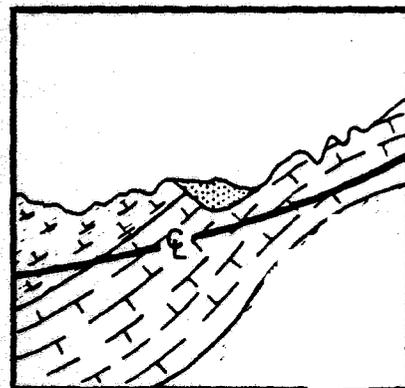
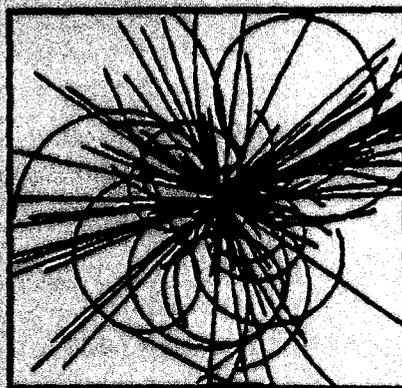


Data Report for Structure Study Zone SF 5.2 and Rotary Wash Borings SF 5.2A and SF 5.2B



Prepared by:  **The Earth Technology Corporation**
Long Beach, California

Prepared for:  **RTK** a joint venture
Oakland, California

FOREWORD

The goal of the geotechnical studies at the Texas Superconducting Super Collider (SSC) site is to allow the geologist and engineer to build their level of knowledge and confidence about the geologic structures and geotechnical properties of the site materials to the point at which there remains only a realistically small risk of encountering geotechnical conditions during construction that would significantly increase construction costs or delay construction schedules. To do this, a characterization program has been designed to meet the following objectives:

- To confirm the site's suitability and optimize the ring location (the "footprint") and hall positions on the ring
- To provide data for a preliminary structural design
- To provide a rational framework within which construction contracts and schedules can be formulated
- To maximize the use of the site-specific data already gathered by the proposer.

The geotechnical program to meet these objectives has been divided into the following three phases of study:

- Footprint location data (the present phase)
- Global data (planned)
- Structure-specific data (planned).

The primary purpose of the present footprint location phase is to quickly assess whether individual components of the collider footprint, or the entire footprint, need to be relocated because of geotechnical constraints. Accordingly, the following areas have been assessed:

- Areas on the western side of the footprint where the geologic structure brings the Eagle Ford Shale close to the depth of the tunnel and experimental halls, thus presenting potential constraints due to weak, deformable rock.
- Areas where the tunnel placement is shallow and/or there are nearby sources of vibration such as major highways and railroads that may represent a problem due to unacceptable vibrations at tunnel depth.
- Zones of potentially poor rock quality and high water inflow in the rock that should be avoided for the experimental hall excavations.

This is one in a series of data reports prepared for the footprint phase of geotechnical characterization at the SSC site. Each data report includes the results of both field and laboratory tests for a specific drilling and sampling site. Interpretations of these data will be covered in topical reports, including three planned reports, as follows:

- Train-, traffic-, and quarry-caused vibrations
- Geomechanical properties of the Eagle Ford Shale
- Structure and stratigraphy of the near-cluster.

Future planned program phases--global and structure-specific data collection--will concentrate on (1) evaluating ring areas where few geotechnical data are currently available and (2) conducting more detailed studies at the sites of the injector and experimental halls.

DATA REPORT

Site Designator: SF5.2

Objective: To constrain existence and location of a fault based on geologic mapping and stratigraphic correlations between borings (determined from wire-line logs).

Hole No. SF5.2A

Location: North ~ 259,975 feet

East ~ 2,251,600 feet

Surface Elevation ~ 482 feet

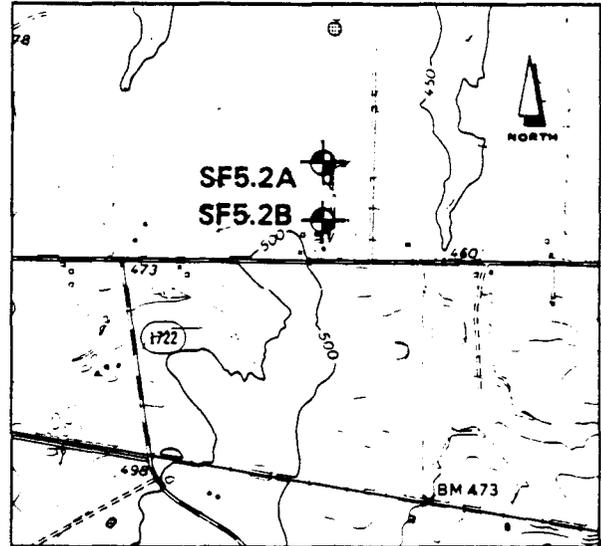
Hole No. SF5.2B

Location: North ~ 259,275 feet

East ~ 2,251,575 feet

Surface Elevation ~ 489 feet

SF5.2A and SF5.2B are located on the eastern side of the proposed tunnel alignment, about 0.2 mile north of State Route 879.



SCALE 1:24,000

1000 0 1000 2000 3000 FEET

CONTOUR INTERVAL 10 FEET

Scope and Schedule: Geologic Mapping	May 28, 1989
SF5.2A: Rotary Wash Boring	June 22, 1989
Wire-line Logging	June 23, 1989
Plugging and Abandonment	June 23, 1989
SF5.2B: Rotary Wash Boring	June 22, 1989
Wire-line Logging	June 22, 1989
Plugging and Abandonment	June 23, 1989

Geologic Mapping: A west-trending lineament identified on the aerial photographs was ground-checked for evidence of faulting over about a 1-mile length. No evidence of faulting was discernible due to the thick soil cover over bedrock (see Appendix A).

Hole No. SF5.2A

Conditions Encountered:

Total Hole Depth 100 feet

Soil 0.0 to 32.0 feet

Taylor Marl 32.0 to 100.0 feet
(see lithologic log, Appendix B)

The wire-line logs indicated about 5 feet of vertical displacement between the two borings, with the strata in SF5.2A (north of the fault) higher than the corresponding strata in SF5.2B (south of the fault).

Geophysical Logging: (See wire-line logs, Appendix C)

Spontaneous Potential
Normal Resistivity (short)
Guarded Resistivity (long)
Natural Gamma
Compensated Density (caliper)
Sonic Velocity (full wave)

Hole Status: Cemented and abandoned.
(See plugging report, Appendix D)

Hole No. SF5.2B

Conditions Encountered:

Total Hole Depth 100 feet

Soil 0.0 to 28.0 feet

Taylor Marl 28.0 to 100.0 feet
(see lithologic log, Appendix B)

The wire-line logs indicated about 5 feet of vertical displacement between the two borings, with the strata in SF5.2A (north of the fault) higher than the corresponding strata in SF5.2B (south of the fault).

Geophysical Logging: (See wire-line logs, Appendix C)

Spontaneous Potential
Normal Resistivity (short)
Guarded Resistivity (long)
Natural Gamma
Compensated Density (caliper)
Sonic Velocity (full wave)

Hole Status: SF5.2A and SF5.2B were cemented in and abandoned.
(See plugging report, Appendix D)

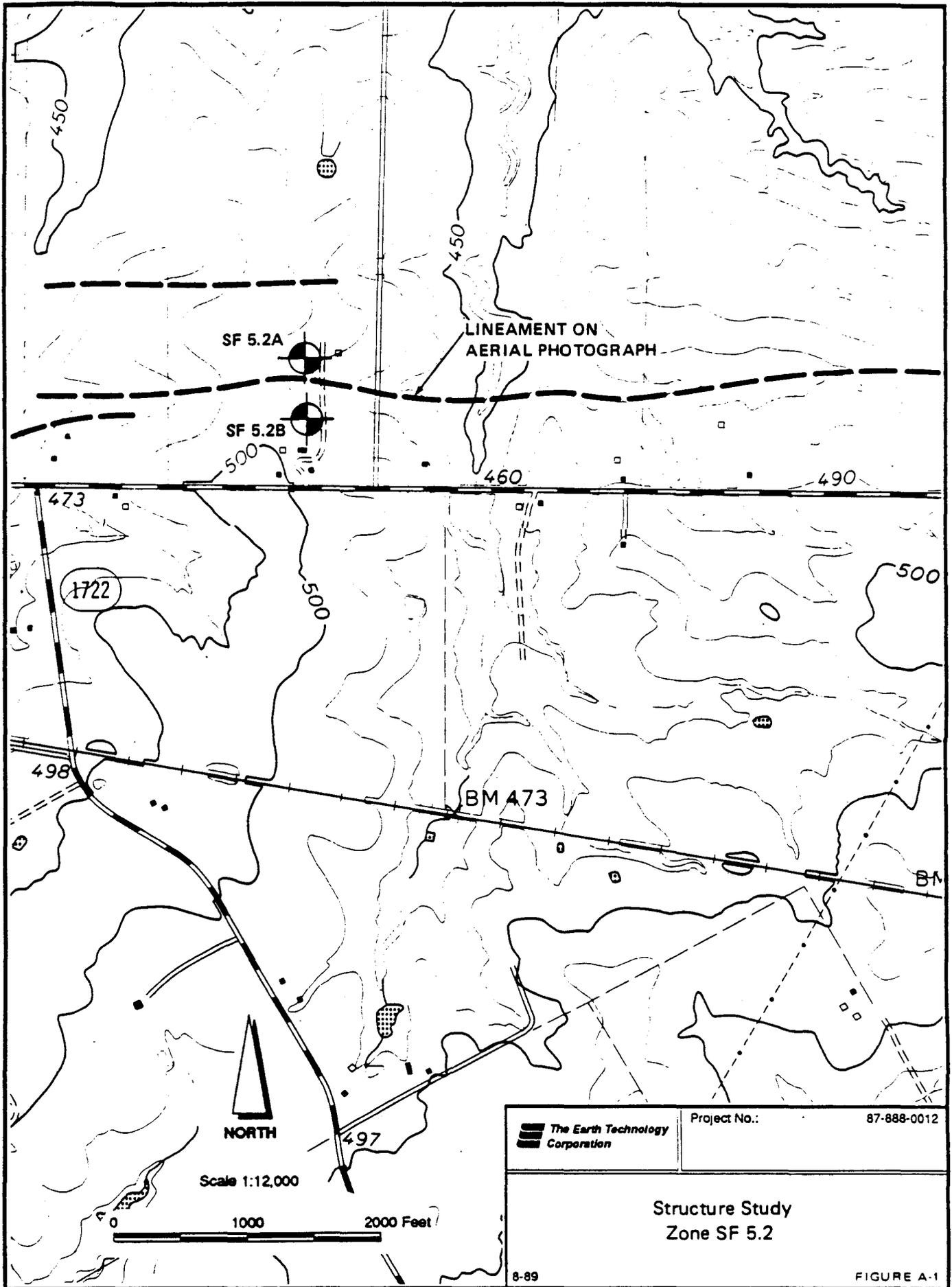
APPENDIX A

STRUCTURE ZONE MAP

STRUCTURE STUDY ZONE SF5.2

Field mapping of Structure Study Zone SF5.2 consisted primarily of a traverse about 1 mile in length of the drainages and fields along the west trending lineament. The lineament was identified on aerial photographs by linearity of the creek and subtle tonal changes in the soil. The surficial geologic formation in this part of the SSC site area is the Taylor Marl. This shaley formation weathers to a relatively deep residual soil that has been covered by alluvial material along the creek; as a result, no bedrock exposures were located from which faulting might be identified.

Borings SF5.2A and SF5.2B were drilled on the north and south side of the lineament, respectively. The borings were located about 700 feet apart because the location of a potential fault associated with the lineament was not constrained during the geologic mapping. Evaluation of the wire-line logs from these borings indicates the potential for 5 feet of vertical displacement between these two borings with SF5.2B (south of the fault) being dropped down relative to SF5.2A (north of the fault). However, both of these borings only penetrate alluvium and the Taylor Marl. The Taylor Marl does not exhibit any distinctive correlatable horizons on the wire-line logs and the interpreted offset is very subjective.



	Project No.: 87-888-0012
Structure Study Zone SF 5.2	
8-89	FIGURE A-1

APPENDIX B

LITHOLOGIC LOGS

LOG OF BORING

PROJECT: TEXAS SSC SITE
 CLIENT: The Earth Technology Corporation
 TASK NO.: 12

BORING NO: SF5.2A PG 2 OF 3
 LOCATION: N ~ 259,975 feet
 E ~ 2,251,600 feet
 GROUND EL: ~ 482 feet

DATE: 6/22/89 TYPE: Air Rotary CASED TO: N/A CONTRACTOR: SwL (89-192)

DEPTH IN FEET	SYMBOL	SAMPLE TYPE & NUMBER	DEPTH RANGE		PERCENT REC.	PERCENT ROD.	STANDARD PENETRATION TEST PER 6 INCHES	HAND PEN. TSF.	SAMPLE LEGEND	WATER INFORMATION
			TOP	BOT.					S = SPLIT SPOON T = 2" THIN WALL TUBE U = 3" THIN WALL TUBE C = NX ROCK CORE	see page 1 of 3
									DESCRIPTION OF STRATUM	
-45									SHALE (Taylor Marl), calcareous, fresh, fissile, bluish-gray	
-50										
-55										
-60										
-65										
-70										
-75										
-80										
-85										
-90										

DRILLING GEOLOGIST S. Wood ASSISTANT N/A CHECKED BY B. Bailey

LOG OF BORING

PROJECT: TEXAS SSC SITE
 CLIENT: The Earth Technology Corporation
 TASK NO.: 12

BORING NO: SF5.2A PG 3 OF 3
 LOCATION: N ~ 259,975 feet
 E ~ 2,252,600 feet
 GROUND EL: ~ 482 feet

DATE: 6/22/89 TYPE: Air Rotary CASED TO: N/A CONTRACTOR: SwL (89-192)

DEPTH IN FEET	SYMBOL	SAMPLE TYPE & NUMBER	DEPTH RANGE		PERCENT REC.	PERCENT ROD.	STANDARD PENETRATION TEST PER 6 INCHES	HAND PEN. TSF.	SAMPLE LEGEND	WATER INFORMATION
			TOP	BOT.					S = SPLIT SPOON T = 2" THIN WALL TUBE U = 3" THIN WALL TUBE C = NX ROCK CORE	see page 1 of 3
DESCRIPTION OF STRATUM										
- 85										SHALE (Taylor Marl), calcareous, fresh, fissile, bluish-gray Bottom of Exploration at 100.0' NOTE: Borehole grouted after completion.
- 90										
- 95										
- 100										
- 105										
- 110										
- 115										
- 120										

DRILLING GEOLOGIST S. Wood ASSISTANT N/A CHECKED BY B. Bailey

LOG OF BORING

PROJECT: TEXAS SSC SITE
 CLIENT: The Earth Technology Corporation
 TASK NO.: 12

BORING NO: SF 5.2B PG 2 OF 3
 LOCATION: N ~ 259,275 feet
 E ~ 2,251,575 feet
 GROUND EL: ~ 489 feet

DATE: 6/22/89 TYPE: Air Rotary CASED TO: N/A CONTRACTOR: SwL (89-192)

DEPTH IN FEET	SYMBOL	SAMPLE TYPE & NUMBER	DEPTH RANGE		PERCENT REC.	PERCENT ROD.	STANDARD PENETRATION TEST PER 6 INCHES	HAND PEN. TSF.	SAMPLE LEGEND	WATER INFORMATION
			TOP	BOT.					S = SPLIT SPOON T = 2" THIN WALL TUBE U = 3" THIN WALL TUBE C = NX ROCK CORE	see page 1 of 3
DESCRIPTION OF STRATUM										
-45										SHALE (Taylor Marl), calcareous, fresh, fissile, bluish-gray
-50										
-55										
-60										
-65										
-70										
-75										
-80										

DRILLING GEOLOGIST S. Wood ASSISTANT N/A CHECKED BY B. Bailey

LOG OF BORING

PROJECT: TEXAS SSC SITE CLIENT: The Earth Technology Corporation TASK NO.: 12	BORING NO: SF 5.2B PG 3 OF 3 LOCATION: N ~ 259,275 feet E ~ 2,251,575 feet GROUND EL: ~ 489 feet
---	---

DATE: 6/22/89 TYPE: Air Rotary CASED TO: N/A CONTRACTOR: SwL (89-192)

DEPTH IN FEET	SYMBOL	SAMPLE TYPE & NUMBER	DEPTH RANGE		PERCENT REC.	PERCENT ROD.	STANDARD PENETRATION TEST PER 6 INCHES	HAND PEN. TSF.	SAMPLE LEGEND	WATER INFORMATION
			TOP	BOT.					S = SPLIT SPOON T = 2" THIN WALL TUBE U = 3" THIN WALL TUBE C = NX ROCK CORE	see page 1 of 3
									DESCRIPTION OF STRATUM	
- 85									SHALE (Taylor Marl), calcareous, fresh, fissile, bluish-gray	
- 90										
- 95										
- 100										
- 105										
- 110								Bottom of Exploration at 100.0' NOTE: Borehole grouted after completion.		
- 115										
- 120										

DRILLING GEOLOGIST S. Wood ASSISTANT N/A CHECKED BY B. Bailey

APPENDIX C
WIRE-LINE LOGS

WIRE-LINE LOGGING PARAMETERS

Hole No. SF5.2A

Log Measured From: Ground Level

Drilling Parameters

Depth 100 feet
Bit Diameter 4.75 inches

Logging Parameters

Electrical Log

Gamma Log

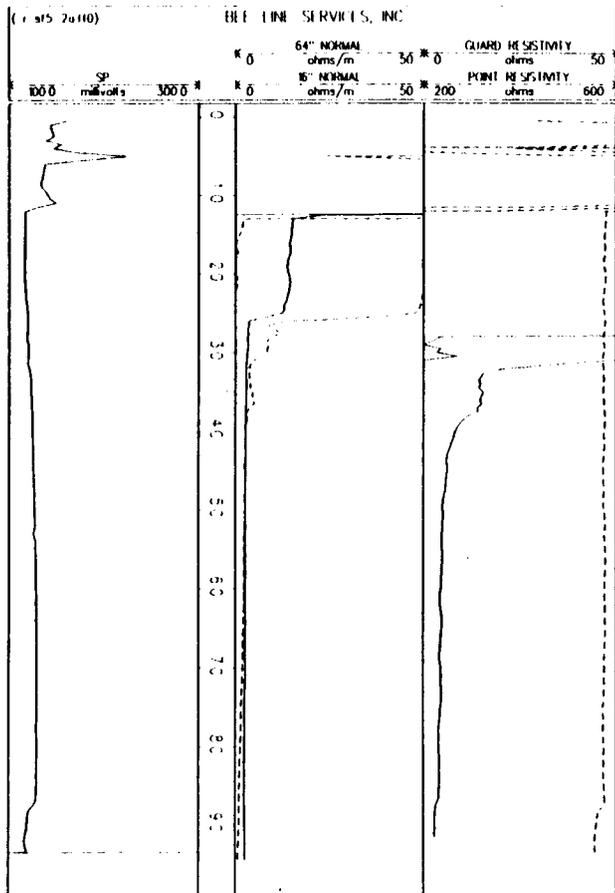
Sonic Log

Date	June 23, 1989	June 23, 1989	June 23, 1989
Bottom Log Interval	97.0 feet	97.0 feet	88.5 feet
Top Log Interval	surface	surface	surface
Type of Fluid in Hole	boring fluid	boring fluid	boring fluid
Time Since Circulation Stop	29 hours	29 hours	29 hours
Probe Type/S.N.	ALP-4979	XAP-4383	CLP-4877A
Module Type/S.N.	ALM-4979	XAM-4383	CLM-4877A
Logging Speed	15 feet/min.	10 feet/min.	5 feet/min.
Sample Interval	0.5 feet	0.5 feet	0.1 feet

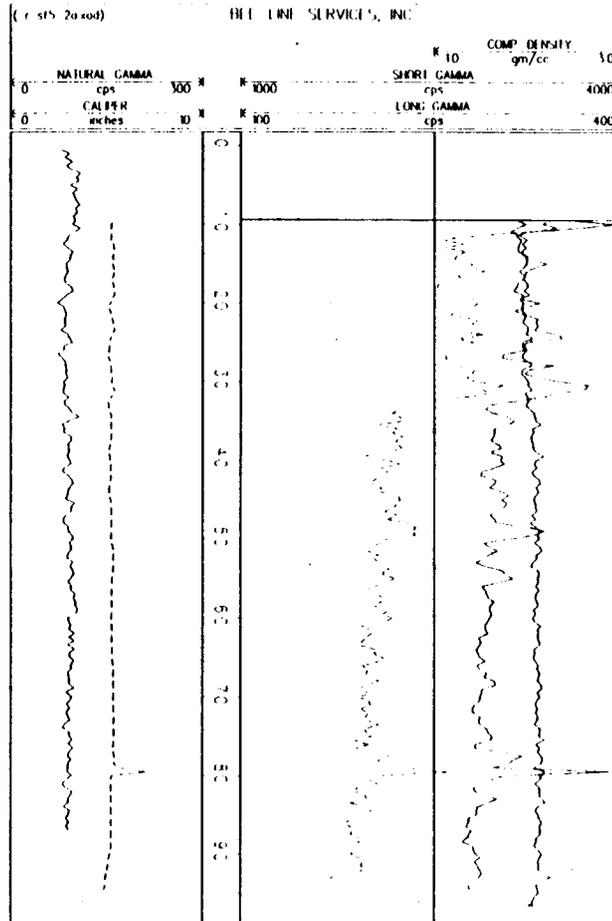
Logged by: BEE-LINE SERVICES, INC.
P.O. Box 2096
Corsicana, TX 75151

SF5.2A Wire-line logs run June 23, 1989. Surface elevation approximately 482 feet.

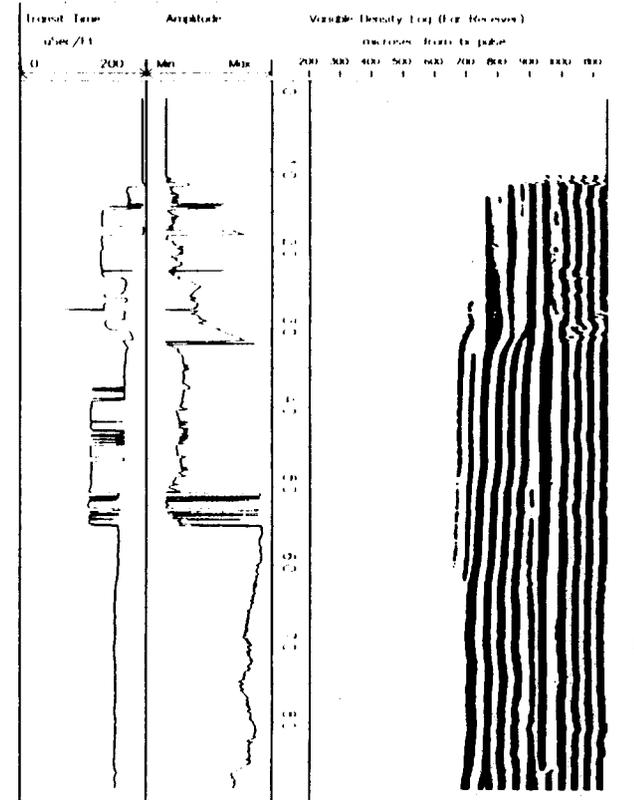
ELECTRICAL LOG



GAMMA LOG



SONIC LOG



WIRE-LINE LOGGING PARAMETERS

Hole No. SF5.2B

Log Measured From: Ground Level

Drilling Parameters

Depth 100 feet
Bit Diameter 4.75 inches

Logging Parameters

Electrical Log

Gamma Log

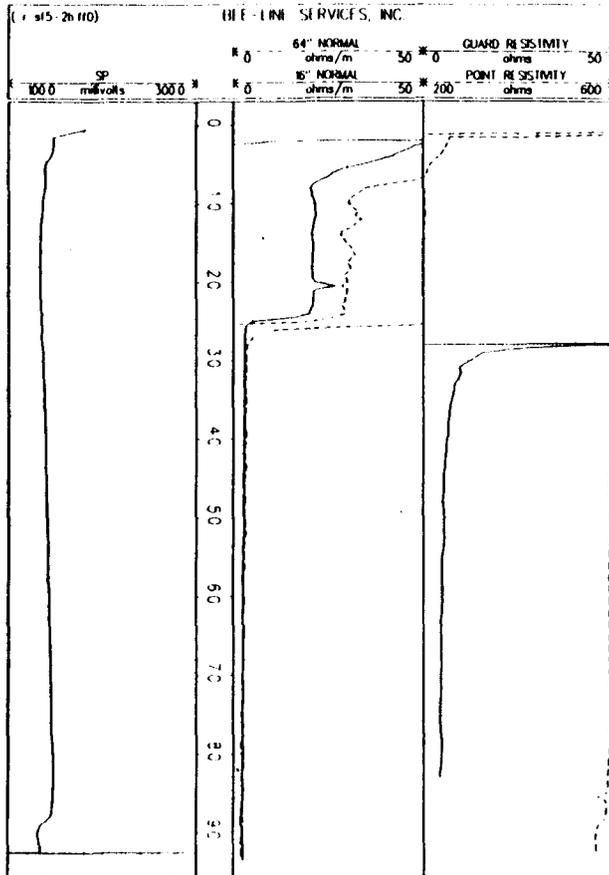
Sonic Log

Date	June 22, 1989	June 22, 1989	June 22, 1989
Bottom Log Interval	93.5 feet	88.5 feet	82.8 feet
Top Log Interval	surface	surface	surface
Type of Fluid in Hole	boring fluid	boring fluid	boring fluid
Time Since Circulation Stop	4 hours	4 hours	4 hours
Probe Type/S.N.	ALP-4979	XAP-4383	CLP-4877A
Module Type/S.N.	ALM-4979	XAM-4383	CLM-4877A
Logging Speed	15 feet/min.	15 feet/min.	5 feet/min.
Sample Interval	0.5 feet	0.5 feet	0.5 feet

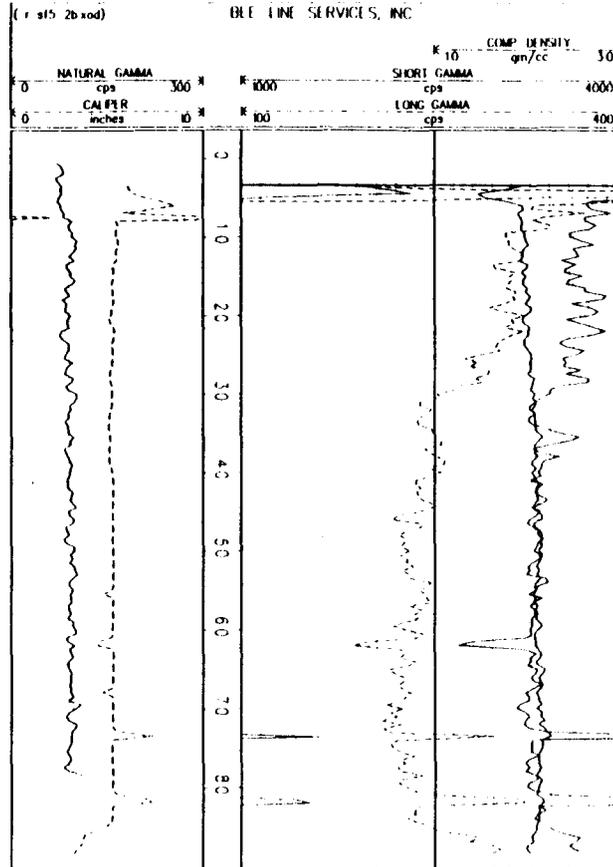
Logged by: BEE-LINE SERVICES, INC.
P.O. Box 2096
Corsicana, TX 75151

SF5.2B Wire-line logs run June 22, 1989. Surface elevation approximately 489 feet.

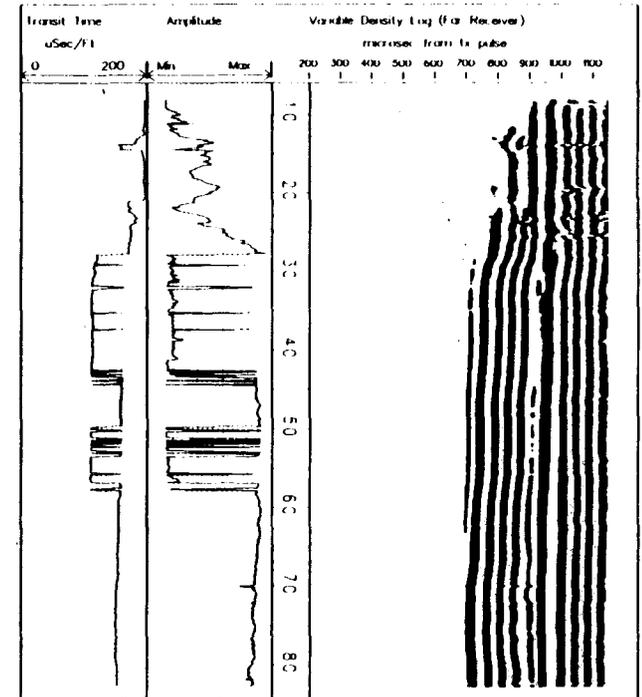
ELECTRICAL LOG



GAMMA LOG



SONIC LOG



APPENDIX D
PLUGGING REPORTS

