KEY ENVIRONMENTAL INCORPORATED

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VIA FEDERAL EXPRESS

July 6, 2012

Ms. Raji Josiam
Remedial Project Manager
US Environmental Protection Agency - Region 6
1445 Ross Ave, Suite 1200, 6SF-RA
Dallas, TX 75202

Re: Northern Area Evaluation
South Cavalcade Superfund Site
Houston, Texas

Dear Ms. Josiam:

On behalf of Beazer East, Inc. (Beazer), please find enclosed one hard copy and one electronic copy of the documents comprising the Northern Area Evaluation for the South Cavalcade Superfund Site located in Houston, Texas. Included in this transmittal are the following:

- A brief write-up describing the processes and approach followed to complete the evaluation;
- A full-size drawing depicting the locations of the borings, wells, and piezometers used in the evaluation;
- A spreadsheet that consolidates verbatim descriptions from the logs of visual observations of the presence of creosote; and,
- A three-ring binder containing copies of the logs used in the evaluation with the notations of the visual observations of creosote or coal tar highlighted.

A hard copy and electronic copy of the documents have also been sent directly to Fay Duke at the Texas Commission on Environmental Quality (TCEQ).

Please feel free to call me or Mike Bollinger at Beazer with any questions.

Sincerely,

James S. Zubrow
Principal Hydrogeologist

cc: F. Duke – TCEQ
M. Bollinger – Beazer

684730

200 Third Avenue • Carnegie • Pennsylvania • 15106 • (412) 279-3363 • Fax: (412) 279-4332

NORTHERN AREA EVALUATION SUMMARY
SOUTH CAVALCADE SUPERFUND SITE
HOUSTON, TEXAS

Objective – Compile, into various formats, all notations regarding visual observations of the presence of creosote and/or coal tar in soils within the northern portion of the South Cavalcade Site.

Area Covered – The approximate northern half of the South Cavalcade Site as shown on Figure 1.

Approach – All logs for borings/wells/piezometers drilled in the northern portion of the Site were reviewed for descriptions of the visual observations of the presence of creosote and/coal tar. Logs for a total of 118 borings/wells/piezometers were reviewed. The locations of the borings/wells/piezometers were plotted on a base map. DNAPL thickness measurements were also considered in the evaluation. Olfactory observations of the presence of creosote and/or coal tar constituents were not considered in the evaluation.

The descriptions of the presence of creosote and coal tar were highlighted on copies of the boring logs themselves and were also recorded verbatim on a spreadsheet along with the depth below ground surface at which the observations were made. The visual observations were then segregated into one of three categories, as follows: 1) Free Phase; 2) Sheen; or 3) Residual. The locations where visual observations of creosote and coal tar were made are color coded by category on Figure 1.

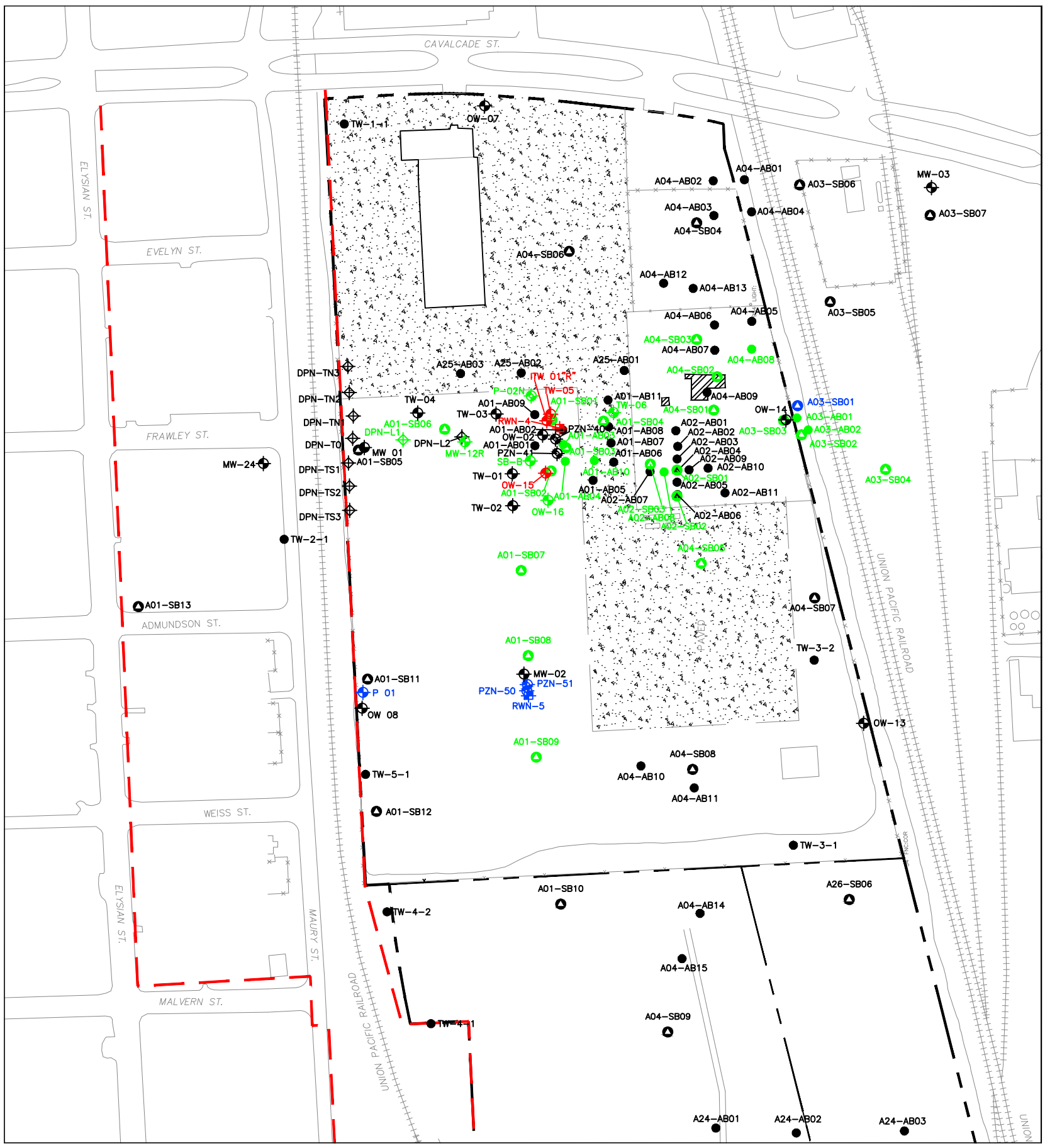
Information Sources – Boring log information was obtained from the following sources:

- Key Environmental, Inc., March, 2006, South Cavalcade Superfund Site, Supplemental Groundwater Investigation Report.
- Key Environmental, Inc., July, 2000, South Cavalcade Superfund Site, Verification of Groundwater Fate and Transport Evaluation.
- Key Environmental, Inc., 1995, South Cavalcade Superfund Site, DNAPL/GW Extraction System Construction.
- McLaren/Hart Environmental Engineering Corporation, October, 1993, South Cavalcade Superfund Site, Groundwater Collection Trench Pilot Study Report.
- Keystone Environmental Resources, Inc., July, 1992, South Cavalcade Superfund Site, Extraction Well Pilot Study Report.
- Keystone Environmental Resources, Inc., October, 1992, South Cavalcade Superfund Site, Pilot Study Design Report – Groundwater Collection Trench.

- Keystone Environmental Resources, Inc., July, 1988, South Cavalcade Site, Remedial Investigation Report.

Deliverables – The following documents are provided herewith:

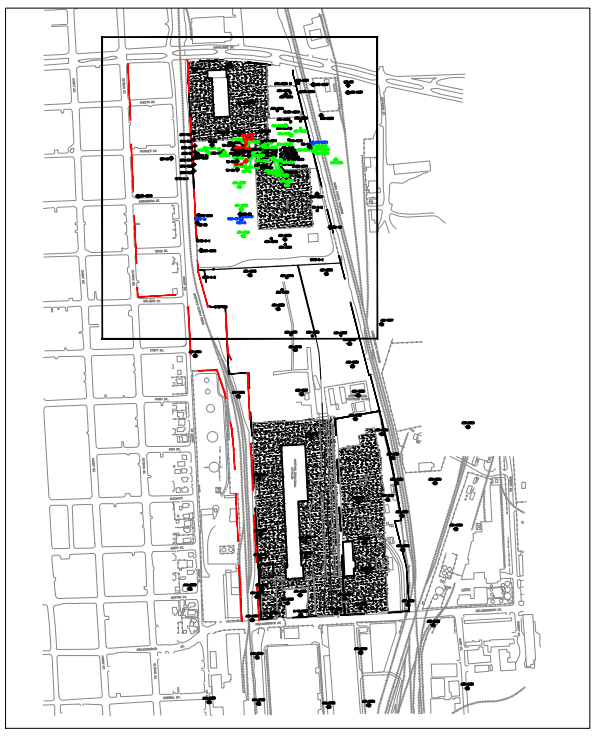
Boring Evaluation Summary – Northern Area (Excel Spreadsheet)
Figure 1 – North Area Boring Evaluation
Northern Area Boring Log Compilation (3-Ring Binder)



0 200 400 FEET

LEGEND

- SITE BOUNDARY
- PROPERTY BOUNDARIES
- PROPOSED HARDY TOLL ROAD EXTENSION RIGHT-OF-WAY
- AREAS COVERED WITH ASPHALT OR CONCRETE
- MW-12R — MONITORING WELL LOCATION
- DPN-L2 — DIRECT PUSH BORING PIEZOMETER LOCATION
- PZN-40 — PIEZOMETER LOCATION
- RWN-4 — DNAPL RECOVERY WELL LOCATION
- AUGER BORING LOCATION (APPROX.)
- SOIL BORING LOCATION
- BORINGS WITH APPARENT RESIDUAL DNAPL IMPACTS (OILS SPOTS/OILY RESIDUE/ STAINING/SOLIDIFIED TAR)
- BORING WHERE A SHEEN WAS OBSERVED
- BORINGS WITH APPARENT FREE PHASE DNAPL IMPACTS



LOCATION MAP

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: SCC	DATE: 06/21/12	KEY ENVIRONMENTAL INCORPORATED
CHKD: BLH	DATE: 06/21/12	
APPD: JSZ	DATE: 06/21/12	
SCALE: AS SHOWN		

SOUTH CAVALCADE SUPERFUND SITE
HOUSTON, TEXAS

NORTH AREA BORING EVALUATION

PROJECT NO: 11-318
FIGURE 1

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: PROPOSED HARDY TOLL ROAD EXTENSION RIGHT-OF-WAY BASED ON HARDY CONNECTOR SCHEMATIC – FROM: US59/IH10 INTERCHANGE TO: HARDY TOLL ROAD/IH10610 INTERCHANGE, DANNENBAUM ENGINEERING CORPORATION, 07/24/2009.

ISSUE DATE:

KEY ENVIRONMENTAL, INC.
200 THIRD AVENUE
CARNEGIE, PA 15106

y:\south cavalcade\11-318\focused feasibility study addendum isco technolofy alternative\figure 1.dwg Last Saved By: Scomer 7/5/2012 12:04 PM Plotted By: Shelly Comer 7/5/2012 12:06 PM Scale: 1:1

BORING EVALUATION SUMMARY
NORTHERN AREA
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

2006	**SUPPLEMENTAL GROUNDWATER INVESTIGATION**			**TERMINOLOGY: NA**	
Boring No.	Total Depth (ft-bgs)	Observation Interval (ft-bgs)	Interval Thickness (ft)	Lithological Description	DNAPL Description
TW-1-1	55	CLEAN			
TW-2-1	50	CLEAN			
TW-3-1	65	CLEAN			
TW-3-2	65	CLEAN			
TW-4-1	55	CLEAN			
TW-4-2	55	CLEAN			
TW-5-1	20	CLEAN			
2000	**VERIFICATION OF GROUNDWATER FATE AND TRANSPORT EVALUATION**			**TERMINOLOGY: Staining**	
Boring No.	Total Depth (ft-bgs)	Observation Interval (ft-bgs)	Interval Thickness (ft)	Lithological Description	DNAPL Description
DPN-T0	20.5	CLEAN			
DPN-L1	19	7.5-11.5	4	Brown gray, silty SAND, trace clay, orange mottles starting at 8.5', wet at 10.5'	Some Black Staining
DPN-L2	19	CLEAN			
DPN-TN1	19	CLEAN			
DPN-TN2	20.5	CLEAN			
DPN-TN3	21	CLEAN			
DPN-TS1	17	CLEAN			
DPN-TS2	20	CLEAN			
DPN-TS3	20	CLEAN			
MW-12R	56	28-30	2	Mottled, light greenish gray and brown, stiff to very stiff CLAY	Staining
		52.4-54	1.6	Mottled, yellowish brown and light gray, very stiff, silty CLAY	Staining
MW-24	20.5	CLEAN			
1995	**DNAPL / GW EXTRACTION SYSTEM CONSTRUCTION**			**TERMINOLOGY: DNAPL, Sheen**	
Boring No.	Total Depth (ft-bgs)	Observation Interval (ft-bgs)	Interval Thickness (ft)	Lithological Description	DNAPL Description
PZN-40*	20	CLEAN		*NOTE* - Boring PZN-40 was not logged. The log for RWN-4 was used.	
PZN-41*	20	CLEAN		*NOTE* - Boring PZN-41 was not logged. The log for RWN-4 was used.	
PZN-50*	20	18-19	1	*NOTE* - Boring PZN-50 was not logged. The log for RWN-5 was used.	Slight Sheen
PZN-51*	20	18-19	1	*NOTE* - Boring PZN-51 was not logged. The log for RWN-5 was used.	Slight Sheen
RWN-4	26	~~CLEAN~~			CURRENTLY PUMPS DNAPL
RWN-5	22	18-19	1	Reddish brown and gray clayey SILT, some fine sand	Slight Sheen

BORING EVALUATION SUMMARY
NORTHERN AREA
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

1993	**GROUNDWATER COLLECTION TRENCH PILOT STUDY**			**TERMINOLOGY: Staining, Discolorations, Sheen, Visible Creosote**	
Boring No.	Total Depth (ft-bgs)	Observation Interval (ft-bgs)	Interval Thickness (ft)	Lithological Description	DNAPL Description
TW-01	22	5-7	2	CLAYEY SAND, light gray, moist	Dark Yellow Discolorations
TW-02	20	CLEAN			
TW-03	22	CLEAN			
TW-04	20	CLEAN			
TW-05	22	10-12	2	SILTY SAND, light gray, moist to wet	Iridescent Sheen
		15-17	2	SILTY SAND, saturated	Visible Creosote, Sheen
TW-06	20	13-15	2	SILTY SAND, light gray, very fine grained, saturated	Creosote Staining
1992	**PILOT STUDY DESIGN REPORT-GROUNDWATER COLLECTION TRENCH**			**TERMINOLOGY: Staining**	
Boring No.	Total Depth (ft-bgs)	Observation Interval (ft-bgs)	Interval Thickness (ft)	Lithological Description	DNAPL Description
SB-B	22	10.4-20..8	10.4	Grey fine SAND, loose, wet	Green Black Staining
1992	**EXTRACTION WELL PILOT STUDY**			**TERMINOLOGY: Black Product, Sheen, Staining**	
Boring No.	Total Depth (ft-bgs)	Observation Interval (ft-bgs)	Interval Thickness (ft)	Lithological Description	DNAPL Description
ITW-1R	58.3	50-55	5	Grey SILT, some clay	Oily Sheen, Trace Black Product 52'-55'
OW-15	55.3	6-6.5	0.5	Brown fine to medium SAND, cemented, wet	Some Dark Brown Staining
		6.5-9.5	3	Crushed Oyster shells	Saturated with Black Product
		9.5-14.5	5	Brown-grey very fine SAND, little silt, saturated, grades to very fine grey sand	Sheen
		14.5-19.5	5	Grey very fine SAND, loose, saturated	Stained, Sheen
		21-32	11	Red-light grey (altered) CLAY, stiff, moist	Little Product Staining in Vertcal Fractures
		44.5-50	2.5	Grey very fine SAND, little silt	Green-Brown Staining 46'-48', Trace Black Product at 48.5'
		50-55.3	<1	Grey very fine SAND, loose, wet	Trace Black Product at 54'
OW-16	55.5	7.5-10	2.5	Grey-brown Clayey SILT, little roots, moist	Black Staining
		12-15	3	Grey fine SAND, loose, saturated	Mottled with Black Staining
		15-30	15	Grey fine SAND, loose, saturated	Very Faint Staining
		38-43	5	Grey SILT, semi-soft, becoming stiff at 42', moist	Little Brown-Yellow Staining
		43-48	5	Grey very fine SAND, little silt, moist	Slight Staining
P-01	28.0	4-6	2	Light brown silty CLAY, trace sand, saturated	Sheen
		6-8	2	Grey sitly CLAY with orange mottling, trace sand, stiff	Sheen
P-02N	25.5	10-12	2	Gray fine SAND	Trace Black Staining

BORING EVALUATION SUMMARY
NORTHERN AREA
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

1988	**REMEDIAL INVESTIGATION**			**TERMINOLOGY: Residue, Sheen, Oil Spots, Solidified Tar, Staining**	
Boring No.	Total Depth (ft-bgs)	Observation Interval (ft-bgs)	Interval Thickness (ft)	Lithological Description	DNAPL Description
A01-AB01	8	CLEAN			
A01-AB02	8	CLEAN			
A01-AB03	8	1	< 1	Dark brown SANDY SILT (ML) "FILL"	Solidified Tars
A01-AB04	8	6	< 1	Light gray and tan SANDY CLAY (CL) with plant debris	Oil Spots
A01-AB05	8	CLEAN			
A01-AB06	8	CLEAN			
A01-AB07	8	CLEAN			
A01-AB08	8	CLEAN			
A01-AB09	8	CLEAN			
A01-AB10	12	10-12	2	Gray SILTY SAND (SM)	Oil Spots
A01-AB11	8	CLEAN			
A02-AB01	8	CLEAN			
A02-AB02	8	CLEAN			
A02-AB03	8	CLEAN			
A02-AB04	8	CLEAN			
A02-AB05	8	CLEAN			
A02-AB06	8	CLEAN			
A02-AB07	8	CLEAN			
A02-AB08	8	0-2.6	2.6	Dark gray and brown SILTY SAND (SM) "FILL"	Solidified Tars
A02-AB09	8	CLEAN			
A02-AB10	8	CLEAN			
A02-AB11	8	CLEAN			
A03-AB01	12	9-11	2	Light gray and tan SILTY SAND (SM)	Oil Spots
		11-12	1	Light gray and tan CLAYEY SAND (SC)	Oil Spots
A03-AB02	8	4-8	4	Light gray and tan SANDY CLAY (CL) with sand pockets, gray and tan at 6'	Staining
A04-AB01	8	CLEAN			
A04-AB02	8	CLEAN			
A04-AB03	8	CLEAN			
A04-AB04	8	CLEAN			
A04-AB05	8	CLEAN			
A04-AB06	8	CLEAN			
A04-AB07	10	CLEAN			
A04-AB08	8	4-8	4	Brown, very SANDY CLAY (CL) with sand pockets, gray and tan at 6'	Oil Spots
A04-AB09	12	CLEAN			
A04-AB10	8	CLEAN			
A04-AB11	8	CLEAN			
A04-AB12	8	CLEAN			
A04-AB13	12	CLEAN			

BORING EVALUATION SUMMARY
NORTHERN AREA
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

A04-AB14	8	CLEAN			
A04-AB15	12	CLEAN			
A24-AB01	8	CLEAN			
A24-AB02	8	CLEAN			
A24-AB03	12	CLEAN			
A25-AB01	8	CLEAN			
A25-AB02	8	CLEAN			
A25-AB03	8	CLEAN			
A01-SB01	29	27	< 1	Reddish brown and light gray CLAY (CH) with silt interbeds	Oily Residue in Silt
A01-SB02	27	0-0.5	0.5	Grayish brown sandy silt "FILL", tars intermixed	Solidified Tars
		10-12	2	Light gray and tan SILTY SAND (SM)	Oily Residue
		12-22	10	Light gray SAND (SP)	Oily Residue
		26	< 1	Reddish brown and light gray CLAY (CH) with silt seams	Oily Residue in Silt
A01-SB03	56	0-4	4	Grayish brown and tan SANDY SILT (ML) "FILL" with roots and sand pockets, tars intermixed	Solidified Tars
		4-8	4	Light gray SANDY CLAY (CL) with sand pockets	Oily Residue
		8-10	2	Light gray, very CLAYEY SAND (SC) with sandy clay pockets	Oily Residue
		10-11.5	1.5	Light gray SILTY SAND (SM)	Oily Residue
		11.5-25	13.5	Light gray SAND (SP) with clay pockets	Oily Residue
		25-34	9	Reddish brown and light gray CLAY (CH) with silt seams and vertical silt filled fissures	Oily Residue in Silt
		45.6-47.2	1.7	Light gray SILTY SAND (SM)	Oily Residue
		50-51	1	Light gray and reddish brown SANDY SILT (ML)	Oily Residue
A01-SB04	54	6	< 1	Light gray and brown SANDY CLAY (CL) with vertical sand filled fissures	Oily Residue
		9.5-12.1	2.6	Light gray and brown SILTY SAND (SM)	Oily Residue
		12.1-21	8.9	Light gray SAND (SP) with occasional clay pockets	Oily Residue
		24	< 1	Light gray and reddish brown slightly CLAYEY SILT (SM)	Oily Residue
		24.5-33.6	9.1	Reddish brown and light gray CLAY (CH) with slickensides, vertical silt filled fissures, bioturbated	Oily Residue
		47	< 1	Light gray very SANDY SILT (ML) with clay pockets	Oily Residue
		50	< 1	Light gray and reddish brown CLAYEY SILT layer	Oily Residue
		50.5-51	0.5	Reddish brown and light gray bioturbated CLAY (CH)	Oily Residue
A01-SB05	56	CLEAN			
A01-SB06	60	11.5	< 1	Greenish gray SANDY CLAY layer	Oily Residue
		26-28	2	Reddish brown CLAYEY SILT (ML) with clay layers, calcareous nodules	Oily Residue
		46-54	8	Gray SILTY SAND (SM) with ferrous nodules	Oily Residue
		54-60	6	Light gray and reddish brown CLAY (CH) with calcareous nodules, sand pockets at 58'	Oily Residue
A01-SB07	67	23-25	2	Light gray CLAYEY SILT (ML)	Oily Residue
		52-53	1	Tan and light gray SANDY CLAY (CL)	Oily Residue
		53-56	3	Light gray and reddish brown CLAY (CH) with slickensides, vertical sand seams	Oily Residue in Sand
A01-SB08	66	9-21	12	Gray SILTY SAND (SM)	Oily Residue
A01-SB09	66	10-21	11	Greenish gray SILTY SAND (SM)	Oily Residue
		21-33.8	12.8	Tan and reddish brown CLAY (CH)	Oily Residue
		43.5	< 1	Light gray, clayey SILTY SAND (SM)	Oily Residue
		45.5	< 1	Light gray SILTY SAND (SM)	Oily Residue
		49.5-53	3.5	Light gray SILTY SAND (SM)	Oily Residue

BORING EVALUATION SUMMARY
NORTHERN AREA
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

A01-SB10	65	CLEAN			
A01-SB11	63	CLEAN			
A01-SB12	66	CLEAN			
A01-SB13	27	CLEAN			
A02-SB01	29	0-1	1	Black SANDY CLAY (CL) "FILL" with wood pieces and gravel	Solidified Tars
A02-SB02	29	0-4	4	Black SANDY CLAY (CL) "FILL" with shells	Solidified Tars
A02-SB03	59	1.5	< 1	Black CLAYEY SAND (SC) "FILL"	Solidified Tars
		51-53.5	2.5	Tan and gray CLAYEY SAND (SC)	Oily Residue
A03-SB01	28	8-11	3	Light gray and gray, very SANDY CLAY (CL) with sand pockets	Oily Residue in Sand
		11-12	1	Light gray CLAYEY SAND (SC) with sandy clay pockets	Oily Residue
		13-14	1	Reddish brown and light gray, slightly SANDY SILT (ML)	Oily Residue
		14-21	7	Light gray SAND (SP)	Oily Residue
		21-24	3	Reddish brown and light gray SANDY SILT (ML) with clay interbeds, calcareous nodules	Oily Residue, Oil Sheen
		24-28	4	Reddish brown and light gray CLAY (CH) with silt interbeds, bioturbation	Oily Residue in Bioturbated Areas
A03-SB02	28	6-11	5	Light gray and tan SANDY CLAY (CL) with wet sand pockets	Oily Residue
		11-21	10	Light gray SILTY SAND (SM)	Oily Residue
		21-22.5	1.5	Reddish brown and light gray, very SILTY CLAY (CL) with silt pockets	Oily Residue in Silt
A03-SB03	56	4-10	6	Brownish gray SANDY CLAY (CL) with sand pockets	Oily Residue in Sand
		10-13	3	Light gray, slightly SILTY SAND (SM)	Oily Residue
		13-14	1	Light gray SANDY SILT (ML) with vertical sand fissures	Oily Residue
		14-23	9	Light gray SILTY SAND (SM)	Oily Residue
		23-25	2	Reddish brown and light gray CLAY (CH) with slickensides, silt interbeds, 2" clayey silt seam at 23.5' and 25'	Oily Residue
		53	< 1	Sand seam in reddish brown and light gray CLAY (CH)	Oily Residue in Sand
A03-SB04	70	2-2.5	0.5	Dark gray SANDY CLAY (CL) "FILL" with shells	Solidified Tars
A03-SB05	67	CLEAN			
A03-SB06	68	CLEAN			
A03-SB07	65	CLEAN			
A04-SB01	55	0-1	1	Black SANDY CLAY (CL) "FILL"	Solidified Tars
		1-3	2	Dark gray CLAYEY SAND (SC) "FILL"	Solidified Tars
		3-10.5	7.5	Tan and gray SANDY CLAY (CL) with ferrous nodules	Oily Residue
		10.5-22	11.5	Gray CLAYEY SAND (SC)	Oily Residue
		22-30	8	Light gray and reddish brown SILTY CLAY (CL) with silt seams, sand pockets at 27'	Oily Residue
		30-35	5	Light gray and reddish brown CLAY (CH), tan and light gray at 34'	Oily Residue
		38-46	8	Tan and light gray SANDY CLAY (CL) with calcareous nodules	Oily Residue
		46-55	9	Light gray and reddish brown CLAY (CH) with vertical sand fissures, sand pockets and layers below 49'	Oily Residue
A04-SB02	60	0-3	3	Dark gray CLAYEY SAND (SC) "FILL" with gravel, roots, intermixed clay, tars	Solidified Tars
		3-10.4	7.4	Gray SANDY CLAY (CL) with clayey sand filled fissure, ferrous nodules	Oily Residue
		10.4-22	11.6	Tan and light gray CLAYEY SAND (SC) with sandy clay and clay interbeds	Oily Residue
		44	< 1	Gray, very SANDY CLAY (CL)	Oily Residue
		50-53	3	Gray CLAYEY SAND (SC)	Oily Residue
A04-SB03	62	10-21	11	Gray CLAYEY SAND (SC) with clay seam at 12'	Oily Residue
		24	< 1	Light gray and reddish brown CLAY (CH) with silt layers, calcareous nodules	Oily Residue in Silt
		38-41	3	Tan and gray CLAYEY SAND (SC)	Oily Residue
		44	< 1	Tan and gray, very SANDY CLAY (CL) with calcareous nodules	Oily Residue
		46-54	8	Greenish gray CLAYEY SAND (SC) with clay pockets at 52'	Oily Residue

BORING EVALUATION SUMMARY
NORTHERN AREA
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

A04-SB04	66	CLEAN			
A04-SB05	66	51.5	< 1	Gray CLAYEY SAND (SC)	Oily Residue
A04-SB06	65	CLEAN			
A04-SB07	66	CLEAN			
A04-SB08	63	CLEAN			
A04-SB09	66	CLEAN			
A26-SB06	67	CLEAN			
A26-SB-07	75	CLEAN			
MW-01	29	CLEAN			
MW-02	24	CLEAN			
MW-03	25	CLEAN			
OW-02	20	CLEAN			
OW-07	17	CLEAN			
OW-08	21	CLEAN			
OW-13	20.5	CLEAN			
OW-14	20.5	CLEAN			

DNAPL Classification:
Oily Residue, Oil Spots, Solidified Tar, Staining
Sheen
Free Phase

NORTHERN AREA BORING LOG COMPILATION

SOUTH CAVALCADE SUPERFUND SITE
HOUSTON, TEXAS

Prepared for:

BEAZER EAST, INC.

Prepared by:

KEY ENVIRONMENTAL, INC.
200 Third Avenue
Carnegie, PA 15106

July 2012

KEY ENVIRONMENTAL INCORPORATED

SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT

SOUTH CAVALCADE SUPERFUND SITE
HOUSTON, TEXAS

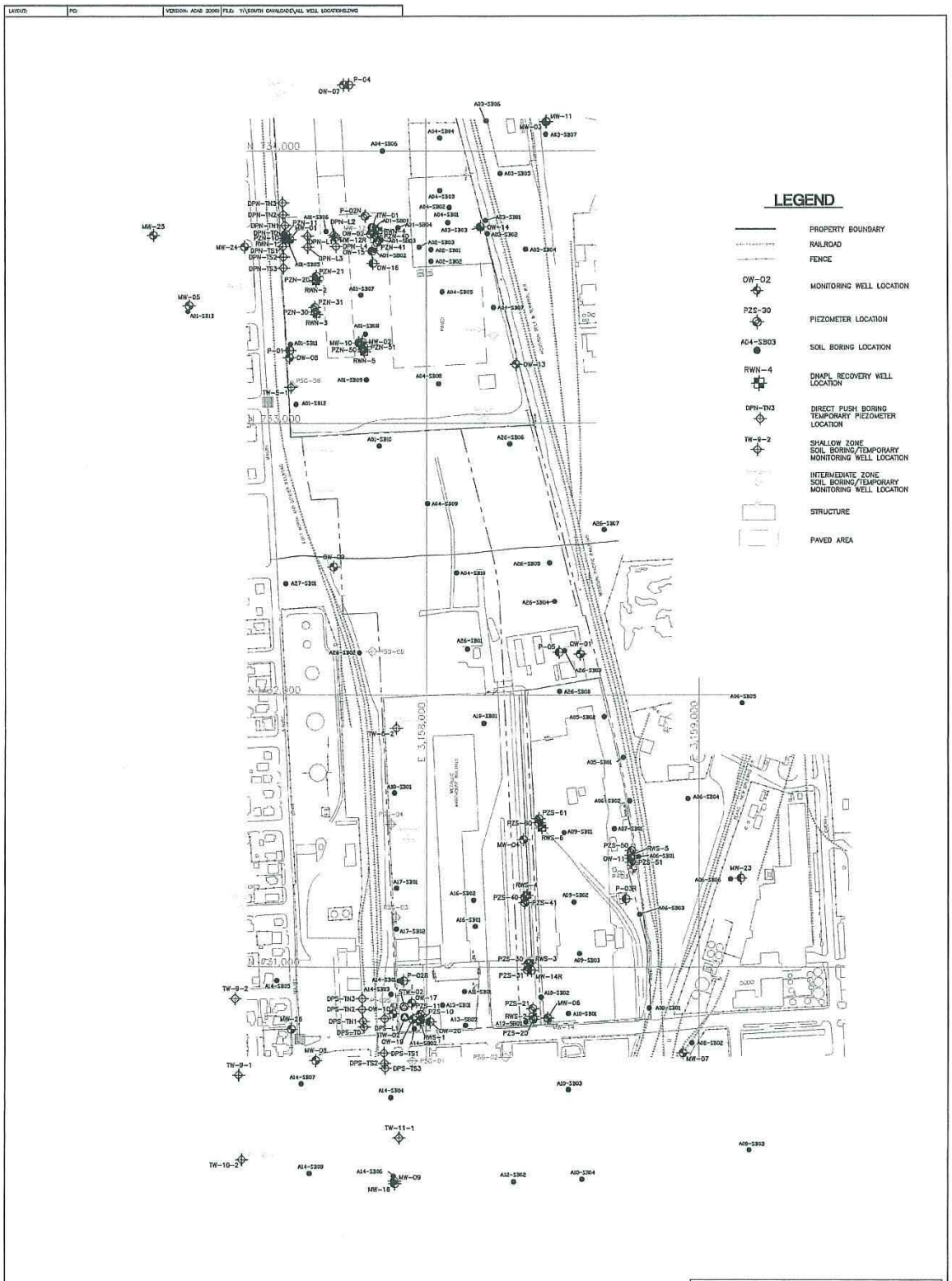
Prepared For:

Beazer East, Inc.
One Oxford Centre, Suite 3000
Pittsburgh, Pennsylvania 15219-6401

Prepared By:

Key Environmental, Inc.
200 Third Avenue
Carnegie, Pennsylvania 15106

March 1, 2006



BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: BKC	DATE: 3/1/08	KEY ENVIRONMENTAL INCORPORATED	
CHKD: RMB	DATE: 3/1/08		
APPD: JSZ	DATE: 3/1/08		
SCALE: AS SHOWN			

SUPPLEMENTAL GROUNDWATER CHARACTERIZATION
SOUTH CAVALCADE SUPERFUND SITE
HOUSTON, TEXAS

REV #	DATE	DESCRIPTION	APPD
△			
△			
△			

KEY ENVIRONMENTAL INC.
ISSUE DATE:
KEY ENVIRONMENTAL, INC.
200 THIRD AVENUE
CARNEGIE, PA 15106

SOIL BORING/TEMPORARY WELL LOCATION MAP

PROJECT NO: 05-113
DRAWING NUMBER
FIGURE 4-1

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-1-1

Client Name:	BEAZER EAST	Drilling/Boring Method:	Geoprobe	Total Boring Depth (ft):	55
Project Number:	05-113	Sampling Method:	5' Split Spon	Ground Surface Elev. (ft-msl)	52.21
Location:	South Cavalcade: Houston, TX	Subcontractor/Drillers:	Advanced Drilling Systems	Measuring Point Elev. (ft-msl)	NA
Date/Time Started:	9/13/2005	Monitoring Equipment:	PID	Geologist/Engineer:	Bob Balkovec
Date/Time Completed:	9/15/2005	Coordinates:	N734211.33 / E3157466.56	Consultant:	KEY Environmental, Inc.

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
0	1			2.1	~1.5' Concrete			TEMPORARY WELL: 3" PVC outer casing grouted in place: 0-25.0	0
1		0.0			~ 1.5 - 5 Gray Silty F-SAND Dry and M. Dense No DNAPL odor or staining observed		SM	1" PVC: riser 0-29' screen 29-44'	1
2		0.0							2
3		0.0							3
4		0.0							4
5		0.0							5
	2			2.0	5' - 10' Gray Silty F-SAND Dry and M. Dense No DNAPL odor or staining observed		SM		
6		0.0							6
7		0.0							7
8		0.0							8
9		0.0							9
10		0.0							10
	3			4.7	Top .8' Gray Silty F-SAND Trace clay. Dry and M. Dense No DNAPL odor or staining observed		SM		
11		0.0			~10.8' - 12.5' Yellow Orange/Lt. Gray/Trace Black Flecks (mottled) Sandy SILT and Trace clay Moist and M. Dense to M. Stiff No DNAPL odor or staining observed				11
12		0.0							12
	▼				~12.5' - 15' Gray F-SAND f-silt Wet and Loose No DNAPL odor or staining observed				
13		0.0							13
14		0.0							14

Silt, Clay, Sand, Gravel, Bedrock

NOTES

in - indicates inches
ft - indicates depth in feet
ft-bgs - indicates feet below ground surface
ft-msl - indicates feet above mean sea level
N/A - indicates not applicable to this boring
ppm - indicates parts per million

Signature of Field Supervisor: Robert Balkovec

Date: _____

LOG OF BORING: TW-1-1 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction
14		0.0						
15		0.0						
	4			4.4	15' - 19.6' Lt Gray F-SAND Wet and Loose No DNAPL odor or staining observed		SP	
16		0.0						
17		0.0						
18		0.0						
19		0.0						
					~19.6' - 20' Redish Brown/Lt Gray (mottled) CLAY (Moist and V. Stiff) No DNAPL odor or staining observed		CL	
20		0.0						
	5			4.0	20' - 25' Reddish Brown/Lt Gray (mottled) CLAY (V. Stiff and Moist) No DNAPL odor or staining observed		CL	
21		0.0						
22		0.0						
23		0.0						
24		0.0						
					Augered to 24' and pushed 3" PVC casing to 25' and grouted			3" PVC Casing set at 25'
25		0.0						
	6			4.0	~25'- 29.8' Reddish Brown/Lt Gray (mottled) CLAY V. Stiff and dry No DNAPL odor or staining observed		CL	
26		0.0						
27		0.0						
28		0.0						
29		0.0						
30		0.0			@ 29.8' Lt Gray SILT M. Dense and Moist		ML	

Silt
Clay
Sand
Gravel
Bedrock

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KEY ENVIRONMENTAL INCORPORATED

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
30									30
	7			4.7	30' - 35' Reddish Brown/Lt Gray (mottled) CLAY (Dry and Hard) No DNAPL odor or staining observed		CL		
31		0.0							31
32		0.0							32
33		0.0							33
34		0.0							34
35		0.0							35
	8			4.4	~35' - 38' Reddish Brown/Lt Gray (mottled) CLAY (Dry and Hard) No DNAPL odor or staining observed		CL		
36		0.0							36
37		0.0							37
38		0.0			~38' - 40' Lt Gray Clayey SILT M. Stiff and Moist No DNAPL odor or staining observed		ML	Sampled 38-40 for TOC on 9/15/05 @ 1640 Possible Water Producing Zon	38
39		0.0							39
40		0.0							40
	9			4.5	Reddish Brown/ Lt Gray/ Yellow Orange (mottled) CLAY w/ trace coarse sand V. Stiff and slightly moist at depth No DNAPL odor or staining observed		CL		
41		0.0							41
42		0.0							42
43		0.0							43
44		0.0							44
45		0.0							45
	10			4.9	Reddish Brown/Lt Gray (mottled) CLAY Stiff and Dry No DNAPL odor or staining observed		CL		
46		0.0							46

Silt
Clay
Sand
Gravel
Bedrock

NOTES

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KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-1-1 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS classification	Well Construction	ft-bgs
46									46
47		0.0			Reddish Brown/Lt Gray (mottled) CLAY Stiff and Dry No DNAPL odor or staining observed		CL		47
48		0.0							48
49		0.0							49
50		0.0							50
	11			4.9	Reddish Brown/Lt Gray (mottled) CLAY Stiff and Dry No DNAPL odor or staining observed		CL		
51		0.0							51
52		0.0							52
53		0.0							53
54		0.0							54
55		0.0			Reddish Brown/Lt Gray (mottled) CLAY Stiff and Dry No DNAPL odor or staining observed				55
56					Backfilled to 44' with Bentonite Set well to 44' Screend 29' - 44' Sand to 27' Bentonite to 20'				56
57									57
58									58
59									59
60									60
61									61
62									62

Silt, Clay, Sand, Gravel, Bedrock

NOTES
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ft - indicates depth in feet
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ft-msl - indicates feet above mean sea level
N/A - indicates not applicable in this zoning
ppm - indicates parts per million

KEY ENVIRONMENTAL INCORPORATED

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-2-1

Client Name:	BEAZER EAST	Drilling/Boring Method: Direct push	Total Boring Depth (ft): 50.0
Project Number:	05-113	Sampling Method: Continuous split-spoon	Ground Surface Elev. (ft-msl) 50.61
Location:	South Cavalcade: Houston, TX	Subcontractor/Drillers: Advanced Drilling Systems	Measuring Point Elev. (ft-msl) NA
Date/Time Started:	9/15/05 8:30	Monitoring Equipment: PID	Geologist/Engineer: P. Sorek
Date/Time Completed:	9/16/05 13:40	Coordinates: N733521.75 / E31573669.75	Consultant: KEY Environmental, Inc.

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction
0	1			5.0	Asphalt and road material.			TEMPORARY WELL: 3" PVC outer casing grouted in place: 0-25.0 1" PVC: rise: 0-38.8' screen 38.8-43.8'
1								
2								
3								
4					Light gray SANDY CLAY. Well sorted, fine grained sand, approximately 20%. Medium stiff, and moist. No observed DNAPL stains or odors.		CL	
5		0.0						
	2			5.0				
6								
7		0.0						
8					Buff to light gray CLAYEY SAND. Well sorted, fine-grained sand, approximately 60 to 80%. Soft and wet. No observed DNAPL stains or odors.		SC	
9								
10		0.0						
	3			5.0				
11								
12		0.0						
13								
14								

Silt, Clay, Sand, Gravel, Bedrock

NOTES

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ft - indicates depth in feet
ft-bgs - indicates feet below ground surface
ft-msl - indicates feet above mean sea level
N/A - indicates not applicable to this boring
ppm - indicates parts per million

Signature of Field Supervisor: PJSK

Date: _____

LOG OF BORING: TW-2-1 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Class/Station	Well Construction	ft-bgs
14									14
							SC		
15		0.0							15
	4			4.5					
16									16
17									17
		0.0							
18									18
19									19
20		0.0							20
	5			4.5					
21									21
22									22
		0.0							
23					Red-brown CLAY with light gray mottling and less than 5% sand and fine gravel. Stiff to very stiff, and moist. No observed DNAPL stains or odors.		CL		23
24									24
25		0.0						Bottom of Outer Casing	25
	6			4.0					
26									26
27									27
		0.0							
28									28
29									29
30		2.2							30

Silt
Clay
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Gravel
Bedrock

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ppm - indicates parts per million

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-2-1 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
30									30
	7			4.2			CL		
31									31
32									32
		2.3							
33									33
					Light gray SANDY CLAY with orange mottling and 5 to 20% fine grained sand. Grading downward to red-brown SANDY CLAY. Stiff and moist. No observed DNAPL stains or odors.		CL		
34									34
35		1.8							35
	8			4.0					
36									36
37		1.4							37
38									38
39									39
40		1.9							40
	9			4.1					
41									41
42									42
					Red-brown CLAYEY SAND with approximately 80% fine grained, well sorted sand. Loose and wet.		SC		
		0.0							
43									43
44		0.0							44
					Light gray SANDY CLAY with 10 to 50% fine grained, well sorted sand. Medium stiff and moist. No observed DNAPL stains or odors.		CL		
45									45
	10			4.5					
46									46

Silt Gravel
Clay Bedrock
Sand

NOTES
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ppm - indicates parts per million

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-2-1 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
46									46
							CL		
47									47
		0.0							
48									48
49									49
50		0.0			END OF BORING				50
	11								
51									51
52									52
53									53
54									54
55									55
56									56
57									57
58									58
59									59
60									60
61									61
62									62

Silt
Clay
Sand
Gravel
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NOTES
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ft - indicates depth in feet
ft-bgs - indicates feet below ground surface
ft-msl - indicates feet above mean sea level
N/A - indicates not applicable to this boring
ppm - indicates parts per million

KEY ENVIRONMENTAL INCORPORATED

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-3-1

Client Name:	BEAZER EAST	Drilling/Boring Method:	Geoprobe	Total Boring Depth (ft):	65
Project Number:	05-113	Sampling Method:	5' Split Spon	Ground Surface Elev. (ft-msl)	50.04
Location:	South Cavalcade: Houston, TX	Subcontractor/Drillers:	Advanced Drilling Systems	Measuring Point Elev. (ft-msl)	NA
Date/Time Started:	9/12/2005	Monitoring Equipment:	PID	Geologist/Engineer:	Bob Balkovac
Date/Time Completed:	9/14/2005	Coordinates:	N733013.9 / E3158212.2	Consultant:	KEY Environmental, Inc.

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction
0	1			3.8	Top .5' Topsoil No DNAPL odor or staining observed		ML	TEMPORARY WELL: 3" PVC outer casing grouted in place: 0-25.0
1		0.0			~.5' - 5' Lt Gray Clayey SILT Moist and M. Stiff No DNAPL odor or staining observed			1" PVC: riser 0-49' screen 49-64'
2		0.0						
3		0.0						
4		0.0						
5		0.0						
	2			4.0	5' - 10' Lt Gray/Yellow Orange (mottled) Clayey SILT, trace f-sand Moist and M. Stiff No DNAPL odor or staining observed		ML	
6		0.0						
7		0.0						
8		0.0						
9		0.0						
10	▼	0.0			Wet at 10'			
	3			3.2	~10' - 14.6' Lt Gray Silty F-SAND Wet and Loose No DNAPL odor or staining observed		SM	
11		0.0						
12		0.0						
13		0.0						
14		0.0						

Silt, Clay, Sand, Gravel, Bedrock

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ft-msl - indicates feet above mean sea level
N/A - indicates not applicable to this boring
ppm - indicates parts per million

Signature of Field Supervisor: Robert Balkovac

Date: _____

LOG OF BORING: TW-3-1 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
14									14
		0.0			~14.6' - 15' Lt Gray CLAY V. Stiff and Dry No DNAPL odor or staining observed		CL		
15		0.0							15
	4			4.5	Top 1.5' Lt Gray Silty F-SAND Wet and Loose No DNAPL odor or staining observed		SM		
16		0.0							16
17		0.0							17
					Bott 3' Lt Gray Clayey SILT, f-sand Wet and M. Stiff No DNAPL odor or staining observed		ML		
18		0.0							18
19		0.0							19
20		0.0							20
	5			4.0	~20' - 24' Lt Gray Clayey SILT, f-sand Wet and M. Stiff No DNAPL odor or staining observed		ML		
21		0.0							21
22		0.0							22
23		0.0							23
24		0.0							24
					~24' - 25' Reddish Brown/Lt Gray CLAY (mottled) V. Stiff and Dry No DNAPL odor or staining observed Auger to 24' and push 3" PVC Casing to 25' and grouted		CL	Bottom of Outer Casing	
25		0.0							25
	6			4.2	Resume drilling on 9/13/05 25-30 Reddish Brown/Lt Gray (mottled) CLAY V.Stiff and Dry No DNAPL odor or staining observed		CL		
26		0.0					ML		26
					Silt seam ~26.4' - 27'				
27		0.0							27
28		0.0							28
29		0.0							29
30		0.0							30

Silt
Clay
Sand
Gravel
Bedrock

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KEY ENVIRONMENTAL INCORPORATED

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
30									30
	7			4.5	30' - 35' Reddish Brown/Lt Gray (mottled) CLAY V. Stiff and Dry No DNAPL odor or staining observed		CL		
31		0.0							31
32		0.0							32
33		0.0							33
34		0.0							34
35		0.0							35
	8			4.0	35' - 40' Reddish Brown/Lt Gray (mottled) CLAY V. Stiff and Dry No DNAPL odor or staining observed		CL		
36		0.0							36
37		0.0							37
38		0.0							38
39		0.0							39
40		0.0							40
	9			5.0	40' - 42.6' Lt Gray Silty CLAY grading to a Clayey SILT V.Stiff and Dry No DNAPL odor or staining observed		CL		
41		0.0							41
42		0.0							42
					42.6' - 50' Lt Gray Clayey SILT M. Stiff and Slightly Moist No DNAPL odor or staining observed		ML		
43		0.0							43
44		0.0							44
45		0.0							45
	10			3.2	~45' - 49' Lt Gray Sandy CLAY M. Dense and Slightly Moist No DNAPL odor or staining observed		CL		
46		0.0							46

Silt — Gravel
Clay — Bedrock
Sand

NOTES
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KEY ENVIRONMENTAL INCORPORATED

ft.-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
46									46
		0.0			~45' - 49' Lt Gray Sandy CLAY M. Dense and Slightly Moist No DNAPL odor or staining observed		CL		
47		0.0							47
48		0.0							48
49		0.0							49
					~49' - 50' Lt Gray Clayey SAND becoming more sandy with depth M. Dense and wet No DNAPL odor or staining observed		SC		
50		0.0							50
	11			3.9	Top 2.4' Lt Gray Clayey SAND becoming more sandy with depth V. Dense and wet No DNAPL odor or staining observed				
51		0.0							51
52		0.0							52
53		0.0							53
					Bott 1.5' Lt Gray F-SAND (little fines) M Dense and Moist No DNAPL odor or staining observed		SP		
54		0.0							54
55		0.0							55
	12			3.9	55' - 60' Lt Gray F-SAND (little fines) M Dense and Moist No DNAPL odor or staining observed		SP		
56		0.0							56
57		0.0							57
58		0.0							58
59		0.0							59
60		0.0							60
	13			4.5	~60' - 63.5' Lt Gray F-SAND (little fines) M Dense and Moist No DNAPL odor or staining observed		SP	Collected TOC from 63'-64' on 9/13/05 @ 0930	
61		0.0							61
62		0.0							62

Silt Gravel
Clay Bedrock
Sand

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KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-3-1 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
63									63
		0.0			~63.5 - 65' Reddish Brown/Lt Gray (mottled) CLAY M. Stiff and Dry No DNAPL odor or staining observed		CL		
64		0.0							64
65		0.0							65
					Set well at 64' Screened from 49' - 64' Sand to 47' Bent to 40'				

Silt Gravel
Clay Bedrock
Sand

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KEY ENVIRONMENTAL INCORPORATED

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-3-2

Client Name:	BEAZER EAST	Drilling/Boring Method:	Geoprobe	Total Boring Depth (ft):	65
Project Number:	05-113	Sampling Method:	5' Split Spon	Ground Surface Elev. (ft-msl)	50.58
Location:	South Cavalcade: Houston, TX	Subcontractor/Drillers:	Advanced Drilling Systems	Measuring Point Elev. (ft-msl)	NA
Date/Time Started:	9/12/2005	Monitoring Equipment:	PID	Geologist/Engineer:	Bob Balkovec
Date/Time Completed:	9/14/2005	Coordinates:	N733321.13 / E3158246.67	Consultant:	KEY Environmental, Inc.

ft -bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
0									0
	1			2.3	Top 1' Topsoil and angular gravel Moist and M. Stiff No DNAPL odor or staining observed		SM	TEMPORARY WELL: 3" PVC outer casing grouted in place: 0-25.0	
1		0.0							1
								1" PVC: riser 0-44' screen 44-59'	
2		0.0							2
3		0.0			Bottom 1.3' Gray F-SAND and SILT Dry and M. Dense No DNAPL odor or staining observed		ML/SM		3
4		0.0							4
5		0.0							5
	2			4.2	Top 1' Lt Gray Clayey SILT Moist and M. Stiff No DNAPL odor or staining observed		ML		
6		0.0							6
					~6' - 7.8' Lt Gray F-Sandy SILT, t- clay Wet and M. Stiff No DNAPL odor or staining observed		ML		
7	Y	0.0							7
8		0.0			~7.8 - 8.2' Lt Gray Silty F-SAND M. Dense and Wet No DNAPL odor or staining observed		SM		8
9		0.0			~8.2' - 10' Yellow Orange/Lt Gray Silty CLAY M. Stiff and Wet No DNAPL odor or staining observed		CL		9
10		0.0							10
	3			4.0					
11		0.0			Top 1' Yellow Orange/Lt Gray Silty CLAY Minor black mottling (looks natural) Moist and Stiff No DNAPL odor or staining observed		CL		11
12		0.0							12
13		0.0			Bottom 3' Lt GrayYellow Orange (mottled) Silty F-SAND Moist and M. Dense No DNAPL odor or staining observed		SM		13
14		0.0							14

Silt Gravel
Clay Bedrock
Sand

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ft-msl - indicates feet above mean sea level
N/A - indicates not applicable to this boring
ppm - indicates parts per million

Signature of Field Supervisor: Robert Balkovec

Date: _____

LOG OF BORING: TW-3-2 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
14									14
		0.0					SM		
15		0.0							15
	4			4.5	Lt Gray and Yellow Orange F-SAND, t-silt Wet and Loose No DNAPL odor or staining observed		SP		
16		0.0							16
17		0.0							17
18		0.0							18
19		0.0							19
20		0.0							20
	5			4.0	~20' - 24.5' Lt Gray and Yellow Orange F-SAND, t-silt Wet and Loose No DNAPL odor or staining observed		SP		
21		0.0							21
22		0.0							22
23		0.0							23
24		0.0							24
					~24.5' - 25' Reddish Brown/Lt Gray (mottled) CLAY (V. Stiff and Dry) No DNAPL odor or staining observed		CL	Bottom of Outer Casing	
25		0.0							25
	6			4.5	Auger to 24' and push 3" PVC Casing to 25' and grouted Resume Drilling on 9/13/05 25' - 30' Reddish Brown/Lt Gray (mottled) CLAY V.Stiff and Dry No DNAPL odor or staining observed Silt seam ~27-27.3' and 27.6'-28'		CL		
26		0.0							26
27		0.0							27
28		0.0							28
29		0.0							29
30		0.0							30

Silt
Clay
Sand
Gravel
Bedrock

NOTES
in - indicates inches
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ft-msl - indicates feet above mean sea level
N/A - indicates not applicable to this boring
ppm - indicates parts per million

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-3-2 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
30									30
	7			4.0	~30' - 31' Reddish Brown/Lt Gray (mottled) CLAY V.Stiff and Dry No DNAPL odor or staining observed		CL		
31		0.0							31
					~31' - 31.8' Reddish Brown SILT seam Dense and Dry No DNAPL odor or staining observed		ML		
32		0.0							32
					~31.8' - 35' Reddish Brown/Lt Gray (mottled) CLAY V. Stiff andd Dry No DNAPL odor or staining observed		CL		
33		0.0							33
34		0.0							34
35		0.0							35
	8			4.0	35' - 40' Reddish Brown/Lt Gray (mottled) CLAY V. Stiff and Dry No DNAPL odor or staining observed		CL		
36		0.0							36
37		0.0							37
38		0.0							38
39		0.0							39
40		0.0							40
	9			4.1	40' - 45' Lt Gray Silty CLAY Stiff and Slightly Moist No DNAPL odor or staining observed		CL		
41		0.0							41
42		0.0							42
43		0.0							43
44		0.0							44
45		0.0							45
	10			4.6	~45' - 47' Lt Gray/Yellow Orange Clayey SILT Grading Into a Silty V.F-SAND @ 47' M. Dense and Moist No DNAPL odor or staining observed		ML		
46		0.0							46

Silt, Clay, Sand, Gravel, Bedrock

NOTES

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KEY ENVIRONMENTAL INCORPORATED

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
46		0.0							46
47		0.0			~47' - 50' Lt Gray/Yellow Orange Silty V.F-SAND M Dense and Moist No DNAPL odor or staining observed		SP		47
48		0.0							48
49		0.0							49
50		0.0							50
	11			4.3	50' - 58.5' Lt Gray V. F-SAND M Dense and Moist No DNAPL odor or staining observed		SP		
51		0.0							51
52		0.0							52
53		0.0							53
54		0.0							54
55		0.0							55
	12			4.4					
56		0.0							56
57		0.0						Collected TOC from 57'-58' on 9/13/05 @ 1505	57
58		0.0							58
59		0.0			58.5' - 60' Reddish Brown/Lt Gray (mottled) CLAY V. Stiff and Dry No DNAPL odor or staining observed		CL		59
60		0.0							60
	13			4.5					
61		0.0							61
62		0.0							62

Silt
Clay
Sand
Gravel
Bedrock

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KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-3-2 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
63									63
		0.0			~63.5' - 65' Reddish Brown/Lt Gray (mottled) CLAY M. Stiff and Dry No DNAPL odor or staining observed		CL		
64		0.0							64
65		0.0							65
					Set well at 59' Screened from 44' - 59' Sand to 42' Bent to 38'				

Silt
Clay
Sand
Gravel
Bedrock

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KEY ENVIRONMENTAL INCORPORATED

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-4-1

Client Name:	BEAZER EAST	Drilling/Boring Method:	Geoprobe	Total Boring Depth (ft):	55
Project Number:	05-113	Sampling Method:	5' Split Spon	Ground Surface Elev. (ft-msl)	50.18
Location:	South Cavalcade: Houston, TX	Subcontractor/Drillers:	Advanced Drilling Systems	Measuring Point Elev. (ft-msl)	NA
Date/Time Started:	9/15/2005	Monitoring Equipment:	PID	Geologist/Engineer:	Bob Balkovec
Date/Time Completed:	9/16/2005	Coordinates:	N732717.5 / E3157610.61	Consultant:	KEY Environmental, Inc.

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction
0								
	1			3.2	Dark to Lt Gray Silty F-SAND Soil looks reworked loose and moist No DNAPL odor or staining observed		SM	TEMPORARY WELL: 3" PVC outer casing grouted in place: 0-20.0 1" PVC: riser 0-40' screen 40-55'
1		0.0						
2		0.0						
3		0.0						
4		0.0						
5		0.0						
	2			4.1	5-10 Lt Gray/Yellow Orange (mottled) Sandy CLAY w/ silt M Stiff and Moist No DNAPL odor or staining observed		CL	
6		0.0						
7		0.0						
8		0.0						
9		0.0						
10		0.0			Top .5 Lt Gray/Yellow Orange (mottled) Sandy CLAY w/ silt. M Stiff and Moist No DNAPL odor or staining observed		CL	
	3			3.7				
11		0.0			~10.5-14 Lt Gray Silty F-SAND Loose and Wet No DNAPL odor or staining observed		SM	
12		0.0						
13		0.0						
14		0.0						

Silt, Clay, Sand, Gravel, Bedrock

NOTES
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ft-msl - indicates feet above mean sea level
NA - indicates not applicable to the boring
ppm - indicates parts per million

Signature of Field Supervisor: Robert Balkovec

Date: _____

ft.-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft.-bgs
14									14
		0.0			~14 Reddish Brown/Lt Gray CLAY (mottled) V. Stiff and Dry No DNAPL odor or staining observed		CL		
15		0.0							15
	4			4.0	15' - 20' Reddish Brown/Lt Gray CLAY (mottled) V. Stiff and Dry No DNAPL odor or staining observed				
16		0.0							16
17		0.0							17
18		0.0							18
19		0.0							19
					Auger to 19' and push 3" PVC Casing to 20' and grout up			Bottom of Outer Casing	
20		0.0							20
	5			3.7	Resume drilling on 9/16/05 20' - 25' Reddish Brown/Lt Gray (mottled) CLAY V.Stiff and Dry No DNAPL odor or staining observed		CL		
21		0.0							21
22		0.0							22
23		0.0							23
24		0.0							24
25		0.0							25
	6			4.3	25' - 30' Reddish Brown/Lt Gray (mottled) CLAY Hard and Dry No DNAPL odor or staining observed		CL		
26		0.0							26
27		0.0							27
28		0.0							28
29		0.0							29
30		0.0							30

Silt
Clay
Sand
Gravel
Bedrock

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KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-4-1 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
30									30
	7			3.9	30' - 35' Reddish Brown/Lt Gray/Yellow Orange (mottled) CLAY Hard and Dry No DNAPL odor or staining observed		CL		
31		0.0							31
32		0.0							32
33		0.0							33
34		0.0							34
35		0.0							35
	8			4.7	~35' - 38' Reddish Brown/Lt Gray/Yellow Orange (mottled) CLAY Hard and Dry No DNAPL odor or staining observed		CL		
36		0.0							36
37		0.0							37
38		0.0			~38' - 40' Lt Gray w/ Yellow Orange flecks CLAY V. Stiff and Slightly Moist No DNAPL odor or staining observed		CL		38
39		0.0							39
40		0.0							40
	9			4.5	~40' - 41' Lt Gray w/ Yellow Orange flecks Silty CLAY becoming increasingly silty with depth V.Stiff and Dry No DNAPL odor or staining observed		CL		
41		0.0							41
42		0.0			~41' - 45' Lt Gray V. F-SAND some silt M. Dense and Wet No DNAPL odor or staining observed		SM		42
43		0.0							43
44		0.0							44
45		0.0							45
	10			4.2	45' - 50' Lt Gray V.F-SAND some silt M. Dense and Moist No DNAPL odor or staining observed		SM		
46		0							46

Silt
Clay
Sand
Gravel
Bedrock

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KEY ENVIRONMENTAL INCORPORATED

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction
46								
		0.0			45' - 50' Lt Gray V.F-SAND some silt M. Dense and Moist No DNAPL odor or staining observed		SM	
47		0.0						
48		0.0						
49		0.0						
50		0.0						
	11			4.9	~50' - 54' Lt Gray Silty F-SAND (little fines) V. Dense and Moist No DNAPL odor or staining observed		SM	
51		0.0						
52		0.0			SAMPLED 51-53 @1100 for TOC			
53		0.0						
54		0.0						
					~54' - 55' Reddish Brown/Lt Gray CLAY (mottled) Hard and Dry No DNAPL odor or staining observed		CL	
55		0.0						
					Set TW at 55' Screened 40-55 Sand to 35 Bent to 30			
56								
57								
58								
59								
60								
61								
62								

Silt Gravel
Clay Bedrock
Sand

NOTES
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KEY ENVIRONMENTAL INCORPORATED

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-4-2

Client Name:	BEAZER EAST	Drilling/Boring Method:	Geoprobe	Total Boring Depth (ft):	55
Project Number:	05-113	Sampling Method:	5' Split Spon	Ground Surface Elev. (ft-msl)	50.14
Location:	South Cavalcade: Houston, TX	Subcontractor/Drillers:	Advanced Drilling Systems	Measuring Point Elev. (ft-msl):	
Date/Time Started:	9/15/2005	Monitoring Equipment:	PID	Geologist/Engineer:	Bob Balkovec
Date/Time Completed:	9/16/2005	Coordinates:	N732903.29 / E3157537.55	Consultant:	KEY Environmental, Inc.

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
0									0
	1			4.1	Dark to Lt Gray Silty F-SAND Soil looks reworked loose and moist No DNAPL odor or staining observed		SM	TEMPORARY WELL: 3" PVC outer casing grouted in place: 0-25.0 1" PVC: riser 0-40' screen 40-55'	
1		0.0							1
2		0.0							2
3		0.0							3
4		0.0							4
5		0.0							5
	2			4.2	Top 1.3' Dark to Lt Gray Silty F-SAND Soil looks reworked loose and moist No DNAPL odor or staining observed		SM		
6		0.0							6
7		0.0			Bottom 2.9' Lt Gray/Yellow Orange (mottled) Sandy CLAY w/ some silt M.Stiff and Moist No DNAPL odor or staining observed		CL		7
8		0.0							8
9		0.0							9
10		0.0							10
	3			4.5	Top 1' Lt Gray/Yellow Orange (mottled) Sandy CLAY w/ some silt M.Stiff and Moist No DNAPL odor or staining observed		CL		
11	Y	0.0							11
					~ 11' - 15' Lt GraySilty F-SAND (little fines) Loose and Wet No DNAPL odor or staining observed		SM		
12		0.0							12
13		0.0							13
14		0.0							14

Silt, Clay, Sand, Gravel, Bedrock

NOTES
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ft-bgs - indicates feet below ground surface
ft-msl - indicates feet above mean sea level
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ppm - indicates parts per million

Signature of Field Supervisor: Robert Balkovec

Date:

LOG OF BORING: TW-4-2 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
14									14
		0.0			@ 14.5' to 15' Color Change to Reddish Brown No DNAPL odor or staining observed		SM		
15		0.0							15
	4			4.2	~ 15' - 19' Lt Gray Silty F-SAND Wet and Loose No DNAPL odor or staining observed				
16		0.0							16
17		0.0							17
18		0.0							18
19		0.0							19
					@ 19 Reddish Brown/Lt Gray (mottled) CLAY V.Stiff and Dry No DNAPL odor or staining observed		CL		
20		0.0							20
	5			4.0	20' - 25' Reddish Brown/Lt Gray (mottled) CLAY V.Stiff and Dry No DNAPL odor or staining observed				
21		0.0							21
22		0.0							22
23		0.0							23
24		0.0			On 9/15/05 Augered to 24' and pushed 3" PVC Casing to 25' and grouted up			Bottom of Outer Casing	24
25		0.0			Resume Drilling on 9/16/05				25
	6			4.0	25' - 30' Reddish Brown/Lt Gray (mottled) CLAY V.Stiff and Dry No DNAPL odor or staining observed		CL		
26		0.0							26
27		0.0							27
28		0.0							28
29		0.0							29
30		0.0							30

Silt
Clay
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Gravel
Bedrock

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KEY ENVIRONMENTAL INCORPORATED

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
30									30
	7			3.4	30' - 35' Reddish Brown/Lt Gray/Yellow Orange (mottled) CLAY Hard and Dry No DNAPL odor or staining observed		CL		
31		0.0							31
32		0.0							32
33		0.0							33
34		0.0							34
35		0.0							35
	8			5.0	35' - 38' Reddish Brown/Lt Gray/Yellow Orange (mottled) CLAY Hard and Dry No DNAPL odor or staining observed		CL		
36		0.0							36
37		0.0							37
38		0.0			38' - 40' Lt Gray w/ Yellow Orange flecks Silty CLAY V. Stiff and Dry No DNAPL odor or staining observed				38
39		0.0							39
40		0.0							40
	9			4.3	40' - 45' Lt Gray w/ Yellow Orange flecks Silty CLAY becoming increasingly silty with depth V.Stiff and Dry No DNAPL odor or staining observed		CL		
41		0.0							41
42		0.0							42
43		0.0							43
44		0.0							44
45		0.0							45
	10			4.2	45' - 50' Lt Gray F-SAND (little fines) V. Dense and Moist No DNAPL odor or staining observed		SM		
46		0.0							46

Silt, Clay, Sand, Gravel, Bedrock

NOTES

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ft-bgs - indicates feet below ground surface

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KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-4-2 *(con't)*

ft.-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
46									46
		0.0			45' - 50' Lt Gray F-SAND (little fines) V. Dense and Moist No DNAPL odor or staining observed		SM		
47		0.0							47
48		0.0							48
49		0.0							49
50		0.0							50
	11			4.2	~50' - 54' Lt Gray F-SAND (little fines) V. Dense and Moist No DNAPL odor or staining observed		SM		
51		0.0							51
52		0.0			SAMPLED 52-53 @1625 for TOC				52
53		0.0							53
54		0.0							54
					~54' - 55' Reddish Brown/Lt Gray CLAY (mottled) Hard and Dry No DNAPL odor or staining observed		CL		
55		0.0							55
56					Set TW at 55' Screened 40-55 Sand to 38 Bent to 34				56
57									57
58									58
59									59
60									60
61									61
62									62

Silt, Clay, Sand, Gravel, Bedrock

NOTES

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ft - indicates depth in feet
ft-bgs - indicates feet below ground surface
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KEY ENVIRONMENTAL INCORPORATED

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: TW-5-1

Client Name:	BEAZER EAST	Drilling/Boring Method:	Geoprobe	Total Boring Depth (ft):	25'
Project Number:	05-113	Sampling Method:	5' Split Spon	Ground Surface Elev. (ft-msl)	50.33
Location:	South Cavalcade: Houston, TX	Subcontractor/Drillers:	Advanced Drilling Systems	Measuring Point Elev. (ft-msl)	NA
Date/Time Started:	9/12/2005	Monitoring Equipment:	PID	Geologist/Engineer:	Bob Balkovec
Date/Time Completed:	9/12/2005	Coordinates:	N733131.46 / E3157501.92	Consultant:	KEY Environmental, Inc.

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction
0	1			3.1	Top .3' Topsoil		ML	TEMPORARY WELL:
					– .3 - 2' Yellow Orange/Lt Gray (mottled) Silty CLAY (Stiff and Dry) No DNAPL odor or staining observed		CL	1" PVC: riser 0-5' screen 5-20'
1		0.0						
2		0.0			–2'-5' Yellow Orange/Lt Gray (mottled) Sandy, Silty CLAY (Stiff and Slightly Moist) No DNAPL odor or staining observed		CL	
3		0.0						
4		0.0						
5		0.0						
	2			4.8	5' - 10' Yellow Orange/Lt Gray F-Sandy SILT T-clay (Moist to Wet and M Dense) No DNAPL odor or staining observed		ML	
6		0.0						
7		0.0						
8	Y	0.0			Wet at 8'			
9		0.0						
10		0.0						
	3			4.7	10'- 15' Lt Gray Silty F-SAND Wet and Medium Dense No DNAPL odor or staining observed		SM	
11		0.0						
12		0.0						
13		0.0						
14		0.0						

Silt, Clay, Sand, Gravel, Bedrock

NOTES
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N/A - indicates not applicable to the boring
ppm - indicates parts per million

Signature of Field Supervisor: Robert Balkovec

Date: _____

LOG OF BORING: TW-5-1 *(con't)*

ft-bgs	Sample No.	PID (ppm)	Blows/6-in.	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Lithology	USCS Classification	Well Construction	ft-bgs
14									14
15		0.0							15
	4			4.5	15' - 18.9' Lt Gray Silty F-SAND Wet and Loose No DNAPL odor or staining observed		SM		
16		0.0							16
17		0.0							17
18		0.0							18
19		0.0			~18.9' - 20' Redish Brown/Lt Gray (mottled) Silty CLAY (Moist and Stiff) No DNAPL odor or staining observed		CL		19
20		0.0							20
	5			1.0	Redish Brown/Lt Gray (mottled) CLAY (Hard and Dry) No DNAPL odor or staining observed		CL		
21		0.0							21
22		0.0							22
23		0.0							23
24		0.0							24
25		0.0							25
					Set TW-5-1 at 20' Screend from 5' - 20' Sand to 3' Chips to surface				
26									26
27									27
28									28
29									29
30									30

Silt
Clay
Sand
Gravel
Bedrock

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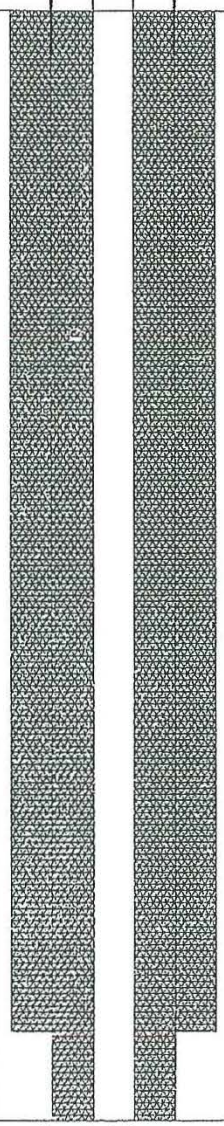
KEY ENVIRONMENTAL INCORPORATED

KEY ENVIRONMENTAL INCORPORATED	Site ID: MW-12R	Location: Houston, TX
	Contractor: Fugro Geosciences	Ground Surface Elevation (ft-msl): 51.18'
	Consulting Firm: Key Environmental	Datum: Mean Sea Level
	Logged By: J. Hale	Date(s): 04/08/00 - 04/11/00
Type: Monitoring Well, Intermediate Zone		Riser Casing: type: PVC dia: 2.00in fm: -2.69' to: 42.75'
Drilling Method: Wash Rotary (14", 7 7/8")		Screens: type: Slotted size: 0.010in dia: 2.00in fm: 42.75' to: 52.75'
Well Construction Materials:: type: Bentonite Grout fm: 0.00' to: 37.40'; type: Bentonite Pellets fm: 37.40' to: 40.70'; type: Sand Pack (generic) fm: 40.70' to: 53.00'		SOUTH CAVALCADE SUPERFUND SITE HOUSTON, TEXAS

Elevation (ft-msl)	Depth (ft-bgs)	Recovery	Sample No.	Blow Count	USCS Code	PID (ppm)	Graphic Log	Material Description
								Wash Rotary (14")
50			SS-1	2 2 3 2	SM	0 ppm		Loose; grayish brown (2.5Y 5/2); L SAND and SILT; moist to wet.
								Wash Rotary (14")
	10		SS-2	WH 2 2 4	SP/SM	0 ppm		Loose; mottled, light grayish brown (2.5Y 6/2); silty L SAND; wet; organic matter.
								Wash Rotary (14")
40			SS-3	7 11 20 19 0	SP	0.2 ppm		M. dense to dense; greenish gray (1 Gley 6/10Y); L SAND; wet to sat.; odor.
								Wash Rotary (14")
			SS-4	6 5 6 5	SP/CL	0.1 ppm		Loose; greenish gray (1 Gley 6/10Y); L SAND; wet to sat. (to 19.3 ft-bgs.) Stiff; mottled, light greenish gray (1 Gley 7/5GY) and yellowish red (5YR 4/6); CLAY; dry (19.3-20 ft.)
	20		SS-5	2 1 4 5	CL/ML	0 ppm		Same as above, silty lense (0.5 ft thick @ approximately 20.5-21 ft.)
30			SS-6	4 7 9 18	CL/ML	0 ppm		8" steel casing installed to 23 ft-bgs. Stiff; mottled, light greenish gray (1 Gley 7/5GY) and yellowish red (5YR 4/6); CLAY; dry; (variable silty horizons).

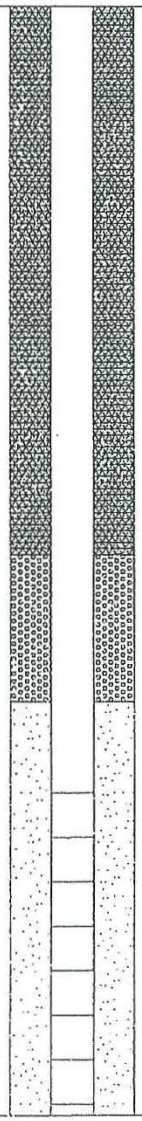
Well Construction
MP. EL. 53.87'



KEY ENVIRONMENTAL INCORPORATED	Site ID: MW-12R	Location: Houston, TX
	Contractor: Fugro Geosciences	Ground Surface Elevation (ft-msl): 51.18'
	Consulting Firm: Key Environmental	Datum: Mean Sea Level
	Logged By: J. Hale	Date(s): 04/08/00 - 04/11/00
Type: Monitoring Well, Intermediate Zone		Riser Casing: type: PVC dia: 2.00in fm: -2.69' to: 42.75'
Drilling Method: Wash Rotary (14", 7 7/8")		Screens: type: Slotted size: 0.010in dia: 2.00in fm: 42.75' to: 52.75'
Well Construction Materials:: type: Bentonite Grout fm: 0.00' to: 37.40'; type: Bentonite Pellets fm: 37.40' to: 40.70'; type: Sand Pack (generic) fm: 40.70' to: 53.00'		SOUTH CAVALCADE SUPERFUND SITE HOUSTON, TEXAS

Elevation (ft-msl)	Depth (ft-bgs)	Recovery	Sample No.	Blow Count	USCS Code	PID (ppm)	Graphic Log	Material Description
								Wash Rotary (7 7/8")
			SS-7	4 6 10	CL			Stiff to v. stiff; mottled, light greenish gray (1 Gley 7/10Y) and strong brown (7.5YR 5/6); CLAY; dry; some staining w/odor.
	30							
								Wash Rotary (7 7/8")
20			SS-8	3 6 8	CL/ML	0.2 ppm		Same as above w/ SILT zones, no staining.
								Wash Rotary (7 7/8")
			SS-9	3 4 6	ML	0 ppm		
	40							Medium stiff to stiff; light gray (2.5Y 7/2); SILT; moist.
								Wash Rotary (7 7/8")
10			SS-10	4 6 9	ML/SM	0 ppm		Stiff; mottled, light gray (2.5Y 7/2); SILT grading down to f. SAND and SILT; moist.
			SS-11	5 10 14	SM	0 ppm		Medium dense; mottled, light gray (2.5Y 7/2); f. SAND w/ SILT; wet.
			SS-12	9 15 17	SM	0 ppm		Medium dense; mottled, light gray (2.5Y 7/2); f. SAND w/ SILT; wet.
			SS-13	12 16 16	SM	0 ppm		Medium dense; mottled, light gray (2.5Y 7/2); f. SAND w/ SILT; wet.
			SS-14	14 28	SM			Medium dense; mottled, light gray (2.5Y 7/2); f. SAND w/ SILT; wet.

Well Construction



KEY ENVIRONMENTAL INCORPORATED	Site ID: MW-12R	Location: Houston, TX
	Contractor: Fugro Geosciences	Ground Surface Elevation (ft-msl): 51.18'
	Consulting Firm: Key Environmental	Datum: Mean Sea Level
	Logged By: J. Hale	Date(s): 04/08/00 - 04/11/00

Type: Monitoring Well, Intermediate Zone

Drilling Method: Wash Rotary (14", 7 7/8")

Well Construction Materials::
type: Bentonite Grout fm: 0.00' to: 37.40'
type: Bentonite Pellets fm: 37.40' to: 40.70'
type: Sand Pack (generic) fm: 40.70' to: 53.00'

Riser Casing:
type: PVC dia: 2.00in fm: -2.69' to: 42.75'

Screens:
type: Slotted size: 0.010in dia: 2.00in fm: 42.75' to: 52.75'

SOUTH CAVALCADE SUPERFUND SITE
HOUSTON, TEXAS

Elevation (ft-msl)	Depth (ft-bgs)	Recovery	Sample No.	Blow Count	USCS Code	PID (ppm)	Graphic Log	Material Description	Well Construction
			SS-15	29 6 25 25	SM	0 ppm		Medium dense; mottled, light gray (2.4Y 7/2); f. SAND w/ SILT; wet.	
			SS-16	8 11 13 18	SM/CL	0 ppm		Same as above to 52.4 ft-bgs. Very stiff; mottled, yellowish brown (10YR 5/6) and light gray (10YR 7/1); silty CLAY; dry to moist; staining; odor.	
0			SS-17	7 10 15 17	CL	0.2 ppm		Very stiff; mottled, yellowish brown and light gray; silty CLAY; dry to moist grading to very stiff; mottled, yellowish red (5YR 4/6) and light greenish gray (1 Gley 7/10Y); CLAY.	
	60					0.1 ppm			
-10									
	70								
-20									

8337

VERIFICATION OF GROUNDWATER FATE AND TRANSPORT EVALUATION

SOUTH CAVALCADE SUPERFUND SITE
HOUSTON, TEXAS

Prepared for:

Beazer East, Inc.
One Oxford Centre, Suite 3000
Pittsburgh, Pennsylvania 15219

Prepared by:

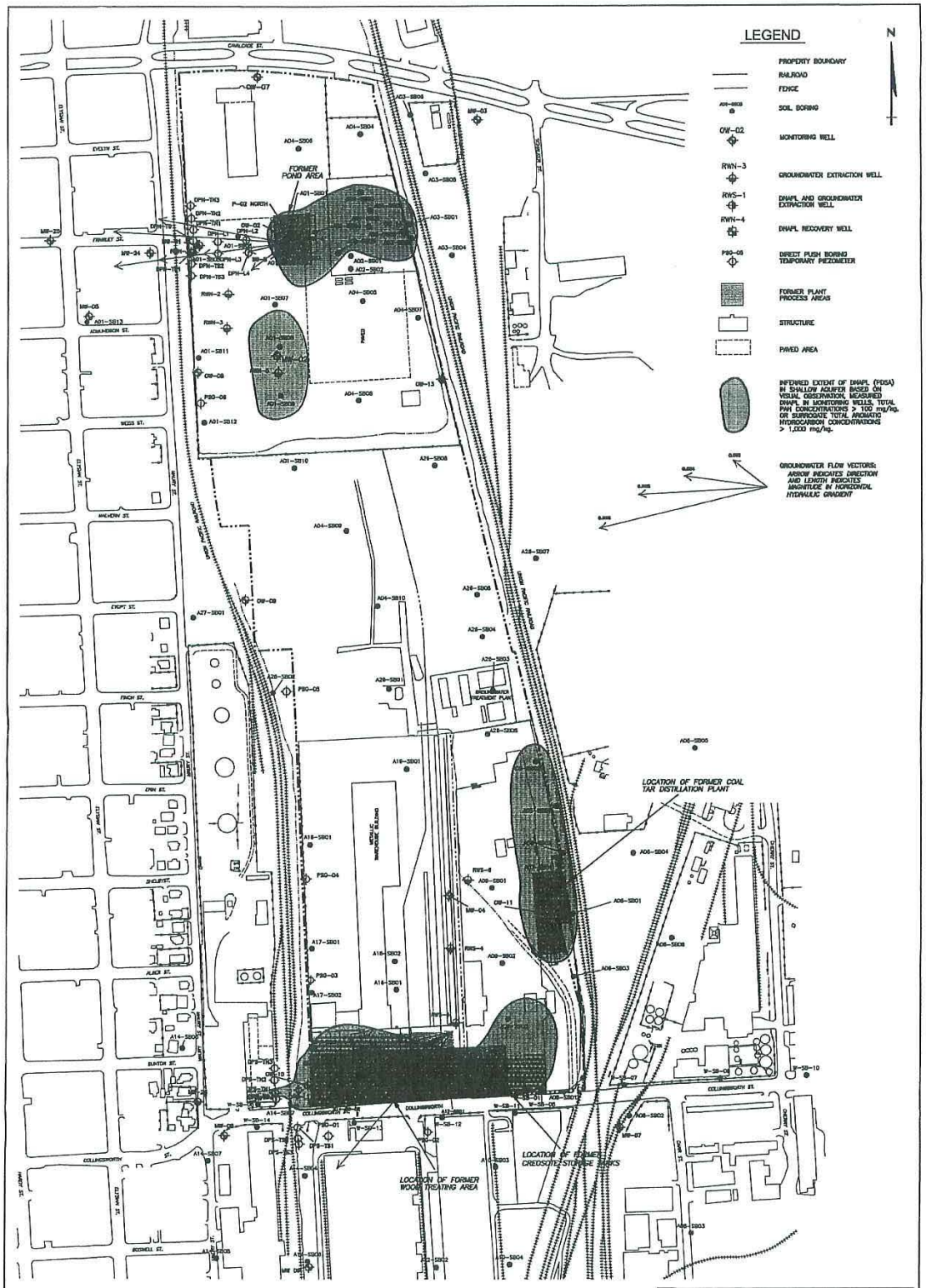
Key Environmental, Inc.
Rosslyn Farms Industrial Park
1200 Arch Street, Suite 200
Carnegie, Pennsylvania 15106

and

Groundwater Insight
5 Wenlock Grove
Halifax, Nova Scotia B3P136
Canada

July 2000

KEY ENVIRONMENTAL INCORPORATED



BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	BJS	DATE: 7/21/00	KEY ENVIRONMENTAL
CHKD:	JRH	DATE: 7/21/00	GROUNDWATER INSIGHT
APPD:	JSZ	DATE: 7/21/00	
SCALE:	AS SHOWN		

VERIFICATION OF GROUNDWATER FATE AND TRANSPORT EVALUATION
SOUTH CAVALCADE SUPERFUND SITE
HOUSTON, TEXAS

SITE CONDITIONS

DRAWING NUMBER 00-780
FIGURE 1-3

REV #	DATE	DESCRIPTION	APPD
△			
△			
△			

KEY ENVIRONMENTAL, INC.
ROSLYN FARMS INDUSTRIAL PARK
1300 ARCH ST., SUITE 300
CARNEGIE, PA 15106

ISSUE DATE:

KEY ENVIRONMENTAL INCORPORATED	Started: 12/01/99	Borehole ID: DPN-T0
	Completed: 12/01/99	Elevation: 51.45'
Project Name: South Cavalcade		Datum: Mean Sea Level
Project Number: 99785		Total Depth: 20.5'
Location: Houston, TX		Drilling Method: Direct Push (Split Spoon)
Contractor: TEG		Logged By: JRH

Elevation (ft)	Depth (ft)	Sample No.	Recovery	Blow Count	PID	USCS Code	Graphic Log	Material Description
50								
		SS-1		Push	1.2 ppm	SM		Grayish brown, mottled; fine SAND w/silt; dry.
		SS-2		Push	0.3 ppm			Grayish brown, mottled; fine SAND w/silt; dry (0.2').
	5							
45		SS-3		Push	1.3 ppm	SM/SC		Grayish brown, mottled; clayey SILT w/fine sand; dry.
		SS-4		Push	1.9 ppm	SM		Grayish brown; sandy SILT w/clay; moist.
	10	SS-5		Push	1.8 ppm			Grayish tan; fine SAND; moist.
40								Grayish tan; fine SAND; wet.
	15							
35								
	20					CL		
30								Silty CLAY @ 20.25' bgs; dry-moist

KEY ENVIRONMENTAL INCORPORATED	Started: 12/01/99	Borehole ID: DPN-L1
	Completed: 12/01/99	Elevation: 51.45'
Project Name: South Cavalcade		Datum: Mean Sea Level
Project Number: 99785		Total Depth: 19'
Location: Houston, TX		Drilling Method: Direct Push (Split Spoon)
Contractor: TEG		Logged By: JZ

Elevation (ft)	Depth (ft)	Sample No.	Recovery	Blow Count	PID	USCS Code	Graphic Log	Material Description
50								
		SS-1		Push	1.2 ppm	ML		Brownish gray, orange mottles; clayey SILT, trace fine sand; dry.
		SS-2		Push	0.2 ppm			Brown gray, orange mottles; clayey SILT, some fine sand; dry.
	5							
45		SS-3		Push	0 ppm			Brown gray, orange mottles; clayey SILT, some fine sand; dry.
						SM		Brown gray, some black staining; silty SAND, trace clay; no odor. (7.75')
		SS-4		Push	0 ppm			Brown gray, orange mottles, some black staining; silty SAND, trace clay; no odor.
	10	SS-5		Push				Brown gray, orange mottles, some black staining; silty SAND, trace clay; wet; no odor.
40								Light gray; fine SAND, trace silt; slight odor; wet.
	15							
35								
						CL		Red brown; CLAY
	20							
30								

KEY ENVIRONMENTAL INCORPORATED	Started: 12/02/99	Borehole ID: DPN-L2
	Completed: 12/02/99	Elevation: 51.67'
Project Name: South Cavalcade		Datum: Mean Sea Level
Project Number: 99785		Total Depth: 19'
Location: Houston, TX		Drilling Method: Direct Push (Split Spoon)
Contractor: TEG		Logged By: JRH

Elevation (ft)	Depth (ft)	Sample No.	Recovery	Blow Count	PID	USCS Code	Graphic Log	Material Description
		SS-1		Push	0 ppm	SM		Brown; fine SAND w/ silt; dry
50		SS-2		Push	0 ppm			Brown; fine SAND w/silt, trace clay; dry.
		SS-3		Push	0 ppm	ML		Mottled, brown & gray; clayey SILT, w/fine sand; dry.
	5	SS-4		Push	0 ppm	SM		Gray-tan; silty fine SAND; moist.
45		SS-5		Push	0 ppm			Mottled brown-tan; silty fine SAND; moist (0.75').
	10	SS-6		Push	0 ppm			Gray-tan; fine SAND; moist (0.6').
40								Gray-tan; fine SAND; wet.
	15							
35								
						CL		Brown; plastic, stiff; clay; dry. (18.8-19')
	20							
30								

KEY ENVIRONMENTAL INCORPORATED	Started: 12/01/99	Borehole ID: DPN-TN1
	Completed: 12/01/99	Elevation: 51.41'
Project Name: South Cavalcade		Datum: Mean Sea Level
Project Number: 99785		Total Depth: 19'
Location: Houston, TX		Drilling Method: Direct Push (Split Spoon)
Contractor: TEG		Logged By: JZ

Elevation (ft)	Depth (ft)	Sample No.	Recovery	Blow Count	PID	USCS Code	Graphic Log	Material Description
50								
		SS-1		Push	0 ppm	SM		Grayish brown; fine SAND, some silt.
		SS-2		Push	0 ppm	ML		Brownish gray; clayey SILT, some fine sand.
	5							
45		SS-3		Push	0 ppm	SM		Brownish gray; sandy SILT, trace clay.
								Brownish gray; clayey SILT, some fine sand (7.5').
		SS-4		Push	0 ppm			Brownish gray: clayey silt, some fine sand.
	10							Brownish gray; silty SAND; wet; no odor.
								No sample; running sand unit.
40								
	15							
35								
						CL		Reddish brown/gray; silty CLAY.
	20							
30								

KEY ENVIRONMENTAL INCORPORATED	Started: 11/30/99	Borehole ID: DPN-TN2
	Completed: 11/30/99	Elevation: 51.52'
Project Name: Cavalcade GIS		Datum: Mean Sea Level
Project Number: 99785		Total Depth: 20.50'
Location: South Cavalcade Site		Drilling Method: Direct Push (Split Spoon)
Contractor: TEG		Logged By: JRH

Elevation (ft)	Depth (ft)	Sample No.	Recovery	Blow Count	PID	USCS Code	Graphic Log	Material Description
		SS-1		Push		FL		Asphalt/concrete (0-1'). SAND/GRAVEL road base(1-1.5').
					1.2 ppm			Grayish brown; clayey SILT, trace fine sand(1.5-2').
50		SS-2		Push		ML		Grayish brown; clayey SILT, trace fine sand (2-3'); dry to moist.
					1.6 ppm			Grayish brown; silty SAND (3-4'); dry-moist.
		SS-3		Push		SM		Grayish tan; fine SAND w/silt; dry-moist.
					1.8 ppm			
		SS-4		Push				Mottled, tan-brown; fine SAND w/silt; dry-moist.
					2 ppm			
		SS-5		Push				Mottled, gray-brown; silty SAND; dry-moist.
					3.1 ppm			Increased moisture below 9'.
	10	SS-6		Push				Mottled, gray-brown; silty SAND; moist (10-10.3').
					0.8 ppm			Gray-tan; fine-medium SAND w/ silt; wet (10.3-12').
40		SS-7		Push				Gray-tan; fine-medium SAND w/silt; wet.
					2.3 ppm			
		SS-8		Push				Gray-tan; fine-medium SAND w/silt; wet-sat; borehole collapsing.
					3.5 ppm			
	20					CL		Red-brown; stiff; CLAY (20.5').
30								

KEY ENVIRONMENTAL INCORPORATED	Started: 11/30/99	Borehole ID: DPN-TN3
	Completed: 11/30/99	Elevation: 51.33'
Project Name: South Cavalcade		Datum: Mean Sea Level
Project Number: 99785		Total Depth: 21'
Location: Houston, TX		Drilling Method: Direct Push (Split Spoon)
Contractor: TEG		Logged By: JZ

Elevation (ft)	Depth (ft)	Sample No.	Recovery	Blow Count	PID	USCS Code	Graphic Log	Material Description
		SS-1		Push		FL		Asphalt/concrete (0-1').
50								SAND/GRAVEL road base (1-1.5'). Grayish brown; clayey SILT, trace fine sand (1.5-2').
		SS-2		Push		ML		Grayish brown; clayey SILT, trace fine sand; dry.
		SS-3		Push		SM		
	5							Brown; fine SAND, some silt; dry.
45		SS-4		Push				Brown; fine SAND, some silt; dry.
								Grayish brown; silty CLAY (7-7.5'). Brown; silty SAND; damp(7.5-8').
		SS-5		Push				Brownish gray; silty SAND; wet.
	10	SS-6		Push				Gray; fine SAND, trace silt, trace medium sand; wet.
40								
		SS-7		Push				Gray; fine SAND, trace silt, trace medium sand; wet.
		SS-8		Push				Gray; fine SAND, trace silt, trace medium sand; wet.
	15							
35								No sample.
		SS-9		Push				Gray; fine SAND, trace silt, trace medium sand; wet.
		SS-10		Push				Gray; fine SAND, trace silt, trace medium sand; wet.
	20					CL		Red/brown-gray; silty CLAY (20.5').
30								

KEY ENVIRONMENTAL INCORPORATED	Started: 12/01/99	Borehole ID: DPN-TS1
	Completed: 12/01/99	Elevation: 50.19'
Project Name: Cavalcade GIS		Datum: Mean Sea Level
Project Number: 99785		Total Depth: 17.00'
Location: Houston, TX		Drilling Method: Direct Push (Split Spoon)
Contractor: TEG		Logged By: JZ

Elevation (ft)	Depth (ft)	Sample No.	Recovery	Blow Count	PID	USCS Code	Graphic Log	Material Description
50								
		SS-1		Push		SM		Brownish gray; silty SAND, trace clay; dry.
		SS-2		Push				Mottled brownish gray; sandy SLIT, trace clay; dry.
		SS-3		Push				Mottled brownish gray; sandy SILT, some clay; damp.
		SS-4		Push				Mottled brownish gray; sandy SILT, some clay; damp.
40	10							Gray; fine SAND, some silt; wet.
						CL		Red brown; silty CLAY.
30	20							

KEY ENVIRONMENTAL INCORPORATED	Started: 12/01/99	Borehole ID: DPN-TS2
	Completed: 12/01/99	Elevation: 50.69'
Project Name: South Cavalcade		Datum: Mean Sea Level
Project Number: 99785		Total Depth: 20'
Location: Houston, TX		Drilling Method: Direct Push (Split Spoon)
Contractor: TEG		Logged By: JRH

Elevation (ft)	Depth (ft)	Sample No.	Recovery	Blow Count	PID	USCS Code	Graphic Log	Material Description
50								
		SS-1		Push	0 ppm	SM		Mottled, gray-brown; silty fine SAND; dry.
		SS-2		Push	0 ppm	ML		Mottled, gray-tan brown; clayey SILT w/fine sand; dry.
	5							
45		SS-3		Push	0 ppm	SM		Mottled, gray-brown-tan; sily SAND, trace clay (6-7.3').
		SS-4		Push	0 ppm			Gray-tan; fine SAND; moist (7.3-8').
								Gray-tan; fine SAND; moist 8-9', wet 9-10'
	10							
40								
	15							
35						CL		Brown CLAY (stiff & plastic).
	20							
30								

KEY ENVIRONMENTAL INCORPORATED	Started: 12/01/99	Borehole ID: DPN-TS3
	Completed: 12/01/99	Elevation: 50.66'
Project Name: South Cavalcade		Datum: Mean Sea Level
Project Number: 99785		Total Depth: 20'
Location: Houston, TX		Drilling Method: Direct Push (Split Spoon)
Contractor: TEG		Logged By: JRH

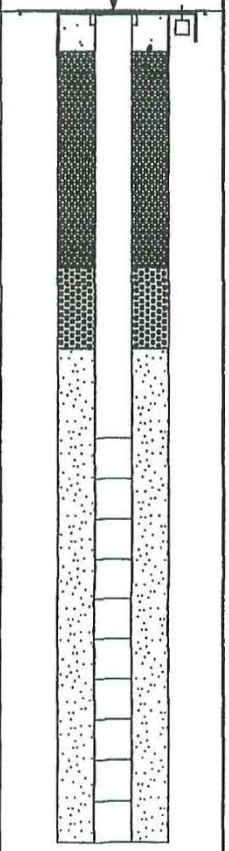
Elevation (ft)	Depth (ft)	Sample No.	Recovery	Blow Count	PID	USCS Code	Graphic Log	Material Description
50								
		SS-1		Push	0 ppm	SM		Mottled, gray-brown; silty fine SAND, trace clay, dry.
		SS-2		Push	0.3 ppm	ML		Mottled, gray/brown; silty SAND, trace clay; moist.
45	5	SS-3		Push	0.2 ppm	SM		Mottled, gray-brown; silty SAND; moist.
		SS-4		Push	0.2 ppm			Mottled, grayish tan-brown; fine SAND; moist-wet.
40	10	SS-5		Push	0 ppm			Greenish gray/tan; fine SAND, wet.
35	15							
30	20					CL		Brown; stiff, plastic; CLAY (19.7-20').

KEY ENVIRONMENTAL INCORPORATED	Site ID: MW-24	Location: South Cavalcade Site
	Contractor: FUGRO	Ground Surface Elevation (ft-msl): 52.01'
	Consulting Firm: Key Environmental	Datum: Mean sea Level
	Logged By: JRH	Date(s): 12/13/99 - 12/13/99
Type: Monitoring Well, Shallow		Riser Casing: type: PVC dia: 2.00in fm: 0.1' to: 10.50'
Drilling Method: 4 1/4" ID Hollow Stem Auger		Screens: type: Slotted size: 0.010in dia: 2.00in fm: 10.50' to: 20.50'
Well Construction Materials:: type: Portland Cement Surface Seal fm: 0.00' to: 1.00'; type: Bentonite Grout fm: 1.00' to: 6.30'; type: Bentonite Pellets fm: 6.30' to: 8.30'		SOUTH CAVALCADE SUPERFUND SITE HOUSTON, TEXAS

Elevation (ft-msl)	Depth (ft-bgs)	Recovery	Sample No.	Blow Count	USCS Code	PID (ppm)	Graphic Log	Material Description
			SS-1	Push	SM			Brown fine SAND; dry, organic debris @ top.
50			SS-2	Push	ML			Mottled, tan-gray-brown SILT w/sand, trace clay; dry.
			SS-3	3 4 4		0 ppm		Loose; mottled, tan-gray-brown SILT w/sand, trace clay; dry.
			SS-4	2 2 2	SM			Loose; mottled, brown-tan; fine SAND w/silt; dry.
			SS-5	2 3 3		0 ppm		Loose; mottled, brown-tan; fine SAND w/silt; moist @ 9.5'.
	10		SS-6	2 4 6		0 ppm		Loose; gray/tan fine SAND; wet.
40			SS-7	4 6 7		0 ppm		Loose; gray/tan fine SAND; wet.
			SS-8	4 6 7				Tan-gray; fine SAND; saturated.
			SS-9	5 6 11		0 ppm		Tan-gray; fine SAND; saturated (running sands).
			SS-10	3 4 5	CL	0.3 ppm		Tan-gray; fine SAND; saturated (19-19.5'). Mottled, gray-brown; stiff plastic clay; odor; dry (19.5-20').
	20							Auger to 20.5' bgs.
30								

Well Construction

MP. EL. 51.99



KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: RWN-4

Client Name:	Beazer East, Inc., South Cavalcade	Drilling/Boring Method:	4-1/4" and 10-1/4" HSA	Total Boring Depth(ft):	26
Project Number:	95-011	Sampling Method:	Shelby Tube & Split-spoon	Ground Surface Elev.(ft-msl):	52.01
Location:	Houston, TX	Subcontractor/Drillers:	Fugro Geosciences, Inc.	Measuring Point Elev.(ft-msl):	49.51
Date/Time Started:	6-21-95 / 0755	Monitoring Equipment:	HNu	Geologist/Engineer:	F.Coll / J.Zubrow
Date/Time complete	6-23-95 / 1240	Coordinates:	N733,706.3462 / 3,157,824.0528	Consultant:	KEY Environmental, Inc.

ft-bgs	Sample No.	Sample Type	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Well Construction
0–3				Dark Gray clayey SILT, some fine sand	
4–5	1	Spoon	21"	Grayish-brown clayey SILT, some sand moist, no odor	
6–8					
9–10	2	Spoon	18"	Light gray clayey SILT, some fine sand bottom six inches of spoon contains gray silty SAND, moist, no odor	
11–13					
14	3	Spoon	16"	Gray fine SAND, trace silt, saturated, slight creosote-like odor	

SAND GROUT

BENTONITE

NOTES

in - indicates inches

ft - indicates depth in feet

ft-bgs - indicates feet below ground surface

ft-msl - indicates feet above mean sea level

N/A - indicates not applicable to this boring

ppm - indicates parts per million

Signature of Field Supervisor: James Zubrow

Date: 7/16/96

LOG OF BORIN RWN-4 (cont'd)

ft-bgs	Sample No.	Sample Type	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Well Construction
14					
15	3 (con't)				
16					
17					
18					
19	4	Spoon		Gray fine SAND, creosote-like odor, saturated	
20				Gray silty CLAY, reddish brown mottling	
21					
22					
23					Sump
24					
25					
26				Bottom of boring at 26 ft-bgs	
27					
28					
29					
30					

SAND GROUT

BENTONITE

NOTES

in - indicates inches

ft - indicates depth in feet

ft-bgs - indicates feet below ground surface

ft-msl - indicates feet above mean sea level

N/A - indicates not applicable to this boring

ppm - indicates parts per million

KEY ENVIRONMENTAL INCORPORATED

KEY ENVIRONMENTAL INCORPORATED

LOG OF BORING: RWN-5

Client Name:	Beazer East, Inc., South Cavalcade	Drilling/Boring Method:	4-1/4" and 10-1/4" HSA	Total Boring Depth(ft):	22
Project Number:	95-011	Sampling Method:	Shelby Tube & Split-spoon	Ground Surface Elev.(ft-msl):	51.43
Location:	Houston, TX	Subcontractor/Drillers:	Fugro Geosciences, Inc.	Measuring Point Elev.(ft-msl):	48.95
Date/Time Started:	6-17-95 / 0730	Monitoring Equipment:	HNu	Geologist/Engineer:	Jim Zubrow
Date/Time complete	6-17-95 / 1630	Coordinates.	N733,262.0562 / E3,157,772.4228	Consultant:	KEY Environmental, Inc.

ft-bgs	Sample No.	Sample Type	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Well Construction
0–3	1	Grab		Brown-Gray clayey SILT, trace very fine sand, dry, no odor	
3–6	2	Tube	14"	Light gray and brown silty CLAY	
6–8				Light brown silty CLAY	
8–11	3	Tube	20"	Light gray and brown silty CLAY trace fine sand	
11–13				Light gray sandy SILT, Slight creosote-like odor	
13–14	4	Spoon	8"	Light gray fine SAND, some silt, Creosote-like odor	

SAND GROUT BENTONITE

NOTES
in - indicates inches
ft - indicates depth in feet
ft-bgs - indicates feet below ground surface
ft-msl - indicates feet above mean sea level
N/A - indicates not applicable to this boring
ppm - indicates parts per million

Signature of Field Supervisor: James Zubrow

Date: 1/16/96

LOG OF BORING: RWN-5 (cont'd)

ft-bgs	Sample No.	Sample Type	Recovery	SOIL DESCRIPTION (color, texture, moisture, etc.)	Well Construction
14					
	4		8"	Light gray fine SAND, some silt. Creosote-like odor	
15					
16					
17					
18					
		Spoon		Reddish-brown and gray clayey SILT. Some fine sand, creosote-like odor.	
19	5		14"	Slight sheen	
				Reddish-brown and gray silty CLAY	
20					
21					
22					
				Bottom of boring at 22 ft-bgs	
23					
24					
25					
26					
27					
28					
29					
30					

SAND GROUT

BENTONITE

NOTES

in - indicates inches

ft - indicates depth in feet

ft-bgs - indicates feet below ground surface

ft-msl - indicates feet above mean sea level

N/A - indicates not applicable to this boring

ppm - indicates parts per million

KEY ENVIRONMENTAL INCORPORATED

8685

Beazer

GROUNDWATER COLLECTION TRENCH PILOT STUDY REPORT SOUTH CAVALCADE SUPERFUND SITE HOUSTON, TEXAS

Prepared For:

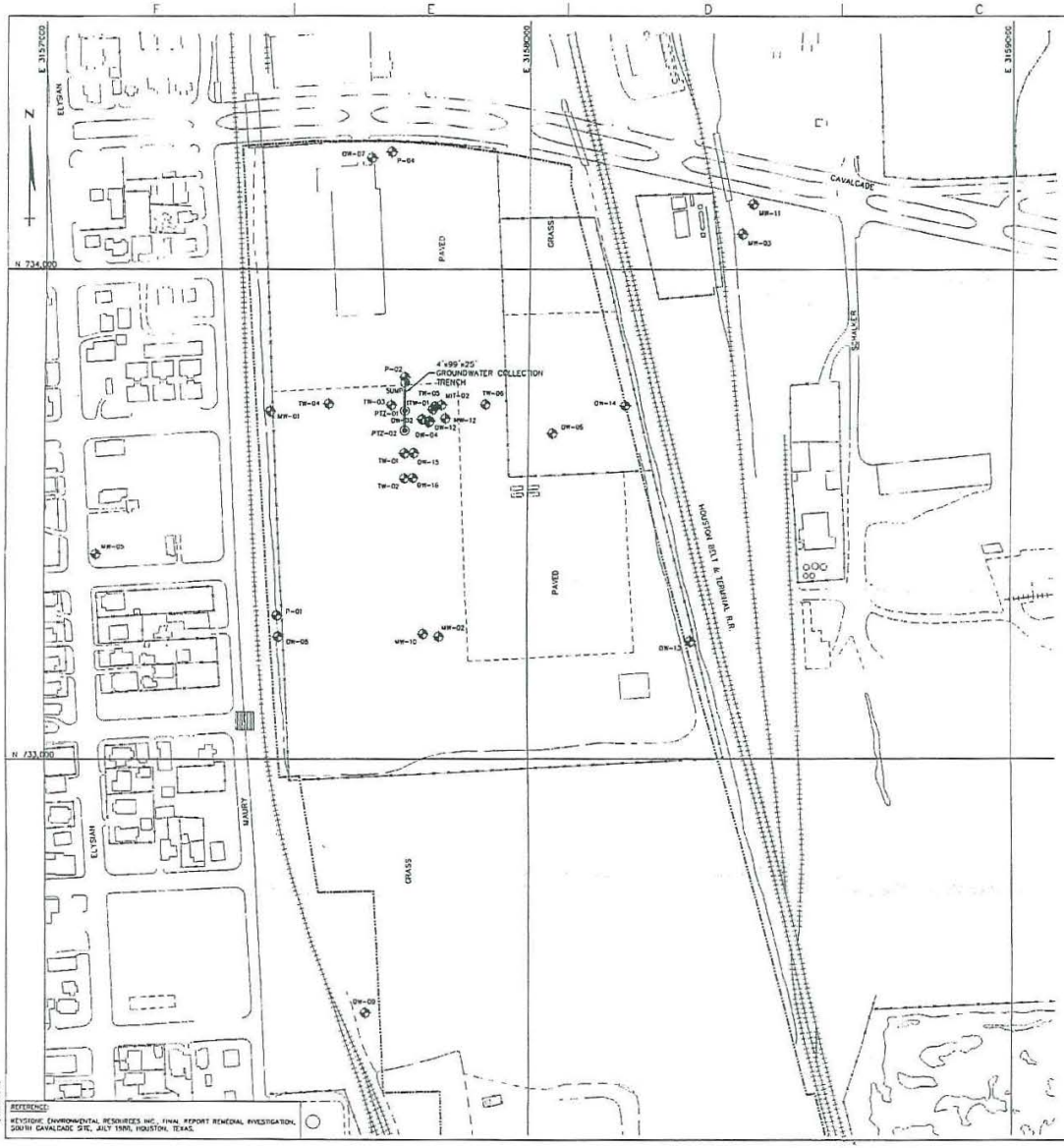
Beazer East, Inc.
436 Seventh Avenue
Pittsburgh, Pennsylvania 15219

Prepared By:

McLaren/Hart Environmental Engineering Corporation
Penn Center West
Building III, Suite 106
Pittsburgh, Pennsylvania 15276

October, 1993

McLaren Hart
ENVIRONMENTAL ENGINEERING CORPORATION


F
E
D
C
B
A
5
4
3
2
1
N
E 3157000
E 3158000
E 3159000
N 734,000
N 733,000
ELYSIAN
MAURY
CAVALCADE
SCHAFER
PAVED
GRASS
HOUSTON BELT & TERMINAL R.R.
4'x99'x25' GROUNDWATER COLLECTION TRENCH
SUMP
P-01
P-02
P-04
TW-01
TW-02
TW-03
TW-04
TW-05
TW-06
MW-01
MW-02
MW-03
MW-10
MW-11
MW-12
PTZ-01
PTZ-02
OW-02
OW-03
OW-04
OW-05
OW-06
OW-07
OW-08
OW-09
OW-12
OW-13
OW-14
OW-15
OW-16
LEGEND:
SITE BOUNDARY
PILOT TREATMENT SYSTEM
OW-06 MONITORING WELL LOCATION
PTZ-01 PIEZOMETER LOCATION
SUMP SUMP LOCATION
SCALE
0 100 200 300 FEET
REFERENCE:
KEYSTONE ENVIRONMENTAL RESOURCES INC., FINAL REPORT REMEDIAL INVESTIGATION, SOUTH CAVALCADE SITE, JULY 1991, HOUSTON, TEXAS.
REV # DATE DESCRIPTION APPD
BEAZER EAST, INC.
HOUSTON, TEXAS
McLaren Hart
ENVIRONMENTAL ENGINEERING CORPORATION
DRWN MJH DATE 10-11-93
CHKD DATE
APPD DATE
SCALE AS SHOWN
GROUNDWATER COLLECTION TRENCH PILOT STUDY
SOUTH CAVALCADE SITE
BEAZER EAST, INC.
HOUSTON, TEXAS
GROUNDWATER COLLECTION TRENCH LOCATION AND DIMENSIONS
DRAWING NUMBER
FIGURE 3
PENN CENTER WEST III
SUITE 106
PITTSBURGH, PA. 15276
8390
Cav-B

DRILLING LOG

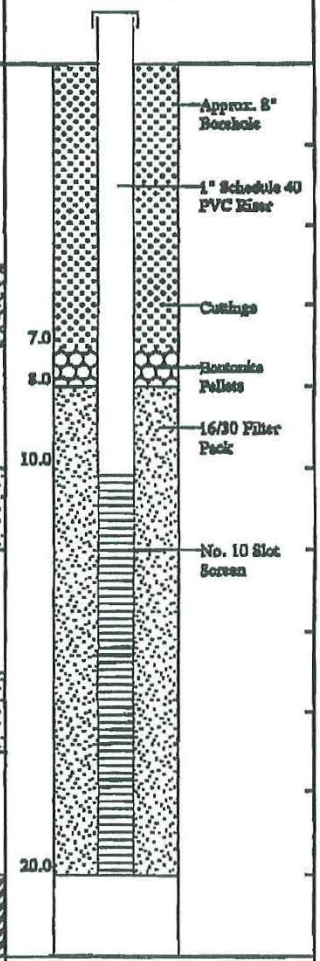
McLaren Hart

SB/MW #: TW1
Log #: TW-1
Page 1 of 1
Geoscientist: Pete Shiman

PROJECT: Beaver East - South Calvacade
PROJECT #: 09.0801228.001
LOCATION: Houston, Texas
TOC ELEVATION: 52.71'
SAMPLING DATE(S): 8/12/93
START: 0936
FINISH: 1038
SAMPLING METHOD: Split Spoon
MONITORING DEVICE: OVM
SUBCONTRACTOR/EQUIPMENT: Layne Environmental/Mobil Drill B-61
DRILLING METHOD: Hollow Stem Auger
NOTES:

Depth Below Surface (ft.)	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log
2						
4						
6			<1	5.0' - 7.0' CLAYEY SAND, light gray, moist, dark yellow discolorations, very strong creosote odor.	SC	
8						
10				10.0' - 12.0' SILTY SAND, light gray, saturated, mild creosote odor	SM	
12						
14						
16				15.0' - 17.0' SAND, very fine grain, saturated, clean, moderate creosote odor	SM	
18						
20				20.0' - 22.0' CLAY, mottled reddish brown-olive gray, very stiff, moist, mild creosote odor, a few brown silt seams	CH	
22						

Well Construction Details



SIGNATURE OF FIELD SUPERVISOR

Site Geoscientist
TITLE

SIGNATURE OF REVIEWER

Project Manager
TITLE

DRILLING LOG

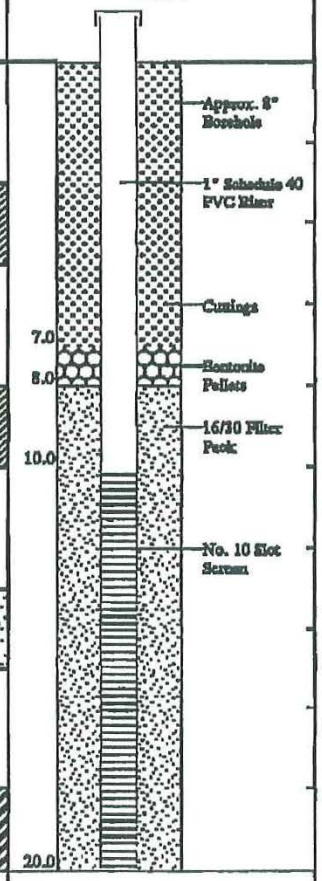
McLaren Hart

SB/MW #: TW2
Log #: TW-2
Page 1 of 1
Geoscientist: Pete Shinsan

PROJECT: Beaver East - South Calvacade
PROJECT #: 09.0801228.001
LOCATION: Houston, Texas
TOC ELEVATION: 52.55'
SAMPLING DATE(S): 8/12/93
START: 1045
FINISH: 1143
SAMPLING METHOD: Split Spoon
MONITORING DEVICE: OVM
SUBCONTRACTOR/EQUIPMENT: Layne Environmental/Mobil Drill B-61
DRILLING METHOD: Hollow Stem Auger
NOTES:

Depth Below Surface (ft.)	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log
2						
4				3.0' - 5.0' SANDY CLAY, mottled gray-dark yellow, stiff to very stiff, moist, with some sand pockets	CL	
6						
8				8.0' - 10.0' SANDY CLAY-CLAYEY SAND, moist, becomes wet sand at 9.7', slight creosote odor	SC CL	
10						
12						
14				13.0' - 15.0' SILTY SAND, light grey, very fine grained, saturated, moderate creosote odor	SM	
16						
18				18.0' - 20.0' SILTY CLAY, mottled red brown-light gray, very stiff, moist, very slight creosote odor	CH	
20						

Well Construction Details



SIGNATURE OF FIELD SUPERVISOR
Site Geoscientist
TITLE

SIGNATURE OF REVIEWER
Project Manager
TITLE

DRILLING LOG

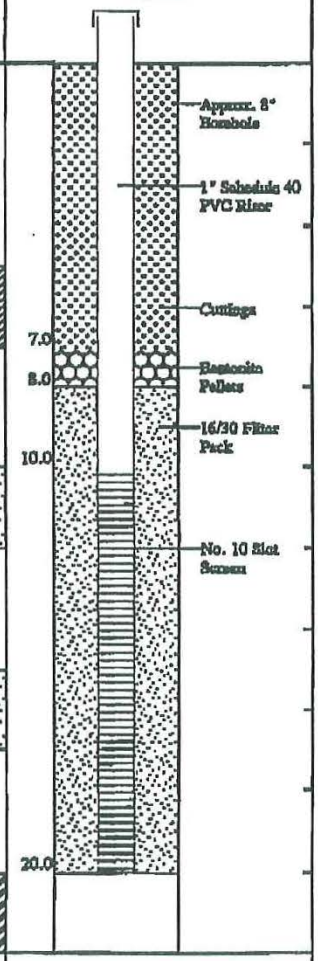
McLaren Hart

SB/MW #: TW3
Log #: TW-3
Page 1 of 1
Geoscientist: Pete Shinnan

PROJECT: Besser East - South Calvacade
PROJECT #: 09.0801228.001
LOCATION: Houston, Texas
TOC ELEVATION: 52.65'
SAMPLING DATE(S): 8/12/93
START: 1248
FINISH: 1340
SAMPLING METHOD: Split Spoon
MONITORING DEVICE: OVM
SUBCONTRACTOR/EQUIPMENT: Layne Environmental/Mobil Drill B-61
DRILLING METHOD: Hollow Stem Auger
NOTES:

Depth Below Surface (ft.)	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log
2						
4						
6				5.0' - 7.0' SANDY CLAY-CLAYEY SAND, light gray-dark yellow, moist, no odor	SC CL	
8						
10				10.0' - 12.0' SILTY SAND, light gray, saturated, mild creosote odor	SM	
12						
14						
16				15.0' - 17.0' SAND, very fine grain, saturated	SM	
18						
20				20.0' - 22.0' CLAY, mottled reddish brown-olive gray, very stiff, moist, moderate creosote odor	CH	
22						

Well Construction Details



SIGNATURE OF FIELD SUPERVISOR

Site Geoscientist
TITLE

SIGNATURE OF REVIEWER

Project Manager
TITLE

DRILLING LOG

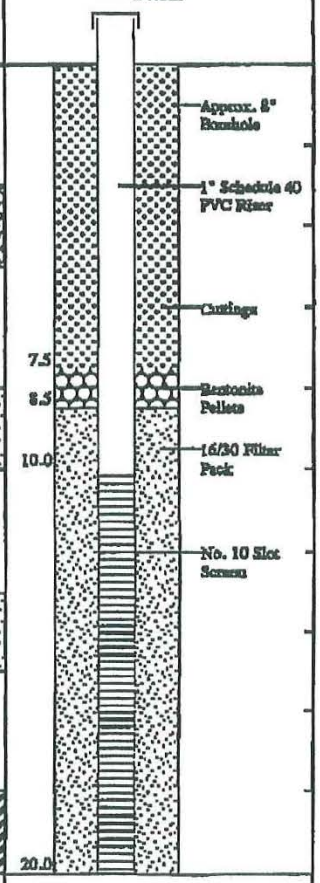
McLaren Hart

SB/MW #: TW4
Log #: TW-4
Page 1 of 1
Geoscientist: Pete Shinsan

PROJECT: Betzer East - South Calvacade
PROJECT #: 09.0801228.001
LOCATION: Houston, Texas
TOC ELEVATION: 52.73'
SAMPLING DATE(S): 8/12/93
START: 1340
FINISH: 1455
SAMPLING METHOD: Split Spoon
MONITORING DEVICE: OVM
SUBCONTRACTOR/EQUIPMENT: Layne Environmental/Mobil Drill B-61
DRILLING METHOD: Hollow Stem Auger
NOTES:

Depth Below Surface (ft.)	Sampler Interval/ Recovery	Sample ID #	FID reading (ppm)	Soil Description Color; Texture, Moisture, Etc.	Unified Classification	Graphic Log
				0.0' - 3.0' TOPSOIL, black-dark gray, sandy		
2						
				3.0' - 5.0' CLAYEY SAND, mottled gray-dark yellow, moist	SC	
4						
6						
8				8.0' - 10.0' SILTY SAND, light gray-dark yellow, moist to wet, mild creosote odor	SM	
10						
12						
				13.0' - 15.0' SILTY SAND, light gray, fine to very fine grained, saturated, moderate creosote odor, 20-30% silt	SM	
14						
16						
18				18.0' - 20.0' CLAY, mottled red brown-light gray, very stiff, moist, mild creosote odor	CH	
20						

Well Construction Details



SIGNATURE OF FIELD SUPERVISOR

Site Geoscientist
TITLE

SIGNATURE OF REVIEWER

Project Manager
TITLE

DRILLING LOG

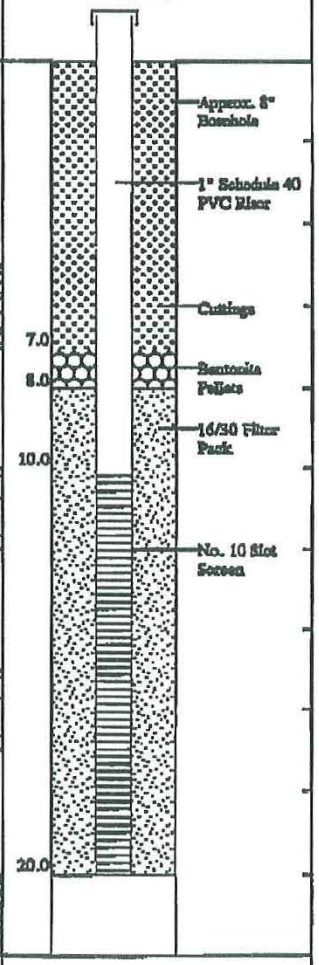
McLaren Hart

SB/MW #: TW5
Log #: TW-5
Page 1 of 1
Geoscientist: Pete Shimon

PROJECT: Beaver East - South Calvacade
PROJECT #: 09.0801228.001
LOCATION: Houston, Texas
TOC ELEVATION: 53.19'
SAMPLING DATE(S): 8/12/93
START: 0810
FINISH: 0936
SAMPLING METHOD: Split Spoon
MONITORING DEVICE: OVM
SUBCONTRACTOR/EQUIPMENT: Layne Environmental/Mobil Drill B-61
DRILLING METHOD: Hollow Stem Auger
NOTES:

Depth Below Surface (ft.)	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log
2						
4						
6				5.0' - 7.0' CLAYEY SAND, brown-gray, moist, creosote odor	SC	
8						
10				10.0' - 12.0' SILTY SAND, light gray, moist to wet, strong creosote odor, iridescent sheen visible	SM	
12						
14						
16				15.0' - 17.0' SILTY SAND, saturated, strong creosote odor, visible creosote, sheen visible	SM	
18						
20				20.0' - 22.0' CLAY, mottled reddish brown-olive gray, very stiff, moist, slight creosote odor	CH	
22						

Well Construction Details



SIGNATURE OF FIELD SUPERVISOR

Site Geoscientist
TITLE

SIGNATURE OF REVIEWER

Project Manager
TITLE

DRILLING LOG

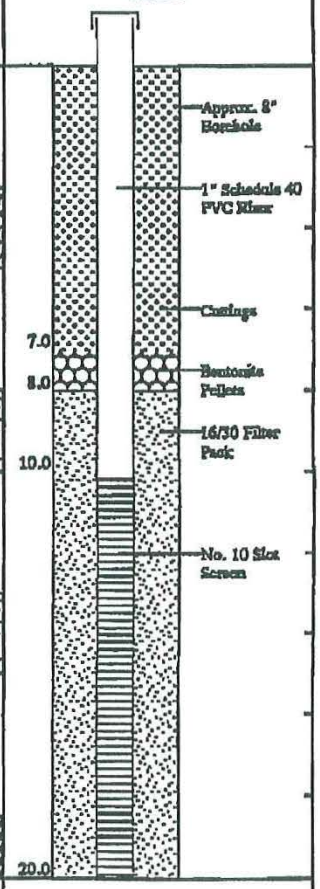
McLaren Hart

SB/MW #: TW6
Log #: TW-6
Page 1 of 1
Geoscientist: Pete Shiman

PROJECT: Besser East - South Calvacade
PROJECT #: 09.0801228.001
LOCATION: Houston, Texas
TOC ELEVATION: 53.08'
SAMPLING DATE(S): 8/17/93
START: 1505
FINISH: 1600
SAMPLING METHOD: Split Spoon
MONITORING DEVICE: OVM
SUBCONTRACTOR/EQUIPMENT: Layne Environmental/Mobil Drill B-61
DRILLING METHOD: Hollow Stem Auger
NOTES:

Depth Below Surface (ft.)	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log
				0.0' - 0.33' ASPHALT 0.33' - 1.0' Cement stabilized sub-base 1.0' - 3.0' TOPSOIL, organic, sandy		
2						
4	X			3.0' - 5.0' CLAYEY SAND-SILTY SAND, brownish gray, moist, moderate creosote odor, roots	SM SC	
6						
8	X			8.0' - 10.0' SILTY SAND, saturated, moderate creosote odor	SM	
10						
12						
14	X			13.0' - 15.0' SILTY SAND, light gray, very fine grained, saturated, creosote staining, strong creosote odor	SM	
16						
18	X			Slough 18.5' - 20.0' CLAY, mottled red brown-light gray, very stiff, moist, slight creosote odor	CH	
20						

Well Construction Details



SIGNATURE OF FIELD SUPERVISOR

Site Geoscientist
TITLE

SIGNATURE OF REVIEWER

Project Manager
TITLE

8482

EXTRACTION WELL
PILOT STUDY REPORT
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

Prepared for:

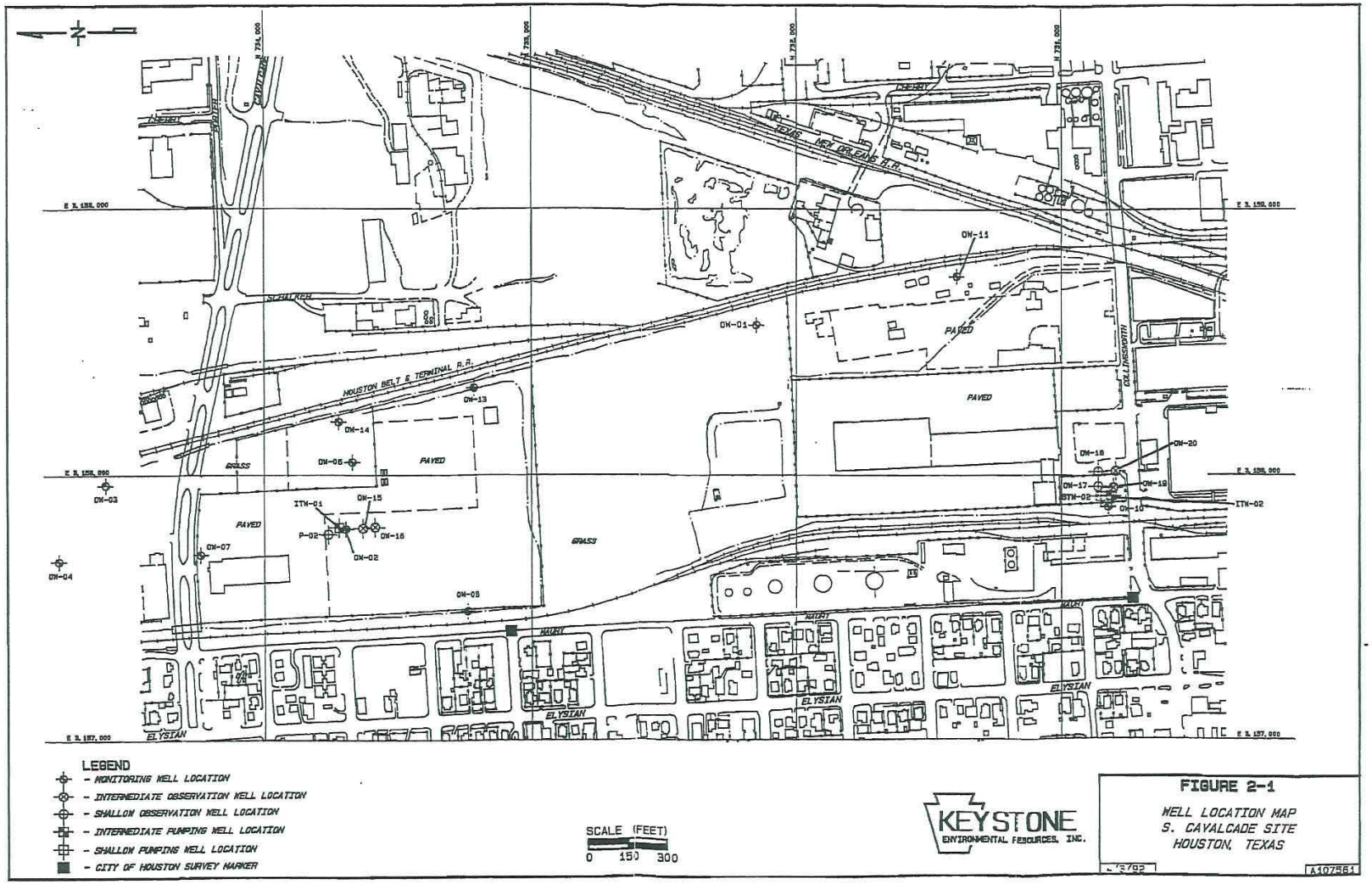
BEAZER EAST, INC.
436 SEVENTH AVENUE
PITTSBURGH, PENNSYLVANIA 15219

Prepared by:

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
3000 TECH CENTER DRIVE
MONROEVILLE, PENNSYLVANIA 15146

PROJECT NO. 157345

JULY 1992



LEGEND

- MONITORING WELL LOCATION
- INTERMEDIATE OBSERVATION WELL LOCATION
- SHALLOW OBSERVATION WELL LOCATION
- INTERMEDIATE PUMPING WELL LOCATION
- SHALLOW PUMPING WELL LOCATION
- CITY OF HOUSTON SURVEY MARKER

SCALE (FEET)
0 150 300

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

FIGURE 2-1

WELL LOCATION MAP
S. CAVALCADE SITE
HOUSTON, TEXAS

A107561

PROJECT: SOUTH CAVALCADE
LOCATION: HOUSTON, TX
CLIENT: BEAZER EAST, INC

WELL LOG: ITW-1R

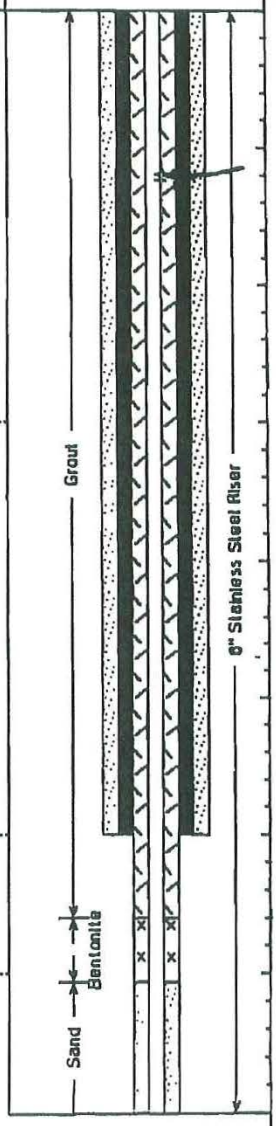
GROUND ELEVATION:
WELL ELEVATION:
WELL DEPTH: 57.5
DEVELOPMENT METHOD: Air

ELEV. DATUM: Mean Sea Level
DATUM: Feet

DRILLING METHOD: Hollow-Stem Auger
DRILLER: Layne Environmental Services
DATE DRILLED: 18 February 1992
GEOLOGIST: Scott Lodge

DEPTH (feet)	BLOW COUNT (SPT)	RECOVERY	SAMPLES	HNU (ppm)	GRAPHIC LOG	DESCRIPTION
	NA	NA				Tan-brown fine SAND; loose.
5						
10						
15						Red Silty CLAY; moist; (slight odor at 30 feet).
20						
25						
30						Red-grey Silty CLAY; stiff.
35						Grey Silty CLAY; little coarse Sand.
40						

WELL DIAGRAM



PROJECT: SOUTH CAVALCADE
LOCATION: HOUSTON, TX
CLIENT: BEAZER EAST, INC

WELL LOG: ITW-1R

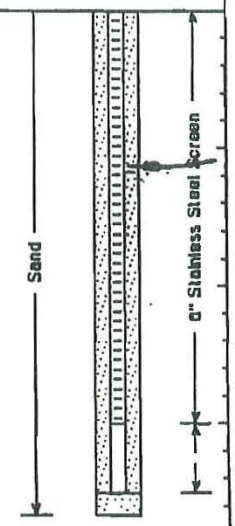
GROUND ELEVATION:
WELL ELEVATION:
WELL DEPTH: 57.5
DEVELOPMENT METHOD: Air

ELEV. DATUM: Mean Sea Level
DATUM: Feet

DRILLING METHOD: Hollow-Stem Auger
DRILLER: Layne Environmental Services
DATE DRILLED: 18 February 1992
GEOLOGIST: Scott Lodge

DEPTH (feet)	BLOW COUNT (SPT)	RECOVERY	SAMPLES	HNU (ppm)	GRAPHIC LOG	DESCRIPTION
45						
						Grey-red Silty CLAY.
50						Grey SILT; some Clay; oily sheen; odor; (trace black product from 52.0 - 55.0 feet).
55						Red CLAY; stiff.
						Bottom of Well = 58.3 feet.
60						
65						
70						
75						
80						

WELL DIAGRAM



PROJECT: SOUTH CAVALCADE
LOCATION: HOUSTON, TX
CLIENT: BEAZER EAST, INC

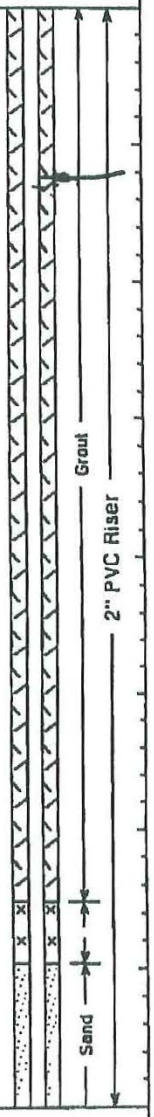
WELL LOG: OW-15

GROUND ELEVATION:
WELL ELEVATION:
WELL DEPTH: 55.0
DEVELOPMENT METHOD: Air
ELEV. DATUM: Mean Sea Level
DATUM: Feet

DRILLING METHOD: Hollow-Stem Auger
DRILLER: Layne Environmental Services
DATE DRILLED: 27 January 1992
GEOLOGIST: Scott Lodge

DEPTH (feet)	BLOW COUNT (SPT)	RECOVERY	SAMPLES	HNU (ppm)	GRAPHIC LOG	DESCRIPTION
	NA	3.0				Brown-orange SILT; some very fine Sand and Roots; very moist.
						Brown-tan mottled SILT; little very fine Sand; trace Clay; trace Roots; wet.
5						Cemented fine SAND; hard, dry.
						Tan fine to medium SAND; little Silt.
	NA	4.0				Brown fine to medium SAND; cemented; some dark brown staining; wet
10						Crushed oyster shells, saturated with black product.
	NA	2.7				Tan SILT; little fine Sand; brown mottling; odor; moist
						Brown-grey very fine SAND; little Silt; sheen; saturated; grades to very fine grey Sand.
15	NA	NA				Grey very fine SAND; loose; stained; sheen; saturated.
20						Grey fine SAND; loose, saturated.
	NA	1.5				Grey-red mottled CLAY; stiff.
	NA	3.0				Red-light grey (altered) CLAY; stiff; little product staining in vertical fractures; moist.
25	NA	1.0				
30	NA	2.0				
	NA	1.5				Brown Clayey SILT; moist.
	NA	2.0				Grey CLAY; some Silt; with light brown weathered fractures throughout; semi stiff; odor; moist.
35	NA	3.5				Grey-brown mottled SILT and very fine SAND; some Clay; odor; moist.
40						Grey-brown mottled SILT and very fine SAND; slight odor; moist.

WELL DIAGRAM



PROJECT: SOUTH CAVALCADE
LOCATION: HOUSTON, TX
CLIENT: BEAZER EAST, INC

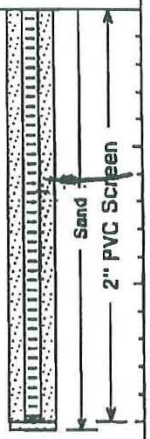
WELL LOG: OW-15

GROUND ELEVATION:
WELL ELEVATION:
WELL DEPTH: 55.0
DEVELOPMENT METHOD: Air
ELEV. DATUM: Mean Sea Level
DATUM: Feet

DRILLING METHOD: Hollow-Stem Auger
DRILLER: Layne Environmental Services
DATE DRILLED: 27 January 1992
GEOLOGIST: Scott Lodge

DEPTH (feet)	BLOW COUNT (SPT)	RECOVERY	SAMPLES	HNU (ppm)	GRAPHIC LOG	DESCRIPTION .
	NA	3.5				
45	NA	4.5				Grey very fine SAND; little Silt; green-brown staining from 46.0 - 48.0 feet; trace black product with odor at 48.5 feet.
50	NA	2.5				Grey very fine SAND; loose; wet; trace black product at 54.0 feet
55						Bottom of Boring = 55.3 feet.
60						
65						
70						
75						
80						

WELL DIAGRAM



PROJECT: SOUTH CAVALCADE
LOCATION: HOUSTON, TX
CLIENT: BEAZER EAST, INC

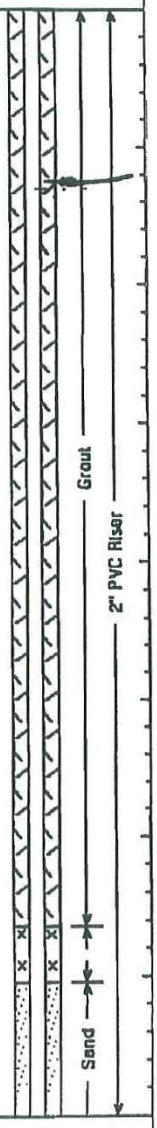
WELL LOG: OW-16

GROUND ELEVATION:
WELL ELEVATION:
WELL DEPTH: 55.0
DEVELOPMENT METHOD: Air
ELEV. DATUM: Mean Sea Level
DATUM: Feet

DRILLING METHOD: Hollow-Stem Auger
DRILLER: Layne Environmental Services
DATE DRILLED: 22 January 1992
GEOLOGIST: Scott Lodge

DEPTH (feet)	BLOW COUNT (SPT)	RECOVERY	SAMPLES	HNU (ppm)	GRAPHIC LOG	DESCRIPTION
						TOP SOIL, with roots and organic matter.
						Dark brown-grey fine SAND; little Silt
	NA	3.0				Light brown-grey mottled Silty CLAY; moist.
5						Grey brown fine SAND; little Silt; wet
	NA	4.0				Grey-brown Clayey SILT; little roots; black staining; odor; moist.
10						Grey fine SAND; loose; odor; saturated.
	NA	3.0				Grey fine SAND, mottled with black staining; loose; saturated.
15						Grey fine SAND; loose; very faint staining; odor; saturated.
	NA	2.6				
20						
25						
30						Red Silty CLAY; soft; moist.
	NA	3.0				
	NA	1.4				Red Clay, altered to whitish grey along fractures; stiff; moist; bottom .4 feet, grades to red Clay with little Silt.
35	NA	2.0				Grey-brown SILT; trace Clay; stiff; moist.
	NA	2.0				Grey SILT; little Clay, altered to light brown in fractures; slight odor; moist.
40						Grey SILT, with little brown-yellow staining; semi soft, becoming stiff at 42 feet; slight odor; moist.

WELL DIAGRAM



PROJECT: SOUTH CAVALCADE
LOCATION: HOUSTON, TX
CLIENT: BEAZER EAST, INC

WELL LOG: OW-16

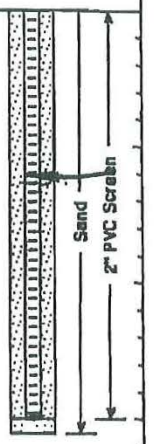
GROUND ELEVATION:
WELL ELEVATION:
WELL DEPTH: 55.0
DEVELOPMENT METHOD: Air

ELEV. DATUM: Mean Sea Level
DATUM: Feet

DRILLING METHOD: Hollow-Stem Auger
DRILLER: Layne Environmental Services
DATE DRILLED: 22 January 1992
GEOLOGIST: Scott Lodge

DEPTH (feet)	BLOW COUNT (SPT)	RECOVERY	SAMPLES	HNU (ppm)	GRAPHIC LOG	DESCRIPTION
	NA	5.0	X			
45	NA	2.7	X			Grey very fine SAND; little Silt; slight staining; moist.
50	NA	4.3	X			Light grey very fine SAND; trace Silt; loose; moist to wet.
55						Bottom of Boring = 55.5 feet.
60						
65						
70						
75						
80						

WELL DIAGRAM



PROJECT: SOUTH CAVALCADE
LOCATION: HOUSTON, TX
CLIENT: BEAZER EAST, INC

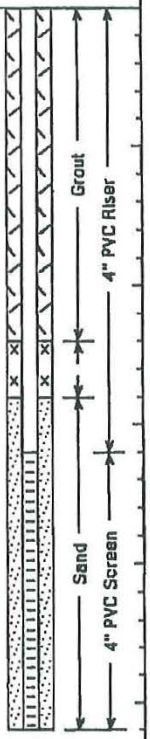
WELL LOG: P-1

GROUND ELEVATION:
WELL ELEVATION:
WELL DEPTH: 26.0
DEVELOPMENT METHOD: Air
ELEV. DATUM: Mean Sea Level
DATUM: Feet

DRILLING METHOD: Hollow-Stem Auger
DRILLER: Layne Environmental Services
DATE DRILLED: 27 January 1992
GEOLOGIST: Paul Carlson

DEPTH (feet)	BLOW COUNT (SPT)	RECOVERY	SAMPLES	HNU (ppm)	GRAPHIC LOG	DESCRIPTION
	1-15-3-5	NA	X			Brown Silty CLAY, moist.
	5-4-4-7	NA	X			Brown fine Sandy SILT, trace Clay.
5	2-4-6-5	NA	X			Light brown Silty CLAY, trace sand, strong odor, sheen, saturated.
	2-5-6-8	NA	X			Grey Silty CLAY with orange mottling, trace sand, stiff, strong odor, sheen.
	NA	NA	X			No Recovery
10	2-6-6-6	NA	X			Grey fine Sandy SILT with orange mottling, trace clay, soft, moist, odor.
	4-5-7-8	NA	X			Grey fine SAND, trace silt and clay, soft, moist.
15	1-8-12-17	NA	X			Grey fine SAND, saturated, grades to red color.
	4-18-17-8	NA	X			Red fine SAND, saturated, odor.
						Red / grey Silty CLAY, stiff, moist.
	7-10-11-11	NA	X			Grey / red Silty CLAY, stiff, moist.
20	6-7-7-7	NA	X			Grey / red Silty CLAY, stiff, dry.
	1-1-1-10	NA	X			Red fine SAND, some clay, loose, saturated.
25	10-15-15-17	NA	X			Red / grey Silty CLAY, stiff, dry.
						Bottom of Boring = 26 feet.
30						
35						
40						

WELL DIAGRAM



PROJECT: SOUTH CAVALCADE
LOCATION: HOUSTON, TX
CLIENT: BEAZER EAST, INC

WELL LOG: P-2 (N)

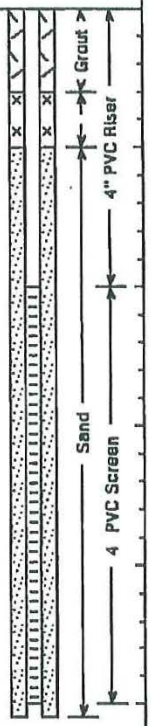
GROUND ELEVATION:
WELL ELEVATION:
WELL DEPTH: 25.0
DEVELOPMENT METHOD: Air

ELEV. DATUM: Mean Sea Level
DATUM: Feet

DRILLING METHOD: Hollow-Stem Auger
DRILLER: Layne Environmental Services
DATE DRILLED: 23 February 1992
GEOLOGIST: Scott Lodge

DEPTH (feet)	BLOW COUNT (SPT)	RECOVERY	SAMPLES	HNU (ppm)	GRAPHIC LOG	DESCRIPTION
	2-5-10-8	1.7	X	NA		Grey brown fine Sandy SILT, some yellow mottling, trace roots, moist.
	3-3-5-8	1.8	X	NA		Grey brown fine SAND and SILT, moist.
5	2-4-5-6	NA	X	NA		Grey brown Sandy SILT, moist.
	1-3-5-7	1.8	X	NA		Grey fine SAND, little silt, semi loose, wet.
	1-3-7-8	NA	X	NA		Brown / tan fine SAND and SILT, moist.
10	5-5-13-17	1.7	X	NA		Grey fine SAND, wet, trace black staining, slight odor.
	2-4-12-19	NA	X	NA		Grey fine SAND, saturated
15	NA	1.8	X	NA		Grey fine SAND, loose, saturated. (running sand)
	NA	NA	X	NA		
20						
25						Red Silty CLAY, stiff, moist
						Bottom of Boring = 25.5 feet.
30						
35						
40						

WELL DIAGRAM



834a

PILOT STUDY DESIGN REPORT
GROUNDWATER COLLECTION TRENCH
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

Prepared for:

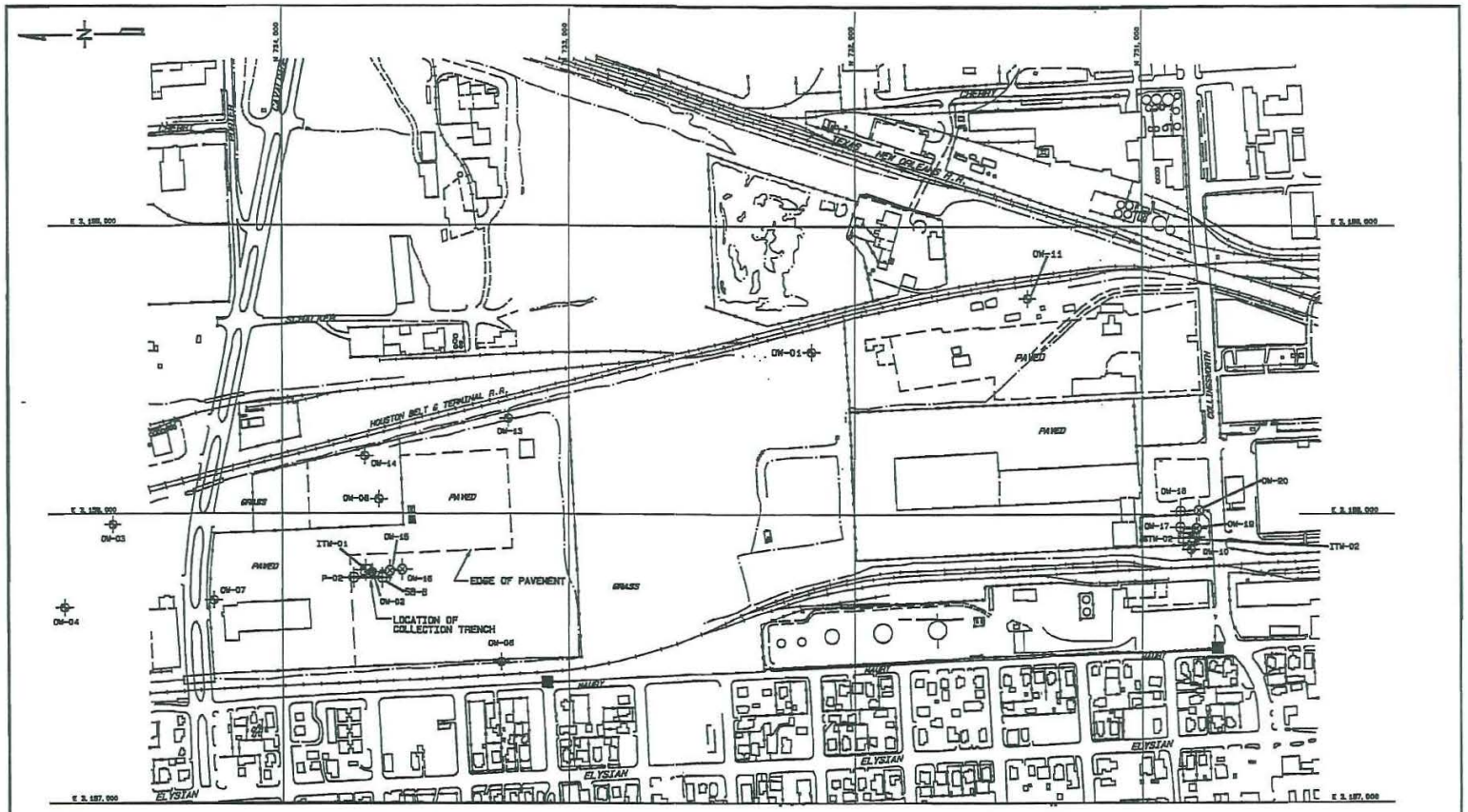
BEAZER EAST, INC.
436 SEVENTH AVENUE
PITTSBURGH, PENNSYLVANIA 15219

Prepared by:

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
3000 TECH CENTER DRIVE
MONROEVILLE, PENNSYLVANIA 15146

PROJECT NO. 157345

OCTOBER 1992



LEGEND

- MONITORING WELL LOCATION
- INTERMEDIATE OBSERVATION WELL LOCATION
- SHALLOW OBSERVATION WELL LOCATION
- INTERMEDIATE PUMPING WELL LOCATION
- SHALLOW PUMPING WELL LOCATION
- CITY OF HOUSTON SURVEY MARKER

SCALE (FEET)
0 150 300

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

FIGURE

COLLECTION TRENCH LOCATION
S. CAVALCADE SITE
HOUSTON, TEXAS

5/27/92 | A107710

PROJECT: SOUTH CAVALCADE
LOCATION: HOUSTON, TX
CLIENT: BEAZER EAST, INC.

BORING NUMBER: SC-SB-B

DRILLING METHOD: Hollow-Stem Auger
DRILLER: Layne Environmental Services
GEOLOGIST: Scott Lodge

GROUND ELEVATION:
ELEVATION DATUM: Mean Sea Level
BORING DEPTH: 22.0 DEPTH DATUM: Feet
DATE DRILLED: 22 February 1992

DEPTH (feet)	BLOW COUNT (SPT)	RECOVERY	SAMPLES	HNU (ppm)	GRAPHIC LOG	DESCRIPTION
	2,4,8,8	1.9	X			Brown SILT and fine SAND, moist, semi-loose.
	2,2,3,4	1.8	X			Brown fine Sandy SILT, moist, semi-loose.
5	3,3,6,8	1.7	X			Lt. gray SILT and fine SAND, rust/tan mottles, moist.
	4,8,4,7	1.9	X			Light brown / tan mottled fine SAND and SILT, semi loose, moist.
	4,6,6,7	1.9	X			Grey Silty SAND with rust brown mottles, moist, odor.
10	7,8,17,10	2.0	X			Grey fine SAND, loose, wet, odor, green black staining.
	14,25,22, 21	2.0	X			saturated at 14'
15	24,44,49, 50/.3'	2.0	X			Flowing SANDS
	NA	2.0	X			
	38,45,38	1.5	X			
20	36,26,48	1.1	X			Red CLAY, stiff, moist, some color altering to grey.
						Bottom of Boring = 22.0 Feet.
25						
30						

where is this?

FINAL REPORT
REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

VOLUME 2 - APPENDICES

PREPARED
FOR

KOPPERS

KOPPERS COMPANY, INC.
PITTSBURGH, PENNSYLVANIA

SUBMITTED TO:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
DALLAS, TEXAS

BY

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

MONROEVILLE, PENNSYLVANIA
JULY 1988

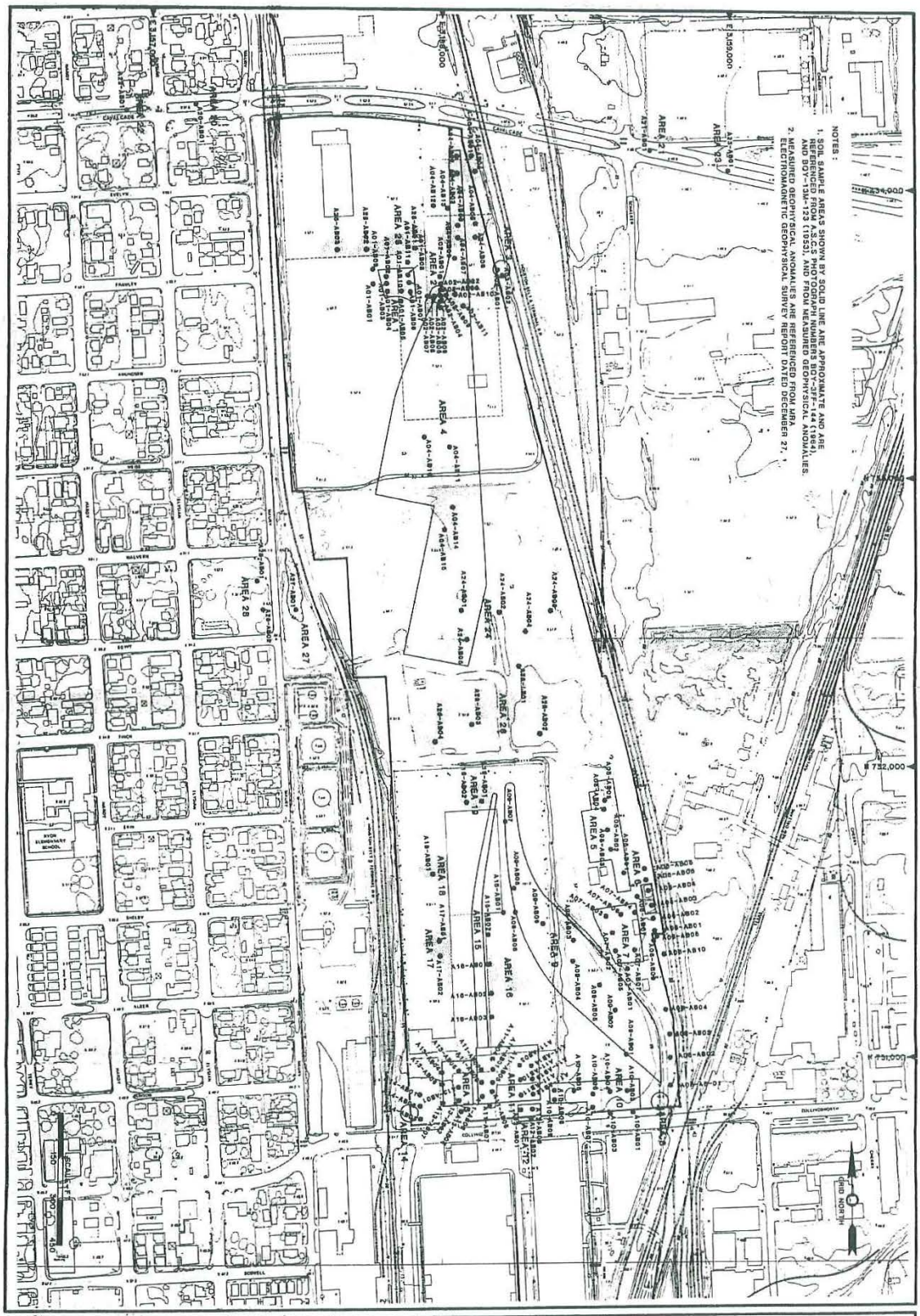


FIGURE NO.	PROJECT NO. 85-317	AUGER BORING LOCATION MAP SOUTH CAVALCADE SITE KOPPERS COMPANY, INC. HOUSTON, TEXAS	Page 3-11
3-4	DATE: 7-13-87		
	ENGINEER:		
	DRAWN BY:		

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray VERY SANDY SILT (ML) w/roots								
2					Light gray VERY SANDY CLAY (CL) w/sand pockets								
4					-wet sand pockets @ 4.5'								
6		01A	7			BDL	BDL	BDL	125	BDL		111	4
8					Bottom @ 8'								
10													
12													

1988

RI

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 in. SPLIT-BARREL	2-3-86	0900	7.4	7.5
A - AUGER				

DATE COMPLETED: 2-3-86
DATE GROUTED: 2-3-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark brown SANDY SILT (ML) w/roots								
2					Light gray SANDY CLAY (CL) w/sand pockets & creosote odor								
4		01A	4			BDL	BDL	BDL	112	196		98	35
					-wet sand pockets @ 5'								
6													
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-3-86
S - 2 in. SPLIT-BARREL	2-3-86	0943	Dry	7.8	DATE COMPLETED: 2-3-86
A - AUGER					DATE GROUTED: 2-3-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark brown SANDY SILT (ML) "FILL"								
					-w/solid tars @ 1'								
2					-w/clay pockets & creosote odor @ 2'								
4					Light gray & tan SANDY CLAY (CL) w/creosote odor								
		01A	5			BDL	BDL	BDL	120	304		17	8
6													
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-3-86
S - 2 in. SPLIT-BARREL	2-3-86	1013	Dry	7.7	DATE COMPLETED: 2-3-86
A - AUGER					DATE GROUTED: 2-3-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB04
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Brown CLAYEY SAND (SC) "FILL"								
2					Light gray SANDY CLAY (CL) w/creosote odor								
4					-w/sand pockets below 4'								
6					- light gray & tan w/plant debris and oil spots @ 6'								
8		01A	8			BDL	BDL	BDL	166	141		15	3
					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-3-86	1045	7.5	8

DATE STARTED: 2-3-86
DATE COMPLETED: 2-3-86
DATE GROUTED: 2-3-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB05
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphalt paving 1.25' Cement stabilized shell "FILL"								
2					Light brownish gray SANDY CLAY (CL) w/creosote odor								
4					- w/sand pockets below 4'								
		01A	5			BDL	BDL	BDL	138	247		100	3
6					-light brownish gray & tan @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-3-86
S - 2 In. SPLIT-BARREL	2-3-86	1125	Dry	7.5	DATE COMPLETED: 2-3-86
A - AUGER					DATE GROUTED: 2-3-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 0.75' Cement stabilized shell "FILL"								
					Brown SILTY SAND (SM) "FILL"								
2					Light gray SANDY CLAY (CL) w/creosote odor								
4					-w/sand pockets below 4'								
6		01A	6			BDL	BDL	BDL	127	BDL		141	4
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-3-86
S - 2 in. SPLIT-BARREL	2-3-86	1310	Dry	7.6	DATE COMPLETED: 2-3-86
A - AUGER					DATE GROUTED: 2-3-86
					DRILLER: MRA TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 0.75' Cement stabilized shell "FILL"								
					Brown CLAYEY SAND (SC) "FILL" w/creosote odor								
2					Light grayish brown SANDY CLAY (CL) w/sand pockets & creosote odor								
4		01A	4		-wet @ 4'	BDL	BDL	BDL	222	35		200+	5
6					-light gray & very sandy @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-3-86
S - 2 In. SPLIT-BARREL	2-3-86	1354	Dry	7.0	DATE COMPLETED: 2-3-86
A - AUGER					DATE GROUTED: 2-3-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB08
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 0.75' Cement stabilized shell "FILL"								
					Brown SILTY SAND (SM) "FILL" w/clay pockets								
2					Light gray SANDY CLAY (CL) w/sand pockets, creosote odor								
4													
6					- light gray and tan @ 6'								
8		01A	8			BDL	BDL	BDL	BDL	47		200+	1
					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-3-86
S - 2 in. SPLIT-BARREL	2-3-86	1435	Dry	7	DATE COMPLETED: 2-3-86
A - AUGER					DATE GROUTED: 2-3-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

006494

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB09
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Brownish gray VERY SILTY SAND (SM) w/roots								
2					Light gray VERY SANDY CLAY (CL)								
4		01A	4		-w/wet sand pockets below 4'	BDL	BDL	BDL	210	BDL		1	0
6													
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-4-86
S - 2 in. SPLIT-BARREL	2-4-86	1103	7.4	7.6	DATE COMPLETED: 2-4-86
A - AUGER					DATE GROUTED: 2-4-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB10
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 0.75' Cement stabilized shell "FILL"								
					Brown SANDY SILT (ML) w/creosote odor								
2					Brownish gray SANDY CLAY (CL) w/creosote odor								
4					-w/sand pockets below 4'								
6					-light brownish gray & wet @ 6'								
8													
10					Gray SILTY SAND (SM) w/oil spots & creosote odor								
12		01A	12			BDL	BDL	BDL	BDL	81		4	3
					Bottom @ 12'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-5-86
S - 2 in. SPLIT-BARREL	2-5-86	1125	5.5	10	DATE COMPLETED: 2-5-86
A - AUGER					DATE GROUTED: 2-5-86
					DRILLER: MRA TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

006496

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-AB11
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 0.75' Cement stabilized shell "FILL"								
					Gray SANDY SILT (ML) "FILL"								
2					Light gray SANDY CLAY (CL)								
4					-light gray & tan w/sand pockets below 4'								
		01A	5			BDL	BDL	BDL	165	BDL		0	0
6					-w/wet sand pockets @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-5-86
S - 2 In. SPLIT-BARREL	2-5-86	1255	7.3	7.5	DATE COMPLETED: 2-5-86
A - AUGER					DATE GROUTED: 2-5-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray and dark gray very SANDY SILT (ML) w/roots								
2					Light gray SANDY CLAY (CL) w/sand pockets								
4		01A	5			BDL	BDL	BDL	140	BDL		20	0
6					-light gray and tan @ 6'								
8					-wet @ 8'								
					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 1-31-86
S - 2 in. SPLIT-BARREL	1-31-86	0925	7.8	8	DATE COMPLETED: 1-31-86
A - AUGER					DATE GROUTED: 1-31-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray and dark gray very SANDY SILT (ML) w/roots								
2					Light gray and tan SANDY CLAY (CL) w/sand pockets								
		01A	3			BDL	BDL	BDL	249	BDL		70	0
4													
6													
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
1-31-86	0955	Dry	7

DATE STARTED: 1-31-86
DATE COMPLETED: 1-31-86
DATE GROUTED: 1-31-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray and dark gray very SILTY SAND (SM) w/roots "FILL" to 0.5'								
2					Brownish gray SANDY CLAY (CL) w/sand pockets								
4					-light gray and tan @ 4'								
					-wet sand pockets below 5'								
6		01A	7			BDL	BDL	BDL	152	BDL		1	0
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 In. THIN-WALLED TUBE
S - 2 In. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
1-31-86	1023	Dry	7.6
1-31-86	1027	7	7.6

DATE STARTED: 1-31-86
DATE COMPLETED: 1-31-86
DATE GROUTED: 1-31-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB04
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark gray very SILTY SAND (SM) "FILL"								
					Gray very SILTY SAND (SM) w/roots								
2					Brownish gray SANDY CLAY (CL) w/sand pockets								
					-w/wet sand pockets below 3.5'								
4					-brownish gray and tan @ 4'								
6		01A	6			BDL	BDL	BDL	171	BDL		200+	0
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
1-31-86	1057	7.5	7.7

DATE STARTED: 1-31-86
DATE COMPLETED: 1-31-86
DATE GROUTED: 1-31-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB05
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark gray SILTY SAND (SM) "FILL" w/rubble								
2					Light gray very SANDY CLAY (CL) w/sand pockets								
4		01A	4		-brownish gray and tan below 4'	BDL	BDL	29	242	BDL		200+	11
6													
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 1-31-86
S - 2 In. SPLIT-BARREL	1-31-86	1129	Dry	7.4	DATE COMPLETED: 1-31-86
A - AUGER					DATE GROUTED: 1-31-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray and white SAND (SP) "FILL" w/shells								
2					Gray SANDY CLAY (CL) w/sand pockets								
4					-light brownish gray and tan @ 4'								
6		01A	6		-tan and light gray @ 6'	BDL	BDL	BDL	BDL	BDL		109	0
8					-wet @ 8'								
					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 1-31-86
S - 2 in. SPLIT-BARREL	1-31-86	1306	7.4	7.8	DATE COMPLETED: 1-31-86
A - AUGER					DATE GROUTED: 1-31-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark gray VERY SANDY SILT (ML) "FILL"								
					Light gray slightly SILTY SAND (SM)								
2					Light gray and tan SANDY CLAY (CL) w/sand pockets								
4		01A	4			BDL	BDL	BDL	162	BDL		114	86
					-w/wet sand pockets below 5'								
6													
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
1-31-86	1338	7.1	7.2

DATE STARTED: 1-31-86
DATE COMPLETED: 1-31-86
DATE GROUTED: 1-31-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB08
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark gray and brown SILTY SAND (SM) "FILL" w/solidified tar								
					Gray and light gray SANDY CLAY (CL)								
2					-w/sand pockets below 2'								
4					-light gray and tan @ 4' w/creosote odor								
6					-w/creosote odor @ 6'							1	
		01A	7		-w/creosote odor @ 7'	BDL	BDL	BDL	148	BDL		46	2
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
1-31-86	1419	7.4	7.6

DATE STARTED: 1-31-86
DATE COMPLETED: 1-31-86
DATE GROUTED: 1-31-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB09
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark gray SILTY SAND (SM) "FILL" w/rubble								
					Grayish brown slightly SILTY SAND (SM) w/roots								
2					Brownish gray and tan SANDY CLAY (CL) w/sand pockets								
4		01A	4		-light gray and tan below 4'	BDL	BDL	BDL	158	BDL		12	8
6					-wet sand pockets @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
1-31-86	1445	7.6	7.7

DATE STARTED: 1-31-86
DATE COMPLETED: 1-31-86
DATE GROUTED: 1-31-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB10
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Brownish gray SILTY SAND (SM). "FILL" w/rubber								
2					Brownish gray SANDY CLAY (CL) w/sand pockets -brownish gray and tan @ 2'								
4		01A	5			BDL	BDL	BDL	129	BDL		181	2
6					-wet sand pockets @ 7'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
1-31-86	1314	6.6	7.4

DATE STARTED: 1-31-86
DATE COMPLETED: 1-31-86
DATE GROUTED: 1-31-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-AB11
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark gray CLAYEY SAND (SC) "FILL" w/rubble								
2					Gray SANDY CLAY (CL) w/sand pockets								
4					-light gray and tan below 4'								
					-wet sand pockets @ 5'								
6		01A	7			BDL	BDL	BDL	226	BDL		200+	5
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
1-31-86	1544	7.4	7.6

DATE STARTED: 1-31-86
DATE COMPLETED: 1-31-86
DATE GROUTED: 1-31-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-AB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark gray SANDY SILT (ML)								
					Brown very SANDY CLAY (CL)								
2					-w/sand pockets & creosote odor below 2'								
4					-brown & light gray w/wet sand pockets below 4'								
6					-light gray & tan below 6'								
8													
					Light gray & tan SILTY SAND (SM) w/oil spots & creosote odor								
10		01A	10			BDL	BDL	BDL	147	BDL		9	
					Light gray & tan CLAYEY SAND (SC) w/oil spots & creosote odor								
12					Bottom @ 12'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-6-86
S - 2 in. SPLIT-BARREL	2-6-86	1147	4.1	8	DATE COMPLETED: 2-6-86
A - AUGER					DATE GROUTED: 2-6-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-AB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Brown SANDY SILT (ML) w/roots								
2					Light gray & tan SANDY CLAY (CL) w/sand pockets								
4					-w/oil stains & creosote odor below 4'								
		01A	5		-wet @ 5'	BDL	BDL	BDL	BDL	BDL		3	
6					-gray & tan @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-6-86
S - 2 In. SPLIT-BARREL	2-6-86	1228	6	7.5	DATE COMPLETED: 2-6-86
A - AUGER					DATE GROUTED: 2-6-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 1.25' Cement stabilized shell "FILL"								
					Brown SILTY SAND (SM) "FILL"								
2					Grayish brown SANDY CLAY (CL)								
4					-tan & light gray w/sand pockets below 4'								
6		01A	7			BDL	BDL	BDL	171	BDL		0	0
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	
T - 3 In. THIN-WALLED TUBE	2-4-86	1234	Dry	7.2	DATE STARTED: 2-4-86
S - 2 In. SPLIT-BARREL					DATE COMPLETED: 2-4-86
A - AUGER					DATE GROUTED: 2-4-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 1.0' Cement stabilized shell "FILL"								
					Brown CLAYEY SAND (SC) "FILL"								
2					Brownish gray SANDY CLAY (CL) w/sand pockets								
4		01A	5			BDL	BDL	BDL	190	BDL		1	0
6					-light gray & tan @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 In. THIN-WALLED TUBE
S - 2 In. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-4-86	1325	6.5	6.7

DATE STARTED: 2-4-86
DATE COMPLETED: 2-4-86
DATE GROUTED: 2-4-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 0.75' Cement stabilized shell "FILL"								
					Brown SILTY SAND (SM) "FILL"								
2					Light gray & tan SANDY CLAY (CL) w/sand pockets								
4					-w/wet sand pockets below 4'								
6													
8		01A	8			BDL	BDL	BDL	106	BDL		0	0
					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-4-86	1404	5.5	7.5

DATE STARTED: 2-4-86
DATE COMPLETED: 2-4-86
DATE GROUTED: 2-4-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB04
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 1.25' Cement stabilized shell "FILL"								
2					Brown CLAYEY SAND (SC) "FILL"								
					Gray SANDY CLAY (CL)								
4		01A	4		-light gray & tan w/sand pockets below 4'	BDL	BDL	BDL	183	BDL		0	0
6					-wet @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-4-86
S - 2 in. SPLIT-BARREL	2-4-86	1447	6.9	7.3	DATE COMPLETED: 2-4-86
A - AUGER					DATE GROUTED: 2-4-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB05
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray very SANDY SILT (ML) w/roots								
2					Gray VERY SANDY CLAY (CL) w/sand pockets								
					-light gray @ 2.5'								
		01A	3		-wet @ 3.5'	BDL	BDL	BDL	146	BDL		0	0
4					-light gray & tan below 4'								
6													
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-4-86
S - 2 in. SPLIT-BARREL	2-4-86	1530	6.8	7.5	DATE COMPLETED: 2-4-86
A - AUGER					DATE GROUTED: 2-4-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark brown CLAYEY SILT (ML) w/roots								
2					Light gray SANDY CLAY (CL) w/sand pockets								
4					-light gray & tan below 4'								
6					-wet @ 6'								
8		01A	8			BDL	BDL	42	149	BDL		0	0
					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-5-86
S - 2 In. SPLIT-BARREL	2-5-86	1312	5	5.8	DATE COMPLETED: 2-5-86
A - AUGER					DATE GROUTED: 2-5-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Tan & light gray crushed limestone "FILL"								
					Gray SANDY SILT (ML) w/roots								
2					Gray & tan SANDY CLAY (CL) w/wet sand pockets								
4					-w/creosote odor below 4'								
6					-light gray & tan below 6'								
8													
		01A	10		Light gray CLAYEY SAND (SC) w/creosote odor	BDL	BDL	BDL	175	BDL		9	7
10					Bottom @ 10'								
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-5-86	1410	5.0	9.0

DATE STARTED: 2-5-86
DATE COMPLETED: 2-5-86
DATE GROUTED: 2-5-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB08
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Black & tan SANDY CLAY (CL) "FILL" w/roots & creosote odor								
2					Gray VERY SANDY CLAY (CL) w/sand pockets, creosote odor,								
4					-brown w/oil spots @ 4'								
		01A	5			BDL	BDL	BDL	165	BDL		8	4
6					-gray & tan w/oil spots @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-5-86	1445	Dry	7.2

DATE STARTED: 2-5-86
DATE COMPLETED: 2-5-86
DATE GROUTED: 2-5-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB09
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark brown SANDY SILT (ML) w/creosote odor								
2					Light gray SANDY CLAY (CL) w/sand pockets & creosote odor								
4													
6					-very sandy @ 6'								
8													
					Light gray CLAYEY SAND (SC) w/creosote odor								
10					Light gray SILTY SAND (SM) w/creosote odor, wet								
		01A	11			BDL	BDL	BDL	160	BDL		2	
12					Bottom @ 12'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-6-86
S - 2 in. SPLIT-BARREL	2-6-86	1038	4	9	DATE COMPLETED: 2-6-86
A - AUGER					DATE GROUTED: 2-6-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB10
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Light gray SILTY SAND (SM) "FILL" w/concrete rubble								
2					Light gray SANDY CLAY (CL) w/sand pockets -w/calcareous nodules @ 2'								
4					-w/wet sand pockets below 4'								
6		01A	6			BDL	BDL	BDL	255	BDL		0	
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-6-86	1454	6.4	7.7

DATE STARTED: 2-6-86
DATE COMPLETED: 2-6-86
DATE GROUTED: 2-6-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB11
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray SILTY SAND (SM) & SANDY CLAY (CL) "FILL" w/shells								
2					Tan & light gray SANDY CLAY (CL) w/sand pockets								
4					-w/wet sand pockets below 4'								
6													
8		01A	8			BDL	BDL	BDL	123	BDL		0	
					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-6-86	1538	5.8	7.3

DATE STARTED: 2-6-86
DATE COMPLETED: 2-6-86
DATE GROUTED: 2-6-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB12
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 0.75' Cement stabilized shell "FILL"								
					Brown SILTY SAND (SM) "FILL"								
2					Gray SANDY CLAY (CL)								
4					-light gray & tan w/sand pockets below 4'								
6		01A	7			BDL	BDL	BDL	114	BDL		0	
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-6-86
S - 2 In. SPLIT-BARREL	2-6-86	1616	7.3	7.6	DATE COMPLETED: 2-6-86
A - AUGER					DATE GROUTED: 2-6-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB13
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					0.25' Asphaltic paving 1.25' Cement stabilized shell "FILL"								
2					Dark CLAYEY SILT (ML)								
					Gray SANDY CLAY (CL) w/sand pockets								
4					-light gray & tan below 4'								
6		01A	6		-wet @ 6'	BDL	BDL	BDL	144	BDL		0	0
8					-very sandy @ 8'								
					Light gray & tan VERY CLAYEY SAND (SC)								
10													
12		02A	12		-w/creosote odors @ 12'	BDL	BDL	BDL	122	BDL		0	0
					Bottom @ 12'								

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA

DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-7-86	1009	4.5	10.5

DATE STARTED: 2-7-86
DATE COMPLETED: 2-7-86
DATE GROUTED: 2-7-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB14
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray SILTY SAND (SM) & SANDY CLAY (CL) "FILL"								
2					Light gray SANDY CLAY (CL) w/sand pockets								
4		01A	5			BDL	BDL	BDL	104	BDL		0	0
6					-light gray & tan w/wet sand pockets @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-7-86	1044	5.9	6.9

DATE STARTED: 2-7-86
DATE COMPLETED: 2-7-86
DATE GROUTED: 2-7-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-AB15
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray SANDY CLAY (CL) & SILTY SAND (SM) w/rubble "FILL"								
2					Light gray very SANDY CLAY (CL) w/sand pockets								
4					-light gray & tan below 4'								
6					-wet @ 7'								
8					-w/ferrous nodules @ 8'								
10		01A	10		-very sandy @ 10'	BDL	134	BDL	BDL	BDL		0	0
					Light gray & tan CLAYEY SAND (SC) wet								
12					Bottom @ 12'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-7-86
S - 2 In. SPLIT-BARREL	2-7-86	1150	4.5	6.5	DATE COMPLETED: 2-7-86
A - AUGER					DATE GROUTED: 2-7-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A24-AB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray CLAYEY SAND (SC) and SANDY CLAY (CL) w/shell fragments "FILL"								
					-wet @ 2'								
2					Gray SANDY CLAY (CL) w/sand pockets								
4					-light gray & tan w/sand interbeds @ 4'								
6													
		01A	7.5			BDL	BDL	BDL	BDL	BDL		0	0
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-7-86	1257	3.4	7.5

DATE STARTED: 2-7-86
DATE COMPLETED: 2-7-86
DATE GROUTED: 2-7-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A24-AB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray & light gray SANDY CLAY (CL) "FILL" w/shell fragments								
2					Gray SANDY CLAY (CL) w/sand pockets								
4													
		01A	5			BDL	BDL	BDL	164	BDL		0	0
6					-light gray & tan w/wet sand pockets @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-7-86
S - 2 In. SPLIT-BARREL	2-7-86	1343	7.5	7.7	DATE COMPLETED: 2-7-86
A - AUGER					DATE GROUTED: 2-7-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A24-AB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray & light gray SANDY CLAY (CL) "FILL" & SILTY SAND (SM) w/shell fragments								
2					Light gray & tan SANDY CLAY (CL) w/sand pockets								
4					-w/wet sand pockets @ 4'								
6					-w/sand interbeds @ 6'								
8													
10					Light gray & tan very CLAYEY SAND (SC) wet								
12		01A	12			BDL	BDL	BDL	BDL	BDL		0	0
					Bottom @ 12'								

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-7-86	1438	3.9	9.5

DATE STARTED: 2-7-86
DATE COMPLETED: 2-7-86
DATE GROUTED: 2-7-86
DRILLER: MRA
TECHNICIAN: P.Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A25-AB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Cement stabilized shell "FILL" w/0.2' asphalt paving								
					Brown very SILTY SAND (SM) "FILL"								
2					Light gray SANDY CLAY (CL)								
4					-w/sand pockets below 4'								
		01A	5			BDL	BDL	BDL	144	BDL		200+	0
6					-w/wet sand pockets @ 6'								
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-3-86
S - 2 in. SPLIT-BARREL	2-3-86	1516	7.2	7.3	DATE COMPLETED: 2-3-86
A - AUGER					DATE GROUTED: 2-3-86
					DRILLER: MRA
					TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A25-AB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Cement stabilized shell "FILL" w/0.2' asphalt paving								
					Dark gray CLAYEY SAND (SC) "FILL"								
2					Light gray SANDY CLAY (CL) w/sand pockets								
4					-w/wet sand pockets @ 4'								
6													
8		01A	8			BDL	BDL	BDL	153	BDL		200+	1
					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-3-86	1550	7.4	7.5

DATE STARTED: 2-3-86
DATE COMPLETED: 2-3-86
DATE GROUTED: 2-3-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A25-AB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION:
GROUND ELEVATION:

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Cement stabilized shell "FILL" w/0.2' asphalt paving								
					Dark gray SANDY CLAY (CL) "FILL"								
2					Light gray SANDY CLAY (CL)								
4					-w/sand pockets below 4'								
6		01A	7			BDL	BDL	BDL	BDL	BDL		200+	0
8					Bottom @ 8'								
10													
12													

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
2-4-86	1144	7.0	7.2

DATE STARTED: 2-4-86
DATE COMPLETED: 2-4-86
DATE GROUTED: 2-4-86
DRILLER: MRA
TECHNICIAN: P. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 710 E 3,157, 810
GROUND ELEVATION: 51.5'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Brown and gray very SILTY CLAY (CL)"FILL" w/roots							0	0
		02T	2.5		Grayish brown and tan SANDY CLAY (CL) w/roots -w/ferrous nodules & bioturbated @ 4'							0	0
5		03T	5		-w/wet sand pockets @ 6'							0	0
		04T	8		-light gray & tan @ 9'							0	0
10		05T	10									0	0
11		06T	11		Gray CLAYEY SAND (SC) wet							0	0
		07T	12.5		Gray SILTY SAND (SM) w/occasional clay pockets -light gray @ 12'							0	0
15		08S	15		Light gray SAND (SP) w/occasional clay pockets -creosote odors to 16'							0	0
		09S	16			173	BDL	BDL	124	45	7	10	0
		10S	19									0	
20		11S	21									0	
23		12S	23		-w/creosote odors @ 22'	BDL	BDL	BDL	BDL	BDL	316	18	
25		13T	25		Reddish brown and light gray CLAY (CH) w/silt interbeds, creosote odors	BDL	BDL	BDL	BDL	BDL	336	17	
		14T	27.5		-oily residue in silt seams @ 27'	BDL	BDL	BDL	BDL	BDL	1020	17	
30					Bottom @ 29'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2/18/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 2/18/86
A - AUGER					DATE GROUTED: 2/19/86
					DRILLER: Van and Sons
					TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 620 E 3,157, 810
GROUND ELEVATION: 51.3'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM LAB	HEADSPACE READING, PPM FIELD
					Grayish brown SANDY SILT (ML) w/roots and ferrous stains								
		01T	2		-grayish brown sandy silt "FILL" w/ solidified tars intermixed to 0.5'							0	0
		02T	2.5									0	0
		03T	4.5		Light gray SANDY CLAY (CL) w/sand pockets & creosote odors							20	4
5					-w/ferrous nodules, diesel odor @ 6'							17	7
		04T	6										
					-w/vertical sand filled fissures @ 8'								
10		05T	9			BDL	BDL	BDL	182	BDL	1530	26	5
10					Light gray & tan SILTY SAND (SM) w/oily residue & creosote odors, wet								
		06T	12									17	2
		07S	13		Light gray SAND (SP) w/oily residue and creosote odors							26	2
15		08S	15			298	BDL	BDL	BDL	BDL	10,300	34	5
		09S	17									21	7
		10S	18.5									29	4
20		11S	20									20	5
22													
		12S	22		Reddish brown & light gray CLAY (CH) w/silt seams, creosote odors	BDL	BDL	25	BDL	BDL	349	23	3
25		13T	25.5		-w/oily residue in silt seams @ 26'							19	1
		14T	27			BDL	BDL	BDL	BDL	BDL	24	18	2
					Bottom @ 27'								
30													

SURROGATE ANALYSES — METALS, PPM

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 2/19/86
DATE COMPLETED: 2/19/86
DATE GROUTED: 2/20/86
DRILLER: Van and Sons
TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 670 E 3,157, 830
GROUND ELEVATION: 51.6'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Grayish brown & tan SANDY SILT (ML)"FILL" w/roots & sand pockets, solidified tars intermixed, creosote odors							4	1
		02T	4									21	2
5		03T	5		Light gray SANDY CLAY (CL) w/sand pockets, creosote odors -oily residue, grades to very sandy clay below 6'							15	3
		04T	8									14	2
10		05T	10		Light gray very CLAYEY SAND (SC) w/sandy clay pockets, creosote odors, and oily residue							12	3
10		06S	11		Light gray SILTY SAND (SM) w/oily residue & creosote odors	139	BDL	BDL	156	BDL	6520	34	4
		07S	12.5		Light gray SAND (SP) w/clay pockets, oily residue & creosote odors							26	1
		08S	14									24	1
15		09S	16									24	4
		10S	19									17	2
20		11S	21									21	3
		12S	23									21	1
25		13T	25	D	Reddish brown & light gray CLAY (CH) w/silt seams & vertical silt filled fissures, oily residue in silt, creosote odors	BDL	BDL	BDL	BDL	BDL	242	1	2
30		14T	32		-w/slickensides & calcareous nodules @ 32'							10	4
					Light gray & tan slightly SANDY CLAY(CL)								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2/20/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 2/21/86
A - AUGER					DATE GROUTED: 2/21/86
					DRILLER: Van and Sons
					TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 670 E 3,157, 830
GROUND ELEVATION: 51.6'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		15T	35		Light gray & tan slightly SANDY CLAY (CL) w/calcareous & ferrous nodules, bioturbated, & creosote odors							4	4
		16T	38									4	0
40		17T	40									5	0
		18T	42									6	1
		19T	43									8	0
45		20T	45.5									12	2
		21S	46		Light gray SILTY SAND (SM) w/oily residue, wet, w/creosote odors	124	BDL	BDL	123	BDL	104	12	0
		22T	48		Light gray CLAYEY SAND (SC) w/clay pockets & creosote odors							5	1
50		23T	51.5		Light gray & reddish brown SANDY SILT (ML) w/oily residue & creosote odor -grades to clayey silt below 51'							12	2
		24T	52		Reddish brown & light gray CLAY (CH) w/slickensides & calcareous nodules, slightly bioturbated, creosote odors							6	0
55		25T	54			BDL	BDL	BDL	BDL	BDL	41	9	0
					Bottom @ 56'								

455
47

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2/20/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 2/21/86
A - AUGER					DATE GROUTED: 2/21/86
					DRILLER: Van and Sons
					TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB04
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 710 E 3,157, 890
GROUND ELEVATION: 51.3'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Pavement								
		01T	2		Brown SANDY SILT (ML) w/roots							7	2
		02T	3.5		Brown SANDY CLAY (CL) w/sand pockets, roots & creosote odor							9	3
5		03T	5.5		-light gray & brown w/vertical sand filled fissures, ferrous nodules, & oily residue @ 6'							16	4
		04T	8									13	5
9.5		05T	9.5									10	5
10		06T	11		Light gray & brown SILTY SAND (SM) w/oily residue & creosote odors	143	BDL	BDL	122	BDL	1130	11	5
		07S	13		Light gray SAND (SP) w/occasional clay pockets, oily residue & creosote odors							24	7
15		08S	15									11	6
		09S	17									5	1
20													
21		10T	22		Reddish brown & light gray CLAY (CH) w/calcareous nodules & creosote odors	BDL	BDL	BDL	BDL	BDL	1070	11	4
		11T	24		Light gray & reddish brown slightly CLAYEY SILT (ML) w/creosote odors, oily residue @ 24'							11	8
25		12T	27		Reddish brown & light gray CLAY (CH) w/slickensides, vertical silt filled fissures, bioturbated, oily residue & creosote odor -silt seams @ 26'							10	4
		13T	29		-w/calcareous nodules @ 28'							2	2
30		14T	31									4	1
		15T	32									1	1
		16T	35		Light gray & tan slightly SILTY CLAY (CL) w/calcareous nodules, bioturbated							1	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2/24/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 2/24/86
A - AUGER					DATE GROUTED: 2/24/86
					DRILLER: Van and Sons
					TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB04
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 710 E 3,157, 890
GROUND ELEVATION: 51.3'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM LAB	HEADSPACE READING, PPM FIELD
		17T	36		Light gray & tan slightly SILTY CLAY (CL) w/calcareous nodules, bioturbated							1	1
		18T	38		-light gray & silty w/ferrous nodules @ 38'							1	0
40		19T	40		-creosote odors @ 40'							2	0
		20T	42		Light gray slightly CLAYEY SILT (ML) w/creosote odors							2	1
45		21T	45		Light gray very SANDY SILT (ML) w/clay pockets, creosote odors							4	1
47.5		22T	47		-oily residue @ 47'	106	BDL	BDL	150	BDL	BDL	3	1
		23S	48		White very SILTY SAND (SM) w/creosote odors -light gray & reddish brown clayey silt layer w/oily residue @ 50'							5	1
50		24T	50.5		Reddish brown & light gray CLAY (CH)							7	4
		25T	53		-slickensided, bioturbated w/creosote odor, oily residue in bioturbated areas 50.5'-51'	BDL	BDL	55	BDL	BDL	BDL	2	1
55					Bottom @ 54'								

SURROGATE ANALYSES — METALS, PPM

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 2/24/86
DATE COMPLETED: 2/24/86
DATE GROUTED: 2/24/86
DRILLER: Van and Sons
TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB05
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 670 E 3,157, 490
GROUND ELEVATION: 50.8'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	2		Gray SANDY CLAY (CL) w/roots -tan & gray @ 2'							0	0
		02T	4		-w/ferrous nodules @ 4'							0	0
5		03T	6		-w/sand pockets @ 6'							0	0
		04T	8									0	0
		05T	9		Gray SILTY SAND (SM)							0	0
10		06S	11		-light green & gray @ 10'							0	0
		07S	13.5		-w/sewage odors @ 13'	BDL	BDL	BDL	187	BDL	BDL	0	0
15													
20													
					Light gray & reddish brown SANDY SILT (ML)								
		08T	24		Light gray & reddish brown CLAY (CH) w/silt seams & sand partings	BDL	BDL	BDL	BDL	BDL	BDL	0	0
		09T	24.1									0	0
25					-w/silt partings & slickensides @ 26'								
		10T	28		-w/calcareous nodules @ 28'							0	1
		11T	28.5									0	0
30													
		12T	32		-tan & light gray below 32'							0	0
		13T	34									0	0
		14T	34.5									0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3/10/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3/10/86
A - AUGER					DATE GROUTED: 3/10/86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB05
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 670 E 3,157, 490
GROUND ELEVATION: 50.8'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Tan & light gray CLAY (CH)								
		15T	38		Tan & gray SANDY CLAY (CL) w/calcareous nodules -w/ferrous nodules @ 38'							0	0
40		16T	40		-very sandy @ 40'							0	0
		17T	42									0	0
		18T	44		Light gray & light reddish brown CLAYEY SAND (SC)							0	0
45		19T	45.5		Gray SILTY SAND (SM) -w/sandy clay layers @ 46'	123	BDL	BDL	BDL	BDL	BDL	0	0
		20S	47.5									0	0
		21S	49.5		Reddish brown & light gray SANDY CLAY (CL)	BDL	BDL	BDL	BDL	BDL	BDL	0	1
50		22T	50.5		Light gray & reddish brown CLAY (CH) w/sand pockets -w/calcareous nodules & slickensides @ 52'	BDL	BDL	BDL	BDL	BDL	BDL	0	0
		23T	52.5									0	0
55		24T	55.5									0	0
					Bottom @ 56'								

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 3/10/86
DATE COMPLETED: 3/10/86
DATE GROUTED: 3/10/86
DRILLER: Van and Sons
TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 680 E 3,157, 630
GROUND ELEVATION: 51.4'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Dark gray SILTY SAND (SM) "FILL" w/roots							0	0
		02T	4		Gray SANDY CLAY (CL) w/roots & ferrous nodules							1	0
5		03T	6									1	0
		04T	7.5									1	0
8.5													
10		05T	10		Gray SILTY SAND (SM) -w/sewage odors @ 9'							1	0
		06T	12		-greenish gray sandy clay layer w/oily residue & creosote odors @ 11.5'							1	0
		07S	13.5		-sandy clay seams @ 12'	99	BDL	BDL	118	BDL	BDL	0	0
15													
20													
22													
		08T	24		Tan & reddish brown CLAY (CH) w/silt seams & creosote odors							1	0
25													
		09T	27	D	Reddish brown CLAYEY SILT (ML) w/clay layers, calcareous nodules, oily residue & creosote odor	104	BDL	BDL	BDL	30	134	7	2
		10S	29		Light gray & reddish brown CLAY (CH) w/silt seams & creosote odor							4	1
30		11T	31		-w/silt partings @ 32'							3	1
		12T	34		-tan & light gray w/calcareous nodules @ 34'							2	1
		13T	34.5									1	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3/10/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3/11/86
A - AUGER					DATE GROUTED: 3/11/86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 680 E 3,157, 630
GROUND ELEVATION: 51.4'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		14T	36.5		Tan CLAY (CH) w/ferrous & calcareous nodules & creosote odors							1	0
		15T	39									1	0
40													
		16T	43.5		Tan & gray SANDY CLAY (CL) w/calcareous nodules & creosote odors							1	0
		17T	44.5									1	0
45													
		18T	47.5		Gray SILTY SAND (SM) w/ferrous nodules, oily residue & creosote odors	249	BDL	BDL	138	39	5010	10	2
		19S	49.5									0	0
50		20S	50.5									1	1
		21T	53.5			127	BDL	BDL	114	BDL	24	2	0
55		22T	55.5		Light gray & reddish brown CLAY (CH) w/calcareous nodules, oily residue & creosote odor -w/slickensides @ 56'							6	1
		23T	57.5		-w/oily residue in sand pockets @ 58'							2	0
		24T	59.5			BDL	BDL	BDL	BDL	BDL	32	1	0
60					Bottom @ 60'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	
S - 2 in. SPLIT-BARREL					
A - AUGER					

DATE STARTED: 3/10/86
DATE COMPLETED: 3/11/86
DATE GROUTED: 3/11/86
DRILLER: Van and Sons
TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 470 E 3,157, 760
GROUND ELEVATION: 51.0'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT(S) DUPLICATE(D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1.5		Gray SILTY SAND (SM) "FILL" w/roots, sand pockets, shell fragments							0	0
		02T	4		Tan & light gray SANDY CLAY (CL) w/ferrous nodules							0	0
5		03T	5.5									0	0
		04T	8		-w/roots, bioturbated below 8'							0	0
10		05T	10									0	0
		06T	12	S	Light gray SILTY SAND (SM) -tan & light gray w/ferrous nodules @ 12'	121	BDL	BDL	BDL	BDL	BDL	0	0
		07S	13.5		-w/ferrous stains @ 13.5'							0	0
15													
20													
22					Light gray & reddish brown CLAY (CH)								
25		08T	25		Light gray CLAYEY SILT (ML) w/oily residue, creosote odor							6	5
		09T	26	D	Reddish brown CLAY (CH) w/sand seams, vertical sand partings, calcareous nodules & slickensides -creosote odors @ 26' -light gray & reddish brown below 28'	94	BDL	27	124	BDL	BDL	1	3
		10T	28									0	0
30		11T	30.5		-w/slickensides, silt partings, calcareous nodules @ 30.5'							0	0
		12T	33		-w/slickensides @ 33'							0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3/14/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3/14/86
A - AUGER					DATE GROUTED: 3/14/86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 470 E 3,157, 760
GROUND ELEVATION: 51.0'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		13T	37		Tan & light gray SANDY CLAY (CL)							0	0
		14T	38.5									0	0
40		15T	41		Light gray CLAYEY SAND (SC)							0	0
		16T	42									0	0
45		17T	44.5		-tan & light gray @ 44.5'							0	0
		18T	47									0	0
		19S	48.5		-w/vertical black streak @ 48.5'							0	1
50		20S	50.5		-w/creosote odor @ 50.5'							0	1
		21S	52.5		Tan & light gray SANDY CLAY (CL) w/oily residue & creosote odors	106	BDL	BDL	BDL	BDL	652	8	10
55		22T	54.5		Light gray & reddish brown CLAY (CH) w/slickensides, vertical sand seams	BDL	BDL	BDL	BDL	BDL	28	1	2
		23T	56		-w/creosote odors, oily residue in sand seams to 56'							0	1
		24T	59									0	0
60		25T	59.5		Reddish brown SANDY SILT (ML)	BDL	BDL	BDL	196	32	BDL	0	0
		26S	62.5									0	0
65		27T	64.5		Reddish brown CLAY (CH) w/silt partings, slickensides							0	0
		28T	67									0	0
					Bottom @ 67'								

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA

DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 3/14/86
DATE COMPLETED: 3/14/86
DATE GROUTED: 3/14/86
DRILLER: Van and Sons
TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB08
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 300 E 3,157, 770
GROUND ELEVATION: 50.6'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Dark gray SILTY SAND (SM) "FILL" w/bricks & roots							1	0
		02T	2.5		Dark gray SANDY CLAY (CL) w/roots							1	0
5		03T	6		-tan & light gray w/bioturbation and ferrous nodules @ 4.5' -very sandy w/ferrous nodules & sand pockets below 6'							1	0
		04T	8									1	0
9		05T	9		-w/creosote odor @ 9'							1	0
10		06T	11.5		Gray SILTY SAND (SM) w/oily residue & creosote odor	125	BDL	27	205	BDL	BDL	2	1
		07S	13.5									4	1
15													
21 20													
		08T	24		Light gray & reddish brown CLAY (CH) w/creosote odor -w/slickensides & calcareous nodules @ 23'							20	5
25		09T	24.5		-6" sandy silt seam @ 23.5'							9	6
		10T	27.5		-w/silt partings & slickensides @ 27.5'	BDL	139	BDL	BDL	BDL	11	10	6
30		11T	29.5		-w/slickensides below 29.5'							12	5
		12T	31.5									7	2
		13T	34		-tan & gray below 34'							2	1
		14T	34.5									1	1

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3/20/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3/20/86
A - AUGER					DATE GROUTED: 3/20/86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB08
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 300 E 3,157, 770
GROUND ELEVATION: 50.6'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Tan & gray CLAY (CH) w/slickensides								
		15T	37		Tan & gray SANDY CLAY (CL) w/creosote odor, calcareous nodules @ 37'							1	1
		16T	39.5									1	1
40													
		17T	41.5		Tan & gray CLAYEY SAND (SC) w/creosote odors							1	0
		18T	44									1	0
45		19S	45.5		-w/silty sand seam @ 45'							5	3
		20T	47.5		-very clayey @ 47.5'							1	1
		21S	49		-w/clay pockets @ 49'							1	1
50													
		22S	51.5			BDL	BDL	BDL	BDL	BDL	BDL	2	2
		23T	53.5		-w/ferrous stains @ 53.5'							1	1
55													
		24T	56		Light gray & reddish brown CLAY (CH) w/slickensides							12	1
		25S	57.5		-interbedded w/sandy silt layers to 62'	BDL	BDL	BDL	BDL	BDL	25	5	2
		26T	59		-w/creosote odors to 60'	BDL	BDL	BDL	BDL	BDL	BDL	3	1
60													
		27S	61.5		-reddish brown w/vertical sand filled fissures @ 62'	116	BDL	BDL	BDL	BDL	BDL	1	1
		28T	63.5		-brown w/silt partings @ 64.5'	BDL	387	BDL	BDL	BDL	BDL	1	0
65													
		29T	66									2	0
					Bottom @ 66'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3/20/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3/20/86
A - AUGER					DATE GROUTED: 3/20/86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB09
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 160 E 3,157, 780
GROUND ELEVATION: 50.7'.

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Dark gray SILTY SAND (SM) "FILL" w/shells, & roots							1	0
		02T	4		Tan & gray SANDY CLAY (CL) w/bioturbation							1	0
5		03T	6									1	0
		04T	8		-w/ferrous nodules @ 8'							1	0
10		05T	10		Greenish gray SILTY SAND (SM) -w/bioturbation @ 10' -w/sewage odors @ 10'							1	1
		06S	11.5		-w/oily residue & creosote odors below 10'	139	BDL	BDL	168	31	11	4	5
15													
20													
					Tan & reddish brown CLAY (CH) w/oily residue & creosote odors								
		07T	24	S	-w/calcareous nodules & silt seams @ 24'	BDL	140	29	BDL	BDL	35	11	7
25													
		08T	28		-w/slickensides, silt & sand partings, calcareous nodules @ 28'							8	7
30		09T	29.5		-w/slickensides below 29.5'							9	2
		10T	31.5		-w/silt partings @ 31.5'							9	2
		11T	34		Light reddish brown & light gray SANDY CLAY (CL) w/creosote odors -w/ferrous & calcareous nodules @ 34'							1	1

B.75
4
21

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 in. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 3/24/86
DATE COMPLETED: 3/24/86
DATE GROUTED: 3/24/86
DRILLER: Van and Sons
TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB09
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 160 E 3,157, 780
GROUND ELEVATION: 50.7'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		12T	35.5		Tan & light gray SANDY CLAY (CL) w/creosote odors							1	1
		13T	37.5		-w/calcareous nodules @ 37.5'							1	1
					Light gray SILTY SAND (SM) w/creosote odors								
40		14T	40									1	1
		15S	41.5									2	0
		16S	43.5		-clayey w/oily residue @ 43.5'							1	1
45		17T	45.5		-w/oily residue @ 45.5'							1	1
		18S	47.5									1	1
		19T	49.5		-w/sand layer @ 49.5' -w/oily residue below 49.5'							5	1
50		20T	51.5		-clayey sand @ 51.5'	BDL	BDL	BDL	111	BDL	7360	12	3
		21T	53.5		Light gray & reddish brown CLAY (CH) w/slickensides w/creosote odors							6	1
55		22T	56		-w/vertical sand filled fissures @ 53.5' -w/calcareous nodules @ 56'							1	1
		23T	57.5									1	0
60		24T	59.5			BDL	159	BDL	BDL	BDL	BDL	2	2
		25T	60.5									1	0
					Light gray & reddish brown SANDY SILT (ML)								
		26S	63.5		Light gray & reddish brown CLAY (CH) -w/vertical sand filled fissures, slickensides @ 63.5'	BDL	BDL	BDL	BDL	BDL	BDL	2	1
65		27T	66		-brown w/silt partings @ 65'	BDL	BDL	BDL	BDL	BDL	BDL	2	1
					Bottom @ 66'								

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 3/24/86
DATE COMPLETED: 3/24/86
DATE GROUTED: 3/24/86
DRILLER: Van and Sons
TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB10
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 732, 910 E 3,157, 830
GROUND ELEVATION: 49.9'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Gray very CLAYEY SAND (SC) w/sand pockets & roots							0	0
		02T	4		Tan & light gray SANDY CLAY (CL) -w/ferrous nodules & roots, 4' to 5.5'							0	0
5		03T	5.5									0	0
		04T	8		-w/bioturbation @ 8'							0	0
		05T	10		Gray SILTY SAND (SM) -w/ferrous nodules @ 10'							0	0
10		06S	11			BDL	BDL	BDL	129	BDL	BDL	0	0
15													
20					Light gray & reddish brown CLAY (CH) w/slickensides								
		07T	23	D/S		BDL	BDL	BDL	BDL	BDL	BDL	0	0
25		08T	26		-w/calcareous nodules @ 26'							0	0
		09T	28									0	0
30		10T	30		-w/silt partings @ 30'							0	0
		11T	32.5		-w/siltstone parting, 4" brown clay layer @ 32.5'							0	0
		12T	34.5									0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3/25/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3/25/86
A - AUGER					DATE GROUTED: 3/25/86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB10
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 290 E 3,157, 500
GROUND ELEVATION: 50.3'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		13T	36.5		Light gray & light reddish brown CLAY (CH)							0	0
		14T	38.5		-w/calcareous nodules @ 38.5'							0	0
40		15T	41		Light gray & tan SANDY CLAY (CL) -w/ferrous nodules @ 41'							0	0
		16T	41.5									0	0
		17T	44		Tan SILTY SAND (SM) -w/ferrous nodules @ 44'	BDL	BDL	BDL	330	47	BDL	0	0
45		18T	46.5									0	0
		19T	48									0	1
50		20S	50									0	0
		21S	52.5		-light gray @ 52.5'							0	0
		22S	54.5		Light gray & reddish brown CLAY (CH) w/slickensides	BDL	101	40	BDL	BDL	BDL	1	0
55		23T	56									0	0
60		24S	60.5		Reddish brown SANDY SILT (ML)							0	0
		25T	62.5		Light gray & reddish brown CLAY (CH) w/slickensides -w/silt partings @ 62.5' -w/vertical sand filled fissures & silt partings @ 63'							0	0
65		26T	65									0	0
					Bottom @ 65'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3/25/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3/25/86
A - AUGER					DATE GROUTED: 3/25/86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB11
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 290 E 3,157, 500
GROUND ELEVATION: 50.3'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Tan & dark gray SANDY CLAY (CL) w/roots -tan & light gray @ 2'							0	0
		02T	3		-w/ferrous nodules @ 4'							0	0
5		03T	6									0	0
		04T	8									0	0
		05T	9.5		Gray SILTY SAND (SM)							0	0
10		06S	11.5			BDL	BDL	BDL	BDL	BDL	BDL	0	0
15													
20					Light gray & reddish brown SILTY CLAY (CL) w/silt partings								
		07T	23		-w/vertical silt filled fissure @ 23'	BDL	BDL	BDL	BDL	BDL	BDL	0	0
		08T	23.5									0	0
25		09T	26.5									0	0
		10T	28		Light gray & reddish brown CLAY (CH) w/silt partings & siltstone seams -w/slickensides @ 29'							0	0
30		11T	30		-w/calcareous nodules @ 31'							0	0
		12T	32.5									0	0
		13T	35		Tan & light gray SANDY CLAY (CL) w/calcareous nodules							0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3/26/86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3/26/86
A - AUGER					DATE GROUTED: 3/26/86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB11
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 732, 910 E 3,157, 830
GROUND ELEVATION: 49.9'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		14T	36.5		Tan & light gray SANDY CLAY (CL)							0	0
		15T	39		Tan & light gray CLAYEY SAND (SC)							0	0
40		16T	40.5			91	BDL	BDL	BDL	BDL	BDL	0	0
		17T	41.5		Tan & light gray SANDY CLAY (CL) -very sandy @ 43'							0	0
45		18T	45									0	0
		19T	46									0	0
					Light gray & reddish brown CLAY (CH) w/sand pockets, slickensides								
		20T	49		Light gray & reddish brown SANDY CLAY (CL)							0	0
50		21T	50.5		Reddish brown & light gray CLAYEY SILT (ML)	92	BDL	BDL	BDL	BDL	BDL	0	0
		22S	52.5		Light gray & reddish brown CLAY (CH) w/slickensides -w/calcareous nodules @ 55'							0	0
55		23T	54.5									0	0
		24T	56									0	0
60		25S	60.5		Reddish brown SANDY SILT (ML)							0	0
		26T	62		Reddish brown CLAY (CH) w/slickensides & silt partings							0	0
65					Bottom @ 63'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 In. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 3/26/86
DATE COMPLETED: 3/26/86
DATE GROUTED: 3/26/86
DRILLER: Van and Sons
TECHNICIAN: Wayne Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB12
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 070 E 3,157, 520
GROUND ELEVATION: 50.1'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM LAB	HEADSPACE READING, PPM FIELD
					Tan & dark gray SANDY CLAY (CL)								
		01T	1.5		-w/roots @ 1.5' -gray & tan below 2'							3	0
		02T	3.5		-w/vertical sand filled fissures @ 4'							2	0
5		03T	5.5		-very sandy @ 6'							1	0
		04T	7.5									1	0
		05T	8.5		Gray SILTY SAND (SM)							1	0
10		06T	11								BDL	1	0
15													
20													
					Light gray & reddish brown CLAY (CH) w/silt pockets								
		07T	23.5									0	0
25		08T	25.5		Light gray & reddish brown SILTY CLAY (CL) -w/3" silty sand seams @ 25' -w/silt partings @ 26'							0	0
		09T	27.5									0	0
		10T	29.5		Light gray & reddish brown CLAY (CH) w/slickensides -w/sand partings @ 28'							0	0
30		11T	31.5									0	0
		12T	34									0	0

SURROGATE ANALYSES — METALS, PPM

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 7-28-86
DATE COMPLETED: 7-28-86
DATE GROUTED: 7-28-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A01-SB12
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 070 E 3,157, 520
GROUND ELEVATION: 50.1'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM LAB	HEADSPACE READING, PPM FIELD
		13T	36		Reddish brown & light gray SANDY CLAY (CL) -tan & light gray below 36'							1	0
		14T	37.5									1	0
		15T	39.5									1	0
40													
		16T	42		-w/ferrous nodules @ 42'							0	0
		17T	43.5									1	0
45		18T	45.5									1	0
		19T	47.5								BDL	0	0
		20T	49.5		Tan & light gray very CLAYEY SAND (SC)							1	0
50					Light gray SILTY SAND (SM)								
		21T	52		Reddish brown & light gray CLAY (CH) -light gray & reddish brown below 52'						BDL	1	0
		22T	53.5		-w/slickensides @ 53.5'							1	0
55		23T	55.5									0	0
		24T	57.5									0	0
		25T	59.5									1	0
60					Reddish brown SILTY SAND (SM)								
		26T	61.5		Reddish brown CLAY (CH) -w/slickensides @ 61.5' -w/silt partings @ 62'						BDL	1	0
		27T	63.5		-brown below 63.5' -w/sand & silt partings @ 64'							0	0
65		28T	65.5									1	0
					Bottom @ 66'								

SURROGATE ANALYSES — METALS, PPM

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 7-28-86
DATE COMPLETED: 7-28-86
DATE GROUTED: 7-28-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK A01-SB13
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N733,410 E3,157,120
GROUND ELEVATION: 50.79'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Tan & dark gray SANDY CLAY (CL) "FILL"								
		01T	1.5		Gray & tan SANDY CLAY (CL)							0	2
					-dark gray to 2'							0	1
		02T	3.5										
5		03T	6		-w/ferrous nodules @ 6'							0	1
		04T	7.5									0	1
10		05T	10		Light gray SILTY SAND (SM)							0	1
		06S	11.5		-light gray & tan w/ferrous nodules to 10'							0	2
15													
20													
					Gray & reddish brown CLAY (CH) w/slickensides								
		07T	24.5		-w/vertical silt filled fissures							0	1
25													
		08T	27		-w/8" clayey silt seam @ 26'							0	0
					Bottom @ 27'								
30													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 7-30-87
S - 2 In. SPLIT-BARREL					DATE COMPLETED: 7-30-87
A - AUGER					DATE GROUTED: 7-30-87
					DRILLER: Van & Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-SB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 620 E 3,158,000
GROUND ELEVATION: 51.4'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Black SANDY CLAY (CL) "FILL" w/wood pieces, gravel and solidified tars							0	0
					Tan CLAYEY SAND (SC)								
5		02T	5.5		Tan SANDY CLAY (CL)							0	0
		03T	8		-w/ferrous nodules below 8'							0	0
10		04T	10									0	0
		05T	10.5		-w/roots @ 10'	BDL	123	BDL	176	BDL	BDL	0	0
		06S	12		Gray CLAYEY SAND (SC)							0	0
15													
20		07S	21.5		-w/clay pockets	161	107	BDL	169	66	BDL	0	
		08T	24		Light gray and reddish brown CLAY (CH) w/creosote odor -w/silt seams @ 24'	BDL	BDL	BDL	134	BDL	589	4	1
25		09T	26		-w/vertical and horizontal sand seams below 26'							2	1
		10T	28			BDL	134	BDL	BDL	BDL	339	3	1
30					Bottom @ 29'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-3-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-3-86
A - AUGER					DATE GROUTED: 3-3-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING
REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-SB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 590 E 3,158, 000
GROUND ELEVATION: 51.4'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Black SANDY CLAY (CL) "FILL" w/shells and solidified tars							0	0
		02T	2.5									0	0
5		03T	6		Tan and light gray SANDY CLAY (CL) w/vertical sand filled fissures							0	0
		04T	8		-w/ferrous nodules below 8'							0	0
		05T	9.5			BDL	434	BDL	BDL	BDL	BDL	0	0
10		06S	11		Tan CLAYEY SAND (SC)							0	0
		07S	13.5			BDL	BDL	BDL	BDL	BDL	BDL	0	0
15													
20													
		08S	22.5		Light gray and reddish brown CLAY (CH)	BDL	BDL	BDL	BDL	BDL	BDL	0	0
		09T	24	D	-w/silt seams and pockets @ 24'	BDL	184	BDL	BDL	BDL	19	0	0
25		10T	26.5		-w/sand seams @ 26.5' -w/creosote odor below 26.5'							1	1
		11T	28			BDL	BDL	39	BDL	BDL	5	2	0
30					Bottom @ 29'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-3-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-3-86
A - AUGER					DATE GROUTED: 3-3-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-SB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 630 E 3,157, 970
GROUND ELEVATION: 51.7'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1.5		Black CLAYEY SAND (SC) "FILL" -w/roots and solidified tars @ 1.5' -w/wood @ 3'							0	0
		02T	4		Tan and gray SANDY CLAY (CL)							0	0
5		03T	6		-w/ferrous and calcareous nodules @ 6'							0	0
		04T	8		-w/ferrous nodules below 8'							0	0
11 10		05T	10									0	0
		06T	12		Gray SILTY SAND (SM)							0	0
		07S	13.5			109	BDL	BDL	146	BDL	BDL	0	0
15													
21 20													
					Light gray and reddish brown CLAY (CH) w/creosote odor to 32'								
		08T	23.5		-w/calcareous nodules and silt seams @ 23.5'	106	BDL	32	161	BDL	6110	15	1
25		09T	25.5									4	2
		10T	27.5									4	1
30					-w/slickensides below 31'								
		11T	32		-w/calcareous nodules, sand pockets @ 34'							0	0
		12T	35		Tan and light gray CLAY (CH)							0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-4-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-4-86
A - AUGER					DATE GROUTED: 3-4-86
					DRILLER: Van & Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A02-SB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 630 E 3,157, 970
GROUND ELEVATION: 51.7'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Tan and light gray CLAY (CH)								
		13T	37		-w/calcareous nodules @ 37'							0	0
					Tan and light gray SANDY CLAY (CL)								
		14T	39									0	0
40		15T	40.5		-very sandy @ 40.5' -w/creosote odor below 41'							0	0
		16S	42.5									0	2
45		17T	45		-very sandy w/sand layer @ 45'							0	1
					Tan and gray CLAYEY SAND (SC)								
		18T	47		-gray below 47'							0	0
		19S	48.5									0	1
50		20S	50									1	2
		21T	52.5		-oily residue, creosote odor below 51'	93	BDL	31	180	BDL	2580	9	2
					Light gray and reddish brown CLAY (CH) w/slickensides and ferrous nodules -w/creosote odors to 57'								
55		22T	55									0	0
		23T	57									0	0
		24T	59			BDL	BDL	BDL	BDL	BDL	BDL	0	0
60					Bottom @ 59'								
65													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-4-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-4-86
A - AUGER					DATE GROUTED: 3-4-86
					DRILLER: Van & Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 740 E 3,158, 200
GROUND ELEVATION: 50.7'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	2		Gray brown SANDY SILT (ML) w/roots							0	0
		02T	3		Light gray and gray very SANDY CLAY (CL) -w/roots @ 3.5' -light gray w/ferrous nodules and sand pockets below 4'							0	0
5		03T	6		-creosote odor below 6'							1	1
		04T	8		-w/oily residue in sand pockets below 8'							1	1
		05T	9			BDL	BDL	BDL	159	BDL	4480	15	6
10		06T	11									4	5
12					Light gray CLAYEY SAND (SC) w/oily residue, creosote odor, and sandy clay pockets								
13		07T	13		Light gray very SILTY SAND (SM) w/clay pockets, creosote odors							3	1
					Reddish brown and light gray slightly SANDY SILT (ML) w/oily residue and creosote odor								
15		08S	15		Light gray SAND (SP) w/oily residue and creosote odor	235	BDL	BDL	BDL	BDL	1260	3	1
21													
20													
		09T	23		Reddish brown and light gray SANDY SILT (ML) w/clay interbeds, calcareous nodules, oily residue, oil sheen, and creosote odor	117	BDL	BDL	BDL	BDL	157	6	2
25		10T	25		Reddish brown and light gray CLAY (CH) w/silt interbeds, bioturbation, oily residue in bioturbated areas, creosote odor							1	1
		11T	27.5			BDL	BDL	BDL	BDL	BDL	36	1	1
					Bottom @ 28'								
30													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T – 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-25-86
S – 2 in. SPLIT-BARREL					DATE COMPLETED: 2-25-86
A – AUGER					DATE GROUTED: 2-25-86
					DRILLER: Van and Sons
					TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 690 E 3,158, 200
GROUND ELEVATION: 50.7'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	2		Dark brown SANDY SILT (ML) -w/roots @ 2'							0	0
5		02T	6		Light gray & tan SANDY CLAY (CL) w/wet sand pockets							0	0
		03T	7		-w/ferrous nodules, bioturbation and sand filled fissures @ 6' -w/oily residue and creosote odor below 6'	BDL	BDL	BDL	BDL	BDL	209	1	0
		04T	8									0	0
10		05T	10.5			120	BDL	BDL	166	BDL	142	3	0
		06T	12		Light gray SILTY SAND (SM) w/oily residue and creosote odor							7	1
15													
20													
		07T	23	D	Reddish brown and light gray very SILTY CLAY (CL) w/silt pockets, oily residue in pockets, creosote odor	BDL	BDL	BDL	BDL	BDL	42	1	1
		08T	24		Reddish brown & light gray CLAY (CH) w/creosote odor -w/silt pockets & slickensides @ 23' -w/silt seams below 24'							5	2
25		09T	26		-w/sand pockets @ 27.5'	BDL	140	BDL	182	BDL	371	9	3
30					Bottom @ 28'								

11

21

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-25-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 2-25-86
A - AUGER					DATE GROUTED: 2-25-86
					DRILLER: Van and Sons
					TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 710 E 3,158, 170
GROUND ELEVATION: 50.7'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	2		Brown SANDY SILT (ML) w/sand pockets fill to 0.5' -sandy clay layer @ 2'							1	0
		02T	3									1	0
5		03T	6		Brownish gray SANDY CLAY (CL) w/sand pockets, oily residue in sand pockets & creosote odor, wet -vertical sand fissures @ 6'							17	4
		04T	7		-ferrous nodules @ 8'							12	2
10		05T	9		-diesel odor @ 9'	BDL	BDL	BDL	115	BDL	32,600	18	2
10		06T	10		Light gray slightly SILTY SAND (SM) w/oily residue & creosote odor							11	3
13		07T	13									18	4
					Light gray SANDY SILT (ML) w/vertical sand fissures, oily residue & creosote odor								
15		08T	15		Light gray SILTY SAND (SM) w/oily residue & creosote odor							18	2
20													
23					-w/occasional clay pockets @ 22'								
		09T	23.5		Reddish brown & light gray CLAY (CH) w/slickensides, silt interbeds, creosote odor	BDL	93	BDL	203	BDL	4180	22	3
25		10T	24		-2" clayey silt layer @ 23.5' and 25' -oily residue to 25'							14	1
		11T	26		-w/vertical silt fissures @ 26' -bioturbated below 28'							7	0
		12T	29									3	0
30		13T	31									1	0
		14T	33									0	0
					Light gray & tan slightly SANDY CLAY (CL) w/calcareous nodules, bioturbated, ferrous staining								

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 in. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 2-26-86
DATE COMPLETED: 2-26-86
DATE GROUTED: 2-26-86
DRILLER: Van and Sons
TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 710 E 3,158, 170
GROUND ELEVATION: 50.7'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		15T	35		Light gray & tan SANDY CLAY (CL)							0	0
		16T	37.5									1	0
		17T	39									1	0
40		18T	41		Light gray & tan CLAYEY SAND (SC) w/ferrous staining	BDL	BDL	BDL	206	BDL	BDL	1	0
		19S	42									1	0
		20T	45									0	0
45		21T	46		Light gray very SANDY CLAY (CL) w/sand pockets & calcareous nodules							1	0
		22T	49		-light gray very clayey sand layer @ 50'							1	0
50		23T	51		Reddish brown & light gray CLAY (CH) w/slickensides, bioturbated -w/creosote odor to 54'							8	0
		24T	53		-w/oily residue in sand seam @ 53' -calcareous nodules @ 54'							1	0
55		25T	56			BDL	228	26	BDL	BDL	BDL	0	0
					Bottom @ 56'								
60													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 2-26-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 2-26-86
A - AUGER					DATE GROUTED: 2-26-86
					DRILLER: Van and Sons
					TECHNICIAN: Paul C. Moore

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB04
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 640 E 3,158, 340
GROUND ELEVATION: 52.4'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01A	2		Dark gray SANDY CLAY (CL) "FILL" w/shells -w/solidified tars and creosote odors @ 2'							0	0
		02T	3.5		Gray SILTY SAND (SM) "FILL" w/clay layers and roots							0	0
5		03T	6		Tan & gray SANDY CLAY (CL) w/silty sand filled fissures							0	0
		04T	8			BDL	BDL	BDL	BDL	BDL	BDL	0	0
10		05T	10									0	0
		06T	11									0	0
		07S	13.5		Tan & light gray SILTY SAND (SM)	BDL	BDL	BDL	211	BDL	BDL	0	0
15													
20													
		08S	24.5									0	0
25													
		09S	27.5		Reddish brown SANDY SILT (ML)	BDL	BDL	BDL	138	BDL	BDL	1	0
30		10T	30		Light gray & reddish brown CLAY (CH) w/silt partings & slickensides -w/calcareous nodules @ 30'							0	0
		11T	31.5									0	0
		12T	33.5									0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-17-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-17-86
A - AUGER					DATE GROUTED: 3-17-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB04
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 640 E 3,158, 340
GROUND ELEVATION: 52.4'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Light gray & reddish brown CLAY (CH)								
		13T	39		Tan & light gray SANDY CLAY (CL) w/calcareous nodules							0	0
40		14T	40.5									0	0
		15T	43									0	0
45		16T	45		Tan & light gray CLAYEY SAND (SC)							0	0
		17T	47									0	0
		18S	49									0	0
50		19S	51									0	0
		20T	53.5									0	0
55		21T	54.5			173	BDL	BDL	BDL	BDL	BDL	0	0
		22T	57.5		Light gray & reddish brown CLAY (CH) w/slickensides, siltstone partings to 58'							0	0
		23T	59									0	0
60		24T	62									0	0
		25T	63.5		-silt partings @ 64'							0	0
65		26T	65									0	0
		27T	67.5		-brown w/silt partings @ 67'							0	0
		28T	69									0	0
					Bottom @ 70'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-17-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-17-86
A - AUGER					DATE GROUTED: 3-17-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB05
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 920 E 3,158, 250
GROUND ELEVATION: 52.6'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark gray SANDY CLAY (CL) "FILL" w/gravel & shell -gray & tan @ 2'								
		01T	3.5		Dark gray SILTY SAND (SM) "FILL"							0	0
5		02T	5.5		Tan & dark gray CLAYEY SAND (SC)							1	0
		03T	7.5		Tan & gray SANDY CLAY (CL)							0	0
		04T	9.5		-w/ferrous nodules below 8'							1	0
10		05T	11.5		-very sandy @ 11'							0	0
		06S	13		Gray & tan SILTY SAND (SM)						BDL	1	0
15													
20					Light gray & reddish brown CLAY (CH) w/silt seams, slickensides, rootlets								
		07T	22.5		Light gray & reddish brown CLAYEY SILT (ML)							1	0
		08T	24.5									0	0
25		09T	26.5		Light gray & reddish brown SILTY CLAY (CL)							1	0
		10T	28.5		Light gray & reddish brown CLAY (CH) w/slickensides & silt partings							1	0
30		11T	30.5									0	0
		12T	32.5									1	0
		13T	34.5		Light gray & tan SANDY CLAY (CL) w/calcareous nodules -w/ferrous nodules @ 34.5'							0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 in. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 3-17-86
DATE COMPLETED: 3-17-86
DATE GROUTED: 3-17-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB05
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 920 E 3,158, 250
GROUND ELEVATION: 52.6'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		14T	36.5		Gray & tan SANDY CLAY (CL) w/calcareous nodules -tan & gray w/ferrous nodules @ 37'							0	0
		15T	38.5									0	0
40		16T	40.5		Tan & gray CLAYEY SAND (SC)							0	0
		17T	42.5		Tan & gray SILTY SAND (SM) w/creosote odor							0	0
		18S	44									0	0
45		19S	45.5									0	0
		20S	47.5									0	0
50		21T	50.5									0	0
55					-light gray & clayey @ 55'								
		22S	56.5								BDL	0	2
		23T	58.5		Light gray & reddish brown CLAY (CH) w/slickensides, creosote odor							0	0
60		24T	60		Reddish brown SANDY SILT (ML)						BDL	0	0
		25S	62.5		Reddish brown CLAY (CH) -w/creosote odor @ 62.5' -w/silt parting below 63'							0	0
		26T	64.5		-w/slickensides @ 65'							1	0
65		27T	66.5								BDL	0	0
					Bottom @ 67'								

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 7-17-86
DATE COMPLETED: 7-17-86
DATE GROUTED: 7-17-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.:

BORING NO.: SCK-A03-SB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 734, 120 E 3,158, 200
GROUND ELEVATION: 52.8'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gray CLAYEY SAND (SC) "FILL" w/shells								
					Tan & light gray SANDY CLAY (CL) "FILL"								
		01T	3.5									0	0
5		02T	5.5		Tan & dark gray SANDY CLAY (CL) w/sewage odor -tan & gray @ 6'							1	0
		03T	7.5									1	0
		04T	9.5		-tan & light gray w/sand pockets & ferrous nodules below 8'							1	0
10		05S	11.5		Light gray CLAYEY SAND (SC)						BDL	2	0
15													
20													
		06T	22.5		Light gray & reddish brown CLAYEY SILT (ML) -w/silty sand seams @ 22' -w/clay seams @ 24'							1	0
25		07T	25.5								BDL	1	0
		08T	27.5		Light gray & reddish brown CLAY (CH) w/slickensides -w/calcareous nodules, 28'-32'							1	0
		09T	29.5									1	0
30		10T	32									1	0
		11T	34									1	0
					Tan & light gray SANDY CLAY (CL) w/calcareous nodules								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 7-29-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 7-29-86
A - AUGER					DATE GROUTED: 7-29-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING
REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 734, 120 E 3,158, 200
GROUND ELEVATION: 52.8'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		12T	35.5		Tan & light gray SANDY CLAY (CL) w/calcareous nodules							1	0
		13T	38									1	0
		14T	39.5		Tan & light gray CLAYEY SAND (SC)							1	0
40		15T	41.5								BDL	1	0
		16S	43		-light gray below 42'							1	0
45		17S	45.5									3	0
		18T	47									3	0
		19T	49									4	0
50		20T	52		Tan & light gray SILTY SAND (SM) w/clay balls						BDL	4	0
		21T	53.5		Light gray & reddish brown CLAY (CH) w/slickensides							3	0
55		22T	55.5									3	0
		23T	57.5	D							BDL	3	0
		24T	59.5									4	0
60		25T	61.5		Reddish brown SILTY SAND (SM)						BDL	3	0
		26T	63.5		Light gray & reddish brown CLAY (CH) w/silt partings -w/slickensides @ 64'							3	0
65		27T	65.5									3	0
		28T	68									3	0
					Bottom @ 68'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T – 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 7-29-86
S – 2 in. SPLIT-BARREL					DATE COMPLETED: 7-29-86
A – AUGER					DATE GROUTED: 7-29-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING
REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 734, 060 E 3,158, 440
GROUND ELEVATION: 51.5'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM LAB	HEADSPACE READING, PPM FIELD
						SURROGATE ANALYSES							
						METALS, PPM							
		01T	1.5		Tan SAND (SP) "FILL" w/gravel & roots							0	1
		02T	3.5		Gray SANDY CLAY (CL) -tan & gray below 4'							0	1
5		03T	5.5								BDL	0	1
		04T	7.5		-very sandy @ 8'							0	0
		05T	9.5									0	0
10		06S	11.5		Light gray SILTY SAND (SM)						BDL	1	0
15													
20													
25		07T	26.5		Light gray & reddish brown CLAY (CH) w/slickensides -w/silt pockets @ 26.5'							1	0
		08T	29									0	0
30		09T	30.5		Tan SILTY SAND (SM)						BDL	0	0
		10T	32.5		Tan & gray CLAY (CH) -w/rootlets, ferrous & calcareous nodules @ 31' -slightly sandy w/rootlets @ 33'							1	0
		11T	34.5									0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 7-30-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 7-30-86
A - AUGER					DATE GROUTED: 7-30-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A03-SB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 734, 060 E 3,158, 440
GROUND ELEVATION: 51.5'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM LAB	HEADSPACE READING, PPM FIELD
		12T	36.5		Tan & light gray CLAY (CH) w/ferrous nodules							0	0
		13T	38.5		Tan & light gray SANDY CLAY (CL) w/calcareous nodules							1	0
40		14T	40.5		Tan & light gray CLAYEY SAND (SC)							1	0
		15T	42.5		-very clayey w/clay balls @ 43'							1	0
		16T	44									1	0
45		17S	46.5		Reddish brown SILTY SAND (SM)							1	0
		18T	48								BDL	1	0
50		19T	50.5		Light gray & reddish brown CLAY (CH) w/slickensides							1	0
		20T	52.5									1	0
		21T	54.5									0	0
55					-w/calcareous nodules @ 55'								
		22T	56.5									0	0
		23T	58		Light gray & reddish brown SANDY SILT (ML) w/rootlets						BDL	0	0
60		24T	60.5		Light gray & reddish brown CLAY (CH) w/silt partings -w/slickensides @ 61'							0	0
		25T	62.5		-brown below 63'							1	0
65		26T	65									0	0
					Bottom @ 65'								

SURROGATE ANALYSES — METALS, PPM

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 7-30-86
DATE COMPLETED: 7-30-86
DATE GROUTED: 7-30-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 730 E 3,158, 060
GROUND ELEVATION: 51.0'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM LAB	HEADSPACE READING, PPM FIELD
					Black SANDY CLAY (CL) "FILL" w/solidified tar and creosote odor								
		01T	2		Dark gray CLAYEY SAND (SC) "FILL" w/solidified tar & creosote odor							8	11
		02T	4		Tan & gray SANDY CLAY (CL) w/ferrous nodules, oily residue and creosote odor							10	10
5		03T	6									10	10
		04T	8									12	8
10		05T	10									14	6
		06T	10.5			BDL	BDL	BDL	236	BDL	54,600	44	6
		07S	13		Gray CLAYEY SAND (SC) w/oily residue and creosote odor							16	9
15													
20													
		08T	24.5	D	Light gray & reddish brown SILTY CLAY (CL) w/silt seams, oily residue and creosote odor	93	BDL	BDL	139	36	1,370	12	1
25		09T	27		-w/sand pockets @ 27'							2	2
		10T	28.5									5	6
30		11T	31		Light gray & reddish brown CLAY (CH) w/oily residue & creosote odor	BDL	BDL	56	BDL	BDL	5	3	2
		12T	33									1	1
		13T	34.5		-tan & light gray @ 34'							0	0

SURROGATE ANALYSES — METALS, PPM

SAMPLE IDENTIFICATION
T – 3 in. THIN-WALLED TUBE
S – 2 in. SPLIT-BARREL
A – AUGER

WATER LEVEL DATA			
DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 3-5-86
DATE COMPLETED: 3-5-86
DATE GROUTED: 3-5-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB01
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 730 E 3,158, 060
GROUND ELEVATION: 51.0'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		14T	36		Tan & light gray CLAY (CH) w/calcareous nodules and creosote odor							0	0
		15T	39		Tan & light gray SANDY CLAY (CL) -w/calcareous nodules, oily residue and creosote odor @ 39'	BDL	BDL	BDL	127	BDL	BDL	0	1
40		16T	41									0	0
		17T	43									0	0
		18S	44.5		-w/creosote odor @ 44.5'							5	6
45		19S	46.5		Light gray & reddish brown CLAY (CH) w/vertical sand fissures, oily residue and creosote odor	BDL	BDL	34	BDL	BDL	42	10	7
		20T	47.5		-sand pockets and layers below 49'							2	1
50		21T	51									2	2
		22T	52									1	1
		23T	54			BDL	204	37	BDL	BDL	BDL	4	1
55					Bottom @ 55'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-5-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-5-86
A - AUGER					DATE GROUTED: 3-5-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 780 E 3,158, 070
GROUND ELEVATION: 51.1'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1.5		Dark gray CLAYEY SAND (SC) "FILL" w/gravel, roots, intermixed clay, solidified tar and creosote odor							0	0
		02T	4		Gray SANDY CLAY (CL) w/clayey sand filled fissure, ferrous nodules, oily residue and creosote odor							1	0
5		03T	6	S		BDL	BDL	BDL	BDL	BDL	2,020	2	1
		04T	7.5									3	1
10		05T	10	S								7	3
		06T	11		Tan & light gray CLAYEY SAND (SC) w/sandy clay and clay interbeds, oily residue and creosote odor	BDL	217	37	BDL	BDL	12,400	11	3
		07S	13.5	S		201	BDL	BDL	BDL	BDL	4820	2	1
15		08S	15.5									1	1
20													
		09T	24		Light gray and reddish brown CLAY (CH) w/silt layers, and creosote odor -w/vertical silty sand fissures @ 24'	120	BDL	BDL	BDL	BDL	485	12	5
25		10T	25.5	S	-w/slickensides @ 26'	BDL	BDL	BDL	129	BDL	180	4	3
		11T	28									2	1
30		12T	30									1	2
		13T	32		-light gray & tan w/calcareous nodules, @ 33'							1	1
		14T	34									0	0
		15T	35									0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-6-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-6-86
A - AUGER					DATE GROUTED: 3-6-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING
REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB02
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 780 E 3,158, 070
GROUND ELEVATION: 51.1'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Tan and gray CLAY (CH)								
		16T	38									0	0
		17T	38.5		Tan & gray SANDY CLAY (CL) w/calcareous nodules & creosote odor							0	0
40													
		18T	41.5	S	-w/sand pockets @ 42'	BDL	BDL	BDL	148	BDL	BDL	1	0
		19T	44		-gray & very sandy w/oily residue @ 44'							1	0
		20T	44.5			107	BDL	BDL	152	BDL	19	2	3
45													
		21T	47									1	1
		22S	49.5									5	3
50		23S	50.5		Gray CLAYEY SAND (SC) w/oily residue and creosote odor							3	4
		24T	54		Light gray & reddish brown CLAY (CH) w/sand pockets & creosote odor	BDL	BDL	BDL	BDL	BDL	BDL	3	2
55		25T	55	S	-w/vertical sand fissures and slickensides @ 54' -w/calcareous nodules @ 56'	BDL	BDL	BDL	BDL	BDL	BDL	1	1
		26T	57.5									0	1
		27T	59.5			BDL	246	BDL	BDL	BDL	BDL	1	1
60					Bottom @ 60'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-6-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-6-86
A - AUGER					DATE GROUTED: 3-6-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 850 E 3,158, 030
GROUND ELEVATION: 51.2'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1.5		Gray SILTY SAND (SM) "FILL" w/debris, shells and roots							0	0
		02T	4		Gray SANDY CLAY (CL) "FILL" w/roots							0	0
5		03T	6		Tan & light gray SANDY CLAY (CL)							0	0
		04T	8		-w/clayey sand filled borrow @ 8'							0	0
		05T	10									0	0
10		06T	11		Gray CLAYEY SAND (SC) w/oily residue and creosote odor -w/clay seams @ 12'	BDL	BDL	BDL	305	BDL	174	7	5
		07S	13.5									1	3
15													
20													
		08T	23.5		Light gray & reddish brown CLAY (CH) w/silt layers, calcareous nodules and creosote odor -w/oily residue in silt layers @ 24'	158	BDL	28	BDL	BDL	BDL	0	1
25		09T	26		-w/silt seams below 26'							2	3
		10T	26.5		-w/silt partings and slickensides @ 28'							0	2
		11T	29.5	D		BDL	136	28	BDL	BDL	BDL	2	2
30		12T	31.5									2	1
		13T	32.5		Tan & gray SANDY CLAY (CL) w/calcareous nodules & creosote odor							0	1

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 in. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 3-6-86
DATE COMPLETED: 3-6-86
DATE GROUTED: 3-6-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB03
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 850 E 3,158, 030
GROUND ELEVATION: 51.2'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		14T	35.5		Tan & gray SANDY CLAY (CL) w/calcareous nodules and creosote odor							0	0
		15T	37									0	0
		16T	39.5		Tan & gray CLAYEY SAND (SC) w/oily residue and creosote odor							0	0
40													
		17T	42		Tan & gray SANDY CLAY (CL) w/calcareous nodules & creosote odor							0	0
		18T	43.5		-very sandy w/oily residue @ 44'							1	1
45		19S	45.5									1	1
		20T	47		Greenish gray CLAYEY SAND (SC) w/oily residue and creosote odor	BDL	BDL	BDL	147	BDL	52	1	1
		21S	49.5									1	3
50		22S	51.5		-w/clay pockets @ 52'							1	2
		23S	53									1	3
55		24T	55.5		Light gray & reddish brown CLAY (CH) w/slickensides and creosote odor							1	1
		25T	57.5									0	1
		26T	59.5									2	1
60		27T	61		Reddish brown SILT (ML) w/creosote odor	BDL	BDL	BDL	BDL	BDL	5	1	1
					Bottom @ 62'								
65													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-6-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-7-86
A - AUGER					DATE GROUTED: 3-7-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB04
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 734, 050 E 3,158, 300
GROUND ELEVATION: 50.9'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					PAVEMENT								
		01T	1.5		Brown SILTY SAND (SM) "FILL" w/gravel -tan & gray @ 2'							0	0
		02T	3.5									0	0
5		03T	6		Tan & light gray SANDY CLAY (CL) w/ferrous nodules and vertical sand fissures							0	0
		04T	8									0	0
10		05T	10		Tan & light gray SILTY SAND (ML) w/creosote odor grades slightly clayey -greenish gray @ 12'							0	0
		06T	10.5			BDL	BDL	BDL	109	BDL	BDL	0	0
		07S	13.5									0	0
15													
20		08T	21		Light gray & reddish brown CLAYEY SILT (ML) w/clay layers	139	BDL	BDL	BDL	BDL	BDL	0	0
		09T	22.5		-w/siltstone layer @ 22'							0	0
25		10T	25.5		Light gray & reddish brown CLAY (CH) w/silt partings							0	0
		11T	27									0	0
		12T	29		-w/slickensides @ 30'	BDL	BDL	BDL	BDL	BDL	BDL	1	0
30		13T	32		-reddish brown and light gray w/calcareous nodules @ 31.5'							1	0
		14T	33.5		Tan & light gray SANDY CLAY (CL) w/calcareous nodules							0	0
		15T	35									0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-12-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-12-86
A - AUGER					DATE GROUTED: 3-12-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING
REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB04
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 734, 050 E 3,158, 300
GROUND ELEVATION: 50.9'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		16T	36.5		Tan & light gray SANDY CLAY (CL) w/calcareous nodules							0	0
		17T	39.5		Tan & light gray SILTY SAND (SM)							0.	0
40		18T	41.5			100	BDL	BDL	127	BDL	BDL	0	0
		19T	44		Tan & light gray CLAYEY SAND (SC)							0	0
45		20T	45.5		Tan & light gray SILTY SAND (SM)							0	0
		21S	46.5									0	0
		22S	49.5		-w/sandy clay layers @ 50'							0	0
50		23T	51.5									0	0
		24T	53		Light gray & reddish brown CLAY (CH) w/slickensides							1	0
55		25T	56									0	0
		26T	57		-w/calcareous nodules @ 58'							0	0
60		27T	60									0	0
		28T	61									0	0
		29S	63.5		Reddish brown SANDY SILT (ML)							0	0
65		30T	66		Brown CLAY (CH) w/silt partings							0	0
					Bottom @ 66'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-12-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-12-86
A - AUGER					DATE GROUTED: 3-12-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB05
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 460 E 3,158, 050
GROUND ELEVATION: 50.7'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Pavement								
					Gray SILTY SAND (SM) "FILL" w/gravel								
					Tan & gray SANDY CLAY (CL)								
		01T	4		-w/sand partings @ 4'							0	0
5		02T	6		-w/calcareous nodules, vertical sand filled fissures @ 6'							0	0
		03T	8		-w/calcareous nodules @ 8'							0	0
9													
		04T	10		Gray SILTY SAND (SM)							0	0
10		05S	11									0	0
		06S	13									0	0
15													
20													
21													
					Light & reddish brown CLAY (CH)								
		07T	23.5		Light & reddish brown SANDY SILT (ML)							0	0
25		08T	25.5		-w/clay layers @ 25.5'							0	0
					Light & reddish brown CLAY (CH)								
		09T	29.5	D	-w/slickensides, silt partings, calcareous nodules @ 29.5'	BDL	BDL	BDL	BDL	BDL	BDL	0 / 0	0 / 0
30		10T	31		-w/slickensides below 30'							0	0
					-w/calcareous nodules @ 32.5'								
		11T	34		Tan & light gray SANDY CLAY (CL)							0	0
		12T	35		-w/calcareous & ferrous nodules @ 35'							0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 in. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 3-13-86
DATE COMPLETED: 3-13-86
DATE GROUTED: 3-13-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB05
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 460 E 3,158, 050
GROUND ELEVATION: 50.7'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		13T	37		Tan & light gray SANDY CLAY (CL) -w/calcareous nodules @ 37'							0	0
		14T	39.5									0	0
40		15T	42									0	0
		16T	44									0	0
45		17S	45		Tan SILTY SAND (SM)							0	0
		18S	47.5		Gray CLAYEY SAND (SC)							0	0
		19T	49.5		-tan & gray w/creosote odor below 49'	BDL	BDL	BDL	116	BDL	BDL	1	0
50		20T	51.5		-w/oily residue @ 51.5'	BDL	BDL	BDL	155	BDL	BDL	1	1
		21T	54		Light gray & reddish brown CLAY (CH) w/vertical sand filled fissures, calcareous nodules	BDL	249	BDL	BDL	BDL	30	0	0
		22T	54.5		-w/slickensides below 54'							0	0
55		23T	58		-w/calcareous nodules below 58'							0	0
		24T	59.5									0	0
60		25T	61		Light gray & reddish brown SANDY SILT (ML)							0	0
		26S	63.5		Light gray & reddish brown CLAY (CH) w/vertical silt filled fissures -w/creosote odors to 65'	BDL	460	BDL	BDL	BDL	BDL	1	0
65		27T	66									0	0
					Bottom @ 66'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 in. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 3-13-86
DATE COMPLETED: 3-13-86
DATE GROUTED: 3-13-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 734,000 E 3,157, 840
GROUND ELEVATION: 51.1'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Pavement								
		01T	3		Dark gray SILTY SAND (SM) "FILL" w/sand pockets							0	0
5		02T	6		Tan & gray SANDY CLAY (CL) w/vertical sand fissures							0	0
		03T	7.5		-gray & tan @ 8'							0	0
10		04T	10			BDL	BDL	BDL	BDL	BDL	BDL	1	0
		05S	13.5		Gray SILTY SAND (SM)	149	BDL	BDL	237	66	BDL	0	0
15													
20													
		06T	24.5	D	Light gray & reddish brown SANDY SILT (ML) w/clay layers	182	BDL	BDL	BDL	43	BDL	0.	0
25		07T	26.5		Light gray & reddish brown CLAY (CH) w/silt layers & slickensides -silt partings @ 30.5'							0	0
		08T	28									0	0
30		09T	30.5		-w/calcareous nodules @ 30.5'							0	0
		10T	32.5									0	0
		11T	34		Tan SANDY CLAY (CL) w/calcareous nodules @ 30.5'							0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-19-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-19-86
A - AUGER					DATE GROUTED: 3-19-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 734, 000 E 3,157, 840
GROUND ELEVATION: 51.1'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		12T	37		Tan & light gray SANDY CLAY (CL) w/calcareous nodules							0	0
		13T	38.5									0	0
40		14T	40.5		Tan & light gray CLAYEY SAND (SC)							0	0
		15T	42									0	0
		16T	43.5									0	0
45													
		17T	47									0	0
		18T	49		Light gray & reddish brown CLAY (CH) w/slickensides	BDL	BDL	BDL	BDL	BDL	BDL	1	0
		19T	49.5									0	0
50					Reddish brown SILTY SAND (SM)								
		20T	52.5		Light gray & reddish brown CLAY (CH) w/slickensides							0	0
		21T	54									0	0
55													
		22T	57									0	0
60		23T	60		Reddish brown SANDY SILT (ML)	87	BDL	BDL	113	BDL	BDL	0	0
		24T	62.5		Reddish brown CLAY (CH) w/vertical silt fissures & silt partings --slickensides @ 63'							0	0
65		25T	64.5									0	0
					Bottom @ 65'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-19-86
S - 2 In. SPLIT-BARREL					DATE COMPLETED: 3-19-86
A - AUGER					DATE GROUTED: 3-19-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 410 E 3,158, 220
GROUND ELEVATION: 50.1'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Dark SANDY CLAY (CL) "FILL" w/gravel and shell								
		01T	3		Dark gray SANDY CLAY (CL)							0	0
5					-tan & light gray w/ferrous & calcareous nodules @ 6'								
		02T	8									0	0
		03T	10									0	0
10		04T	11.5		Tan & light gray SILTY SAND (SM) w/ferrous nodules							0	0
		05S	13.5									0	0
15													
20													
					Light gray & reddish brown CLAY (CH) w/calcareous nodules								
		06T	23.5		Light gray & reddish brown SANDY SILT (ML) w/clay layers							0	0
		07T	24.5	D		119	BDL	BDL	154	62	BDL	0	0
25													
		08T	27.5		Light gray & reddish brown CLAY (CH) w/silt partings & calcareous nodules -w/slickensides @ 28'							0	0
		09T	29.5									0	0
30													
		10T	32									0	0
		11T	34		-tan & light gray @ 34'							0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-21-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-21-86
A - AUGER					DATE GROUTED: 3-21-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 410 E 3,158, 220
GROUND ELEVATION: 50.1'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		12T	36		Tan & light gray CLAY (CH) grades slightly sandy @ 36'							0	0
		13T	38									0	0
		14T	39.5		Tan & light gray SANDY CLAY (CL) w/calcareous nodules	BDL	BDL	BDL	BDL	BDL	BDL	1	0
40													
		15T	42									0	0
		16S	43.5									0	0
45		17T	45.5		-vertical sand fissures and sand seams @ 46'							0	0
		18T	47.5		-w/sand pockets @ 46'							0	0
		19T	50									0	0
50		20T	51.5		Gray SILTY SAND (SM)							0	0
		21S	53									0	0
55		22T	56		Light gray & reddish brown CLAY (CH) w/slickensides and vertical sand fissures -w/creosote odor to 60'	BDL	BDL	BDL	BDL	BDL	BDL	1	0
		23T	57		-silt partings @ 58'							0	0
		24T	59.5			BDL	BDL	BDL	BDL	BDL	BDL	0	0
60		25T	62		-4" silt layer @ 61.5'							0	0
		26T	64									0	0
65		27T	65.5		-light gray & brown w/calcareous nodules @ 65'							0	0
					Bottom @ 66'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-21-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-21-86
A - AUGER					DATE GROUTED: 3-21-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB08
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 120 E 3,158, 030
GROUND ELEVATION: 50.5'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Gravel and shell "FILL"								
		01T	2		Dark gray SANDY CLAY (SC) "FILL"							1	0
		02T	3		Light gray and tan SANDY CLAY (CL) w/ferrous nodules -tan and light gray below 4'							1	0
5		03T	6									1	0
		04T	7.5									1	0
10		05T	10		Tan and light gray SILTY SAND (SM)							1	0
		06T	11.5									1	0
		07S	13.5			121	BDL	BDL	189	BDL	BDL	1	0
15													
20													
		08T	24.5	D	Light gray and reddish brown CLAY (CH) w/slickensides and silt seams	BDL	BDL	48	BDL	BDL	BDL	1	0
25		09T	26.5		Light gray and reddish brown SANDY SILT (ML)							3	0
		10T	28.5		Reddish brown CLAY (CH) w/slickensides w/silt partings @ 27' -w/calcareous nodules @ 29'							1	0
30		11T	30.5									1	0
		12T	32.5									1	0
		13T	34									1	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T – 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S – 2 in. SPLIT-BARREL				
A – AUGER				

DATE STARTED: 3-27-86
DATE COMPLETED: 3-27-86
DATE GROUTED: 3-27-86

DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB08
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 733, 120 E 3,158, 030
GROUND ELEVATION: 50.5'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
					Reddish brown CLAY (CH)								
		14T	36		Tan and light gray SANDY CLAY (CL)							1	0
		15T	39									1	0
40		16T	40.5									1	0
		17T	44.5									1	0
45					Tan and light gray CLAYEY SAND (SC)								
		18S	48.5									1	0
50		19S	50.5									1	0
		20T	52									1	0
		21T	54.5			BDL	BDL	BDL	BDL	BDL	BDL	1	0
55		22T	56.5		Tan and reddish brown CLAY (CH) w/slickensides -w/sand pockets @ 55' -w/vertical sand filled fissures @ 57'							1	0
		23T	58.5									1	0
60		24T	60.5		Light gray and reddish brown SANDY SILT (ML)	113	BDL	BDL	BDL	BDL	BDL	1	0
		25T	63		Light gray and reddish brown CLAY (CH) w/vertical sand filled fissures							1	0
65					Bottom @ 63'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 3-27-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 3-27-86
A - AUGER					DATE GROUTED: 3-27-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB09
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 732, 710 E 3,158, 000
GROUND ELEVATION: 50.4'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1.5		Tan and gray CLAYEY SAND (SC) "FILL" w/shells, and gravel							0	0
		02T	4		Tan and light gray SANDY CLAY (SC) w/ferrous nodules -w/bioturbation @ 4'							1	0
5		03T	6		-w/sand pockets @ 6'	BDL	BDL	BDL	BDL	BDL	BDL	0	0
		04T	8									0	0
10		05T	10									0	0
		06S	10.5		-w/sand pockets @ 10.5'							1	0
		07S	13		Light gray CLAYEY SAND (SC) w/clay seam							1	0
15		08T	15.5		Reddish brown and light gray very SILTY CLAY (CH)							0	0
		09T	18		Light gray and reddish brown CLAYEY SILT (ML)							0	0
20		10S	19.5		Light gray and reddish brown SANDY SILT (ML) w/sand seams	BDL	BDL	BDL	BDL	BDL	BDL	0	0
		11T	22		Light gray and light reddish brown CLAY (CH)							1	0
					Light gray and light reddish brown CLAYEY SILT (ML)								
		12T	24		Light gray and reddish brown CLAY (CH)							0	0
25		13T	26		-w/silt seams and slickensides @ 26'							1	0
		14T	27.5		-w/silt partings, sand and siltstone seams @ 27.5'							1	0
30		15T	29.5		-w/silt partings @ 29.5'							1	0
		16T	31		-w/slickensides and calcareous nodules below 30'							1	0
		17T	33.5		-w/silt partings and siltstone seams @ 33.5' -tan and light gray @ 34.5'							1	0

SAMPLE IDENTIFICATION
T - 3 in. THIN-WALLED TUBE
S - 2 in. SPLIT-BARREL
A - AUGER

WATER LEVEL DATA

DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT

DATE STARTED: 3-31-86
DATE COMPLETED: 3-31-86
DATE GROUTED: 3-31-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A04-SB09
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 732, 710 E 3,158, 000
GROUND ELEVATION: 50.4'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		18T	35.5		Tan and light gray CLAY (CH)							1	0
		19T	37.5		Tan and light gray SANDY CLAY (CL)								
		20T	39.5		Light gray SILTY SAND (SM)	BDL	BDL	BDL	140	BDL	BDL	1	0
40		21T	41									0 0	
		22T	43									1	
45		23S	45.5									1	0
		24S	47.5									0	0
		25S	49.5									1	0
50		26T	51.5		-very clayey @ 51.5'							0	0
		27T	53									0	0
55		28S	55.5		Light gray SANDY CLAY (SC) w/sand seams	BDL	BDL	BDL	BDL	BDL	BDL	0	0
					Light gray SAND (SP)								
		29T	58		Light gray and reddish brown CLAY (CH)							0	0
60		30T	59.5		-w/slickensides and sand pockets @ 59.5'							0	0
		31T	62		Reddish brown SANDY SILT (ML)							0	0
		32T	64		Light gray and reddish brown CLAY (CH) -w/sand pockets @ 64'							0	0
65		33T	65.5		-w/silt partings @ 65.5'							0	0
					Bottom @ 66'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 In. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 3-31-86
DATE COMPLETED: 3-31-86
DATE GROUTED: 3-31-86

DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A26-SB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 732, 930 E 3,158, 280
GROUND ELEVATION: 50.3'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Dark gray SANDY CLAY (CL) "FILL" w/shells, organics, roots							0	0
		02T	3									0	0
5		03T	5.5		Light gray and tan SANDY CLAY (CL) -w/roots @ 4' -w/ferrous nodules @ 6'							0	0
		04T	8		-very sandy @ 8'							0	0
		05T	9.5									0	0
10		06T	11.5		Tan and light gray very CLAYEY SAND (SC)							0	0
		07T	13.5		Light gray CLAYEY SILT (ML) -reddish brown and light gray @ 14'						BDL	0	0
15		08T	16									0	0
20													
		09T	24.5		Light gray and reddish brown CLAY (CH) w/clayey silt pockets and vertical filled fissures, calcareous nodules							0	0
25		10T	26.5		Light gray and reddish brown SILTY CLAY (CL) w/sand seams							0	0
		11T	28.5		Light gray and reddish brown CLAY (CH) w/slickensides -w/silt partings @ 27' -w/siltstone seams @ 29'							0	0
30		12T	30.5	D							BDL	0	0
		13T	32.5									0	0
		14T	34.5		Light gray and tan CLAYEY SAND (SC)							0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 In. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 7-31-86
DATE COMPLETED: 7-31-86
DATE GROUTED: 7-31-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A26-SB06
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 732, 930 E 3,158, 280
GROUND ELEVATION: 50.3'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		15T	36.5		Light gray and tan CLAYEY SAND (SC) -tan @ 37'							0	0
		16S	38		-gray @ 39'							0	0
40		17S	40									0	0
		18T	44.5									0	0
45		19S	46		Tan and light gray SILTY SAND (SM)						BDL	0	0
		20S	47.5		-light gray below 47'							0	0
50		21T	50									0	0
		22T	53		Tan and light gray CLAYEY SAND (SC) -w/clay seams @ 53'							0	0
55		23T	55		-w/clay balls @ 55'							0	0
		24T	57									0	0
		25T	58.5		Light gray and reddish brown CLAY (CH) w/slickensides, vertical sand seams.							0	0
60		26S	60.5		Reddish brown SILTY SAND (SM)						BDL	0	0
		27T	62.5		Reddish brown CLAY (CL) w/slickensides -w/silt partings @ 63'							0	0
65		28T	65		-brown w/silt partings @ 65'							0	0
		29T	67		w/silt partings							0	0
					Bottom @ 67'								

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 In. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 In. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 7-31-86
DATE COMPLETED: 7-31-86
DATE GROUTED: 7-31-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A26-SB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 732, 620 E 3,158, 630
GROUND ELEVATION: 50.5'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		01T	1		Tan and gray SANDY CLAY (CL) "FILL" w/shells and gravel to 4'							0	0
		02T	4		-w/clay pockets @ 4'							0	0
5		03T	6									0	0
		04T	7.5		Dark gray CLAYEY SAND (SC) w/roots							0	0
10		05T	10		Tan and gray very SANDY CLAY (CL) -w/ferrous and calcareous nodules, roots @ 8'							0	0
		06T	12		-light gray & tan w/ferrous nodules below 12'							0	0
		07T	13.5									0	0
15		08T	15.5									0	0
		09S	17.5		Tan SILTY SAND (SM)						BDL	0	0
20													
25													
					Light gray and reddish brown CLAY (CH)								
30		10T	30.5		Reddish brown SILTY SAND (SM)							0	0
		11T	32.5								BDL	0	0
		12T	34.5		Light gray and reddish brown CLAY (CH) w/siltseams and pockets, slickensides							0	0

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
S - 2 in. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 8-1-86
DATE COMPLETED: 8-1-86
DATE GROUTED: 8-1-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A26-SB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 730, 620 E 3,158, 630
GROUND ELEVATION: 50.5

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		13T	36.5		Light gray and reddish brown CLAY (CH) w/slickensides -w/silt partings @ 35' -w/silty sand seams @ 37'							0	0
		14T	38.5									0	0
40		15T	41									0	0
		16T	43		Light gray and reddish brown slightly SANDY CLAY (CL) -w/calcareous nodules @ 43'							0	0
		17T	44.5									0	0
45		18T	46.5		-sandy @ 46' -w/clay layers @ 47'							0	0
		19T	48.5		-tan and light gray @ 49'							0	0
50		20T	50.5									0	0
		21T	52.5		Reddish brown CLAY (CH) -w/sand pockets, calcareous nodules @ 51' -w/vertical sand seams @ 53'							0	0
55		22T	55									0	0
		23T	55.5		Light gray and reddish brown SANDY SILT(ML)						BDL	1	0
		24T	58.5		Light gray and reddish brown CLAY (CH) -w/vertical silt partings @ 58' -w/slickendsides below 59' -w/calcareous nodules @ 59'							0	0
60		25T	60.5									0	0
		26T	62.5									1	0
65		27T	65									0	0
		28T	66		Reddish brown SILTY SAND (SM)						BDL	3	0
		29S	67.5									0	0
					Reddish brown CLAY (CH)								

SAMPLE IDENTIFICATION	WATER LEVEL DATA			
	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT
T - 3 in. THIN-WALLED TUBE				
S - 2 in. SPLIT-BARREL				
A - AUGER				

DATE STARTED: 8-1-86
DATE COMPLETED: 8-1-86
DATE GROUTED: 8-1-86
DRILLER: Van and Sons
TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

LOG OF SOIL BORING

REMEDIAL INVESTIGATION
SOUTH CAVALCADE SITE
HOUSTON, TEXAS

FIGURE NO.

BORING NO.: SCK-A26-SB07
PROJECT NO.: 85-317
CLIENT: Koppers Company, Inc.
LOCATION: N 732, 620 E 3,158,630
GROUND ELEVATION: 50.5'

DEPTH, FT.	STRATIGRAPHY	SAMPLES	SAMPLE DEPTH	SPLIT (S) DUPLICATE (D)	SOIL CLASSIFICATION	SURROGATE ANALYSES: METALS, PPM: ARSENIC (As)	CHROMIUM (Cr)	COPPER (Cu)	LEAD (Pb)	ZINC (Zn)	TOTAL AROMATIC HYDROCARBONS, PPM	HEADSPACE READING, PPM: LAB	FIELD
		30T	70.5		Reddish brown CLAY (CH) w/slickensides -w/silt partings @ 71'							0	0
		31T	72.5									0	0
75		32T	75									0	0
					Bottom @ 75'								
80													
85													
90													
95													
100													

SAMPLE IDENTIFICATION	WATER LEVEL DATA				
T - 3 in. THIN-WALLED TUBE	DATE	TIME	WATER DEPTH, FT	CAVED DEPTH, FT	DATE STARTED: 8-1-86
S - 2 in. SPLIT-BARREL					DATE COMPLETED: 8-1-86
A - AUGER					DATE GROUTED: 8-1-86
					DRILLER: Van and Sons
					TECHNICIAN: Wayne D. Turney

McBride-Ratcliff and Associates, Inc.

MONITORING WELL INSTALLATION REPORT

PROJECT: South Cavalcade Site

FIGURE: F-1

CLIENT: Koppers Company, Inc.

PROJECT NO. 85-317

DRILLER: Layne-Western Company, Inc.

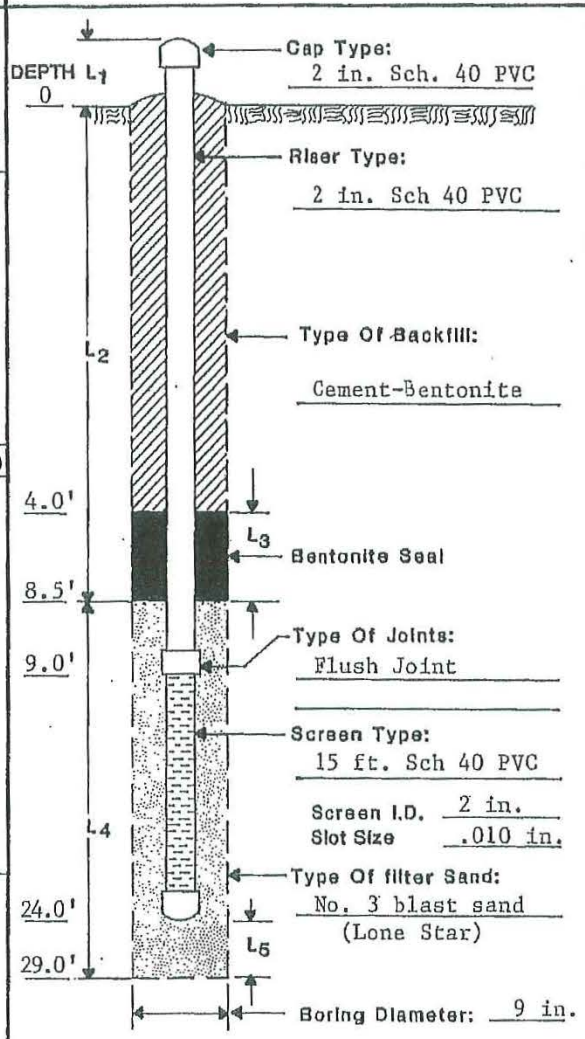
TECHNICAN: P.C. Moore

N 733,700 E 3,157,490

LOG OF BORING NO.

DEPTH - FT	SYMBOL	SAMPLE NO.	FIELD HEADSPACE READING, PPM	LAB HEADSPACE READING, PPM	SAMPLES	MATERIAL DESCRIPTION TOP OF RISER ELEV.53.24'
						Brownish Gray SANDY CLAY (CL)
						-tan @ 4'
5						
						Tan CLAYEY SAND (SC)
10		01S	0	4	X	Light gray & tan SAND (SP) wet
15						
20						Reddish brown CLAY (CH)
25		02A	0	3		
						Bottom @ 29'

MONITORING WELL NO. SCK-MW01



REMARKS

COMPLETION DATE: 7-28-86
WELL DEVELOPMENT DATE: 8-11-86
DEPTH TO WATER : 9.2 ft.
WATER MEASUREMENT DATE: 8-12-86
INSTALLATION METHOD: Hollow-stem auger

CONSTRUCTION DATA

L_1 = 2.9 ft. L_4 = 20.5 ft.
L_2 = 8.5 ft. L_5 = 5 ft.
L_3 = 4.5 ft.

McBride-Ratcliff and Associates, Inc.

006594

MONITORING WELL INSTALLATION REPORT

PROJECT: South Cavalcade Site

FIGURE: F-2

CLIENT: Koppers Company, Inc.

PROJECT NO. 85-317

DRILLER: Layne-Western Company, Inc.

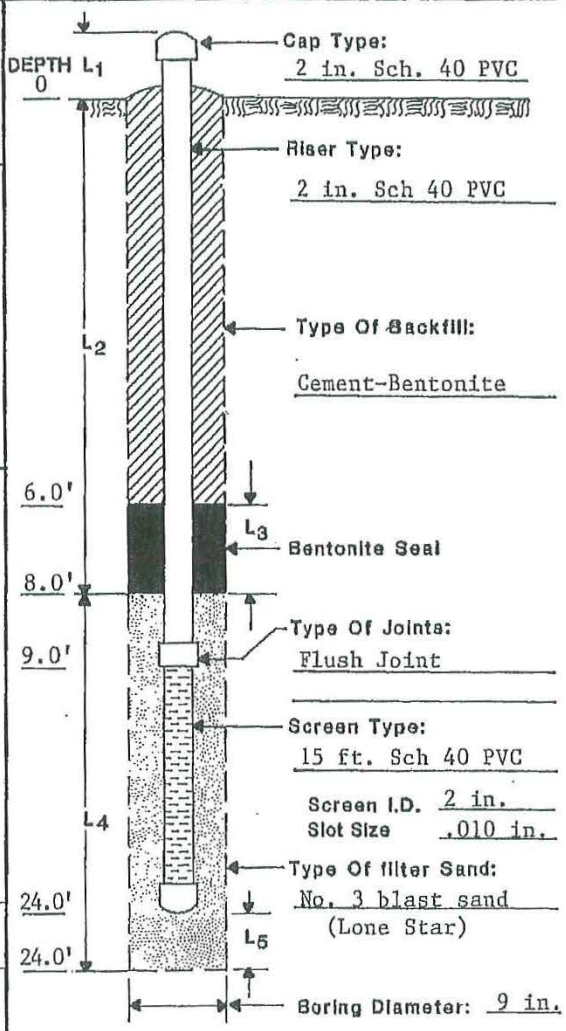
TECHNICAN: P.C. Moore

N 733,230 E 3,157,830

LOG OF BORING NO.

DEPTH - FT	SYMBOL	SAMPLE NO.	FIELD HEADSPACE READING, PPM	LAB HEADSPACE READING, PPM	SAMPLES	MATERIAL DESCRIPTION
						TOP OF RISER ELEV. 52.81'
5						
						Lt. gray & tan SANDY CLAY (CL)
10		01S	0	0	X	Light gray SILTY FINE SAND (SM) wet, w/creosote odor
15						
20						
						Reddish brown CLAY (CH)
25						Bottom @ 24'

MONITORING WELL NO. SCK-MW02



REMARKS

COMPLETION DATE: 7-30-86
WELL DEVELOPMENT DATE: 8-11-86
DEPTH TO WATER : 8.8 ft.
WATER MEASUREMENT DATE: 8-12-86
INSTALLATION METHOD: Hollow stem auger

CONSTRUCTION DATA

L_1 = 3 ft. L_4 = 16 ft.
L_2 = 8 ft. L_5 = 0 ft.
L_3 = 2 ft.

McBride-Ratcliff and Associates, Inc.

006595

MONITORING WELL INSTALLATION REPORT

PROJECT: South Cavalcade Site

FIGURE: F-3

CLIENT: Koppers Company, Inc.

PROJECT NO. 85-317

DRILLER: Layne-Western Company, Inc.

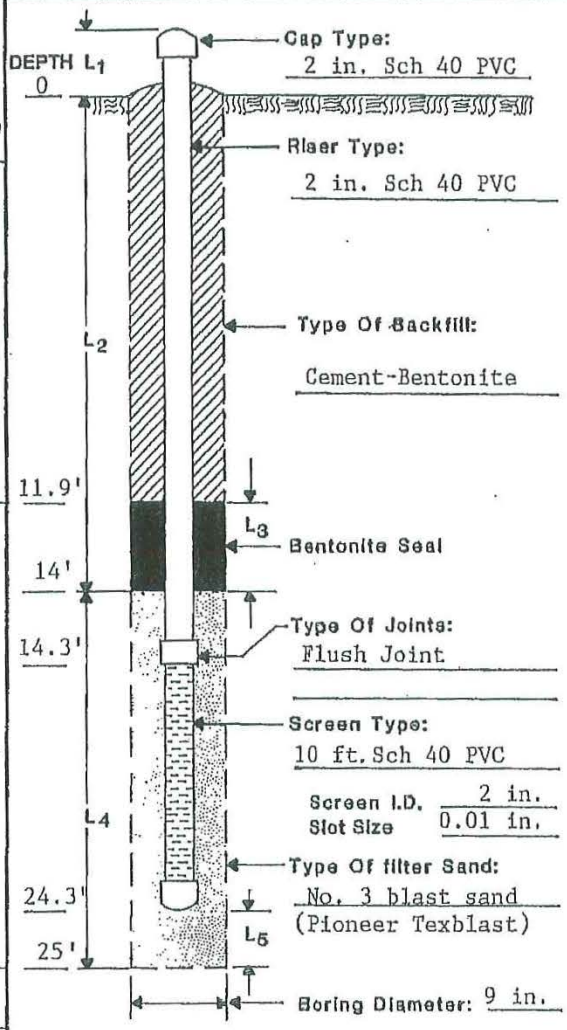
TECHNICAN: W. Turney

N 734,110 E 3,158,440

LOG OF BORING NO.

DEPTH - FT	SYMBOL	SAMPLE NO.	FIELD HEADSPACE READING, PPM	LAB HEADSPACE READING, PPM	SAMPLES	MATERIAL DESCRIPTION
						TOP OF RISER ELEV. 51.20'
5						
10						Light gray and tan SANDY CLAY (CL)
		01T	0	0	■	Tan and light gray SILTY SAND (SM) w/bio-turbation
15						
20						
25						Reddish brown CLAY (CH)
						Bottom @ 25'

MONITORING WELL NO. SCK-MW03



REMARKS

COMPLETION DATE: 11-4-86
WELL DEVELOPMENT DATE: 11-7-86
DEPTH TO WATER : 5.3 ft.
WATER MEASUREMENT DATE: 11-21-86
INSTALLATION METHOD: Hollow-stem auger

CONSTRUCTION DATA

L_1 = 2.3 ft.
L_2 = 14.0 ft.
L_3 = 2.1 ft.
L_4 = 11.0 ft.
L_5 = 0.7 ft.

McBride-Ratcliff and Associates, Inc.

006596

MONITORING WELL INSTALLATION REPORT

PROJECT: South Cavalcade Site

FIGURE: F-25

CLIENT: Houston Transit Consultants

PROJECT NO. 85-317

DRILLER: McClelland Engineers, Inc.

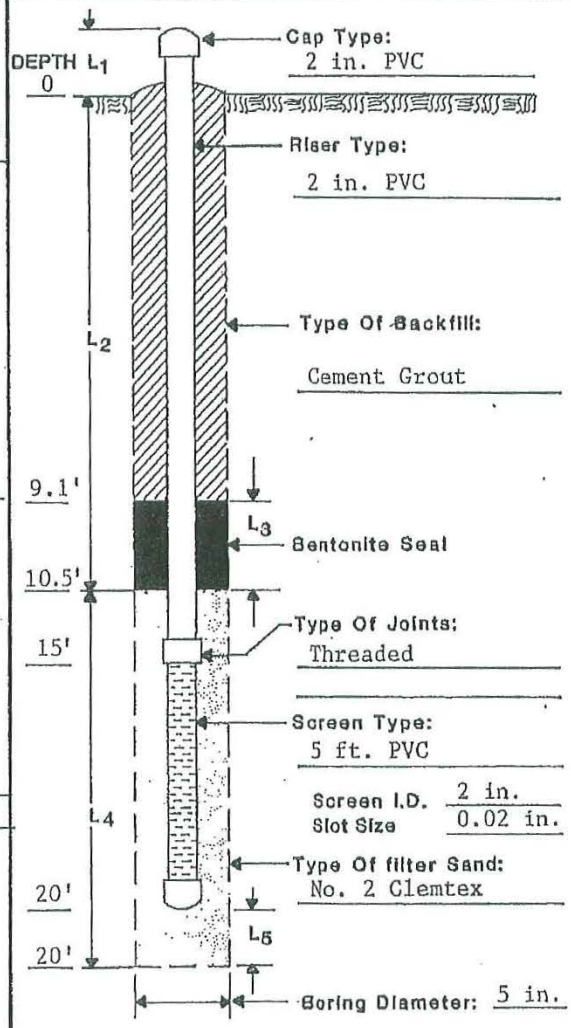
TECHNICAN:

N 733,695 E 3,157,796

LOG OF BORING NO.

DEPTH - FT	SYMBOL	SAMPLE NO.	FIELD HEADSPACE READING, PPM	LAB HEADSPACE READING, PPM	SAMPLES	MATERIAL DESCRIPTION
						TOP OF RISER ELEV. 52.95'
						CLAY (CH)
5						
10						Brown and gray FINE SAND (SP)
15						
						Brown CLAY (CH)
20						Bottom @ 20'
25						

MONITORING WELL NO. CAV-OW-02



REMARKS Well installed by Camp, Dresser & McKee during previous contaminant survey (ref. CDM draft report dated July 11, 1983).

COMPLETION DATE: 2-5-83
WELL DEVELOPMENT DATE:
DEPTH TO WATER : 3.6 ft.
WATER MEASUREMENT DATE: 2-8-83
INSTALLATION METHOD: wet rotary

CONSTRUCTION DATA

L_1 = 2.2 ft. L_4 = 9.5 ft.

L_2 = 10.5 ft. L_5 = 0.0 ft.

L_3 = 1.4 ft.

McBride-Ratcliff and Associates, Inc.

006597

MONITORING WELL INSTALLATION REPORT

PROJECT: South Cavalcade Site

FIGURE: F-27

CLIENT: Houston Transit Consultants

PROJECT NO. 85-317

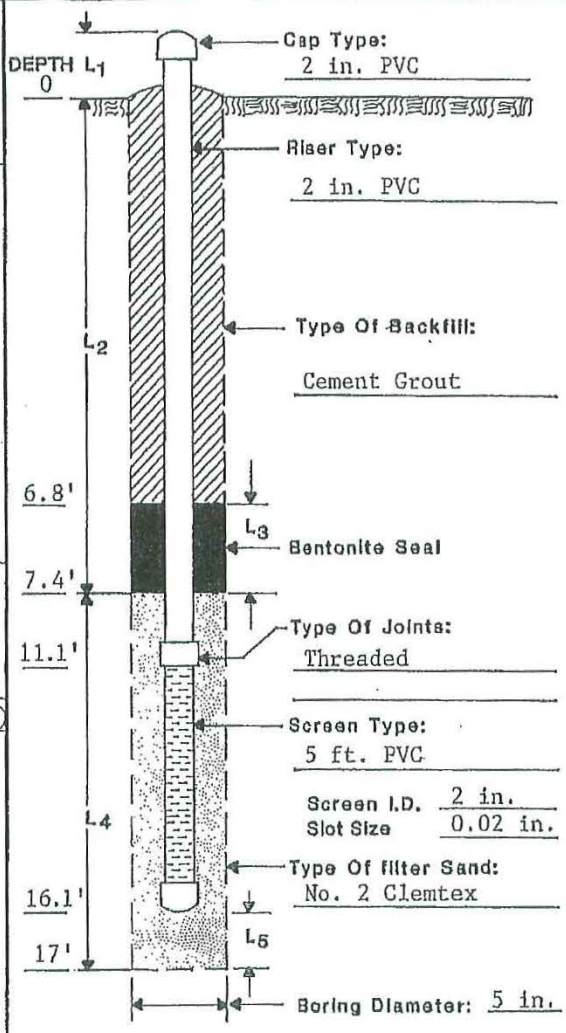
DRILLER: McClelland Engineers, Inc.

TECHNICAN: N 734,241 E 3,157,700

LOG OF BORING NO.

MONITORING WELL NO. CAV-OW-07

DEPTH - FT	SYMBOL	SAMPLE NO.	FIELD HEADSPACE READING, PPM	LAB HEADSPACE READING, PPM	SAMPLES	MATERIAL DESCRIPTION
						TOP OF RISER ELEV. 53.61'
						Brown SANDY CLAY (CL)
5						
10						
						Brown FINE SAND (SP)
15						
						Gray SANDY CLAY (CL) Bottom @ 17'
20						
25						



REMARKS Well installed by Camp, Dresser & McKee during previous contaminant survey (red. CDM draft report dated July 11, 1983).

COMPLETION DATE: 5-3-83
WELL DEVELOPMENT DATE:
DEPTH TO WATER : 8.0 ft.
WATER MEASUREMENT DATE: 5-9-83
INSTALLATION METHOD: wet rotary w/no recirculation of drilling fluid

CONSTRUCTION DATA

L_1 = 2.0 ft. L_4 = 9.6 ft.

L_2 = 7.4 ft. L_5 = 0.9 ft.

L_3 = 0.6 ft.

McBride-Ratcliff and Associates, Inc.

006598

MONITORING WELL INSTALLATION REPORT

PROJECT: South Cavalcade Site

FIGURE: F-28

CLIENT: Houston Transit Consultants

PROJECT NO. 85-317

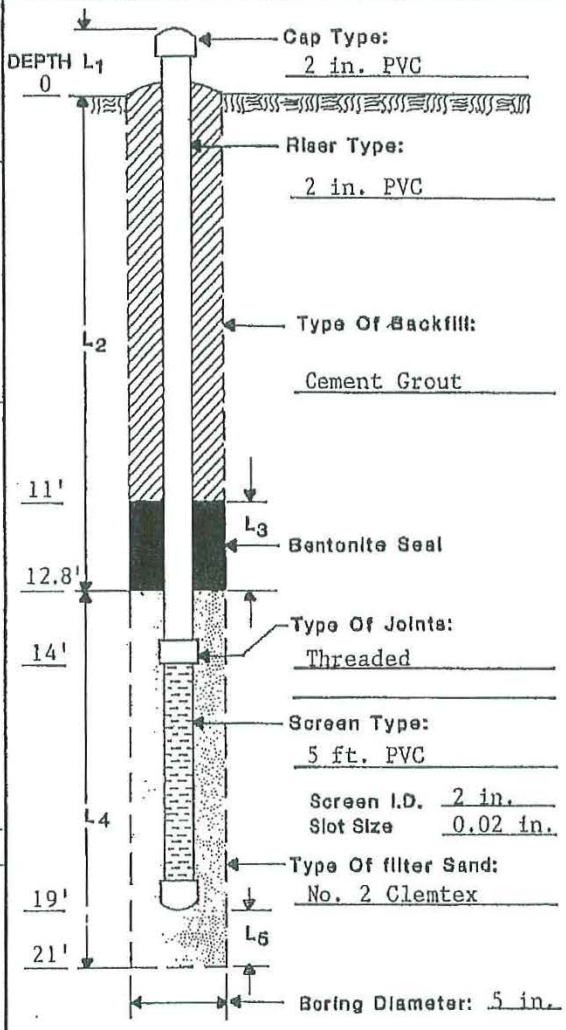
DRILLER: McClelland Engineers, Inc.

TECHNICAN: N 733,241 E 3,157,488

LOG OF BORING NO.

MONITORING WELL NO. CAV-OW-08

DEPTH - FT	SYMBOL	SAMPLE NO.	FIELD HEADSPACE READING, PPM	LAB HEADSPACE READING, PPM	SAMPLES	MATERIAL DESCRIPTION
						TOP OF RISER ELEV. 51.84'
						Brown SANDY CLAY (CL)
5						
						Brown FINE SAND (SP)
10						
15						
20						Brown CLAY (CH) Bottom @ 21'
25						



REMARKS Well installed by Camp, Dresser & McKee during previous contaminant survey (ref. CDM draft report dated July 11, 1983).

COMPLETION DATE: 5-3-83
WELL DEVELOPMENT DATE:
DEPTH TO WATER : 7.9 ft.
WATER MEASUREMENT DATE: 5-9-83
INSTALLATION METHOD: wet rotary w/no recirculation of drilling fluid

CONSTRUCTION DATA

L_1 = 2.0 ft. L_4 = 8.2 ft.

L_2 = 12.8 ft. L_5 = 2.0 ft.

L_3 = 1.8 ft.

McBride-Ratcliff and Associates, Inc.

006599

MONITORING WELL INSTALLATION REPORT

PROJECT: South Cavalcade Site

FIGURE: F-32

CLIENT: Houston Transit Consultants

PROJECT NO. 85-317

DRILLER: McClelland Engineers, Inc.

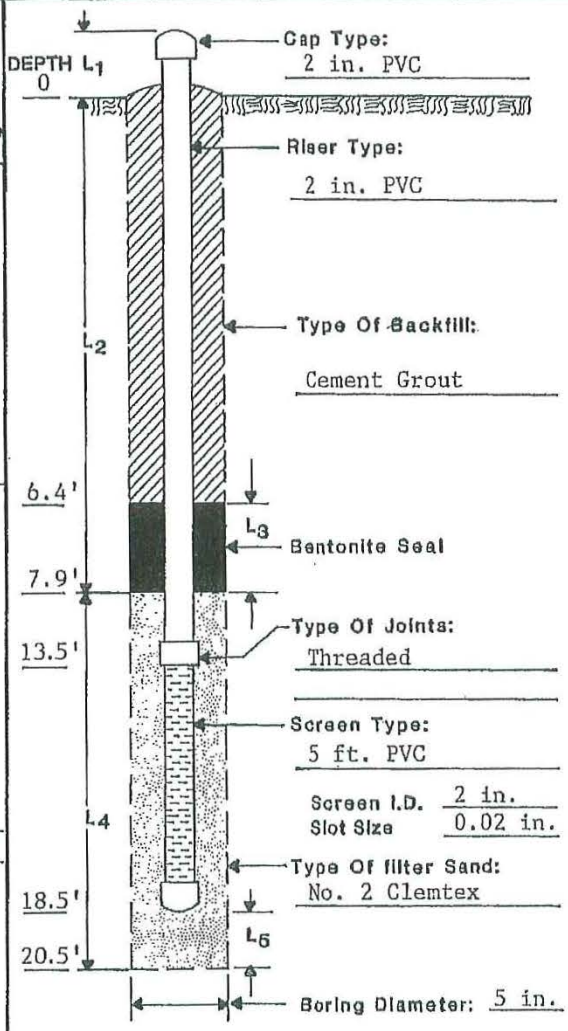
TECHNICAN:

N 733,216 E 3,158,329

LOG OF BORING NO.

MONITORING WELL NO. CAV-OW-13

DEPTH - FT	SYMBOL	SAMPLE NO.	FIELD HEADSPACE READING, PPM	LAB HEADSPACE READING, PPM	SAMPLES	MATERIAL DESCRIPTION
						TOP OF RISER ELEV. 51.07'
						Brown SANDY CLAY (CL)
5						
10						Brown FINE SAND (SP)
15						
20						Brown CLAY (CH)
						Bottom @ 20.5'
25						



REMARKS Well installed by Camp, Dresser & McKee during previous contaminant survey (ref. CDM draft report dated July 11, 1983).

COMPLETION DATE: 5-6-83
WELL DEVELOPMENT DATE:
DEPTH TO WATER : 4.5 ft.
WATER MEASUREMENT DATE: 5-9-83
INSTALLATION METHOD: wet rotary w/no recirculation of drilling fluid

CONSTRUCTION DATA

L_1 = 2.0 ft. L_4 = 12.6 ft.
L_2 = 7.9 ft. L_5 = 2.0 ft.
L_3 = 1.5 ft.

McBride-Ratcliff and Associates, Inc.

006600

MONITORING WELL INSTALLATION REPORT

PROJECT: South Cavalcade Site

FIGURE: F-33

CLIENT: Houston Transit Consultants

PROJECT NO. 85-317

DRILLER: McClelland Engineers, Inc.

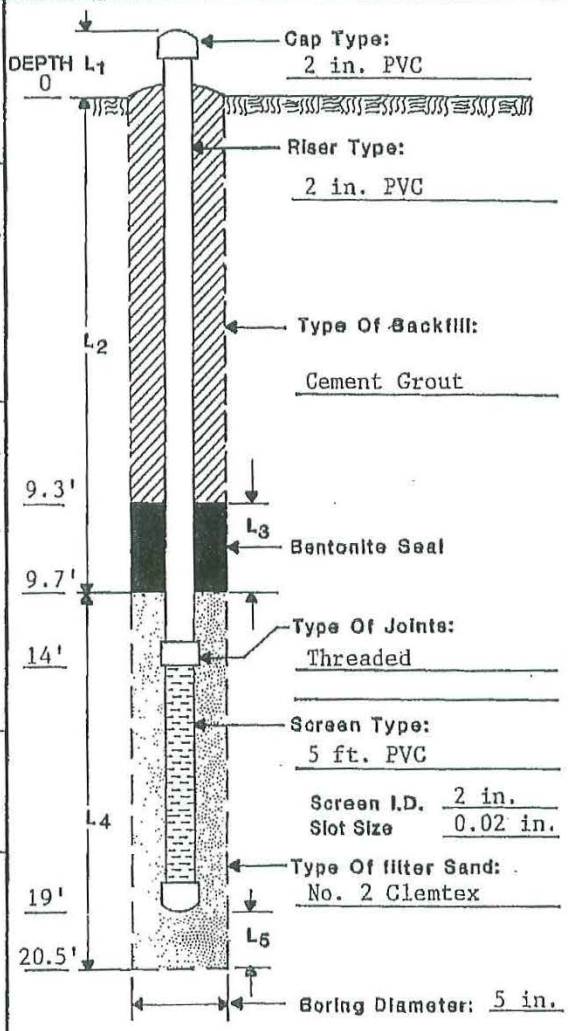
TECHNICAN:

N 733,720 E 3,158,200

LOG OF BORING NO.

DEPTH - FT	SYMBOL	SAMPLE NO.	FIELD HEADSPACE READING, PPM	LAB HEADSPACE READING, PPM	SAMPLES	MATERIAL DESCRIPTION
						TOP OF RISER ELEV. 51.47'
						Dark gray SILTY CLAY (CL)
						Gray SANDY CLAY (CL)
5						
						Intermixed gray SANDY CLAY (CL) and CLAYEY SAND (SC) w/ creosote odors
10						
						Brown FINE SAND (SP) w/creosote odor
15						
						Brown CLAY (CH)
20						
						Bottom @ 20.5'
25						

MONITORING WELL NO. CAV-OW-14



REMARKS Well installed by Camp, Dresser & McKee during previous contaminant survey (ref. CDM draft report dated July 11, 1983).

COMPLETION DATE: 5-2-83
WELL DEVELOPMENT DATE:
DEPTH TO WATER : 5.4 ft.
WATER MEASUREMENT DATE: 5-9-86
INSTALLATION METHOD: wet rotary w/no recirculation of drilling fluid

CONSTRUCTION DATA

L_1 = 2.0 ft.
L_2 = 9.7 ft.
L_3 = 0.4 ft.
L_4 = 10.8 ft.
L_6 = 1.5 ft.

McBride-Ratcliff and Associates Inc

006601

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