR 8/4 VERY PALE BROWN, DRY, NO PLASTICITY, UNCONSOLIDATED, MINOR CALICHE	CL		NS		0
	4.0	COBBLEY SANDY SILT: VERY FINE GRAIN SILICA SAND, 10 YR 8/3 VERY PALE BROWN, CALICHE CEMENTATION, DRY TO SLIGHTLY MOIST			1 1.5		
	5	ABUNDANT SUBROUNDED DOLOMITE GRAVEL			2 1.1		5
					NS		
					3 1.0		
					NS		
					4 1.0		
	10				NS		
		AFTER 12.0', MINOR MOIST 7.5 YR 5/4 BROWN, SILTY CLAY BINDER	GM		5 1.1		
					NP		
					NS		
					6 1.0		
					NR		
	15				NS		15
		SATURATION AFTER 17.0', STRONG CONDENSATE ODOR			7 0.9		
					NR		
					NS		
					8 0.1		
	19.4				NS		
	19.5	SANDSTONE: VERY FINE GRAIN SILICA SAND, 2.5 YR 7/2 LIGHT GRAY WITH 2.5 YR 5/0 GRAY BANDS, VERY HARD	SS				20
	20	AUGER REFUSAL AT 19.5'					
		GROUNDWATER ENCOUNTERED DURING BORING: 17.66'					
	25						25
	30						30
	35						35

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-26 (BH-49)**

DATE DRILLED 5/19/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3791.9					
	0	SANDY SILT: VERY FINE GRAIN SAND, 10 YR 6/4 LIGHT YELLOW BROWN, DRY, UNCONSOLIDATED	SM		NS		0
	2.8	COBBLEY SANDY SILT: VERY FINE GRAIN SILICA SAND, 10 YR 8/2 WHITE, DRY, UNCONSOLIDATED, ABUNDANT DOLOMITE GRAVEL	GM		1 0.6		
	4.5				NR		
	5	SILTY SAND: VERY FINE TO FINE SILICA SAND, 20% SILT, 80% SAND, 10 YR 6/2 LT. YELLOW BROWN, SLIGHTLY MOIST, UNCONSOLIDATED	SM		2 0.6		5
					NR		
	8.3	COBBLEY SANDY SILT: VERY FINE GRAIN SAND, 10 YR 7/3 VERY PALE BROWN, DRY, UNCONSOLIDATED, DOLOMITE COBBLES AND MINOR SUBROUNDED GRAVEL			3 1.1		
					NR		
	10		GM		4 0.4		10
					NS		
		CALICHE CEMENTATION AFTER 12.5'			5 0.2		
					NS		
	15	AFTER 15.5', SLIGHTLY MOIST 5 YR 5/4 RED BROWN, SILTY CLAY BINDER			6 0.8		
					NS		
	16.0	AUGER REFUSAL AT 16.0'			7 0.3		15
		GROUNDWATER NOT ENCOUNTERED DURING BORING.					
	20						20
	25						25
	30						30
	35						35

- SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)
- WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-27 (BH-50)**

DATE DRILLED **5/19/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3794.9					
	0	CLAYEY SILT: LIGHT YELLOWISH BROWN, 10 YR 6/4, DRY, VERY LOW PLASTICITY, CALICHE DEPOSITS, 70% SILT, 30% CLAY	CL		1 NS		0
	5				2 NR		
	6.0				3 NR		
	6.0	BOULDERY-COBBLEY SILT: LIGHT YELLOWISH BROWN TO LIGHT BROWNISH GRAY, 10 YR 6/2 TO 6/4, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 3 CM TO 0.5 M, ROUND, DOLOMITE	GM		4 NR		
	10				5 NR		
	12.5				6 NR		
	15	CLAYEY-GRAVELLY SAND: BROWN, 7.5 YR 7/2, MOIST, V. FINE TO FINE QUARTZ, MANGANESE NODULES, DOMOMITE PEBBLES FROM 0.5 TO 1 CM ROUND, 70% SAND, 20% CLAY, 10% PEBBLES	ML		7 NR		
	17.0	AUGER REFUSAL AT 17.0'			NR		
	20	GROUNDWATER NOT ENCOUNTERED DURING BORING.					
	25						
	30						
	35						

- | | | | |
|--|---------------------------|-----------------|------------------------------|
| | SPLIT-SPOON SAMPLER | | WATER TABLE (TIME OF BORING) |
| | STANDARD PENETRATION TEST | | LABORATORY TEST LOCATION |
| | UNDISTURBED SAMPLE | | PENETROMETER (TONS/SQ. FT.) |
| | WATER TABLE (24 HOURS) | NR: NO RECOVERY | |
| | | NS: NOT SAMPLED | |

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-28 (BH-52)**

DATE DRILLED 5/20/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3792.0					
	0	CLAYEY SILT: BROWN, 10 YR 5/5, DRY, V. LOW PLASTICITY, V. FINE QUARTZ, 70% SILT, 10% CLAY, 20% SAND	CL		1		1.00
	3.0				2	1.0	3.50
	5	BOULDERY-COBBLELY SILT: BROWN TO LIGHT BROWNISH GRAY, 10 YR 5/3 TO 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO 0.5 M, ROUND TO SUBROUND, DOLOMITE	GM		3	1.0	5.70
					4	1.0	7.62
	10	CLAYEY FROM 9.0' TO 10.0', SANDY/GRAVELLY, BROWN TO STRONG BROWN, 10 YR 5/4 TO 5/6, MOIST, LOW PLASTICITY, FINE TO VERY FINE QUARTZ			5	0.9	10
	12.3				NR		12.31
		AUGER REFUSAL AT 12.3'			NR		12.70
	15	GROUNDWATER NOT ENCOUNTERED DURING BORING.					
	20						
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-29 (BH-53)**

DATE DRILLED 5/20/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3786.0					
	0	CLAYEY SILT: BROWN TO BROWNISH YELLOW, 10 YR 5/3 TO 5/4, DRY, VERY LOW PLASTICITY, CALICHE DEPOSITS, 70% SILT, 30% CLAY, VERY FINE QUARTZ	CL		1 NS		0
					2 NR		
	5				3 NR		5
					4 NS		
	7.5	COBBLEY SILT, BROWN TO LIGHT GRAY-ISH BROWN, 10 YR 5/2 TO 5/2, MOD. WELL SORTED, COBBLES FROM 4 CM TO 10 CM, GRAVELLY, ROUND TO SUB-ROUND	GM		NR NS NR	0.7 0.0	7.5
	10	DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 6/2, MASSIVE, HARD	DOLO.		NR	0.0	10
	10.5						
	12.5	BORING TERMINATED AT 12.5'					12.19 12.52
		GROUNDWATER NOT ENCOUNTERED DURING BORING.					7-3/8"
	15						15
	20						20
	25						25
	30						30
	35						35

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-30 (BH-54)**

DATE DRILLED 5/21/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3788.7					
	0	CLAYEY SILT: BROWN TO VERY PALE BROWN, 10 YR 5/3 TO 7/4, V. LOW PLASTICITY, CALICHE DEPOSITS, 70% SILT, 30% CLAY, VERY FINE QUARTZ	CL		1		
					NS		
					2		
					NR		
	5	SLIGHTLY MOIST BELOW 7.0'					
		MOIST FROM 9.0' TO 9.5', GRAVELLY, DARK BROWN, 10 YR 4/3					
	9.5	BOULDERY/COBBLEY SILT, DARK BROWN TO LIGHT GRAYISH BROWN, 10 YR 4/3 TO 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 3.0 CM TO >20 CM, ROUND TO SUBROUND	CM		3		
	10	CLAYEY FROM 12.0' TO 12.5', MOIST			NR		
		VERY HARD FROM 13.0' TO 14.0', CLAYEY FROM 14.0' TO 14.5', SATURATED AT 16.71			NS		
					NS		
	15						
	17.4	AUGER REFUSAL AT 17.4'					
	20						
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-31 (BH-55)**

DATE DRILLED 5/22/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD									
GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL		
		GROUND SURFACE: 3795.2							
	0	CONGLOMERATE: VERY PALE BROWN TO LIGHT GRAYISH BROWN, 10 YR 7/3 TO 6/2, LIMESTONE/DOLOMITE PEBBLES, COBBLES, BOULDERS, COBBLES/BOULDERS FROM 5 CM TO 2 M, ROUND TO SUBROUND, CARBONATE CEMENT, WEATHERED AT SURFACE, HARD	CNG.	0.00	NS		1.00		0
				0.00	NR	0.0			
				0.00	NS				
				0.00	NR	0.4			
	5			0.00	NS			5.30	
	8.5	BOULDERY-COBBLEY SILT: BROWN TO LIGHT GRAYISH BROWN, 10 YR 5/3 TO 6/2, GRAVELLY, POORLY SORTED, COBBLES/BOULDERS FROM 4 CM TO 20 CM, ROUND TO SUBROUND, VERY FINE QUARTZ	GM	0.00	NR	0.2	7.50		
				0.00	NS				
				0.00	NR	1.5			
				0.00	NS				
	10			0.00	NR	0.0		9.60	
	14.5	AUGER REFUSAL AT 14.5'		0.00	NR	0.0	14.29		
				0.00	NS				
				0.00	NR	0.0			
				0.00	NS				
	15			0.00	NR	0.0		14.50	
		GROUNDWATER NOT OBSERVED DURING DRILLING.							
	20								20
	25								25
	30								30
	35								35

SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-32 (BH-56)**

DATE DRILLED 5/22/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	'N' VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3800.9					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3802.48 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX SODIUM BENTONITE PELLETS 4" PVC RISER 8 - 20 SILICA SAND PACK .020 SLOT PVC SCREEN SUMP 10 5/8"
	4.5	CLAYEY SILT: LIGHT BROWN, 7.5 YR 6/4, DRY, VERY LOW PLASTICITY, VERY FINE QUARTZ, CALICHE DEPOSITS, 70% SILT, 30% CLAY	CL		1 NS 2 1.1 NR 3 0.8 NR		
	5	BOULDERY-COBBLEY SILT: LIGHT BROWN TO LIGHT BROWNISH GRAY, 7.5 YR 6/4 TO 10 YR 6/2, POORLY SORTED, GRAVELLY, COBBLES/BOULDERY FROM 2 CM TO >15 CM, ROUND TO SUB-ROUND			4 NS 5 0.5 NR 6 1.5 NR 7 0.2 NR		
	10		GM		8 0.8 NR 9 0.15 NR		
	15	CLAYEY BELOW 17.5', SANDY, FINE TO MED. GRAIN QUARTZ, MOIST, VERY STRONG HYDROCARBON ODOR					
	18.5	SATURATED BELOW 18.0', HYDROCARBON ODOR					
	18.65	DOLOMITE: LIGHT GRAYISH BROWN, 10 YR 6/2, MASSIVE, HARD	DOLO.				
	20	AUGER REFUSAL AT 18.65'					
		GROUNDWATER NOT OBSERVED DURING DRILLING.					
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 V. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-33 (BH-57)**

DATE DRILLED 5/23/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY SAR

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	'N' VALUE	WELL COMPLETION DETAIL
		Start: 14:33 5/23/91 Stop: 15:44 Resume: 07:30 5/24/91 Finish: 11:35 GROUND SURFACE: 3803.7					
	0	CLAYEY SILT: PALE BROWN TO BROWN, 10 YR 5/3 TO 6/3, DRY, VERY LOW PLASTICITY, VERY FINE QUARTZ, CALICHE DEPOSITS, 70% SILT, 30% CLAY	CL		1 NS		1.00
	2.7				2 0.6 NR		4.03
	5	BOULDERY-COBBLEY SILT: BROWN TO LIGHT GRAYISH BROWN, 10 YR 5/3 TO 6/4, POORLY SORTED, COBBLES/BOULDERS FROM 5 CM TO > 50 CM, ROUND TO SUBROUND, DOLOMITE WITH CALICHE WEATHERING, GRAVELLY.			NR 0.0		6.40
					NS		7.82
		HYDROCARBON ODOR FROM 9.0' TO 9.9', DRY			3 0.5 NR		
					NS		
	10	STRONG HYDROCARBON ODOR BELOW 14.0', VERY MOIST, SANDY, COARSE GRAIN QUARTZ	GM		4 0.9 NR		
					NS		
					5 1.0 NR		
					NS		
	15				NR 0.0		
					NS		
	18.6				6 0.5 NR		17.34
					7 0.8 NR		17.67
		AUGER REFUSAL AT 18.6'					18.6
	20	GROUNDWATER NOT OBSERVED DURING DRILLING.					
	25						
	30						
	35						



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

└ LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-34 (BH-58)**

DATE DRILLED 5/24/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY MJL

CHECKED BY BJS

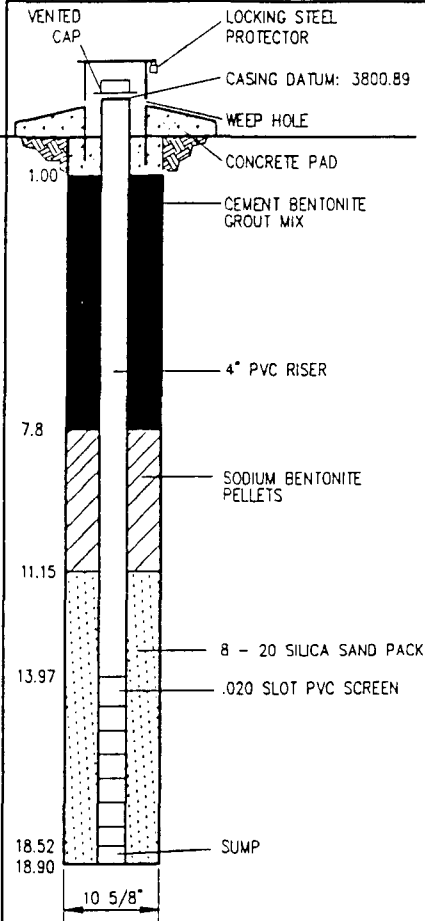
DRAWN BY SAR

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	'N' VALUE	WELL COMPLETION DETAIL	
							Diagram	Labels
		Start: 14:58 5/14/91 Stop: 08:45 5/25/91						
		GROUND SURFACE: 3799.0						
	0	CLAYEY SILT: LIGHT YELLOWISH BROWN, 10 YR 6/4, VERY FINE QUARTZ, DRY, LOW PLASTICITY, CALICHE DEPOSITS, 70% SILT, 30% CLAY	CL		1			VENTED CAP, LOCKING STEEL PROTECTOR, CASING DATUM: 3800.89, WEEP HOLE, CONCRETE PAD, CEMENT BENTONITE GROUT MIX
	2.9	CLAYEY SILT: DUSKY YELLOW (5 YR 6/4), DRY, LOOSE, V. SLIGHTLY PLASTIC, 10% CLAY, 70% SILT	CL		2	1.0		
	5	CLAYEY SILT: LIGHT BROWN (5 YR 6/4), SLIGHTLY PLASTIC, 30% CLAY, CALICHE DEPOSIT 25%, 45% SILT, DRY	CL		3	1.1		
	8.0	CLAYEY SILT: LIGHT BROWN (7.5 YR 6/4), FIRM, 30% CLAY, SLIGHTLY PLASTIC, FRIABLE, DRY	CL		4	1.5		
	10				5	0.9		
	11.0	GRAVEL AND COBBLES IN CLAYEY SILT: 50% COARSE, 50% FINE, GRAVEL FINE TO COARSE, 5MM TO 75, SEGMENTS OF COBBLES SIZE UNKNOWN, CLAYEY SILT, PINKISH GRAY (7.5 YR 7/2), LOOSE, DRY, VERY LOW PLASTIC, COBBLES AND GRAVEL, WELL ROUNDED, POORLY SORTED	GM		6	0.9		
	14.5	DOLOMITE, GRAY LIMESTONE			7	0.7		
	15	GRAVEL AND COBBLES: COARSE GRAVEL 25-75MM, COBBLES POSS. TO BOULDER SIZE, DECREASING CLAYEY SILT TO 20%, LIMESTONE FACTION TYPICALLY LT. BROWNISH GRAY (2.5 YR 6/2), FAIR ODOR OF HYDROCARBON AT 14.5', V. SLIGHTLY MOIST, 30% GS GRAVEL, 50% COBBLES, SATURATED W/ HYDROCARBONS	GM		8			
	18.9	HSA REFUSAL AT 18.9'						
	20	BEDROCK LT. BROWNISH GRAY, DOLOMITE, LIMESTONE, DENSE (10 YR 6/2)						
	25							
	30							
	35							



- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-35 (BH-59)**

DATE DRILLED 5/25/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3791.4					
	0	GRAVELLY SILT: GRAVEL TO 0.5" DIAMETER 10% GRAVEL, 90% SILT, 10 YR 6/3, PALE BROWN TO 0.6', TO YR 8/2, WHITE AFTER 0.6', DRY	SM		NS		
	5				1 1.0 NS 2 1.0		
	7.2	T.D. 7.23'					
	10						
	15						
	20						
	25						
	30						
	35						

- | | | | |
|--|------------------------------|-----------------|------------------------------|
| | CME CONTINUOUS AUGER SAMPLER | | WATER TABLE (TIME OF BORING) |
| | STANDARD PENETRATION TEST | | LABORATORY TEST LOCATION |
| | UNDISTURBED SAMPLE | | PENETROMETER (TONS/SQ. FT.) |
| | WATER TABLE (24 HOURS) | NR: NO RECOVERY | |
| | | NS: NOT SAMPLED | |

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-36 (BH-21)**

DATE DRILLED **4/30/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

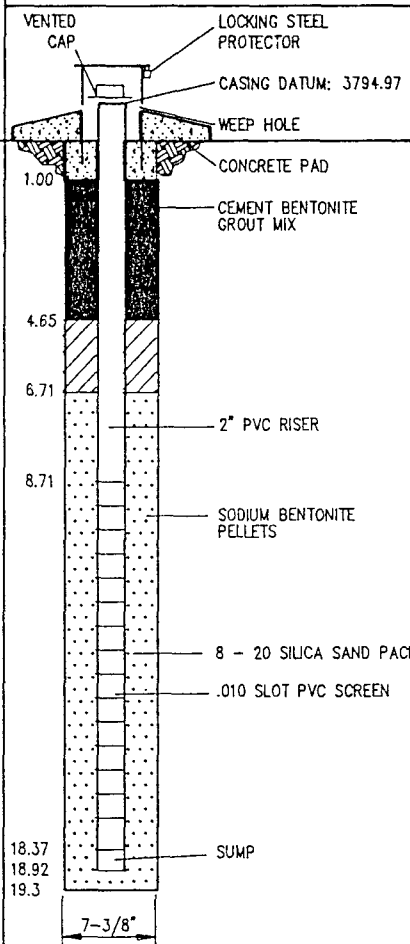
ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	'N' VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3793.5					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3794.97 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX
	0	SILT: BROWN (7.5 YR 5/3), LOOSE NO PLASTICITY, DRY	ML		1		1.00
	2.7				2		
	5	CLAYEY SILT: LT. BROWN (7.5 YR 6/4), SLIGHTLY PLASTICITY, DRY, 10% CLAY, SOME CALICHE DEPOSITS, 90% SILT, LOOSE	ML		3		4.65
	7.8				4		6.71
	9.3	CLAYEY SILT: LIGHT BROWN, (7.5 YR 6/4) AND PINK (7.5 YR 7/3), SLIGHTLY PLASTICITY, FIRM, DRY, 25% CLAY, 20% CLAY DEPOSITS	CL		5		8.71
	10				6		
	12.9	SILTY CLAY: BROWN (7.5 YR 5/3), 20% SILT, 5% CALICHE DEPOSITS, SLIGHTLY PLASTICITY, HARD, DRY, SLIGHTLY MOIST AT 12.5' TO 12.9', NO ODOR	CL		7		
	14.0				8		
	15	SILTY GRAVEL: LT. BROWN (7.5 YR 6/4), GRAVEL, COARSE WITH SOME FINE 5 MM TO 30 MM, SLIGHTLY MOIST, POORLY SORTED, HYDROCARBON SATURATION BELOW 13.4'	GM		9		
	18.2						
	19.3	SANDY GRAVEL: DARK GRAY (7.5 YR 4/0) SATURATED, SAND 10%, COARSE GRAINED, SUBANG., GRAVEL FINE TO COARSE 10-50 MM, STRONG HYDROCARBON ODOR, POORLY GRADED, LARGER GRAVEL WITH ROUNDED	GP				
	20	BEDROCK, LIMESTONE, BROWN, DOLOMITE, DENSE, HARD, WEATHERED GRAY ON SURFACES	DOLO.				
		HSA REFUSAL AT 19.3'					
	25						
	30						
	35						



- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-37 (BH-60)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED **5/26/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3795.5					
	0	SILT: BROWN (7.5 YR 5/3), LOOSE, NO PLASTICITY, DRY	ML		1		0
	3.2	CLAYEY SILT: BROWN (7.5 YR 5/4), CLAY 20%, CALICHE DEPOSITS 10%, FIRM, FRIABLE, DRY	CL		2		
	4.6				3		
	5	CLAYEY SILT: LIGHT BROWN (7.5 YR 6/4), 30% CLAY, 20% CALICHE DEPOSITS, SLIGHTLY PLASTICITY, FIRM FRIABLE, DRY	CL		4		
	10				5		
	12.0	SILTY GRAVEL: LIGHT REDDISH BROWN (5 YR 6/3), SILT 30%, GRAVEL COARSE UP TO 50MM AND FINE TO 5MM, POORLY SORTED, DRY, GRAVEL DOLOMITE LIMESTONE, LIGHT GRAY (7.5 YR 7/0), DENSE, DRY	GM		6		
	14.2	DOLOMITE LIMESTONE: WEATHERED, FRACTURES, DENSE IN PART, LIGHT GRAY (7.5 YR 7/0), SATURATED	DOLO.		7		
	15				8		
	18.3	SANDSTONE: GRAY (7.5 YR N5/0), POORLY CEMENTED, FRIABLE, STRONG HYDRO-CARBON ODOR, V.FINE TO FINE GRAINED, SATURATED	SS				
	18.8						
	20						
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-38 (BH-61)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 5/27/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3795.5					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 2796.20 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX
	0	SILT: BROWN (7.5 YR 5/3), LOOSE, NO PLASTICITY, DRY	ML		1	NS	1.00
	3.6	CLAYEY SILT: PALE RED (10 YR 6/3), 10% CLAY, 20% CALICHE DEPOSITS, FIRM, FRIABLE, DRY, GRADING TO PINKISH WHITE (5 YR 8/2) BELOW 4.0'	CL		2	NS	4.90
	5				3	NR	7.0
	7.5	SILTY GRAVELLY SAND: PINKISH WHITE (5 YR 8/2), LOOSE, ANGULAR, FINE GRAINED, DRY, 30% SILT, 15% GRAVEL	GM		4	NR	9.37
	9.5	CLAYEY SILT: BROWN (7.5 YR 5/4), 25% CLAY, TRACE CALICHE DEPOSITS, SOFT, LOOSE, DRY	ML		5	NR	
	10				6	NS	
	12.5	CLAYEY GRAVEL AND POSS. COBBLES: LT. BROWN (7.5 YR 6/4), CLAY 25%, V. SLIGHTLY PLASTICITY, MOIST, NO ODOR, GRAVEL 50%, GRAY (7.5 YR N 5/0), COARSE AND FINE 5-40 MM	GC		7	NR	
	14.3				8	NS	
	15	SILTY GRAVEL AND COBBLES: SILT 10%, GRAVEL 50%, COBBLES 40%, W/ ROUNDED SOME GREASY DARK GRAY SUBSTANCES ON GRAVEL SURFACES (7.5 YR N 4/0) STRONG HYDROCARBON ODOR, WET	GP		9	NS	
	17.8	WEATHERED SANDSTONE: LIGHT BROWN (7.5 YR 6/3), V. FINE GRAINED, POORLY CEMENTED, FRIABLE, ODOR, WET, SOME SILT 20%	WEATH. SS				
	19.2						
	19.5						
	20	SILTY SANDSTONE: LIGHT GRAY (2.5 YR N 6/0), CALCAREOUS CEMENT, VERY FINE GRAINED, WET, SOFT, POORLY CEMENT, FRIABLE	SANDSTONE				
		HSA REFUSAL AT 19.5'					
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MW-39 (BH-62)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED **5/28/91**

DRILLING METHOD **HSA**

DRILLED BY **SHB**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3801.2					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3803.12 WEEP HOLE CONCRETE PAD
	0	SILT: PINKISH GRAY (7.5 YR 7/2), LOOSE, DRY	ML		1	NS	CEMENT BENTONITE GROUT MIX
	3.0	CLAYEY SILT: LIGHT BROWN (7.5 YR 6/4) 20% CLAY, 10% CALICHE DEPOSITS, VERY SLIGHTLY PLASTICITY, FRIABLE TO LOOSE GRADING TO PINKISH WHITE (7.5 YR 8/2) AT 7.0', DRY	ML		2	NS	SODIUM BENTONITE PELLETS
	5				3	NR	2" PVC RISER
	9.2				4	NS	8 - 20 SILICA SAND PACK
	10	SANDSTONE: V. PALE BROWN (10 YR 8/3), V. FINE GRAINED, SILTY, CALC. CEMENT, MOD. CEMENTED, BUT FRIABLE, DRY	SS		5	NS	.010 SLOT PVC SCREEN
	12.1	DOLOMITE: LIGHT BROWNISH GRAY (10 YR 6/2), DENSE, HARD, DRY	DOLO.		6	NS	SUMP
		HSA REFUSAL AT 12.1'					7-3/8"

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-40 (BH-63)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 5/29/91

DRILLING METHOD HSA

DRILLED BY SHB

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3797.3					
	0	SILT: WEAK RED (2.5 YR 5/2), LOOSE, DRY	ML		1		0
	2.8	SILTY CLAY: REDDISH BROWN (5 YR 5/3), 25% SILT, 15% CALICHE DEPOSITS, FIRM, FRIABLE, DRY	CL		2		
	4.7	SILTY CLAY: PINK (7.5 YR 7/3), 20% SILT, 30% CALICHE DEPOSITS, FIRM, FRIABLE, DRY	CL		3		5
	8.5	CLAYEY GRAVEL AND COBBLES: GRAVEL IN DOLOMITE, LIMESTONE GRAY (5 YR 5/1), DENSE, 60% GRAVEL, 10% COBBLES, 30% CLAY, CLAY IS LIGHT BROWN (9.5 YR 6/3) DRY	GC		4		
	10				5		10
	14.5	CLAYEY GRAVEL AND COBBLES: AS ABOVE BUT SATURATED BELOW 14.5' WITH STRONG HYDROCARBON ODOR	GC		6		
	15				7		15
	18.0	SILTY SANDSTONE: OLIVE GRAY (5 YR 5/2), VERY SOFT, VERY FINE GRAINED, VERY POORLY CEMENTED, VERY FINELY BEDDED, SATURATED, STRONG HYDROCARBON ODOR	SILTY SANDSTONE		8		
	20				9		20
	22.5	POSSIBLY DOLOMITE BELOW 22.8', VERY HARD	DOLO.		10		
	23.0				NS		23.00
	25	HSA REFUSAL AT 23.0'					25
	30						30
	35						35

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-41 (BH-64)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED **5/30/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	'N' VALUE	WELL COMPLETION DETAIL	
							VENTED CAP	LOCKING STEEL PROTECTOR
	0	GROUND SURFACE: 3802.7						CASING DATUM: 3804.73
	0	SILT: BROWN (7.5 YR 5/4), LOOSE, DRY	ML		1		1.00	WEEP HOLE
	2.8	CLAYEY SILT: PINK (7.5 YR 7/3), 25% CLAY, SLIGHTLY LOOSE, DRY, VERY SLIGHTLY PLASTICITY	ML		2	1.5		CONCRETE PAD
	4.8	CLAYEY SILT: PINKISH WHITE (5 YR 8/2), LOOSE, DRY 25% CLAY, CONTAINS TRACE OF GRAVEL	ML		3	1.5		CEMENT BENTONITE GROUT MIX
	5				NS			2" PVC RISER
	7.5	SANDSTONE: PINKISH GRAY (7.5 YR 7/2), POORLY CEMENTED, CALICHE DEPOSITS, FRIABLE, DRY. VERY FINE GRAINED, SILTY, DRY	SILTY SAND STONE		4	0.2	7.50	SODIUM BENTONITE PELLETS
	9.0				5	0.3		
	10	SANDSTONE: VERY SILTY LIGHT GRAY (5 YR 7/1), HARD, FRIABLE, VERY FINE GRAINED, FAIRLY WELL CEMENTED, CALCAREOUS, DRY, VERY BEDDED	SAND STONE		6	0.4	9.50	
					7	0.1	11.50	8 - 20 SILICA SAND PACK
	14.0				8	0.2		.010 SLOT PVC SCREEN
	15	SANDSTONE: BROWN (7.5 YR 5/2), SLIGHTLY DOLOMITE, CALCAREOUS CEMENT, FAIRLY WELL CEMENTED, HARD, VERY SLIGHTLY FRIABLE, DRY	SAND STONE		9	0.1		
					10			
	20				NS			SUMP
	22.0	HSA REFUSAL AT 22.0'					21.15 21.56 22.00	7-3/8"

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TNS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3835

JOB NAME/NUMBER **MW-42 (BH-65)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 5/30/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY GHR

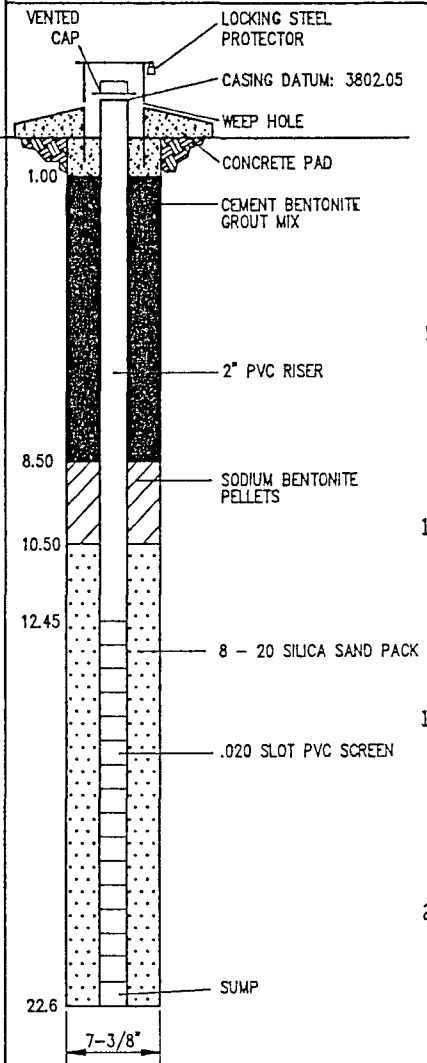
CHECKED BY BJS

DRAWN BY SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNITED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3800.1					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3802.05 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX
	0	SILT: LIGHT BROWN (7.5 YR 6/4), LOOSE, DRY	ML		1		1.00
	3.0	CLAYEY SILT: BROWN (7.5 YR 5/4), FIRM, FRIABLE, 20% CLAY, 10% CALICHE DEPOSITS, DRY, NO PLASTICITY	ML		2	1.2	
	5				3	1.0	
	6.0	SILT, GRAVEL AND COBBLES: 20% SILT, 60% GRAVEL COARSE TO FINE 10-40MM, TRACE POSSIBLE COBBLES, DRY, LOOSE, GRAVEL, SLIGHTLY DOLOMITE LIMESTONE AND LIMESTONE, ANGULAR IN PART, SILT PINKISH WHITE (5 Y R 8/2)			4	0.2	
	10	15% CLAY IN MATRIX AT 14.5'-18.5'			5	1.1	
	15	WET AT 17.7'			6	0.5	
	17.7	STRONG HYDROCARBON ODOR AND DARK COLOR (BLACK) AT 17.7'-19.4'			7	1.1	
	19.4	SANDSTONE: 2.5 YR 5/4, LIGHT OLIVE BROWN, VERY FINE GRAIN, MODERATELY HARD, HYDROCARBON ODOR	SS		8		
	20				9		
	22.6	HSA REFUSAL AT 22.6'			10	0.4	
	25						
	30						
	35						



- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-43 (BH-66)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED **5/31/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **JMB**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 V. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	'N' VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3801.1					
	0	SILT: LIGHT BROWN (7.5 YR 6/4), SOFT, DRY, LOOSE	ML		1		0
	3.3	CLAYEY SILT: 7.5 YR 5/4, BROWN, FIRM, CALICHE NODULES, DRY, FRIABLE, 15% CLAY, 10% CALICHE, 75% SILT	ML		2	1.2	
	5				3	1.0	
	9.0				4	1.3	
	10	SILT, GRAVEL & COBBLES: 2.5 YR 6/2, LIGHT BROWNISH GRAY AND 7.5 YR 7/2 PINKISH GRAY, LIGHTLY CEMENT, HARD, DRY, V. SILTY DOLOMITE LIMESTONE GRAVELS, WET AT 14.3'	GM		5	0.8	
	14.3				6	1.0	
	15	SILTY CLAY: 10 YR 4/4, SOFT, WET, LOW PLASTICITY, STRONG HYDROCARBON ODOR, 30% CLAY, 70% SILT (LENS) AT 14.4-15.0			7	1.0	
	20				8	1.3	
	22.1				9	1.2	
	22.3	SANDSTONE: 2.5 YR 5/4, LIGHT OLIVE BROWN, FINE GRAINED, SILTY, HARD, STRONG HYDROCARBON ODOR	SS		10	0.3	
	25	HSA REFUSAL AT 22.3'					
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-44 (BH-67)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 6/1/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3806.6					
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, LOOSE, SOFT, DRY	ML		1		0
	2.7	CLAYEY SILT: 7.5 YR 5/4, BROWN, NON-PLASTIC, DRY, FRIABLE, CALICHE NODULES, 15% CLAY, 10% CALICHE, 75% SILT	ML		2	1.5	
	5		ML		3	1.5	
	9.3	SANDSTONE: 2.5 YR 8/4, PALE YELLOW, MODERATLY HARD, SLIGHTLY CEMENTED, FINE GRAINED, SILTY			4	1.5	
	10	COLOR CHANGES TO 2.5 YR 5/6 LIGHT OLIVE BROWN WITH INCREASED MOISTURE			5	0.9	
	15	2.5 YR 4/4 OLIVE BROWN AND 2.5 YR 5/6 LIGHT OLIVE BROWN AT 17.5', CEMENTED, HARD AT 18.0, WET AT 18.5'	GM		6	0.2	
	20				7	0.6	
	24.5	HSA REFUSAL AT 24.5'			8	0.6	
	25				9	0.4	
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-45 (BH-68)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 6/2/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

1. *Prüfungstermin:* _____
 2. *Prüfungsort:* _____
 3. *Prüfungsfach:* _____
 4. *Prüfungsinhalt:* _____

[illegible]

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL		
		GROUND SURFACE: 3803.0							
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, LOOSE, SOFT, DRY	ML		1				
	3.0	CLAYEY SILT: 7.5 YR 5/4, BROWN, HARD, DRY, CALICHE. 15% CLAY, 25% CALICHE, 60~ SILT	ML		2	1.0			
	3.7				3	1.0			
	5				4	0.5			
	5	SILT, GRAVEL & COBBLES: 7.5 YR 7/2, PINKISH GRAY, DOLOMITE LIMESTONE, VERY HARD, DRY, BLACK HYDROCARBON SLUDGE AT 4.8' TO 5.0'. COBBLES AND GRAVEL ARE 10 YR 7/1, LIGHT GRAY AT 6.5'-T.D.	CM		5	0.4		6.0	5
	10	6			1.0	8.0			
	15	7			1.0	9.66			
	20	8			1.0				
	25	9			0.5				
	30								
	35								
	19.7	AUGER REFUSAL AT 19.7'						19.2	20
	20					19.95			

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MW-47 (BH-70)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 6/4/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3804.4					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3806.18 WEEP HOLE CONCRETE PAD
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, LOOSE, SOFT, DRY	ML		1 NS		1.00
	3.0	CLAYEY SILT: 7.5 YR 5/4, BROWN, NON-PLASTIC, DRY, FRIABLE, CALICHE PRESENT, 15% CLAY, 10% CALICHE	ML		2 NS		4.0
	5	SILT, GRAVEL, COBBLES: SILT IS 7.5 YR 7/2, PINKISH GRAY, GRAVEL & COBBLES ARE 10 YR 7/1 LIGHT GRAY TO 7.5 YR 6/4 LIGHT BROWN, GRAVELS ARE DOLOMITE LIMESTONE, LOOSE, CALICHE IN SILT	GM		3 NS		6.0
	10				4 NS		8.16
	15				5 NS		
	19.0				6 NS		
	20	SANDSTONE: 2.5 YR 5/6, LIGHT OLIVE BROWN, MODERATLY, HARD, FINE GRAINED, SLIGHT HYDROCARBON ODOR, MOIST AT 22.0', COLOR CHANGES TO 2.5 YR 4/4, OLIVE BROWN AT 22.0'	SANDSTONE		7 NS		17.71
	25				8 NS		18.2
	29.0				9 NS		
	30	SANDSTONE: 2.5 YR 6/0 TO 7/0, GRAY TO LIGHT GRAY, DRY, HARD, FINE GRAINED	SANDSTONE		10 NS		
	32.0	AUGER REFUSAL AT 32.0'			11 NS		32.0
	35				12 NS		

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-48 (BH-71)**

DATE DRILLED **6/4/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **JMB**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3803.7					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX
	0	SILT: 10 YR 7/3, VERY PALE BROWN, LOOSE, DRY, SOFT	ML		1		1.00
	3.0				NS		
	3.0				2	1.5	
	5	SANDSTONE: 2.5 YR 8/2, WHITE, FRIABLE, HIGHLY WEATHERED, SOFT TO MODERATLY HARD, SLIGHTLY MOIST AT 4.0', 2.5 YR 7/4, PALE YELLOW, SLIGHTLY CEMENTED AT 7.5, MODERATLY HARD TO HARD, COLOR CHANGES TO 2.5 YR 7/2, LIGHT GRAY, 2.5 YR 6/8, OLIVE YELLOW AT 9.5' CEMENTED HARD LAYERS AT 17'-17.3', 17.8'-18.0			3	0.5	
	5				NS		2" PVC RISER
	10				4	0.2	
	10				NS		
	10				5	0.2	
	10				NS		10.0
	10				6	0.3	
	10				NS		12.0
	10				7	0.3	
	10				NS		13.91
	15				8	0.2	
	15				NS		
	15				9	0.6	
	15				NS		
	20				10	0.4	
	20				NS		23.54
	24.0	AUGER REFUSAL AT 24.0'					24.04
	25	BOREHOLE OVM READING: 59.0 PPM					24.74
	25						SUMP
	30						7-3/8"
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-49 (BH-72)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED **6/5/91**

DRILLING METHOD **HSA/SS**

DRILLED BY **SHB**

LOGGED BY **JMB**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	'N' VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3811.2					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3813.35 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX 2" PVC RISER SODIUM BENTONITE PELLETS .010 SLOT PVC SCREEN 8 - 20 SILICA SAND PACK SUMP
	0	SILT: 10 YR 7/3, VERY PALE BROWN, LOOSE, DRY, SOFT	ML		1		
	2.5	SANDSTONE: 2.5 YR 8/2, WHITE, DRY, MODERATELY HARD, VERY FINE GRAINED, SILTY, WEATHERED			2	1.3	
					3	0.3	
	5	2.5 YR 7/4 PALE YELLOW AT 4.0'			4	0.3	
					5	0.3	
	10	2.5 YR 6/8 OLIVE YELLOW AT 8.5' MOIST AT 9.0'			6	0.6	
					7	0.5	
	15	CEMENTED LAYER SET 13.5'	SS		8	0.2	
		VERY MOIST TO WET AT 19.0'			9		
	20	2.5 YR 4/4 OLIVE BROWN AT 20.0'			10		
					11		
	25	VERY HARD & CEMENTED AT 24.5'-25.0'					
	26.5						
	28.5						
	30						
	35	T.D. 35.0'					34.51 35.0

- | | |
|---------------------------|------------------------------|
| SPLIT-SPOON SAMPLER | WATER TABLE (TIME OF BORING) |
| STANDARD PENETRATION TEST | LABORATORY TEST LOCATION |
| UNDISTURBED SAMPLE | PENETROMETER (TENS./SQ. FT.) |
| WATER TABLE (24 HOURS) | NR: NO RECOVERY |
| | NS: NOT SAMPLED |

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3825

JOB NAME/NUMBER **MW-50 (BH-73)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 6/6/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		GROUND SURFACE: 3809.3					
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, LOOSE, DRY, SOFT	ML		1	NS	1.00
	2.8	CLAYEY SILT: 7.5 YR 5/4, BROWN, FIRM, FRIABLE, DRY, CALICHE, 15% CLAY, 10% CALICHE	ML		2	NS	1.0
	5		ML		3	NS	0.8
	8.5				4	NS	1.0
	10	SILT, GRAVEL, COBBLES: SILT IS 10 YR 6/4 TO 5/4, LIGHT YELLOWISH BROWN TO YELLOWISH BROWN, DRY, GRAVEL & COBBLES ARE 2.5 YR 5/0 TO 4/0, GRAY TO DARK GRAY AND ARE DOLOMITE LIMESTONE, VUGGY POROSITY, LIMESTONE IS ALSO 2.5 YR 6/2 LIGHT BROWNISH GRAY	GM		5	NS	0.6
	15				6	NS	0.6
	17.9				7	NS	0.7
	18.5	SANDSTONE: 2.5 YR 6/6, OLIVE YELLOW HARD, FINE GRAINED, SILTY	SS		8	NS	0.5
	20	T.D. 18.5'					18.01
	25						18.5
	30						
	35						



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)



WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR NO RECOVERY

NS NOT SAMPLED

JOB NAME/NUMBER **MW-51 (BH-74)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 6/6/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3815.3					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3817.49 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX 2" PVC RISER SODIUM BENTONITE PELLETS .010 SLOT PVC SCREEN 8 - 20 SILICA SAND PACK SUMP 7-3/8"
	0	SILT: 7.5 YR 6/4, LIGHT BROWN, ROOTLETS TOP 2.0', LOOSE, SOFT, DRY	ML		1		
	2.8	CLAYEY SILT: 7.5 YR 5/4, BROWN, FRIABLE, FIRM, NON-PLASTIC, DRY, CALICHE, 15% CLAY, 10% CALICHE	ML		2	1.2	
	4.7				3	0.9	
	5	SILT, GRAVEL & COBBLES: SILT IS 10 YR 6/4 TO 5/4, LIGHT YELLOWISH BROWN TO YELLOISH BROWN, DRY, GRAVEL & COBBLES ARE 2.5 YR 5/0 TO 4/0, GRAY TO LIGHT GRAY TO 2.5 YR 6/2, LIGHT BROWNISH GRAVEL, GRAVELS ARE DOLOMITE LIMESTONE, VUGGY POROSITY	GM		4	0.6	
	10				5	1.0	
	15				6		
	19.0				7		
	19.25	DOLOMITE LIMESTONE: 7.5 YR 6/2, PINKISH GRAY, VERY HARD, VUGGY POROSITY, MOIST	LS		8	35	
	20	T.D. 19.25'					
	25						
	30						
	35						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MW-52 (BH-75)**

BORING NUMBER **MARATHON/91029**

DATE DRILLED 6/7/91

DRILLING METHOD HSA/SS

DRILLED BY SHB

LOGGED BY JMB

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD									
GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL		
		GROUND SURFACE: 3807.5							
	0	COBBLEY CLAYEY SILT: BROWN, 10 YR 4/3, DRY, VERY LOW PLASTICITY, COBBLES FROM 3 CM TO 10 CM, SUB-ROUND		0.00	1		1.00		0
				0.00	NS		2.0		
				0.00	2	1.0			
				0.00	NR		4.2		
	5			0.00	NR	0.2			5
		BOULDERY BELOW 7.5', ROUND, > 50CM	GM	0.00	NS		6.17		
				0.00	NR	0.7			
				0.00	NR				
	10			0.00	NS	0.6			10
		CLAYEY AND GRAVELLY BELOW 11.5'		0.00	NR	0.2			
				0.00	NS	0.6			
	13.6	AUGER REFUSAL AT 13.6'		0.00	NR		12.72		
				0.00	NR		12.90		
	15	GROUNDWATER NOT OBSERVED DURING DRILLING		0.00	NR		13.60		
							7-3/8"		15
	20								20
	25								25
	30								30
	35								35

SPLIT-SPOON SAMPLER
 STANDARD PENETRATION TEST
 UNDISTURBED SAMPLE
 WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)
 LABORATORY TEST LOCATION
 PENETROMETER (TONS/SQ. FT.)
 NR: NO RECOVERY
 NS: NOT SAMPLED

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 221-3899

JOB NAME/NUMBER **MW-53 (BH-77)**
 BORING NUMBER **MARATHON/91029**
 DATE DRILLED 6/7/91
 DRILLING METHOD HSA/SS
 DRILLED BY SHB
 LOGGED BY JMB
 CHECKED BY BJS
 DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD # 83 FOR MORE DETAILED LITHOLOGIC DESCRIPTION					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3823.86 WEEP HOLE CONCRETE PAD CEMENT/BENTONITE GROUT MIX 4" PVC RISER VOLCLAY PURE GOLD GROUT 8" PVC CONDUCTOR CASING 10 5/8" BOREHOLE SODIUM BENTONITE PELLETS .020 SLOT 4" PVC SCREEN 8 - 20 SILICA SAND PACK SJUMP
	0	GROUND SURFACE: 3821.90					
	3.5	CLAYEY SILT: 10% CLAY, 90% 7.5 YR 6/4, UNCONSOLIDATED, DRY	CL				
	6.0	SILTSTONE: 2.5 YR 8/1 WHITE, HARD, DRY	SILTSTONE				
	8.0	SANDY DOLOMITE: VERY FINE GRAIN SILICA SAND, 10 YR 7/1 LT. GRAY, VERY HARD, FRACTURED, DRY	SANDY DOLOMITE				
	15	SANDSTONE: VERY FINE GRAIN SILICA, WELL SORTED, HARD, MOIST, 10 YR 7/2 LT. GRAY, MASSIVE, MINOR IRON OXIDE MOTTLING FRACTURES (HORIZONTAL) AT 8.1, 8.8, 9.7, 10, & 10.3 FEET, SANDY DOLOMITE INTERBEDDED AT 10.3' TO 10.6', FRACTURES AT 6.2, 9.0, 10.2, 11.7, 12.9, 13.4, 13.9, 15.9, SANDSTONE VERY MOIST AFTER 12.8' VARYING DEGREES OF CARBONATE CEMENTATION	SANDSTONE				
	30	AFTER 22.0', 10 YR 5/2 GRAY BROWN, NO CARBONATE CEMENTATION, MODERATLY HARD, FRACTURES AT 17.7, 18.8, 20.5, 20.9, 24.5 FEET					
	45	27.0' TO 27.3', 2.5 YR 7/4 PALE YELLOW					
	60	2.5 YR GRAY BROWN AFTER 30', FRACTURES AT 29.7, 29.8, 29.9, 30.1, 30.2, 30.4, 30.8, 31.0, 32.2, 31.5, 31.9, 32.3, 32.5, 33.1, 33.5, 33.9, 34.1, 34.5, 34.9, 35.5, 36.6, 37.2, 37.5, 37.9, CALCITE AND IRON OXIDE FRACTURE, FILL AFTER 34.0'	SANDSTONE				
	75	AFTER 35.1', MODERATELY WELL CEMENTED, ABUNDANT FRACTURES - EVERY .2 FEET					
	90	AFTER 36.0', 2.5 YR 6/2 LIGHT BROWN GRAY TO 2.5 YR 6/4 LIGHT YELLOW BROWN IRON OXIDE STAINING, MOIST MOD. WELL CEMENTED AFTER 38.8', 2.5 YR 4/2 DARK GRAY BROWN GRADING INTO 10 YR 3/1 VERY DARK GRAY, VERY FINE GRAIN SANDSTONE BETWEEN 42.5' AND 43.5', VERY FINE GRAIN SILTY SANDSTONE 5 YR 4/1 DARK GRAY					
	105	SANDSTONE: VERY FINE GRAIN, 10 YR 5/1 GRAY TO 10 YR 3/1 VERY DARK GRAY, VERY HARD, MODERATELY FRACTURED, AFTER 47.0' 2.5 YR 7/0 LIGHT GRAY, MOTTLED WITH 10 YR 6/3 PALE BROWN, SLIGHTLY DOLOMITIC AFTER 50.7', BETWEEN 54.8' AND 55' 5 YR 4/1 DARK GRAY					
	120	CONTINUING ALTERNATING BANDS OF 10 YR 5/1 GRAY AND 2.5 YR 7/6 LIGHT GRAY MOTTLED WITH 10 YR 6/3 PALE BROWN					
	135	BETWEEN 62.8' AND 62.7': SILTY SANDSTONE 5 YR 5/2 OLIVE GRAY, HIGHLY WEATHERED	DOLO.				
	150	DOLOMITE: GRADATIONAL CONTACT WITH SANDSTONE, 5 YR 5/1 GRAY, VERY HARD, HORIZONTAL FRACTURES AT 72.6, 73, 73.3, 73.4, 74.7, 75.0, STRONG CONDENSATE ODOR AT 76.0'					
	165	T.D. 76.0'					
	180	W/L AFTER DRILLING 14.90'					

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-54 (BH-80)**

DATE DRILLED 6/27/91

DRILLING METHOD AIR ROTARY

DRILLED BY SHB

LOGGED BY GBR

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD # 83 FOR MORE DETAILED LITHOLOGIC DESCRIPTION					
	0	GROUND SURFACE: 3792.60					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3794.40 WEEP HOLE CONCRETE PAD CEMENT/BENTONITE GROUT MIX 12" STEEL CONDUCTOR CASING 14" BOREHOLE VOLCLAY PURE GOLD GROUT SODIUM BENTONITE PELLETS 4" PVC RISER .020 SLOT 4" PVC SCREEN 8 - 20 SILICA SAND PACK SUMP
	10						
	11.0	SANDSTONE: VERY FINE GRAINED SILICA, 10 YR 6/3 PALE BROWN, 10 YR 5/3 BROWN, MODERATLY HARD TO VERY HARD, SLIGHTLY MOIST, WEATHERED, MOIST AND FRIABLE BETWEEN 18.5 AND 21.5', AFTER 21.5' VERY HARD, FRACTURES LARGELY CEMENTED, FRACTURES AT 15.2, 16.0, 16.8, 17.2, 17.5, 18.5, 19.7, 20.0, 20.8, 21-21.5, 23.3, 24.0, NO ODOR	SANDSTONE		NR		
	20	10 YR 5/2 GRAY BROWN AFTER 25.0'			1	10	
		FRACTURE (HORIZONTAL) AT 28.5'			2		
					3		
					4		
					5		
					6	10	
					7		
					8		
	30.5	SANDY DOLOMITE: VERY FINE GRAIN SAND, 10 YR 6/1, LT. GRAY-GRAY, VERY HARD	SANDY DOLO		9		
	31.5	DOLOMITE: MICROCRYSTAL, 2.5 YR 6/2, LIGHT BROWN GRAY, VERY HARD, FRACTURES AT 31.8, 32.1, 32.2, 32.5-33.5, 33.8, 33.9, 35.1, 35.7	DOLOMITE		10		
		32.1 TO 32.2 FEET FRIABLE			11		
		SANDSTONE INTERBED, 5 YR 5/3 OLIVE, MOIST, IRON OXIDE AND PYRITE ALONG FRACTURES BELOW 33' AFTER 34.3', VERY HARD, FRACTURES LARGELY CEMENTED AFTER 35' GRADES	DOLOMITE SANDSTONE		12		
	39.6	DOLOMITIC SANDSTONE: VERY FINE GRAIN SAND, GRADATIONAL CONTACT WITH DOLOMITE, VERY HARD 10 YR 6/1 LIGHT GRAY-GRAY 10 YR 5/2 GRAY BROWN 38.9' TO 39.8', FRACTURES 36.7', 37.8', 38.8', 42.4', 43.8', 44, 44.7'	SANDSTONE		13		
	40				14		
		SANDSTONE: VERY FINE GRAIN SILICA 2.5 YR 6/2 LIGHT BROWN GRAY, VERY HARD BETWEEN 6.9 AND 7.4 FEET, 10 YR 4/1 DARK GRAY ZONE, SILTSTONE INTERBED BETWEEN 42.8 AND 43.4 FEET: HIGHLY FRIABLE AND WEATHERED, 2.5 YR 4/2 DARK GRAY BROWN	DOLOMITE SANDSTONE		15		
		BETWEEN 43.4 AND 44.4 FEET DOLOMITIC SANDSTONE: VERY FINE GRAINED, 10 YR 6/1 LIGHT GRAY TO GRAY			16	10	
		AFTER 44.4 FEET SANDSTONE: VERY FINE GRAIN 5 YR 4/1 DARK GRAY, MOD. HARD, 5 YR 4/1 DARK GRAY 45 TO 46.1 FEET	DOLOMITE SANDSTONE		17		
		DOLOMITIC SANDSTONE: VERY FINE GRAIN, 7.5 YR 7/0 LIGHT GRAY, VERY HARD, HORIZONTAL FRACTURES AT 44.1'			18		
		SANDY DOLOMITE: VERY FINE GRAIN 10 YR 6/2 LIGHT BROWN GRAY, VERY HARD, HORIZONTAL FRACTURES AT 49.9', 51.9', 52.7', 53.5', 53.7', 45' FRACTURE AT 49.9', VERTICAL FRACTURE AT 44.2' TO 53.0', PYRITE, CALCITE AND HEMATITE FRACTURE FILL, STRONG CONDENSATE ODOR AFTER 53.0'	DOLOMITE		19		
		DOLOMITE: 10 YR 8/2 LIGHT BROWN GRAY, HIGHLY FRACTURED WITH THIN INTERBEDS OF DOLOMITIC SILTSTONE AND SANDSTONE, STRONG CONDENSATE ODOR			20		
	65.0				21	10	
					22		
					23		
					24		
					25		
	70	T.D. 65.0'					

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-55 (BH-81)**

DATE DRILLED **6/25/91**

DRILLING METHOD **AIR ROTARY**

DRILLED BY **SHB**

LOGGED BY **GBR**

CHECKED BY **BJS**

DRAWN BY **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

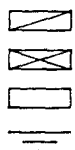
NORMAN, OKLAHOMA 73072

(405) 321-3895

WELL COMPLETION RECORD

DRAFT

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD # 83 FOR MORE DETAILED LITHOLOGIC DESCRIPTION					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3782.45 WEEP HOLE CONCRETE PAD CEMENT/BENTONITE GROUT MIX 12" STEEL CONDUCTOR CASING 14" BOREHOLE 4" PVC RISER VOLCLAY PURE GOLD GROUT MIX SODIUM BENTONITE PELLETS .020 SLOT 4" PVC SCREEN 8 - 20 SILICA SAND PACK SUMP 7-3/8"
	0	GROUND SURFACE: 3780.3			1		
		CLAYEY SILT: 20% CLAY, 80% SILT, 10 YR 5/3, BROWN, DRY, UNCONSOLIDATED, LOW PLASTICITY	CL		NS		
	6.0				2		
		SILTY CLAY: 30% SILT, 70% CLAY, 10 YR 5/3, BROWN, SOFT, MED. PLASTICITY, MINOR SUBANG DOLOMITE GRAVEL TO 1/4 INCH, MINOR DOLOMITE COBBLES TO APPROXIMATELY 3 INCHES	CL		NS		
	9.5				3		
		DOLOMITE: 10 YR 4/1, DARK GRAY TO 10 YR 6/1, GRAY-LIGHT GRAY, DRY, HARD,	DOLOMITE		4		
	10				5		
		VERTICAL FRACTURE BETWEEN 16.2-17.0' MODERATELY FRACTURED BELOW 17.0'			6		
	17.7				7		
		DOLOMITE: WITH INTERBEDS OF SILTY DOLOMITE, 10 YR 5/2, GRAYISH BROWN, 10 YR 6/2, LIGHT BROWNISH GRAY, AND 10 YR 5/1, GRAY, ABUNDANT HEMATITE-REPLACED FUSSILT - POSSIBLY GRAPTOLITES OR SPONGESPICULES, AFTER 21.0', CHET-LIKE CONCOIDAL FRACTURING	DOLOMITE/SILTY DOLO.		8	8.0	
	20				9		
					10		
	25.0				11		
		DOLOMITE: 10 YR 5/2, GRAYISH BROWN, MICRO-CRYSTALLINE, VERY HARD, HIGHLY FRACTURED, 2.5 Y 6/2, LIGHT BROWNISH GRAY SILT ALONG FRACTURES, MINOR IRON OXIDE STAINING	DOLOMITE		NR		
	30				12	9.0	
		STRONG CONDENSATE ODOR IN FRACTURE AT 32.8' IN FRACTURE 45' FROM VERTICAL			13		
	40				14		
	41.61				15		
		STRONG CONDENSATE ODOR IN FRACTURES TO 35.6'			16	5.0	
		AFTER 35.6', FRACTURES LARGELY CEMENTED			17		
					18		
					19		
		T.O. 41.61					
		GROUNDWATER AT 32.75' 1/8" FLOATING PRODUCT STRONG CONDENSATE ODOR 6/21/91					
	50						
	60						
	70						



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029.01**BORING NUMBER **MW-56 (BH-82)**DATE DRILLED **6/27/91**DRILLING METHOD **SCHRAMM ROTARY/CORE**DRILLED BY **BOYLES BROS.**LOGGED BY **GHR**CHECKED BY **BJS**DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL	
							VENTED CAP	LOCKING STEEL PROTECTOR
		NOTE: SEE BORING RECORD # 83 FOR MORE DETAILED LITHOLOGIC DESCRIPTION						
		GROUND SURFACE: 3785.6						
	0.0	SANDY SILT:	SM				1.0	CASING DATUM: 3787.70
	2.1	SANDY DOLOMITE:	SANDY					WEEP HOLE
	10.0	SANDY DOLOMITE:						CONCRETE PAD
	20.0	SILTSTONE:	SILTSTONE					CEMENT/BENTONITE GROUT MIX
	25	DOLOMITE:	DOLOMITE					8" PVC CONDUCTOR CASING
	38.0	DOLOMITE:	DOLOMITE					10 5/8" BOREHOLE
	46.0	DOLOMITE:	DOLOMITE					
	48.0	DOLOMITE:	DOLOMITE					
	50	DOLOMITE:	DOLOMITE					
	56.0	DOLOMITE:	DOLOMITE					
	58.0	DOLOMITE:	DOLOMITE					
	65.0	GYPSUM:	GYPSUM					
	67.0	DOLOMITE:	DOLOMITE					
	74.0	DOLOMITE:	DOLOMITE					
	75	DOLOMITE:	DOLOMITE					
	76.0	DOLOMITE:	DOLOMITE					
	80.0	DOLOMITE:	DOLOMITE					
	87.0	DOLOMITE:	DOLOMITE					
	88.0	DOLOMITE:	DOLOMITE					
	90.0	DOLOMITE:	DOLOMITE					
	91.5	SILTSTONE:	SILTSTONE					
	96.0	DOLOMITE:	DOLOMITE					
	100	DOLOMITE:	DOLOMITE					
	106.0	DOLOMITE:	DOLOMITE					
	108.0	LIMESTONE:	LIMESTONE					
	119.0	LIMESTONE:	LIMESTONE					
	122.0	DOLOMITE:	DOLOMITE					
	125	LIMESTONE:	LIMESTONE					
	126.0	LIMESTONE:	LIMESTONE					
	140.0	LIMESTONE:	LIMESTONE					
	142.0	SILTSTONE:	SILTSTONE					
	148.0	LIMESTONE:	LIMESTONE					
	149.0	LIMESTONE:	LIMESTONE					
	150	LIMESTONE:	LIMESTONE					
	154.0	LIMESTONE:	LIMESTONE					
	158.0	LIMESTONE:	LIMESTONE					
	162.0	LIMESTONE:	LIMESTONE					
	164.0	DOLOMITE:	DOLOMITE					
	166.0	DOLOMITE:	DOLOMITE					
	172.0	SANDSTONE: DOLOMITIC	SANDSTONE					
	175							

	SPLIT-SPOON SAMPLER		WATER TABLE (TIME OF BORING)
	STANDARD PENETRATION TEST		LABORATORY TEST LOCATION
	UNDISTURBED SAMPLE		PENETROMETER (TONS/SQ. FT.)
	WATER TABLE (24 HOURS)	NR: NO RECOVERY	NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **MW-57 (BH-83)**

DATE DRILLED **6/25/91**

DRILLING METHOD **AIR ROTARY**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

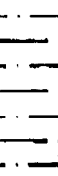
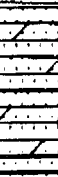
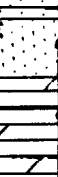
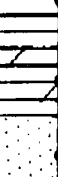
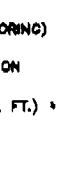
ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3895

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 14.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM	
		GROUND SURFACE: 3821.60																	
	0	CLAYEY SILT: LIGHT BROWN, 7.5 YR 6/3, 30% CLAY, 80% SILT, FIRM TO LOOSE, FRIABLE, 10% CALCARE DEPOSITS, DRY	ML											1	0.0	GC	2.0		0
														2	0.0	GC	4.0		
														3	0.0	GC	6.0		
	5	SILTSTONE: LIGHT GRAY, 5 YR 7/1, SLIGHTLY HARD, FRIABLE, DRY, WEATHERED APPEARANCE, SILICEOUS	SILTSTONE											4	0.0	GC	8.0		5
														5	0.0	GC	10.0		
	10	DOLOMITE: SANDY, LIGHT GRAY, 5 Y 7/1, AND LIGHT BROWNISH GRAY 10 YR 6/2, VERY SLIGHTLY CALCAREOUS, HARD, DRY, DENSE, SCATTERED HEMATITE ~ 5% THROUGHOUT	SANDY DOLOMITE											6	0.0	GC	12.0		10
														7	0.0	GC	14.0		
														8	0.0	GC	16.0		
	15	DOLOMITE: 10 YR 6/1, GRAY, VERY HARD, VERY FINE MICROCRYSTALLINE, DENSE, CHERTY, DRY, FRACTURED INTERVAL FROM 15.0-15.2', AND 16.2-16.4', DRY	DOLOMITE											9	0.0	GC	18.0		15
														10	0.0	GC	20.0		
	18.0	DOLOMITE: AS ABOVE, INTERBEDDED WITH SANDSTONE, VERY FINE GRAIN, LIGHT BROWNISH GRAY, 10 YR 6/2, AND PALE BROWN, 10 YR 6/3, SILICEOUS CEMENT, DRY, DENSE	DOLOMITE / SANDSTONE											11	0.0	GC	22.0		20
	20.5	SANDSTONE: PALE BROWN, 10 YR 6/3, AND GRAYISH BROWN, 2.5 YR 5/2, ARGILLACEOUS, MODERATELY SOFT, SILICEOUS CEMENT, DRY	SANDSTONE											12	0.0	GC	24.0		
	22.0	DOLOMITE, LIGHT GRAY, VERY FINE CRYSTALLINE, VERY SLIGHTLY SANDY, SLIGHTLY CALC., 10 YR 7/1, VERY HARD, DENSE, DRY, INTERBEDDED WITH SANDSTONE, AS ABOVE, BELOW 25.0'	DOLOMITE											13	0.0	GC	26.0		25
														14	0.0	GC	28.0		
	28.0	SANDSTONE: GRAY, 2.5 YR N6/0, AND GRAYISH BROWN, 10 YR 5/2, VERY FINE GRAIN SLIGHTLY CALCAREOUS CEMENT, MOD. CEMENTED, MOD. HARD, SLIGHTLY FRIABLE, DENSE	SANDSTONE											15	0.0	GC	30.0		30
	30	SANDSTONE: LIGHT BROWNISH GRAY, 10 YR 6/2, AND PALE BROWN, 10 YR 6/3, SLIGHTLY HARD TO SOFT, VERY FINE GRAIN, VERY SLIGHTLY CALCAREOUS, PREDOMINATELY SILICEOUS, DRY, MASSIVE, WEAKLY CEMENTED	SANDSTONE											1	2.0	GC	32.0		
														2	78.0	GC	34.0		
														3	0.0	GC	35.0		35

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
-  GC: GRAB COMPOST

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3705 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3485

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-84 (MW-58)**

DATE DRILLED **6/29/91**

DRILLING METHOD **7-5/8" AIR HAMMER**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS											SAMPLE				REMARKS
					PPM X 14.0											NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18	18						
		GROUND SURFACE: 3521.60																		
	35	SANDSTONE, AS ABOVE BUT BECOMING VERY POORLY CEMENTED TO UNCONSOLIDATED BELOW 40.0'; SILTY	SANDSTONE													3	0.0	GC	38.0	35
																4	0.0	GC	38.0	
																5	0.0	GC	40.0	
	40	SANDSTONE: LIGHT GRAY 7.5 YR N 7/0, SLIGHTLY DOLOMITIC, SILICEOUS, VERY FINE GRAIN, MOD. HARD, FRIABLE, DRY	SANDSTONE													6	115.0	GC	42.0	40
	42.0															7	91.8	GC	44.0	
	44.0															8	0.0	GC	46.0	
	45	SANDSTONE: LIGHT BROWN, 7.5 YR 8/3, SILICEOUS, VERY FINE GRAIN, VERY POORLY CEMENTED, DRY, SILTY	SANDSTONE													9	0.0	GC	48.0	45
																10	0.0	GC	50.0	
	48.0															11	122.0	GC	52.0	
	50	GRADING TO SANDSTONE: LIGHT BROWNISH GRAY, 10 YR 8/2, VERY FINE GRAIN, SLIGHTLY DOLOMITIC, HARD, DRY, WELL CEMENTED	SANDSTONE													12	13.9	GC	54.0	
																13	280.0	GC	56.0	55
	55															14	0.0	GC	58.0	
		SANDSTONE: BROWN, 7.5 YR 5/3, VERY FINE GRAIN, SILICEOUS, VERY POORLY CEMENTED, LOOSE, MOIST, SILTY	SANDSTONE													15	0.0	GC	60.0	60
	60															16	0.0	GC	62.0	
																17	0.0	GC	64.0	
	65	SANDSTONE: BROWN, 7 YR 5/3, VERY FINE GRAIN, SILICEOUS, VERY POORLY CEMENTED LOOSE, MOIST, SILTY, INTERBEDDED WITH MINOR DOLOMITIC SANDSTONE	SANDSTONE													18	0.0	GC	66.0	65
																19	152.0	GC	68.0	
																20	0.0	GC	70.0	70

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-84 (MW-58)**

DATE DRILLED 6/29/91

DRILLING METHOD 7-5/8" AIR HAMMER

DRILLED BY BOYLES BROS.

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR PAGE 2 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3750 N. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-5000

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 14.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH			
		GROUND SURFACE: 3821.60																		
	70	SANDSTONE: CONTINUED FROM PREVIOUS PAGE	SANDSTONE													21	0.0	GC	72.0	70
																22	148.0	GC	74.0	
	75															23	0.0	GC	76.0	75
	76.0	DOLOMITE: LIGHT GRAY, 5 YR 6/1, MICRO-CRYSTALLINE, CHERT, HARD, DRY	DOLOMITE													24	0.0	GC	78.0	
																25	0.0	GC	80.0	
	80															26	0.0	GC	82.0	80
	82.0	SANDSTONE: LIGHT GRAY, 7.5 YR N 7/0, VERY FINE GRAIN, SLIGHTLY DOLOMITIC, MODERATELY HARD, FRIABLE, DRY	SANDSTONE													27	0.0	GC	84.0	
	84.0	SANDSTONE: GRAYISH BROWN, 10 YR 5/2, SOFT, VERY POORLY CEMENTED, VERY FINE GRAIN, MOIST	SANDSTONE													28	0.0	GC	86.0	
	85	BELOW 88.0', SANDSTONE AS ABOVE INTER-BEDDED WITH SANDSTONE, 7.5 YR N 7/0, VERY FINE GRAIN, VERY SLIGHTLY DOLOMITIC, MOD. SILICEOUS CEMENT, FRIABLE, THINLY BEDDED														29	0.0	GC	88.0	85
	90															30	0.0	GC	90.0	
																31	47.4	GC	92.0	90
	94															32	0.0	GC	94.0	
	95	SANDSTONE: DOLOMITIC, GRAY, 10 YR 6/1, MOD. HARD, VERY FINE GRAIN, MOD. CEMENTED, DRY	DOLOMITIC SANDSTONE													33	18.3	GC	96.0	95
																34	88.1	GC	98.0	
	97	DOLOMITE: GRAYISH BROWN, 10 YR 5/2, PREDOMINATELY MICROCRYSTALLINE, TRACE FN CRYSTALLINE, SLIGHTLY SANDY DOLOMITE, HARD, DENSE, DRY	DOLOMITE													35	0.0	GC	100.0	
	100	DOLOMITE: GRAYISH BROWN, 10 YR 5/2, MICROCRYSTALLINE, SOME FN CRYSTALLINE WITH SANDY TEXTURE, HARD, DENSE, DRY, VERY SLIGHTLY CALCAREOUS	DOLOMITE													36	0.0	GC	102.0	100
																37	0.0	GC	104.0	
	104	DOLOMITE: GRAYISH BROWN, 10 YR 5/2,	DOLOMITE													38	0.0	GC	106.0	105

SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-84 (MW-58)**

DATE DRILLED 8/29/91

DRILLING METHOD 7-5/8" AIR HAMMER

DRILLED BY BOYLES BROS.

LOGGED BY GHR

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

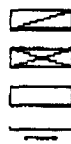
NORMAN, OKLAHOMA 73072

(800) 321-3888

PAGE 3 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS										SAMPLE				REMARKS
					PPM X 16.0										NUMBER	OVM READING	RECOVERY	DEPTH	
					2	4	6	8	10	12	14	16	18						
		GROUND SURFACE: 3821.60																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	105	AND BROWN, 10 YR 5/3, MICROCRYSTALLINE, CHERTY, DENSE, HARD, DRY, INTERBEDDED WITH SILTSTONE, MINOR DUSKY YELLOWISH GREEN, 5 GY 5/2, SOFT, FISSILE	DOLOMITE												38	0.0	GC	105	
															39	0.0	GC	106.0	
															40	0.0	GC	108.0	
																0.0	GC	110.0	
	110	BECOMING VERY SILTY DOLOMITE BELOW, 110.0'													41	0.0	GC	110	
																0.0	GC	112.0	
	112.0	SANDY DOLOMITE: LIGHT GRAY, 10 YR 6/1, COARSELY CRYSTALLINE, DENSE, HARD, DRY, INTERBEDDED WITH SILT, LIGHT GRAY 10 YR 7/1, VERY SOFT, UNCONSOLIDATED POWDERY IN CUTTINGS, DRY	DOLOMITE SANDY WITH INTERBEDDED SILT												42	0.0	GC	112.0	
															43	0.0	GC	114.0	
	115														44	248.0	GC	115	
															45	78.0	GC	116.0	
																0.0	GC	118.0	
	118.0	SANDY DOLOMITE: GRAY, 7.5 YR N 6/0, FINE CRYSTALLINE, SANDY, DULL APPEARANCE, HARD, MASSIVE, DRY	SANDY DOLOMITE												46	223.0	GC	118.0	
															47	0.0	GC	120.0	
	120														48	0.0	GC	120	
															49	0.0	GC	122.0	
															50	0.0	GC	124.0	
	124.0	DOLOMITE: LIGHT GRAY, 10 YR 6/1, MICROCRYSTALLINE, DENSE, CHERTY, HARD, DRY, VERY SLIGHTLY SILTY	DOLOMITE												51	0.0	GC	124.0	
															52	0.0	GC	126.0	
	125														53	0.0	GC	125	
															54	0.0	GC	128.0	
															55	0.0	GC	128.0	
	130															0.0	GC	130.0	
															56	0.0	GC	132.0	
															57	0.0	GC	134.0	
	135	DOLOMITE: LIGHT GRAY, 10 YR 6/1, MICRO CRYSTALLINE, DENSE, CHERTY, HARD, DRY, SOME VERY SLIGHTLY SILTY	DOLOMITE												58	0.0	GC	135	
															59	0.0	GC	136.0	
	138.0	DOLOMITE, AS ABOVE, INTERBEDDED WITH SANDSTONE, GRAYISH BROWN, 10 YR 5/2, SOFT, VERY POORLY CEMENTED, DRY	DOLOMITE WITH INTERBEDDED SANDSTONE												60	0.0	GC	138.0	
															61	0.0	GC	140.0	
	140																	140	



SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)

L LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-84 (MW-58)**

DATE DRILLED **6/29/91**

DRILLING METHOD **7-5/8" AIR HAMMER**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 4 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

NORMAN, OKLAHOMA 73072

(405) 321-3485

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM x 14.0										SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH		
		GROUND SURFACE: 3821.60																	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM
	140	(CONTINUED FROM PREVIOUS PAGE)	DOLOMITE											56	0.0	GC		140	
	142.0	SANDY DOLOMITE: LIGHT BROWNISH GRAY 10 YR 6/2, VERY FINE CRYSTALLINE, SLIGHTLY SILTY, DENSE, HARD, DRY	SANDY DOLOMITE											57	0.0	GC	142.0		
														58	0.0	GC	144.0		
	145													59	0.0	GC	146.0		
														60	0.0	GC	148.0		
	150													61	0.0	GC	150.0		
		SANDY DOLOMITE, AS ABOVE, GRADING TO GRAY, 7.5 YR N 6/0, HARD, DRY, MASSIVE, DENSE												62	0.0	GC	152.0		
														63	0.0	GC	154.0		
	155													64	0.0	GC	156.0		
														65	0.0	GC	158.0		
	160													66	1.4	GC	160.0		
		SILTSTONE: WHITE 10 YR 8/2, TO PINKISH WHITE 7.5 YR 8/2, INTERBEDDED WITH DOLOMITE, VERY FINE CRYSTALLINE, DENSE, HARD, SILTSTONE, VERY POORLY CEMENTED, POWDERY IN SAMPLES, LOOSE DRY, CALCAREOUS WITH INCREASING DOLOMITE BELOW 168.0'	SILTSTONE WITH INTERBEDDED DOLOMITE											67	1.4	GC	162.0		
	164.0													68	2.8	GC	164.0		
	165													69	0.0	GC	166.0		
														70	0.0	GC	168.0		
	170													71	1.4	GC	170.0		
	172.0	DOLOMITE: LIGHT BROWNISH GRAY, 10 YR 6/2, VERY FINE CRYSTALLINE TO MICRO-CRYSTALLINE, DENSE, HARD, DRY, INTERBEDDED WITH SOME DOLOMITE, SANDY, VERY PALE BROWN 10 YR 7/3, POORLY	DOLOMITE & SANDY DOLOMITE											72	0.0	GC	172.0		
	175													73	0.0	GC	173.0		



SPLIT-SPOON SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
GC GRAB COMPOST

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3750 W. ROBINSON
NORMAN, OKLAHOMA 73072
405/311-3888

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-84 (MW-58)**

DATE DRILLED **6/30/81**

DRILLING METHOD **7-5/8" AIR HAMMER**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 5 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 14.0											SAMPLE				REMARKS
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH	BACKGROUND OVM READING: SOIL: 0.0 PPM AIR: 0.0 PPM		
	175	GROUND SURFACE: 3821.80																	175	
		CONTINUED FROM PREVIOUS PAGE	DOLOMITE & SANDY DOLOMITE												73	0.0	GC	178.0		
															74	0.0	GC	178.0		
															75	0.0	GC	180.0		
	180														76	0.0	GC	182.0	180	
															77	0.0	GC	184.0		
															78	1.4	GC	186.0	185	
	185														79	0.0	GC	188.0		
															80	0.0	GC	190.0		
	190														81	0.0	GC	192.0	190	
	192.0	DOLOMITE: LIGHT GRAY, 5 YR 8/1, MICRO-CRYSTALLINE, CHERTY, DENSE, MASSIVE, HARD, DRY	DOLOMITE												82	0.0	GC	194.0		
															83	0.0	GC	196.0	195	
	195														84	0.0	GC	198.0		
	198.0	DOLOMITIC LIMESTONE: PINK, 7.5 YR 8/3, AND PINKISH GRAY, 7.5 YR 7/2, SOFT, MED. HARD, CHALKY, FINE CRYSTALLINE, DRY, HYDROCARBON ODOR IN SAMPLE #85	DOLOMITIC LIMESTONE												85	25.0	GC	200.0	200	
	200														86	21.0	GC	202.0		
	202.0	LIMESTONE: WHITE, 10 YR 8/2, SOFT, ARGILLACEOUS, VERY CHALKY WITH FAIR HYDROCARBON ODOR IN SAMPLE #88	LIMESTONE												87	2.6	GC	204.0		
															88	280.0	GC	206.0	205	
	205	LIMESTONE: AS ABOVE, AND VERY SANDY LIMESTONE, VERY PALE BROWN, 10 YR 8/3 AND WHITE 10 YR 8/2, FAIR HYDROCARBON ODOR, MOD. CONSOLIDATED, VERY SLIGHTLY MOIST	LIMESTONE SANDY												89	245.0	GC	208.0		
	207.0	SANDSTONE: LIGHT BROWNISH GRAY, 10 YR 8/2, DOLOMITIC, VERY POORLY CEMENTED, MEDIUM GRAINED, SOME FINE GRAINED, POORLY GRADED, ANGULAR	SANDSTONE												90	29.5	GC	210.0	210	



SPLIT-SPHOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

+ PENETROMETER (TONS/SQ. FT.)

GC: GRAB COMPOST

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-84 (MW-58)**

DATE DRILLED **5/30/91**

DRILLING METHOD **7-5/8" AIR HAMMER**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 221-1000

PAGE 6 OF 7

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 14.0										SAMPLE				REMARKS			
					2	4	6	8	10	12	14	16	18	NUMBER	OVM READING	RECOVERY	DEPTH					
		GROUND SURFACE: 3821.60																				
	210	PERMAEABLE SATURATED, NO HYDROCARBON ODOR DETECTED	SANSTONE											91	29.5	GC	212.0			210		
														92	1.0	GC	214.0					
	215													93	0.0	GC	216.0			215		
	216.0	T.D. 216.0'																				
	200																				220	
	225																				225	
	230																				230	
	235																				235	
	240																				240	
	245																				245	

-  SPLIT-SPOON SAMPLER
-  STANDARD PENETRATION TEST
-  UNDISTURBED SAMPLE
-  WATER TABLE (24 HOURS)

-  WATER TABLE (TIME OF BORING)
-  LABORATORY TEST LOCATION
-  PENETROMETER (TONS/SQ. FT.)
-  GC: GRAB COMPOSIT

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **BH-84 (MW-58)**

DATE DRILLED **8/30/91**

DRILLING METHOD **7-5/8" AIR HAMMER**

DRILLED BY **BOYLES BROS.**

LOGGED BY **GHR**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 7 OF 7

ROBERTS/SCHORNICK

& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS

3700 W. ROBINSON

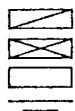
NORMAN, OKLAHOMA 73072

(405) 321-3888

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD #85 FOR MORE DETAILED LITHOLOGIC DESCRIPTION.					
		GROUND SURFACE: 3816.60					
	0.0	CLAYEY SILT:	ML				VENTED CAP
	3.0	DOLOMITE:	DOLOMITE				LOCKING STEEL PROTECTOR
	8.0	SILTSTONE:	SILTSTONE				CASING DATUM: 3819.59
	11.0	SANDSTONE:	SANDSTONE				WEEP HOLE
	16.0	DOLOMITE:	DOLOMITE				CONCRETE PAD
	2.0	SANDSTONE SILTY:	SANDSTONE SILTY				CEMENT BENTONITE GROUT MIX
	30.0						8" PVC CONDUCTOR CASING
	32.0	SANDSTONE:	SANDSTONE				10 5/8" BOREHOLE
		DOLOMITE SANDSTONE:	DOL/SS				
	47.0						VOLCLAY PURE GOLD GROUT MIX
	48.0	SANDSTONE:	SANDSTONE				
		DOLOMITE SANDSTONE:	DOL/SS				
	60.0						
	74.0	CHERTY DOLOMITE:	DOLOMITE				
	79.0	DOLOMITE SANDSTONE:	DOL/SS				
	84.0	SANDSTONE:	SANDSTONE				
	87.0	DOLOMITE SANDSTONE:	DOL/SS				
	90.0						4" PVC RISER
	96.0	CHERTY DOLOMITE:	DOLOMITE				
	100.0	CHERTY DOLOMITE:	DOLOMITE				
	110.0	DOLOMITE:	DOLOMITE				
	116.0	DOLOMITE SANDSTONE:	DOL/SS				
	120.0						
	122.0	DOLOMITE:	DOLOMITE				
	128.0	SANDY DOLOMITE:	SANDY DOL				
	130.5	DOLOMITE SANDSTONE:	DOL/SS				
	135.5	DOLOMITE:	DOLOMITE				
	141.6	DOLOMITE SANDSTONE:	DOL/SS				
	150.0						
	152.0	DOLOMITE:	DOLOMITE				
	180.0						
	190.0	DOLOMITE LIMESTONE:	DOL/LIME				
	192.0	DOLOMITE:	DOLOMITE				
	194.0	LIMESTONE:	LIMESTONE				
	201.0	SANDY DOLOMITE:	SAND/DOL				
	204.0	SANDSTONE:	SANDSTONE				
	205.0	SANDSTONE:	SANDSTONE				
	208.0	SANDSTONE:	SANDSTONE				

TO 208' FEET W/L 1 HR. AFTER DRILLING 191 FEET, 0.9 FEET OF FLOATING PRODUCT



CME CONTINUOUS AUGER SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HOURS)

--- WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/SQ. FT.)
NR: NO RECOVERY
NS: NOT SAMPLED

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON**

BORING NUMBER **MH-59 (BH-85)**

DATE DRILLED **7/5/91**

DRILLING METHOD **AIR ROTARY 10 5/8"**

DRILLED BY **BOYLES BROS.**

LOGGED BY **WEP**

CHECKED BY **BJS**

DRAWN BY: **BDR**

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD # 86 FOR MORE DETAILED LITHOLOGIC DESCRIPTION					
		GROUND SURFACE: 3812.10					
	0	CLAYEY SILT:	DOLOMITE				VENTED CAP
	1.5	DOLOMITE:					LOCKING STEEL PROTECTOR
	9.0	DOLOMITIC SANDSTONE:	SANDSTONE				CASING DATUM: 3815.28
	15.0	SANDSTONE:	SANDSTONE				WEEP HOLE
	19.0	DOLOMITIC SANDSTONE:	SANDSTONE				CONCRETE PAD
	27.0	SANDSTONE:	SANDSTONE				CEMENT/BENTONITE GROUT MIX
	30.0	SILTSTONE:	DOLOMITE				8" SCH 40 PVC FLUSH THREAD CONDUCTOR CASING
	32.5	DOLOMITE:	SANDSTONE				14" BOREHOLE
	34.5	DOLOMITIC SANDSTONE:	SANDSTONE				
	37.0	DOLOMITE:	DOLOMITE				
	40.0	DOLOMITIC SANDSTONE:	SANDSTONE				
	45.0	DOLOMITE:	SANDSTONE				
	49.5	DOLOMITIC SANDSTONE:	SANDSTONE				
	50.5	SANDSTONE:	SANDSTONE				
	59.0	DOLOMITIC SANDSTONE:	SANDSTONE				
	70.0	DOLOMITIC SANDSTONE:	SANDSTONE				
	72.0	SANDSTONE:	SANDSTONE				
	73.0	DOLOMITIC SANDSTONE:	DOLOMITE				
	77.5	SANDY DOLOMITE:	DOLOMITE				
	81.0	SANDY DOLOMITE:	SANDSTONE				
	93.0	SANDSTONE:	DOLOMITE				
	95.0	SANDY DOLOMITE:	DOLOMITE				
	100.0	DOLOMITE:	DOLOMITE				
	105.0	DOLOMITE:	DOLOMITE				
	109.0	SANDY DOLOMITE:	DOLOMITE				
	115.0	DOLOMITIC SANDSTONE:	SANDSTONE				
	121.0	DOLOMITE:	DOLOMITE				
	127.0	SANDY DOLOMITE:	DOLOMITE				
	131.0	DOLOMITIC SANDSTONE:	SANDSTONE				
	137.0	SANDY DOLOMITE:	DOLOMITE				
	140.0	SANDY DOLOMITE:	DOLOMITE				
	145.0	DOLOMITIC SANDSTONE:	SANDSTONE				
	169.0	SILTSTONE:	SILTSTONE				
	170.0	SANDY DOLOMITE:	DOLOMITE				
	175.0	DOLOMITE:	DOLOMITE				
	185.0	SANDSTONE:	SANDSTONE				
	185.5	DOLOMITE:	DOLOMITE				
	203.0	DOLOMITIC SANDSTONE:	SANDSTONE				
	210.0	SANDSTONE:	SANDSTONE				
	220.0	BORING TERMINATED AT 220.0'					

7/12/91
▽ 185.59'

▽ 210.0'

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **MW-60 (BH-86)**

DATE DRILLED 7/12/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROS.

LOGGED BY M.J.

CHECKED BY BJS

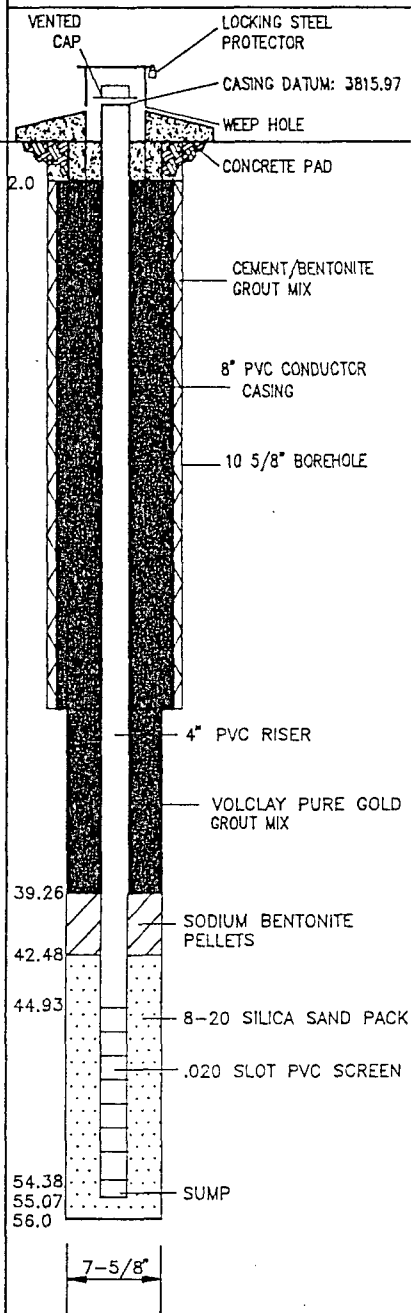
DRAWN BY: SAR PAGE 1 OF 1

ROBERTS/SCHORNICK
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL	
							VENTED CAP	LOCKING STEEL PROTECTOR
		NOTE: SEE BORING RECORD # 83 FOR MORE DETAILED LITHOLOGIC DESCRIPTION						
	0	GROUND SURFACE: 3813.60						
		CLAYEY SILT:	ML		1			
	3.5				2			
		SANDSTONE:	SAND-STONE		3			
					4			
	9.0				5			
	10	SANDY DOLOMITE:	SANDY DOLO.		6			
	13.0				7			
		SANDSTONE:	SAND-STONE		8			
	17.0				9			
		DOLOMITE - SANDY DOLOMITE:	DOLO. & SANDY DOLO.		10			
	20				11			
	21.0				12			
		SANDSTONE:	SAND-STONE		13			
					14			
					15			
	30				16 GC			
		SANDSTONE:			17 GC			
					18 GC			
					19 GC			
					20 GC			
	40		SAND-STONE		21 GC			
					22 GC			
					23 GC			
					24 GC			
	50				25 GC			
					26 GC			
					27 GC			
					28 GC			
	56.0	BORING TERMINATED AT 56.0'						
	60	NOTE: SEE LOG BH-87 FOR MORE IN-DEPTH DESCRIPTION.						
	70							



- | | | | |
|--|---------------------------|-----------------|------------------------------|
| | SPLIT-SPOON SAMPLER | | WATER TABLE (TIME OF BORING) |
| | STANDARD PENETRATION TEST | | LABORATORY TEST LOCATION |
| | UNDISTURBED SAMPLE | | PENETROMETER (TONS/SQ. FT.) |
| | WATER TABLE (24 HOURS) | NR: NO RECOVERY | NS: NOT SAMPLED |

ROBERTS/SCHORNICK
 & ASSOCIATES, INC.
 ENVIRONMENTAL CONSULTANTS
 3700 W. ROBINSON
 NORMAN, OKLAHOMA 73072
 (405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-61 (BH-87)**

DATE DRILLED 7/12/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE:					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3815.96 WEEP HOLE CONCRETE PAD
	0	CLAYEY SILT:	ML				
	9.0	SANDSTONE:	SS W/ DOLO.			2.0	
	15.0	DOLOMITE:	DOLO. W/ SDY. DOLO.				
	23.0	SANDSTONE:	SS W/ SDY. DOLO.				
	35	SANDSTONE:	SANDSTONE				CEMENT BENTONITE GROUT MIX 8" PVC CONDUCTOR CASING 10 5/8" BORHOLE
	70	SANDSTONE:	SANDSTONE				
	77.0	SANDY DOLOMITE:	SDY. DOLO.				
	83.0	SANDSTONE:	SANDSTONE				
	95.0	DOLOMITE SANDSTONE:	DOLO. SS				
	101.0	SANDY DOLOMITE:	SDY. DOLO.				
	105	DOLOMITIC SANDSTONE:	DOLO. SS				4" PVC RISER
	107.0	SANDSTONE:	SANDSTONE				
	111.0	SANDY DOLOMITE:	SDY. DOLO.				
	122.0	DOLOMITIC SANDSTONE:	DOLO. SS				
	131.0	SANDY DOLOMITE:	SDY. DOLO.				
	140	DOLOMITIC SANDSTONE:	DOLO. SS				
	141.0	SANDY DOLOMITE:	SDY. DOLO.				
	147.0	DOLOMITIC SANDSTONE:	DOLO. SS				
	149.0	SANDSTONE:	SANDSTONE				
	171.0	DOLOMITIC SANDSTONE:	DOLO. SS				168.2 171.1 173.5 SODIUM BENTONITE PELLETS
	175	SANDSTONE:	SANDSTONE				
	185.0	SANDY DOLOMITE:	SDY. DOLO.				8-20 SILICA SAND PACK .020 SLOT PVC SCREEN
	187.0	SANDSTONE:	SANDSTONE				
	206.0	SANDSTONE:	SANDSTONE				212.7 213.3 214.0 SUMP
	210	BORING TERMINATED AT 214.0'					
	214.0						
	245						

NOTE:
SEE LOG BH-87A FOR MORE
IN-DEPTH DESCRIPTION.

- | | | | |
|---|---------------------------|---|------------------------------|
|  | SPLIT-SPOON SAMPLER |  | WATER TABLE (TIME OF BORING) |
|  | STANDARD PENETRATION TEST |  | LABORATORY TEST LOCATION |
|  | UNDISTURBED SAMPLE |  | PENETROMETER (TONS/SQ. FT.) |
|  | WATER TABLE (24 HOURS) | NR: | NO RECOVERY |
| | | NS: | NOT SAMPLED |

ROBERTS/SCHORNICK

& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-61A (BH-87A)**

DATE DRILLED 7/15/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD # 83 FOR MORE DETAILED LITHOLOGIC DESCRIPTION					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3819.90 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX 12" PVC CONDUCTOR CASING 14" BOREHOLE VOLCLAY PURE GOLD GROUT MIX 4" PVC RISER SODIUM BENTONITE PELLETS 8-20 SILICA SAND PACK .020 SLOT PVC SCREEN SUMP
	0.0	GROUND SURFACE: 3817.00					
	0.3	CLAYEY SILT:	ML				
	8.0	CHERTY DOLOMITE:	CRT.DOLO.				
	10.0	SILTSTONE CHERTY DOLOMITE:	CRT.DOLO.				
	12.0	CHERTY DOLOMITE:	CRT.DOLO.				
		DOLOMITIC SILTSTONE:	DOLO. SILTSTONE				
	22.0	SANDSTONE:	SS				
	30.0	SANDSTONE:	SS				
	34.0	SANDSTONE:	SS				
	55.0	SANDSTONE:	SS				
	40.0	SANDSTONE:	SS				
	42.0	SANDSTONE:	SS				
	50.0	SANDSTONE:	SS				
	52.0	SANDSTONE:	SS				
	54.0	SANDSTONE:	SS				
	66.0						
	70.0	CHERTY DOLOMITE:	CRT.DOLO.				
	72.0	DOLOMITIC SANDSTONE:	DOLO.SS				
	74.0	DOLOMITIC SANDSTONE:	DOLO.SS				
	77.0	DOLOMITIC SANDSTONE:	DOLO.SS				
			DOLO.SS				
	92.0	CHERTY DOLOMITE:	CRT.DOLO.				
	96.0	CHERT:	CHERT				
	100.0	CHERTY DOLOMITE:	CRT.DOLO.				
	102.0	CHERTY DOLOMITE:	CRT.DOLO.				
	106.0	CHERTY DOLOMITE:	CRT.DOLO.				
	114.0	DOLOMITIC SANDSTONE:	DOLO.SS				
	116.0	CHERTY DOLOMITE:	CRT.DOLO.				
	128.0	DOLOMITIC SANDSTONE:	DOLO.SS				
	134.0						
	136.0	SANDSTONE & CHERTY DOLOMITE:	SS/CT.DOLO.				
		CHERTY DOLOMITE:	CRT.DOLO.				
	240.0	DOLOMITIC SANDSTONE:	DOLO.SS				
	150.0	DOLOMITIC SANDSTONE:	DOLO.SS				
	154.0	CHERTY DOLOMITE:	CRT.DOLO.				
	162.0	DOLOMITIC SANDSTONE:	DOLO.SS				
	164.0	DOLOMITIC SANDSTONE:	DOLO.SS				
	174.0						
	225.0	CHERTY DOLOMITE:	CRT.DOLO.				
	184.0	DOLOMITIC SANDSTONE:	DOLO.SS				
	190.0	CHERTY DOLOMITE:	CRT.DOLO.				
	198.0						
	200.0	CHERTY DOLOMITE:	CRT.DOLO.				
	202.0	CHERTY DOLOMITE:	CRT.DOLO.				
	204.0	CHERTY DOLOMITE:	CRT.DOLO.				
	211.0	SANDSTONE:	SS				
	223.0	BORING TERMINATED AT 223.0'					
		NOTE: SEE LOG BH-88 FOR MORE IN-DEPTH DESCRIPTION.					

	SPLIT-SPOON SAMPLER		WATER TABLE (TIME OF BORING)
	STANDARD PENETRATION TEST		LABORATORY TEST LOCATION
	UNDISTURBED SAMPLE		PENETROMETER (TONS/SQ. FT.)
	WATER TABLE (24 HOURS)	NR: NO RECOVERY	NS: NOT SAMPLED

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-62 (BH-88)**

DATE DRILLED 7/24/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY PHC

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD # 83 FOR MORE DETAILED LITHOLOGIC DESCRIPTION					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3824.49 WEEP HOLE CONCRETE PAD 14" BOREHOLE 12" STEEL CONDUCTOR CASING CEMENT BENTONITE GROUT MIX 10 5/8" BOREHOLE 8" CONDUCTOR CASING VOLCLAY GOLD PURE GROUT MIX 4" PVC RISER SODIUM BENTONITE PELLETS 8-20 SILICA SAND PACK .020 SLOT PVC SCREEN SUMP 7-5/8"
	0	GRAVELLY COBBLEY SILT:	SILT				0
	12.0	CHERTY DOLOMITE:	CRT.DOLO.				
	20.0	CHERTY DOLOMITE:	CRT.DOLO.				
	24.0	SANDSTONE:	SANDSTONE				
	24.5	DOLOMITE:	DOLO.				
	35						
	64.0	SANDSTONE:	SANDSTONE				
	70						
	76.0	DOLOMITE:	DOLO.				
	88.0	SANDSTONE:	SANDSTONE				
	96.0	DOLOMITE:	DOLO.				
	99.0	SANDSTONE:	SANDSTONE				
	105						
	108.0	DOLOMITE:	DOLO.				
	140						
	175						
	187.0	SANDSTONE:	SANDSTONE				
	204.0	DOLOMITE:	DOLO.				
	209.0	SANDSTONE:	SANDSTONE				
	215.0	SANDY DOLOMITE:	DOLO.				
	220.0	BORING TERMINATED AT 220.0'					
		NOTE: SEE LOG BH-89 FOR MORE IN-DEPTH DESCRIPTION.					

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY

NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029**

BORING NUMBER **MW-63 (BH-89)**

DATE DRILLED 7/20/91 TO 7/30/91

DRILLING METHOD AIR HAMMER

DRILLED BY BOYLES BROTHERS

LOGGED BY MJL

CHECKED BY BJS

DRAWN BY: SAR

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3835

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
		NOTE: SEE BORING RECORD #90 FOR MORE DETAILED LITHOLOGIC DESCRIPTION					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3798.57 WEEP HOLE CONCRETE PAD CEMENT BENTONITE GROUT MIX 8" PVC CONDUCTOR CASING 10 5/8" BOREHOLE VOLCLAY PURE GOLD GROUT MIX 4" PVC RISER SODIUM BENTONITE PELLETS .020 SLOT PVC SCREEN 8 - 20 SILICA SAND PACK SUMP 7-5/8"
	0.0	GROUND SURFACE: 3796.1					
	0.2	SILTY SANDY LOAM:	ML				
		SANDSTONE:	SANDSTONE				
	10.0	SANDSTONE:	SANDSTONE				
	12.0	SANDSTONE:	SANDSTONE				
	14.0	SANDSTONE:	SANDSTONE				
	16.0	SANDSTONE:	SANDSTONE				
	18.0	SANDSTONE:	SANDSTONE				
	22.0	SANDSTONE:	SANDSTONE				
	24.0	SANDSTONE:	SANDSTONE				
	26.0	SANDSTONE:	SANDSTONE				
	28.0	SANDSTONE/CHERT:	SANDSTONE				
	30.0	SANDSTONE/DOLOMITE:	SANDSTONE				
	36.0	SANDSTONE:	SANDSTONE				
	40.0	SANDSTONE:	SANDSTONE				
		DOLOMITIC SANDSTONE:	SANDSTONE				
		SANDSTONE:					
	50.0	SANDSTONE:	SANDSTONE				
	59.0	DOLOMITIC CHERT:	DOLOMITIC CHERT				
	64.0	SANDY DOLOMITE:	SANDY DOLOMITE				
	70.0	SANDSTONE:	SANDSTONE				
	81.0	DOLOMITE:	DOLOMITE				
	90.0						
	112.0	DOLOMITIC LIMESTONE:	DOLOMITIC				
	120.0						
	125.0	LIMESTONE:	LIMESTONE				
	130.0	DOLOMITIC LIMESTONE:	LIMESTONE				
	131.0	SANDSTONE:	SANDSTONE				
	144.0	SANDSTONE:	SANDSTONE				
	146.0	DOLOMITIC LIMESTONE:	LIMESTONE				
	150.0	SANDSTONE:	SANDSTONE				
	160.0	DOLOMITIC LIMESTONE:	DOLOMITIC LIMESTONE				
	180.0						
	199.42	T.D. 200.0'					
	210.0						

- | | | | |
|--|---------------------------|-----------------|------------------------------|
| | SPLIT-SPOON SAMPLER | | WATER TABLE (TIME OF BORING) |
| | STANDARD PENETRATION TEST | | LABORATORY TEST LOCATION |
| | UNDISTURBED SAMPLE | | PENETROMETER (TONS/SQ. FT.) |
| | WATER TABLE (24 HOURS) | NR: NO RECOVERY | NS: NOT SAMPLED |

ROBERTS/SCHORNICK
& ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **MW-64 (BH-90)**

DATE DRILLED 8/11/91

DRILLING METHOD AIR ROTARY

DRILLED BY BOYLES BROS.

LOGGED BY WEP

CHECKED BY BJS

DRAWN BY: SAR

PAGE 1 OF 1

WELL COMPLETION RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLE INTERVAL	"N" VALUE	WELL COMPLETION DETAIL
	0	GROUND SURFACE: 3760.3					VENTED CAP LOCKING STEEL PROTECTOR CASING DATUM: 3763.42 WEEP HOLE CONCRETE PAD
	0	SANDY SILTY LOAM: 10 YR 5/6, YELLOWISH BROWN, DRY	ML		1 GC		1.0
	4.0	CHERTY DOLOMITIC LIMESTONE: 10 YR 6/2, LIGHT BROWNISH GRAY, INTERBEDDED WITH CLAYEY SILTSTONE, 10 YR 6/0, LIGHT BROWNISH YELLOW, DRY	LIMESTONE/SILTSTONE		2 GC		
					3 GC		
					4 GC		
					5 GC		
	10	CHERTY DOLOMITIC LIMESTONE: 10 YR 5/3, BROWN INTERBEDDED WITH SILTSTONE, 10 YR 6/6, LIGHT BROWNISH YELLOW, DRY	LIMESTONE/SILTSTONE		6 GC		CEMENT BENTONITE GROUT MIX
	12.0	CHERTY DOLOMITIC LIMESTONE: 10 YR 5/2, GRAYISH BROWN, AND CHERT, 10 YR 6/4, BROWNISH YELLOW, DRY	LIMESTONE/CHERT		7 GC		
					8 GC		
					9 GC		2" PVC RISER
					10 GC		
	20	CHERTY DOLOMITE: 10 YR 6/1, GRAY AND CHERT, 5 Y 7/3, PINK, DRY	CHERTY DOLOMITE		11 GC		
					12 GC		
					13 GC		
					14 GC		
	28.0	DOLOMITE: 10 YR 7/1, LIGHT GRAY, VERY HARD, DRY	DOLOMITE		15 GC		
	30				16 GC		
					17 GC		SODIUM BENTONITE PELLETS
					18 GC		
					19 GC		
					20 GC		
	40				21 GC		.010 SLOT PVC SCREEN
					22 GC		
	42.5	SANDSTONE: 5 YR 4/3, REDDISH BROWN, VERY FINE GRAIN, SOFT, MOIST TO WET	SANDSTONE		23 GC		8 - 20 SILICA SAND PACK
	44.0	CHERTY DOLOMITE: DOLOMITE, 10 YR 5/2, GRAYISH BROWN, CHERT IS 10 YR 5/6, YELLOWISH BROWN, HARD, CHERT EXHIBITS CONCHOIDAL FRACTURING, DOLOMITE - MICROCRYSTALLINE	CHERTY DOLOMITE		24 GC		
					25 GC		
					26 GC		
	50				27 GC		
	54.4	T.D. 54.4'					53.80 54.48 7-5/8"
	60						SUMP
	70						

- SPLIT-SPOON SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/SQ. FT.)

NR: NO RECOVERY
NS: NOT SAMPLED

JOB NAME/NUMBER **MARATHON/91029.01**

BORING NUMBER **MW-65 (BH-91)**

DATE DRILLED **8/12/91**

DRILLING METHOD **AIR ROTARY/DOWNHOLE HAMMER**

DRILLED BY **BOYLES BROS.**

LOGGED BY **JMB**

CHECKED BY **BJS**

DRAWN BY: **SAR**

PAGE 1 OF 1

ROBERTS/SCHORNICK

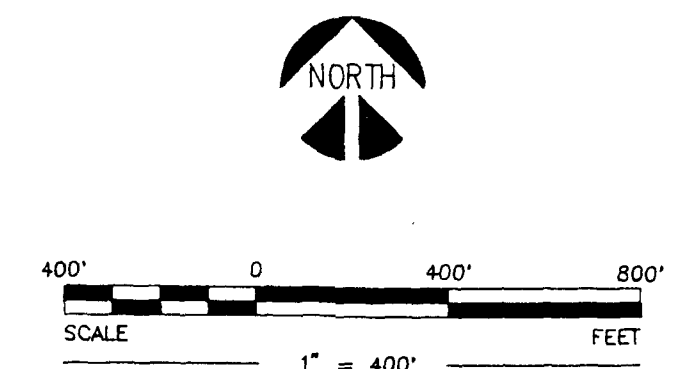
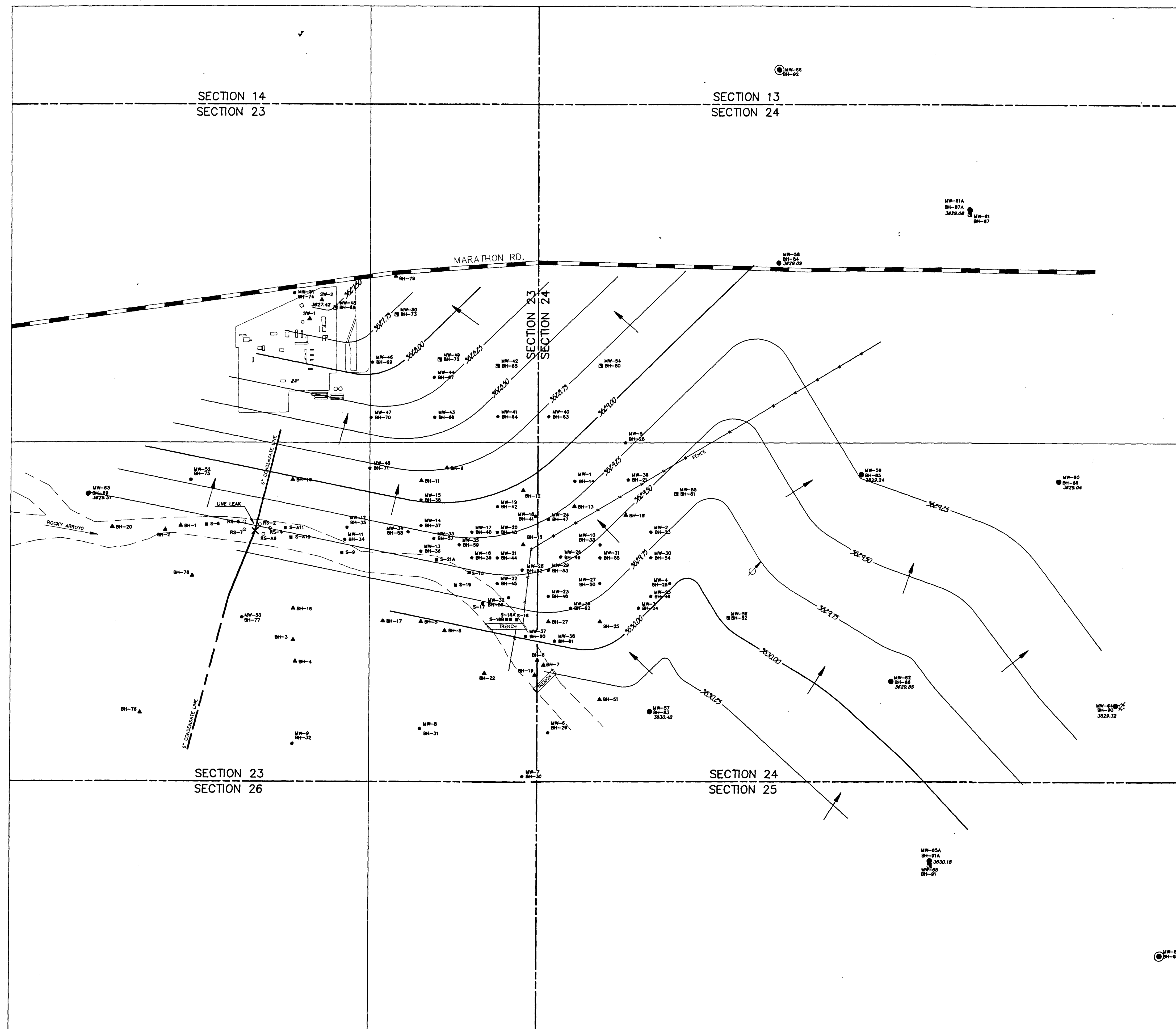
& ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
3700 W. ROBINSON
NORMAN, OKLAHOMA 73072
(405) 321-3895

APPENDIX H

Potentiometric Map - Deep Bedrock

INDIAN BASIN GAS PLANT ARTESIA, NEW MEXICO



LEGEND

- BH-3 ▲ SOIL CHARACTERIZATION BOREHOLE
- MW-1 ● SHALLOW ALLUVIUM GROUNDWATER MONITORING WELL
- MW-57 ● DEEP BEDROCK WELL LOCATION AND ELEVATION OF GROUNDWATER, FEET AMSL, 8/17/91
- MW-58 ● SHALLOW BEDROCK WELL LOCATION
- SW-1 ▲ WATER SUPPLY WELL
- RS-2 ○ 4-INCH PVC RECOVERY SUMP
- S-A11 ■ 24-INCH GALVANIZED STEEL RECOVERY SUMP
- ✕ DRY HOLE, PLUGGED & ABANDONED
- ⊙ INJECTION / DISPOSAL WELL
- POTENTIOMETRIC SURFACE CONTOUR, DEEP BEDROCK WELLS, FEET AMSL, 8/17/91
- CONTOUR INTERVAL = 0.25 FEET
- PROPOSED MONITOR WELL, DEEP BEDROCK

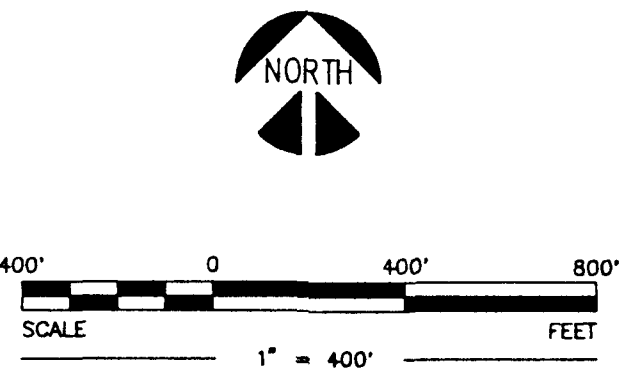
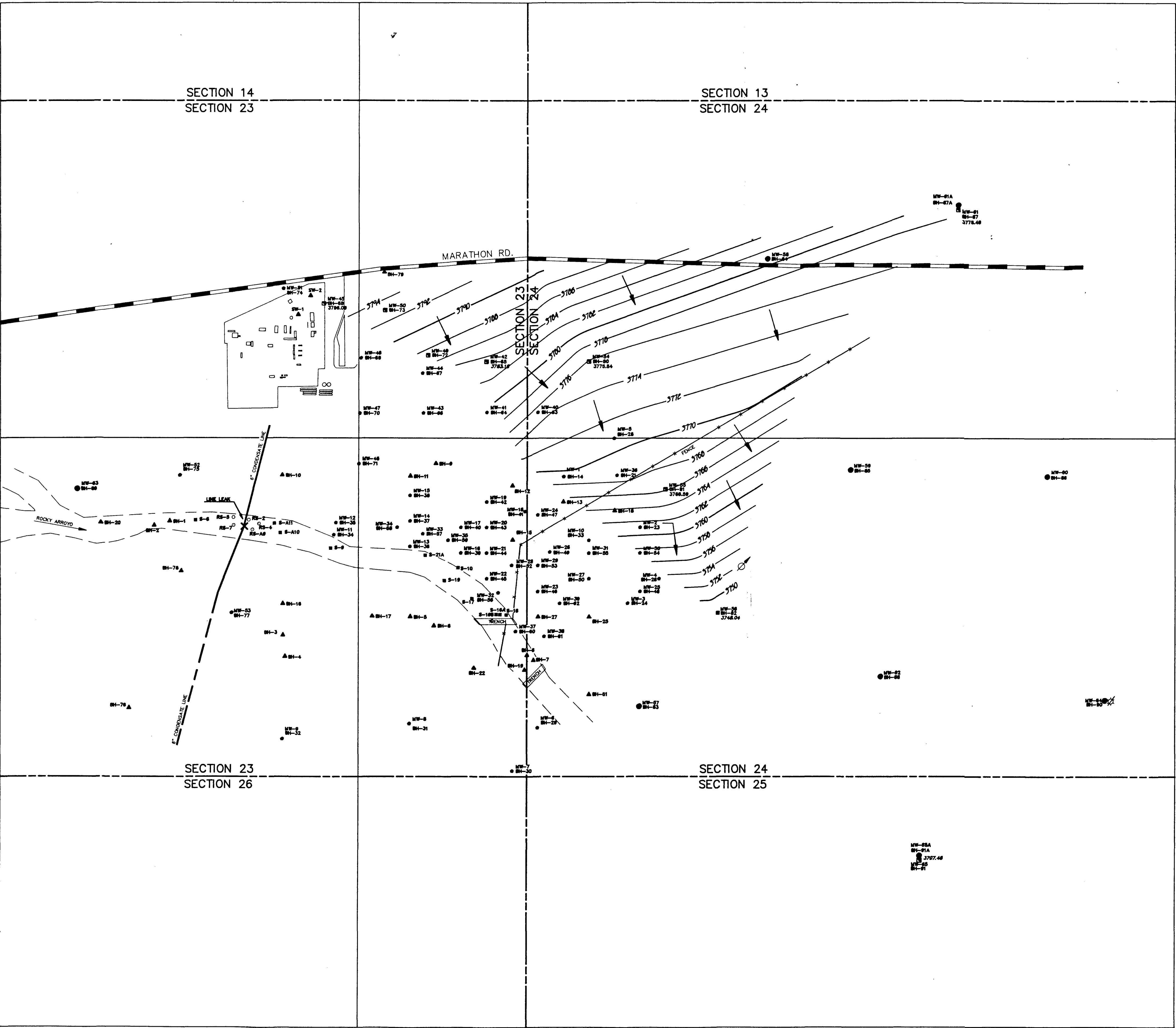
DRAFT

Figure Title: POTENTIOMETRIC SURFACE MAP DEEP BEDROCK WELLS, FEET AMSL, 8/17/91	Client: MARATHON OIL COMPANY
Document Title: PHASE II INVESTIGATION	Location: INDIAN BASIN GAS PLANT
ROBERTS/SCHORNICK & ASSOCIATES, INC. Environmental Consultants 3700 West Robinson, Suite 200 Norman, Oklahoma 73071 (405) 351-3888	DATE: 8/17/91 SCALE: 1"=400' PROJECT NO: 91029 M42
	PREPARED BY: B.J.S. CHECKED BY: B.J.S. DRAFTED BY: RML PLATE NO.:

APPENDIX I

Potentiometric Map - Shallow Bedrock

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



LEGEND

- BH-3 ▲ SOIL CHARACTERIZATION BOREHOLE
- MW-1 ● SHALLOW ALLUVIUM GROUNDWATER MONITORING WELL
- MW-63 ● DEEP BEDROCK WELL LOCATION
- MW-61 ■ SHALLOW BEDROCK WELL LOCATION
- BH-87 ■ AND GROUNDWATER ELEVATION, FEET AMSL, 8/17/91
- 3778.49
- SW-1 ▲ WATER SUPPLY WELL
- RS-2 ○ 4-INCH PVC RECOVERY SUMP
- S-A11 ■ 24-INCH GALVANIZED STEEL RECOVERY SUMP
- ✕ DRY HOLE, PLUGGED & ABANDONED
- INJECTION / DISPOSAL WELL
- 3700 POTENTIOMETRIC SURFACE CONTOUR, SHALLOW BEDROCK WELLS, FEET AMSL, 8/17/91
- CONTOUR INTERVAL = 2 FEET
- DIRECTION OF GROUNDWATER FLOW

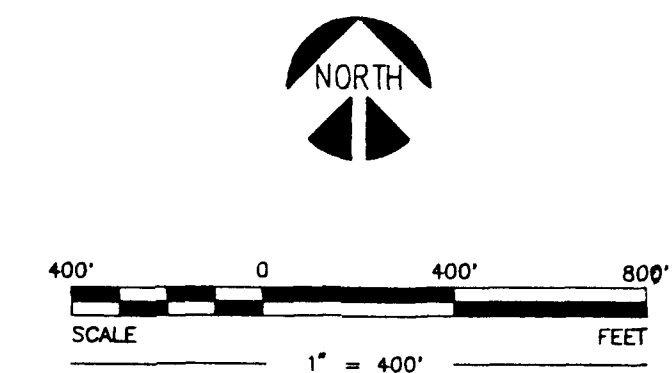
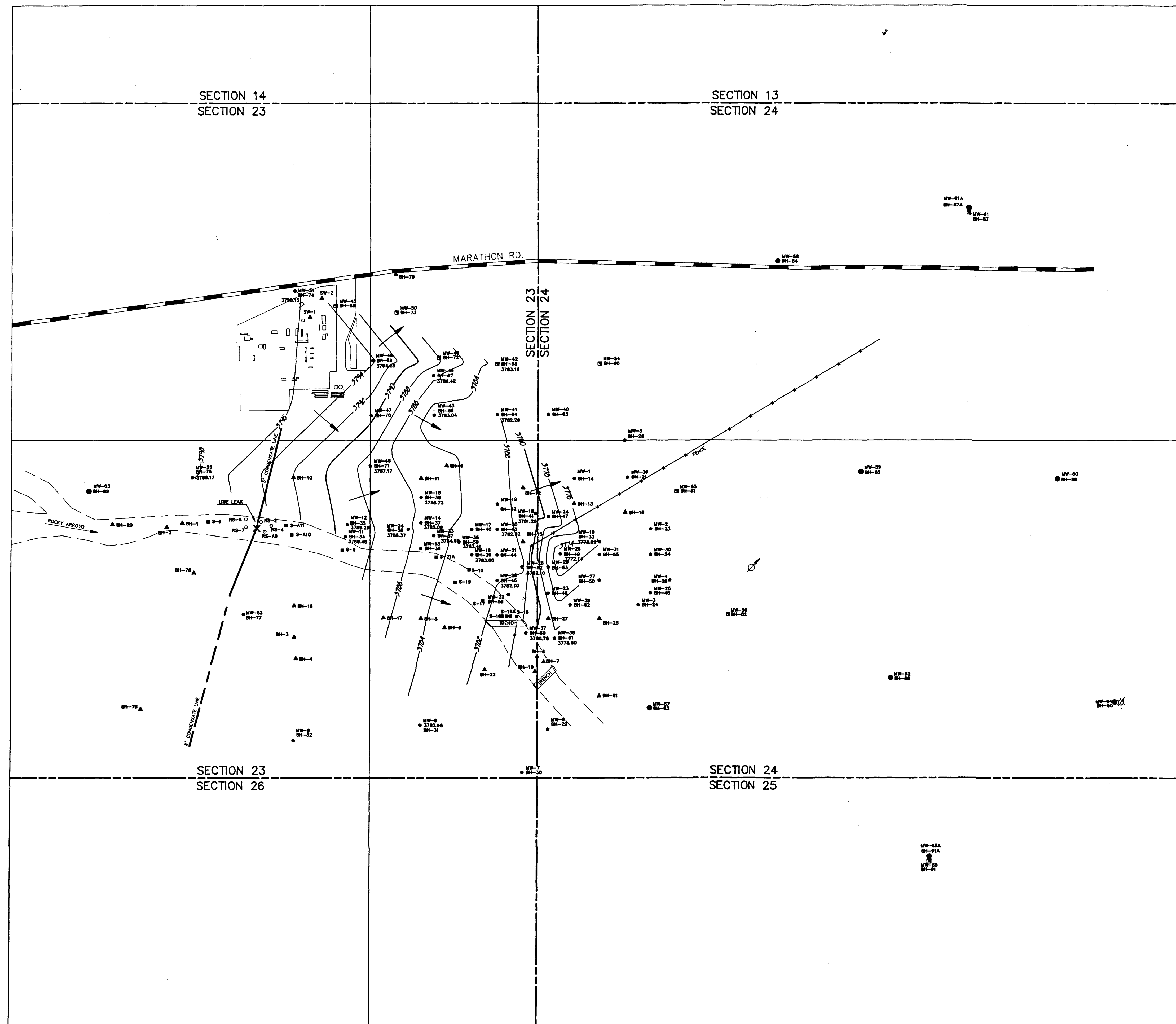
DRAFT

Figure Title: POTENTIOMETRIC SURFACE MAP, SHALLOW BEDROCK WELLS, FEET AMSL, 8/17/91	Client: MARATHON OIL COMPANY
Document Title: PHASE II INVESTIGATION	Location: INDIAN BASIN GAS PLANT
ROBERTS/SCHORNICK & ASSOCIATES, INC. Environmental Consultants 3709 West Robinson, Suite 200 Norman, Oklahoma 73072 (405) 321-3800	DATE: 7/9/91 SCALE: 1"=400' PROJECT NO: 91029 M41
PREPARED BY: B.J.S. CHECKED BY: B.J.S. DRAFTED BY: RML	PLATE NO:

APPENDIX J.

Potentiometric Map - Alluvium

INDIAN BASIN GAS PLANT ARTESIA, NEW MEXICO



LEGEND

- BH-3 ▲ SOIL CHARACTERIZATION BOREHOLE
- MW-14 ● SHALLOW ALLUVIAL GROUNDWATER MONITORING WELL
3771.20 AND GROUNDWATER ELEVATION, FEET AMSL, 8/17/91
- MW-63 ● DEEP BEDROCK WELL LOCATION
- BH-89 ● DEEP BEDROCK WELL LOCATION
- MW-81 ■ SHALLOW BEDROCK WELL LOCATION
- BH-87 ■ SHALLOW BEDROCK WELL LOCATION
- SW-1 ▲ WATER SUPPLY WELL
- RS-2 ○ 4-INCH PVC RECOVERY PUMP
- S-A11 ■ 24-INCH GALVANIZED STEEL RECOVERY SUMP
- ✕ DRY HOLE, PLUGGED & ABANDONED
- ⊙ INJECTION / DISPOSAL WELL
- 3704 POTENTIOMETRIC SURFACE CONTOUR, ALLUVIAL GROUNDWATER,
RECOVERY PUMPS ON, FEET AMSL, 8/17/91
CONTOUR INTERVAL = 2 FEET
- DIRECTION OF GROUNDWATER FLOW

DRAFT

Figure Title: POTENTIOMETRIC SURFACE MAP ALLUVIAL WELLS, FEET AMSL, 8/17/91	Client: MARATHON OIL COMPANY
Document Title: PHASE II INVESTIGATION	Location: INDIAN BASIN GAS PLANT
ROBERTS/SCHORNICK & ASSOCIATES, INC. Environmental Consultants 2700 West Robinson, Suite 200 Norman, Oklahoma 73072 (405) 321-3890	DATE: 7/9/91
	PREPARED BY: B.J.S.
SCALE: 1" = 400'	CHECKED BY: B.J.S.
PROJECT NO: 91029 M40	DRAFTED BY: RML
	PLATE NO.:

APPENDIX K

Monitor Well Analytical Data

APPENDIX K

ALLUVIAL/SHALLOW BEDROCK MONITOR WELL WATER ANALYSES

Monitor Wells (Borehole)	Date Sampled	Benzene	Concentration (PPM)		Xylene	Chlorides
			Toluene	E Benzene		
MW #1 (BH-14)	5/23/91	0.500	ND	1.000	ND	310
MW #10 (BH-33)	5/23/91	5.500	7.000	ND	4.500	60
MW #18 (BH-41)	5/23/91	--	--	--	--	310
MW #19 (BH-42)	5/22/91	--	--	--	--	320
MW #19	7/30/91	4.900	1.000	1.300	2.500	466
MW #21 (BH-44)	5/23/91	0.009	0.009	ND	0.003	230
MW #26 (BH-49)	5/21/91	--	--	--	--	440
MW #37 (BH-60)	6/25/91	ND	ND	ND	ND	52
MW #38 (BH-61)	5/28/91	0.500	ND	0.250	ND	60
MW #38	6/25/91	ND	ND	ND	ND	38
MW #39 (BH-62)	5/28/91	ND	ND	0.011	0.038	9
MW #39	6/25/91	ND	ND	ND	ND	244
MW #41 (BH-64)	6/04/91	--	--	--	--	29
MW #41	7/02/91	0.300	ND	0.350	ND	38
MW #41	7/30/91	0.380	ND	0.220	0.025	71
MW #43 (BH-66)	6/05/91	ND	ND	0.015	0.010	138
MW #43	6/25/91	ND	ND	ND	ND	94
MW #44 (BH-67)	6/04/91	0.075	ND	0.220	ND	33
MW #44	6/25/91	0.050	ND	0.100	ND	34
MW #45 (BH-68)	6/07/91	ND	ND	ND	ND	451
MW #45	6/25/91	ND	ND	ND	ND	507
MW #46 (BH-69)	6/06/91	3.200	ND	0.900	ND	152
MW #46	7/02/91	0.300	ND	0.250	0.250	45
MW #46	7/30/91	0.170	ND	0.260	0.060	76
MW #47 (BH-70)	6/06/91	0.600	ND	2.000	2.700	51
MW #47	6/25/91	0.550	ND	ND	ND	164
MW #49 (BH-72)	6/06/91	0.060	ND	0.060	0.040	365
MW #49	6/25/91	ND	ND	0.020	0.020	310
MW #50 (BH-73)	6/07/91	0.009	0.006	0.001	0.002	376
MW #50	6/25/91	ND	ND	ND	ND	388
MW #54 (BH-80)	6/24/91	ND	ND	ND	ND	97
MW #55 (BH-81)	6/30/91	ND	ND	ND	0.100	200
MW #56 (BH-82)	7/01/91	2.000	0.500	1.000	1.000	102

APPENDIX K

LOWER QUEEN MONITOR WELL WATER ANALYSES

Monitor Wells (Borehole)	Date Sampled	Benzene	Toluene	E Benzene	Xylene	Chlorides
MW-57 (BH-83)	6/25/91	0.005	0.009	ND	0.004	16
MW-57	6/30/91	ND	0.001	ND	ND	15
MW-57	7/19/91	ND	ND	ND	ND	13
MW-58 (BH-84)	7/04/91	0.600	ND	0.200	0.900	65
MW-59 (BH-85)	7/12/91	1.200	ND	0.750	1.500	22
MW-60 (BH-86)	7/14/91	ND	ND	ND	ND	9
MW-60		ND	ND	ND	ND	10
MW-61A (BH-87A)	7/14/91	ND	ND	ND	0.001	10
MW-61A	7/18/91	0.003	0.001	ND	0.003	10