

BORING LOG NO. 13-B1

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13824519
E: 3256691**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES						TESTS										
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI		
Approx. Surface Elevation: 18.2 feet																			
	FAT CLAY dark gray, light gray, and tan, medium stiff to stiff, high plasticity, uniform, moist - with scattered roots and calcareous nodules 0 to 6 feet	10.2	8.0	CH	ST	10		2.0		35									
					ST	8		1.5		36	82	76	25	51	98	0.90	8	3	
					ST	8		1.5		35	85								
					ST	14		2.5		26	97				100	0.99	2	0	
		LEAN CLAY light gray and tan, stiff to very stiff, medium plasticity, moist, with silt pockets	6.2	12.0	CL	ST	12		3.0		22		47	19	28	100			
					ST	11		3.0		24	102					1.51	3	0	
		FAT CLAY light gray, tan, and reddish brown, stiff to very stiff, moist - with silt pockets 16 to 20 feet			CH	ST	14		3.0		30	94							
					ST	12		3.25		27	96	71	23	48	100	2.07	5	6	
					ST	15		2.25		27									
					ST	16		2.75		31	91	73	22	51	99				
					ST	20		2.5		31		83	28	55					
					ST	15		2.75		31	91					1.73	3	0	
					ST	12		2.75		33									
					ST	20		2.0		38									
					ST	13		3.75		30	93				100	1.67	2	0	
					ST	15		2.25		32	80								
					ST	15		3.0		41	82				100	1.90	4	14	
					ST	13		2.75		38									
					ST	16		2.75		33	87					1.56	2	0	
					ST	16		2.75		40									
		-21.8 - with ferrous stains below 38 feet		40.0															
		Boring terminated at 40 feet.																	

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 40 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED 3/14/2013	Page 1 of 1
PROJECT NUMBER 92135100	13-B1
	EXHIBIT A-4

BORING LOG NO. 13-B2

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13824926
E: 3256579**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES							TESTS									
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI		
Approx. Surface Elevation: 18.1 feet																			
10.1	FAT CLAY gray, light gray, and tan, stiff to very stiff, high plasticity, moist - with scattered roots 0 to 6 feet	1	CH	ST	12		1.75		36		71	24	47						
		2																	
		3		ST	12		1.25		33	87									
		4																	
		5		ST	17		4.5		23										
		6																	
		7		ST	20		4.5		27	98	93	24	69	97	2.73	2	0		
		8																	
		9																	
		8.0	LEAN CLAY light gray and tan, very stiff, medium plasticity, dry, with silt pockets - with ferrous stains 16 to 18 feet	10	CL	ST	16		4.5		21								
11				ST	19		4.5		21										
12				ST	19		4.5		22										
13																			
14				ST	13		4.0		20	110									
15																			
16				ST	19		3.0		21										
17																			
18				ST	16		3.5		24										
19																			
20																			
-1.9	Boring terminated at 20 feet.																		
20.0																			

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 20 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED
3/17/2013

PROJECT NUMBER
92135100

Page 1 of 1

13-B2

EXHIBIT A-5

BORING LOG NO. 13-B3

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13825398
E: 3257057**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES					TESTS									
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
Approx. Surface Elevation: 18.0 feet																	
1	FAT CLAY light gray, tan, and gray, stiff to hard, high plasticity, moist	1	CH	ST	9		2.0		34								
2		2															
3		3		ST	7		1.75		31	89			95	1.43	4	0	
4		4															
5		5		ST	14		2.0		24								
6		6															
7	- with calcareous nodules 6 to 8 feet	7		ST	9.5		4.0		22	105			93	5.17	3	0	
8		8															
9		9		CL	12		4.5			32	15	17	97				
10	LEAN CLAY light gray and tan, very stiff, medium plasticity, dry, with silt seams	10		ST	11		4.5		24								
11		11															
12		12		CL-ML	15		4.5		23	98							
13		13															
14		14		CH	10		3.25		21	102	58	18	40	99	2.78	6	6
15		15															
16		16		CL	13		3.75		23	101					2.47	9	0
17		17															
18		18															
19	FAT CLAY light gray and tan, very stiff, high plasticity, moist	19		ST	20		3.0		28								
20		20															
21		21		CH	17.5		3.25		31								
22		22															
23	LEAN CLAY light gray, tan, and reddish brown, very stiff, medium plasticity, moist, with silt pockets	23		ST	18		3.0		34								
24		24															
25		25		ST	13		3.0		31	91	82	26	56	100	1.98	8	11
26		26															
27		27		ST	18		3.25		32	89							
28		28															
29		29		ST	14		3.0		38								
30		30															
31		31		ST	12.5		3.25		32	91				100	1.92	2	0
32		32															
33		33		ST	15		3.75		30								
34		34															
35		35		ST	14		3.0		34								
36		36															
37		37		ST	19		3.5		37	82							
38		38															
39		39		ST	18.5		2.25		36								
40		40															
41	- with peat seams 40 to 42 feet	41		ST	18		2.75		35								
42		42															
43	- with organics 42 to 44 feet	43		ST	20		2.0		42								
44		44															
45	- with ferrous stains 44 to 46 feet	45		ST	13		2.25		43		91	28	63				
46		46															
47	- with calcareous nodules 46 to 48 feet	47		ST	20		2.0		43	79	103	30	73	98			
48		48															
49		49		ST	12		2.5		43								
50		50															

Continued Next Page

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 60 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED 3/13/2013	Page 1 of 2
PROJECT NUMBER 92135100	13-B3
	EXHIBIT A-6

BORING LOG NO. 13-B3

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13825398
E: 3257057**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES						TESTS									
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI	
	Approx. Surface Elevation: 18.0 feet																	
/	FAT CLAY reddish brown, light gray, and gray, stiff to very stiff, high plasticity, moist - with ferrous stains 52 to 54 feet - with calcareous nodules 56 to 58 feet	51	ST	15.5	2.25	43	76											
		52	ST	19.5	2.25	41												
		54	ST	12	2.25	31												
		56	ST	20.5	2.5	25	97	58	20	38	96	1.78	13	24				
		57	ST	17.5	2.5	27												
		58																
	Boring terminated at 60 feet.	60																

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 60 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED 3/13/2013
PROJECT NUMBER 92135100

Page 2 of 2
13-B3
EXHIBIT A-6

BORING LOG NO. 13-B4

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13825643
E: 3257568**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES							TESTS								
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI	
Approx. Surface Elevation: 16.2 feet																		
	<p>FAT CLAY gray, light gray, and reddish brown, stiff to hard, high plasticity, moist - with scattered roots 0 to 2 feet - with silt pockets 8 to 16 feet - with calcareous nodules below 14 feet</p>	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	CH	ST	8		2.0		31		66	24	42	91				
					ST	17		1.5		32								
					ST	12		2.0		26	95	74	19	55	97	4.02	8	0
					ST	9		4.5		25	99							
					ST	9		3.0		24		65	21	44	100			
					ST	10		3.0		30								
					ST	18		1.5		24								
					ST	12		3.5		23								
					ST	11		3.75		24								
					ST	13		2.0		34								
	-3.8	20.0																
	Boring terminated at 20 feet.																	

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 20 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED
3/12/2013

PROJECT NUMBER
92135100

Page 1 of 1

13-B4

EXHIBIT A-7

BORING LOG NO. 13-B5

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13826062
E: 3257978**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES						TESTS								
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
Approx. Surface Elevation: 14.6 feet																	
	<p>FAT CLAY gray, reddish brown, and tan, stiff to very stiff, high plasticity, dry - with calcareous nodules 4 to 6 feet</p>	1 2 3 4 5 6 7 8 9	CH	ST	13.5	2.75	27	92									
		10.0			13	2.5	30	91	70	24	46	96	1.69	6	0		
		4.6			12.5	4.5	24										
			12.0			11	4.25	24	101			100	3.41	5	3		
					13	2.25	25										
		<p>FAT CLAY w/ SAND light gray and tan, very stiff, high plasticity, moist, with silt pockets</p>	10 11 12	CH	ST	12	2.75	22	105	52	17	35	81				
					13	2.75	21										
		<p>FAT CLAY light gray, tan, and reddish brown, stiff to very stiff, high plasticity, moist - with silt pockets and calcareous nodules 12 to 14 feet</p>	14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50	CH	ST	10	2.75	21									
					9	2.0	32										
					13	2.0	28	95	77	22	55	100	1.47	3	7		
					11	1.5	42										
					13	2.0	34	89	83	25	58	100	1.57	2	0		
					16	2.75	34										
					17.5	2.25	38	84									
					10	3.0	33										
					15	3.0	32										
		- with ferrous stains 30 to 32 feet			18	2.75	39										
					20.5	2.5	39	82	102	27	75	100					
					18	2.75	41										
					19	2.5	41	81					1.50	3	0		
					20	2.0	45	77									
					14.5	2.5	37										
					19	2.25	41										
					20	2.25	39	81	95	30	65	92	1.39	4	19		
					15	1.75	41										
		- with calcareous nodules 48 to 50 feet			19	1.75	41										

Continued Next Page

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL. REMARKS: **Hollow stem to 60 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED
3/14/2013

PROJECT NUMBER
92135100

Page 1 of 2

13-B5

EXHIBIT A-8

BORING LOG NO. 13-B5

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13826062
E: 3257978**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES						TESTS								
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
Approx. Surface Elevation: 14.6 feet																	
	FAT CLAY light gray, tan, and reddish brown, stiff to very stiff, high plasticity, moist - with calcareous nodules below 56 feet	51	ST	14.5		2.25		37									
		52	ST	17		2.25		26									
		53	ST	14.5		3.0		33	87	69	25	44	97	1.00	2	0	
		54	ST	18		2.5		33	88								
		55	ST	11		2.5		32									
		56															
57																	
58																	
59																	
60																	
-45.4	60.0																
Boring terminated at 60 feet.																	

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 60 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED 3/14/2013
PROJECT NUMBER 92135100

Page 2 of 2
13-B5
EXHIBIT A-8

BORING LOG NO. 13-B6

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13826334
E: 3258845**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES					TESTS									
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
Approx. Surface Elevation: 13.0 feet																	
7.0	FILL: FAT CLAY light gray and tan, stiff to very stiff, high plasticity, moist - with scattered roots 0 to 4 feet	6.0	CH	ST	6		2.75		28								
			CH	ST	9		2.25		29	89	82	21	61	96	1.09	4	0
			CH	ST	17		1.75		38								
5.0	FILL: SILTY SAND light gray and tan, non-plastic, fine-grained, wet, with clay seams	8.0	SM	ST	16				25					44			
			CH	ST	11		2.0		31	91				97	1.47	4	4
			CH	ST	6		1.5		31								
-3.0	FAT CLAY light gray and tan, medium stiff to stiff, high plasticity, moist - with ferrous stains 12 to 14 feet - with organics 14 to 16 feet	16.0	CH	ST	10		1.0		38	84	83	24	59	98			
-5.0		18.0	CH	ST	12		1.0		49								
-7.0	FAT CLAY w/ SAND light gray and tan, medium stiff, high plasticity, moist	20.0	CH	ST	13.5		1.0		21	98	50	15	35	71			
			CL	ST	12		1.5		23	110	43	14	29	73			
			CL	ST	13		2.0		19								
-11.0	LEAN CLAY w/ SAND light gray and tan, stiff, medium plasticity, moist, with silt pockets and ferrous stains	24.0	CH	ST	18		2.5		18	111	41	19	22	63	1.91	8	10
			CH	ST	13		2.75		27								
			CH	ST	15		2.75		43	77	80	28	52	99	1.69	5	0
			CH	ST	13		2.25		39								
			CH	ST	13		2.0		39								
			CH	ST	15.5		2.25		41	81							
			CH	ST	12		2.25		47								
			CH	ST	20		1.75		42	78				100	1.35	4	0
			CH	ST	14		2.0		43								
			CH	ST	17.5		2.0		45	78							
			CH	ST	15		1.75		44								
-33.0		46.0	CH	ST	11		2.5		32								
-35.0	SANDY LEAN CLAY gray, stiff, medium plasticity, wet, with silt pockets	48.0	CL	ST	17		2.0		22	106	27	16	11	60			
			CH	ST	14		2.25		29	92	60	24	36	99	1.91	6	20

Continued Next Page

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL. REMARKS: **Hollow stem to 60 feet.**

WATER LEVEL OBSERVATIONS		
▽ 55 ft	WD	▽
▽		▽



DATE DRILLED 3/15/2013	Page 1 of 2
PROJECT NUMBER 92135100	13-B6
	EXHIBIT A-9

BORING LOG NO. 13-B6

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13826334
E: 3258845**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES						TESTS							
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %
Approx. Surface Elevation: 13.0 feet																
▨	FAT CLAY gray, stiff to very stiff, high plasticity, moist, with silt pockets	51 52 53 54 55 56		ST	15		2.25		28							
▨		57	SC	ST	15		1.0		26							
▨	CLAYEY SAND gray, loose, low plasticity, fine-grained, moist, with silt pockets	58 59		ST	15		1.0		21	108						
▨	SILTY SAND gray, non-plastic, fine-grained, wet	60	SM	ST	16				28							
	Boring terminated at 60 feet.															

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 60 feet.**

WATER LEVEL OBSERVATIONS		
▽ 55 ft	WD	▽
▽		▽



DATE DRILLED
3/15/2013

PROJECT NUMBER
92135100

Page 2 of 2

13-B6

EXHIBIT A-9

BORING LOG NO. 13-B7

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13826140
E: 3259178**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES						TESTS								
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
Approx. Surface Elevation: 12.6 feet																	
8.6	FILL: LEAN CLAY light gray and tan, stiff, medium plasticity, moist - with scattered roots and gravel 0 to 2 feet - with silt pockets 2 to 4 feet	4.0	CL	ST	7		2.0		24	95							
				ST	13		2.0		23								
			CH	ST	13		2.0		24	100	62	18	44	1.55	7	2	
				ST	12		2.75		25	100	62	20	42	90			
				ST	4.5		1.5		24								
				ST	6		1.0		29								
-0.4	FAT CLAY light gray and tan, medium stiff to very stiff, high plasticity, moist - with silt pockets 8 to 12 feet	13.0		ST	15		1.25		32	90							
			CL	ST	15		1.5		17	116	37	14	23	68			
-5.4	SANDY LEAN CLAY light gray, tan, and reddish brown, stiff to very stiff, medium plasticity, moist	18.0		ST	14		4.0		17								
			CH	ST	13.5		4.0		19	109				88	2.69	5	0
-9.4	FAT CLAY light gray and tan, very stiff, high plasticity, moist - with ferrous stains 18 to 20 feet	22.0		ST	15		3.0		21								
			SC-SM	ST	19		2.0		19	111	21	17	4	44			
-13.4	SILTY CLAYEY SAND light gray and tan, loose to medium dense, low plasticity, fine-grained, uniform, wet	26.0		ST	14				19	107				41	0.41	8	10
			CH	ST	13.5		3.25		39	80					0.89	2	0
				ST	14		2.0		37	85							
				ST	14		3.25		34	89	91	27	64	100			
				ST	12		2.75		38								
				ST	14.5		3.0		31								
				ST	14		2.25		44	78				100	0.91	2	0
				ST	15		2.0		41								
				ST	14		2.25		43	79							
				ST	16		2.25		44	78					1.61	5	0
				ST	13.5		1.0		30	93	72	24	48	94			
				ST	17		1.0		23								
				ST	12.5		2.5		32	92				98	1.69	7	0
	- with sand pockets 46 to 50 feet																

Continued Next Page

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 80 feet.**

WATER LEVEL OBSERVATIONS		
▽ 61 ft	WD	▽
▽		▽



DATE DRILLED 3/16/2013	Page 1 of 2
PROJECT NUMBER 92135100	13-B7
	EXHIBIT A-10

BORING LOG NO. 13-B7

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13826140
E: 3259178**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES						TESTS								
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
Approx. Surface Elevation: 12.6 feet																	
-39.4		52.0	51	ST	14.5		1.75		25	99				86	1.53	13	22
	FAT CLAY w/ SAND		52	CH													
	gray, medium stiff, high plasticity, moist		53	ST	12		0.75		24	103							
-43.4		56.0	54														
	FAT CLAY		55	ST	15		1.25		26	96				76	0.71	14	0
	gray, stiff, high plasticity, moist		56	CH													
	- with calcareous nodules 58 to 60 feet		57	ST	14		1.25		30								
-47.4		60.0	58														
	SANDY LEAN CLAY		59	ST	15		2.75		29	93	67	22	45	1.61	3	25	
-49.4		62.0	60	CL													
	gray, stiff, medium plasticity, wet		61	ST	17		1.75		28								
	POORLY GRADED SAND w/ SILT		62	SP-SM													
	gray and light gray, very dense, non-plastic, fine-grained, uniform, wet		63	SS	18	65			27					10			
			64														
			65														
			66														
			67														
			68	SS	18	50/4			22								
			69														
			70														
-59.4		72.0	71														
	POORLY GRADED SAND		72	SP													
	light gray, medium dense to very dense, non-plastic, fine-grained, uniform, wet		73	SS	16	50/4			21					4			
			74														
			75														
			76														
			77	SS		24			20								
			78														
			79														
-67.4		80.0	80	SS													
Boring terminated at 80 feet.																	

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL. REMARKS: **Hollow stem to 80 feet.**

WATER LEVEL OBSERVATIONS		
▽ 61 ft	WD	▽
▽		▽



DATE DRILLED 3/16/2013	Page 2 of 2
PROJECT NUMBER 92135100	13-B7
	EXHIBIT A-10

BORING LOG NO. 13-B8

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13825760
E: 3259559**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES						TESTS							
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %
Approx. Surface Elevation: 15.0 feet																
-41.0	FAT CLAY light gray, tan, and reddish brown, stiff to very stiff, high plasticity, damp	51	ST	10		3.0		25	100							
		52	ST	16		2.75		27								
-45.0	FAT CLAY w/ SAND gray, very stiff, high plasticity, moist	54	ST	12		2.25		22								
		55	ST	12		2.25		22								
-45.0	Boring terminated at 60 feet.	56														
		57	CH	13		2.75		22	102			82	1.33	14	0	
		58														
		59	ST	10.5		3.0		25								
		60														

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 60 feet.**

WATER LEVEL OBSERVATIONS		
▽ 56 ft	WD	▽
▽		▽



DATE DRILLED
3/18/2013

PROJECT NUMBER
92135100

Page 2 of 2

13-B8

EXHIBIT A-11

BORING LOG NO. 13-B9

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13825129
E: 3258916**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES							TESTS								
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI	
Approx. Surface Elevation: 18.9 feet																		
	<p>FAT CLAY light gray, tan, and reddish brown, medium stiff to very stiff, high plasticity, damp - with scattered roots 0 to 2 feet - with calcareous nodules 2 to 6 feet</p> <p style="text-align: center;">- with ferrous stains 14 to 16 feet</p> <p style="text-align: center;">- with slickensides 28 to 30 feet</p>	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	CH	ST	10	2.75	36											
		ST	13	1.75	35	81							0.74	4	0			
		ST	12	4.5	24	99	79	23	56	96	2.06	1	2					
		ST	12	3.25	28	94												
		ST	10	3.0	22													
		ST	12	2.25	21	103				100	2.51	5	0					
		ST	20	2.5	25													
		ST	17	2.5	23	105	60	20	40	99								
		ST	16	2.25	25													
		ST	13.5	2.75	29	92				99	0.86	1	0					
		ST	15	3.25	32													
		ST	15.5	3.0	30	92												
		ST	14	2.5	29	92	74	23	51	100	0.72	1	10					
		ST	16	3.25	32													
		ST	14	3.0	34	89					1.39	2	0					
		ST	14	2.25	37													
		ST	13	2.75	38													
		ST	13	2.75	39	82				100	1.41	4	15					
		ST	17	3.0	35													
		ST	12.5	2.75	40	81												
		Boring terminated at 40 feet.	40															

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL. REMARKS: **Hollow stem to 40 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED
3/18/2013

PROJECT NUMBER
92135100

Page 1 of 1

13-B9

EXHIBIT A-12

BORING LOG NO. 13-B10

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13824876
E: 3258432**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES						TESTS								
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
Approx. Surface Elevation: 18.4 feet																	
	<p>FAT CLAY dark gray, light gray, and tan, stiff to very stiff, high plasticity, damp</p> <p>- with scattered roots 0 to 2 feet</p> <p>- with calcareous nodules 4 to 10 feet</p>	<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20</p>	<p>CH</p>	<p>ST</p>	<p>9</p>	<p>2.0</p>	<p>36</p>										
	<p>- with silt pockets 14 to 18 feet</p>																
	<p>- with calcareous nodules below 18 feet</p>																
	<p>Boring terminated at 20 feet.</p>																

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL. REMARKS: **Hollow stem to 20 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED
3/19/2013

PROJECT NUMBER
92135100

Page 1 of 1

13-B10

EXHIBIT A-13

BORING LOG NO. 13-B11

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13824472
E: 3258049**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES							TESTS								
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI	
Approx. Surface Elevation: 19.7 feet																		
	FAT CLAY light gray, tan, and reddish brown, stiff to very stiff, high plasticity, moist - with calcareous nodules and ferrous stains 4 to 12 feet	1	CH	ST	13		3.5		32	86				99	1.08	2	0	
		2		ST	15		1.75											
		3		ST	12		2.0		29	93	70	27	43	97				
		4		ST	14		2.25		32	90					1.65	2	0	
		5		ST	14		3.25		28	96				99	1.39	1	4	
		6		ST	13		3.25		29									
		7		ST	19.5		3.0		28	96	70	24	46	100	1.40	6	5	
		8		ST	13		2.5		29	94								
		9		ST	18.5		2.0		23									
		10		ST	17.5		3.0		28	96					1.03	5	0	
		11		ST	13.5		3.0		28									
		12		ST	14.5		3.25		32	90								
		13		ST	15		3.25		29									
		14		ST	18		3.25		28	95	77	23	54	100				
		15		ST	19.5		3.25		35									
		16		ST	11		3.0		30	93								
		17		ST	18.5		3.25		33	88					1.51	3	14	
		18		ST	14.5		2.75							100				
		19		ST	16.5		2.75		37									
		20		ST	14.5		3.0		39	83								
	21																	
	22																	
	23																	
	24																	
	25																	
	26																	
	27																	
	28																	
	29																	
	30																	
	31																	
	32																	
	33																	
	34																	
	35																	
	36																	
	37																	
	38																	
	39																	
	40																	

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 40 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED 3/17/2013	Page 1 of 1
PROJECT NUMBER 92135100	13-B11
	EXHIBIT A-14

BORING LOG NO. 13-B12

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13824194
E: 3257515**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES							TESTS							
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
Approx. Surface Elevation: 19.0 feet																	
/	FAT CLAY dark gray, light gray, and tan, very stiff, high plasticity, moist - with scattered roots 0 to 6 feet	1 2 3 4 5 6 7 8 9 10 11 12	CH	ST	5		2.5	34									
/		13		ST	10		2.5	35	82	87	28	59	97				
/		14		ST	10		2.5	29									
/		15		ST	15		4.0	30	94				98	2.40	2	0	
/		16		ST	9		4.0	24									
/	7.0	12.0		ST	12		2.75	30									
/	LEAN CLAY light gray and tan, very stiff, medium plasticity, damp, with silt pockets	13 14	CL	ST	18		3.0	31	41	17	24						
/		15	CH	ST	10		2.75	27									
/		16		ST	18		2.75	27	64	22	42	100					
/	FAT CLAY light gray and tan, very stiff, high plasticity, damp, with ferrous stains and silt pockets - with silt seams 14 to 16 feet	17 18 19		ST	16		3.5	24									
	-1.0	20.0															
	Boring terminated at 20 feet.																

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 20 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED 3/19/2013	Page 1 of 1
PROJECT NUMBER 92135100	13-B12
	EXHIBIT A-15

BORING LOG NO. 13-B13

CLIENT: **Quaternary Resource Investigations
Baton Rouge, Louisiana**

PROJECT: **Cedar Bayou - Alternate 47**

BORING LOCATION: **N: 13824816
E: 3257327**

SITE: **New Placement Area
Cedar Bayou, Texas**

Graphic Log	DESCRIPTION	DEPTH, FEET	SAMPLES							TESTS									
			USCS SYMBOL	TYPE	RECOVERY, IN	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TORVANE, TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI		
Approx. Surface Elevation: 18.0 feet	FAT CLAY dark gray, light gray, and tan, medium stiff to very stiff, high plasticity, moist	1	CH	ST	6		2.0		38										
		2		ST	10		1.5		40	77	87	26	61	98	0.63	3	0		
		3		ST	15		1.5		40										
		4		ST	12		1.5		29	94				96					
		5		ST	9		4.5		23										
		6		ST	12		4.0		22										
		7	6.0	12.0															
		8	LEAN CLAY light gray and tan, very stiff, medium plasticity, moist	13	CL	ST	15		3.0		21	41	17	24	97				
		9		ST	10		3.25		23										
		10	2.0	16.0															
		11	FAT CLAY light gray and tan, very stiff, high plasticity, moist	17	CH	ST	16		3.75		29								
		12		ST	10		2.5		32										
13	-2.0	20.0																	
Boring terminated at 20 feet.		20																	

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: **Hollow stem to 20 feet.**

WATER LEVEL OBSERVATIONS	
▽	▽
▽	▽
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS	



DATE DRILLED
3/12/2013

PROJECT NUMBER
92135100

Page 1 of 1

13-B13

EXHIBIT A-16

